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.21) – APRIL 2015

PREPARED FOR
CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT (CEDD)

Date	Reference No.	Prepared By	Certified By
13 May 2015	TCS00670/13/600/R0369v2		
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Version	Date	Remarks
1	8 May 2015	First Submission
2	13 May 2015	Amended according to the IEC's comments on 11 May 2015

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By Email & Post

Attention: Mr Simon LEUNG

Dear Sirs

Agreement No. CE 45/2008 (CE)
Liantang/Heung Yuen Wai Boundary Control Point and Associated Works
Independent Environmental Checker – Investigation
Monthly EM&A Report (No. 21) – April 2015

With reference to the Monthly EM&A Report No. 21 for April 2015 (Version 2) certified by the ET Leader provided to us on 14 May 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 / Mr Eric CHAN / 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 **21th** monthly EM&A report presenting the monitoring results and inspection findings for the reporting period from **1 to 30 April 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**	**102**
	24-hour TSP	**6**	**30**
Construction Noise	$L_{eq(30min)}$ Daytime	**8**	**40**
Water Quality	Water sampling	**3 (Contract 2&3)**	**13(*)**
		2 (Contract 5)	**11(*)**
Joint Site Inspection / Audit	IEC, ET, the Contractor and RE joint site Environmental Inspection and Auditing	**Contract 2**	**5**
		Contract 3	**4**
		Contract 5	**5**

(*) *Monitoring day*

BREACH OF ACTION AND LIMIT (A/L) LEVELS

ES04 In the Reporting Period, no noise exceedance was registered for the Project. However, 1 Limit Level exceedance of 24-hour for air quality exceedance was recorded at AM3 and a total of thirteen (13) water quality exceedances were recorded at W1 and W4. 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	**1**	**1**	Not project related	**N/A**
Construction Noise	$L_{eq(30min)}$ Daytime	0	0	0	--	--
Water Quality	DO	0	**7**	**7**	All exceedances were not project related	**N/A**
	Turbidity	0	**3**	**3**	All exceedances were not project related	**N/A**
	SS	0	**3**	**3**	All exceedances were not project related	**N/A**

ENVIRONMENTAL COMPLAINT

ES05 In this Reporting Period, no environmental complaint in relation to the EM&A Programme was recorded.

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 **1**, **10**, **17**, **24** and **29 April 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 **8**, **15**, **20** and **27 April 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 **2**, **9**, **16**, **23** and **30 April 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.

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1 INTRODUCTION

1.1 PROJECT BACKGROUND

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

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 **21st** monthly EM&A report presenting the monitoring results and inspection findings for reporting period from **1** to **30 April 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*

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

2 PROJECT ORGANIZATION AND CONSTRUCTION PROGRESS

2.1 CONSTRUCTION CONTRACT PACKAGING

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

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

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

Contract 2 (CV/2012/08)

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

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

Contract 3 (CV/2012/09)

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

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

Contract 4 (Contract number to be assigned)

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

Contract 5 (CV/2013/03)

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

- site formation of about 23 hectares of land for the development of the BCP;
- construction of an approximately 1.6 km long perimeter road at the BCP including a 175m long depressed road;

- associated diversion/modification works at existing local roads and junctions including Lin Ma Hang Road;
- construction of pedestrian subway linking the BCP to Lin Ma Hang Road;
- provision of resite area with supporting infrastructure for reprovisioning of the affected village houses; and
- construction of associated footpath, slopes, retaining structures, drainage, sewerage, waterworks, landscaping works and other ancillary works.

Contract 6 (CV/2013/08)

2.1.7 Contract 6 is still yet awarded. Major Scope of Work of the Contract 6 would be included below:

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

2.2 PROJECT ORGANIZATION

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

Civil Engineering and Development Department (CEDD)

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

Environmental Protection Department (EPD)

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

Engineer or Engineers Representative (ER)

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

- Monitor the Contractors' compliance with contract specifications, including the implementation and operation of the environmental mitigation measures and their effectiveness
- Monitor Contractors's, ET's and IEC's compliance with the requirements in the Environmental Permit (EP) and EM&A Manual
- Facilitate ET's implementation of the EM&A programme
- Participate in joint site inspection by the ET and IEC
- Oversee the implementation of the agreed Event / Action Plan in the event of any exceedance
- Adhere to the procedures for carrying out complaint investigation
- Liaison with DSD, Engineer/Engineer's Representative, ET, IEC and the Contractor of the "Construction of the DSD's 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 (Environmental Permit EP-430/2011);

(b) Building works and road works by contractors of Architectural Services Department (ArchSD) (Environmental Permit EP-404/2011/B);

(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 for Tunnel Boring Machine (TBM) • South Bound Tunnel Bench excavation • North Bound Top heading excavation (canopies) • TBM onsite assembly + testing and commissioning • MS (water treatment system) testing and commissioning
South Portal	• Temporary Slope Cut with Soil Nails Installation • 2nd Wetsep Delivery + testing and commissioning
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
- Demolition of central divider at Fanling Highway
- E&M work for new valve control & Telemetry House
- Erection of temporary support at DSD nullah for Bridge E
- 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
- Pre-drilling works
- Road works at Fanling Highway
- Sewer works at Tai Wo Service Road West (TWSRW)
- Tree felling works
- Utilities duct laying
- Waterworks

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
- Waterproofing and backfilling works for Western pedestrian subway & staircase at LMH
- 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, Box 4 & construction of sedimentation tank) at BCP Area
- 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

Item	Description	License/Permit Status	
		GW-RN0087-15	Valid 23 Feb 2015 - 22 May 2015
		GW-RN0195-15	Valid 30 Mar 2015 - 30 May 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-RN0684-14	Valid on 16 Nov 2014 till 26 Apr 2015
		GW-RN0095-15	Valid on 24 Feb 2015 till 18 Jul 2015
		GW-RN0129-15	Valid on 3 Mar 2015 till 30 May 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
Contract 5			
1	Air pollution Control (Construction Dust) Regulation	Ref. No: 359338	Notified EPD on 13 May 2013
2	Chemical Waste Producer Registration	Waste Producers Number No.: 5213-642-S3735-01	Valid form 8 Jun 2013 till the end of Contract
3	Water Pollution Control Ordinance - Discharge License	No.: W5/1G44/1	Valid from 8 Jun 13 to 30 Jun 2018
4	Waste Disposal Regulation - Billing Account for Disposal of Construction Waste	Account No. 7017351	Valid form 29 Apr 13 till the end of Contract
5	Construction Noise Permit	NA	NA

3 SUMMARY OF IMPACT MONITORING REQUIREMENTS

3.1 GENERAL

3.1.1 The Environmental Monitoring and Audit requirements are set out in the Approved EM&A manual. Environmental issues such as air quality, construction noise and water quality were identified as the key issues during the construction phase of the Project.

3.1.2 A summary of construction phase EM&A requirements are presented in the sub-sections below.

3.2 MONITORING PARAMETERS

3.2.1 The EM&A program of construction phase monitoring shall cover the following environmental issues:

- Air quality;
- Construction noise; and
- Water quality

3.2.2 A summary of the monitoring parameters is presented in ***Table 3-1.***

Table 3-1 Summary of EM&A Requirements

Environmental Issue	Parameters
Air Quality	• 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

Wind Data Monitoring Equipment

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

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

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

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

Noise Monitoring

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

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

Table 3-6 Construction Noise Monitoring Equipment

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

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

Water Quality Monitoring

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

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

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

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

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

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

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

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

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

Table 3-7 Water Quality Monitoring Equipment

Equipment	Model
Water Depth Detector	Eagle Sonar or tape measures
Water Sampler	A 2-litre transparent PVC cylinder with latex cups at both ends or teflon/stainless steel bailer or self-made sampling bucket
Thermometer & DO meter	YSI Professional Plus / YSI 6820/650MDS / YSI PRO20 Handheld Dissolved Oxygen Instrument / YSI 550A Multifunctional Meter
pH meter	YSI Professional Plus / YSI 6820/650MDS / AZ8685 pH pen-style meter
Turbidimeter	YSI Professional Plus / YSI 6820/650MDS / Hach 2100Q
Sample Container	High density polythene bottles (provided by laboratory)
Storage Container	'Willow' 33-liter plastic cool box with Ice pad

3.6 MONITORING METHODOLOGY

1-hour TSP Monitoring

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

In-situ Measurement

3.6.14 YSI PRO20 Handheld Dissolved Oxygen Instrument or YSI 550A Multifunctional Meter is used for water in-situ measures, which automates the measurements and data logging of temperature, dissolved oxygen and dissolved oxygen saturation.

3.6.15 A portable AZ Model 8685 pH pen-style meter is used for in-situ pH measurement. The pH meter is capable of measuring pH in the range of 0 – 14 and readable to 0.1.

3.6.16 A portable Hach 2100Q Turbidimeter is used for in-situ turbidity measurement. The turbidity meter is capable of measuring turbidity in the range of 0 – 1000 NTU.

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

Laboratory Analysis

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

3.7 EQUIPMENT CALIBRATION

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

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

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

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

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

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

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

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

Monitoring Station	Action Level (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 ***102*** 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
8-Apr-15	61	1-Apr-15	10:25	82	72	59
14-Apr-15	82	9-Apr-15	14:24	255	248	216
20-Apr-15	50	13-Apr-15	11:18	116	106	108
25-Apr-15	68	18-Apr-15	12:36	68	66	69
30-Apr-15	59	24-Apr-15	10:49	139	81	93
		29-Apr-15	10:50	98	84	98
Average (Range)	**64 (50-82)**	Average (Range)		**114 (59 – 255)**		

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
8-Apr-15	103	1-Apr-15	10:18	75	64	54
14-Apr-15	139	9-Apr-15	14:13	238	233	246
22-Apr-15#	83	13-Apr-15	11:00	105	95	95
25-Apr-15	142	18-Apr-15	12:56	55	64	78
30-Apr-15	101	24-Apr-15	10:33	120	82	67
		29-Apr-15	10:39	110	104	124
Average (Range)	**114 (83-142)**	Average (Range)		**112 (54 – 246)**		

Remark: monitoring was changed from 20 Apr 2015 to 22 Apr 2015 due to power failure.

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
8-Apr-15	90	1-Apr-15	10:01	76	65	51
14-Apr-15	**519**	9-Apr-15	14:02	223	247	232
20-Apr-15	85	13-Apr-15	10:56	133	109	141

Date	24-hour TSP (μg/m³)	1-hour TSP (μg/m³)				
		Date	Start Time	1st reading	2nd reading	3rd reading
25-Apr-15	67	18-Apr-15	12:58	65	60	74
30-Apr-15	61	24-Apr-15	10:24	131	87	74
		29-Apr-15	10:31	86	71	62
Average (Range)	**164 (64-519)**	Average (Range)		**110 (51 – 247)**		

Remark: bold and underline value indicated Limit Level exceedance.

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
8-Apr-15	74	8-Apr-15	13:50	55	45	47
14-Apr-15	132	14-Apr-15	9:58	43	43	58
20-Apr-15	85	20-Apr-15	10:47	103	90	91
25-Apr-15	129	25-Apr-15	10:03	106	115	107
30-Apr-15	113	30-Apr-15	10:12	96	78	83
Average (Range)	**107 (73-132)**	Average (Range)		**77 (43 – 115)**		

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
8-Apr-15	60	8-Apr-15	14:12	69	52	72
14-Apr-15	95	14-Apr-15	10:34	49	50	52
20-Apr-15	55	20-Apr-15	10:59	91	81	81
25-Apr-15	59	25-Apr-15	10:34	95	109	92
30-Apr-15	53	30-Apr-15	10:20	124	86	90
Average (Range)	**64 (53-95)**	Average (Range)		**80 (49 – 124)**		

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
8-Apr-15	78	1-Apr-15	09:40	121	114	107
14-Apr-15	118	9-Apr-15	09:56	163	143	123
20-Apr-15	49	13-Apr-15	10:04	119	104	94
25-Apr-15	75	18-Apr-15	12:53	61	55	57
30-Apr-15	52	24-Apr-15	09:52	87	72	67
		29-Apr-15	10:00	84	64	57
Average (Range)	**74 (52-118)**	Average (Range)		**94 (55 - 163)**		

4.2.2 As shown in ***Tables 4-1 to 4-6***, all the 1-hour TSP monitoring results were below the Action/Limit Levels. However, one Limit Level exceedance of 24-hour TSP was recorded at AM3 on 14 April 2015. Notification of Exceedance (NOE) was issued to relevant parties upon confirmation of the monitoring result. The investigation for cause of exceedance has been completed and the result is presented in below.

4.2.3 According to the information provided by the Contractor (SRJV), the active construction activities on 14 April 2015 were conducted at the BCP area which about 400m away from AM3

and the works area in Lin Ma Hang Road which close to AM3 was idled.

4.2.4 During the course of monitoring on 14 April 2015, it was observed that a covered soil stockpile was placed next to the HVS at AM3 and this stockpile was not belonged to the SRJV. As reported by our monitoring team and SRJV, construction of concrete slab for flag post was carried out right next to AM3 by other contractor in mid-April 2015. On the other hand, no construction activities were observed for SRJV near AM3 and the adjoined Lin Ma Hang Road.

4.2.5 During regular weekly site inspection by ET in April 2015, it was noted that the works area near AM3 and the adjoined Lin Ma Hang Road was idled. Water bowser was arranged daily on the Lin Ma Hang Road as dust suppresser measures and the road surface was wetted.

4.2.6 During site inspection on 30 April 2015, it was noted that the stockpile was removed but some construction waste was stored near AM3 by other contractor. There were no exceedances recorded in the subsequent 24-hour TSP monitoring results on 20 and 25 April 2015. Based on the above investigation, it is concluded that the exceedance was likely due to the works by other contractor and not related to the construction activities under Contract 5

4.2.7 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 **40** event noise measurements were carried out at the designated locations. The sound level meter was set in 1m from the exterior of the building façade including noise monitoring locations NM1, NM2, NM5, NM6, NM7, NM8 and NM9. Therefore, no façade correction (+3 dB(A)) is added according to acoustical principles and EPD guidelines. However, free-field status was performed at NM10. So, façade correction (+3 dB(A)) has added according to the requirement in this month. The noise monitoring results at the designated locations are summarized in ***Table 5-1.*** The detailed noise monitoring data are presented in ***Appendix I*** and the relevant graphical plots are shown in ***Appendix J***.

Table 5-1 Summary of Construction Noise Monitoring Results

Construction Noise Level ($L_{eq30min}$), dB(A)									
Date	**NM1**	**NM2**	**NM8**	**NM9**	**NM10(*)**	**Date**	**NM5**	**NM6**	**NM7**
9-Apr-15	54	59	58	58	64	8-Apr-15	61	60	62
13-Apr-15	56	59	57	58	65	14-Apr-15	59	60	62
18-Apr-15	56	60	60	59	71	20-Apr-15	52	60	63
24-Apr-15	54	56	58	61	65	25-Apr-15	52	60	54
29-Apr-15	51	59	58	55	58	30-Apr-15	52	61	66
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, construction work was carried out at South Portal of Contract 2 during public holiday between 3 to 7 April 2015 and therefore there were **thirteen (13)** sampling days for at the related water monitoring location WM4, WM4-Control A & WM4-Control B. For WM1 and WM1-Control, **eleven (11)** sampling days of water quality monitoring was conducted

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
1-Apr-15	**2.60**	5.81	2.71	5.90	5.72	6.71	5.5	7.0	7.5
3-Apr-15	**2.21**	4.60	1.74	7.46	6.00	5.88	6.0	3.0	3.0
6-Apr-15	**2.32**	4.98	1.61	5.82	4.14	5.48	12.5	3.5	4.0
9-Apr-15	4.92	5.24	2.05	13.55	7.39	9.83	12.5	7.0	4.5
11-Apr-15	5.91	5.34	4.52	31.20	13.80	17.80	30.0	11.5	10.5
13-Apr-15	5.06	6.68	2.93	10.85	4.71	7.65	9.5	4.5	6.0
16-Apr-15	6.41	7.05	4.66	19.10	5.84	6.64	24.0	8.5	6.0
18-Apr-15	4.68	5.07	1.93	18.90	5.68	8.70	23.5	4.0	8.0
20-Apr-15	4.76	5.36	3.85	13.45	3.30	7.15	19.5	2.0	10.0
22-Apr-15	4.15	6.13	2.53	11.50	4.59	7.21	19.5	2.0	10.0
24-Apr-15	4.29	7.01	4.65	11.35	2.91	10.40	15.0	3.0	9.0
27-Apr-15	**3.38**	3.88	1.13	10.30	5.01	5.55	10.5	5.0	6.0
29-Apr-15	**3.62**	3.16	1.06	9.55	4.62	6.49	16.0	4.5	8.5

Remark: bold and underline value 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
#1-Apr-15	3.41	6.26	28.3	12.6	26.0	10.0
#9-Apr-15	1.61	4.55	116.5	195.5	76.5	93.0
11-Apr-15	6.84	8.21	605.5	864.5	263.0	374.5
#13-Apr-15	2.04	3.38	161.0	94.1	100.0	51.5
16-Apr-15	6.28	5.97	47.8	84.8	44.5	56.0
18-Apr-15	8.00	4.54	**82.6**	53.9	**83.0**	42.5
20-Apr-15	**2.72**	6.40	**183.0**	39.7	**174.0**	31.0

Date	Dissolved Oxygen (mg/L)		Turbidity (NTU)		Suspended Solids (mg/L)	
	WM1	WM1-Control	WM1	WM1-Control	WM1	WM1-Control
22-Apr-15	***2.72***	5.63	***187.0***	34.6	***174.0***	28.0
#24-Apr-15	6.01	6.60	97.5	34.8	104.0	21.0
#27-Apr-15	6.64	7.74	94.5	58.2	63.5	45.0
#29-Apr-15	7.86	6.72	45.1	33.0	17.0	24.0

Remark:

i. bold and underlined indicated Limit Level exceedance.

ii. bold and italic indicated Action 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	**2**	0	**3**	0	**3**	0	**8**
WM4	0	**5**	0	0	0	0	0	5
No of Exceedance	0	**7**	0	**3**	**0**	**3**	**0**	**13**

6.2.3 During water monitoring on 1, 9, 13, 24, 27 and 29 April 2015, very shallow water was observed at the proposed water monitoring location and water sampling at WM1 was unable to carry out. To avoid missing of monitoring data, water sampling was 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 five (5) exceedances of DO on 1, 3, 6, 27 and 29 April 2015 recorded at WM4. For WM1, a total of eight (8) Limit Level exceedances were recorded, namely two (2) Limit Level exceedance of DO on 20 and 22 April 2015 and three (3) Limit Level exceedance of turbidity and SS on 18, 20 and 22 April 2015.

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 DO Exceedance at WM1 on 20 and 22 April 2015

6.2.6 According to the site information provided by the Contractor, formation work at BCPB, construction of retaining wall No.2a and construction of depressed road at BCP3 were conducted during 20 to 22 April 2015. The active construction works were located at far upstream of WM1 and these construction activities did not disturb the water body and no water discharge was made into the existing channel.

6.2.7 During of the water monitoring on 20 and 22 April 2015, large amount of algae growth was observed throughout the Kong Yiu channel especially at close upstream of WM1 during the exceedance day. Moreover, very slow water flow was observed near WM1 and the water was stagnant at a box culvert at downstream.

6.2.8 It is considered that large amount of algae growing in the water body as well as slow water flow were the major factor resulting to low DO level. Based on above investigation, it is concluded that the DO exceedances during 20 and 22 April 2015 were not related to the project.

Investigation Result for turbidity and SS Exceedance at WM1 on 18, 20 and 22 April 2015

6.2.9 According to the site information provided by the Contractor, formation work at BCPB, construction of retaining wall No.2a and construction of depressed road at BCP3 were conducted

during 18 to 22 April 2015. The active construction works were located at far upstream of WM1 and these construction activities did not disturb the water body and no water discharge was made into the existing channel.

6.2.10 During the water monitoring on 18, 20 and 22 April 2015, very shallow water and slow water flow was observed at WM1. Moreover, large amount of algae was cumulated at WM1 due to slow water flow. Due to shallow water and presence of algae, the water sample collected at WM1 included the mixture of water and tiny pieces of algae.

6.2.11 In view of the unavoidable algae in the water sample, it is concluded that the turbidity and SS exceedances during 18 and 22 April 2015 were not related to the project.

Investigation Result for DO Exceedance at WM4 on 1, 3 and 6 April 2015 (Contract 2)

6.2.12 Site information was obtained from the Contractor of C2 (DHK), construction activities carried out at South Portal on 1, 3 and 6 April 2015 included site formation, hoarding erection, construction of site office and slope stabilization. All works were carried out far from the river course and discharge was only made on 1 April 2015.

6.2.13 As advised by DHK, visual checking for discharge quality will be carried out when there is discharge needs to be made. According to the self-checking result on 1 April 2015, the water quality performance was satisfactory. There were no discharge made on 3 and 6 April 2015, thus no test was carried out.

6.2.14 During weekly site inspection by the ET on 1 April 2015, it was observed the wastewater generated from works was treated by the onsite wastewater treatment system and treated water was recycled for further use such as wheel washing. No adverse impact on water quality was observed on 1 April 2015.

6.2.15 According to the photo record provided by the other party on 1 April 2015, muddy water flowed from outside site boundary was observed. The muddy water deteriorated the existing stream water and affected the water quality at the downstream.

6.2.16 Moreover, low DO levels were recorded at upstream control station WM4-CB during the exceedance days. 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 1, 3 and 6 April 2015 (Contract 3)

6.2.17 There was site closed during 3 to 7 April 2015 and site information was obtained from the Contractor on 1 April 2015 only in this investigation. According to the site dairy provided by the Contractor, construction works carried out on 1 April 2015 included excavation, backfilling, concreting, erect of formwork and welding. These works did not disturb the water environment and comprised none of DO depleting characteristics.

6.2.18 Daily inspection for wastewater treatment facilities within the site area was conducted by the Contractor, when there is water discharge observed, visual test would be carried out to check the performance of discharge and the surrounding environment. According to the inspection record on 1 April 2015, muddy water flowed from outside site boundary was observed near WWTS NO.9. The external muddy water deteriorated the existing stream water and affected the water quality at the downstream. Moreover, low DO levels were recorded at upstream control station WM4-CB during the exceedance days as well.

6.2.19 It was noted that exceedance of DO was recorded at WM4 even the site was closed on 3 and 6 April 2015. Therefore, it is considered that the exceedances during 1, 3 and 6 April 2015 were likely due to natural variation and not related to the works under Contract 3.

Investigation Result for DO Exceedance at WM4 on 27 and 29 April 2015 (Contract 2)

6.2.20 According to the site information provided from the Contractor of C2 (DHK), construction activities carried out at South Portal on 27 and 29 April 2015 included tunnel excavation, spoil transportation, slope stabilization and construction of site office. All works were far from the river and no discharges were made on 27 and 29 April 2015.

6.2.21 During weekly site inspection by the ET on 29 April 2015, it was observed that the wastewater generated from works was treated by the onsite wastewater treatment system and treated water was recycled for further use such as wheel washing. No adverse impact on water quality was observed on 29 April 2015.

6.2.22 According to the photo record provided by the other party on 27 and 29 April 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.

6.2.23 Moreover, lower DO levels were recorded at upstream control station WM4-CB on 27 and 29 April 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 27 and 29 April 2015 (Contract 3)**

6.2.24 According to the site diaries provided by the Contractor, construction works carried out on 27 and 29 April 2015 included excavation, installation and uninstallation of sheet pile, erecting of formwork, welding, concreting and soil compact. The abovementioned works were carried out away from the watercourse and comprised none of DO depleting characteristics.

6.2.25 Inspection of the wastewater treatment facilities and the surrounding environment was conducted by the Contractor on 27 and 29 April 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 on 27 and 29 April 2015, 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.

6.2.26 It was also noted that lower DO levels were recorded at upstream control station WM4-CB on 27 and 29 April 2015. Therefore, it is considered that the exceedances on 27 and 29 April 2015 were likely due to natural variation and not related to the works under Contract 3.

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)	**49.2330**	--	**3.597**	--	0	--	**52.83**
Reused in this Project (Inert) (in '000 m^3)	**0.2770**	--	**2.308**	--	0	--	**2.585**
Reused in other Projects (Inert) (in '000 m^3)	**48.7494**	C5	0	--	0	--	**48.7494**
Disposal as Public Fill (Inert) (in '000 m^3)	**0.2066**	Tuen Mun 38	**1.289**	Tuen Mun 38	0	--	**1.4956**

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	-	**2.767**	Licensed collector	0	--	**2.767**
Recycled Paper / Cardboard Packing ('000kg) #	**0.2300**	Licensed collector	0	-	0	--	**0.2300**
Recycled Plastic ('000kg) #	0	-	0	-	0	--	0
Chemical Wastes ('000kg) #	0	-	0	-	0	--	0
General Refuses ('000m^3)	**0.2278**	NENT	**0.065**	NENT	**0.04**	NENT	**0.3328**

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 **1, 10, 17, 24 and 29 April 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
1 April 2015	• Stagnant water cumulated inside the pit near the site exit was observed. The contractor should drain the water away to prevent mosquito breeding. (Mid-Vent)	• DHK sprayed larvicide to the described location in order to prevent mosquito breeding.
	• Water spraying should be applied for excavating / breaking / drilling activities to minimize dust generation. (South Portal)	• Not required for reminder
10 April 2015	• Oil drums without drip tray was observed. The contractor should provide drip tray underneath. (Mid-Vent and North Portal)	• The oil drums were removed.
	• Stagnant water cumulated inside the lifting eye of the concrete block was observed. The contractor should be clear the water to prevent mosquito breeding. (Mid-Vent and South Portal)	• The lifting eyes were filled with sand.
	• Stagnant water cumulated inside the drip tray was observed. The contractor should drain the water away and the waste water should be disposed as chemical waste. (North Portal)	• Stagnant water removed and provided with tarpaulin to cover well.
	• Chemical waste storage inside the chemical storage area was observed. The contractor should separate storage the chemical and chemical waste. (South Portal)	• To be followed in next reporting month.
	• It was reminded that water spraying should be applied for breaking activities to reduce dust impact. (South Portal)	• Not required for reminder

Date	Findings / Deficiencies	Follow-Up Status
17 April 2015	• As a reminder, water spraying frequency should be increase for the haul road to minimize dust generation. (South Portal & North Portal)	• Not required for reminder
24 April 2015	• Construction material cumulated inside the tree protection zone was observed. The contractor should remove the material to prevent damage of the retain tree. (South Portal) • Broken water barriers was observed along the site entrence. The contractor should prevent stagnant water cumulated inside the barrier to cause mosquito breeding. (South Portal) • Contractor was reminded to provide tarpaulin to cover the free standing oil drums to prevent stagnant water cumulated inside the drip tray. (South Portal)	• The construction material inside the tree protection zone were relocated. The tree protection zone were removed as the trees inside are felled. • Openings of water barriers are covered to avoid mosquito breeding inside. • Not required for reminder
29 April 2015	• Waste skip and rubbish bin was observed full. The contractor was reminded to clean more frequency. (South Portal)	• Not required for reminder

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 **8, 15, 20 and 27 April 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
8 April 2015	• Old version EP display at the site exit was observed, the Contractor should update the EP and display at the site exit.	• Updated EP has been displayed at the site exit.
15 April 2015	• C&D materials next to the retained tree was observed at SA11, the Contractor should remove the C&D materials and provide protection fence for the retained tree. • Chemical drums without drip tray was observed at SA11, the Contractor should remove them and prevent leakage of chemical.	• The C&D materials was removed and protection fence was provided. • The chemical drums without drip tray was removed from site.

Date	Findings / Deficiencies	Follow-Up Status
	• The Contractor was reminded to provide label for all trees within the site area.	• Not required for reminder.
20 April 2015	• Oil stain was observed at Bridge E, the Contractor was reminded to remove the oil stain and treat properly as chemical waste	• The oil stain has been cleared up and the stained soil was stored as chemical waste storage area for proper disposal
27 April 2015	• Oil drum placed above an air compressor was observed at FH9, the Contractor should remove the oil drum and store it at proper area.	• 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 **2, 9, 16, 23 and 30 April 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
2 April 2015	• Dry haul road at LMH site office was observed, water spraying should be provided to minimize dust generation.	• Water spraying on the haul road at LMH site office was provided.
9 April 2015	No environmental issue was observed during the site inspection.	NA
16 April 2015	• Free standing chemical containers of LMH site office was observed and leakage was also found. The Contractor should provide drip tray for chemical container and to remove the oil stain.	• The chemical containers were removed and the oil stain was cleaned.
23 April 2015	• Dusty materials at the site entrance/exit in LMH site office was observed, the Contractor should ensure that the vehicles are washed before leaving the site and clean the public road regularly. • As a reminder, the Contractor should review the condition of their temporary drainage system during the rainy season. • As a reminder, any dusty stockpile should be covered with impervious sheeting to minimize dust generation.	• Regular washing on the public road was provided and no dusty trails were observed. • Not required for reminder • Not required for reminder
30 April 2015	No environmental issue was observed during the site inspection.	NA

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 environmental complaint, summons and prosecution under the EM&A Programme was lodged for Contracts 2, 3 and 5.

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

Table 9-1 Statistical Summary of Environmental Complaints

Reporting Period	Contract No	Environmental Complaint Statistics		
		Frequency	Cumulative	Complaint Nature
19 May 2014 – 31 Mar 2015	Contract 2	0	**11**	• **(4) Water Quality** • **(5) Construction Dust** • **(2) Noise**
06 Nov 2013 – 31 Mar 2015	Contract 3	0	**3**	• **(1) Construction Dust** • **(2) Water quality**
16 Aug 2013 – 31 Mar 2015	Contract 5	0	**2**	• **(2) Construction Dust**
1 – 30 Apr 2015	Contract 2	0	**11**	• **(4) 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 – 31 Mar 2015	Contract 2	0	0	NA
06 Nov 2013 – 31 Mar 2015	Contract 3	0	0	NA
16 Aug 2013 – 31 Mar 2015	Contract 5	0	0	NA
1 – 30 Apr 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 – 31 Mar 2015	Contract 2	0	0	NA
06 Nov 2013 – 31 Mar 2015	Contract 3	0	0	NA
16 Aug 2013 – 31 Mar 2015	Contract 5	0	0	NA
1 – 30 Apr 2015	Contract 2	0	0	NA
	Contract 3	0	0	NA
	Contract 5	0	0	NA

The Other Contracts

9.1.3 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 • Cavern excavation
North Portal	• Permanent slope formation • Conveyor Belt System Construction for RBM (remaining) • South Bound Tunnel Bench Excavation (remaining) • South Bound TBM Tunneling works (sliding to face, TBM launch, TBM DT) • Slab Cradle for TBM Shifting way • North Bound Top heading excavation (canopies) • North Bound Tunnel Blast door installation
South Portal	• Temporary Slope Cut with Soil Nails Installation • 3rd Wetsep Delivery plus Testing and Commissioning • Rock excavation to Ventilation Building Formation • South Bound Foundation Works • North Bound Bored Piles Works & Pile tests
Admin Building	• Backfilling for surcharge • Demolition of existing building

Contract 3

- Cable detection and trial trenches
- Catch fence erection
- Decking construction for Bridge E
- Diversion of DN1400 watermain deck construction of 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
- Pre-drilling works and piling works for viaduct
- Road works at Fanling Highway
- Sewer works at Tai Wo Service Road West (TWSRW)
- Socket H-pile load test
- Tree felling works
- Utilities duct laying
- Viaduct segment erection
- Waterworks

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 **21st** monthly EM&A report presenting the monitoring results and inspection findings for the Reporting Period from **1** to **30 April 2015**.

11.1.2 For air quality monitoring, no 1-hour TSP monitoring results triggered the Action or Limit Levels were recorded but there was 1 Limit level exceedance of 24-hour TSP recorded at AM3 on 14 April 2015. The investigation for the cause of exceedance is underway by the ET.

11.1.3 No noise complaint (which is an Action Level exceedance) was received and no construction noise measurement results that exceeded the Limit Level were recorded in the Reporting Period. No NOEs or the associated corrective actions were therefore issued.

11.1.4 For water quality monitoring, there were five (5) exceedances of DO on 1, 3, 6, 27 and 29 April 2015 recorded at WM4. For WM1, a total of eight (8) Limit Level exceedances were recorded, namely two (2) Limit Level exceedance of DO on 20 and 22 April 2015 and three (3) Limit Level exceedance of turbidity and SS on 18, 20 and 22 April 2015. 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 No environmental complaint under the EM&A Programme of the Project was received in the reporting period for Contract 2, 3 and 5.

11.1.7 During the Reporting Period, five (5), 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.

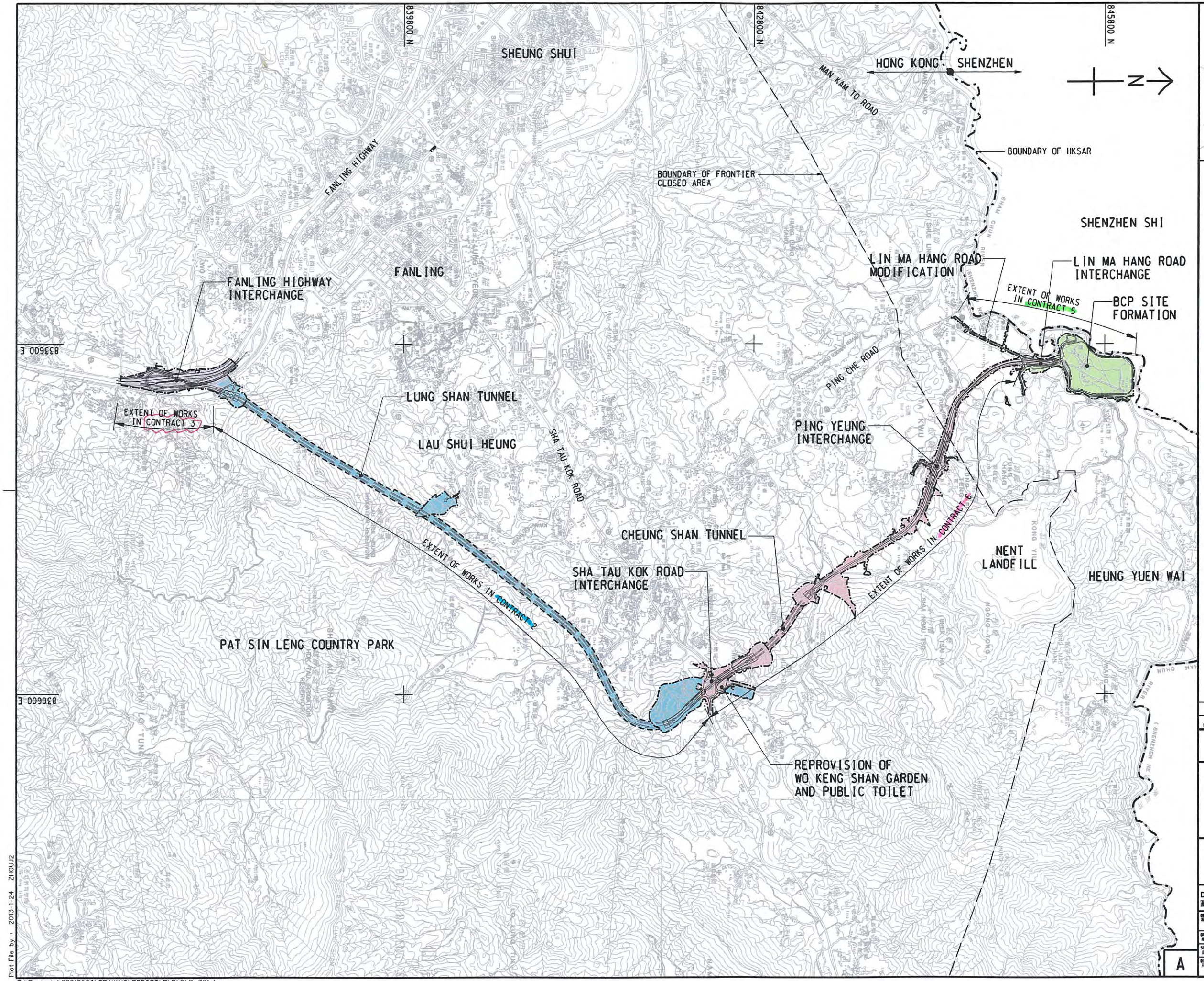
11.2.2 Construction noise should be a key environmental impact during the works. The noise mitigation measures such as use of quiet plants or temporary noise barrier installation at the construction noise predominate area should be implemented as accordance with the EM&A requirement.

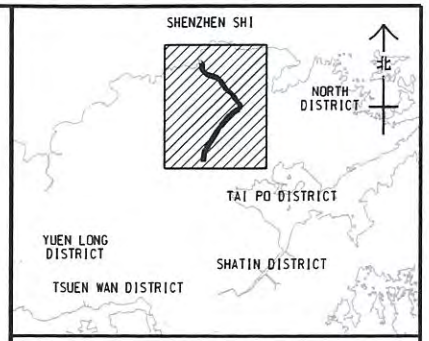
11.2.3 Since most of construction sites under the Project are adjacent to villages, the contractors should be paid attention on the construction dust emission. The Contractor should fully implement the construction dust mitigation measures properly.

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

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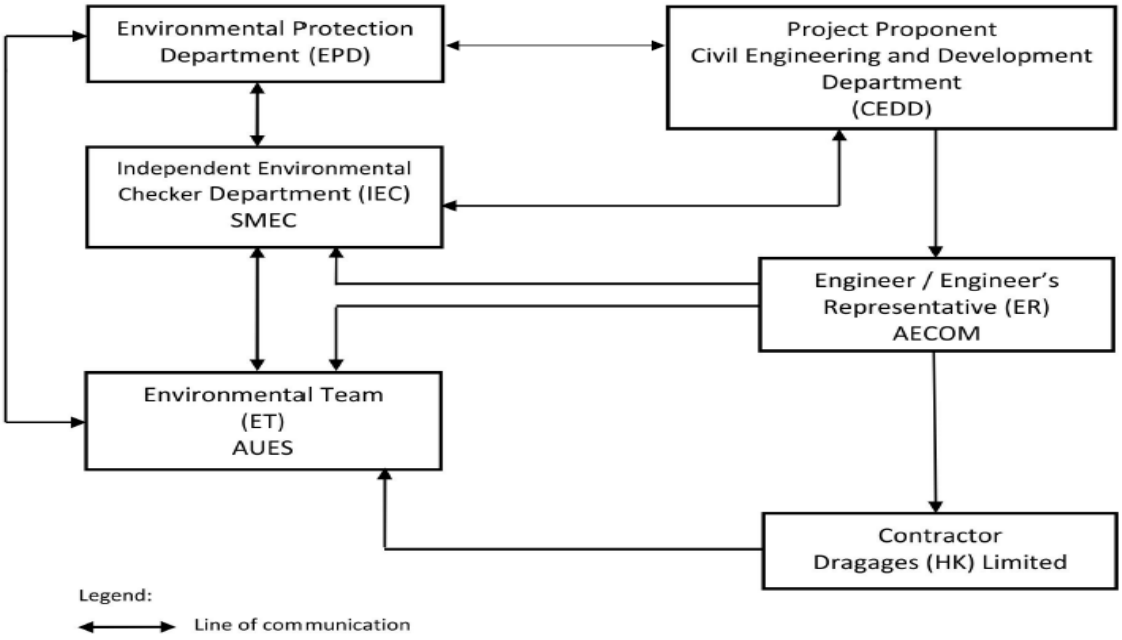
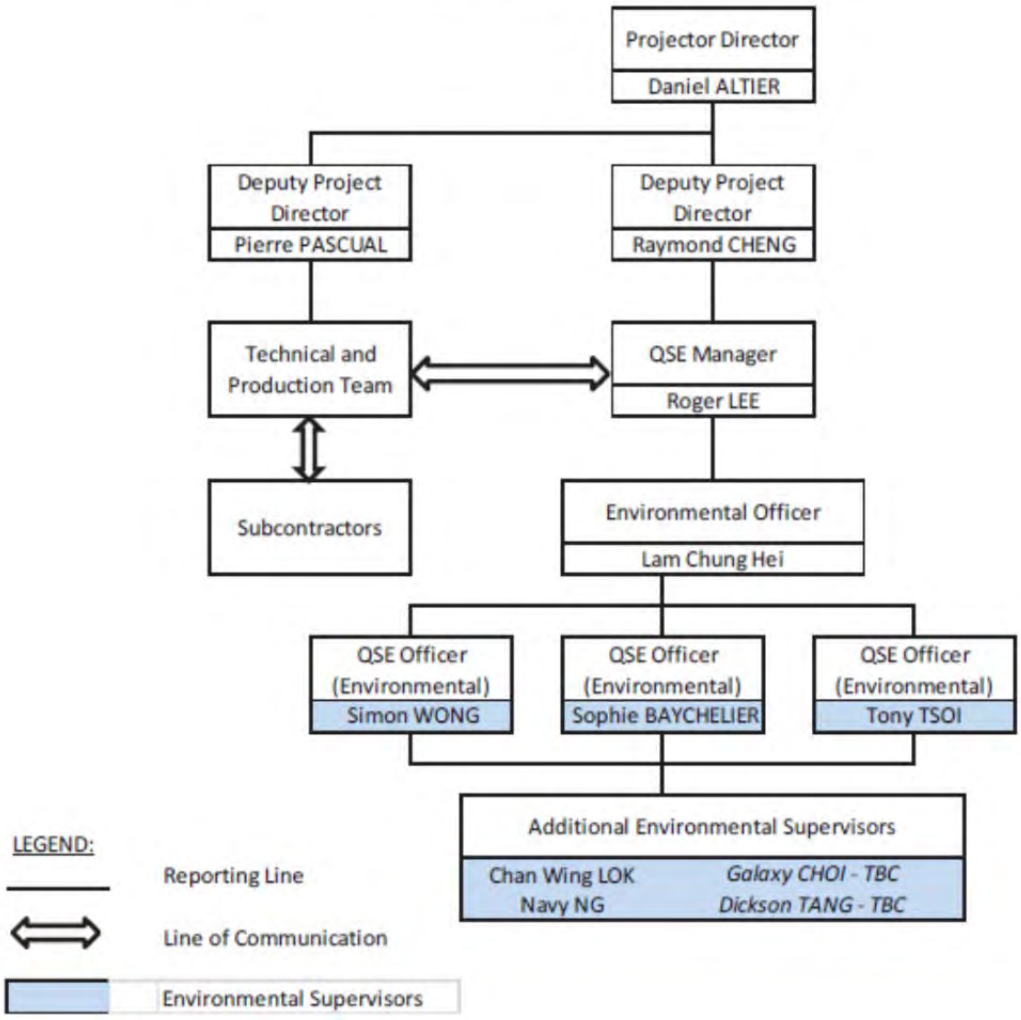
Appendix B

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:

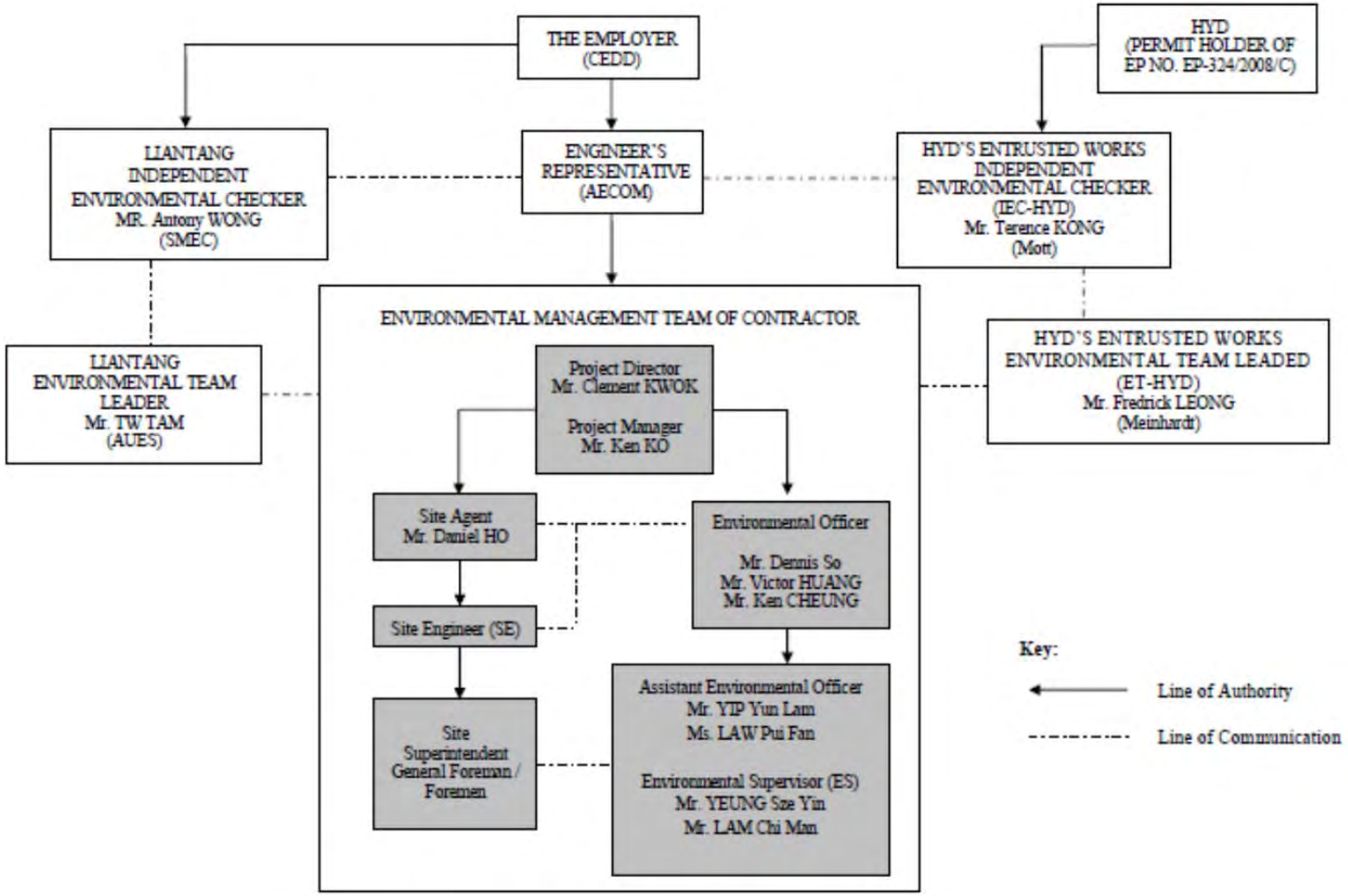
CEDD (Employer) – Civil Engineering and Development Department

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:

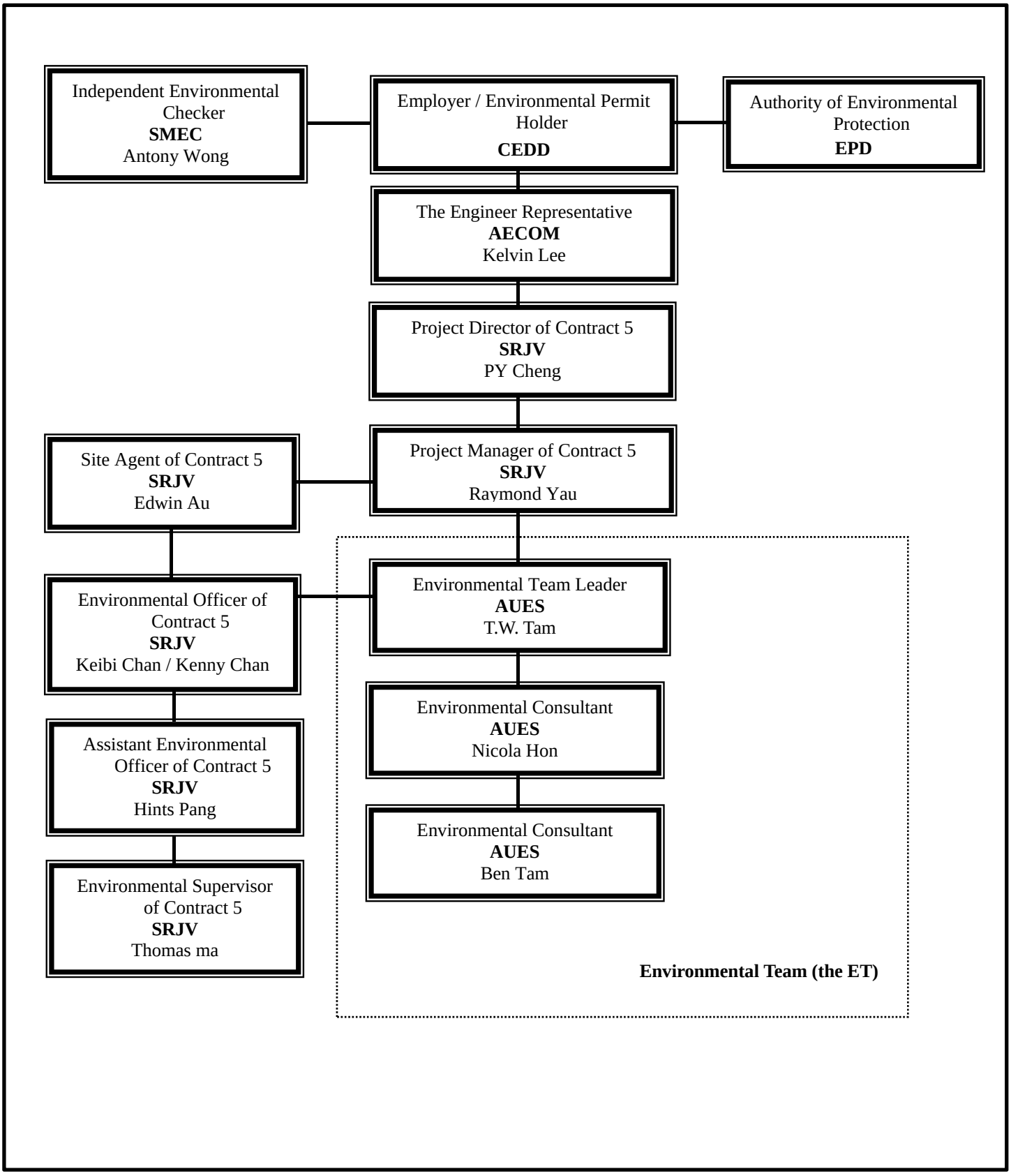
CEDD (Employer) – Civil Engineering and Development Department

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

MPR16; HKLTH Works Programme update 20-Apr-2015 [wpd]; DHK_HKLTH_Works Programme new 3MRP; 28-Apr-15; 11:41

Activity ID	Activity Name	Working Duration	BL Project Start	BL Project Finish
Total		1023.0	20-Jan-14	10-Jul-17
HKLTH Works Programme update 20-Apr-2015 [wpd]		1023.0	20-Jan-14	10-Jul-17
2 General		952.0	17-Apr-14	10-Jul-17
Geotechnical Interpretative Report 2nd Revision		65.0	09-Dec-14	25-Feb-15
DDA Submission		65.0	09-Dec-14	25-Feb-15
GIR21021940	IPs'/ ER's Review	28.0	09-Dec-14	13-Jan-15
GIR21021960	Preparation of DDA with ICE Certification for resubmission to ER/ICE/IP	13.0	14-Jan-15	28-Jan-15
GIR21022050	ER/IP's Approval	28.0	29-Jan-15	25-Feb-15
Noise Barriers		45.0	03-Jul-15	28-Aug-15
DDA Submission		45.0	03-Jul-15	28-Aug-15
CONTDS1090	Preparation of DDA for formal submission to ER/ICE/IP	45.0	03-Jul-15	28-Aug-15
Project Wide E&M		952.0	17-Apr-14	10-Jul-17
E&M Design Works for Civil Design Interface		180.0	29-Aug-14	18-Feb-15
PD.AE.1130	E&M Spatial Study and Structural Provisions Check for Ventilation Buildings	110.0	29-Aug-14	10-Jan-15
PD.AE.1140	E&M Spatial Study and Structural Provisions Check for Administration Building	125.0	20-Sep-14	18-Feb-15
E&M Design & Engineering Works		460.0	17-Apr-14	29-Aug-15
Engineering Design Submission		340.0	17-Apr-14	12-Jun-15
PD..FS.DS	Fire Service System Submission and Approval by the Engineer	230.0	21-Jul-14	30-Apr-15
PD.CM.DS	CMCS System Submission and Approval by the Engineer	230.0	21-Jul-14	30-Apr-15
PD.EC.DS	Tunnel Ventilation System Submission and Approval by the Engineer	340.0	17-Apr-14	12-Jun-15
PD.EC.DS.a	Environmental Control System Submission and Approval by the Engineer	230.0	21-Jul-14	30-Apr-15
PD.EL.DS	Electrical System Submission and Approval by the Engineer	230.0	21-Jul-14	30-Apr-15
PD.EV.DS	ELV System Submission and Approval by the Engineer	230.0	21-Jul-14	30-Apr-15
PD.PD.DS	Plumbing & Drainage System Submission and Approval by the Engineer	230.0	21-Jul-14	30-Apr-15
Shop Drawing & Builder's Drawing Submission		179.0	17-Dec-14	29-Aug-15
PD.DW.1000	Shop Drawings & Builder's Drawings Preparation	176.0	17-Dec-14	27-Jul-15
PD.DW.1010	Shop Drawings & Builder's Drawings Submission & Approval	177.0	22-Jan-15	29-Aug-15
Equipment Selection & Submission		509.0	01-Aug-14	17-Mar-16
PD.PQ.1480	ELV System Submission and Approval by the Engineer	294.0	01-Aug-14	29-Jul-15
PD.PQ.1910	P&D System Submission and Approval by the Engineer	169.0	01-Nov-14	30-May-15
PD.PQ.2260	ECS System Submission and Approval by the Engineer	263.0	02-May-15	17-Mar-16
Manufacturing & Delivery of Major Equipment		656.0	02-Mar-15	10-Jul-17
PD.FS.MD	Manufacturing and Delivery of FS System	398.0	19-May-15	17-Sep-16
PD.PD.MD	Manufacturing and Delivery of P&D System	409.0	28-Mar-15	15-Aug-16
PD.PQ.1040	Manufacturing and Delivery of ELV/CMCS/LAN/TEL System	588.0	02-Mar-15	23-Feb-17
PD.PQ.1070	Manufacturing and Delivery of Tunnel Ventilation System	581.0	29-Jun-15	14-Jun-17
PD.PQ.1410	Manufacturing and Delivery of Electrical Services System	649.0	02-May-15	10-Jul-17
3 South Portal Area		444.8	13-Oct-14	09-Jan-16
3.1 South Portal Subcontract & Procurement		296.8	29-Jan-15	09-Jan-16
SPS&P0060	Subcontract : Ventilation Building Foundation Works	60.0	29-Jan-15	16-Apr-15
SPS&P0070	Subcontract : Retaining Wall Structure Works	60.0	17-Apr-15	29-Jun-15
SPS&P0080	Subcontract : Ventilation Building Structure Works	60.0	30-Jun-15	08-Sep-15
SPS&P0090	Subcontract : Tunnel Lining Works	60.0	13-Jul-15	19-Sep-15
SPS&P0100	Subcontract : Tunnel Lining Formworks (Design, Fabrication, Delivery, & On-Site Assembly)	150.0	13-Jul-15	09-Jan-16
3.2 South Portal Design Submission		241.4	15-Dec-14	08-Aug-15

REV	DESCRIPTION	DATE	PREPARED	CHECKED	APPROVED
A	Monthly Report No.16	20/04/2015	RAN	RBS/SJO	PPL/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

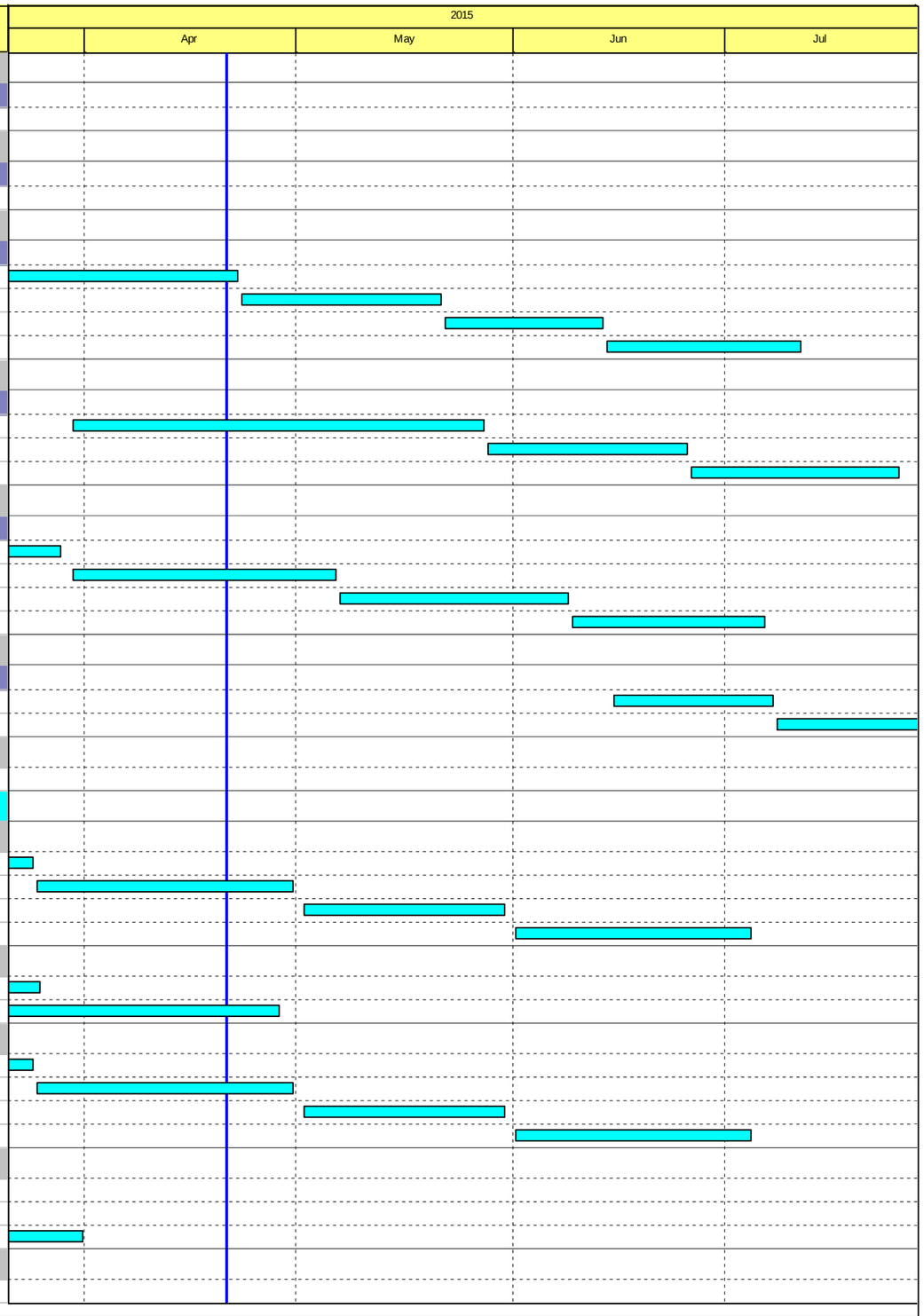
TITLE: Monthly Report No.16 3-Months Rolling Programme (Approved Works Programme Rev. D)

DOCUMENT NO.: LTH/DHK/PGR/PW/PLP/00044/A

DOC. STATUS	CREATION DATE	REVISION
FOR INFO.	20/04/2015	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		28.0	01-Jan-15	28-Jan-15
DDA Submission		28.0	01-Jan-15	28-Jan-15
DSN07990	ER/IP's Approval	28.0	01-Jan-15	28-Jan-15
South Portal: Temp Works For D&B Tunneling		28.0	28-Dec-14	24-Jan-15
DDA Submission		28.0	28-Dec-14	24-Jan-15
DSN010320	ER/IP's Approval	28.0	28-Dec-14	24-Jan-15
South Tunnel Permanent Lining		192.8	18-Feb-15	11-Jul-15
DDA Submission		192.8	18-Feb-15	11-Jul-15
STPL1023520	Preparation for formal submission to ER/ICE/IP	48.0	18-Feb-15	22-Apr-15
STPL1023570	IPs'/ ER's Review	24.0	23-Apr-15	21-May-15
STPL1023590	Preparation for resubmission to ER/ICE/IP with ICE Certification	19.0	22-May-15	13-Jun-15
STPL1023690	ER/IP's Approval	28.0	14-Jun-15	11-Jul-15
South Tunnel Internal Structures		186.4	30-Mar-15	25-Jul-15
DDA Submission		186.4	30-Mar-15	25-Jul-15
STIS1L1023520	Preparation for formal submission to ER/ICE/IP	45.0	30-Mar-15	27-May-15
STIS1L1023570	IPs'/ ER's Review	24.0	28-May-15	25-Jun-15
STIS1L1023590	Preparation for resubmission to ER/ICE/IP with ICE Certification	25.0	26-Jun-15	25-Jul-15
Cross Passages -Temp Works D&B Tunnel - Soft Ground		154.0	27-Jan-15	06-Jul-15
DDA Submission		154.0	27-Jan-15	06-Jul-15
DSN26930	Preparation for formal submission to ER/ICE/IP	50.0	27-Jan-15	28-Mar-15
DSN26980	IPs'/ ER's Review	28.0	30-Mar-15	06-May-15
DSN27000	Preparation for resubmission to ER/ICE/IP with ICE Certification	27.0	07-May-15	08-Jun-15
DSN27100	ER/IP's Approval	28.0	09-Jun-15	06-Jul-15
Cross Passages -Temp Works D&B Tunnel - Rock		28.6	15-Jun-15	08-Aug-15
DDA Submission		28.6	15-Jun-15	08-Aug-15
FL326930	Preparation for formal submission to ER/ICE/IP	18.0	15-Jun-15	07-Jul-15
FL326980	IPs'/ ER's Review	28.0	08-Jul-15	08-Aug-15
CIA- South Portal & South D&B Tunnels inc Mid Vent Junction & CP		21.0	15-Dec-14	04-Jan-15
SC01175	*Final CIA Report (14d)	21.0	15-Dec-14	04-Jan-15
3.3 South Portal Method Statement Submission		222.6	13-Oct-14	04-Jul-15
South Portal: Tunnel Mechanical Excavation		123.6	24-Jan-15	04-Jul-15
FL2022093	Prepare Method Statement	48.0	24-Jan-15	24-Mar-15
FL2022094	Engineer's Comment	28.0	25-Mar-15	30-Apr-15
FL2022095	Re-submission Method Statement	24.0	02-May-15	30-May-15
FL2022096	Engineer's Approval	28.0	01-Jun-15	04-Jul-15
South Tunnels: Blasting Method Statement		160.0	13-Oct-14	28-Apr-15
FL2022101	Preparation and Submission of Blasting Method Statement	135.0	13-Oct-14	25-Mar-15
FL2022104	Engineer's/IP's Review & Approval	113.0	06-Dec-14	28-Apr-15
South Portal: Bored Piling Works		168.2	24-Jan-15	04-Jul-15
A25485	Prepare Method Statement	48.0	24-Jan-15	24-Mar-15
A25486	Engineer's Comment	28.0	25-Mar-15	30-Apr-15
A25487	Re-submission Method Statement	24.0	02-May-15	30-May-15
A25488	Engineer's Approval	28.0	01-Jun-15	04-Jul-15
South Portal: Pilecap, Footings & Tie beams		80.0	22-Dec-14	31-Mar-15
A2340	Engineer's Comment	28.0	22-Dec-14	26-Jan-15
A2350	Re-submission Method Statement	24.0	27-Jan-15	26-Feb-15
A2360	Engineer's Approval	28.0	27-Feb-15	31-Mar-15
South Portal: Permanent Retaining Walls		106.8	08-Dec-14	18-May-15
A25481	Prepare Method Statement	48.0	08-Dec-14	04-Feb-15



REV	DESCRIPTION	DATE	PREPARED	CHECKED	APPROVED
A	Monthly Report No.16	20/04/2015	RAN	RBS/SJO	PPL/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

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DOC. STATUS	CREATION DATE	REVISION
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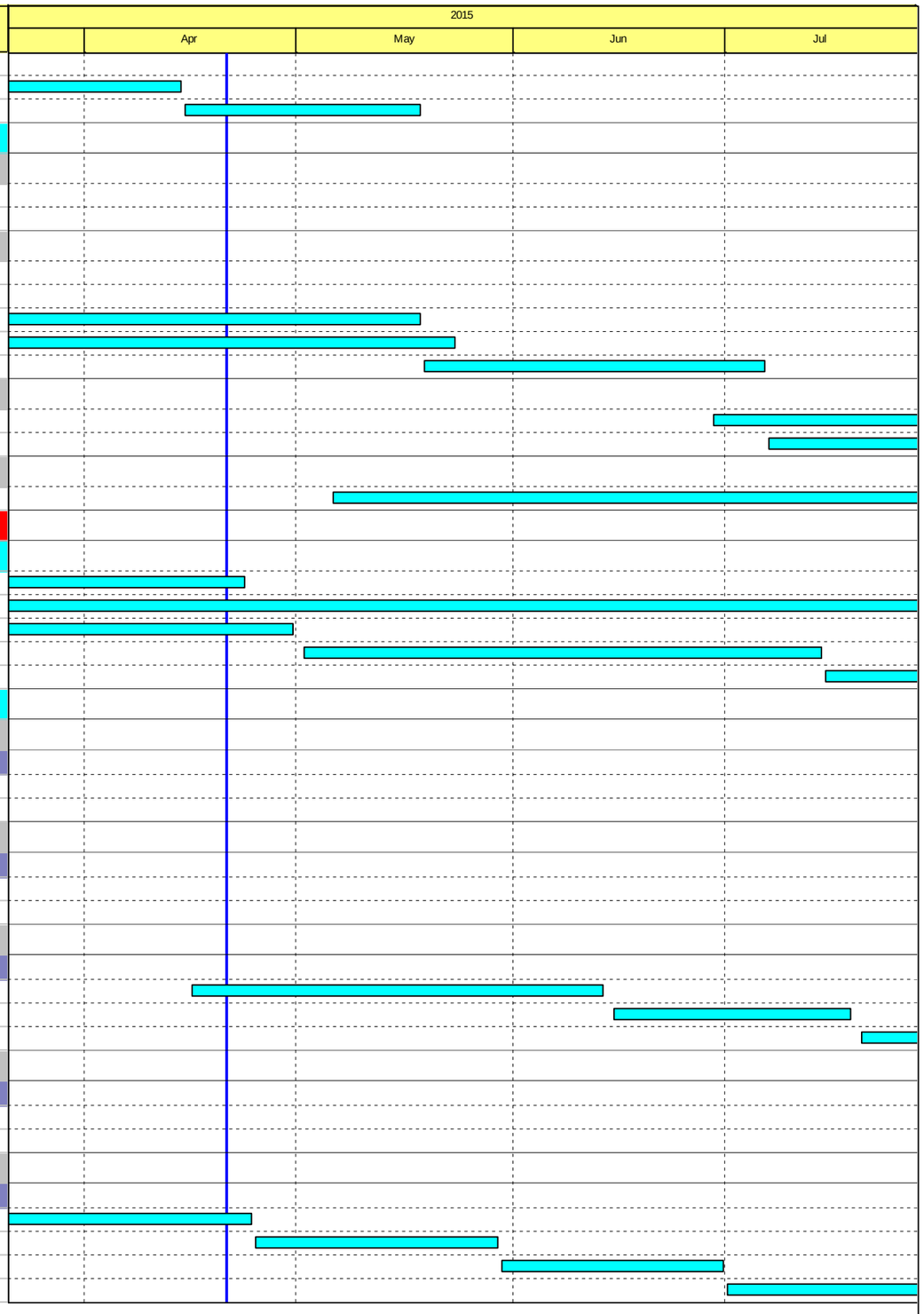
A3	N/A	2 of 8

Activity ID	Activity Name	Working Duration	BL Project Start	BL Project Finish
A25482	Engineer's Comment	28.0	05-Feb-15	12-Mar-15
A25483	Re-submission Method Statement	24.0	13-Mar-15	14-Apr-15
A25484	Engineer'sApproval	28.0	15-Apr-15	18-May-15
3.5 South Portal Works		274.0	18-Oct-14	04-Sep-15
South Portal: CLP Substation		170.0	18-Oct-14	28-Feb-15
SCLP2060	Sub-station Construction + CLP Installation	106.0	18-Oct-14	28-Feb-15
SCLP2090	Energization	1.0	28-Feb-15	28-Feb-15
South Portal: Slopeworks		106.4	05-Nov-14	06-Jul-15
SV2690	Permanent Cut Slope (+68.0 to apprx +45.0mPD)	55.0	05-Nov-14	10-Jan-15
SV2700	Temporary Slope Cut below +45.0mPD (soft) w/Soil Nails	48.0	12-Jan-15	14-Mar-15
SV2701dwp	Temporary Slope Cut below +45.0mPD (soft) w/Soil Nails	48.0	16-Mar-15	18-May-15
SV2702dwp	Temporary Soil Nails between +44.6mPd to +26.7mPD	71.0	16-Feb-15	23-May-15
SV2710	Rock Excavation to Vent. Bldg. Formation	36.0	19-May-15	06-Jul-15
South Portal: Foundation & Substructure		55.8	29-Jun-15	04-Sep-15
SV2180	South Bound Foundation	54.0	29-Jun-15	04-Sep-15
SV2210	N/B Bored Piles 4nos & Pile Test	48.0	07-Jul-15	04-Sep-15
South Tunnels: Southbound Tunnel		101.0	06-May-15	04-Sep-15
DB6300	D&B Setup / Site Installation	101.0	06-May-15	04-Sep-15
4 Middle Portal Area		360.3	26-Sep-14	10-Oct-15
4.1 Middle Portal Subcontract & Procurement		187.4	05-Feb-15	22-Sep-15
MPS&P0040	Subcontract : Tunnel Lining Works	60.0	05-Feb-15	23-Apr-15
MPS&P0050	Subcontract : Tunnel Lining Formworks (Design, Fabrication, Delivery, & On-Site Assembly)	150.0	05-Feb-15	11-Aug-15
MPS&P0060	Subcontract : Ventilation Building Foundation Works	60.0	12-Feb-15	30-Apr-15
MPS&P0070	Subcontract : Ventilation Building Structure Works	60.0	02-May-15	14-Jul-15
MPS&P0080	Subcontract : Ventilation Building ABWF Works	60.0	15-Jul-15	22-Sep-15
4.2 Middle Portal Design Submission		265.3	03-Dec-14	28-Aug-15
Mid Vent Building - Foundation		26.0	12-Dec-14	11-Feb-15
DDA Submission		26.0	12-Dec-14	11-Feb-15
DSN29064	Preparation for resubmission to ER/ICE/IP with ICE Certification	26.0	12-Dec-14	14-Jan-15
DSN29065	ER/IP'sApproval	28.0	15-Jan-15	11-Feb-15
Mid Vent Adit Permanent Lining		28.0	03-Dec-14	04-Feb-15
DDA Submission		28.0	03-Dec-14	04-Feb-15
DSN29076	Preparation for resubmission to ER/ICE/IP with ICE Certification	28.0	03-Dec-14	07-Jan-15
DSN29077	ER/IP'sApproval	28.0	08-Jan-15	04-Feb-15
Mid Vent Adit Internal Structure		67.0	16-Apr-15	28-Aug-15
DDA Submission		67.0	16-Apr-15	28-Aug-15
DSN29082	Preparation for formal submission to ER/ICE/IP	49.0	16-Apr-15	13-Jun-15
DSN29083	IPs'/ ER's Review	28.0	15-Jun-15	18-Jul-15
DSN29084	Preparation for resubmission to ER/ICE/IP with ICE Certification	35.0	20-Jul-15	28-Aug-15
Mid Vent Adit/Junction - Temp Works For D&B Tunnelling		53.0	29-Dec-14	28-Feb-15
DDA Submission		53.0	29-Dec-14	28-Feb-15
DSN29088	Preparation for resubmission to ER/ICE/IP with ICE Certification	29.0	29-Dec-14	31-Jan-15
DSN29089	ER/IP'sApproval	28.0	01-Feb-15	28-Feb-15
Mid Vent Adit/Junction Permanent Lining & Backfill		150.5	23-Feb-15	28-Jul-15
DDA Submission		150.5	23-Feb-15	28-Jul-15
DSN29094	Preparation for formal submission to ER/ICE/IP	49.0	23-Feb-15	24-Apr-15
DSN29095	IPs'/ ER's Review	28.0	25-Apr-15	29-May-15
DSN29096	Preparation for resubmission to ER/ICE/IP with ICE Certification	26.0	30-May-15	30-Jun-15
DSN29097	ER/IP'sApproval	28.0	01-Jul-15	28-Jul-15



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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

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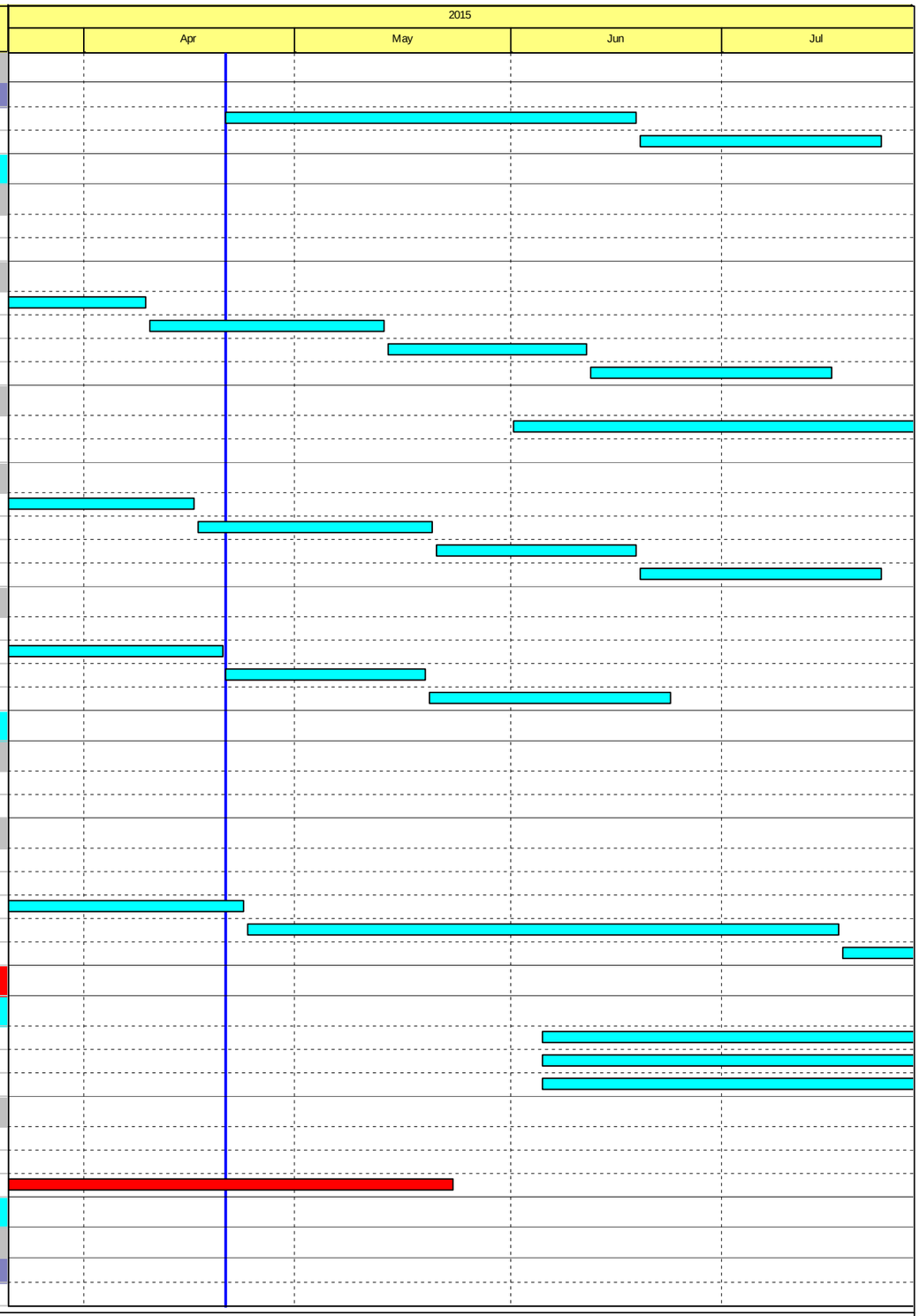
Activity ID	Activity Name	Working Duration	BL Project Start	BL Project Finish
Mid Vent Junction Internal Structure		77.0	21-Apr-15	23-Jul-15
DDA Submission		77.0	21-Apr-15	23-Jul-15
DSN29102	Preparation for formal submission to ER/ICE/IP	49.0	21-Apr-15	18-Jun-15
DSN29103	IPs'/ ER's Review	28.0	19-Jun-15	23-Jul-15
4.3 Middle Portal Method Statement Submission		287.4	14-Oct-14	29-Aug-15
Cavern Blasting Method Statement		242.0	14-Oct-14	03-Mar-15
FL2022107	Preparation and Submission of Blasting Method Statement	90.0	14-Oct-14	29-Jan-15
FL2022108	Engineer's/IP's Review & Approval	90.0	12-Nov-14	03-Mar-15
Middle Ventilation Adit Lining Works		143.2	05-Feb-15	16-Jul-15
A25513	Prepare Method Statement	48.0	05-Feb-15	09-Apr-15
A25514	Engineer's Comment	28.0	10-Apr-15	13-May-15
A25515	Re-submission Method Statement	24.0	14-May-15	11-Jun-15
A25516	Engineer'sApproval	28.0	12-Jun-15	16-Jul-15
Cavern Permanent Lining		48.0	01-Jun-15	29-Aug-15
A25521	Prepare Method Statement	48.0	01-Jun-15	28-Jul-15
A25522	Engineer's Comment	28.0	29-Jul-15	29-Aug-15
Mid Vent Bldg. Foundation		128.0	12-Feb-15	23-Jul-15
A25509	Prepare Method Statement	48.0	12-Feb-15	16-Apr-15
A25510	Engineer's Comment	28.0	17-Apr-15	20-May-15
A25511	Re-submission Method Statement	24.0	21-May-15	18-Jun-15
A25512	Engineer'sApproval	28.0	19-Jun-15	23-Jul-15
Mid Vent Building Construction		128.0	14-Jan-15	23-Jun-15
FL5900	Prepare Method Statement for Mid Vent Building Construction	48.0	14-Jan-15	13-Mar-15
FL5910	Engineer's Comment	28.0	14-Mar-15	20-Apr-15
FL5920	Re-submission Method Statement for Mid Vent Building Construction	24.0	21-Apr-15	19-May-15
FL5930	Engineer'sApproval	28.0	20-May-15	23-Jun-15
4.5 Middle Portal Works		286.1	26-Sep-14	10-Oct-15
Middle Portal: CLP Substation		196.5	26-Sep-14	07-Feb-15
TSS3P2060	Sub-station Construction + CLP Installation	110.0	26-Sep-14	06-Feb-15
TSS3P2090	Energization	1.0	07-Feb-15	07-Feb-15
Adit Construction - Mid Portal		273.1	14-Oct-14	10-Oct-15
MV2490dwp2a	Top Heading Canopies & Bench Excavation Ch24>Ch70	91.0	14-Oct-14	29-Jan-15
MV2490dwp3	Blast door installation + Noise Measurement and 24Hr permit approval	30.0	30-Jan-15	05-Mar-15
MV2490dwp4	D&B Full Face Ch70>Ch133; 63m	41.0	06-Mar-15	23-Apr-15
MV2490dwp5	D&B Full Face Ch133>Ch302 169m	70.0	24-Apr-15	17-Jul-15
MV2530	Cavern Excavation Ch302>Ch371	70.0	18-Jul-15	10-Oct-15
5 North Portal Area		654.2	20-Jan-14	02-Dec-15
5.1 North Portal Subcontract & Procurement		654.2	20-Jan-14	02-Dec-15
NPS&P0070	Subcontract : Tunnel Lining Works	60.0	05-Jun-15	15-Aug-15
NPS&P0080	Subcontract : Tunnel Concreting Works	60.0	05-Jun-15	15-Aug-15
NPS&P0090	Subcontract : Tunnel Lining Formworks (Design, Fabrication, Delivery, & On-Site Assembly)	150.0	05-Jun-15	02-Dec-15
North Portal: TBM Procurement & Delivery		395.0	20-Jan-14	23-May-15
DSN027980	TBM Procurement, Fabrication & Delivery	405.0	20-Jan-14	28-Feb-15
DSN027981	Conveyor Belt System Procurement & Delivery	90.0	03-Nov-14	31-Jan-15
N21410a	Precast Segment Fabrication (1.6m Ring) - Temporary Segments	190.0	30-Sep-14	23-May-15
5.2 North Portal Design Submission		292.1	25-Nov-14	20-Aug-15
North Tunnel Curved Section Southbound Temp Support For Enlargement		194.6	25-Nov-14	06-May-15
DDA Submission		194.6	25-Nov-14	06-May-15
FL2022145	Preparation for formal submission to ER/ICE/IP	56.0	25-Nov-14	31-Jan-15



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FL2022146	IPs'/ ER's Review	28.0	02-Feb-15	09-Mar-15
FL2022147	Preparation for resubmission to ER/ICE/IP with ICE Certification	22.0	10-Mar-15	08-Apr-15
FL2022148	ER/IP's Approval	28.0	09-Apr-15	06-May-15
Bored Tunnel OHVD Slab		214.2	13-Jan-15	04-Jun-15
DDA Submission		214.2	13-Jan-15	04-Jun-15
FL2022165	Preparation for formal submission to ER/ICE/IP	42.0	13-Jan-15	05-Mar-15
FL2022166	IPs'/ ER's Review	28.0	06-Mar-15	11-Apr-15
FL2022167	Preparation for resubmission to ER/ICE/IP with ICE Certification	21.0	13-Apr-15	07-May-15
FL2022168	ER/IP's Approval	28.0	08-May-15	04-Jun-15
Bored Tunnel Internal Structure (except OHVD Slab)		137.9	13-Jan-15	04-Jun-15
DDA Submission		137.9	13-Jan-15	04-Jun-15
FL2022173	Preparation for formal submission to ER/ICE/IP	42.0	13-Jan-15	05-Mar-15
FL2022174	IPs'/ ER's Review	28.0	06-Mar-15	11-Apr-15
FL2022175	Preparation for resubmission to ER/ICE/IP with ICE Certification	21.0	13-Apr-15	07-May-15
FL2022176	ER/IP's Approval	28.0	08-May-15	04-Jun-15
Bored Tunnel/ D&B Tunnel Transition - Headwall Structure (N/B & S/B)		123.0	17-Mar-15	15-Aug-15
DDA Submission		123.0	17-Mar-15	15-Aug-15
FL2022181	Preparation for formal submission to ER/ICE/IP	95.0	17-Mar-15	14-Jul-15
FL2022182	IPs'/ ER's Review	28.0	15-Jul-15	15-Aug-15
Northbound TBM Dismantling Cavern Temporary Works		116.0	03-Jan-15	26-May-15
DDA Submission		116.0	03-Jan-15	26-May-15
FL2022185	Preparation for formal submission to ER/ICE/IP	42.0	03-Jan-15	24-Feb-15
FL2022186	IPs'/ ER's Review	28.0	25-Feb-15	28-Mar-15
FL2022187	Preparation for resubmission to ER/ICE/IP with ICE Certification	22.0	30-Mar-15	28-Apr-15
FL2022188	ER/IP's Approval	28.0	29-Apr-15	26-May-15
North Tunnel Curved Section Cross Passages - Temp Works		70.0	29-May-15	20-Aug-15
DDA Submission		70.0	29-May-15	20-Aug-15
FL2022189	Preparation for formal submission to ER/ICE/IP	42.0	29-May-15	18-Jul-15
FL2022190	IPs'/ ER's Review	28.0	20-Jul-15	20-Aug-15
Bored Tunnel Cross Passages Temp Works (Soft Ground)		169.0	27-Jan-15	06-Jul-15
DDA Submission		169.0	27-Jan-15	06-Jul-15
FL2022197	Preparation for formal submission to ER/ICE/IP	50.0	27-Jan-15	28-Mar-15
FL2022198	IPs'/ ER's Review	28.0	30-Mar-15	06-May-15
FL2022199	Preparation for resubmission to ER/ICE/IP with ICE Certification	27.0	07-May-15	08-Jun-15
FL2022200	ER/IP's Approval	28.0	09-Jun-15	06-Jul-15
Bored Tunnel Cross Passages Temp Works (Rock)		159.0	27-Jan-15	06-Jul-15
DDA Submission		159.0	27-Jan-15	06-Jul-15
FL2022201	Preparation for formal submission to ER/ICE/IP	50.0	27-Jan-15	28-Mar-15
FL2022202	IPs'/ ER's Review	28.0	30-Mar-15	06-May-15
FL2022203	Preparation for resubmission to ER/ICE/IP with ICE Certification	27.0	07-May-15	08-Jun-15
FL2022204	ER/IP's Approval	28.0	09-Jun-15	06-Jul-15
Bored Tunnel Cross Passages Permanent Lining (Soft Ground)		124.0	20-Dec-14	27-Jul-15
AIP Submission		34.0	20-Dec-14	03-Feb-15
FL2022207	Preparation for resubmission to ER/ICE/IP with ICE Certification	12.0	20-Dec-14	06-Jan-15
FL2022208	ER/IP's Approval	28.0	07-Jan-15	03-Feb-15
DDA Submission		72.0	24-Mar-15	27-Jul-15
FL2022209	Preparation for formal submission to ER/ICE/IP	72.0	24-Mar-15	23-Jun-15
FL2022210	IPs'/ ER's Review	28.0	24-Jun-15	27-Jul-15
Bored Tunnel Cross Passages Permanent Lining (Rock)		135.6	20-Dec-14	19-Aug-15
AIP Submission		34.0	20-Dec-14	03-Feb-15

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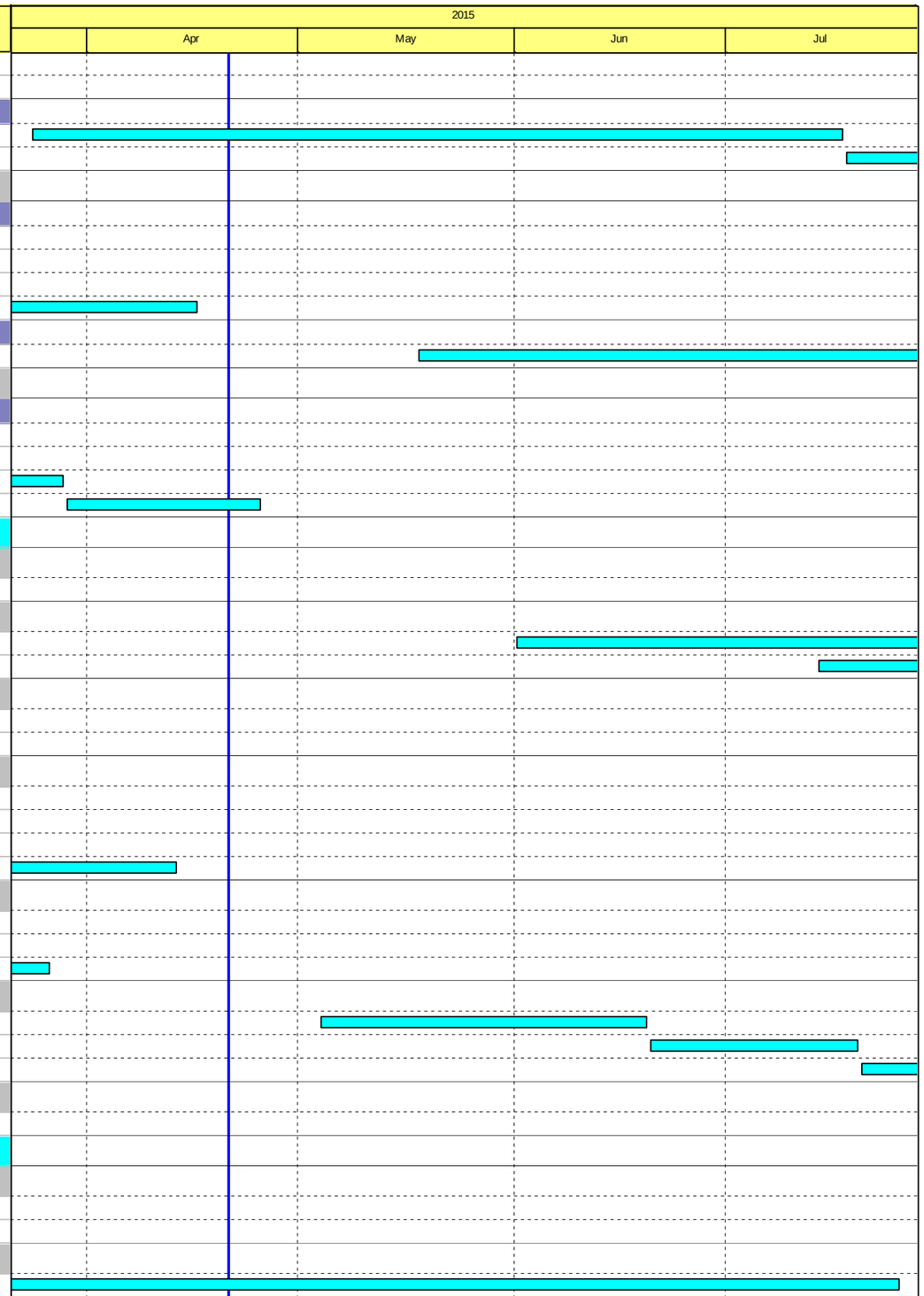
FL2022215	Preparation for resubmission to ER/ICE/IP with ICE Certification	12.0	20-Dec-14	06-Jan-15
FL2022216	ER/IP's Approval	28.0	07-Jan-15	03-Feb-15
DDA Submission		122.6	24-Mar-15	19-Aug-15
FL2022217	Preparation for formal submission to ER/ICE/IP	92.0	24-Mar-15	17-Jul-15
FL2022218	IPs'/ ER's Review	28.0	18-Jul-15	19-Aug-15
Bored Tunnel Cross Passages Internal Structures		290.1	27-Nov-14	15-Aug-15
AIP Submission		188.1	27-Nov-14	16-Apr-15
FL2022221	Preparation for formal submission to ER/ICE/IP	42.0	27-Nov-14	17-Jan-15
FL2022222	IPs'/ ER's Review	28.0	19-Jan-15	23-Feb-15
FL2022223	Preparation for resubmission to ER/ICE/IP with ICE Certification	21.0	24-Feb-15	19-Mar-15
FL2022224	ER/IP's Approval	28.0	20-Mar-15	16-Apr-15
DDA Submission		75.0	18-May-15	15-Aug-15
FL2022225	Preparation for formal submission to ER/ICE/IP	75.0	18-May-15	15-Aug-15
Temp Gallery for TBM Segment Del in Curved Section		188.2	03-Dec-14	25-Apr-15
DDA Submission		188.2	03-Dec-14	25-Apr-15
FL2022229	Preparation for formal submission to ER/ICE/IP	42.0	03-Dec-14	23-Jan-15
FL2022230	IPs'/ ER's Review	28.0	24-Jan-15	28-Feb-15
FL2022231	Preparation for resubmission to ER/ICE/IP with ICE Certification	24.0	02-Mar-15	28-Mar-15
FL2022232	ER/IP's Approval	28.0	29-Mar-15	25-Apr-15
5.3 North Portal Method Statement Submission		205.0	13-Nov-14	21-Sep-15
North Tunnel (D&B Section) Blasting Method Statement		60.0	13-Nov-14	24-Jan-15
FL2022110	Engineer's/IP's Review & Approval	60.0	13-Nov-14	24-Jan-15
North Tunnel (Cross Passages) Blasting Method Statement		95.0	01-Jun-15	21-Sep-15
FL2022111	Preparation and Submission of Blasting Method Statement	70.0	01-Jun-15	22-Aug-15
FL2022112	Engineer's/IP's Review & Approval	60.0	14-Jul-15	21-Sep-15
MS for TBM On-Site Assembly		43.0	23-Dec-14	14-Feb-15
FL4885	Prepare & Re-submit Method Statement	18.0	23-Dec-14	15-Jan-15
FL4890	ER's Approval for Method Statement	30.0	16-Jan-15	14-Feb-15
MS for TBM Launching		199.0	02-Dec-14	13-Apr-15
FL2022061	Prepare & Submit Method Statement	40.0	02-Dec-14	20-Jan-15
FL2022062	ER's Comment for Method Statement	30.0	21-Jan-15	19-Feb-15
FL2022063	Prepare & Re-submit Method Statement	18.0	23-Feb-15	14-Mar-15
FL2022064	ER's Approval for Method Statement	30.0	15-Mar-15	13-Apr-15
MS forTBM Excavation		65.8	01-Jan-15	26-Mar-15
FL2880	ER's Comment for Method Statement	30.0	01-Jan-15	30-Jan-15
FL2885	Prepare & Re-submit Method Statement	18.0	31-Jan-15	24-Feb-15
FL2890	ER's Approval for Method Statement	30.0	25-Feb-15	26-Mar-15
North Portal: MS for Cross Passage Ground Treatment		80.0	04-May-15	08-Aug-15
FL2022065	Prepare & Submit Method Statement	40.0	04-May-15	19-Jun-15
FL2022066	ER's Comment for Method Statement	30.0	20-Jun-15	19-Jul-15
FL2022067	Prepare & Re-submit Method Statement	18.0	20-Jul-15	08-Aug-15
North Portal: WSD Tunnel Instrumentation		30.0	07-Dec-14	05-Jan-15
FL2022494	ER's Approval for Method Statement	30.0	07-Dec-14	05-Jan-15
5.5 North Portal Works		394.0	07-Oct-14	30-Sep-15
CLP Substation		151.0	07-Oct-14	14-Feb-15
N21060	Sub-station Construction	110.0	07-Oct-14	14-Feb-15
N21090	Energization	1.0	14-Feb-15	14-Feb-15
North Portal: Site Formation		366.0	23-Oct-14	30-Sep-15
N20505	Permanent Slope Formation (Remaining)	200.0	08-Nov-14	25-Jul-15



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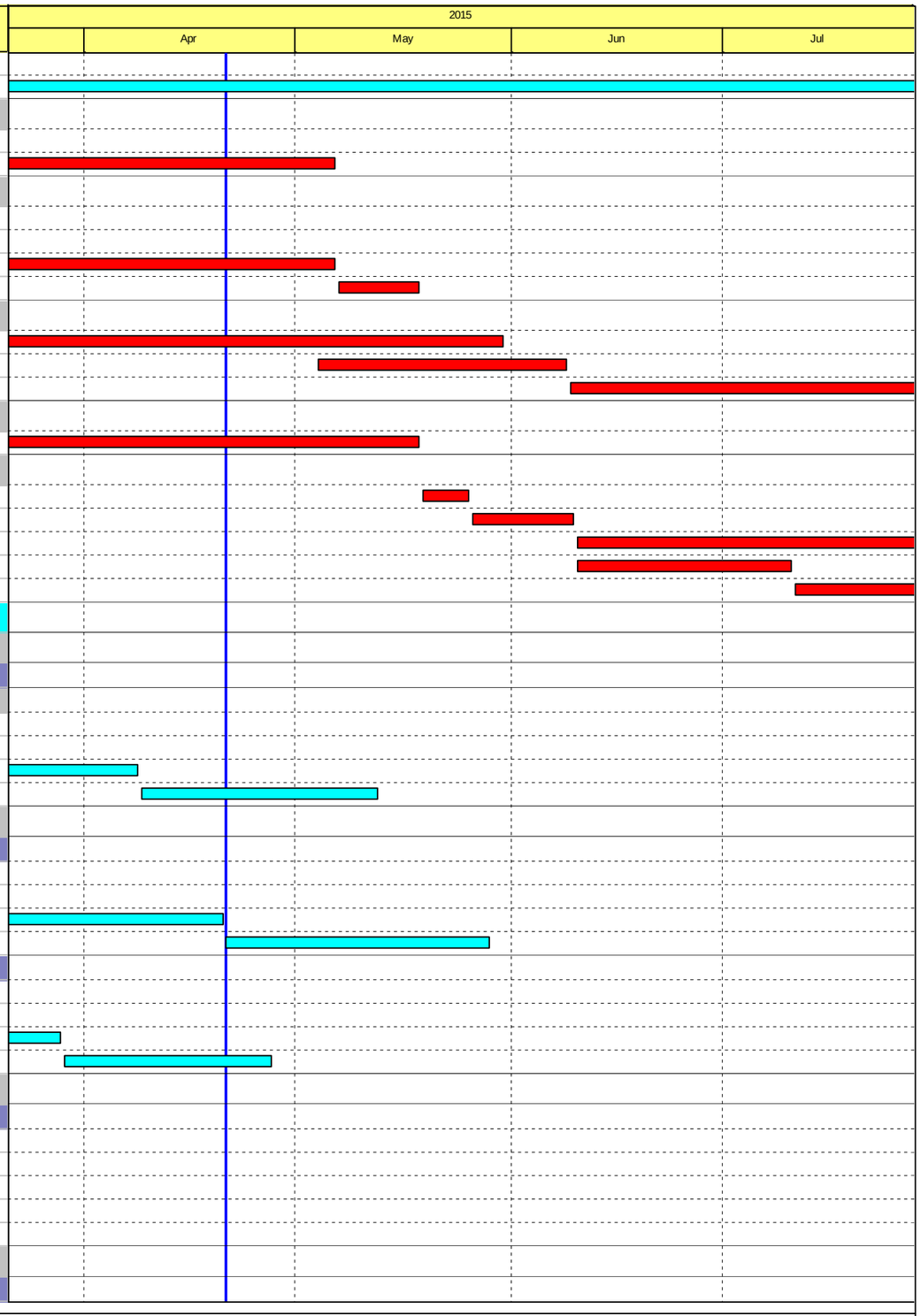
Activity ID	Activity Name	Working Duration	BL Project Start	BL Project Finish
N20635	NB: Stage 2 Excavation from +38mPD to +18mPD w/10 rows Soil Nail	74.0	23-Oct-14	20-Jan-15
N20655	NB: Stage 3 Permanent Slope from +75mPD to +30mPD	192.0	21-Jan-15	30-Sep-15
North Portal: Site Installation for TBM		99.0	08-Nov-14	06-May-15
SC01310	Site Installation and Logistics for TBM Works	60.0	08-Nov-14	20-Jan-15
TD1000	Conveyor Belt System Construction	75.0	26-Jan-15	06-May-15
Southbound Tunnel (Mined Excavation) inc Enlargement		185.0	06-Dec-14	18-May-15
DB6370c	Top Heading Excavation (Canopies) (Ch6,415>Ch6,355) (60m) [P21: 4815 to 4755]	72.0	06-Dec-14	02-Mar-15
DB6370d	Platform excavation for bench excavation	22.0	12-Feb-15	09-Mar-15
DB6370e	Bench Excavation (Ch6,450>Ch6,355) (95m) [P21: 4850 to 4755]	48.0	10-Mar-15	06-May-15
DB6372	RC Slab Cradle for TBM Shifting way	10.0	07-May-15	18-May-15
Northbound Tunnel (Mined Excavation)		152.0	02-Mar-15	31-Aug-15
DB6400a	Top Heading Canopies (Ch6446>Ch6410); 36m; [P20: 4824 to 4788]	76.0	02-Mar-15	30-May-15
DB6400a1	Blast door installation + Noise Measurement and 24Hr permit approval	30.0	04-May-15	08-Jun-15
DB6400a2	Top Heading Canopies (Ch6410>Ch6350); 60m; [P20: 4788 to 4728]	70.0	09-Jun-15	31-Aug-15
TBM On-Site Assembly		65.0	02-Mar-15	18-May-15
TD0990	TBM On-site Assembly and T&C	65.0	02-Mar-15	18-May-15
Southbound Tunnel (TBM Tunneling)		101.0	19-May-15	16-Sep-15
TD0995	TBM Sliding to Face	6.0	19-May-15	25-May-15
TD0995a	Erection of Thrust Frame / Preparation to Start TBM Launch	12.0	26-May-15	09-Jun-15
TD1000a	TBM DT (Ch6,355>Ch6,077) 278m	82.0	10-Jun-15	16-Sep-15
TD1000a10	TBM DT (Ch6,355>Ch6,268) 87m	26.0	10-Jun-15	10-Jul-15
TD1000a20	TBM DT (Ch6,268>Ch6,148) 120m - WSD Restriction Zone	35.0	11-Jul-15	21-Aug-15
5.6 Administration Building:		203.0	20-Dec-14	23-Jul-15
5.62 Administration Building: Design Submission		171.0	20-Dec-14	12-May-15
Admin. Building - Foundation Design		171.0	20-Dec-14	12-May-15
DDA Submission		171.0	20-Dec-14	12-May-15
DSN29107	Preparation for formal submission to ER/ICE/IP	35.0	20-Dec-14	02-Feb-15
DSN29108	IPs'/ ER's Review	28.0	03-Feb-15	10-Mar-15
DSN29109	Preparation for resubmission to ER/ICE/IP with ICE Certification	21.0	11-Mar-15	08-Apr-15
DSN29110	ER/IP's Approval	28.0	09-Apr-15	12-May-15
5.63 Administration Building: Method Statement Submission		179.0	09-Jan-15	28-May-15
Method Statement for Admin.Building Construction		109.0	14-Jan-15	28-May-15
A1990	Prepare Method Statement for Adminstration Building Construction	24.0	14-Jan-15	10-Feb-15
A2000	ER's Comment	28.0	11-Feb-15	18-Mar-15
AD2190	Re-submission Method Statement for Building Construction	24.0	19-Mar-15	20-Apr-15
AD2200	ER's Approval	28.0	21-Apr-15	28-May-15
MS for Adminstration Building: Demolition		95.0	09-Jan-15	27-Apr-15
SV2905	Prepare & Submit Demolition Plan & Method Statement	24.0	09-Jan-15	05-Feb-15
SV2910	ER's Comment for Demolition Plan & Method Statement	30.0	06-Feb-15	07-Mar-15
SV2915	Prepare & Re-submit Demolition Plan & Method Statement	18.0	09-Mar-15	28-Mar-15
SV2920	ER's Approval for Demoliton & Method Statement	30.0	29-Mar-15	27-Apr-15
5.64 Administration Building: General Submission		55.0	02-Jan-15	09-Mar-15
Adminstration Building: Egress/Ingress		55.0	02-Jan-15	09-Mar-15
N21275	Appoint Consultant for TTMs	12.0	02-Jan-15	15-Jan-15
N21285	Prepare & Submit Temp.Traffic Management Scheme	12.0	16-Jan-15	29-Jan-15
N21295	TMLG Meeting	12.0	30-Jan-15	12-Feb-15
N21305	TTMS Reviewed & Comment	12.0	13-Feb-15	02-Mar-15
N21315	Notification to RMO	6.0	03-Mar-15	09-Mar-15
5.65 Administration Building: Works		91.0	10-Mar-15	23-Jul-15
Administration Building:Demolition		44.0	01-Jun-15	23-Jul-15



REV	DESCRIPTION	DATE	PREPARED	CHECKED	APPROVED
A	Monthly Report No.16	20/04/2015	RAN	RBS/SJO	PPL/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

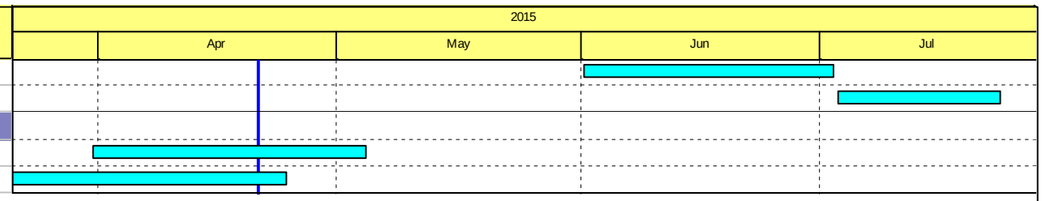
TITLE: Monthly Report No.16 3-Months Rolling Programme (Approved Works Programme Rev. D)

DOCUMENT NO.: LTH/DHK/PGR/PW/PLP/00044/A

DOC. STATUS	CREATION DATE	REVISION
FOR INFO.	20/04/2015	A

PAPER SIZE	SCALE	PAGE
A3	N/A	7 of 8

Activity ID	Activity Name	Working Duration	BL Project Start	BL Project Finish
SV2925	Precautionary Measures	24.0	01-Jun-15	02-Jul-15
SV2940	Demolish Existing Building (AB1 - GLL T11742)	18.0	03-Jul-15	23-Jul-15
Administration Building: Site Formation		37.0	10-Mar-15	04-May-15
AD2000	Site Hoarding	24.0	31-Mar-15	04-May-15
AD2050	U/U Diversion & Drainage Diversion (if required)	36.0	10-Mar-15	24-Apr-15



REV	DESCRIPTION	DATE	PREPARED	CHECKED	APPROVED
A	Monthly Report No.16	20/04/2015	RAN	RBS/SJO	PPL/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.16 3-Months Rolling Programme (Approved Works Programme Rev. D)

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FOR INFO.	20/04/2015	A
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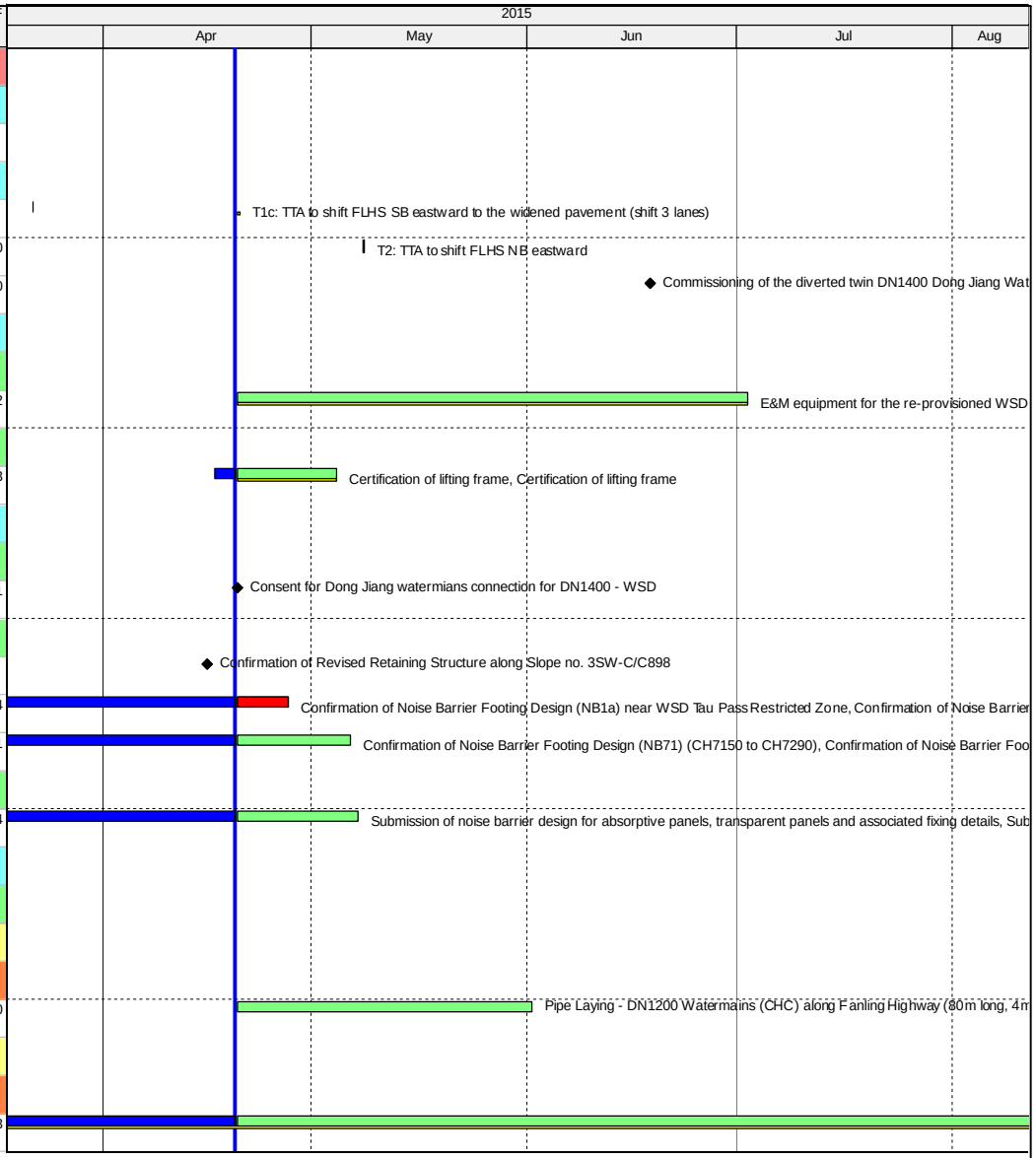
A3	N/A	8 of 8

Contract 3

Activity ID	Activity Name	OD	RD	Start	Finish	TF
3-Month Rolling Programme 2015-04-21						
Key Dates (Contractual)						
KD-0010	Commencement of Works	0	0	31-Jul-13 A		
Major Milestones and Events						
MS-2000A3	T1c: TTA to shift FLHS SB eastward to the widened pavement (shift 3 lanes)	1	0	22-Mar-15 A	22-Mar-15 A	
MS-2000B	T2: TTA to shift FLHS NB eastward	1	1	08-May-15	08-May-15	0
MS-0220	Commissioning of the diverted twin DN1400 Dong Jiang Watermains (Stage 1)	0	0		18-Jun-15	250
Major Procurement & Delivery						
Water Supply Pipeworks						
MM-1060	E&M equipment for the re-provisioned WSD Valve Control House	60	60	20-Apr-15	02-Jul-15	22
Precast Bridge Segment Lifting Frames and Precast Yard						
MM-2050	Certification of lifting frame	12	12	17-Apr-15 A	04-May-15	13
Design and Submissions						
Statutory Approval						
PRE-1210	Consent for Dong Jiang watermians connection for DN1400 - WSD	0	0		20-Apr-15	281
Design Confirmation						
PRE-1510	Confirmation of Revised Retaining Structure along Slope no. 3SW-C/C898	0	0		16-Apr-15 A	
PRE-1220	Confirmation of Noise Barrier Footing Design (NB1a) near WSD Tau Pass Restricted Zone	45	7	09-Apr-14 A	27-Apr-15	-14
PRE-1500	Confirmation of Noise Barrier Footing Design (NB71) (CH7150 to CH7290)	70	14	17-Apr-14 A	06-May-15	61
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	15	11-Mar-14 A	07-May-15	54
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	01-Jun-15	280
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	152	26-Jul-14 A	20-Oct-15	53



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

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CEDD Contract No. CV/2012/09

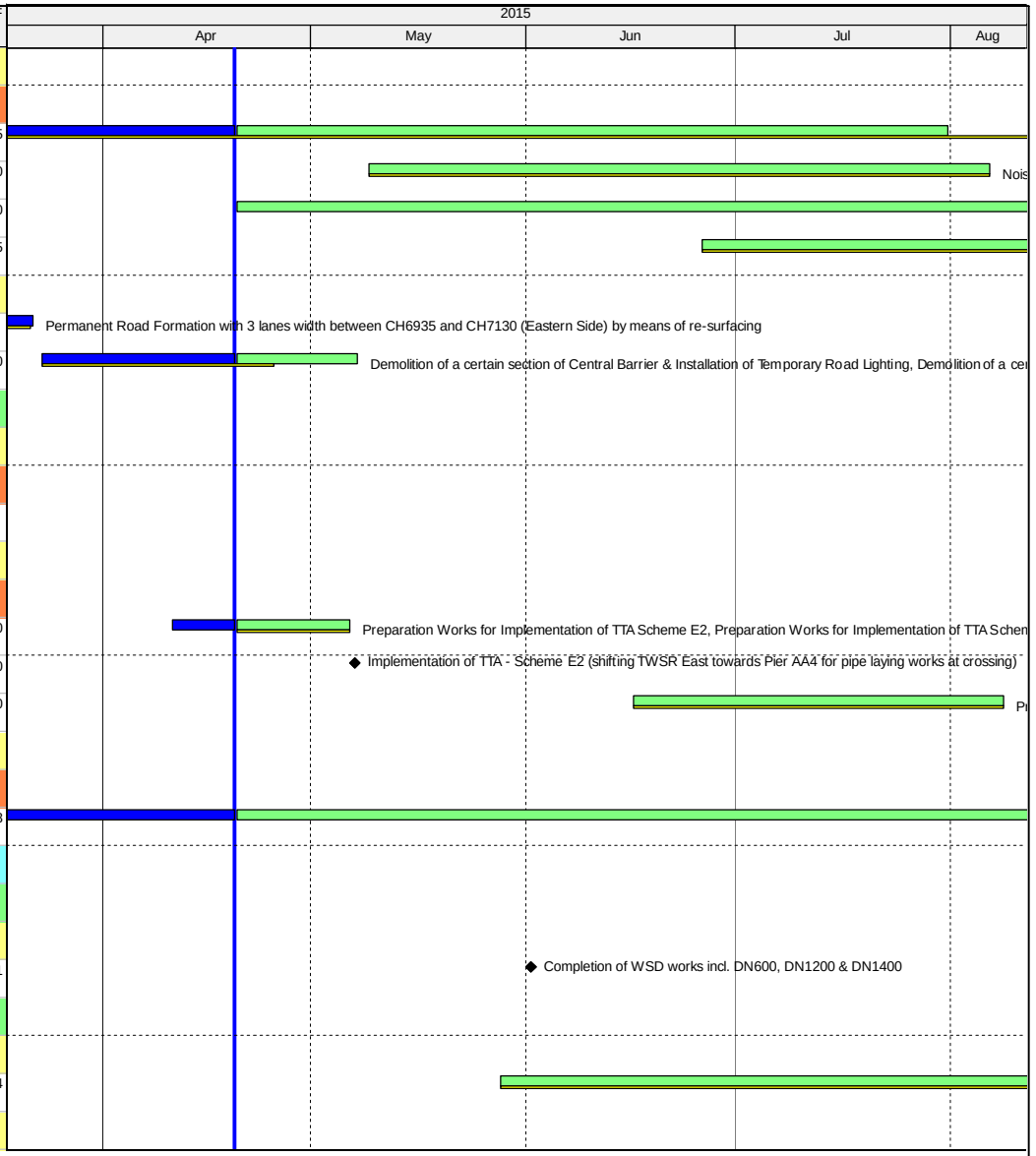
Liantang / Heung Yuen Wai BCP - Site Formation & Infrastructure Works, Contract 3

3-Month Rolling Programme

3-Month Rolling Programme updated to 2015-04-21

Date	Revision	Checked	Approved
20-Apr-15	Rev.1	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	85	23-May-14 A	31-Jul-15	155
FHW-3210	Noise Barrier NB69 - Mini-Piling adjacent to NB lane (CSD: 32nos)	74	74	09-May-15	06-Aug-15	0
FHW-3150*	Pipe Laying - DN600, DN1200 Watermains (CHB &CHC) along Fanling Highway (90m long, 3m depth)	150	145	07-Jun-14 A	12-Oct-15	170
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-1030	Permanent Road Formation with 3 lanes width between CH6935 and CH7130 (Eastern Side) by means of re-surfacing	12	0	09-Mar-15 A	22-Mar-15 A	
FHW-M-1040	Demolition of a certain section of Central Barrier & Installation of Temporary Road Lighting	26	15	23-Mar-15 A	07-May-15	0
	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	0	27-Nov-14 A	18-Apr-15 A	
	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	14	14	11-Apr-15 A	06-May-15	0
FHW-5120B	Implementation of TTA - Scheme E2 (shifting TWSR East towards Pier AA4 for pipe laying works at crossing)	0	0	07-May-15		0
FHW-5120C	Preparation Works for Implementation of TTA Scheme E3	45	45	16-Jun-15	08-Aug-15	0
	Fanling Highway Zone 7 between CH7660 and CH7925					
	At-Grade Roadworks (265m)					
FHW-7100	Site Formation, Preparation Works & Tree Transplant	127	158	30-Aug-13 A	28-Oct-15	8
	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		01-Jun-15	651
	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)					



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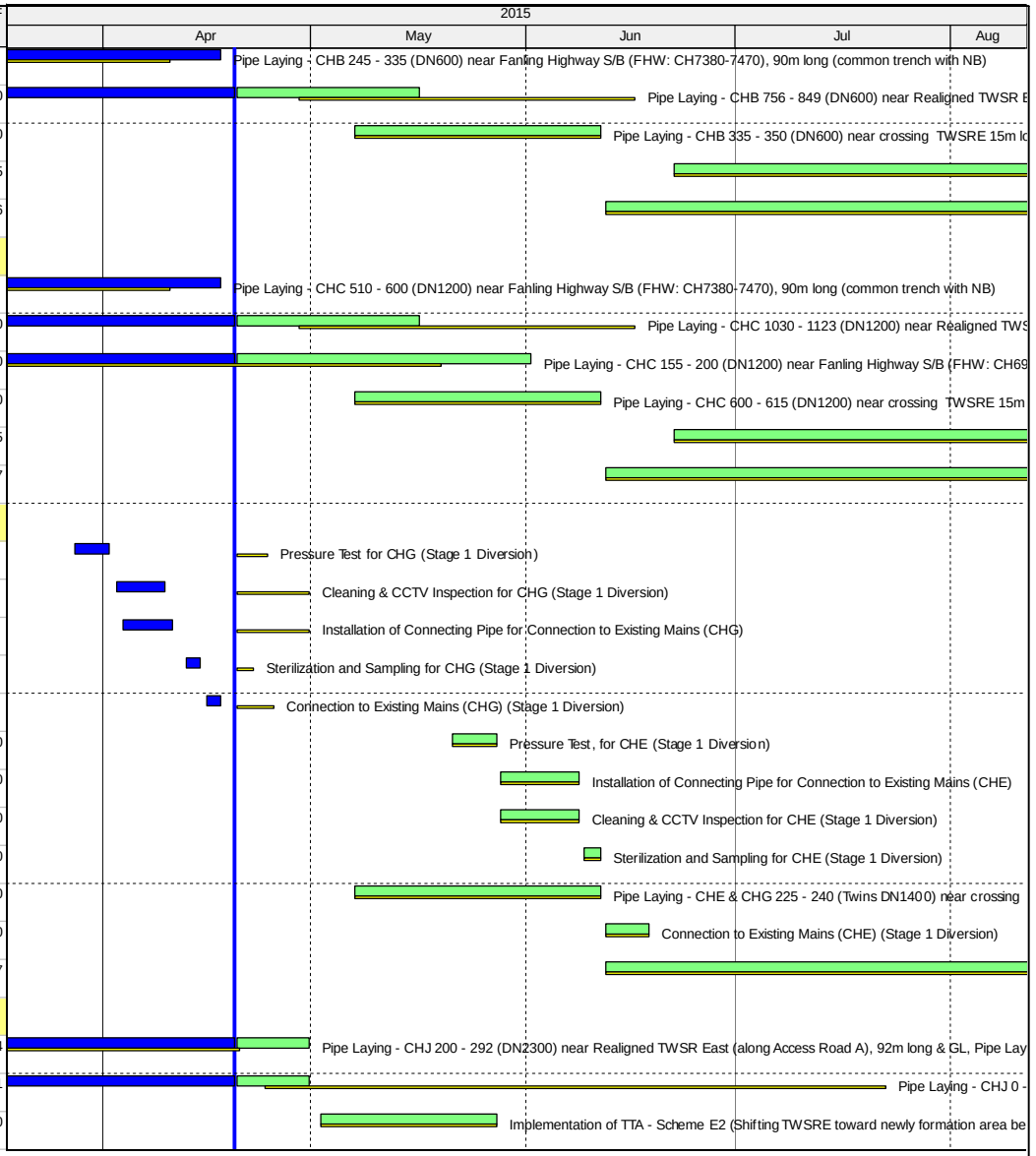
Date	Revision	Checked	Approved
20-Apr-15	Rev.1	SL	

Activity ID	Activity Name	OD	RD	Start	Finish	TF
WB-1020	Pipe Laying - CHB 245 - 335 (DN600) near Fanling Highway S/B (FHW: CH7380-7470), 90m long (common trench with NB)	60	0	27-Nov-14 A	18-Apr-15 A	
WB-1090	Pipe Laying - CHB 756 - 849 (DN600) near Realigned TWSR East (along Access Road A), 93m long & GL	40	23	03-Mar-15 A	16-May-15	0
WB-1030A	Pipe Laying - CHB 335 - 350 (DN600) near crossing TWSRE 15m long & 3m depth	30	30	07-May-15	11-Jun-15	0
WB-1070	Pipe Laying - CHB 635 - 700 (DN600) near Realigned TWSR East (TWSRE: CH380-456), 65m long & GL	78	78	22-Jun-15	21-Sep-15	35
WB-1030C	Pipe Laying - CHB 350 - 450 (DN600) from Portal AB7/AD9/AC12 to Portal AB8	85	85	12-Jun-15	21-Sep-15	656
DN1200 Water Mains (CHC)						
WC-1080	Pipe Laying - CHC 510 - 600 (DN1200) near Fanling Highway S/B (FHW: CH7380-7470), 90m long (common trench with NB)	60	0	27-Nov-14 A	18-Apr-15 A	
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-May-15	0
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	01-Jun-15	280
WC-1090A	Pipe Laying - CHC 600 - 615 (DN1200) near crossing TWSRE 15m long & 3m depth	30	30	07-May-15	11-Jun-15	0
WC-1130	Pipe Laying - CHC 910 - 980 (DN1200) near Realigned TWSR East (TWSRE: CH380-456), 70m long & GL	78	78	22-Jun-15	21-Sep-15	35
WC-1090C	Pipe Laying - CHC 615 - 720 (DN1200) from Portal AB7/AD9/AC12 to Portal AB8	85	85	12-Jun-15	21-Sep-15	297
Twin DN1400 Water Mains (CHE & CHG)						
WE-2000B	Pressure Test for CHG (Stage 1 Diversion)	5	0	28-Mar-15 A	02-Apr-15 A	
WE-2010B	Cleaning & CCTV Inspection for CHG (Stage 1 Diversion)	10	0	03-Apr-15 A	10-Apr-15 A	
WE-2020B	Installation of Connecting Pipe for Connection to Existing Mains (CHG)	10	0	04-Apr-15 A	11-Apr-15 A	
WE-2030B	Sterilization and Sampling for CHG (Stage 1 Diversion)	3	0	13-Apr-15 A	15-Apr-15 A	
WE-2050B	Connection to Existing Mains (CHG) (Stage 1 Diversion)	6	0	16-Apr-15 A	18-Apr-15 A	
WE-2000A	Pressure Test, for CHE (Stage 1 Diversion)	5	5	21-May-15	27-May-15	250
WE-2020A	Installation of Connecting Pipe for Connection to Existing Mains (CHE)	10	10	28-May-15	08-Jun-15	250
WE-2010A	Cleaning & CCTV Inspection for CHE (Stage 1 Diversion)	10	10	28-May-15	08-Jun-15	250
WE-2030A	Sterilization and Sampling for CHE (Stage 1 Diversion)	3	3	09-Jun-15	11-Jun-15	250
WE-1030	Pipe Laying - CHE & CHG 225 - 240 (Twins DN1400) near crossing TWSRE 15m long & 3m depth	30	30	07-May-15	11-Jun-15	0
WE-2050A	Connection to Existing Mains (CHE) (Stage 1 Diversion)	6	6	12-Jun-15	18-Jun-15	250
WE-1050	Pipe Laying - CHE & CHG (Twins DN1400) from Portal AB7/AD9/AC12 to Portal AB8	85	85	12-Jun-15	21-Sep-15	127
DN2300 Water Mains and Leakage Collection System (CHJ & CHKA/CHK)						
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	30-Apr-15	24
WJ-1010A	Pipe Laying - CHJ 0 - 10 (DN2200) near existing TWSR East, 10m long & 6m depth	90	11	13-Oct-14 A	30-Apr-15	1
WJ-1000	Implementation of TTA - Scheme E2 (Shifting TWSRE toward newly formation area beside Fanling Highway)	21	21	02-May-15	27-May-15	0



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CEDD Contract No. CV/2012/09

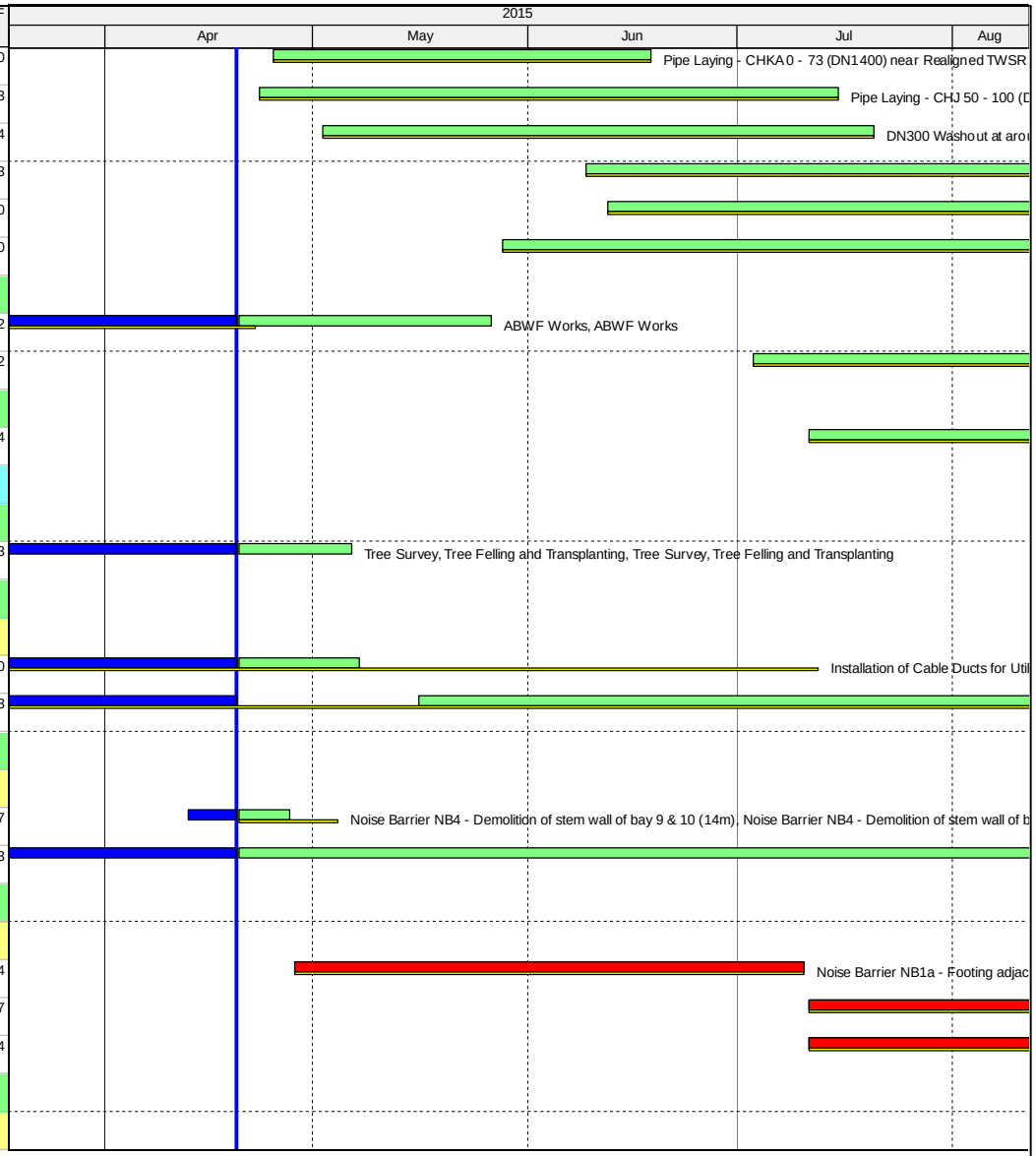
Liantang / Heung Yuen Wai BCP - Site Formation & Infrastructure Works, Contract 3

3-Month Rolling Programme

3-Month Rolling Programme updated to 2015-04-21

Date	Revision	Checked	Approved
20-Apr-15	Rev.1	SL	

Activity ID	Activity Name	OD	RD	Start	Finish	TF
WJ-1020B	Pipe Laying - CHKA 0 - 73 (DN1400) near Realigned TWSR East, 73m long & 4m depth	55	55	25-Apr-15	18-Jun-15	0
WJ-1010C	Pipe Laying - CHJ 50 - 100 (DN2200) near existing TWSR East, 50m long & 6m depth	68	68	23-Apr-15	15-Jul-15	3
WJ-1100	DN300 Washout at around CHJ 268	65	65	02-May-15	20-Jul-15	24
WJ-1110	DN300 Washout at CHJ 155	55	55	09-Jun-15	13-Aug-15	3
WJ-1020A	Pipe Laying - CHK 0 - 80 (DN1400) near RealignedTWSR East, 80m long & 4m depth	55	55	12-Jun-15	17-Aug-15	0
WJ-1010B	Pipe Laying - CHJ 10 - 50 (DN2200) crossing existing TWSR East, 40m long & 6m depth	68	68	28-May-15	17-Aug-15	0
Kau Lung Hang Valve Control & Telemetry House Reprovision						
VCTH-1040	ABWF Works	70	30	06-Jan-15 A	26-May-15	52
VCTH-1010	BS and E&M Works	60	60	03-Jul-15	10-Sep-15	22
Existing Nam Wa Po Trunk Sewage Pumping Station (PST3)						
PS-1000	Demolition of Existing Boundary Wall of Pumping Station (PST3)	50	50	11-Jul-15*	07-Sep-15	614
Stage 1A - Realignment of Tai Wo Service Road West (KD-7)						
Preliminary Works						
TWSRW-1100	Tree Survey, Tree Felling and Transplanting	81	14	16-Oct-13 A	06-May-15	3
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	18	22-Oct-14 A	07-May-15	250
TWSRW-1160	Road Formation, Road Drainage, Kerb, Planter & Pavement	286	169	15-Nov-14 A	05-Dec-15	33
TWSRW Zone 2 betweeen CH155 and CH280						
At-Grade Roadworks						
TWSRW-2110A	Noise Barrier NB4 - Demolition of stem wall of bay 9 & 10 (14m)	12	7	13-Apr-15 A	27-Apr-15	367
TWSRW-2120	Road Formation, Road Drainage, Kerb, Planter and Pavement	165	191	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 (31m)	60	60	28-Apr-15	10-Jul-15	-14
TWSRW-3110	Installation of Cable Ducts for Utilities Diversion Works at Zone 2 (Approx. 120m) (by utilities undertakers)	120	120	11-Jul-15	07-Nov-15	-17
TWSRW-3120	Road Formation, Road Drainage, Kerb, Planter and Pavement	171	171	11-Jul-15	02-Feb-16	-14
TWSRW Zone 4 betweeen CH315 and CH376						
Construction of Bridge E						



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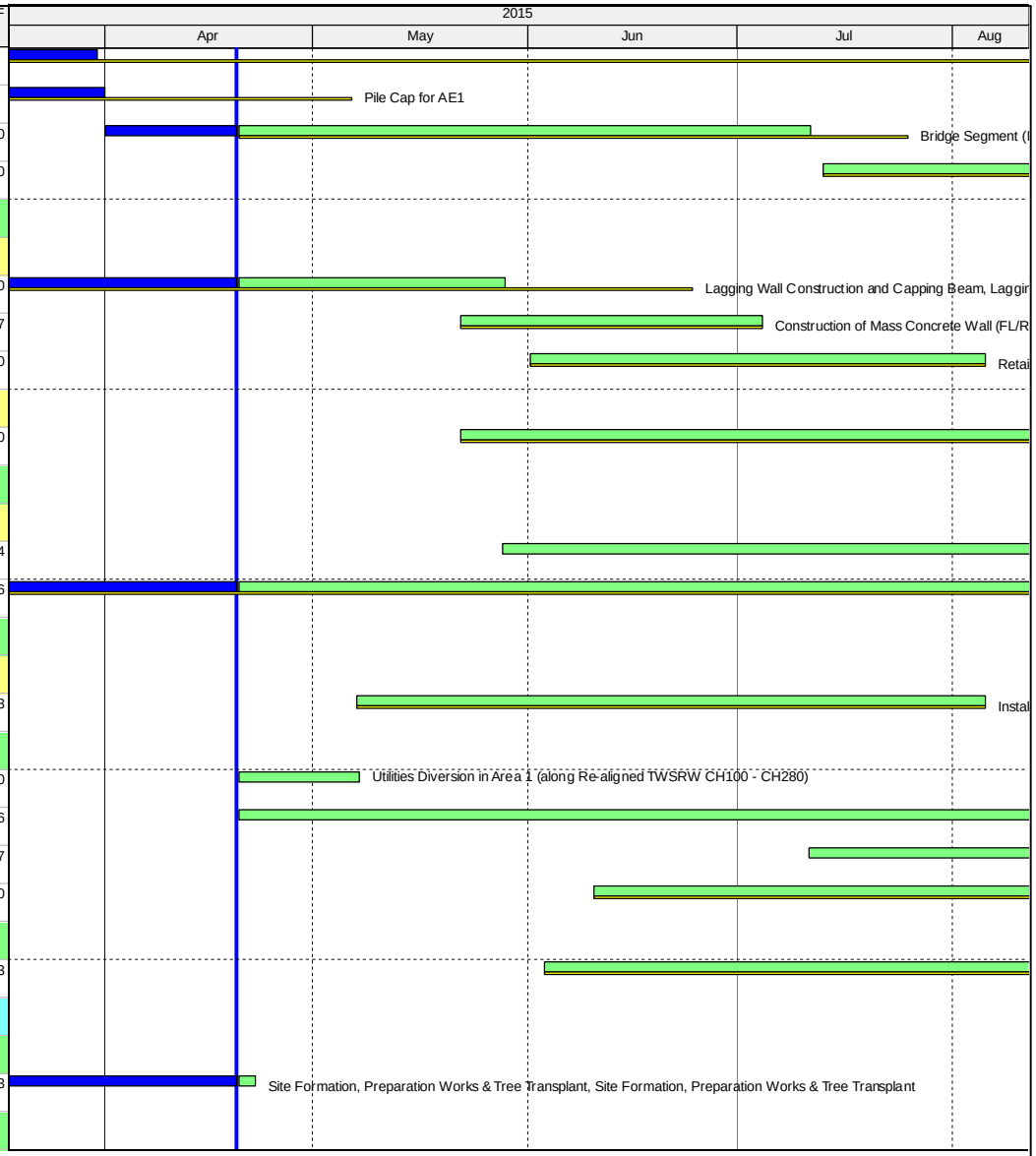
Liantang / Heung Yuen Wai BCP - Site Formation & Infrastructure Works, Contract 3

3-Month Rolling Programme

3-Month Rolling Programme updated to 2015-04-21

Date	Revision	Checked	Approved
20-Apr-15	Rev.1	SL	

Activity ID	Activity Name	OD	RD	Start	Finish	TF
TWSRW-4060	Construction of Temporary Support at DSD nullah (Work in dry season)	55	0	22-Jan-15 A	31-Mar-15 A	
TWSRW-4050A	Pile Cap for AE1	55	0	11-Feb-15 A	01-Apr-15 A	
TWSRW-4070	Bridge Segment (North Bay & Middle Bay)	80	68	01-Apr-15 A	11-Jul-15	0
TWSRW-4080	Bridge Segment (South Bay)	40	40	13-Jul-15	27-Aug-15	0
TWSRW Zone 5 betweeen CH376 and CH520						
Construction of Retaining Structures						
TWSRW-5090	Lagging Wall Construction and Capping Beam	160	32	06-Nov-14 A	28-May-15	0
TWSRW-5070	Construction of Mass Concrete Wall (FL/RW4)	35	35	22-May-15	04-Jul-15	27
TWSRW-5080	Retaining Structure along Slope no. 3SW-C/C898 (to be covered by VO)	55	55	01-Jun-15	05-Aug-15	0
At-Grade Roadworks						
TWSRW-5100	Noise Barrier NB2 - Footing and Retaining Structure adjacent to Realigned TWSR West (66m)	90	90	22-May-15	07-Sep-15	0
TWSRW Zone 7 betweeen CH530 and CH640						
At-Grade Roadworks						
TWSRW-7120*	Pipe Laying - DN450 Watermains (CHA)	70	70	28-May-15	19-Aug-15	14
TWSRW-7140	Installation of Cable Ducts for Utilities Diversion Works at Area 4 (Approx. 150m) (by utilities undertakers)	233	135	28-Jan-15 A	01-Sep-15	16
TWSRW Zone 8 betweeen CH640 and CH695						
Kiu Tau Footbridge Reprovision (West)						
TWSRW-8010	Installation of Socket H-Pile for Proposed Kiu Tau Footbridge (14 nos of Pile)	75	75	07-May-15	05-Aug-15	3
Remainder of the Works						
TWSRW-9010*	Utilities Diversion in Area 1 (along Re-aligned TWSRW CH100 - CH280)	167	18	22-Oct-14 A	07-May-15	250
TWSRW-9040*	Utilities Diversion in Area 4 (along Re-aligned TWSRW CH530 - CH640)	233	135	28-Jan-15 A	01-Sep-15	16
TWSRW-9020*	Utilities Diversion in Area 2 (along Re-aligned TWSRW CH 280 - CH315)	120	120	11-Jul-15	07-Nov-15	-17
TWSRW-9030	Utilities Diversion in Area 3 (along existing TWSRW, Approx. 150m) (by utilities undertakers)	217	217	10-Jun-15*	12-Jan-16	0
Remaining Works for Noise Barrier along realigned TWSR West						
TWSRW-NB-110	Noise Barrier Steelworks & Panel for NB4 (105m) at Zones 1 & 2	60	60	03-Jun-15*	13-Aug-15	33
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	3	15-Apr-14 A	22-Apr-15	3
TWSRE Zone 1 between CH100 and CH270						



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CHUN WO CONSTRUCTION & ENGINEERING CO., LTD.

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

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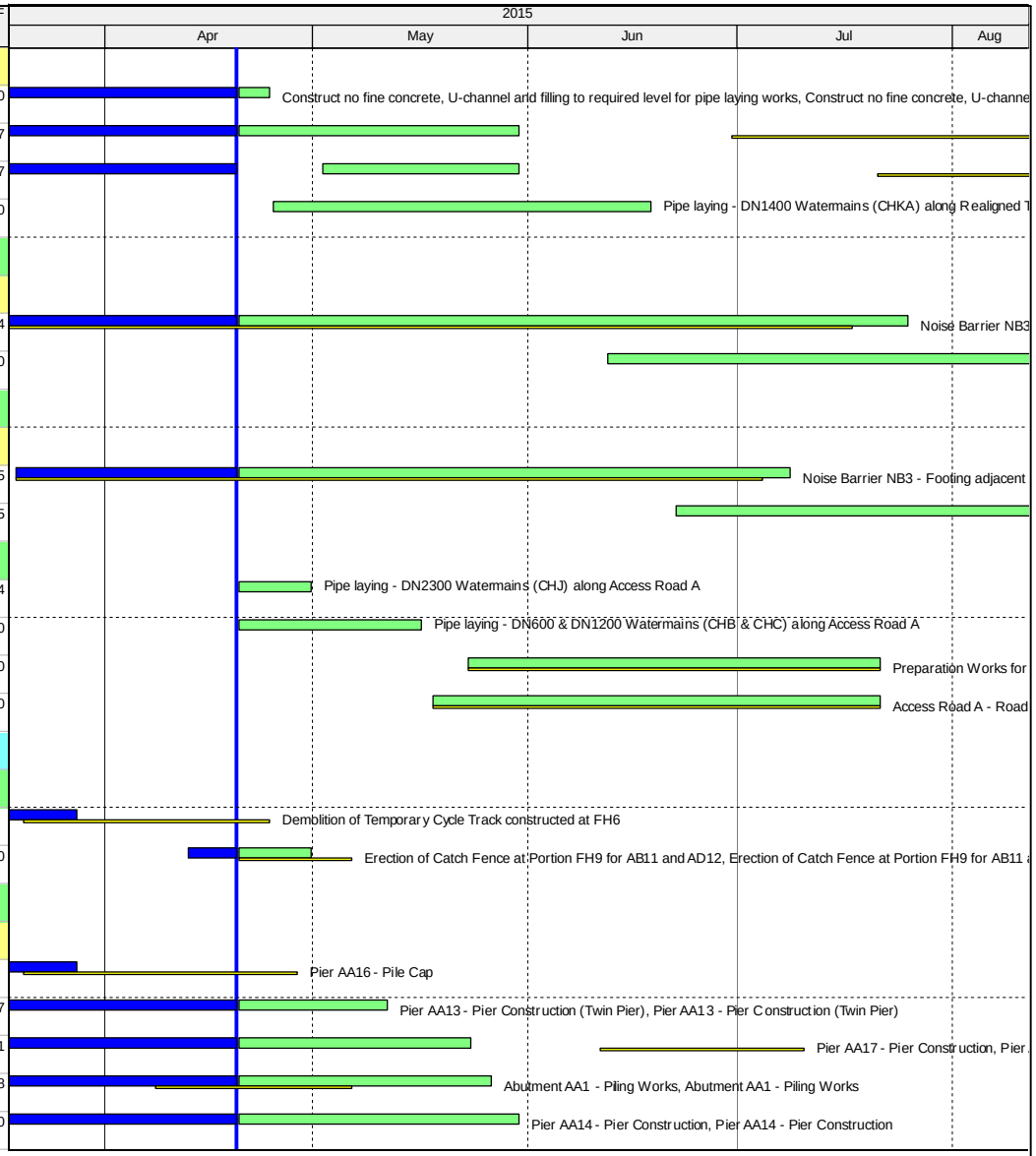
Activity ID	Activity Name	OD	RD	Start	Finish	TF
	At-Grade Roadworks					
TWSRE-1150	Construct no fine concrete, U-channel and filling to required level for pipe laying works	30	5	06-Jan-15 A	24-Apr-15	0
TWSRE-1110	Noise Barrier NB3 - PC01 & PC02 Pile Cap Construction	55	34	19-Jan-15 A	30-May-15	17
TWSRE-1120	Noise Barrier NB3 - Footing adjacent to Realigned TWSR East (96m)	110	24	29-Dec-14 A	30-May-15	17
TWSRE-1140*	Pipe laying - DN1400 Watermains (CHKA) along Realigned TWSR East	55	55	25-Apr-15	18-Jun-15	0
	TWSRE Zone 2 between CH270 and CH380					
	At-Grade Roadworks					
TWSRE-2010	Noise Barrier NB3 - Footing adjacent to Realigned TWSR East (96m)	110	80	03-Mar-15 A	25-Jul-15	134
TWSRE-2030B*	Pipe laying - DN1400 Watermains (CHK) along Realigned TWSR East	55	55	12-Jun-15	17-Aug-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	65	19-Mar-15 A	08-Jul-15	35
TWSRE-3020A*	Pipe Laying - DN600 & DN1200 Watermains (CHB & CHC) along Realigned TWSR East	78	78	22-Jun-15	21-Sep-15	35
	Roundabout A, Slip Road and Access Road					
TWSRE-4050A*	Pipe laying - DN2300 Watermains (CHJ) along Access Road A	68	10	02-Jan-15 A	30-Apr-15	24
TWSRE-4040A*	Pipe laying - DN600 & DN1200 Watermains (CHB & CHC) along Access Road A	58	23	03-Mar-15 A	16-May-15	0
TWSRE-4080	Preparation Works for Implementation of TTA Scheme E1	48	48	23-May-15	21-Jul-15	0
TWSRE-4060B	Access Road A - Road Formation, Kerb, Planter and Pavement	53	53	18-May-15	21-Jul-15	0
	Stage 1C - Viaduct Structure & TCSS Civil Provisions (KD-9)					
	Preliminaries					
B-5020	Demolition of Temporary Cycle Track constructed at FH6	27	0	03-Mar-15 A	28-Mar-15 A	
B-4050	Erection of Catch Fence at Portion FH9 for AB11 and AD12	14	10	13-Apr-15 A	30-Apr-15	0
	Foundation & Pier Construction					
	Bridge A					
BA-16-1020	Pier AA16 - Pile Cap	30	0	03-Mar-15 A	28-Mar-15 A	
BA-13-1030	Pier AA13 - Pier Construction (Twin Pier)	38	18	06-Nov-14 A	11-May-15	7
BA-17-1030	Pier AA17 - Pier Construction	24	29	05-Feb-15 A	23-May-15	21
BA-01-1000	Abutment AA1 - Piling Works	24	30	14-Mar-15 A	26-May-15	88
BA-14-1030	Pier AA14 - Pier Construction	31	34	20-Nov-14 A	30-May-15	20



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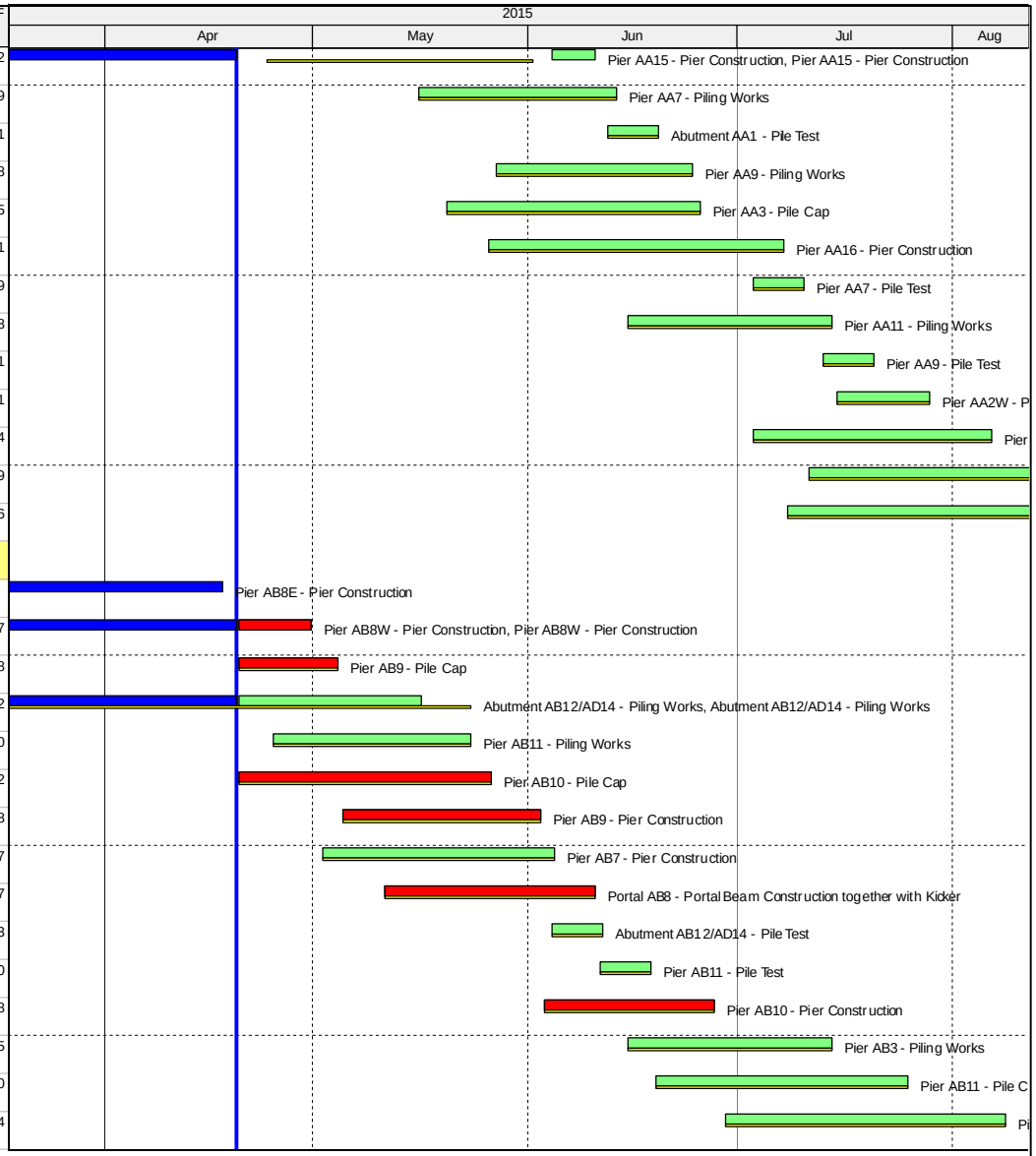
BA-15-1030	Pier AA15 - Pier Construction	31	6	14-Feb-15 A	10-Jun-15	12
BA-07-1000	Pier AA7 - Piling Works	24	24	16-May-15	13-Jun-15	29
BA-01-1010	Abutment AA1 - Pile Test	7	7	12-Jun-15	19-Jun-15	371
BA-09-1000	Pier AA9 - Piling Works	24	24	27-May-15	24-Jun-15	88
BA-03-1020	Pier AA3 - Pile Cap	30	30	20-May-15*	25-Jun-15	85
BA-16-1030	Pier AA16 - Pier Construction	35	35	26-May-15	07-Jul-15	21
BA-07-1010	Pier AA7 - Pile Test	7	7	03-Jul-15	10-Jul-15	29
BA-11-1000	Pier AA11 - Piling Works	24	24	15-Jun-15	14-Jul-15	118
BA-09-1010	Pier AA9 - Pile Test	7	7	13-Jul-15	20-Jul-15	111
BA-02-1000	Pier AA2W - Piling Works	12	12	15-Jul-15	28-Jul-15	141
BA-02-1020A	Pier AA2E - Pile Cap	30	30	03-Jul-15	06-Aug-15	154
BA-07-1020	Pier AA7 - Pile Cap	30	30	11-Jul-15	14-Aug-15	29
BA-18-1030	Pier AA18 - Pier Construction	56	56	08-Jul-15	10-Sep-15	76
Bridge B						
BB-08-1030	Pier AB8E - Pier Construction	24	0	15-Dec-14 A	18-Apr-15 A	
BB-08-1040	Pier AB8W - Pier Construction	24	10	13-Dec-14 A	30-Apr-15	-37
BB-09-1020	Pier AB9 - Pile Cap	12	12	20-Apr-15*	04-May-15	-28
BB-12-1000A	Abutment AB12/AD14 - Piling Works	70	23	06-Feb-15 A	16-May-15	102
BB-11-1000	Pier AB11 - Piling Works	24	24	25-Apr-15	23-May-15	0
BB-10-1020	Pier AB10 - Pile Cap	30	30	20-Apr-15*	26-May-15	-22
BB-09-1030	Pier AB9 - Pier Construction	24	24	05-May-15	02-Jun-15	-28
BB-07-1030	Pier AB7 - Pier Construction	28	28	02-May-15	04-Jun-15	7
BB-08-1050	Portal AB8 - Portal Beam Construction together with Kicker	26	26	11-May-15	10-Jun-15	-37
BB-12-1010	Abutment AB12/AD14 - Pile Test	7	7	04-Jun-15	11-Jun-15	233
BB-11-1010	Pier AB11 - Pile Test	7	7	11-Jun-15	18-Jun-15	0
BB-10-1030	Pier AB10 - Pier Construction	21	21	03-Jun-15	27-Jun-15	-28
BB-03-1000	Pier AB3 - Piling Works	24	24	15-Jun-15	14-Jul-15	35
BB-11-1020	Pier AB11 - Pile Cap	30	30	19-Jun-15	25-Jul-15	0
BB-05-1030	Pier AB5 - Pier Construction	35	35	29-Jun-15	08-Aug-15	144



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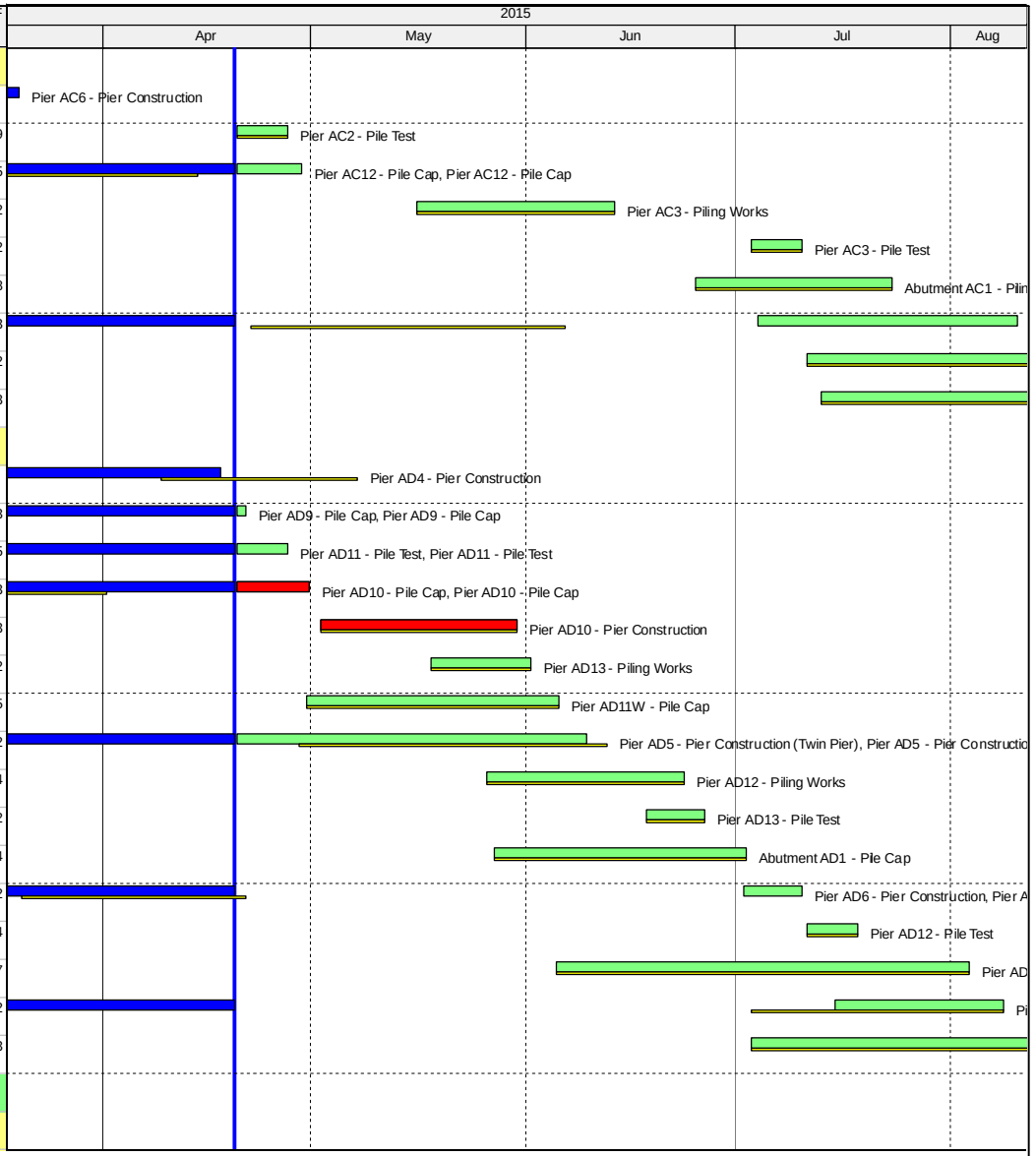
Bridge C						
BC-06-1030	Pier AC6 - Pier Construction	24	0	21-Oct-14 A	20-Mar-15 A	
BC-02-1010	Pier AC2 - Pile Test	7	7	20-Apr-15	27-Apr-15	149
BC-12-1020	Pier AC12 - Pile Cap	30	9	26-Jan-15 A	29-Apr-15	85
BC-03-1000	Pier AC3 - Piling Works	24	24	16-May-15	13-Jun-15	112
BC-03-1010	Pier AC3 - Pile Test	7	7	03-Jul-15	10-Jul-15	112
BC-01-1000	Abutment AC1 - Piling Works	24	24	25-Jun-15	23-Jul-15	88
BC-05-1030	Pier AC5 - Pier Construction (Twin Pier)	38	32	22-Dec-14 A	10-Aug-15	23
BC-03-1020	Pier AC3 - Pile Cap	30	30	11-Jul-15	14-Aug-15	112
BC-11-1030	Pier AC11 - Pier Construction (Twin Pier)	55	55	13-Jul-15	14-Sep-15	23
Bridge D						
BD-04-1030	Pier AD4 - Pier Construction	24	0	19-Nov-14 A	18-Apr-15 A	
BD-09-1020	Pier AD9 - Pile Cap	30	2	03-Nov-14 A	21-Apr-15	43
BD-11-1010	Pier AD11 - Pile Test	7	7	26-Jan-15 A	27-Apr-15	335
BD-10-1020	Pier AD10 - Pile Cap	30	10	26-Jan-15 A	30-Apr-15	-43
BD-10-1030	Pier AD10 - Pier Construction	24	24	02-May-15	30-May-15	-43
BD-13-1000	Pier AD13 - Piling Works	12	12	18-May-15	01-Jun-15	102
BD-11-1020B	Pier AD11W - Pile Cap	30	30	30-Apr-15	05-Jun-15	305
BD-05-1030	Pier AD5 - Pier Construction (Twin Pier)	37	42	29-Jan-15 A	09-Jun-15	2
BD-12-1000	Pier AD12 - Piling Works	24	24	26-May-15	23-Jun-15	114
BD-13-1010	Pier AD13 - Pile Test	7	7	18-Jun-15	26-Jun-15	102
BD-01-1020	Abutment AD1 - Pile Cap	30	30	27-May-15	02-Jul-15	154
BD-06-1030	Pier AD6 - Pier Construction	24	8	02-Jan-15 A	10-Jul-15	2
BD-12-1010	Pier AD12 - Pile Test	7	7	11-Jul-15	18-Jul-15	114
BD-09-1030	Pier AD9 - Pier Construction	49	49	05-Jun-15	03-Aug-15	7
BD-07-1030	Pier AD7 - Pier Construction	32	22	04-Feb-15 A	08-Aug-15	2
BD-01-1030	Abutment AD1 - Abutment Construction	50	50	03-Jul-15	29-Aug-15	353
Pier Head Construction						
Bridge A						



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PA-1130	Pier Table Construction at Pier AA13	30	30	20-May-15	25-Jun-15	7
PA-1140	Pier Table Construction at Pier AA14	30	30	09-Jun-15	15-Jul-15	20
PA-1150	Pier Table Construction at Pier AA15	30	30	26-Jun-15	31-Jul-15	7
Bridge B						
PB-1090	Pier Table Construction at Pier AB9	30	30	11-Jun-15	17-Jul-15	-26
PB-1100	Pier Table Construction at Pier AB10	30	30	08-Jul-15	11-Aug-15	-28
Bridge C						
PC-1080	Pier Table Construction at Pier AC8	30	0	26-Jan-15 A	01-Apr-15 A	
PC-1070	Pier Table Construction at Pier AC7	30	5	10-Mar-15 A	24-Apr-15	27
PC-1060	Pier Table Construction at Pier AC6	30	19	08-Apr-15 A	12-May-15	36
Bridge D						
PD-1100	Pier Table Construction at Pier AD10	24	24	05-Jun-15	04-Jul-15	-43
PD-1050	Pier Table Construction at Pier AD5	30	30	18-Jun-15	24-Jul-15	9
Viaduct Bridge Segement Erection						
Bridge A						
EA-1130	Bridge Deck Construction at Pier AA13 by Typical Lifting Frame (27 nos)	23	23	06-Jul-15	31-Jul-15	13
Bridge B						
EB-1080	Bridge Deck Construction at Pier AB8 by Special Lifting Frame (30 nos)	13	13	16-Jun-15	02-Jul-15	-37
Bridge C						
EC-1080	Bridge Deck Construction at Pier AC8 by Typical Lifting Frame (21 nos)	25	25	05-May-15	03-Jun-15	13
EC-1070	Bridge Deck Construction at Pier AC7 by Typical Lifting Frame (28 nos)	12	12	04-Jun-15	17-Jun-15	13
EC-1060	Bridge Deck Construction at Pier AC6 by Typical Lifting Frame (18 nos)	13	13	18-Jun-15	04-Jul-15	13
Bridge D						
ED-1100	Bridge Deck Construction at Portal AD10 by Special Lifting Frame (60 nos)	28	28	10-Jul-15	11-Aug-15	-43
Section VI - Works in Portion FH9 (KD-6A)						
Major Works						
S6-2000	Construction of Abutment AB12/AD14 (including Piling, Pile Cap & Abutment construction)	276	280	06-Feb-15 A	01-Apr-16	174

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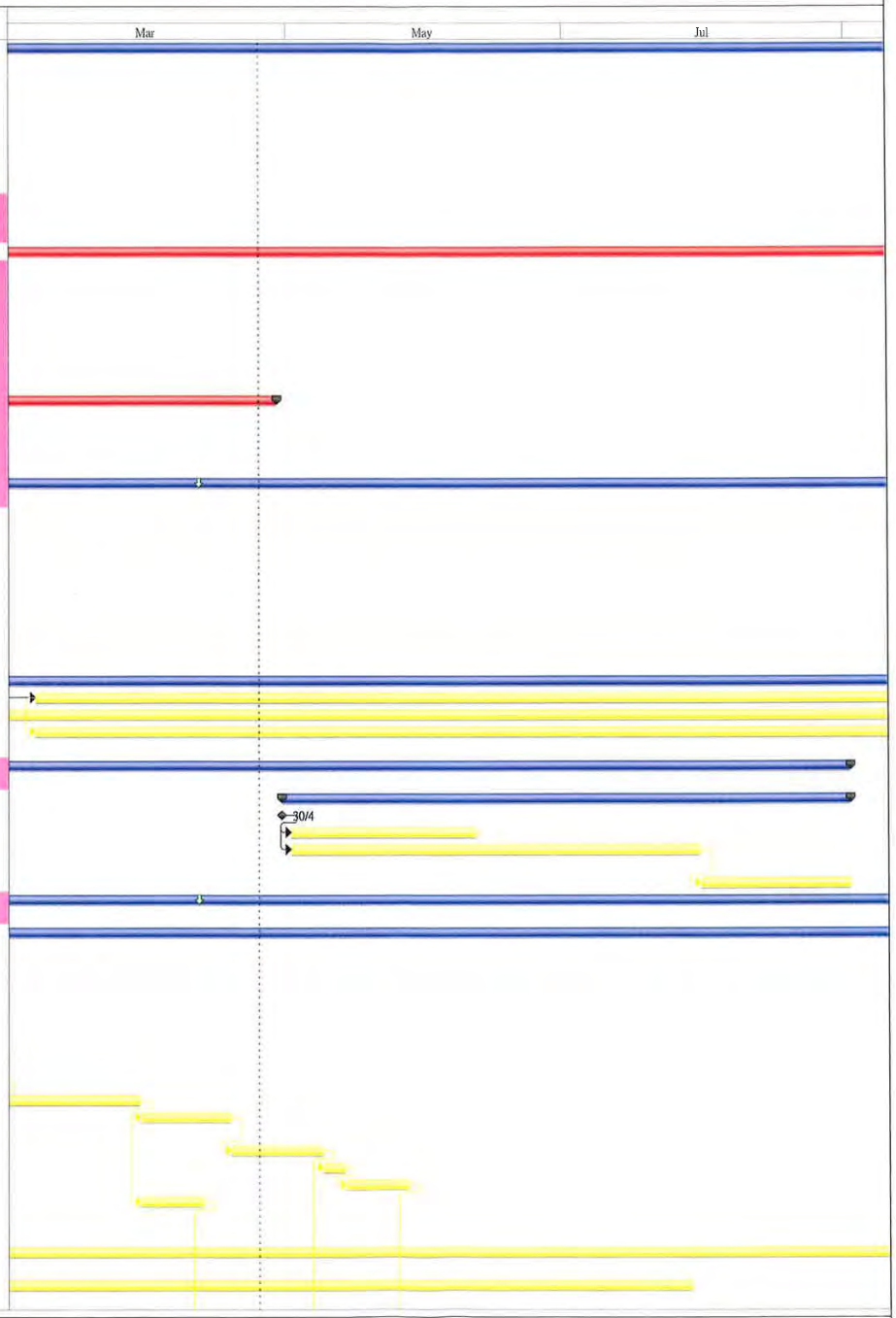
Contract 5

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
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



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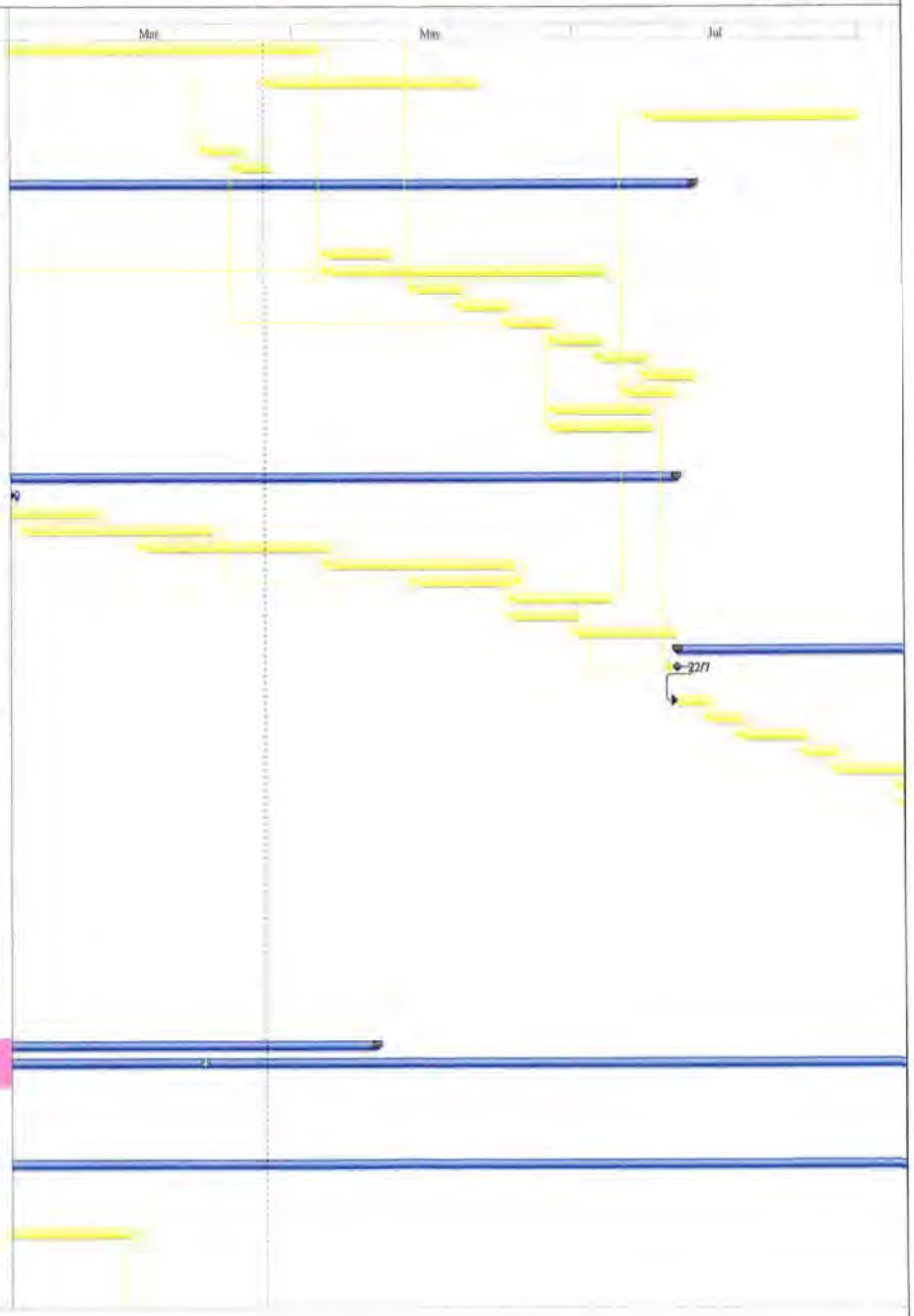
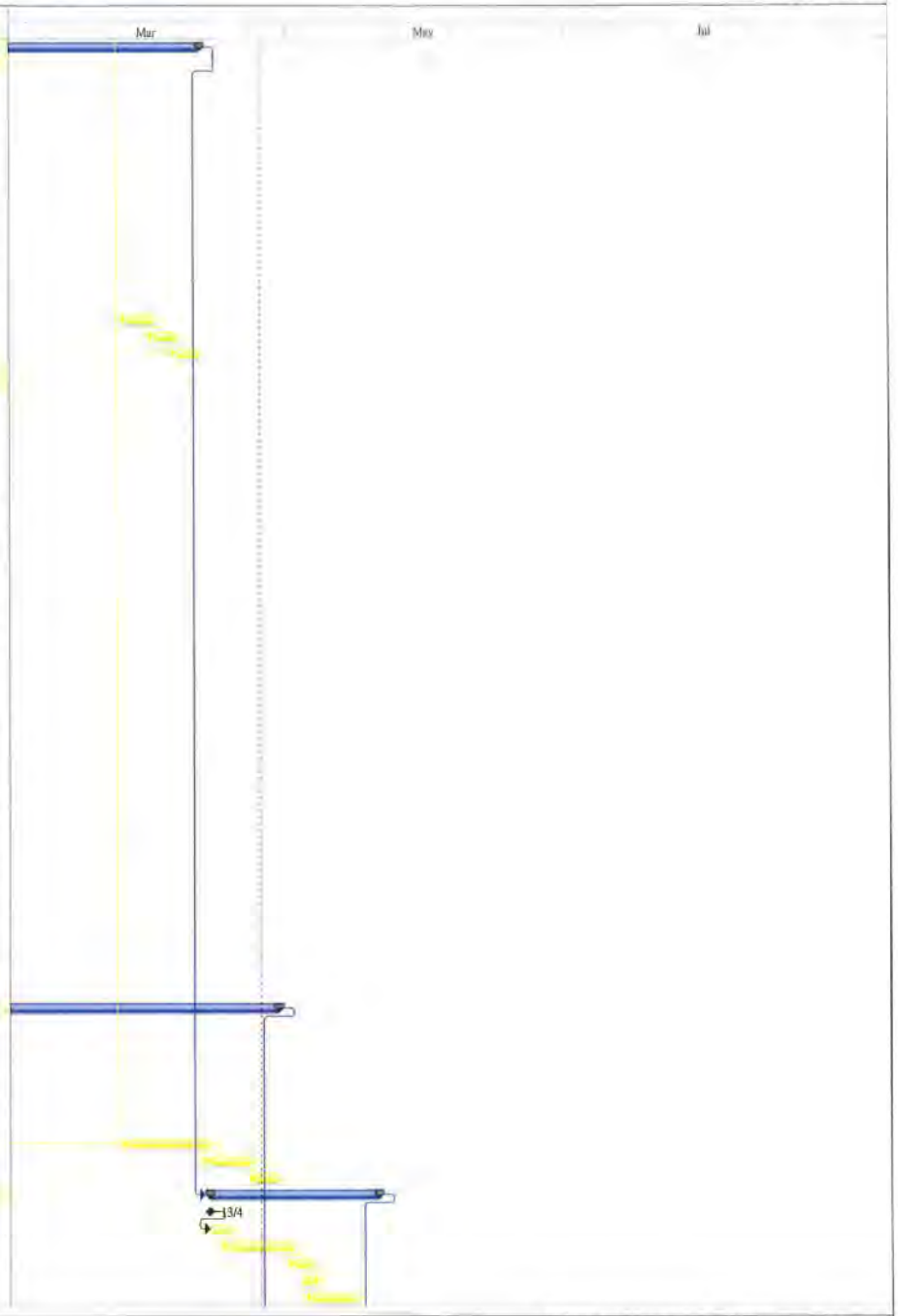
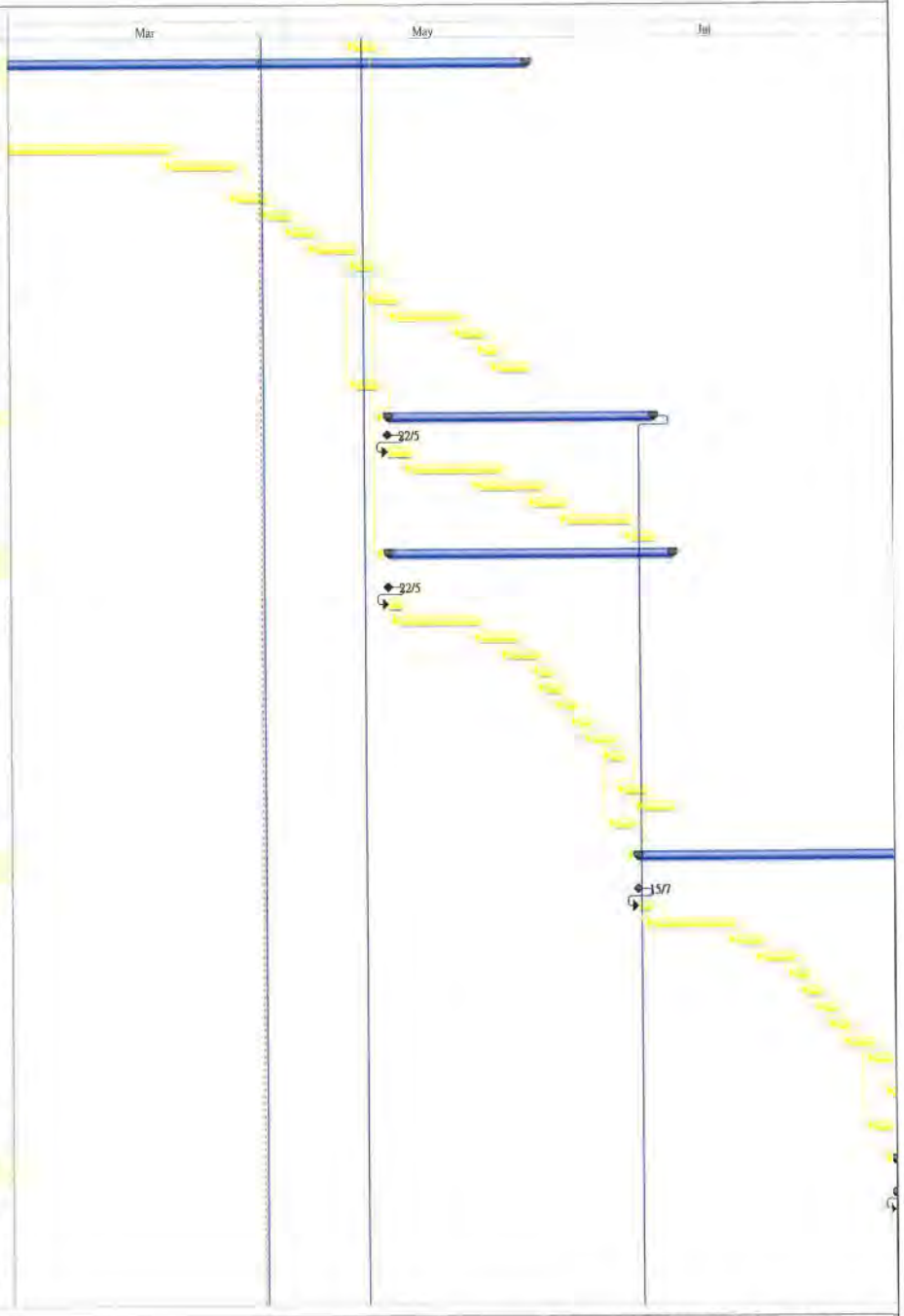
256	4.10.1.16	Secondary Boundary Fencing Ch1234 to Ch1436 (Bay 159 to 184)	70 days	Thu 26/2/15	Wed 6/5/15
257	4.10.1.17	Secondary Boundary Fencing ChA0 to ChA125 (Bay 1 to 16)	45 days	Mon 27/4/15	Wed 10/6/15
258	4.10.1.18	Secondary Boundary Fencing Ch1436 to Ch1520 (Bay 185 to 197)	45 days	Sat 18/7/15	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**
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**



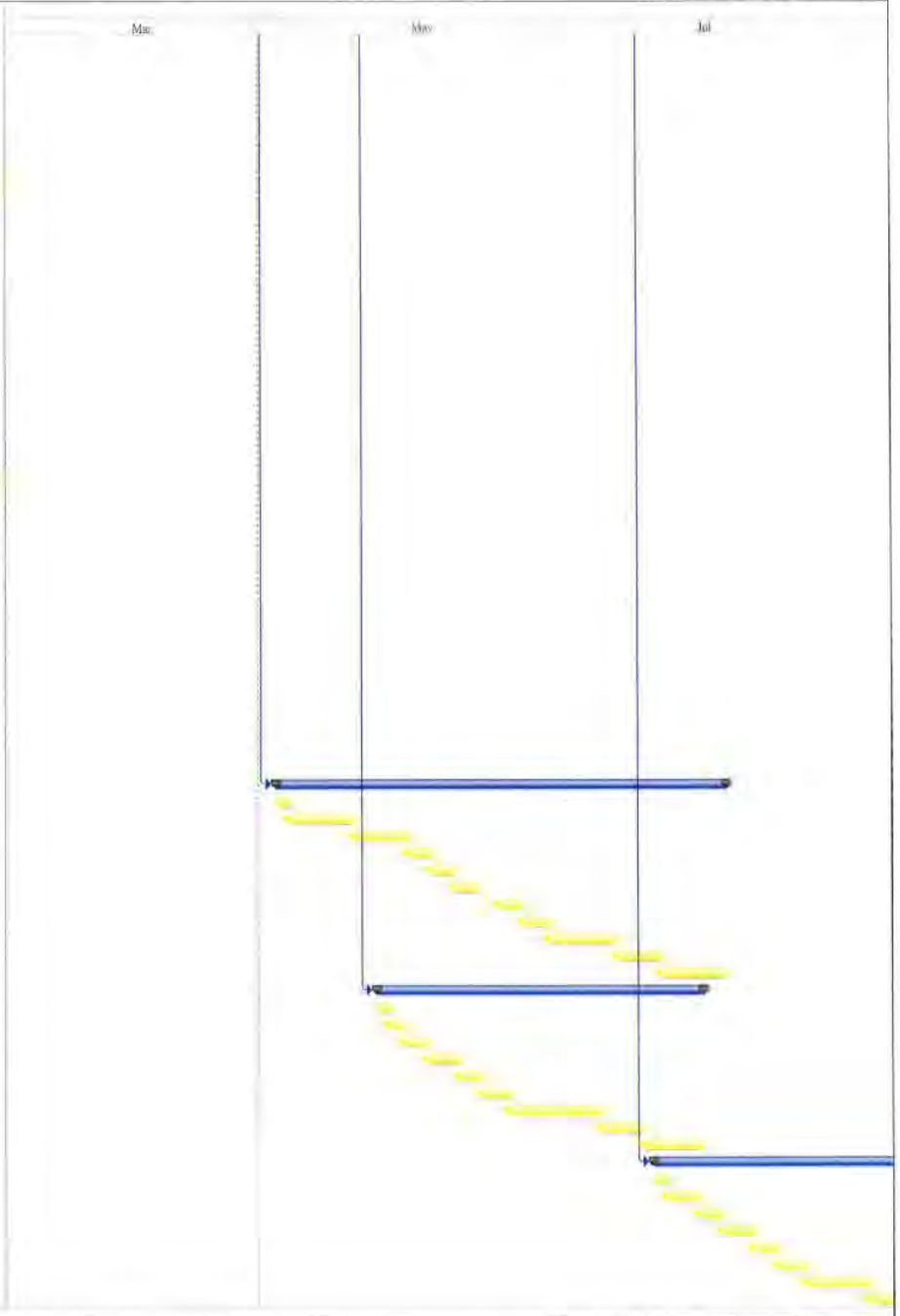
ID	WBS	Task Name	Duration	Start	Finish
504	4.12.4.6	**1 Works from chainage 190 to chainage 380 (west side carriageway & footpath)**	**231 days**	**Sun 24/8/14**	**Sat 11/4/15**
505	4.12.4.6.1	TTA for ch 310-380(west)	0 days	**Sun 24/8/14**	Sun 24/8/14
506	*4.12.4.6.2*	*earthwork to lay drainage & waterwork*	*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*
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*



ID	WBS	Task Name	Duration	Start	Finish
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**
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



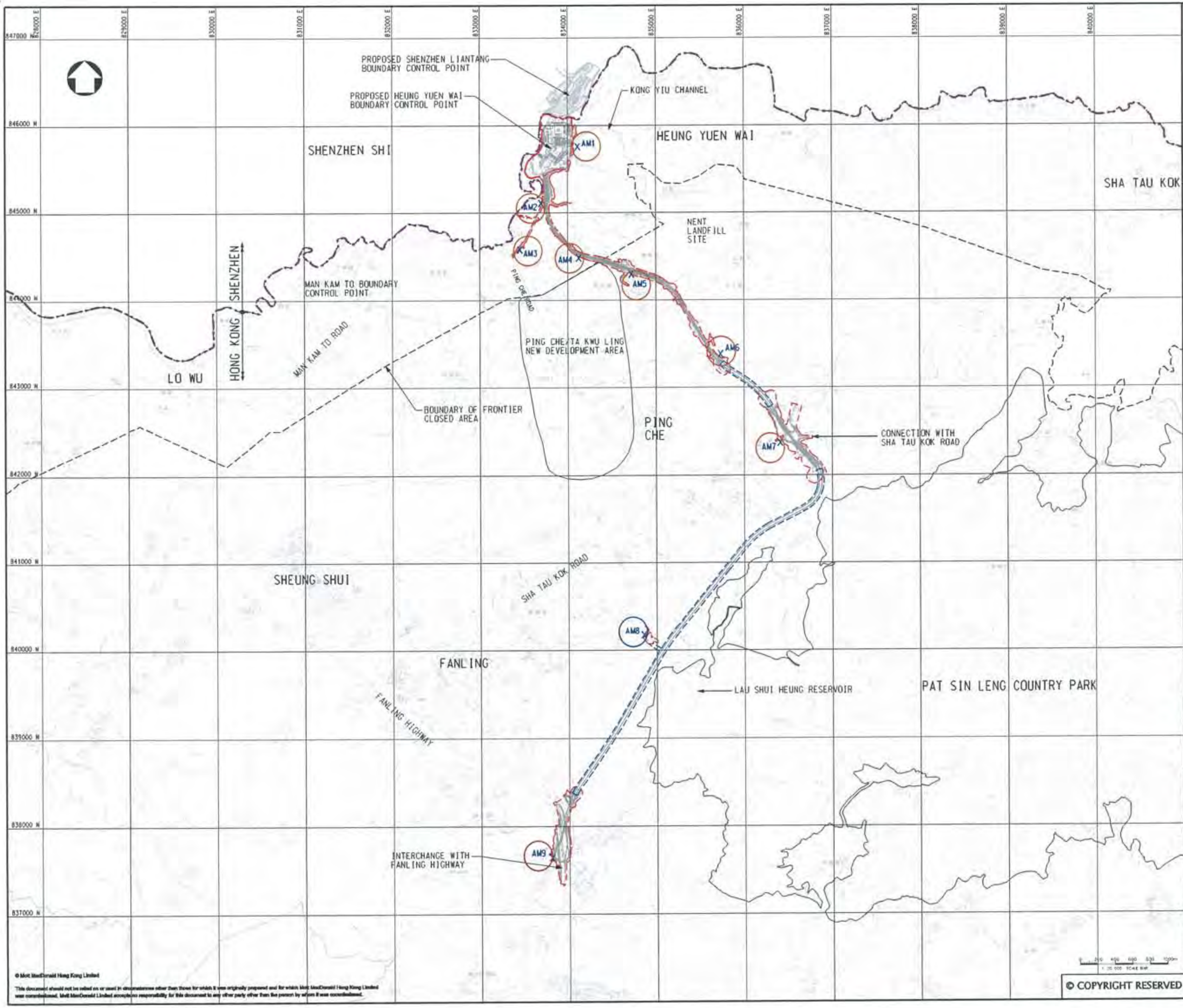
ID	WBS	Task Name	Duration	Start	Finish
634	4.12.4.14.8	kerb bedding, laying & backing before bituminous material	5 days	Thu 1/10/15	Mon 5/10/15
635	4.12.4.14.9	filling works to formation of footpath	3 days	Tue 6/10/15	Thu 8/10/15
636	**4.12.4.14.10**	***UU for ch 125-200 (PCCW/HGC)***	***5 days***	**Fri 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	3 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
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



ID	WBS	Task Name	Duration	Start	Finish
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

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	HT

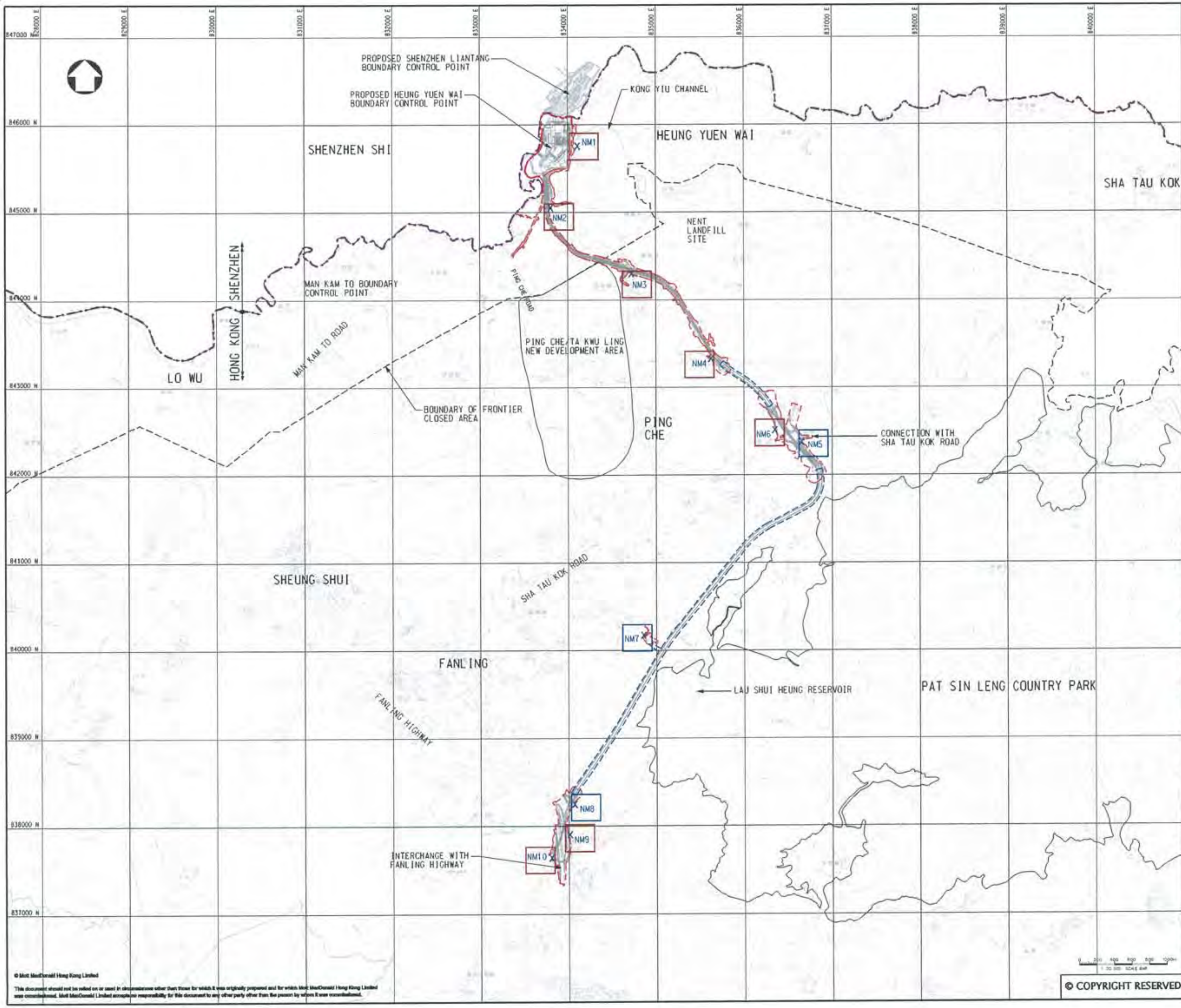
Mott MacDonald

Client: CEDD CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT

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

Title: PROPOSED LOCATION OF CONSTRUCTION AIR QUALITY MONITORING STATIONS

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



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

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

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Client

CEDD CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT

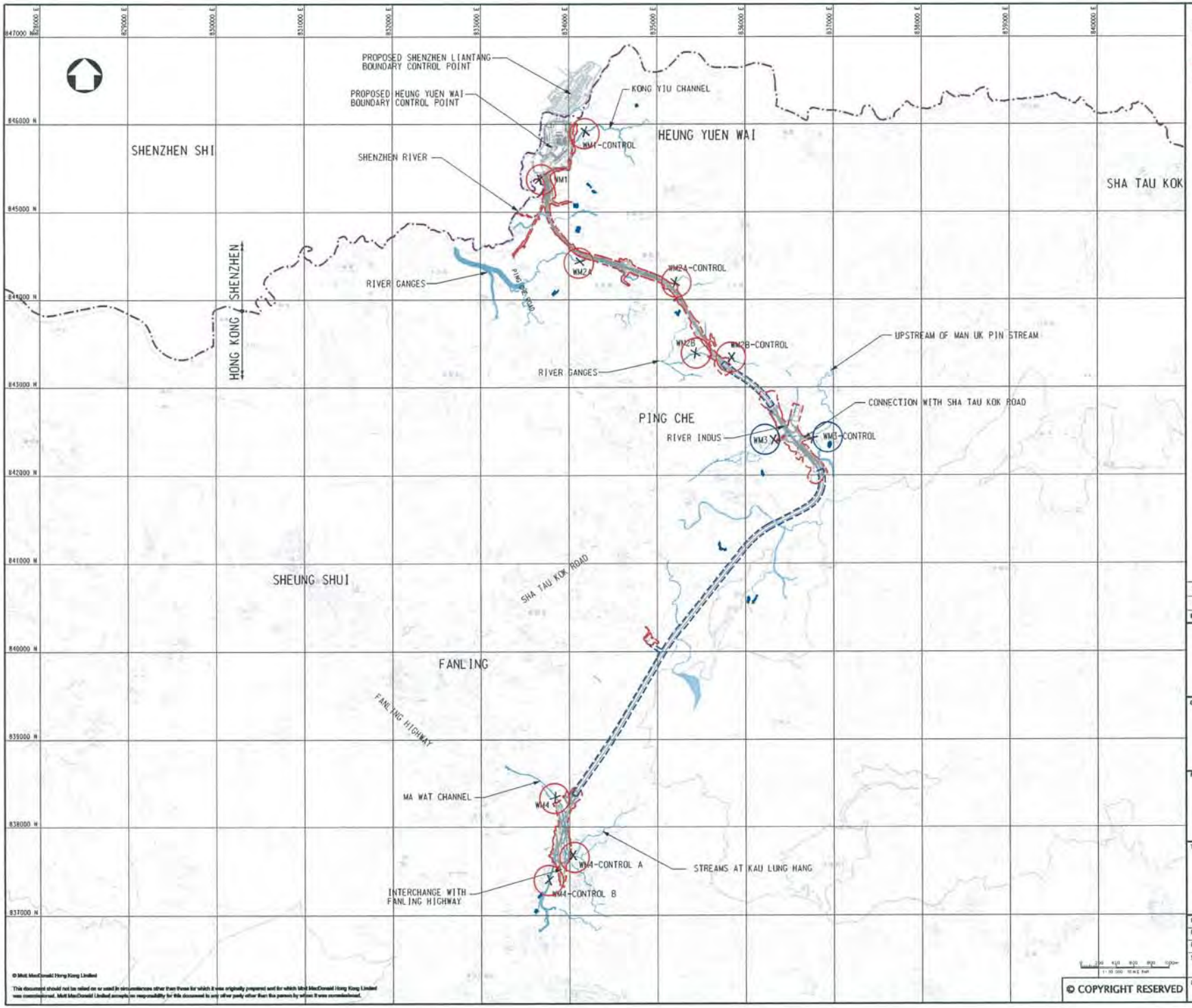
Project

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

Title

PROPOSED LOCATION OF CONSTRUCTION NOISE MONITORING STATIONS

Designed	DC	Eng Chk	EC
Drawn	WING	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

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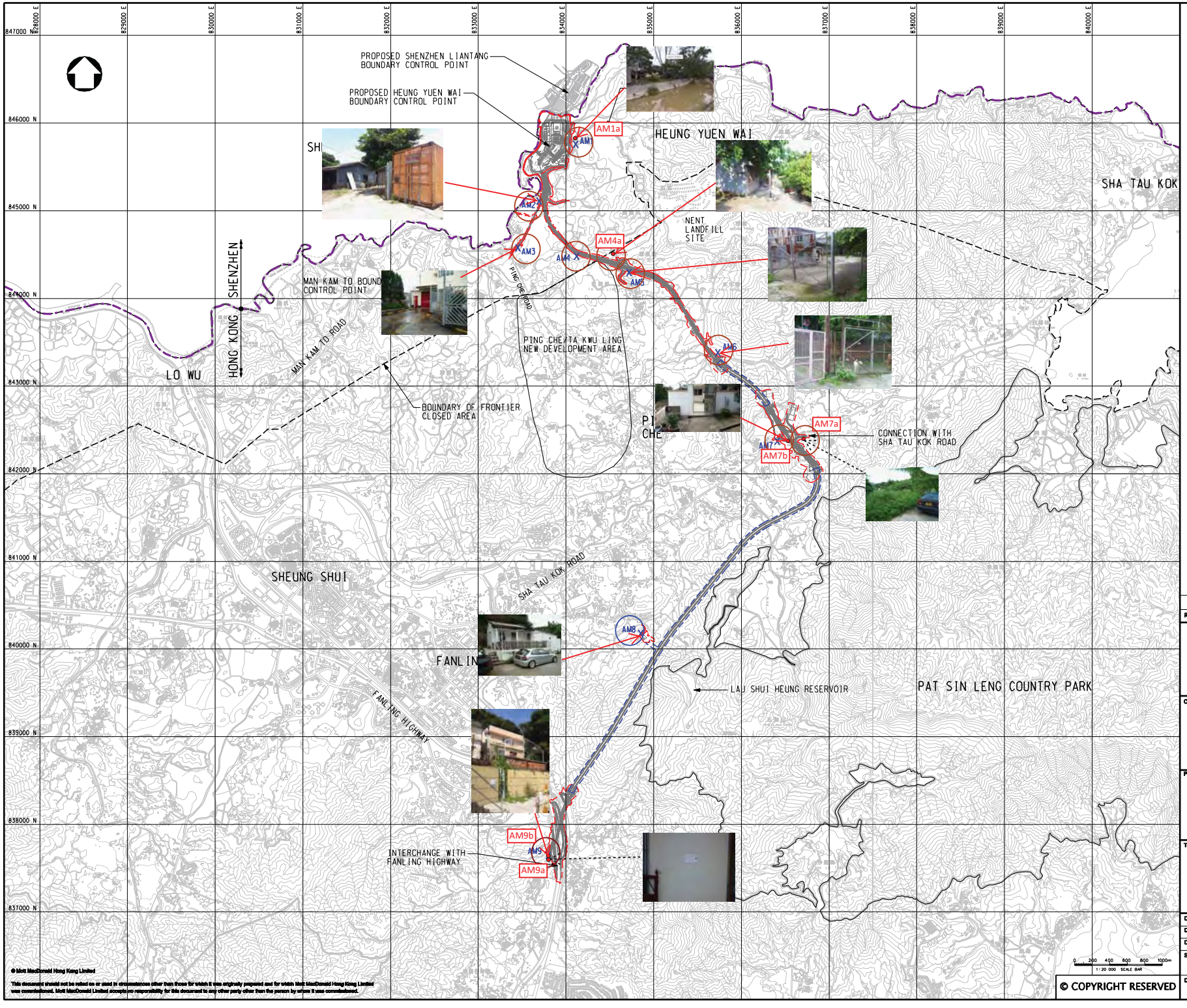
Title: LOCATIONS OF PROPOSED WATER QUALITY MONITORING STATIONS

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

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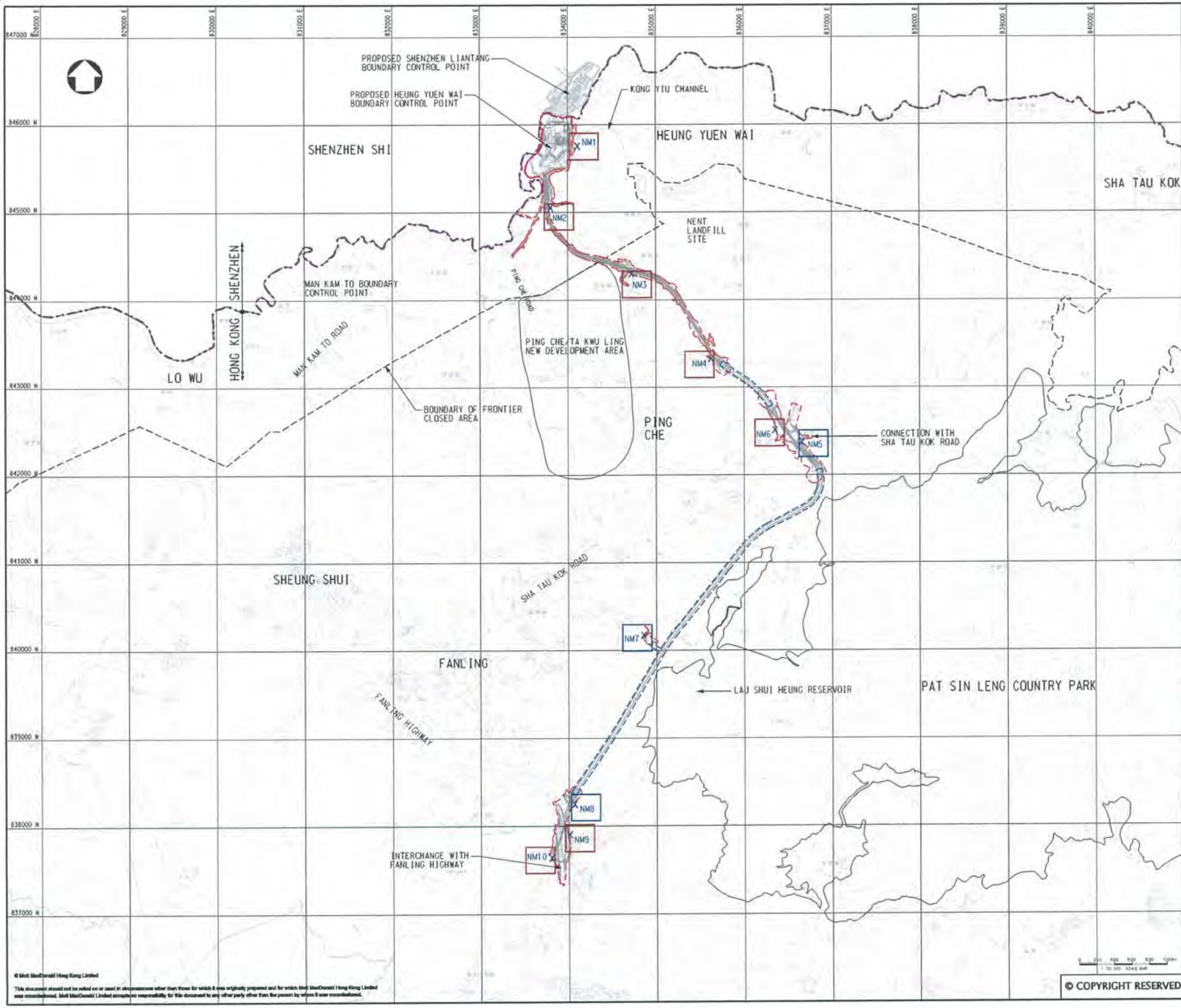
LIANTANG/HEUNG YUEN WAI BOUNDARY CONTROL POINT AND ASSOCIATED WORKS

Title

PROPOSED LOCATION OF CONSTRUCTION AIR QUALITY MONITORING STATIONS

Designed	DC		Eng.Chk.	EC	
Drawn	MING		Coordination	EC	
Dwg.Chk.	DC		Approved	HT	
Scale at A1	1:20000	Project	255228	Status	PRE
		CAD file	j:\255228\report\env\em&o\00831\FIG 2-1.dgn		
Drawing No	FIGURE 2.1			Rev	P1

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



LEGEND:

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

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

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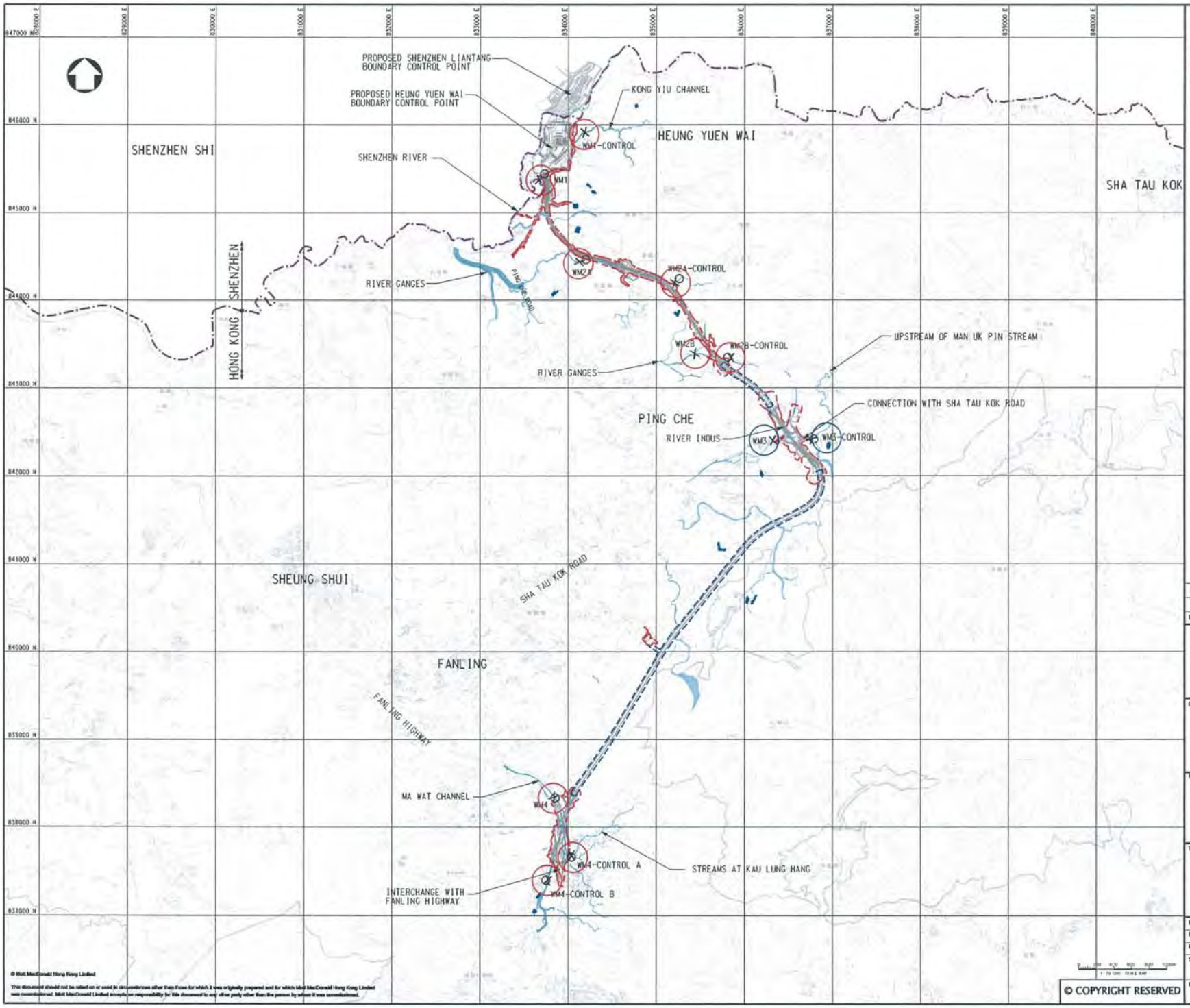
Title: PROPOSED LOCATION OF CONSTRUCTION NOISE MONITORING STATIONS

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

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LIANTANG/HEUNG YUEN WAI BOUNDARY CONTROL POINT AND ASSOCIATED WORKS

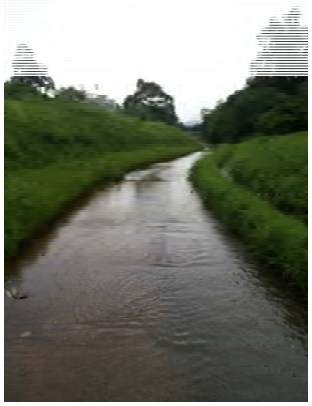
Title

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:	23/2/2015
Location ID : AM1a		Next Calibration Date:	23/4/2015
		Technician:	Keung Chi Young

CONDITIONS

Sea Level Pressure (hPa)	1015.5	Corrected Pressure (mm Hg)	761.625
Temperature (°C)	18.6	Temperature (K)	292

CALIBRATION ORIFICE

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

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	6.2	6.2	12.4	1.783	52	52.62	Slope = 30.1415
13	4.5	4.5	9.0	1.520	42	42.50	Intercept = -2.4355
10	3.4	3.4	6.8	1.323	36	36.43	Corr. coeff. = 0.9962
7	2.2	2.2	4.4	1.065	29	29.35	
5	1.1	1.1	2.2	0.756	21	21.25	

Calculations :

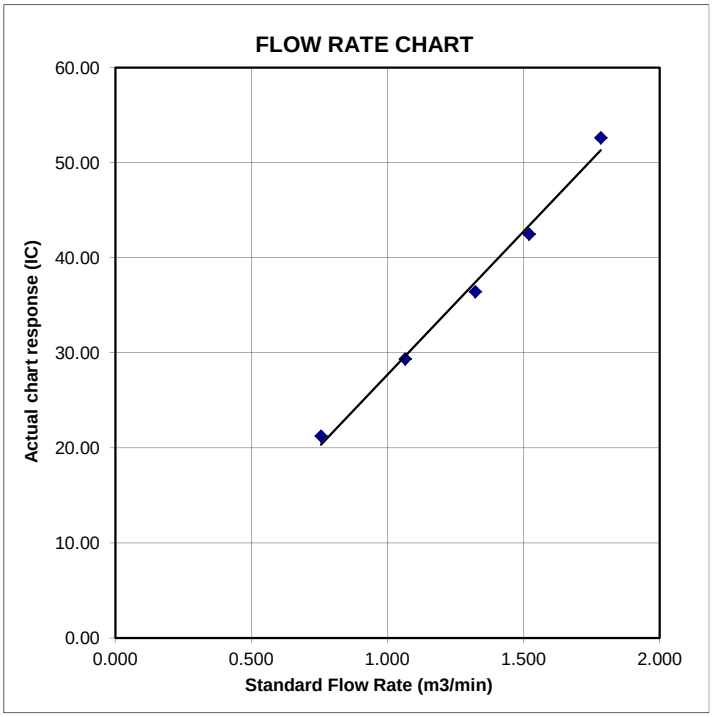
Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

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

For subsequent calculation of sampler flow:

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

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



TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

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

Date of Calibration: 23/2/2015
Next Calibration Date: 23/4/2015
Technician: Keung Chi Young

CONDITIONS

Sea Level Pressure (hPa)	1015.5	Corrected Pressure (mm Hg)	761.625
Temperature (°C)	18.6	Temperature (K)	292

CALIBRATION ORIFICE

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

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	6.2	6.2	12.4	1.783	55	55.66	Slope = 33.4114
13	4.9	4.9	9.8	1.586	49	49.59	Intercept = -4.0686
10	4	4	8.0	1.434	42	42.50	Corr. coeff. = 0.9977
7	2.5	2.5	5.0	1.135	34	34.41	
5	1.6	1.6	3.2	0.910	26	26.31	

Calculations :

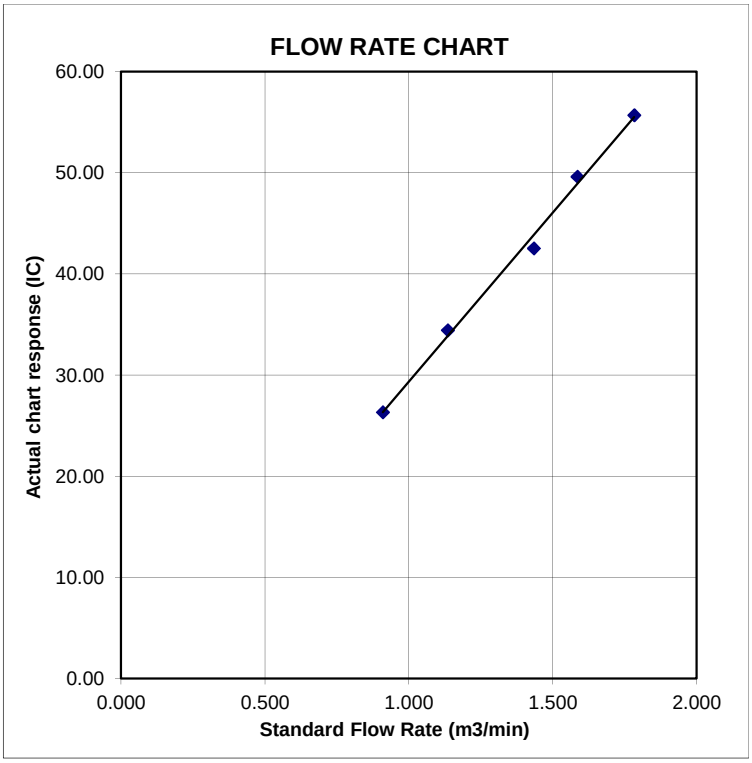
Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

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: 23/2/2015
Next Calibration Date: 23/4/2015
Technician: Keung Chi Young

CONDITIONS

Sea Level Pressure (hPa)	1015.5	Corrected Pressure (mm Hg)	761.625
Temperature (ºC)	18.6	Temperature (K)	292

CALIBRATION ORIFICE

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

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	6.1	6.1	12.2	1.769	55	55.66	Slope = 32.1530
13	4.8	4.8	9.6	1.570	48	48.58	Intercept = -1.2603
10	3.5	3.5	7.0	1.342	42	42.50	Corr. coeff. = 0.9983
7	2.3	2.3	4.6	1.089	34	34.41	
5	1.6	1.6	3.2	0.910	27	27.32	

Calculations :

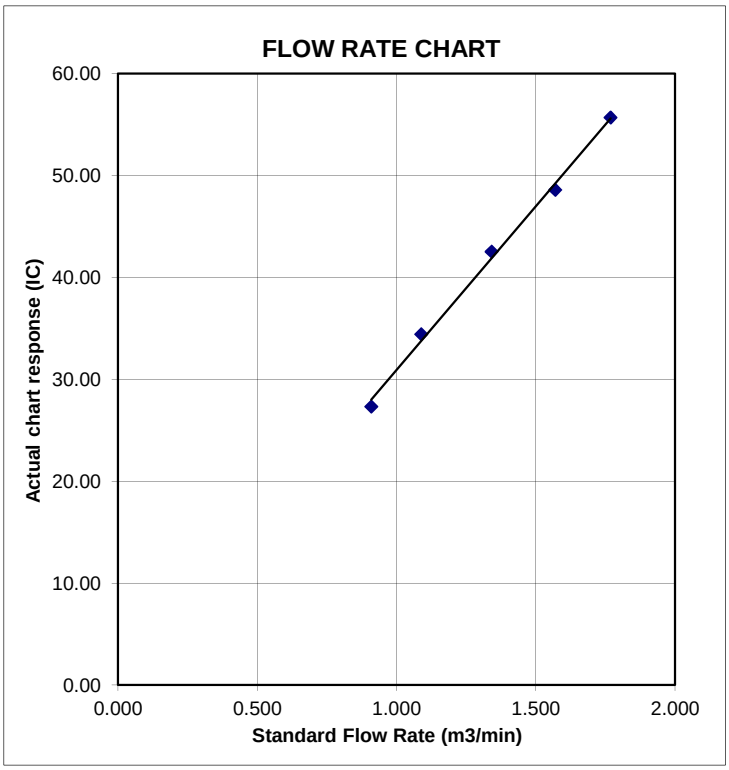
Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

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

For subsequent calculation of sampler flow:

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

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



TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

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

Date of Calibration: 23/2/2015
Next Calibration Date: 23/4/2015
Technician: C Y Keung

CONDITIONS

Sea Level Pressure (hPa)	1015.5	Corrected Pressure (mm Hg)	761.625
Temperature (°C)	18.6	Temperature (K)	292

CALIBRATION ORIFICE

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

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	4.1	4.1	8.2	1.452	55	55.66	Slope = 34.8533
13	3.6	3.6	7.2	1.361	50	50.60	Intercept = 4.1942
10	2.5	2.5	5.0	1.135	43	43.52	Corr. coeff. = 0.9973
7	1.7	1.7	3.4	0.938	37	37.44	
5	1.1	1.1	2.2	0.756	30	30.36	

Calculations :

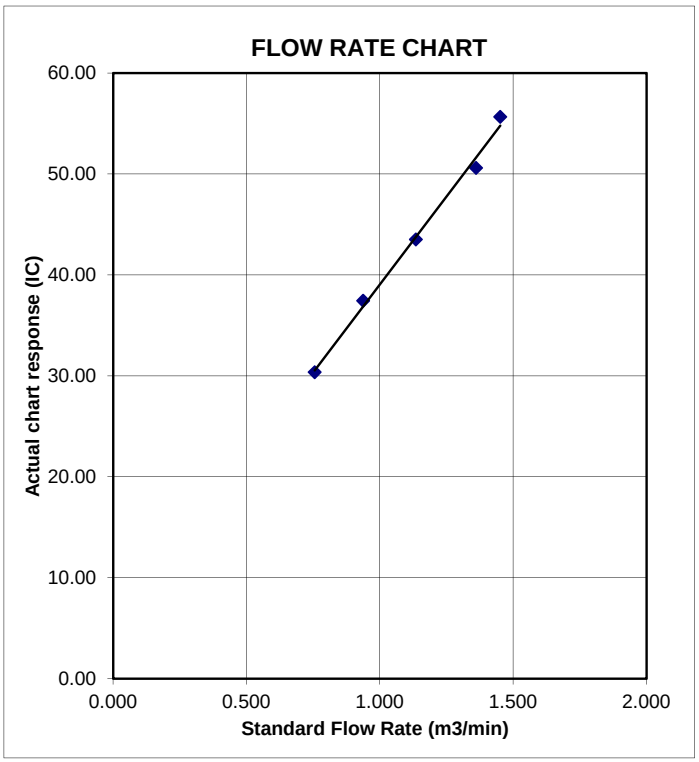
Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

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: 23/2/2015
Next Calibration Date: 23/4/2015
Technician: C Y Keung

CONDITIONS

Sea Level Pressure (hPa)	1015.5	Corrected Pressure (mm Hg)	761.625
Temperature (°C)	18.6	Temperature (K)	292

CALIBRATION ORIFICE

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

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	6.1	6.1	12.2	1.769	61	61.73	Slope = 31.6008
13	4.8	4.8	9.6	1.570	56	56.67	Intercept = 6.1977
10	3.9	3.9	7.8	1.416	50	50.60	Corr. coeff. = 0.9990
7	2.2	2.2	4.4	1.065	39	39.47	
5	1.3	1.3	2.6	0.821	32	32.38	

Calculations :

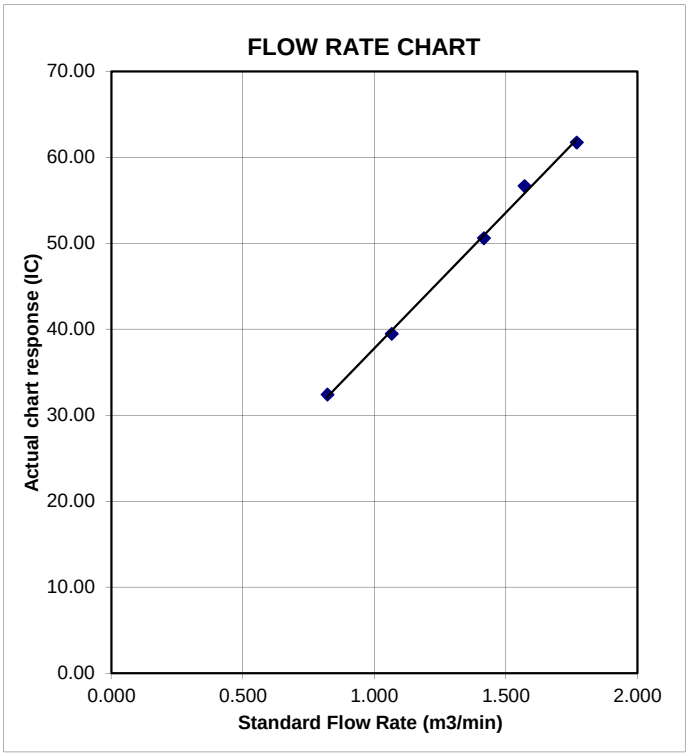
Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

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:	23/2/2015
Location ID : AM9b		Next Calibration Date:	23/4/2015
		Technician:	Keung Chi Young

CONDITIONS

Sea Level Pressure (hPa)	1015.5	Corrected Pressure (mm Hg)	761.625
Temperature (ºC)	18.6	Temperature (K)	292

CALIBRATION ORIFICE

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

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	6.6	6.6	13.2	1.840	57	57.68	Slope = 32.0674
13	5.1	5.1	10.2	1.618	49	49.59	Intercept = -2.0301
10	3.8	3.8	7.6	1.398	41	41.49	Corr. coeff. = 0.9976
7	2.4	2.4	4.8	1.113	34	34.41	
5	1.5	1.5	3.0	0.881	26	26.31	

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)

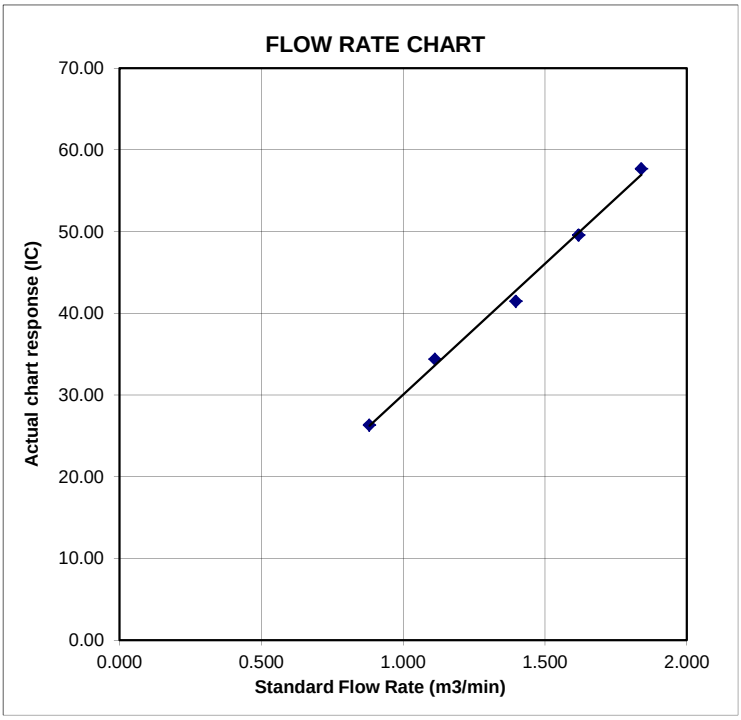
m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure



TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : 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 :

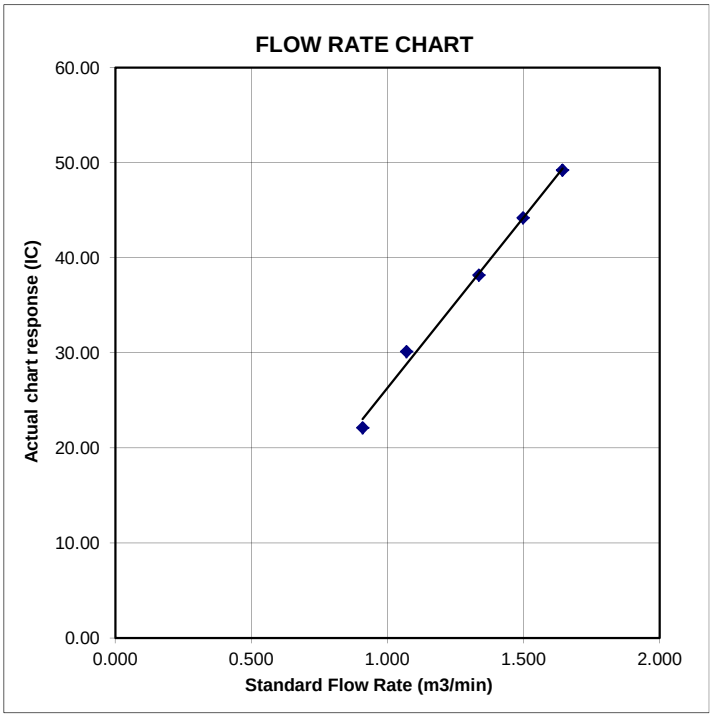
Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

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 :

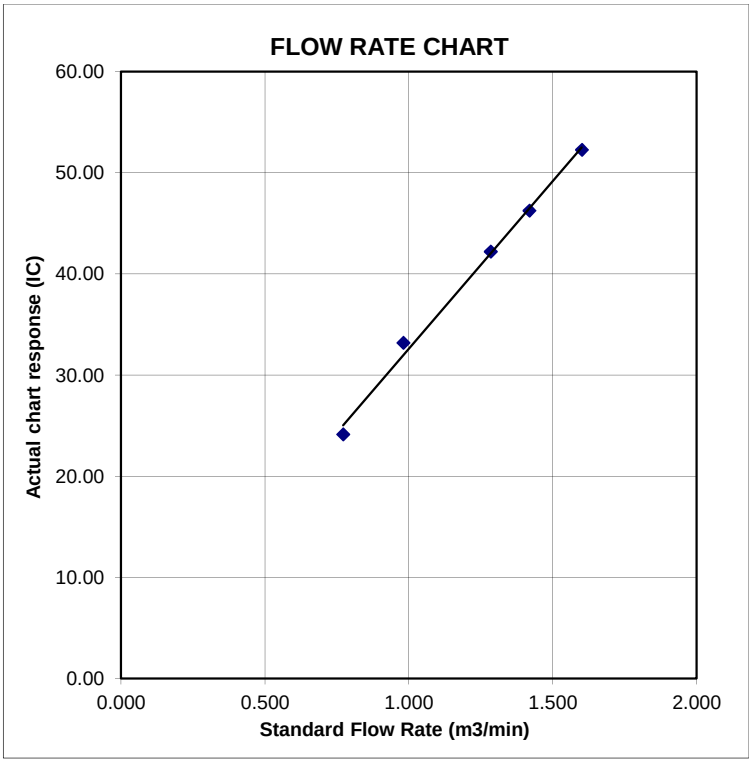
Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

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 :

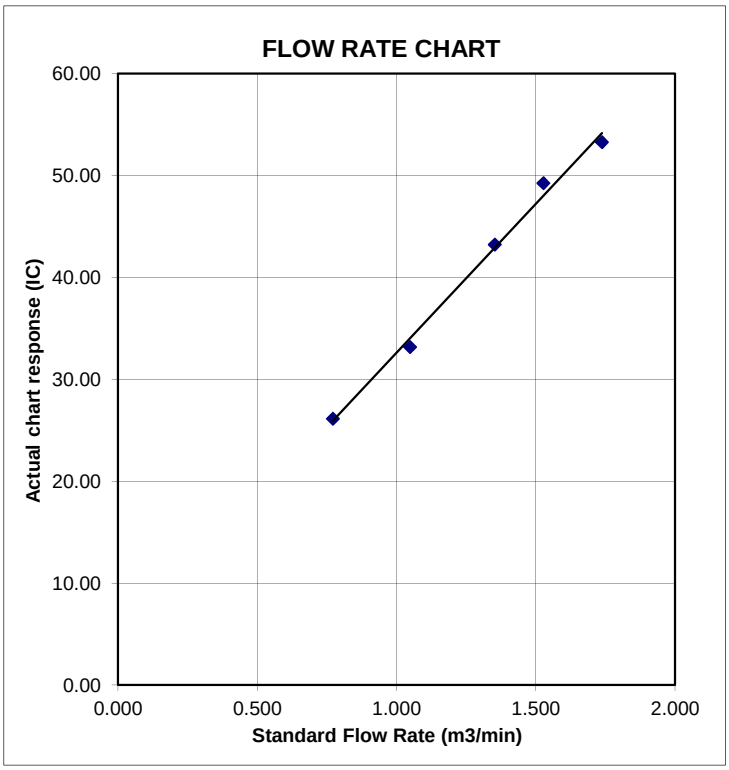
Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

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 :

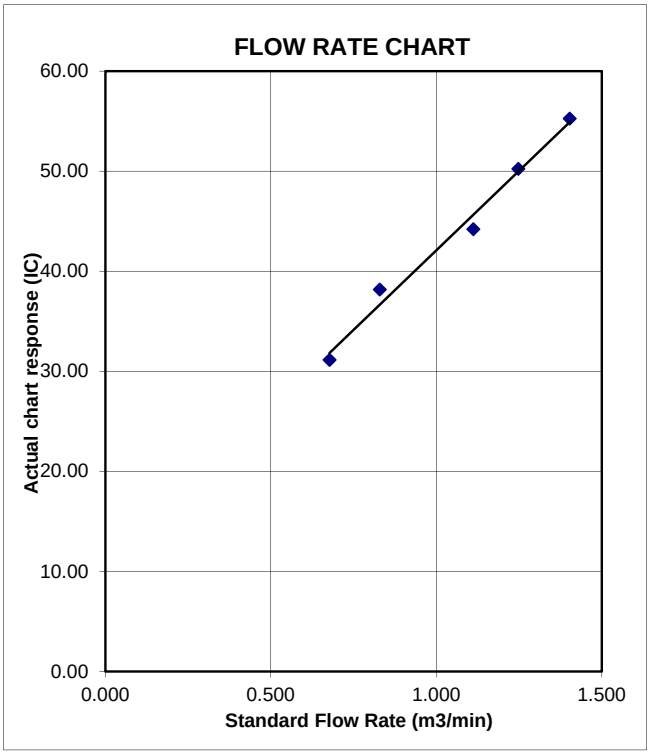
Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

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 :

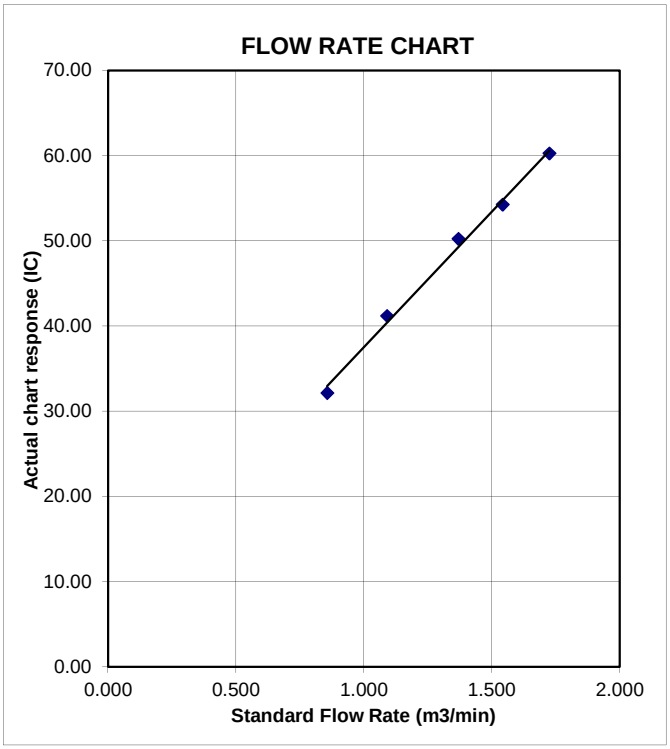
Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

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 :

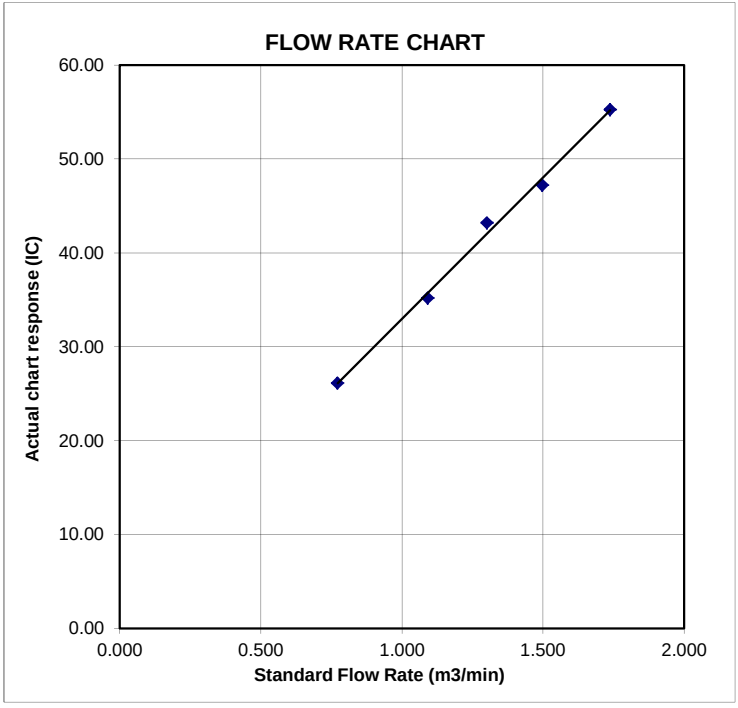
Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

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

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ORIFICE TRANSFER STANDARD CERTIFICATION WORKSHEET TE-5025A

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

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

DATA TABULATION

Vstd	(x axis) Qstd	(y axis)
0.9866	0.7077	1.4077
0.9823	1.0034	1.9908
0.9804	1.1140	2.2258
0.9791	1.1726	2.3345
0.9739	1.4094	2.8155

Qstd slope (m) = 2.00757
intercept (b) = -0.01628
coefficient (r) = 0.99989

y axis = SQRT[H2O(Pa/760)(298/Ta)]

Va	(x axis) Qa	(y axis)
0.9957	0.7142	0.8896
0.9914	1.0127	1.2581
0.9894	1.1243	1.4066
0.9881	1.1834	1.4753
0.9829	1.4224	1.7793

Qa slope (m) = 1.25710
intercept (b) = -0.01029
coefficient (r) = 0.99989

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}

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}

SIBATA

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 30, 2014

Equipment Name	:	Laser Dust Monitor, Model LD-3B (EQ115)
Code No.	:	080000-42
Quantity	:	1 unit
Serial No.	:	456658
Sensitivity	:	0.001 mg/m3
Sensitivity Adjustment	:	702 CPM
Scale Setting	:	May 24, 2014

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

Sincerely

SIBATA SCIENTIFIC TECHNOLOGY LTD.

Kentaro Togo
Overseas Sales Division

SIBATA

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 30, 2014

Equipment Name	:	Laser Dust Monitor, Model LD-3B (EQ116)
Code No.	:	080000-42
Quantity	:	1 unit
Serial No.	:	456659
Sensitivity	:	0.001 mg/m3
Sensitivity Adjustment	:	727 CPM
Scale Setting	:	May 24, 2014

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

Sincerely

SIBATA SCIENTIFIC TECHNOLOGY LTD.

Kentaro Togo
Overseas Sales Division

SIBATA

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 30, 2014

Equipment Name	:	Laser Dust Monitor, Model LD-3B (EQ117)
Code No.	:	080000-42
Quantity	:	1 unit
Serial No.	:	456660
Sensitivity	:	0.001 mg/m3
Sensitivity Adjustment	:	598 CPM
Scale Setting	:	May 24, 2014

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

Sincerely

SIBATA SCIENTIFIC TECHNOLOGY LTD.

Kentaro Togo
Overseas Sales Division

Equipment Calibration Record

Equipment Calibrated:

Type:	Laser Dust monitor
Manufacturer:	Sibata LD-3B
Serial No.	2X6145
Equipment Ref:	EQ 105
Job Order	HK1500976

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	2637	33.3
2hr15min	11:25 ~ 13:40	17.3	1017.0	0.111	6771	50.2
2hr06min	15:40 ~ 17:46	17.3	1017.0	0.047	2331	18.5

Sensitivity Adjustment Scale Setting (Before Calibration) 593 (CPM)

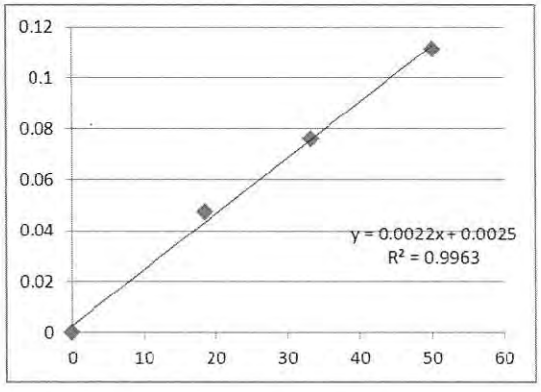
Sensitivity Adjustment Scale Setting (After Calibration) 592 (CPM)

Linear Regression of Y or X

Slope (K-factor): 0.0022

Correlation Coefficient 0.9963

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 :

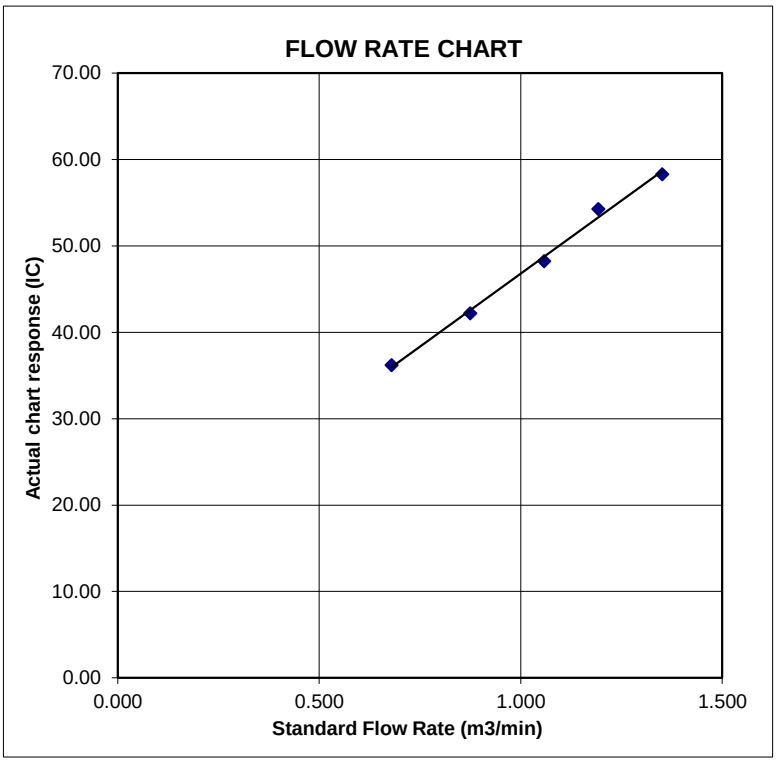
Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

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.	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)

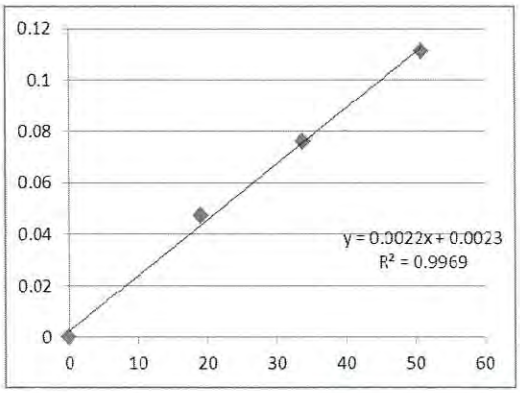
Sensitivity Adjustment Scale Setting (After Calibration) 588 (CPM)

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 :

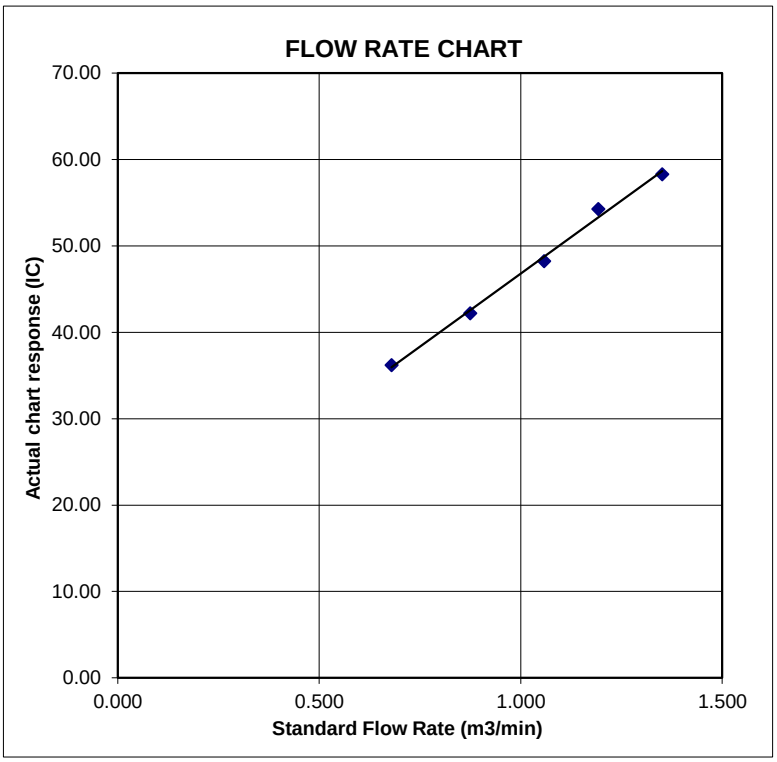
Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

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)

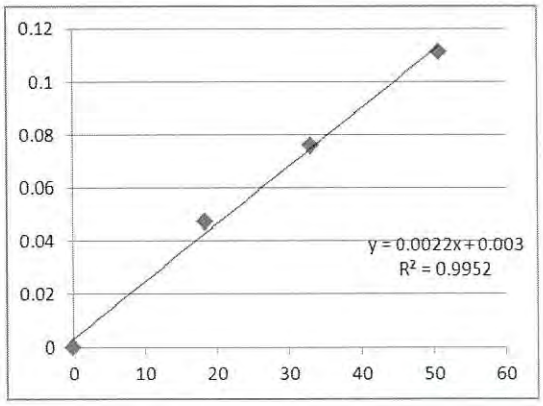
Sensitivity Adjustment Scale Setting (After Calibration) 533 (CPM)

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 :

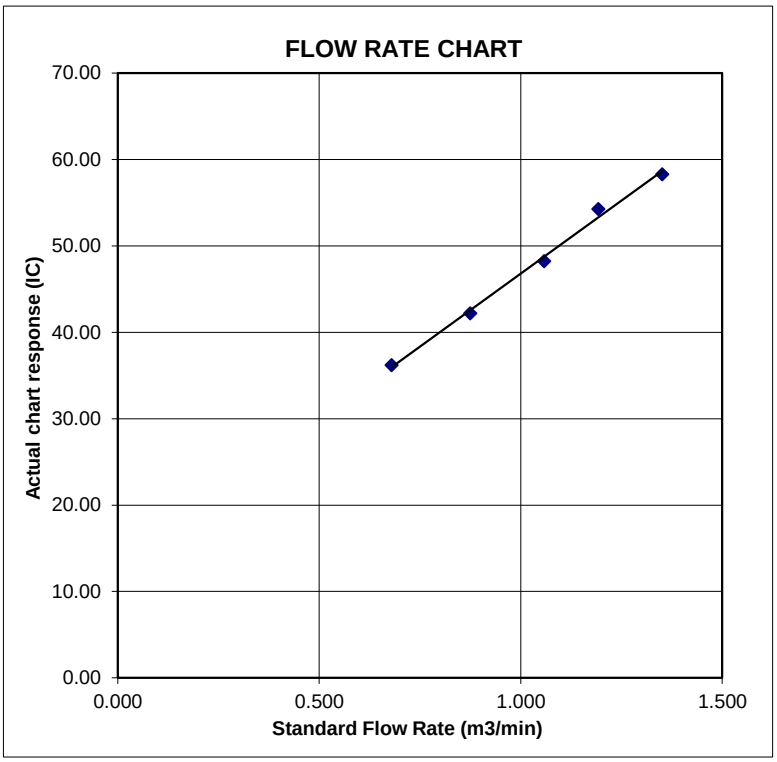
Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

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



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. : C142871
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC14-0853) Date of Receipt / 收件日期 : 8 May 2014

Description / 儀器名稱 : Integrating Sound Level Meter (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 : 13 May 2014

TEST RESULTS / 測試結果

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

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

Tested By 測試 : K C Lee, Project Engineer

Certified By 核證 : K M Wu, Engineer

Date of Issue 簽發日期 : 15 May 2014

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. : C142871
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	94.3

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	94.0	± 0.7

6.1.2 Linearity

UUT Setting				Applied Value		UUT Reading (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	
50 - 130	L_{AFP}	A	F	94.00	1	94.0 (Ref.)
				104.00		104.0
				114.00		113.9

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

Certificate of Calibration
校正證書

Certificate No. : C142871
證書編號

6.2 Time Weighting

6.2.1 Continuous Signal

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
50 - 130	L_{AFP}	A	F	94.00	1	94.0	Ref.
	L_{ASP}		S			94.0	± 0.1
	L_{AIP}		I			94.0	± 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	55.1	-39.4 ± 1.5
					63 Hz	68.0	-26.2 ± 1.5
					125 Hz	77.9	-16.1 ± 1.0
					250 Hz	85.3	-8.6 ± 1.0
					500 Hz	90.8	-3.2 ± 1.0
					1 kHz	94.0	Ref.
					2 kHz	95.2	+1.2 ± 1.0
					4 kHz	95.0	+1.0 ± 1.0
					8 kHz	92.9	-1.1 (+1.5 ; -3.0)
					12.5 kHz	89.8	-4.3 (+3.0 ; -6.0)

Certificate of Calibration
校正證書

Certificate No. : C142871
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	93.3	-0.8 ± 1.5
					125 Hz	93.8	-0.2 ± 1.0
					250 Hz	94.0	0.0 ± 1.0
					500 Hz	94.0	0.0 ± 1.0
					1 kHz	94.0	Ref.
					2 kHz	93.8	-0.2 ± 1.0
					4 kHz	93.2	-0.8 ± 1.0
					8 kHz	91.0	-3.0 (+1.5 ; -3.0)
					12.5 kHz	87.8	-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	89.5	± 0.5
			60 sec.			$1/10^3$		80	79.2	± 1.0
			5 min.			$1/10^4$		70	69.1	± 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
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輝創工程有限公司
Sun Creation Engineering Limited
Calibration and Testing Laboratory

Certificate of Calibration
校正證書

Certificate No. : C142872
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC14-0853) Date of Receipt / 收件日期 : 8 May 2014

Description / 儀器名稱 : Integrating Sound Level Meter (EQ008)
Manufacturer / 製造商 : Brüel & Kjær
Model No. / 型號 : 2238
Serial No. / 編號 : 2285690
Supplied By / 委託者 : Action-United Environmental Services and Consulting
Unit A, 20/F., Gold King Industrial Building,
35-41 Tai Lin Pai Road, Kwai Chung, N.T.

TEST CONDITIONS / 測試條件

Temperature / 溫度 : (23 ± 2)°C Relative Humidity / 相對濕度 : (55 ± 20)%
Line Voltage / 電壓 : ---

TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 13 May 2014

TEST RESULTS / 測試結果

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

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

Tested By 測試 : K C Lee, Project Engineer

Certified By 核證 : K M Wu, Engineer

Date of Issue 簽發日期 : 15 May 2014

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. : C142872
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	94.2

6.1.1.2 After Self-calibration

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
50 - 130	L_{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		104.1
				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
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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. : C142872
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	54.8	-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	93.0	-1.1 (+1.5 ; -3.0)
					12.5 kHz	89.9	-4.3 (+3.0 ; -6.0)

Sun Creation Engineering Limited – Calibration & Testing Laboratory
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Certificate of Calibration
校正證書

Certificate No. : C142872
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	91.2	-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	91.1	-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	99.9	± 0.5
						$1/10^2$		90	89.7	± 0.5
			60 sec.			$1/10^3$		80	79.8	± 1.0
			5 min.			$1/10^4$		70	69.8	± 1.0

Remarks : - UUT Microphone Model No. : 4188 & S/N : 2812706

- 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.

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

Certificate of Calibration
校正證書

Certificate No. : 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
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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.

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

Certificate of Calibration
校正證書

Certificate No. : C142545
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC14-0853) Date of Receipt / 收件日期 : 14 April 2014

Description / 儀器名稱 : Acoustical Calibrator (EQ081)
Manufacturer / 製造商 : Brüel & Kjær
Model No. / 型號 : 4231
Serial No. / 編號 : 2326408
Supplied By / 委託者 : Action-United Environmental Services and Consulting
Unit A, 20/F., Gold King Industrial Building,
35-41 Tai Lin Pai Road, Kwai Chung, N.T.

TEST CONDITIONS / 測試條件

Temperature / 溫度 : (23 ± 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 : 26 April 2014

TEST RESULTS / 測試結果

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

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

Tested By 測試 : K C Lee
Project Engineer

Certified By 核證 : K M Wu
Engineer

Date of Issue 簽發日期 : 29 April 2014

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

Certificate of Calibration
校正證書

Certificate No. : C142545
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	C133632
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 :
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輝創工程有限公司
Sun Creation Engineering Limited
Calibration and Testing Laboratory

Certificate of Calibration
校正證書

Certificate No. : C142870
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC14-0853) Date of Receipt / 收件日期 : 8 May 2014

Description / 儀器名稱 : Acoustical Calibrator (EQ082)
Manufacturer / 製造商 : Brüel & Kjær
Model No. / 型號 : 4231
Serial No. / 編號 : 2713428
Supplied By / 委託者 : Action-United Environmental Services and Consulting
Unit A, 20/F., Gold King Industrial Building,
35-41 Tai Lin Pai Road, Kwai Chung, N.T.

TEST CONDITIONS / 測試條件

Temperature / 溫度 : (23 ± 2)°C Relative Humidity / 相對濕度 : (55 ± 20)%
Line Voltage / 電壓 : ---

TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 13 May 2014

TEST RESULTS / 測試結果

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

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

Tested By 測試 : K C Lee
Project Engineer

Certified By 核證 : K M Wu
Engineer

Date of Issue 簽發日期 : 15 May 2014

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@[illegible]tion.com Website/網址: www.suncreation.com

Certificate of Calibration
校正證書

Certificate No. : C142870
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	C133632
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	114.1		

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
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輝創工程有限公司 – 校正及檢測實驗所
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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 -
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REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

CONTACT:	MR BEN TAM	**WORK ORDER:**	HK1503231
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:	23/01/2015
		DATE OF ISSUE:	28/01/2015

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:	27 January, 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: HK1503231
Sub-batch: 0
Date of Issue: 28/01/2015
Client: ACTION UNITED ENVIRO SERVICES

Equipment Type: Turbidimeter
Brand Name: HACH
Model No.: 2100Q
Serial No.: 11030C008499
Equipment No.: --
Date of Calibration: 27 January, 2015 Date of next Calibration: 27 April, 2015

Parameters:

Turbidity

Method Ref: APHA 21st Ed. 2130B

Expected Reading (NTU)	Displayed Reading (NTU)	Tolerance (%)
0	0.00	--
4	4.11	+2.8
40	39.0	-2.5
80	79.3	-0.9
400	383	-4.3
800	775	-3.1
	Tolerance Limit (%)	±10.0

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

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General Manager -
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REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

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

WORK ORDER:	HK1509486
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, pH, Salinity, Temperature and Turbidity
Equipment Type:	YSI Sonde/ Multifunctional Meter
Brand Name:	YSI
Model No.:	YSI 6820/ 650MDS
Serial No.:	02J0912/02K0788 AA
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: HK1509486
Sub-Batch: 0
Date of Issue: 25/03/2015
Client: ACTION UNITED ENVIRO SERVICES

Equipment Type: YSI Sonde/ Multifunctional Meter
Brand Name: YSI
Model No.: YSI 6820/ 650MDS
Serial No.: 02J0912/02K0788 AA
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)
4.15	4.18	+0.03
6.24	6.44	+0.20
8.94	8.98	+0.04
	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	4.04	+0.04
7.0	7.01	+0.01
10.0	9.96	-0.04
	Tolerance Limit (pH unit)	±0.20

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

Expected Reading (ppt)	Displayed Reading (ppt)	Tolerance (%)
0	0.00	--
10	10.90	+9.0
20	21.95	+9.8
30	31.87	+6.2
	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

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

Work Order: HK1509486
Sub-Batch: 0
Date of Issue: 25/03/2015
Client: ACTION UNITED ENVIRO SERVICES

Equipment Type: YSI Sonde/ Multifunctional Meter
Brand Name: YSI
Model No.: YSI 6820/ 650MDS
Serial No.: 02J0912/02K0788 AA
Equipment No.: --
Date of Calibration: 25 March, 2015 Date of next Calibration: 25 June, 2015

Parameters:

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	10.06	+0.1
20.0	18.54	-1.5
40.0	38.06	-1.9
	Tolerance Limit (°C)	±2.0

Turbidity

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

Expected Reading (NTU)	Displayed Reading (NTU)	Tolerance (%)
0	0.2	--
4	3.9	-2.5
40	38.4	-4.0
80	79.1	-1.1
400	390.2	-2.5
800	761.5	-4.8
	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

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 – April 2015

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

	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 – 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				

* Water quality monitoring only carry out at WM4, WM4-Control A & WM4-Control B.

	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															
8-Apr-15	27846	9781.47	9805.47	1440.00	42	43	42.5	22.1	1013.3	1.50	2157	2.8452	2.9759	0.1307	61
14-Apr-15	27862	9805.47	9829.47	1440.00	43	43	43.0	23.4	1011.8	1.51	2175	2.8404	3.0198	0.1794	82
20-Apr-15	27898	9829.47	9853.47	1440.00	42	42	42.0	23.9	1012	1.48	2125	2.7325	2.8385	0.1060	50
25-Apr-15	27917	9853.68	9877.23	1413.00	35	36	35.5	23.9	1017.1	1.26	1779	2.7244	2.8446	0.1202	68
30-Apr-15	27948	9877.23	9901.23	1440.00	36	38	37.0	24.8	1010.7	1.30	1867	2.8695	2.9795	0.1100	59
AM2 - Village House near Lin Ma Hang Road															
8-Apr-15	27845	5307.43	5331.34	1434.60	33	34	33.5	22.1	1013.3	1.13	1620	2.8487	3.0156	0.1669	103
14-Apr-15	27864	5331.34	5355.25	1434.60	31	33	32.0	23.4	1011.8	1.08	1551	2.8556	3.0705	0.2149	139
22-Apr-15	27918	5379.19	5403.15	1437.60	27	31	29.0	23.9	1012	0.99	1424	2.7335	2.8523	0.1188	83
25-Apr-15	27817	5403.15	5427.16	1440.60	34	34	34.0	23.9	1017.1	1.05	1508	2.8744	3.0882	0.2138	142
30-Apr-15	27950	5427.16	5451.56	1464.00	33	34	33.5	24.8	1010.7	1.03	1503	2.8603	3.0116	0.1513	101
AM3 - Ta Kwu Ling Fire Service Station of Ta Kwu Ling Village															
8-Apr-15	27844	6316.23	6340.23	1440.00	39	40	39.5	22.1	1013.3	1.27	1834	2.8477	3.0130	0.1653	90
14-Apr-15	27863	6340.23	6364.23	1440.00	39	39	39.0	23.4	1011.8	1.25	1806	2.8465	3.7832	0.9367	519
20-Apr-15	27896	6364.23	6388.23	1440.00	39	40	39.5	23.9	1012	1.27	1828	2.7373	2.8934	0.1561	85
25-Apr-15	27919	6388.41	6412.41	1440.00	41	42	41.5	23.9	1017.1	1.31	1887	2.7149	2.8407	0.1258	67
30-Apr-15	27951	6412.41	6436.41	1440.00	42	42	42.0	24.8	1010.7	1.32	1902	2.8515	2.9675	0.1160	61
AM7b - Loi Tung Village House															
8-Apr-15	27848	13860.75	13884.75	1440.00	30	34	32.0	22.1	1013.3	0.80	1155	2.8498	2.9354	0.0856	74
14-Apr-15	27889	13884.75	13908.75	1440.00	35	38	36.5	23.4	1011.8	0.93	1338	2.7240	2.9002	0.1762	132
20-Apr-15	27901	13908.75	13932.75	1440.00	35	35	35.0	23.9	1012	0.89	1274	2.7477	2.8556	0.1079	85
25-Apr-15	27920	13932.88	13956.88	1440.00	45	47	46.0	23.9	1017.1	1.13	1624	2.7221	2.9312	0.2091	129
30-Apr-15	27953	13956.89	13980.89	1440.00	44	47	45.5	24.8	1010.7	1.11	1592	2.8563	3.0369	0.1806	113
AM8 - Po Kat Tsai Village No. 4															
8-Apr-15	27847	7731.11	7755.11	1440.00	39	40	39.5	22.1	1013.3	1.06	1526	2.8461	2.9380	0.0919	60
14-Apr-15	27888	7755.11	7779.11	1440.00	40	40	40.0	23.4	1011.8	1.07	1544	2.7416	2.8877	0.1461	95
20-Apr-15	27901	7779.11	7803.11	1440.00	40	40	40.0	23.9	1012	1.07	1542	2.7321	2.8165	0.0844	55
25-Apr-15	27922	7803.24	7827.24	1440.00	49	49	49.0	23.9	1017.1	1.37	1967	2.8686	2.9852	0.1166	59
30-Apr-15	27954	7827.25	7851.25	1440.00	49	50	49.5	24.8	1010.7	1.37	1979	2.8564	2.9609	0.1045	53
AM9b - Nam Wa Po Village House No. 80															
8-Apr-15	27849	15270.55	15294.05	1410.00	34	34	34.0	22.1	1013.3	1.13	1592	2.8561	2.9808	0.1247	78
14-Apr-15	27861	15294.05	15318.05	1440.00	34	35	34.5	23.4	1011.8	1.14	1643	2.8496	3.0436	0.1940	118
20-Apr-15	27903	15318.05	15342.05	1440.00	34	34	34.0	23.9	1012	1.12	1620	2.7426	2.8224	0.0798	49
25-Apr-15	27924	15342.06	15366.06	1440.00	34	34	34.0	23	1017.1	1.04	1498	2.8581	2.9706	0.1125	75
30-Apr-15	27964	15366.06	15390.06	1440.00	38	40	39.0	24.8	1010.7	1.20	1727	2.8711	2.9610	0.0899	52

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																					
9-Apr-15	14:26	53.3	56.2	49.8	54.6	55.7	49.5	55.3	57.5	51.1	53.7	56.6	50.2	52.2	54.1	49.3	53.5	55.4	50.3	54	NA
13-Apr-15	11:15	61.9	54.4	50.6	53.6	54.6	50.6	53.0	55.4	49.8	56.1	58.0	50.8	52.0	54.3	48.6	51.0	53.4	46.7	56	NA
18-Apr-15	13:10	50.3	52.0	47.9	50.7	52.4	47.9	53.0	54.2	51.0	53.7	54.4	51.1	53.2	53.9	51.0	61.9	60.9	52.0	56	NA
24-Apr-15	10:47	52.5	54.9	47.9	51.2	52.8	48.8	57.2	59.7	52.7	56.1	58.3	50.4	51.9	54.3	48.9	54.0	56.0	48.2	54	NA
29-Apr-15	13:08	50.4	51.6	47.2	52.9	55.7	49.1	51.6	54.4	48.0	51.8	54.4	48.1	51.4	53.8	48.7	50.0	52.3	47.3	51	NA
NM2 - Village House near Lin Ma Hang Road																					
9-Apr-15	15:27	58.1	58.9	52.7	60.5	60.8	52.8	60.0	59.0	51.9	59.3	59.7	52.2	60.2	62.7	53.0	58.2	61.7	52.8	59	NA
13-Apr-15	13:02	61.7	62.7	50.5	57.5	59.7	48.1	59.2	62.9	49.6	58.9	60.8	50.6	58.5	61.7	52.6	57.6	61.4	52.6	59	NA
18-Apr-15	13:01	64.1	66.0	51.5	60.0	62.0	50.5	59.1	59.0	53.0	58.9	62.0	52.5	56.4	57.0	52.5	59.9	61.0	52.0	60	NA
24-Apr-15	11:27	57.2	56.5	51.9	58.7	61.8	46.8	58.6	61.9	44.4	52.6	56.6	44.1	54.3	56.9	41.4	53.2	54.1	42.8	56	NA
29-Apr-15	13:54	57.7	59.2	50.4	60.6	65.6	50.7	58.7	60.9	49.8	59.0	60.2	53.5	60.7	62.4	53.4	57.2	57.4	52.0	59	NA
NM5– Ping Yeung Village House (façade facing northeast)																					
8-Apr-15	17:09	68.7	57.2	44.5	53.2	56.9	43.9	52.4	56.1	41.0	52.2	56.1	41.9	52.0	55.4	40.5	51.5	55.2	40.2	61	NA
14-Apr-15	13:39	52.6	55.9	44.1	54.7	56.9	46.8	60.9	62.2	55.7	59.9	62.4	55.6	59.5	62.6	55.9	58.8	61.0	55.7	59	NA
20-Apr-15	10:52	51.2	54.5	44.0	52.2	55.5	45.5	51.8	55.5	44.0	53.0	56.0	45.0	51.1	54.0	44.5	51.8	55.0	45.0	52	NA
25-Apr-15	14:36	53.2	56.7	44.4	52.1	55.5	44.4	52.3	55.2	44.7	52.0	55.6	46.1	52.4	56.3	44.5	51.8	55.2	45.4	52	NA
30-Apr-15	11:33	51.1	53.9	44.9	54.9	58.0	46.9	52.0	55.2	45.1	50.4	53.4	44.3	50.3	53.4	45.0	50.1	53.3	44.6	52	NA
NM6 – Tai Tong Wu Village House 2																					
8-Apr-15	14:51	59.1	62.7	47.1	60.5	63.8	52.7	59.8	63.8	51.1	60.8	64.6	50.9	59.5	63.1	49.4	58.6	62.3	49.8	60	NA
14-Apr-15	11:13	60.2	63.2	52.7	60.5	63.5	47.4	61.1	63.7	55.5	59.8	63.3	49.4	58.4	62.7	45.4	60.6	64.2	45.3	60	NA
20-Apr-15	11:32	60.2	63.4	51.3	62.0	64.0	51.4	58.5	62.3	48.1	60.2	63.2	53.8	60.2	63.5	51.1	59.5	62.9	45.4	60	NA
25-Apr-15	11:19	60.1	64.0	50.9	59.5	62.9	49.9	60.1	62.6	49.3	58.7	62.3	50.2	60.5	64.5	50.7	60.8	64.3	53.7	60	NA
30-Apr-15	11:00	62.0	65.3	57.1	59.3	63.2	51.9	60.6	63.6	52.4	59.5	63.0	49.8	60.7	63.7	54.2	60.4	63.5	53.1	61	NA
NM7 – Po Kat Tsai Village																					
8-Apr-15	14:08	63.9	67.9	58.4	63.4	67.1	56.7	61.7	66.1	54.8	59.5	62.5	54.5	60.3	63.0	56.0	59.8	63.3	54.7	62	NA
14-Apr-15	10:31	65.1	66.9	55.8	62.8	66.7	54.3	62.8	66.7	57.1	61.5	62.6	54.3	57.6	59.8	55.0	55.6	58.0	53.5	62	NA
20-Apr-15	10:52	59.5	60.3	55.6	63.3	65.1	54.4	60.4	64.1	55.4	65.1	66.4	56.1	63.3	65.5	54.5	60.9	60.9	54.9	63	NA
25-Apr-15	10:33	55.6	57.0	52.4	54.7	56.5	52.3	53.8	55.1	50.3	52.9	54.5	51.0	54.8	57.3	50.4	53.7	55.4	48.8	54	NA
30-Apr-15	10:20	61.8	65.6	55.5	63.0	67.0	56.2	71.6	71.9	56.1	64.4	67.8	56.4	57.9	58.3	55.4	67.1	64.6	57.1	66	NA
NM8 - Village House, Tong Hang																					
9-Apr-15	10:28	58.2	63.5	50.7	56.9	63.4	50.7	58.0	63.2	52.1	56.7	55.7	51.4	56.9	61.9	52.6	59.2	66.1	52.6	58	NA
13-Apr-15	14:05	56.2	55.9	51.2	55.2	58.1	50.5	57.3	59.8	52.4	57.5	62.3	50.3	58.1	63.8	49.8	57.6	62.5	51.3	57	NA
18-Apr-15	15:37	60.6	63.5	53.5	59.4	63.0	53.5	60.1	64.0	53.0	59.7	64.0	54.0	59.0	63.0	53.5	59.3	63.0	54.0	60	NA
24-Apr-15	14:09	60.3	60.5	52.5	57.9	61.0	53.5	58.9	62.5	52.0	59.1	62.0	53.5	9.1	62.5	53.5	59.5	62.0	54.0	58	NA
29-Apr-15	16:38	60.2	63.0	55.5	59.8	62.5	52.0	56.9	62.0	49.5	56.3	61.0	51.0	58.6	63.5	50.5	55.8	57.5	50.0	58	NA
NM9 - Village House, Kiu Tau Village																					
9-Apr-15	11:21	56.0	60.6	51.0	63.8	62.3	51.9	53.8	57.2	50.4	54.9	58.2	51.2	53.6	54.6	50.7	56.2	58.8	51.4	58	NA
13-Apr-15	15:23	59.3	62.5	51.1	56.8	61.0	50.8	57.0	61.7	50.9	58.2	61.9	51.7	55.5	58.3	51.5	58.4	61.8	53.7	58	NA

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
18-Apr-15	16:28	60.1	63.0	57.0	60.8	63.5	57.0	59.4	62.0	56.0	59.1	61.0	56.0	59.6	63.0	54.5	56.2	58.5	54.0	59	NA
24-Apr-15	15:03	57.1	58.5	53.0	63.0	62.0	54.0	59.3	60.0	53.5	63.0	6.0	53.0	57.7	59.5	53.5	59.6	61.0	52.0	61	NA
29-Apr-15	17:21	52.4	55.7	50.9	53.4	55.8	51.9	57.1	61.6	52.2	57.0	59.8	51.5	54.4	56.6	52.0	54.7	59.2	52.5	55	NA
NM10 - Nam Wa Po Village House No. 80																					
9-Apr-15	9:52	61.5	62.8	59.7	62.0	64.3	57.8	59.7	61.7	56.8	61.0	64.2	57.3	60.6	63.0	57.8	60.2	62.3	57.3	61	64
13-Apr-15	16:00	60.3	61.8	58.5	61.7	64.1	59.3	60.3	61.8	58.3	61.2	63.8	57.5	63.1	66.2	59.6	62.1	64.1	59.6	62	65
18-Apr-15	16:23	68.9	72.9	63.6	69.3	73.7	63.6	69.2	74.7	61.3	66.8	69.8	61.1	67.6	71.5	61.5	67.6	71.7	61.4	68	71
24-Apr-15	15:07	62.1	64.0	59.0	61.4	63.0	8.5	60.9	62.5	57.5	62.8	65.5	58.0	60.3	62.0	58.5	64.2	67.0	58.0	62	65
29-Apr-15	17:41	54.2	55.9	51.8	54.6	55.7	53.4	54.9	55.9	53.3	53.7	54.9	52.0	56.0	58.5	53.5	54.4	55.9	52.5	55	58

Water Quality Monitoring Data for Contract 5

Date	1-Apr-15															
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM1-C	10:36	0.41	23.3	23.3	6.34	6.3	74.4	73.5	12.8	12.6	8.6	8.6	10	10.0
			23.3		6.18		72.6		12.3		8.6		10	
WM1*	11:08	0.32	23.7	23.7	3.45	3.4	40.8	40.4	27.9	28.3	7.7	7.7	26	26.0
			23.7		3.37		39.9		28.7		7.7		26	

Date	9-Apr-15															
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM1-C	14:44	0.41	17.9	17.9	4.56	4.6	48.1	48.0	190.0	195.5	7.4	7.4	94	93.0
			17.9		4.54		47.8		201.0		7.4		92	
WM1*	15:11	0.31	19.4	19.4	1.63	1.6	17.8	17.6	119.0	116.5	7.8	7.8	78	76.5
			19.4		1.59		17.3		114.0		7.8		75	

Date	11-Apr-15															
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM1-C	10:39	0.67	17.3	17.3	8.24	8.2	85.9	85.4	874.0	864.5	8.7	8.7	368	374.5
			17.3		8.17		84.8		855.0		8.7		381	
WM1	11:14	0.28	16.9	16.9	6.85	6.8	70.8	70.7	601.0	605.5	7.6	7.6	262	263.0
			16.9		6.83		70.6		610.0		7.6		264	

Date	13-Apr-15															
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM1-C	11:22	0.45	20.5	20.5	3.39	3.4	37.7	37.6	93.5	94.1	8.7	8.7	51	51.5
			20.5		3.37		37.5		94.6		8.6		52	
WM1*	12:16	0.31	19.9	19.9	2.05	2.0	22.5	22.4	162.0	161.0	7.5	7.5	98	100.0
			19.9		2.02		22.2		160.0		7.5		102	

Date	16-Apr-15															
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM1-C	11:03	0.45	21.4	21.4	6	6.0	67.8	67.4	85.0	84.8	7.7	7.7	55	56.0

			21.4		5.93		67.0		84.5		7.7		57	
WM1	10:30	0.07	22.9	22.9	6.24	6.3	72.7	73.2	50.1	47.8	7.6	7.6	47	44.5
			22.9		6.31		73.6		45.4		7.6		42	

Date	**18-Apr-15**													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM1-C	13:16	0.19	25.1	25.1	4.58	4.5	55.6	55.1	54.5	53.9	8.6	8.6	43	42.5
			25.1		4.5		54.5		53.3		8.6		42	
WM1	13:45	0.34	28.2	28.2	8.01	8.0	102.8	102.7	82.4	**82.6**	8.2	8.2	81	**83.0**
			28.2		7.99		102.5		82.8		8.2		85	

Date	**20-Apr-15**													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM1-C	16:48	0.26	27.3	27.3	6.4	6.4	68.1	68.2	39.8	39.7	7.3	7.3	29	31.0
			27.3		6.4		68.2		39.6		7.3		33	
WM1	17:09	0.11	28.5	28.5	2.72	2.7	35.2	35.2	181.0	**183.0**	7.9	7.9	165	**174.0**
			28.5		2.72		35.1		185.0		7.9		183	

Date	**22-Apr-15**													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM1-C	10:15	0.26	23.2	23.2	5.52	5.6	64.7	66.0	34.9	34.6	8.1	8.1	23	28.0
			23.2		5.74		67.2		34.3		8.1		33	
WM1	11:11	0.14	24.5	24.5	2.74	2.7	33.0	32.8	188.0	**187.0**	8	8.0	165	**174.0**
			24.5		2.7		32.5		186.0		8		183	

Date	**24-Apr-15**													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM1-C	11:05	0.29	24.5	24.5	6.63	6.6	79.5	79.1	34.7	34.8	7.3	7.3	22	21.0
			24.5		6.56		78.7		34.9		7.3		20	
WM1*	11:20	0.34	29.3	29.3	6.02	6.0	78.8	78.7	99.0	97.5	7.8	7.8	104	104.0
			29.3		6		78.5		96.0		7.8		104	

Date	**27-Apr-15**															
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM1-C	13:21	0.38	30.9	30.9	7.79	7.7	104.7	104.0	58.2	58.2	7.5	7.5	44	45.0
			30.9		7.68		103.3		58.2		7.5		46	
WM1*	14:05	0.43	30.2	30.2	6.63	6.6	88.2	88.3	94.2	94.5	8	8.0	64	63.5
			30.2		6.65		88.4		94.7		8		63	

Date	**29-Apr-15**															
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM1-C	13:01	0.37	30	30.0	6.73	6.7	89.0	88.9	33.2	33.0	7.1	7.1	24	24.0
			30		6.71		88.8		32.8		7.1		24	
WM1*	14:35	0.23	29.5	29.5	7.84	7.9	103.1	103.3	44.7	45.1	7.6	7.6	16	17.0
			29.5		7.87		103.5		45.4		7.6		18	

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

Water Quality Monitoring Data for Contract 2 and 3

Date	1-Apr-15													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM4-CA	13:54	0.08	25.6	25.6	5.79	5.8	70.8	71.1	5.8	5.7	8.1	8.1	7	7.0
			25.6		5.83		71.3		5.63		8.1		7	
WM4-CB	14:36	0.21	26.2	26.2	2.78	2.7	34.5	33.6	6.77	6.7	7.8	7.8	7	7.5
			26.2		2.63		32.6		6.65		7.8		8	
WM4	13:29	0.22	26	26.0	2.6	2.6	38.8	38.7	5.93	5.9	7.3	7.3	5	5.5
			26		2.6		38.6		5.87		7.3		6	

Date	3-Apr-15													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM4-CA	13:18	0.07	24.4	24.4	4.61	4.6	55.2	55.1	6.0	6.0	7.7	7.7	3	3.0
			24.4		4.59		55.0		6.0		7.7		3	
WM4-CB	12:18	0.18	25.2	25.2	1.75	1.7	21.3	21.1	6.0	5.9	7.8	7.8	3	3.0
			25.1		1.72		20.9		5.7		7.8		3	
WM4	12:49	0.22	25	25.0	2.24	2.2	27.2	26.8	7.6	7.5	7.3	7.3	6	6.0
			25		2.18		26.3		7.3		7.3		6	

Date	6-Apr-15													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM4-CA	11:22	0.07	24	24.0	5.01	5.0	60.0	59.7	4.1	4.1	7.6	7.6	4	3.5
			24		4.95		59.3		4.2		7.6		3	
WM4-CB	10:16	0.20	24.6	24.6	1.63	1.6	19.8	19.6	5.4	5.5	7.4	7.4	4	4.0
			24.6		1.59		19.3		5.5		7.4		4	
WM4	10:51	0.23	24.3	24.4	2.37	2.3	28.7	28.0	5.7	5.8	7.3	7.3	13	12.5
			24.4		2.26		27.3		5.9		7.3		12	

Date	9-Apr-15													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM4-CA	11:49	0.08	20.4	20.4	5.26	5.2	58.3	58.1	7.5	7.4	7.6	7.6	7	7.0
			20.3		5.22		57.8		7.3		7.6		7	
WM4-CB	10:06	0.26	19.9	19.9	2.07	2.1	22.8	22.6	9.6	9.8	7.7	7.7	5	4.5

			19.9		2.03		22.3		10.1		7.6		4	
WM4	11:06	0.33	21.5	21.5	4.94	4.9	56.0	55.8	13.7	13.6	7.3	7.4	13	12.5
			21.5		4.9		55.6		13.4		7.4		12	

Date	**11-Apr-15**													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM4-CA	15:13	0.12	18.7	18.7	5.37	5.3	57.6	57.2	13.9	13.8	7.8	7.8	11	11.5
			18.7		5.3		56.8		13.7		7.8		12	
WM4-CB	15:49	0.41	19.5	19.5	4.58	4.5	49.9	49.2	18.0	17.8	7.6	7.6	11	10.5
			19.5		4.45		48.5		17.6		7.6		10	
WM4	14:47	0.38	18.2	18.2	5.95	5.9	63.2	62.7	31.6	31.2	7.8	7.8	29	30.0
			18.2		5.86		62.2		30.8		7.8		31	

Date	**13-Apr-15**													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM4-CA	15:21	0.08	24.1	24.1	6.71	6.7	79.9	79.5	4.6	4.7	7.9	7.9	4	4.5
			24.1		6.64		79.0		4.9		7.9		5	
WM4-CB	16:15	0.24	25.2	25.2	2.97	2.9	36.1	35.7	7.7	7.6	7.6	7.6	6	6.0
			25.2		2.89		35.2		7.6		7.5		6	
WM4	14:50	0.23	26.2	26.2	5.08	5.1	62.9	62.7	11.0	10.9	7.3	7.3	10	9.5
			26.2		5.04		62.5		10.7		7.3		9	

Date	**16-Apr-15**													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM4-CA	13:22	0.08	26.5	26.5	7.06	7.1	87.9	87.8	5.8	5.8	8	8.0	7	8.5
			26.5		7.04		87.6		5.9		8		10	
WM4-CB	13:00	0.23	27.5	27.5	4.66	4.7	59.1	59.0	6.6	6.6	7.7	7.7	5	6.0
			27.5		4.65		58.9		6.7		7.7		7	
WM4	12:55	0.22	27	27.0	6.38	6.4	80.1	80.4	18.8	19.1	7.6	7.6	24	24.0
			27		6.43		80.7		19.4		7.6		24	

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

WM4-CA	15:58	0.08	24.8	24.8	5.04	5.1	60.8	61.1	5.7	5.7	7.8	7.8	4	4.0
			24.8		5.09		61.4		5.7		7.8		4	
WM4-CB	16:30	0.23	25.5	25.5	1.94	1.9	23.7	23.5	8.4	8.7	7.6	7.6	8	8.0
			25.5		1.91		23.3		9.0		7.6		8	
WM4	15:40	0.21	26.4	26.4	4.64	4.7	57.6	58.0	19.3	18.9	7.4	7.4	23	23.5
			26.4		4.71		58.4		18.5		7.4		24	

Date	**20-Apr-15**													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM4-CA	15:08	0.08	26.5	26.5	5.32	5.4	66.2	66.8	3.5	3.3	7.7	7.7	<2	2.0
			26.5		5.4		67.3		3.1		7.7		<2	
WM4-CB	15:27	0.24	27.7	27.7	3.81	3.9	48.5	49.0	7.3	7.1	7.3	7.3	10	10.0
			27.7		3.89		49.5		7.0		7.3		10	
WM4	14:47	0.22	27.1	27.1	4.74	4.8	59.6	59.9	13.1	13.5	7.9	7.9	20	19.5
			27.1		4.78		60.2		13.8		7.9		19	

Date	**22-Apr-15**													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM4-CA	16:42	0.08	24.5	24.6	6.18	6.1	74.1	73.5	4.5	4.6	7.7	7.7	<2	2.0
			24.6		6.07		72.9		4.7		7.7		<2	
WM4-CB	17:06	0.19	25.7	25.7	2.56	2.5	34.1	32.4	7.2	7.2	7.6	7.6	10	10.0
			25.7		2.49		30.6		7.3		7.6		10	
WM4	17:51	0.24	25.3	25.3	4.18	4.2	50.9	50.5	11.6	11.5	7.3	7.3	20	19.5
			25.3		4.12		50.1		11.4		7.3		19	

Date	**24-Apr-15**													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM4-CA	16:56	0.09	25.6	25.6	7.04	7.0	86.1	85.8	2.9	2.9	7.8	7.8	3	3.0
			25.6		6.98		85.4		3.0		7.8		3	
WM4-CB	15:49	0.26	27.7	27.7	4.72	4.6	60.0	59.1	10.7	10.4	7.6	7.6	10	9.0
			27.7		4.57		58.1		10.1		7.6		8	
WM4	16:28	0.28	27.8	27.8	4.25	4.3	54.0	54.6	11.4	11.4	7.4	7.4	15	15.0
			27.8		4.33		55.2		11.3		7.4		15	

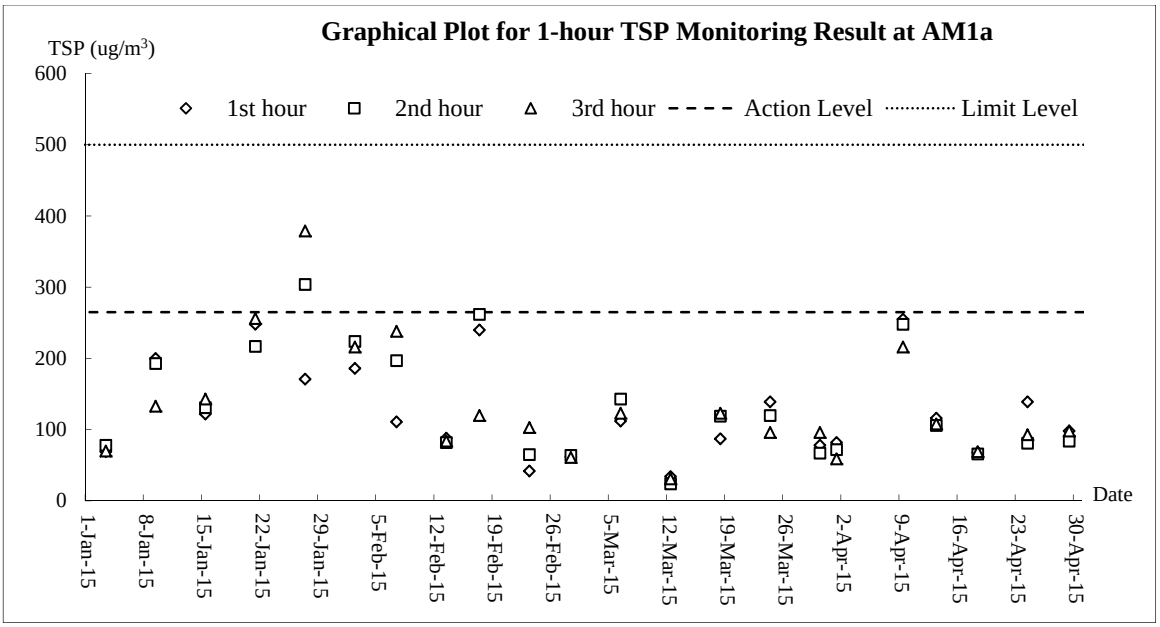
Date	27-Apr-15															
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM4-CA	17:36	0.07	26.3	26.3	3.83	3.9	47.4	48.0	5.0	5.0	7.6	7.6	5	5.0
			26.3		3.92		48.5		5.0		7.6		5	
WM4-CB	17:50	0.21	27.1	27.1	1.12	1.1	14.1	14.2	5.4	5.6	7	7.0	6	6.0
			27.1		1.13		14.2		5.7		7		6	
WM4	17:16	0.22	27.8	27.8	3.38	3.4	43.0	43.0	10.5	10.3	7.3	7.3	10	10.5
			27.8		3.37		42.9		10.1		7.3		11	

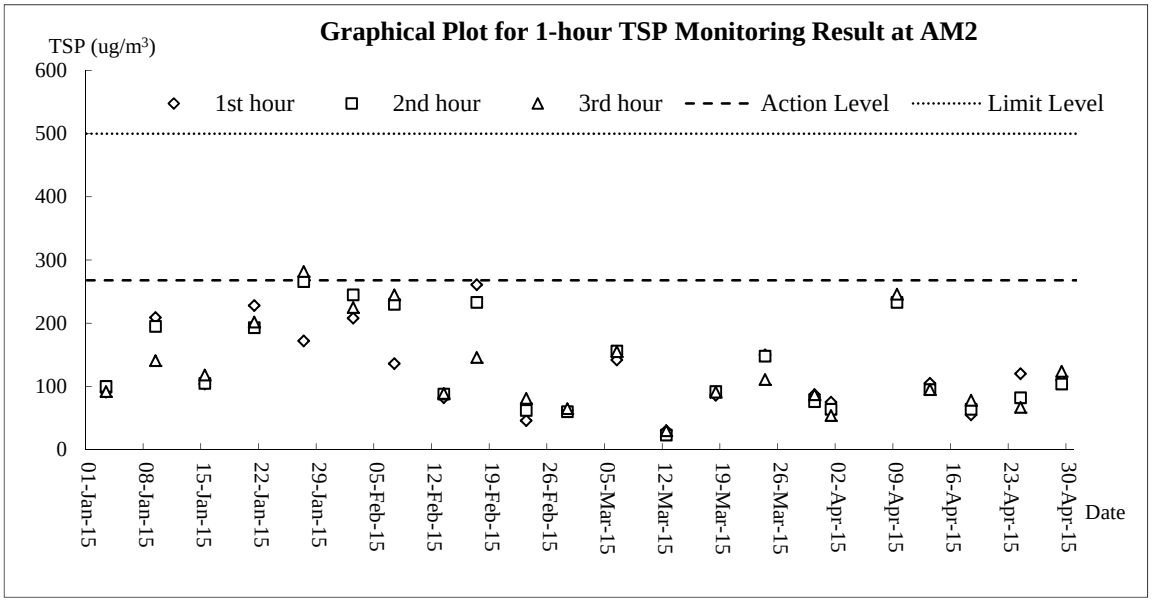
Date	29-Apr-15															
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM4-CA	17:28	0.07	27.5	27.5	3.16	3.2	40.0	40.0	4.6	4.6	7.5	7.5	5	4.5
			27.4		3.15		39.9		4.6		7.5		4	
WM4-CB	17:58	0.23	27.5	27.5	1.07	1.1	13.5	13.4	6.4	6.5	6.9	6.9	8	8.5
			27.5		1.05		13.3		6.6		6.9		9	
WM4	17:02	0.25	29	29.0	3.67	3.6	47.0	46.8	9.6	9.5	7.4	7.4	15	16.0
			29		3.57		46.5		9.5		7.3		17	

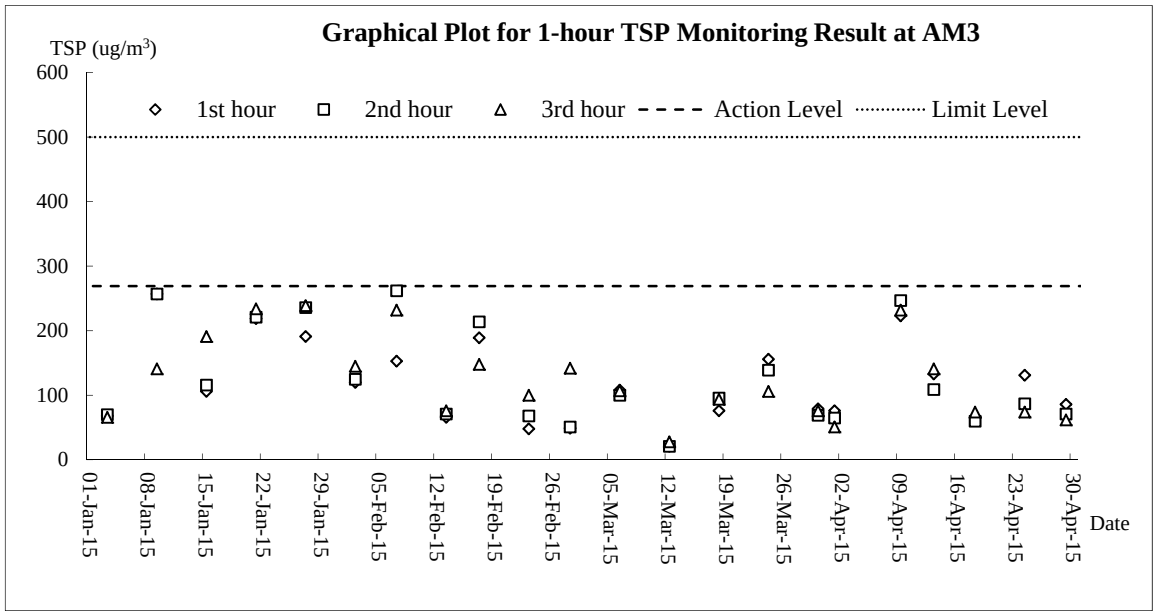
Appendix J

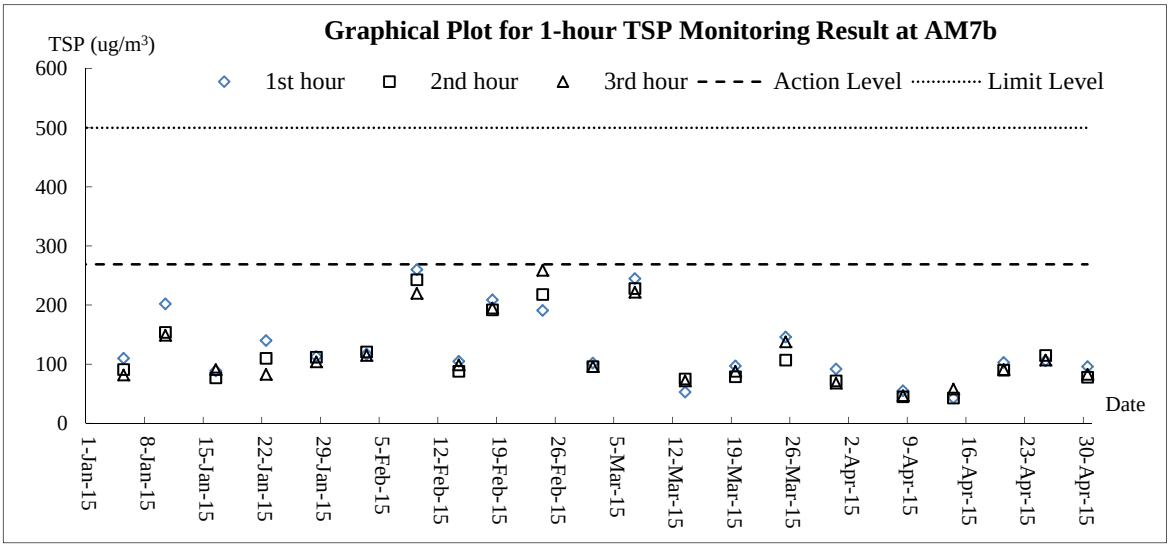
Graphical Plots for Monitoring Result

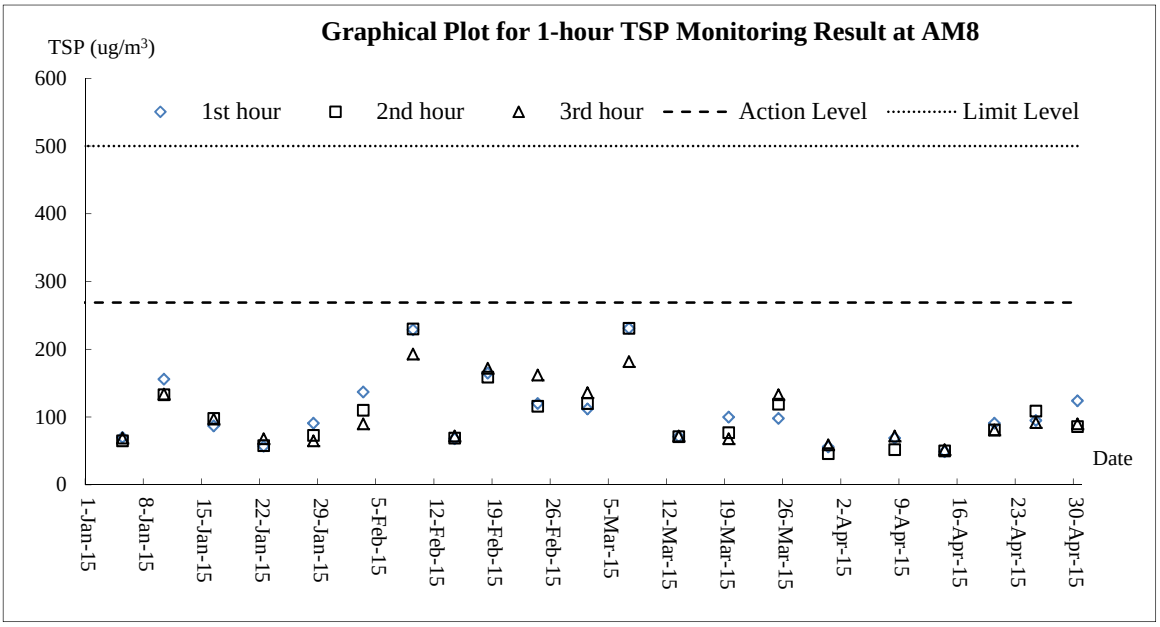
Air Quality – 1-hour TSP

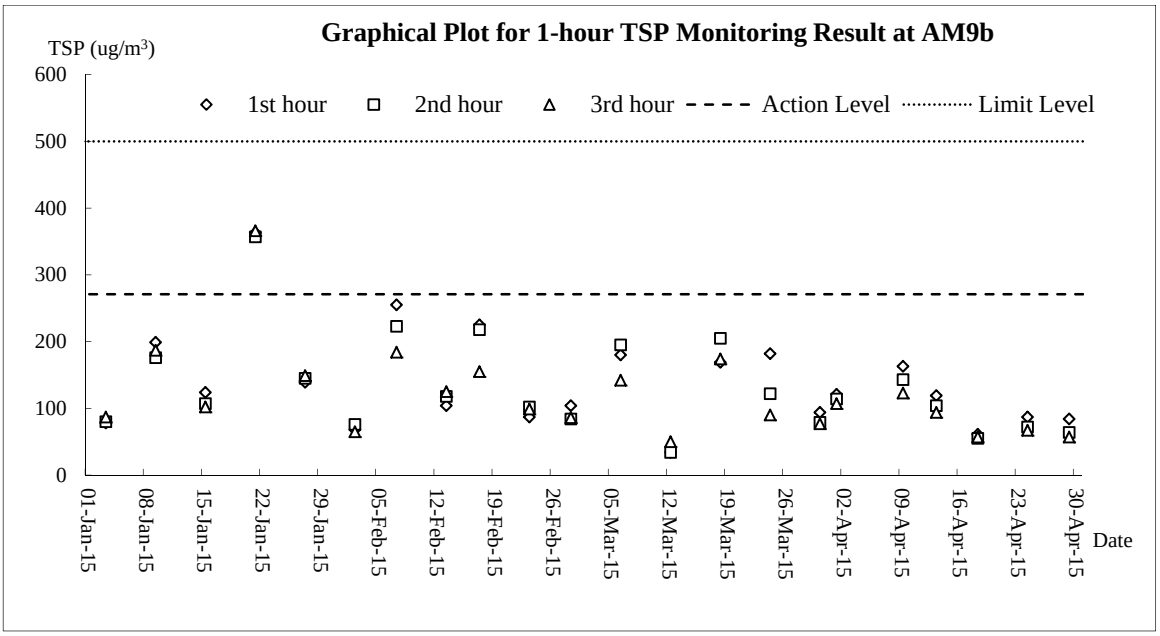




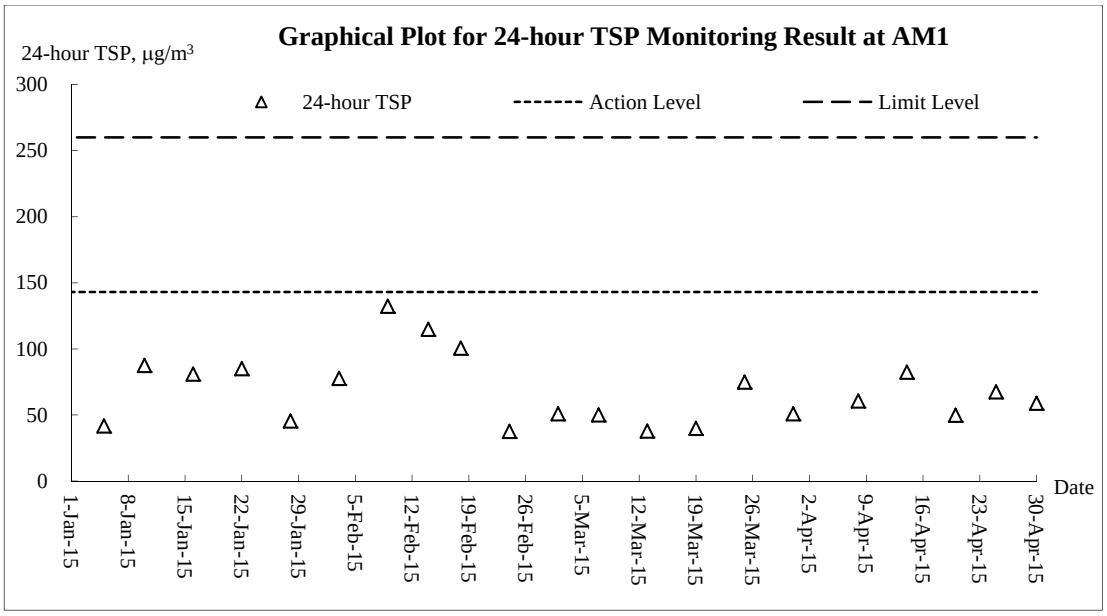


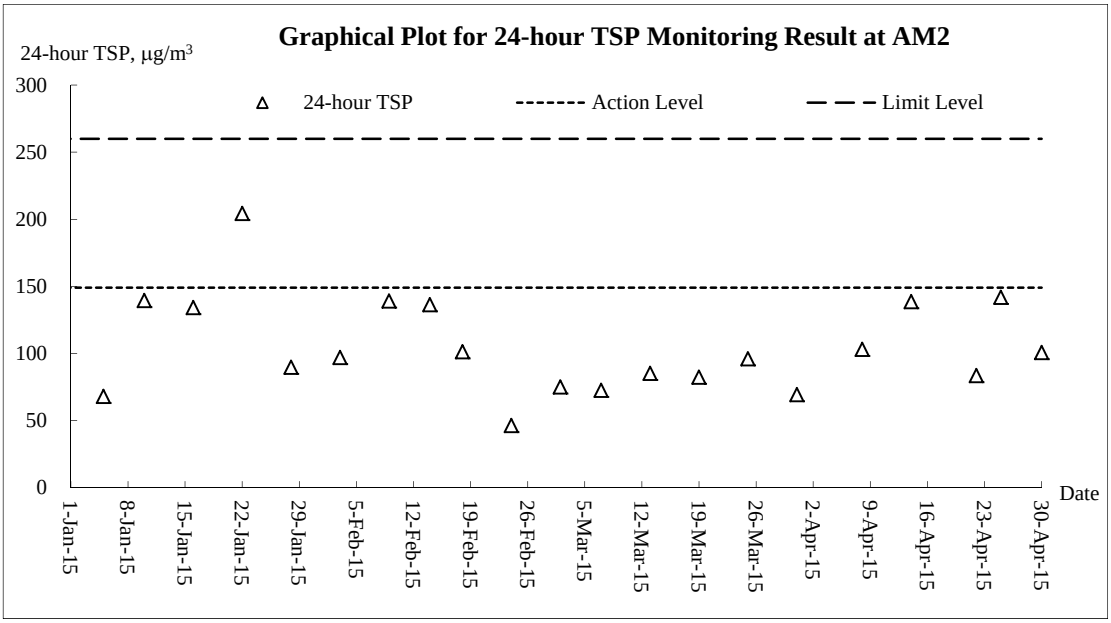

Graphical Plot for 1-hour TSP Monitoring Result at AM7b
TSP (ug/m3)
1st hour
2nd hour
3rd hour
Action Level
Limit Level
600
500
400
300
200
100
0
Date
1-Jan-15
8-Jan-15
15-Jan-15
22-Jan-15
29-Jan-15
5-Feb-15
12-Feb-15
19-Feb-15
26-Feb-15
5-Mar-15
12-Mar-15
19-Mar-15
26-Mar-15
2-Apr-15
9-Apr-15
16-Apr-15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

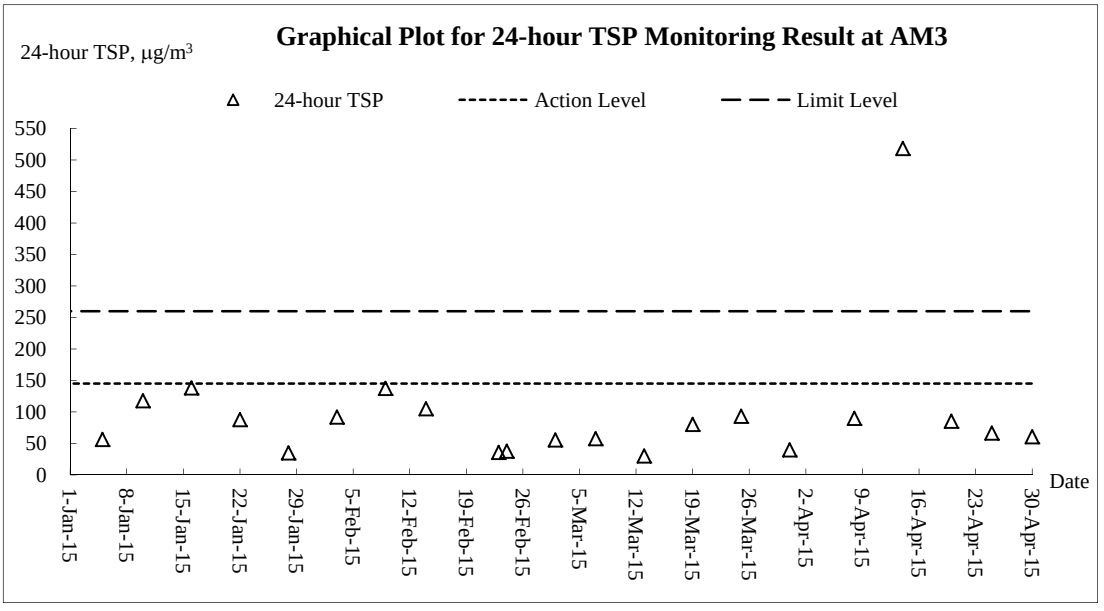

Graphical Plot for 1-hour TSP Monitoring Result at AM8
TSP (ug/m3)
1st hour
2nd hour
3rd hour
Action Level
Limit Level
600
500
400
300
200
100
0
Date
1-Jan-15
8-Jan-15
15-Jan-15
22-Jan-15
29-Jan-15
5-Feb-15
12-Feb-15
19-Feb-15
26-Feb-15
5-Mar-15
12-Mar-15
19-Mar-15
26-Mar-15
2-Apr-15
9-Apr-15
16-Apr-15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

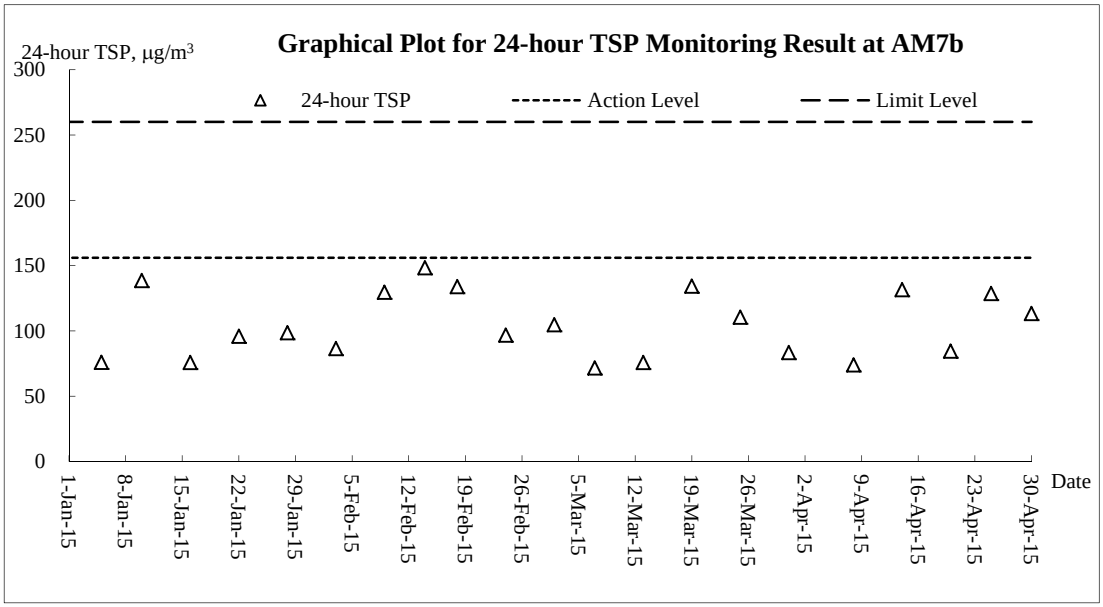

Graphical Plot for 1-hour TSP Monitoring Result at AM9b
TSP (ug/m3)
1st hour
2nd hour
3rd hour
Action Level
Limit Level
600
500
400
300
200
100
0
Date
01-Jan-15
08-Jan-15
15-Jan-15
22-Jan-15
29-Jan-15
05-Feb-15
12-Feb-15
19-Feb-15
26-Feb-15
05-Mar-15
12-Mar-15
19-Mar-15
26-Mar-15
02-Apr-15
09-Apr-15
16-Apr-15
23-Apr-15
30-Apr-15

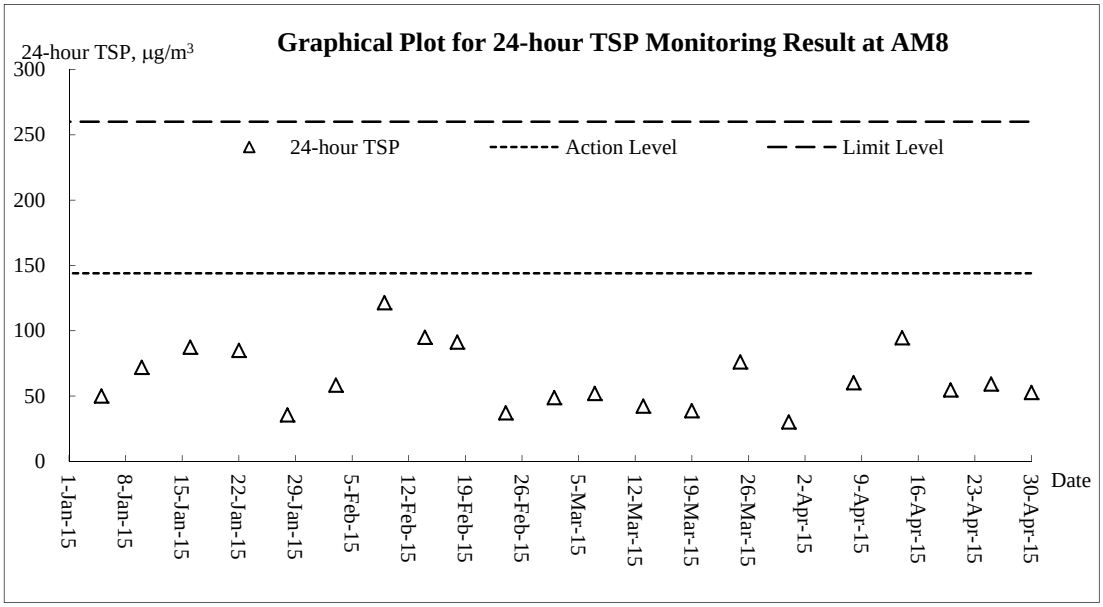
Air Quality – 24-hour TSP

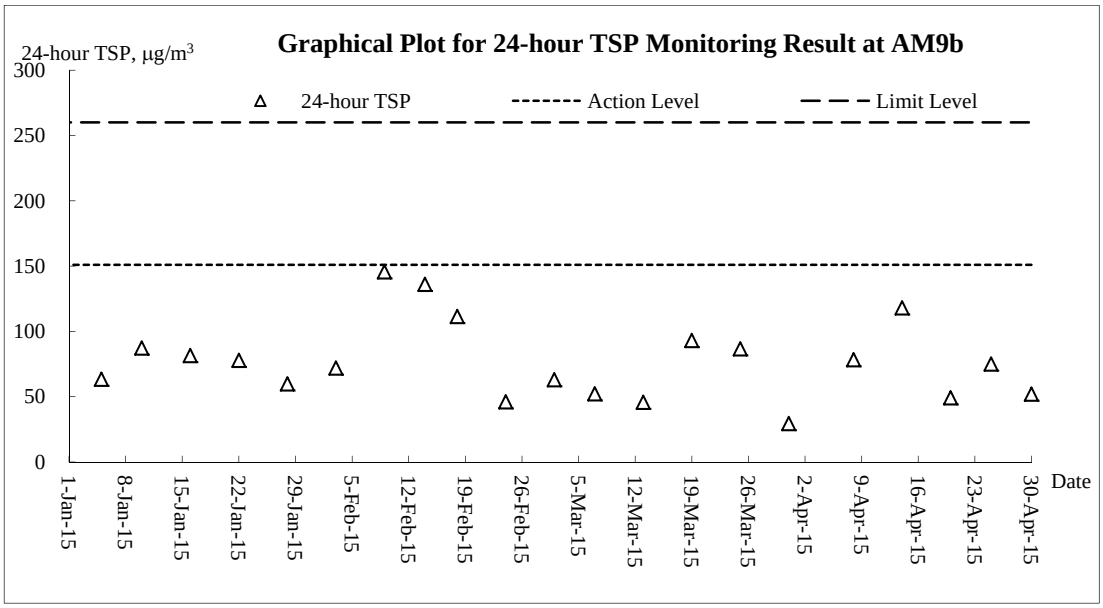




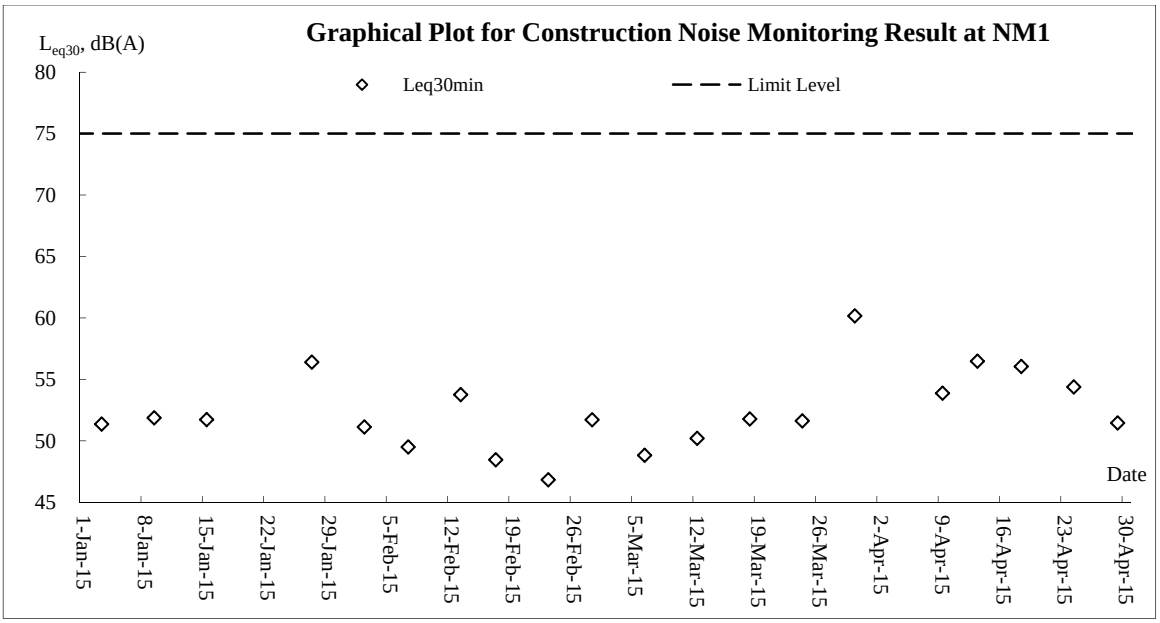



Graphical Plot for 24-hour TSP Monitoring Result at AM7b
24-hour TSP, µg/m3
24-hour TSP
Action Level
Limit Level
300
250
200
150
100
50
0
1-Jan-15
8-Jan-15
15-Jan-15
22-Jan-15
29-Jan-15
5-Feb-15
12-Feb-15
19-Feb-15
26-Feb-15
5-Mar-15
12-Mar-15
19-Mar-15
26-Mar-15
2-Apr-15
9-Apr-15
16-Apr-15
23-Apr-15
30-Apr-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-Jan-15
8-Jan-15
15-Jan-15
22-Jan-15
29-Jan-15
5-Feb-15
12-Feb-15
19-Feb-15
26-Feb-15
5-Mar-15
12-Mar-15
19-Mar-15
26-Mar-15
2-Apr-15
9-Apr-15
16-Apr-15
23-Apr-15
30-Apr-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-Jan-15
8-Jan-15
15-Jan-15
22-Jan-15
29-Jan-15
5-Feb-15
12-Feb-15
19-Feb-15
26-Feb-15
5-Mar-15
12-Mar-15
19-Mar-15
26-Mar-15
2-Apr-15
9-Apr-15
16-Apr-15
23-Apr-15
30-Apr-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-Jan-15
8-Jan-15
15-Jan-15
22-Jan-15
29-Jan-15
5-Feb-15
12-Feb-15
19-Feb-15
26-Feb-15
5-Mar-15
12-Mar-15
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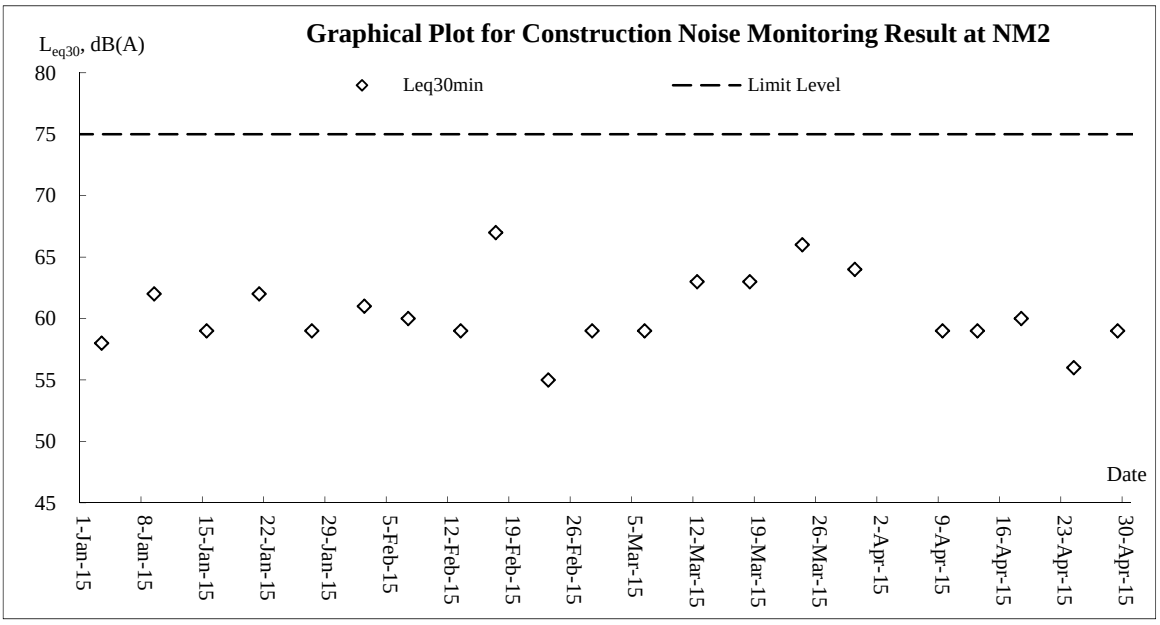
23-Apr-15
30-Apr-15


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-Jan-15
8-Jan-15
15-Jan-15
22-Jan-15
29-Jan-15
5-Feb-15
12-Feb-15
19-Feb-15
26-Feb-15
5-Mar-15
12-Mar-15
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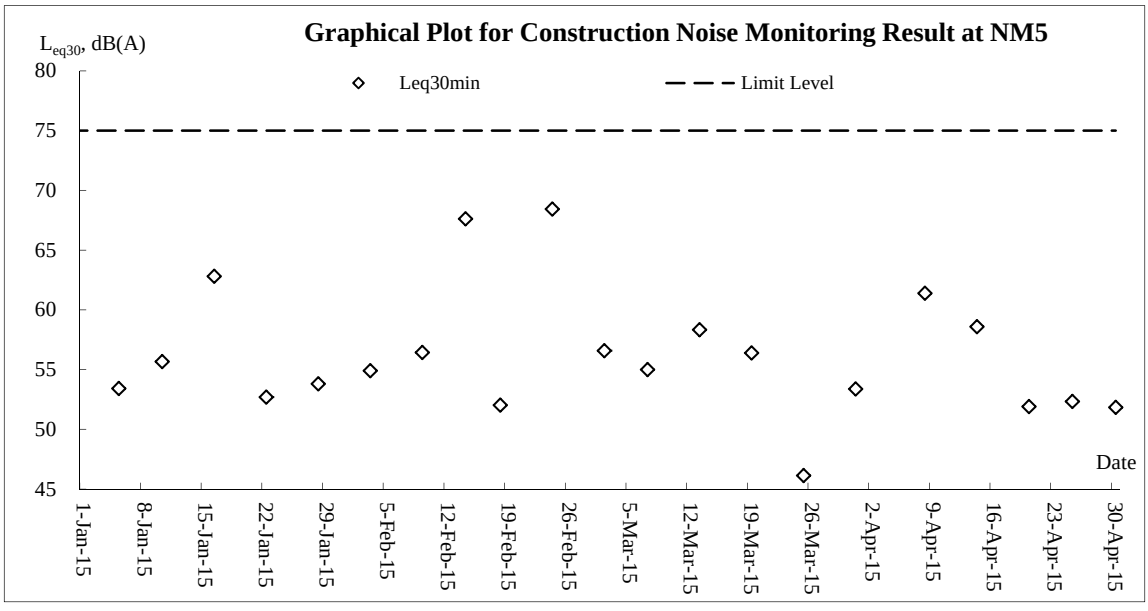
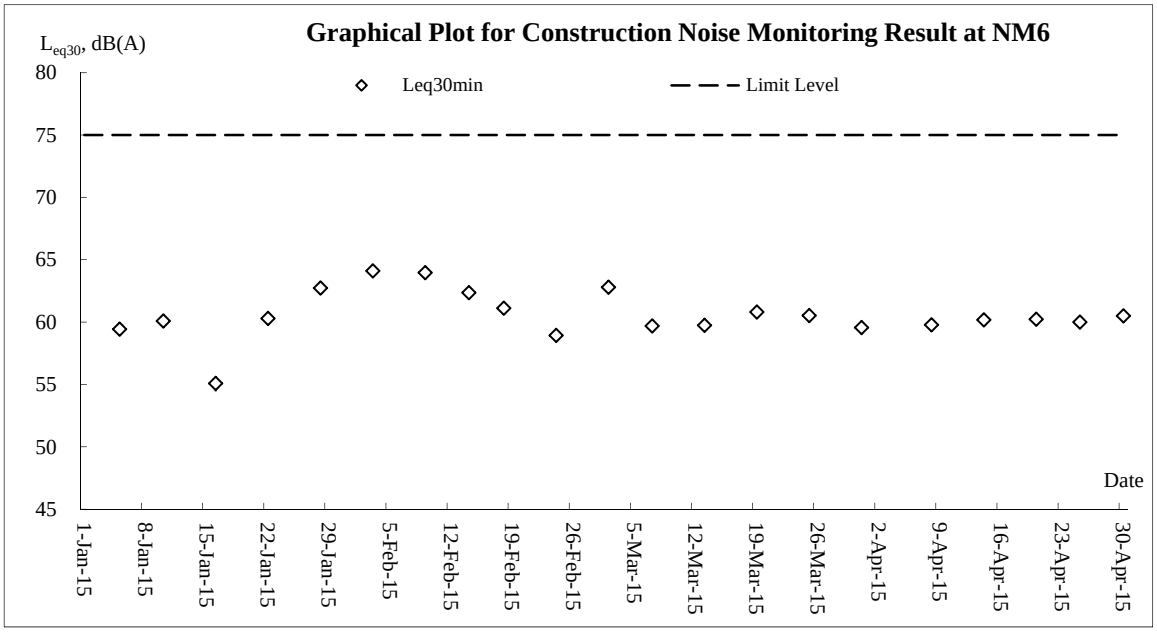
2-Apr-15
9-Apr-15
16-Apr-15
23-Apr-15
30-Apr-15


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-Jan-15
8-Jan-15
15-Jan-15
22-Jan-15
29-Jan-15
5-Feb-15
12-Feb-15
19-Feb-15
26-Feb-15
5-Mar-15
12-Mar-15
19-Mar-15
26-Mar-15
2-Apr-15
9-Apr-15
16-Apr-15
23-Apr-15
30-Apr-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-Jan-15
8-Jan-15
15-Jan-15
22-Jan-15
29-Jan-15
5-Feb-15
12-Feb-15
19-Feb-15
26-Feb-15
5-Mar-15
12-Mar-15
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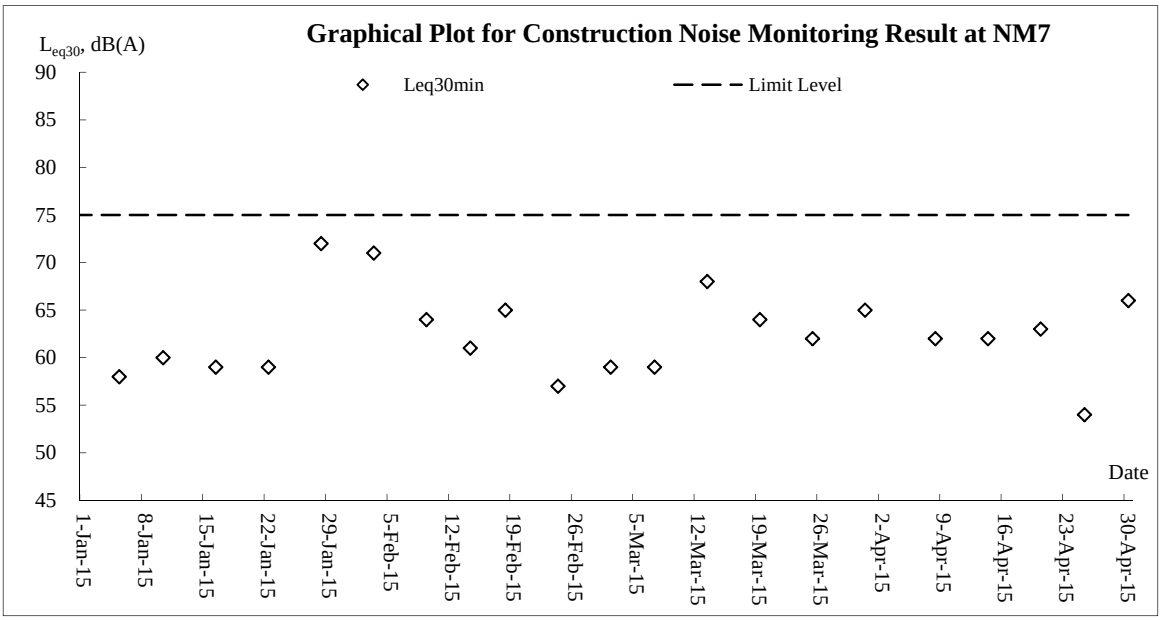
26-Mar-15
2-Apr-15
9-Apr-15
16-Apr-15
23-Apr-15
30-Apr-15


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-Jan-15
8-Jan-15
15-Jan-15
22-Jan-15
29-Jan-15
5-Feb-15
12-Feb-15
19-Feb-15
26-Feb-15
5-Mar-15
12-Mar-15
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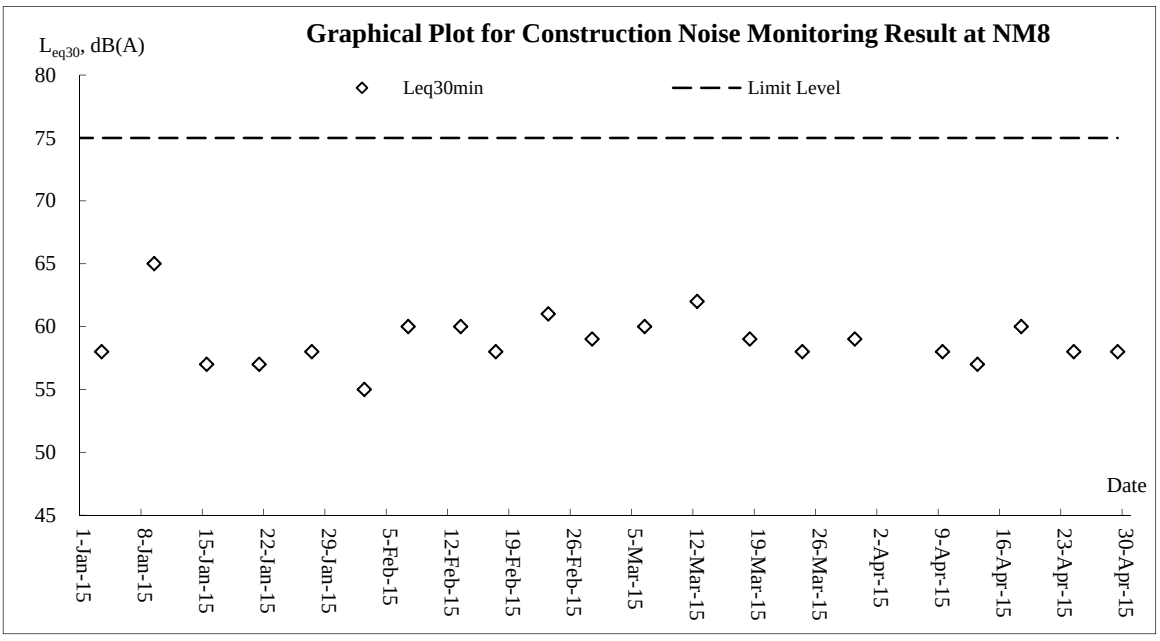
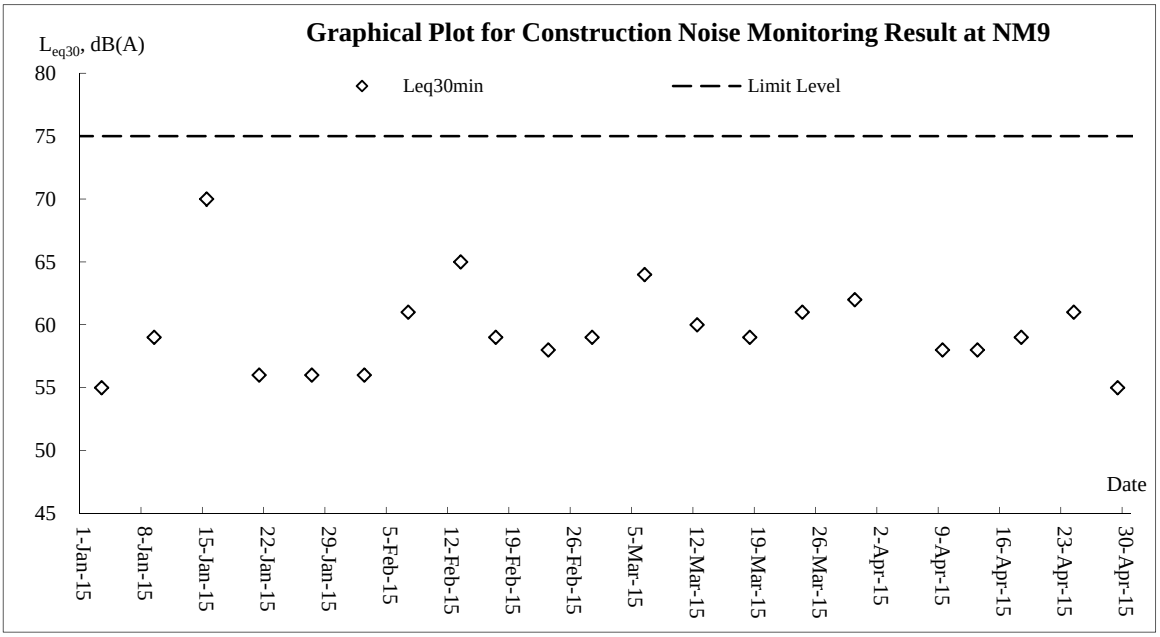
2-Apr-15
9-Apr-15
16-Apr-15
23-Apr-15
30-Apr-15


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-Jan-15
8-Jan-15
15-Jan-15
22-Jan-15
29-Jan-15
5-Feb-15
12-Feb-15
19-Feb-15
26-Feb-15
5-Mar-15
12-Mar-15
19-Mar-15
26-Mar-15
2-Apr-15
9-Apr-15
16-Apr-15
23-Apr-15
30-Apr-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-Jan-15
8-Jan-15
15-Jan-15
22-Jan-15
29-Jan-15
5-Feb-15
12-Feb-15
19-Feb-15
26-Feb-15
5-Mar-15
12-Mar-15
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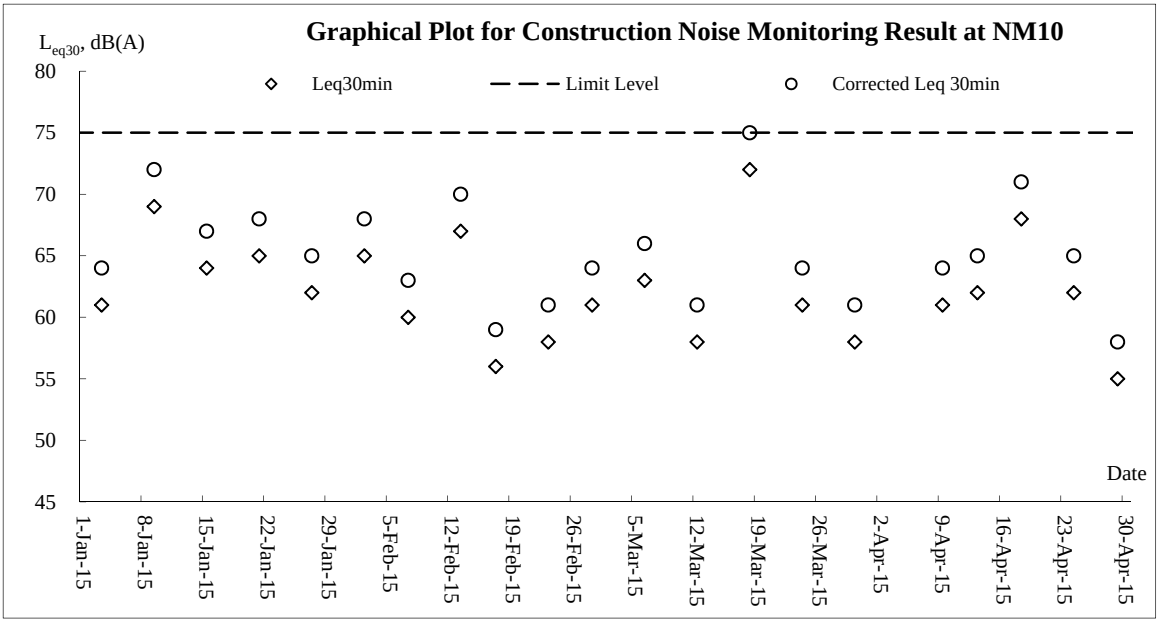
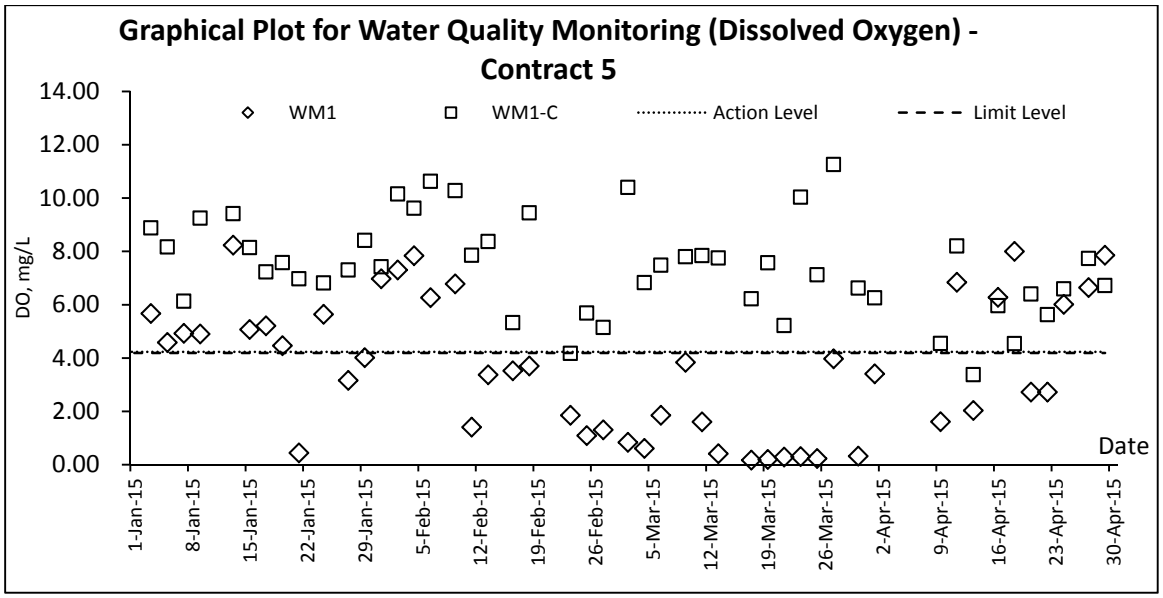
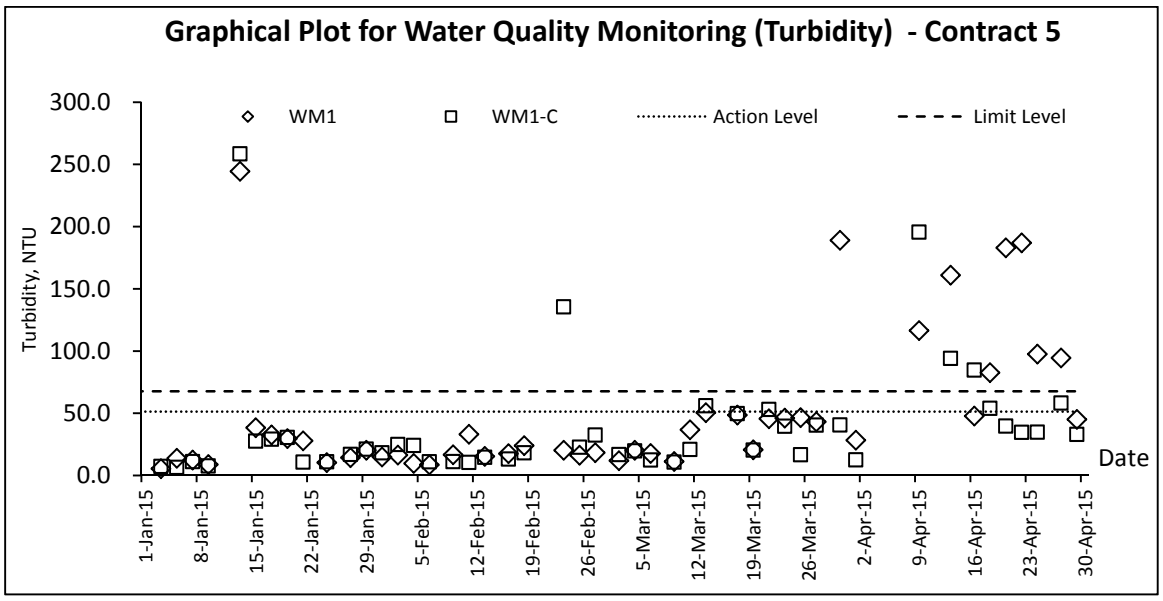
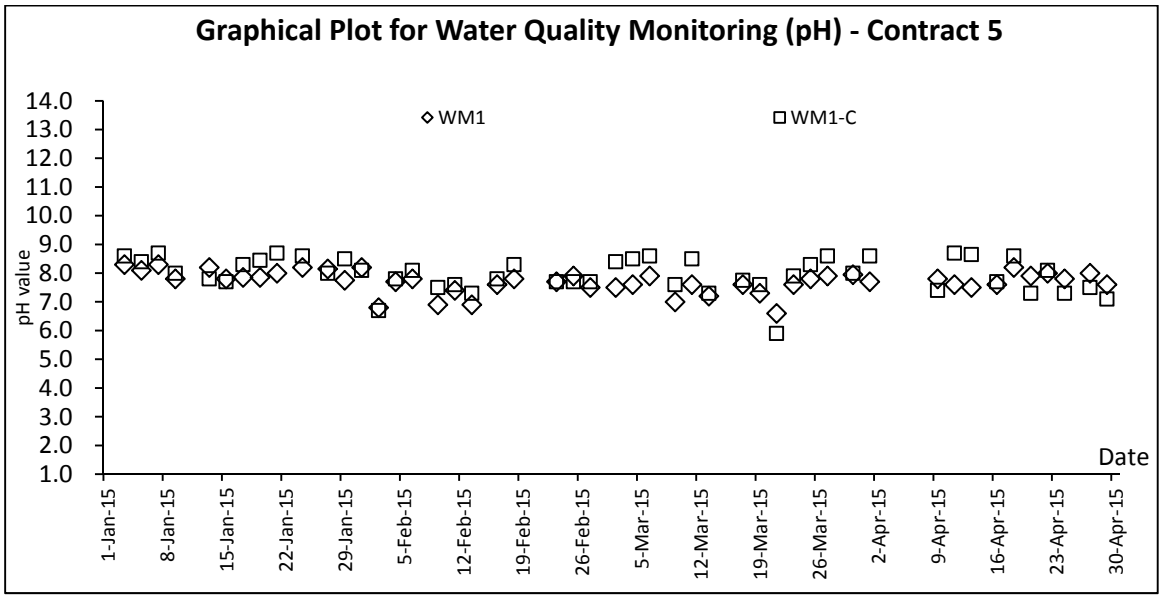
2-Apr-15
9-Apr-15
16-Apr-15
23-Apr-15
30-Apr-15

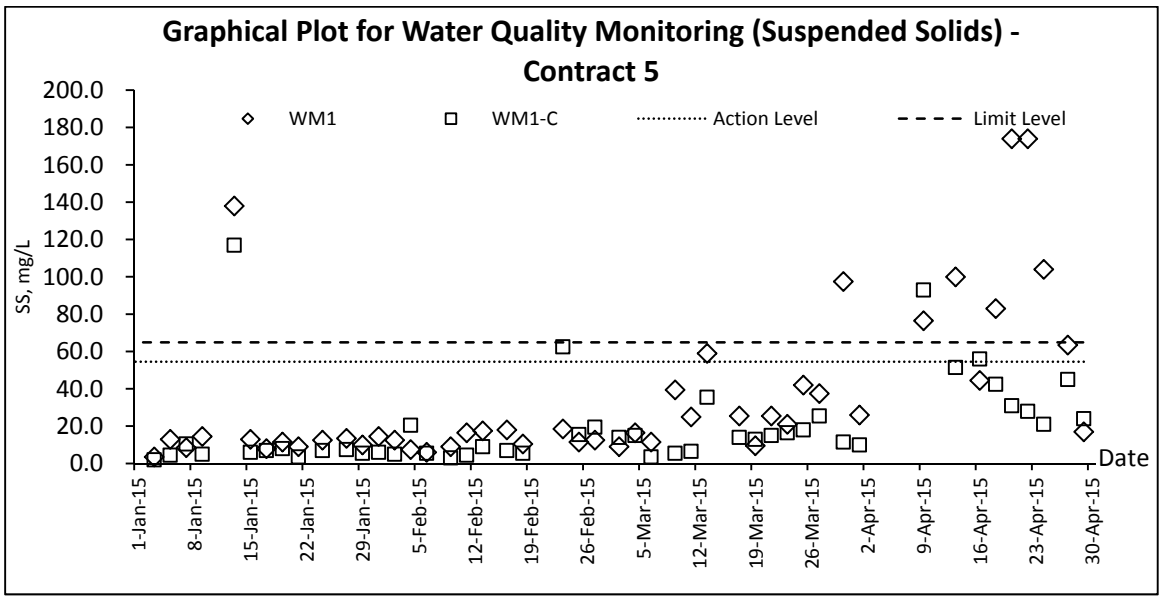

Graphical Plot for Construction Noise Monitoring Result at NM10
L_{eq30}, dB(A)
Leq30min
Limit Level
Corrected Leq 30min
80
75
70
65
60
55
50
45
Date
1-Jan-15
8-Jan-15
15-Jan-15
22-Jan-15
29-Jan-15
5-Feb-15
12-Feb-15
19-Feb-15
26-Feb-15
5-Mar-15
12-Mar-15
19-Mar-15
26-Mar-15
2-Apr-15
9-Apr-15
16-Apr-15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

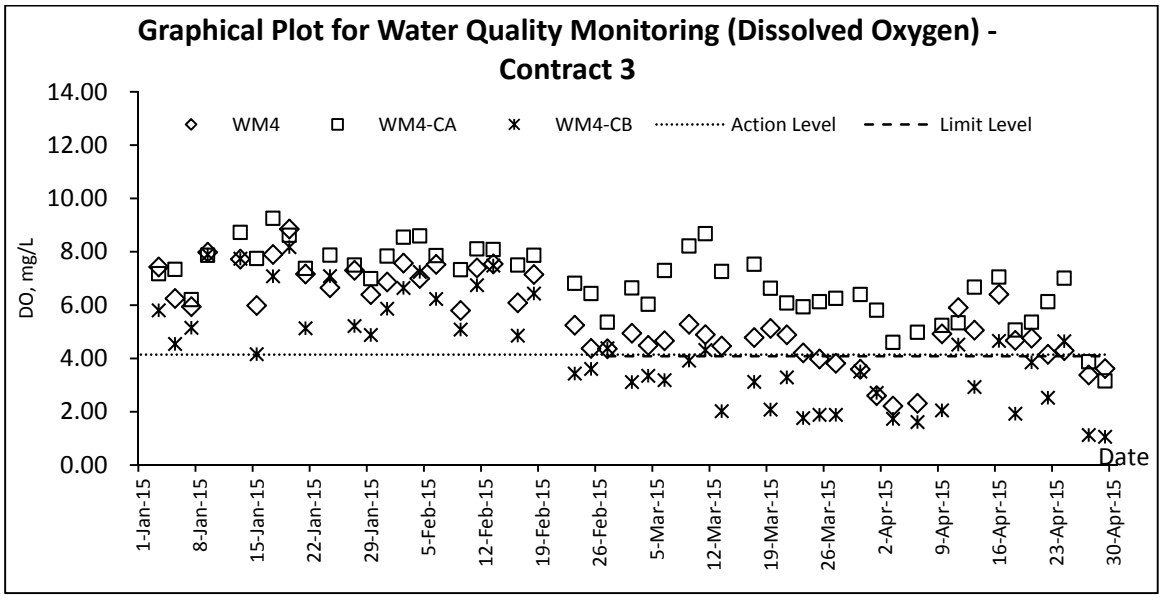
Water Quality








Graphical Plot for Water Quality Monitoring (Suspended Solids) - Contract 5
WM1
WM1-C
Action Level
Limit Level
SS, mg/L
200.0
180.0
160.0
140.0
120.0
100.0
80.0
60.0
40.0
20.0
0.0
Date
1-Jan-15
8-Jan-15
15-Jan-15
22-Jan-15
29-Jan-15
5-Feb-15
12-Feb-15
19-Feb-15
26-Feb-15
5-Mar-15
12-Mar-15
19-Mar-15
26-Mar-15
2-Apr-15
9-Apr-15
16-Apr-15
23-Apr-15
30-Apr-15


Graphical Plot for Water Quality Monitoring (Dissolved Oxygen) - Contract 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-Jan-15
8-Jan-15
15-Jan-15
22-Jan-15
29-Jan-15
5-Feb-15
12-Feb-15
19-Feb-15
26-Feb-15
5-Mar-15
12-Mar-15
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26-Mar-15
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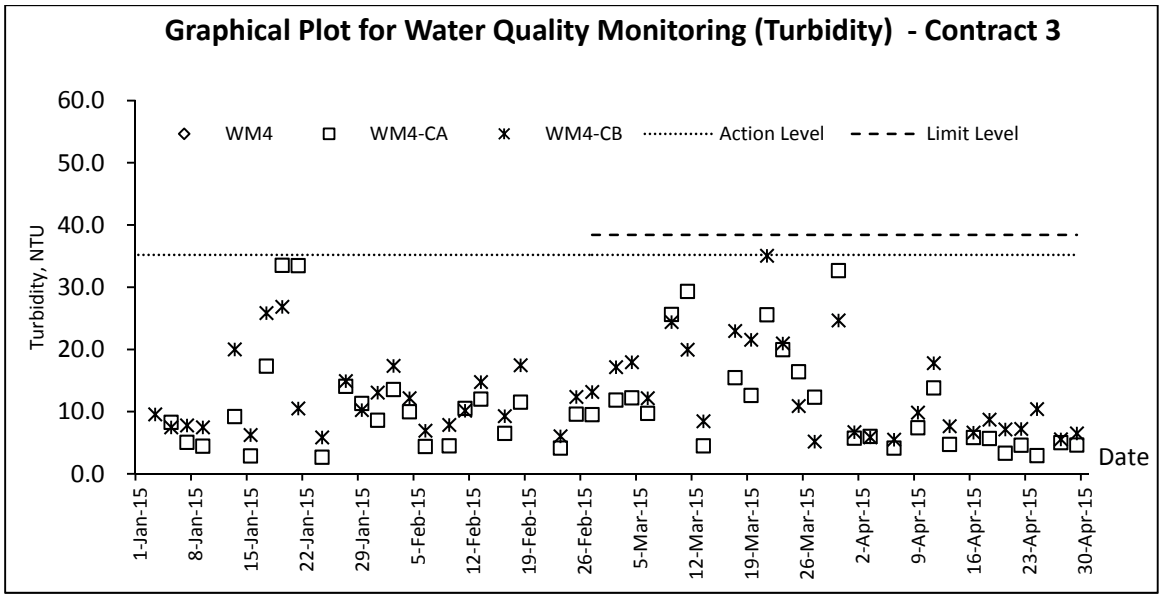
23-Apr-15
30-Apr-15


Graphical Plot for Water Quality Monitoring (Turbidity) - Contract 3
WM4
WM4-CA
WM4-CB
Action Level
Limit Level
Turbidity, NTU
60.0
50.0
40.0
30.0
20.0
10.0
0.0
Date
1-Jan-15
8-Jan-15
15-Jan-15
22-Jan-15
29-Jan-15
5-Feb-15
12-Feb-15
19-Feb-15
26-Feb-15
5-Mar-15
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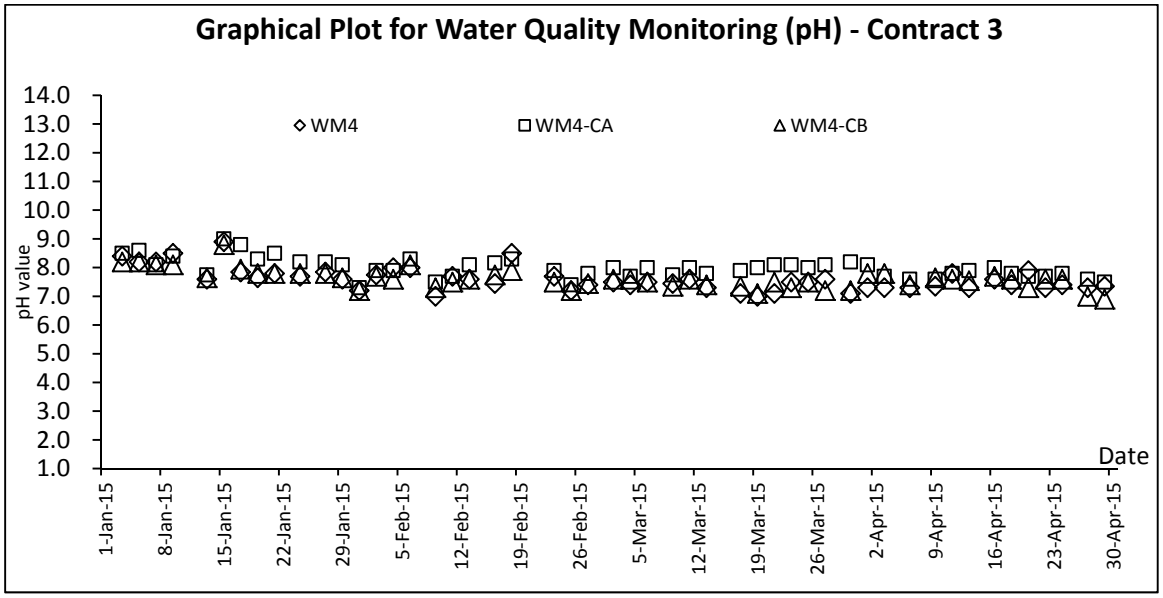
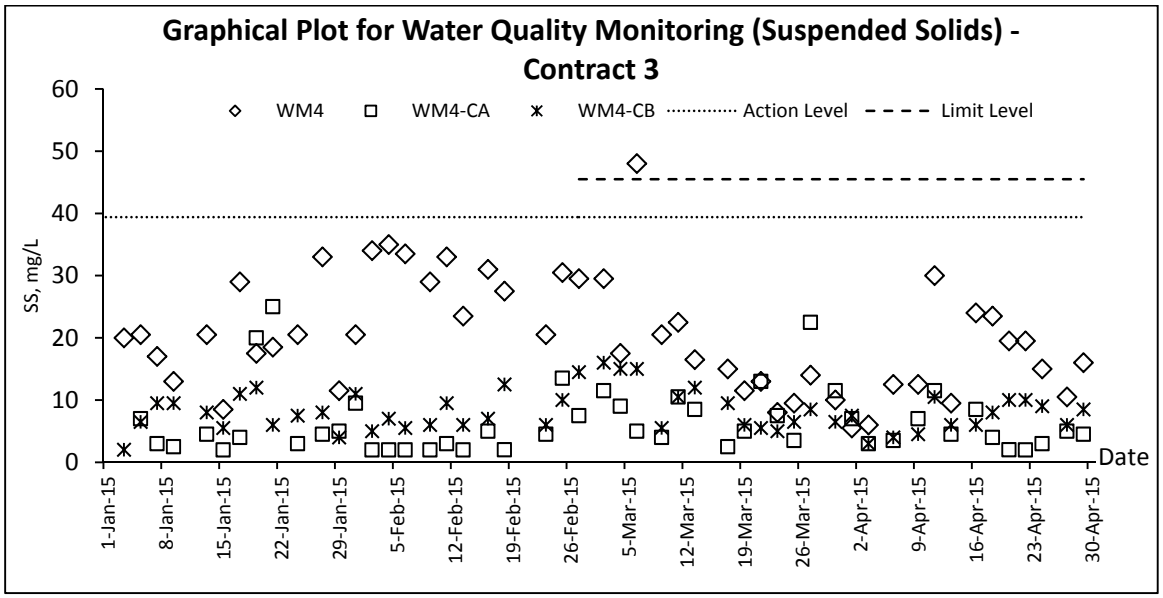
2-Apr-15
9-Apr-15
16-Apr-15
23-Apr-15
30-Apr-15


Graphical Plot for Water Quality Monitoring (pH) - Contract 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-Jan-15
8-Jan-15
15-Jan-15
22-Jan-15
29-Jan-15
5-Feb-15
12-Feb-15
19-Feb-15
26-Feb-15
5-Mar-15
12-Mar-15
19-Mar-15
26-Mar-15
2-Apr-15
9-Apr-15
16-Apr-15
23-Apr-15
30-Apr-15


Graphical Plot for Water Quality Monitoring (Suspended Solids) - Contract 3
WM4
WM4-CA
WM4-CB
Action Level
Limit Level
SS, mg/L
Date
60
50
40
30
20
10
0
1-Jan-15
8-Jan-15
15-Jan-15
22-Jan-15
29-Jan-15
5-Feb-15
12-Feb-15
19-Feb-15
26-Feb-15
5-Mar-15
12-Mar-15
19-Mar-15
26-Mar-15
2-Apr-15
9-Apr-15
16-Apr-15
23-Apr-15
30-Apr-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-Apr-15	Wed	It will be fine. Very dry in the afternoon. Moderate north to northeasterly winds, fresh at times.	0	25.8	8	77	E
2-Apr-15	Thu	Fine and very dry. Light to moderate northeasterly winds.	0	26.1	9.2	76.2	E/SE
3-Apr-15	Fri	Fine and very dry. Light to moderate northeasterly winds.	Trace	27.5	8.6	71.5	S
4-Apr-15	Sat	Fine and very dry. Light to moderate northeasterly winds.	0	28	9	68.7	E/SE
5-Apr-15	Sun	Fine and very dry. Light to moderate northeasterly winds.	0	27.4	8.2	67.5	E/SE
6-Apr-15	Mon	Fine and very dry. Light to moderate northeasterly winds.	Trace	26.6	4.9	70.7	E
7-Apr-15	Tue	Cloudy and cooler with one or two rain patches. Moderate to fresh north to northeasterly winds.	0.1	24.7	8.2	74.5	E
8-Apr-15	Wed	Cloudy and cooler with one or two rain patches. Moderate to fresh north to northeasterly winds.	10	16.9	11.9	74	N
9-Apr-15	Thu	Cloudy with a few rain patches and relatively low visibility. Moderate east to northeasterly winds.	1.3	15.8	4.5	87	N
10-Apr-15	Fri	Cloudy with a few rain patches. Moderate northeasterly winds.	0.7	15.9	5.5	86.5	N/NW
11-Apr-15	Sat	Cloudy to overcast with rain patches at first. Moderate north to northeasterly winds.	52	15	5.5	95	N/NW
12-Apr-15	Sun	Cloudy to overcast with rain patches at first. Moderate north to northeasterly winds.	0.2	19.7	8.2	72.2	N/NW
13-Apr-15	Mon	It will be fine. Very dry in the afternoon. Moderate north to northeasterly winds, fresh at times.	0	20	9.1	60	N
14-Apr-15	Tue	Fine and very dry. Light to moderate northeasterly winds.	0	19.2	8.2	45	N/NE
15-Apr-15	Wed	It will be fine. Very dry in the afternoon. Light winds.	0	19.3	6.9	60.5	N/NE
16-Apr-15	Thu	Fine and dry. Hot in the afternoon. Light winds.	0	20.9	5	82	W/SW
17-Apr-15	Fri	Mainly fine. Light to moderate southeasterly winds.	0	22.3	8.9	68.5	E/SE
18-Apr-15	Sat	Mainly fine. Light to moderate southeasterly winds.	Trace	25.5	8.5	78.2	S/SW
19-Apr-15	Sun	Fine and dry. Hot in the afternoon. Light winds.	Trace	27.6	9.2	75.7	S/SW
20-Apr-15	Mon	Mainly cloudy. Moderate north to northeasterly winds, fresh at times.	0.2	26	7	79.2	S/SW
21-Apr-15	Tue	Mainly cloudy. Moderate north to northeasterly winds, fresh at times.	Trace	23.4	8.4	73	N/NW
22-Apr-15	Wed	Sunny periods in the afternoon. Cloudy tonight. Moderate east to northeasterly winds, fresh at times.	Trace	23	7	72	E/SE
23-Apr-15	Thu	Mainly fine in the afternoon. Cloudy periods tonight. Moderate easterly winds.	Trace	23	7	59	E/SE
24-Apr-15	Fri	Mainly fine in the afternoon. Cloudy periods tonight. Moderate easterly winds.	0	25.4	5.5	66.2	E
25-Apr-15	Sat	Mainly fine in the afternoon. Moderate east to southeasterly winds.	0	24.2	8	72	E/SE
26-Apr-15	Sun	Mainly fine in the afternoon. Moderate east to southeasterly winds.	0	24.8	9.1	70	E
27-Apr-15	Mon	Mainly fine in the afternoon. Moderate east to southeasterly winds.	0	24.9	7.5	73.2	E
28-Apr-15	Tue	Mainly cloudy. Sunny intervals in the afternoon. Light to moderate southeasterly winds.	0	25.9	6.1	73.5	W/SW
29-Apr-15	Wed	Mainly cloudy. Moderate southerly winds.	0	27.1	5.5	72.5	W/SW
30-Apr-15	Thu	Mainly sunny during the day and becoming cludy overnight. Moderate south to southeasterly winds.	0	27.8	6.5	70	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	49.2330	0.0000	0.2770	48.7494	0.2066	0.1928	0.0000	0.2300	0.0000	0.0000	0.2278
May	0.0000										
June	0.0000										
Half-year total	239.5173	0.0000	0.7055	237.1240	1.6879	0.7312	3.3200	1.1620	0.0000	1.2320	0.5095
July	0.0000										
August	0.0000										
September	0.0000										
October	0.0000										
November	0.0000										
December	0.0000										
Yearly Total	239.5173	0.0000	0.7055	237.1240	1.6879	0.7312	3.3200	1.1620	0.0000	1.2320	0.5095

(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 (in '000m^3)	Hard Rock and Large Broken Concrete (in '000m^3)	Reused in the Contract (in '000m^3)	Reused in other Projects (in '000m^3)	Disposed as Public Fill (in '000m^3)	Imported Fill (in '000m^3)	Metals (in '000m^3)	Paper/ cardboard packaging (in '000m^3)	Plastics (see Note 3) (in '000m^3)	Chemical Waste (in '000m^3)	Others, e.g. general refuse (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											
Jun											
Sub-total	13.603	0.297	4.744	0.000	8.859	0.408	2.767	0.000	0.009	0.940	0.295
Jul											
Aug											
Sep											
Oct											
Nov											
Dec											
Total	13.603	0.297	4.744	0.000	8.859	0.408	2.767	0.000	0.009	0.940	0.295

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											
JUN											
Sub Total	0	0	0	0	0	66.5505	5.15	0.24	0	0	1.015
JUL											
AUG											
SEP											
OCT											
NOV											
DEC											
Total	0	0	0	0	0	66.55	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