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.24) – JULY 2015

PREPARED FOR
CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT (CEDD)

Date	Reference No.	Prepared By	Certified By
13 August 2015	TCS00670/13/600/R0462v2		
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Version	Date	Remarks
1	10 August 2015	First Submission
2	13 August 2015	Amended according to the IEC's comments on 12 August 2015

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13 August 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. 24) – July 2015

With reference to the Monthly EM&A Report No. 24 for July 2015 (Version 2) certified by the ET Leader provided to us on 13 August 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	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 **24th** monthly EM&A report presenting the monitoring results and inspection findings for the reporting period from **1 to 31 July 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 to six CEDD contracts including Contract 2 (CV/2012/08), Contract 3 (CV/2012/09), Contract 4 (TCSS), Contract 5 (CV/2013/03), Contract 6 (CV/2013/08) and Contract 7 (NE/2014/03)).

ES03 Currently, the construction works have been undertaking 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**	**96**
	24-hour TSP	**6**	**36**
Construction Noise	$L_{eq(30min)}$ Daytime	**8**	**43**
Water Quality	Water sampling	**3 (Contract 2&3)**	**13(*)**
		2 (Contract 5)	**13(*)**
Joint Site Inspection / Audit	IEC, ET, the Contractor and RE joint site Environmental Inspection and Auditing	**Contract 2**	**5**
		Contract 3	**4**
		Contract 5	**5**

(*) *Monitoring day*

BREACH OF ACTION AND LIMIT (A/L) LEVELS

ES04 In the Reporting Period, no air quality and noise exceedance was registered for the Project. For water quality, a total of three (3) Limit Level exceedances were recorded at WM4. The summary of exceedance in the Reporting Period is shown below.

Environmental Aspect	Monitoring Parameters	Action Level	Limit Level	Event & Action		
				NOE Issued	**Investigation Result**	**Corrective Actions**
Air Quality	1-hour TSP	0	0	0	--	--
	24-hour TSP	0	0	0	--	--
Construction Noise	$L_{eq(30min)}$ Daytime	0	0	0	--	--
Water Quality	DO	0	0	0	--	--
	Turbidity	0	**1**	**1**	- Exceedances at WM4 on 20 Jul 2015 were not project related - Exceedance at WM4 on 25 Jul 2015 is under investigation	N/A
	SS	0	**2**	**2**		

ENVIRONMENTAL COMPLAINT

ES05 In this Reporting Period, one (1) documented environmental complaint was received and lodged for Contracts 2 regarding blockage of surface channel at Po Kat Tsai on 6 July 2015. Follow up

actions have been undertaking by the Contractor to resolve the deficiencies. According to the investigation findings by the ET, this complaint was not related to the Contract and investigation report had submitted to all relevant parties.

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 **3, 10, 17, 24 and 31 July 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 **6, 15, 20 and 27 July 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 July 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 **24th** monthly EM&A report presenting the monitoring results and inspection findings for reporting period from **1** to **31 July 2015**.

1.2 REPORT STRUCTURE

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

Section 1 *Introduction*
Section 2 *Project Organization and Construction Progress*
Section 3 *Summary of Impact Monitoring Requirements*
Section 4 *Air Quality Monitoring*
Section 5 *Construction Noise Monitoring*
Section 6 *Water Quality Monitoring*
Section 7 *Waste Management*

2 PROJECT ORGANIZATION AND CONSTRUCTION PROGRESS

2.1 CONSTRUCTION CONTRACT PACKAGING

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

- Contract 2 (CV/2012/08)
- Contract 3 (CV/2012/09)
- Contract 4 (NE/2014/02)
- Contract 5 (CV/2013/03)
- Contract 6 (CV/2013/08)
- Contract 7 (NE/2014/03)

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

Contract 2 (CV/2012/08)

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

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

Contract 3 (CV/2012/09)

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

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

Contract 4 (NE/2014/02)

2.1.5 Contract 4 has 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 has awarded in June 2015 and construction work was expected to be commenced on 1 November 2015. Major Scope of Work of the Contract 6 would be included below:

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

Contract 7 (NE/2014/03)

2.1.8 Contract 7 has not yet been awarded. Major Scope of Work of the Contract 7 would be included below:

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

2.2 PROJECT ORGANIZATION

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

Civil Engineering and Development Department (CEDD)

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

Environmental Protection Department (EPD)

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

Engineer or Engineers Representative (ER)

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

- Monitor the Contractors' compliance with contract specifications, including the implementation and operation of the environmental mitigation measures and their effectiveness
- Monitor Contractors's, ET's and IEC's compliance with the requirements in the Environmental Permit (EP) and EM&A Manual
- Facilitate ET's implementation of the EM&A programme

- Participate in joint site inspection by the ET and IEC
- Oversee the implementation of the agreed Event / Action Plan in the event of any exceedance
- Adhere to the procedures for carrying out complaint investigation
- Liaison with DSD, Engineer/Engineer's Representative, ET, IEC and the Contractor of the "Construction of the DSD's Regulaiton of Shenzhen River Stage 4 (RSR 4)" Project discussing regarding the cumulative impact issues.

The Contractor(s)

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

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

Environmental Team (ET)

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

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

Independent Environmental Checker (IEC)

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

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

2.3 CONCURRENT PROJECTS

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

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

2.4 CONSTRUCTION PROGRESS

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

Contract 2 (CV/2012/08)

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

Mid-Vent Portal	• Cavern excavation • Adit invert slab
North Portal	• Permanent slope and composite wall • Tunnel Boring Machine (TBM) onsite assembly and cradle construction • Southbound bench excavation • Associated PME installation for operation of TBM (mortar plant,

cooling system etc.)

South Portal	• Rock Excavation to Vent. Bldg. Formation • Southbound excavation and foundation works • Northbound excavation and bored piles works • Drill and Blast Set Up + Site installation
Admin Building	• Backfilling for surcharge • Drainage works

Contract 3 (CV/2012/09)

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

- Cable detection and trial trenches
- Decking construction for Bridge E
- E&M work for new valve control & Telemetry House
- Filling works at Tong Hang
- Storm drain laying
- Noise barrier construction
- Pier / pier table construction
- Pile cap works
- Piling works
- Portal beam erection
- Pre-drilling
- Road works at Fanling Highway
- Retaining Wall construction
- Socket H-pile installation
- Tree felling works
- Utilities duct laying
- Viaduct segment erection
- Portal beam construction

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:

- Diversion of UU at existing LMH Road
- Construction of secondary boundary fencing
- Construction of Depressed Road at BCP3
- Additional works (Access Works) for Village House at RS4
- Drainage works at existing/proposed LMH Road
- Drainage works (Connection to Box 3) at BCP Area
- Brick laying at footpath of proposed LMH road
- Water works at proposed LMH Road
- Formation works at BCPB Area
- Installation of Underground utilities at proposed and existing LMH road
- Road works (kerb laying) for proposed and existing LMH road
- Bituminous laying at existing & proposed LMH road

Contract 6 (CV/2013/08)

2.4.6 Contract 6 has awarded in June 2015 and construction work was expected to be commenced on 1

November 2015.

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
- Woodland Compensation Plan
- Habitat Creation Management Plan

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

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

Item	Description	License/Permit Status	
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-RN0279-15	Valid 12 May 2015 -

Item	Description	License/Permit Status	
			29 Aug 2015
		GW-RN0305-15	Valid 19 May 2015 - 18 Aug 2015
		GW-RN0304-15	Valid 19 May 2015 - 14 Nov 2015
		GW-RN0298-15	Valid 30 May 2015 - 29 Aug 2015
		GW-RN0299-15	Valid 23 May 2015 - 22 Aug 2015
		GW-RN0479-15	Valid 31 Jul 2015 - 29 Jan 2016
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-RN0120-15	Valid on 8 Mar 2015 till 1 Jul 2015
		GW-RN0230-15	Valid on 15 Apr 2015 till 14 Oct 2015
		GW-RN0270-15	Valid on 7 May 2015 till 18 Jul 2015
		GW-RN0275-15	Valid on 7 May 2015 till 15 Aug 2015
		GW-RN0295-15	Valid on 31 May 2015 till 30 Aug 2015
		GW-RN0326-15	Valid on 2 Jun 2015 till 29 Aug 2015
		GW-RN0334-15	Valid on 8 Jun 2015 till 7 Dec 2015
		GW-RN0404-15	Valid on 21 Jul 2015 till 4 Dec 2015
		GW-RN0430-15	Valid on 9 Jul 2015 till 22 Aug 2015
		GW-RN0428-15	Valid on 9 Ju1 2015 till 31 Dec 2015
		GW-RN0473-15	Valid on 29 Jul 2015 till 17 Dec 2015
Contract 5			

Item	Description	License/Permit Status	
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*

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

Wind Data Monitoring Equipment

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

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

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

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

Noise Monitoring

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

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

Table 3-6 Construction Noise Monitoring Equipment

Equipment	Model
Integrating Sound Level Meter	B&K Type 2238* or Rion NL-31 or Rion NL-52*
Calibrator	B&K Type 4231* or Cesva CB-5* or Rion NC-74*

Equipment	Model
Portable Wind Speed Indicator	Testo Anemometer

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

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

Water Quality Monitoring

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

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

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

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

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

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

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

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

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

Table 3-7 Water Quality Monitoring Equipment

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

Equipment	Model
pH meter	YSI Professional Plus / AZ8685 pH pen-style meter w/ serial no. 212632*
Turbidimeter	Hach 2100Q*
Sample Container	High density polythene bottles (provided by laboratory)
Storage Container	'Willow' 33-liter plastic cool box with Ice pad

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

3.6 MONITORING METHODOLOGY

1-hour TSP Monitoring

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

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

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

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

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

24-hour TSP Monitoring

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

(a.) An anodized aluminum shelter;

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

(c.) A blower motor assembly;

(d.) A continuous flow/pressure recorder;

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

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

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

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

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

Noise Monitoring

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

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

restricted hours), if necessary.

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

Water Quality

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

Sampling Procedure

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

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

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

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

In-situ Measurement

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

3.6.15 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 ***96*** events of 1-hour TSP and ***36*** events (in which 4 events were incomplete due to power failure) 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
4-Jul-15	39	6-Jul-15	10:41	85	80	85
7-Jul-15	34	10-Jul-15	10:11	46	41	39
13-Jul-15	18	16-Jul-15	10:09	68	76	71
18-Jul-15	41	22-Jul-15	11:00	48	61	64
28-Jul-15#	33	28-Jul-15	10:58	33	32	29
30-Jul-15	34					
Average (Range)	**33 (18-41)**	Average (Range)		**57 (29 – 85)**		

 # monitoring was rescheduled from 24 July 2015 to 28 July 2015 due to power failure.

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
4-Jul-15	67	6-Jul-15	10:45	123	100	121
7-Jul-15	63	10-Jul-15	10:22	54	49	44
13-Jul-15	59	16-Jul-15	10:00	59	69	60
18-Jul-15	116	22-Jul-15	10:44	49	66	67
24-Jul-15	34	28-Jul-15	10:52	27	25	21
30-Jul-15	48					
Average (Range)	**65 (34-116)**	Average (Range)		**62 (21 – 123)**		

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
4-Jul-15	46	6-Jul-15	10:50	98	96	111
7-Jul-15	43	10-Jul-15	14:19	35	23	21
13-Jul-15	28	16-Jul-15	9:56	51	39	105

Date	24-hour TSP (μg/m³)	1-hour TSP (μg/m³)				
		Date	Start Time	1st reading	2nd reading	3rd reading
18-Jul-15	33	22-Jul-15	10:36	107	112	109
24-Jul-15	27	28-Jul-15	10:48	28	25	22
30-Jul-15	38					
Average (Range)	**36 (27-46)**	Average (Range)		**65 (21 – 112)**		

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
4-Jul-15	54	3-Jul-15	10:50	50	48	47
7-Jul-15	47	8-Jul-15	10:00	90	98	116
13-Jul-15	81	14-Jul-15	10:10	40	32	51
18-Jul-15	54	20-Jul-15	10:59	48	26	22
24-Jul-15	31	25-Jul-15	9:00	43	39	47
30-Jul-15	41	31-Jul-15	10:10	20	17	42
Average (Range)	**51 (31-81)**	Average (Range)		**49 (17 – 116)**		

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
4-Jul-15	41	3-Jul-15	10:52	37	35	36
7-Jul-15	32	8-Jul-15	10:26	74	75	98
13-Jul-15	28	14-Jul-15	10:24	32	28	26
18-Jul-15	30	20-Jul-15	11:10	25	24	21
24-Jul-15	35	25-Jul-15	11:08	32	35	29
30-Jul-15	35	31-Jul-15	10:34	12	7	11
Average (Range)	**34 (28-41)**	Average (Range)		**35 (7 – 98)**		

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

Date	24-hour TSP (μg/m³)	1-hour TSP (μg/m³)				
		Date	Start Time	1st reading	2nd reading	3rd reading
6-Jul-15#	132	6-Jul-15	13:45	118	95	100
7-Jul-15	51	10-Jul-15	13:35	39	33	40
13-Jul-15	50	16-Jul-15	13:40	73	70	78
18-Jul-15	28	22-Jul-15	13:05	68	75	72
24-Jul-15	28	28-Jul-15	13:02	39	38	45
30-Jul-15	40					
Average (Range)	**55 (28-132)**	Average (Range)		**66 (33 – 118)**		

 # monitoring was rescheduled from 4 July 2015 to 6 July 2015 due to power failure.

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

4.2.3 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 **43** 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**
6-Jul-15	53	59	58	61	65	3-Jul-15	55	62	64
10-Jul-15	51	56	58	59	62	8-Jul-15	55	58	63
16-Jul-15	54	60	59	61	65	14-Jul-15	58	62	67
22-Jul-15	54	55	59	61	65	20-Jul-15	51	62	58
28-Jul-15	53	58	58	60	65	25-Jul-15	63	63	63
						31-Jul-15	54	63	63
Limit Level	**75 dB(A)**								

Remarks

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

5.2.2 As shown in ***Table 5-1***, the noise level measured at the designated monitoring locations NM1, NM2, NM5, NM6, NM7, NM8, NM9 and NM10, were below 75dB(A). Furthermore, there was no noise complaints (Action Level exceedance) received by the RE, Contractors or CEDD in the Reporting Period. Therefore, no Action or Limit Level exceedance was triggered and no corrective action was required.

6 WATER QUALITY MONITORING

6.1 GENERAL

6.1.1 In the Reporting Period, construction works under the project has been commenced in Contracts 3 and 5 and water quality monitoring was performed at 5 relevant designated locations as below:

- WM1 – Contract 5 working site downstream at Kong Yiu Channel;
- WM1 – Control – Contract 5 working site upstream at Kong Yiu Channel;
- WM4 –South Portal of Contract 2 and Contract 3 working site downstream of Ma Wat Channel
- WM4 – Control A - Contract 3 working site Kau Lung Hang Stream
- WM4 – Control B - Contract 3 working site Upstream of Ma Wat Channel

6.1.2 The water quality monitoring schedule is presented in ***Appendix H***. The monitoring results are summarized in the following sub-sections.

6.2 RESULTS OF WATER QUALITY MONITORING

6.2.1 In the Reporting Period, there were **thirteen (13)** sampling days of water quality monitoring conducted at the designated water monitoring location.

6.2.2 The key monitoring parameters including Dissolved Oxygen, Turbidity and Suspended Solids are summarized in ***Tables 6-1 and 6-2***. Breaches of water quality monitoring criteria are shown in ***Table 6-3***. Detailed monitoring database including in-situ measurements and laboratory analysis data are shown in ***Appendix I*** and the relevant graphical plot are shown in ***Appendix J***.

Table 6-1 Summary of Water Quality Monitoring Results for Contracts 2 and 3

Date	Dissolved Oxygen (mg/L)			Turbidity (NTU)			Suspended Solids (mg/L)		
	WM4	WM4-CA	WM4-CB	WM4	WM4-CA	WM4-CB	WM4	WM4-CA	WM4-CB
2-Jul-15	7.33	7.19	5.95	13.2	5.7	11.5	9.5	2.5	19.5
4-Jul-15	7.25	7.49	6.85	15.4	5.6	13.5	13.5	3.5	15.5
6-Jul-15	7.28	7.78	5.95	12.8	6.3	10.3	17.0	5.0	10.0
8-Jul-15	7.84	7.22	7.41	14.4	5.8	15.1	14.0	7.5	14.0
10-Jul-15	7.04	7.99	6.04	19.6	6.5	13.3	20.0	7.5	11.0
14-Jul-15	5.83	5.11	3.84	14.3	5.3	14.5	12.5	3.5	12.5
16-Jul-15	5.96	6.59	4.51	13.4	5.2	16.8	14.0	5.5	22.5
18-Jul-15	6.78	6.20	4.77	33.7	17.6	18.5	36.0	4.0	16.0
20-Jul-15	5.78	6.84	5.20	**70.8**	19.7	43.0	**51.5**	15.5	32.0
22-Jul-15	6.51	7.27	5.95	22.1	6.9	16.7	15.5	4.5	14.5
25-Jul-15	6.56	6.50	5.60	33.7	8.2	14.7	**51.5**	5.0	11.5
28-Jul-15	7.52	7.33	6.09	23.2	6.7	9.0	12.0	2.5	6.0
30-Jul-15	6.73	7.25	5.77	25.0	5.2	10.4	26.0	5.0	8.0

Remark:

i. bold and underlined indicated Limit Level exceedance.

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

Date	Dissolved Oxygen (mg/L)		Turbidity (NTU)		Suspended Solids (mg/L)	
	WM1	WM1-Control	WM1	WM1-Control	WM1	WM1-Control
2-Jul-15	6.66 #	6.83	45.7	22.8	40.0	15.0
4-Jul-15	6.81 #	6.48	44.0	9.9	40.5	6.5
6-Jul-15	6.11 #	6.40	74.4	23.8	58.5	20.5
8-Jul-15	6.07 #	7.85	77.5	14.9	59.0	10.0
10-Jul-15	6.17 #	5.41	459.5	120.0	225.5	59.5
14-Jul-15	6.88 #	5.72	29.7	38.6	24.5	22.0
16-Jul-15	5.23 #	3.37	97.4	over range	57.0	329.5
18-Jul-15	5.85 #	5.38	633.5	325.0	209.5	149.0

Date	Dissolved Oxygen (mg/L)		Turbidity (NTU)		Suspended Solids (mg/L)	
	WM1	WM1-Control	WM1	WM1-Control	WM1	WM1-Control
20-Jul-15	5.66 #	6.65	193.0	135.0	92.5	104.0
22-Jul-15	6.25 #	5.80	533.5	223.0	276.5	179.0
25-Jul-15	7.10 #	6.81	16.6	10.9	17.5	5.5
28-Jul-15	6.84 #	7.25	28.7	9.5	30.0	4.5
30-Jul-15	6.93 #	7.02	50.1	11.6	55.5	7.5

Remark:

i bold and underlined indicated Limit Level exceedance.

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

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

Location	Dissolved Oxygen (mg/L)		Turbidity (NTU)		Suspended Solids (mg/L)		Total Exceedance	
	Action	Limit	Action	Limit	Action	Limit	Action	Limit
WM1	0	0	0	0	0	0	0	0
WM4	0	0	0	**1**	0	**2**	0	**3**
No of Exceedance	0	0	0	**1**	0	**2**	0	**3**

6.2.3 During water monitoring in July 2015, very shallow water was observed at the proposed water monitoring location and water sampling at WM1 was unable to carry out. Water sampling was then carried out near the box culvert 2 at close downstream and the data is served as reference only.

6.2.4 In this Reporting Period, total of three (3) Limit Level exceedances, namely one (1) Limit Level exceedances of turbidity and two (2) Limit Level exceedances of suspended solids were recorded at WM4/

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

Investigation Result for turbidity and SS Exceedance at WM1 on 24 June 2015 (Contract 5) (follow up of last Reporting Period)

6.2.6 According to the site information provided by the Contractor, site formation at Boundary Control Point B was carried out under Contract 5 on 24 June 2015. No wastewater was generated from site formation work thus no discharges were made neither.

6.2.7 According to the site record from the monitoring team, there was heavy rain in North District before the water monitoring work. During the water monitoring on 24 June 2015, muddy water was observed throughout the channel including both impact and control station due to heavy rain.

6.2.8 Since the water monitoring was conducted after rainstorm, the existing condition of the river water was deteriorated by vigorous water flow in the river and stirred up the sediment at river bed. High turbidity and SS result was also recorded at upstream control station.

6.2.9 In view of the subsequent monitoring activities and results during non-rainy day in the week after, no muddy water was observed. It is considered that the exceedances were a single incident due to the rainstorm.

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

6.2.10 According to the site information provided from the Contractor of C2 (DHK), construction

activities carried out on 20 July 2015 at South Portal included tunnel excavation, foundation work and spoil hauling and all works were far from the Ma Wat River.

6.2.11 According to the site record by the monitoring team, there was heavy rainstorm in Taipo before the water monitoring work and muddy water was observed at upstream of the Ma Wat River WM4-CB. It was suspected the muddy water was come from other construction site which located at the upstream of the Contract. Moreover, according to the photo record provided by other contractor, muddy water flowed from other upstream location was observed but this location was not under monitored by the Contract.

6.2.12 Since the water monitoring was conducted after rainstorm, the existing condition of the river water was deteriorated by vigorous water flow in the river and stirred up the sediment at river bed. In view of the subsequent monitoring activities and results during non-rainy day in the week after, no muddy water was observed and no exceedance was triggered. It is considered that the exceedances were a single incident due to cumulative effect of the rainstorm and muddy water from upstream.

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

6.2.13 According to the site diary provided by the Contractor, construction works carried out on 20 July 2015 included erection of formwork, drilling, dismantle of sheetpile and tree felling. The works were carried out away from the watercourse and no wastewater was generated. Surface runoff of the site was all diverted to the wastewater treatment facilities for de-silting prior to discharge.

6.2.14 According to the site record from the monitoring team, there was heavy rain before the water monitoring work. During the course of monitoring, turbid water was observed throughout the Ma Wat River including control station WM4-CB and impact locations WM4. It was suspected the muddy water was come from other construction site which located at the upstream of the Contract which recorded at WM4-CB. Moreover, muddy water flowed from other upstream location was observed but this location was not under monitored by the Contract.

6.2.15 Since the water monitoring was conducted after rain, the existing condition of the river water was deteriorated by vigorous water flow in the river and stirred up the sediment at river bed. Since no exceedance was recorded in the subsequent non-rainy day, it is considered that the exceedances were a single incident due to cumulative effect of the rainstorm and muddy water from upstream.

Investigation Result for SS Exceedance at WM4 on 25 July 2015 (Contract 2)

6.2.16 To be updated in next reporting month.

Investigation Result for SS Exceedance at WM4 on 25 July 2015 (Contract 3)

6.2.17 To be updated in next reporting month.

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)	**19.5844**	--	**1.177**	--	0	--	**20.7614**
Reused in this Project (Inert) (in '000 m^3)	**0.5171**	--	**0.351**	--	0	--	**0.8681**
Reused in other Projects (Inert) (in '000 m^3)	**18.2752**	C5	**0**	--	0	--	**18.2752**
Disposal as Public Fill (Inert) (in '000 m^3)	**0.7922**	Tuen Mun 38	**0.826**	Tuen Mun 38	0	--	**1.6182**

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

Type of Waste	Contract 2		Contract 3		Contract 5		Total Quantity
	Quantity	Disposal Location	Quantity	Disposal Location	Quantity	Disposal Location	
Recycled Metal ('000kg) #	0	-	0	-	0	--	0
Recycled Paper / Cardboard Packing ('000kg) #	**0.2500**	Licensed collector	0	-	0	--	**0.2500**
Recycled Plastic ('000kg) #	0	-	0	-	0	--	0
Chemical Wastes ('000kg) #	**0.8800**	Licensed collector	0	-	0	--	**0.8800**
General Refuses ('000m^3)	**0.0496**	NENT	**0.065**	NENT	**0.02**	NENT	**0.1346**

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 **3, 10, 17, 24 and 31 July 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
3 July 2015	• Uncovered cement bags (over 20 bags) were observed, the Contractor should cover the cement bags with impervious sheeting. (Mid-Vent)	• All bagged cement onsite had been covered by tarpaulin
10 July 2015	• No adverse environmental were observed.	• NA
17 July 2015	• It was reminded that stagnant water cumulated on site should be cleaned to prevent mosquito breeding.	• Not required for reminder.
24 July 2015	• No adverse environmental were observed.	• NA
31 July 2015	• Stagnant water cumulated inside the waste skip and the lifting eye of the concrete block was observed. The contractor should clean the stagnant water to prevent mosquito breeding. (Mid-Vent)	• The stagnantwater in the waste skip was removed and the lifting eyes were filled with sand.

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 **6, 15, 20 and 27 July 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
6 July 2015	• The Contractor was reminded to provide water spraying for dry haul road.	• Not required for reminder.
15 July 2015	• Chemical container without proper drip tray was observed, the Contractor should provide drip tray underneath.	• Drip tray was provided for the chemcial containers.
20 July 2015	• No adverse environmental were observed.	• NA

Date	Findings / Deficiencies	Follow-Up Status
27 July 2015	• Construction material placed next to the retained tree was observed opposite to SA2, the Contractor should provide protective fence and buffet area for the retained tree. • The Contractor was reminded to provide the preventive measures for rainwater being discharge of site.	• The concerned trees will be fell and no corrective mesaures is proposed. • Not required for reminder.

The Contract 5

8.2.5 In the Reporting Period, joint site inspection for Contract 5 to evaluate the site environmental performance has been carried out by the RE, IEC, ET and the Contractor on **2, 9, 16, 23 and 30 July 2015**. No non-compliance was noted.

8.2.6 The findings / deficiencies of ***Contract 5*** that observed during the weekly site inspection are listed in ***Table 8-3***.

Table 8-3 Site Observations for Contract 5

Date	Findings / Deficiencies	Follow-Up Status
2 July 2015	• At the site entrance/exit in LMH site area (1500 pipe), the Contractor was reminded that all vehicles should be washed before leaving the site and the public road should be kept clean of sand and gravel	• Not required for reminder.
9 July 2015	• Stagnant water was found in precast construction materials, the Contractor should drain away the stagnant water to prevent mosquito breeding. • The Contractor was reminded that breaking activity should be provided with water spraying.	• Mosquito larvicidal oil was applied to the stagnant water. • Not required for reminder.
16 July 2015	• Scattered general refuse was observed, the Contractor should improve the site cleanliness. (Location: BCP 3) • Broken drip tray underneath a generator was observed on site, the Contractor should provide proper drip tray for the generator. (Location: BCP 3) • The Contractor was reminded to properly store any all empty chemical containers.	• The general refuse was removed and site cleanliness was improved. • A wood framed impervious tarpaulin sheet was provided underneath the generator. However, the Contractor was advised to provide a proper sized metal drip tray for the generator. • Not required for reminder.
23 July 2015	• The Contractor was reminded to maintain cleanliness at pubic road.	• Not required for reminder.
30 July 2015	• The Contractor should clean up the accumulated sand and mud at the U-Channel at patrol road.	• To be followed.

8.2.7 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

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

9 ENVIRONMENTAL COMPLAINT AND NON-COMPLIANCE

9.1 ENVIRONMENTAL COMPLAINT, SUMMONS AND PROSECUTION

9.1.1 In the Reporting Period, no summons and prosecution under the EM&A Programme was lodged for Contracts 2, 3 and 5. However, one (1) documented environmental complaint was received and lodged for Contracts 2. Follow up actions have been undertaking by the Contractor to resolve the deficiencies The details of complaint are listed below:-

- 6 July 2015 - A complaint was lodged by the DSD on 6 July 2015 and another verbal complaint was received on 8 July 2015 regards to the blocked surface channel with rubbish at Po Kat Tsai Village. A site inspection was carried out by DSD on 8 July 2015 and the covered surface channel concerned was found blocked with mud and siltation. Debris was found near a natural watercourse in the vicinity. According to the complainant, it was suspected that mud water had been discharged to the existing village drains from the construction site (Contract No. CV/2012/08). Also, the debris found was dumped by the workers working in the construction site.

9.1.2 Upon receipt of the complaint, follow up action has been undertaken by both Contractor promptly to resolve the complaints and deficiencies. During the complaint investigation work, the Contractor was co-operated with the ET in providing all the necessary information and assistance for completion of the investigation. According to the investigation findings by the ET, this complaint was not related to the Contract and investigation report had submitted to all relevant parties.

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

Table 9-1 Statistical Summary of Environmental Complaints

Reporting Period	Contract No	Environmental Complaint Statistics		
		Frequency	Cumulative	Complaint Nature
19 May 2014 – 31 May 2015	Contract 2	0	**12**	• **(4) Water Quality** • **(5) Construction Dust** • **(2) Noise**
06 Nov 2013 – 31 May 2015	Contract 3	0	**3**	• **(1) Construction Dust** • **(2) Water quality**
16 Aug 2013 – 30 Jun 2015	Contract 5	0	**2**	• **(2) Construction Dust**
1 – 31 Jul 2015	Contract 2	1	**13**	• **(6) 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 May 2015	Contract 2	0	0	NA
06 Nov 2013 – 31 May 2015	Contract 3	0	0	NA
16 Aug 2013 – 30 Jun 2015	Contract 5	0	0	NA
1 – 31 Jul 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 May 2015	Contract 2	0	0	NA
06 Nov 2013 – 31 May 2015	Contract 3	0	0	NA
16 Aug 2013 – 30 Jun 2015	Contract 5	0	0	NA
1 – 31 Jul 2015	Contract 2	0	0	NA
	Contract 3	0	0	NA
	Contract 5	0	0	NA

The Other Contracts

9.1.4 Since the construction works at the Contract 4, Contract 6 and Contact 7 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
- Adit invert slab
- Cavern excavation

North Portal
- Permanent slope
- South Bound invert grouting
- North Bound blast door installation
- North Bound top heading canopies
- TBM sliding to face
- Associated equipment installation for operation of TBM (mortar plant, cooling system etc.)
- TBM initial drive

South Portal
- Rock Excavation to Vent. Bldg. Formation
- Southbound foundation works
- Northbound bored piles works & pile tests
- Drill and blast set up and site installation
- Installation of blast door for Southbound tunnel

Admin Building
- Backfilling for surcharge

Contract 3

- Cable detection and trial trenches
- Decking construction for Bridge E
- E&M work for new valve control & Telemetry House
- Filling works at Tong Hang East
- Storm Drains Laying
- Noise barrier construction
- Pier / Pier Table construction
- Pile cap works
- Piling works
- Portal beam erection
- Pre-drilling works
- Road works at Fanling Highway
- Retaining Wall construction
- Socket H-pile installation
- Tree felling works
- Utilities duct laying
- Viaduct segment erection
- Portal Beam construction

Contract 5

- Laying of additional rising main at LMH road
- Bituminous laying at proposed and existing LMH road.
- Construction of secondary boundary fencing
- 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
- Construction of superstructure at Footbridge (RS4)
- Construction of Depressed Road at BCP3
- Filling work for ArchSD permanent office
- Drainage works at 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, Contract 6 and Contact 7 have not yet commenced and no environmental issue is presented.

11 CONCLUSIONS AND RECOMMENDATIONS

11.1 CONCLUSIONS

11.1.1 This is **24th** monthly EM&A report presenting the monitoring results and inspection findings for the Reporting Period from **1** to **31 July 2015**.

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

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

11.1.4 For water quality monitoring, a total of three (3) Limit Level exceedances were recorded, namely one (1) Limit Level exceedances of turbidity and two (2) Limit Level exceedances of suspended solids. It was concluded that the exceedances at WM4 were all not project related.

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 In this Reporting Period, one (1) documented environmental complaint was received and lodged for Contracts 2 regarding blockage of surface channel at Po Kat Tsai on 6 July 2015. Follow up actions have been undertaking by the Contractor to resolve the deficiencies. According to the investigation findings by the ET, this complaint was not related to the Contract and investigation report had submitted to all relevant parties.

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.

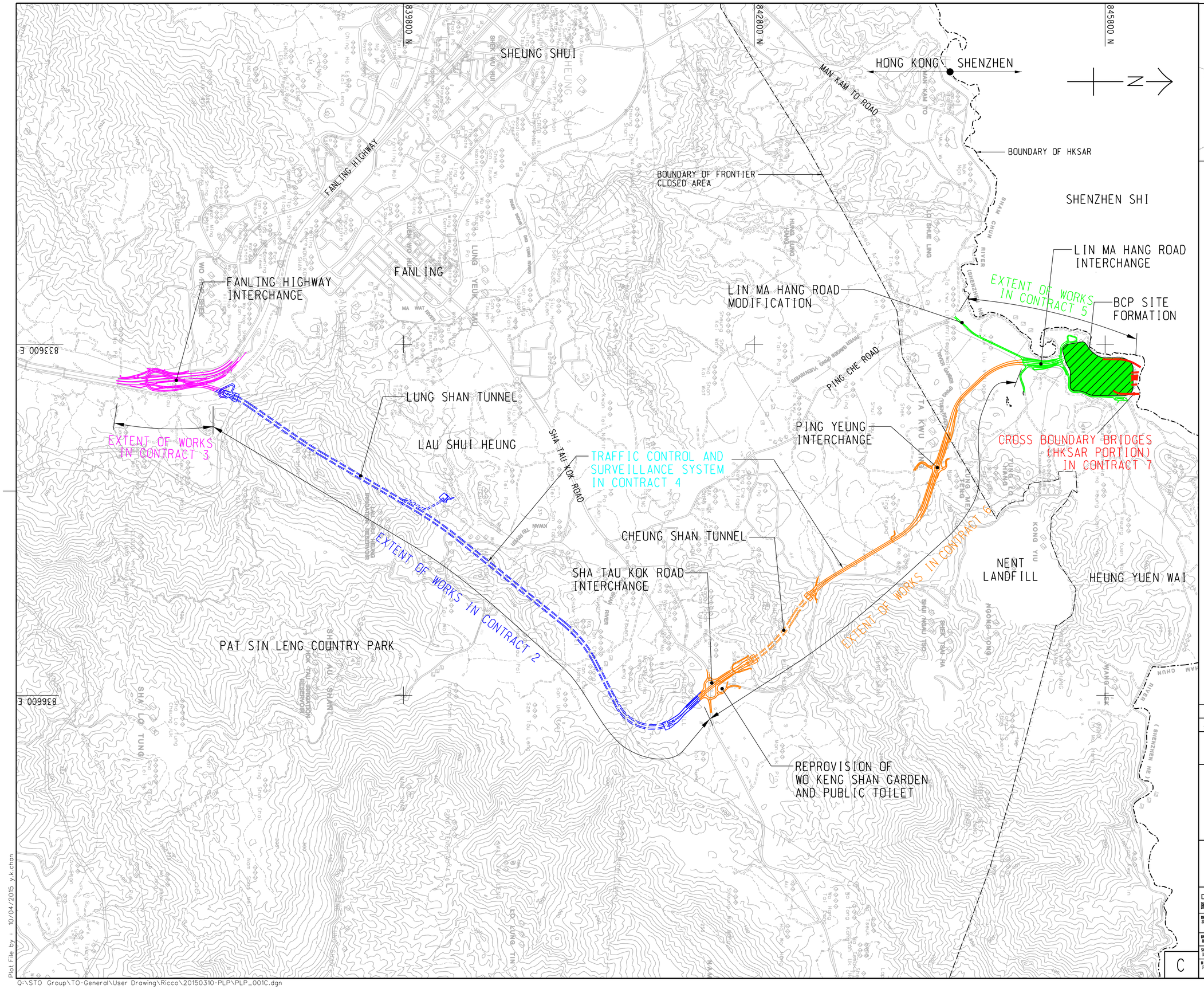
11.2.2 Construction noise should be a key environmental impact during the works. The noise mitigation measures such as use of quiet plants or temporary noise barrier installation at the construction noise predominate area should be implemented as accordance with the EM&A requirement.

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:

UNDERGROUND WORKS

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

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

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

PROJECT LAYOUT PLAN

AECOM

DRG.NO. 圖紙編號 60212563/PLP/001

DESIGNED BY 設計	CONTRACT NO. 合約編號	P. Dir. APPROVED 批准人
–	–	–
DRAWN BY 繪圖 ZJ	STATUS 階段	
SCALE 比例 A1 1 : 15000 A3 1 : 30000		
DIMENSIONS ARE IN 尺寸單位 METRES		

C

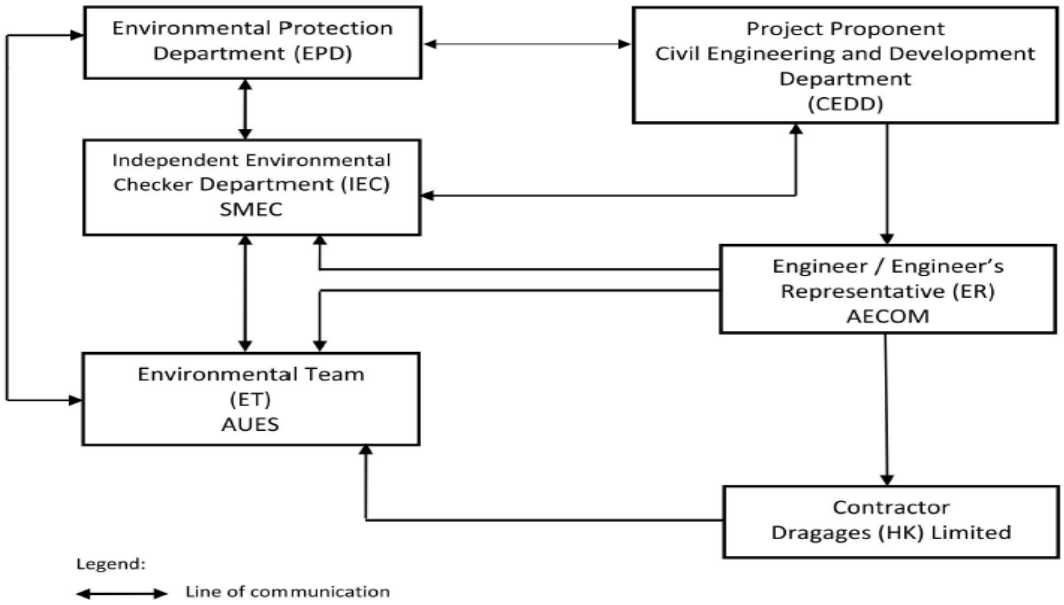
Plot File by : 10/04/2015 y.k.chan

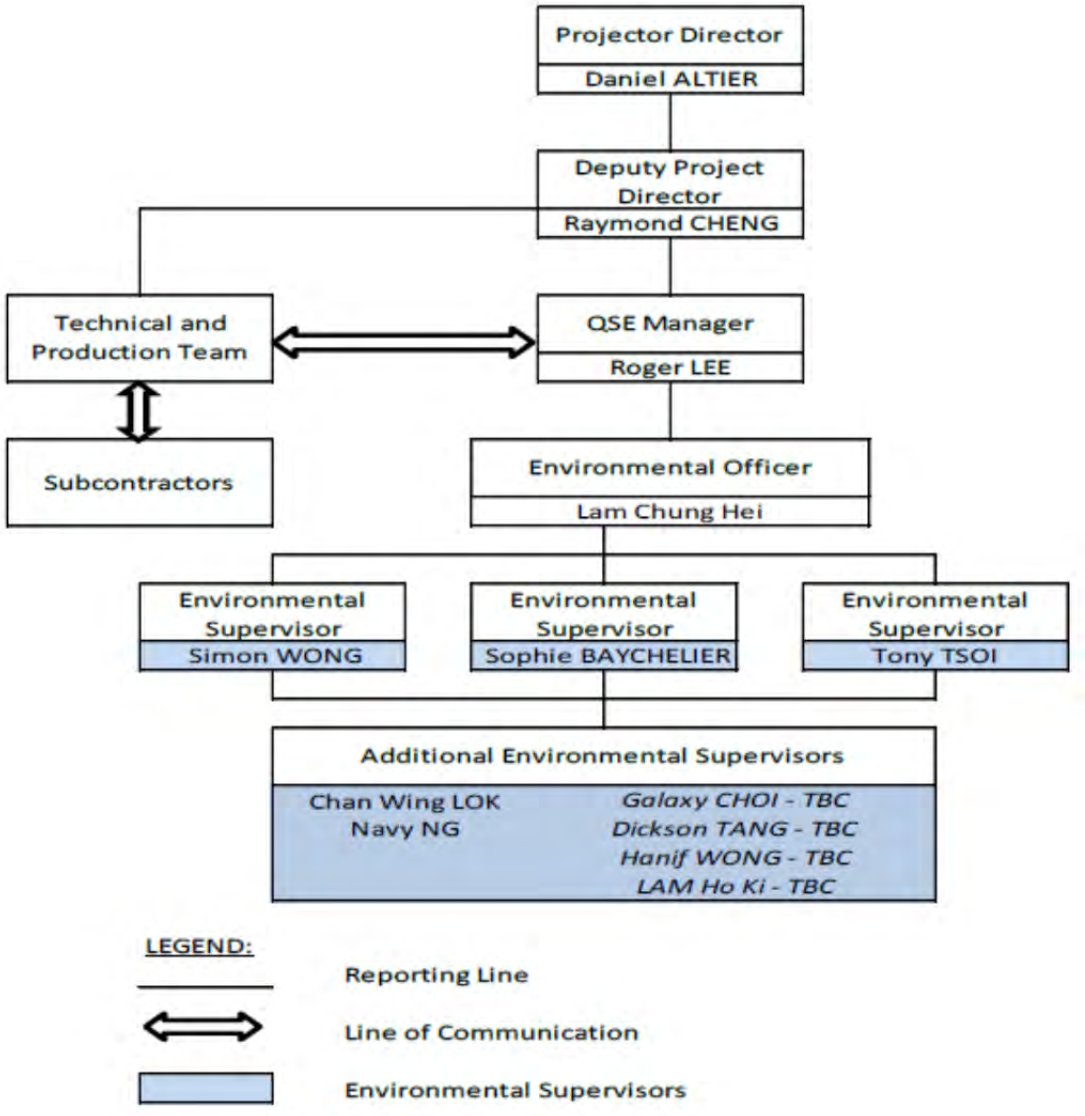
Q:\STO Group\TO-General\User Drawing\Ricco\20150310-PLP\PLP_001C.dgn

Appendix B

Organization Chart

Project Organization Structure





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:

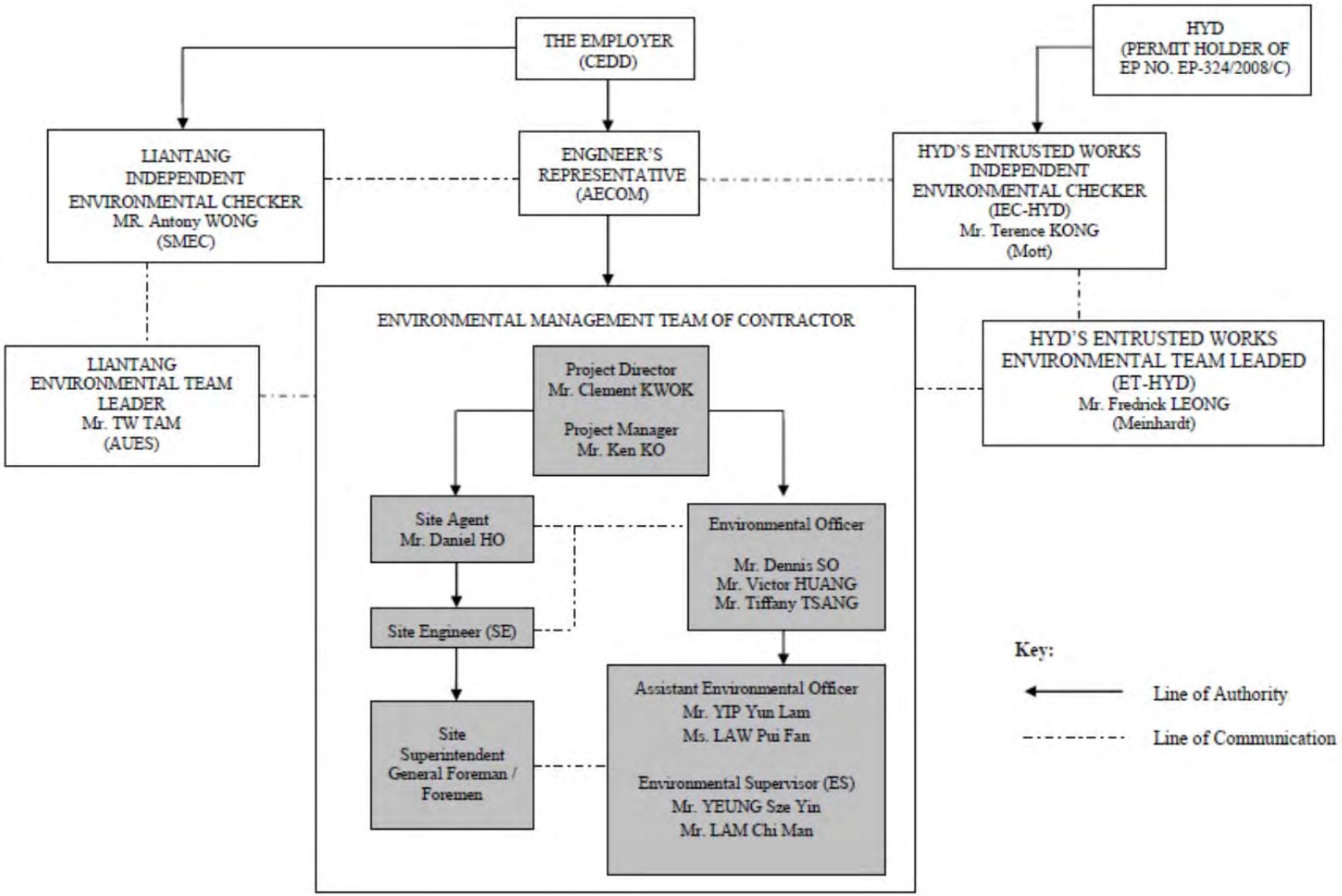
CEDD (Employer) – Civil Engineering and Development Department

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 Tiffany Tsang 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:

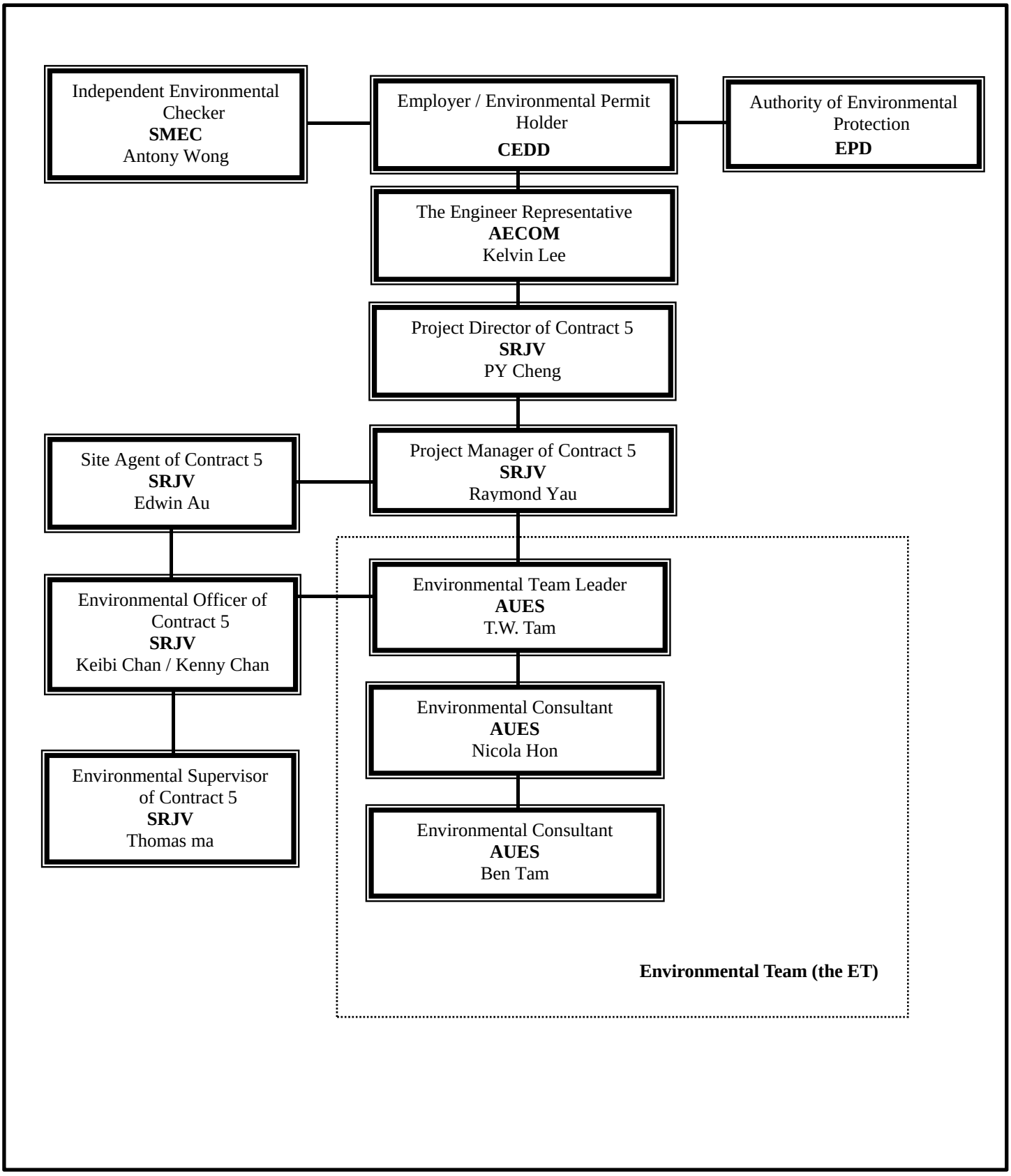
CEDD (Employer) – Civil Engineering and Development Department

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

MPR19; HKLTH Works Programme update 20-July-2015 [wpd]; DHK_HKLTH_Works Programme new 3MRP; 23-Jul-15; 12:50

Activity ID	Activity Name	Working Duration	BL Project Start	BL Project Finish
Total		1090.0	20-Jan-14	10-Jul-17
HKLTH Works Programme update 20-July-2015 [wpd]		1090.0	20-Jan-14	10-Jul-17
2 General		1019.0	17-Apr-14	10-Jul-17
Geotechnical Interpretative Report 2nd Revision		55.5	09-Dec-14	25-Feb-15
DDA Submission		55.5	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		1019.0	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		649.0	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		424.6	13-Oct-14	09-Jan-16
3.1 South Portal Subcontract & Procurement		251.6	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		280.0	15-Dec-14	22-Aug-15

REV	DESCRIPTION	DATE	PREPARED	CHECKED	APPROVED
A	Monthly Report No.19	20/07/2015	RAN	RBS/SJO	DAL

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

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

THE ENGINEER: AECOM

CONTRACTOR'S DESIGNER: ATKINS

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

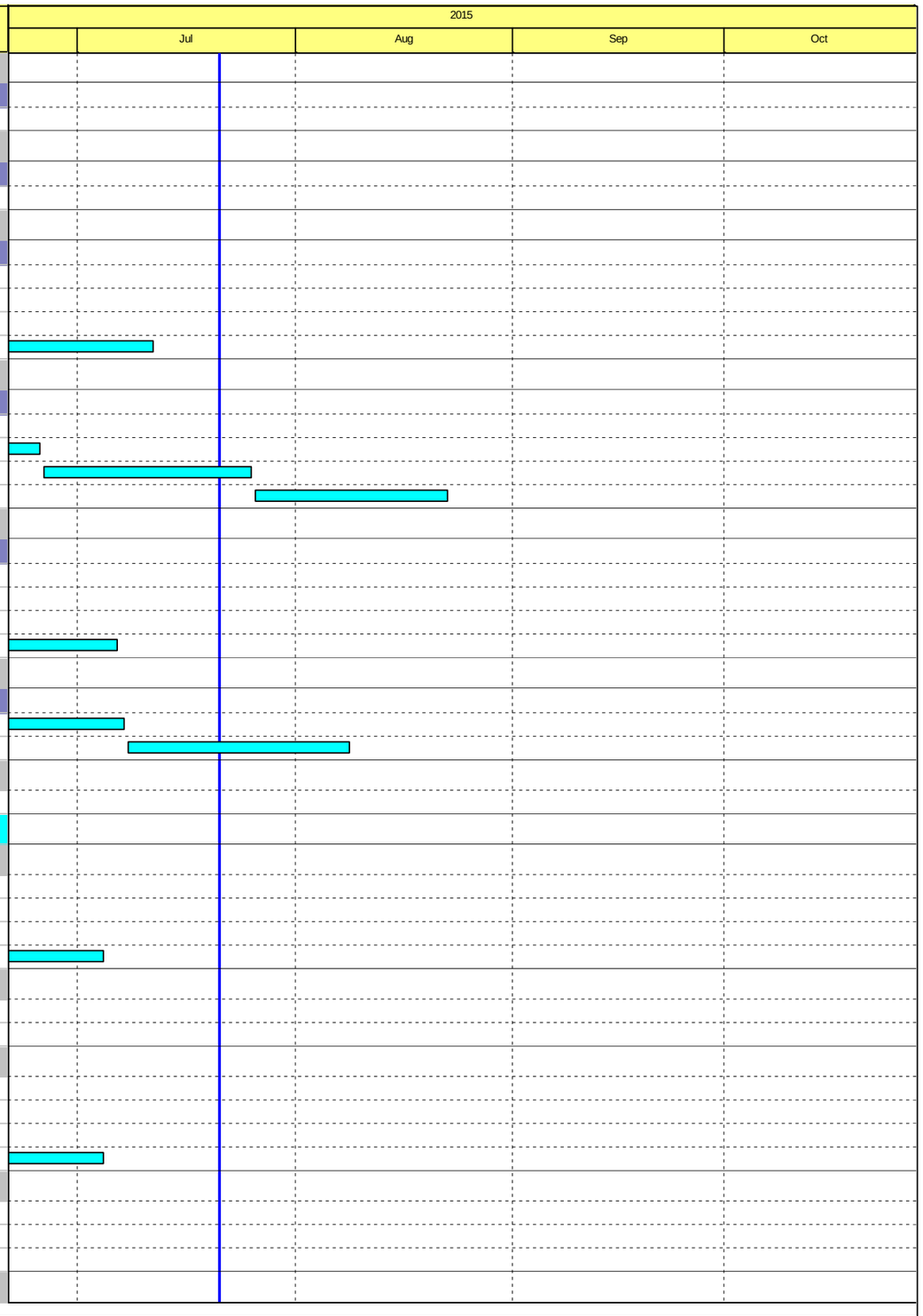
TITLE: Monthly Report No.19 3-Months Rolling Programme (Approved Works Programme Rev. D)

DOCUMENT NO.: LTH/DHK/PGR/PW/PLP/00064/A

DOC. STATUS	CREATION DATE	REVISION
FOR INFO.	20/07/2015	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		161.1	18-Feb-15	11-Jul-15
DDA Submission		161.1	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		225.0	30-Mar-15	22-Aug-15
DDA Submission		225.0	30-Mar-15	22-Aug-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
STIS1L1023690	ER/IP's Approval	28.0	26-Jul-15	22-Aug-15
Cross Passages -Temp Works D&B Tunnel - Soft Ground		221.0	27-Jan-15	06-Jul-15
DDA Submission		221.0	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		249.6	13-Oct-14	04-Jul-15
South Portal: Tunnel Mechanical Excavation		140.6	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		162.0	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		199.0	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		52.0	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		107.2	08-Dec-14	18-May-15



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Activity ID	Activity Name	Working Duration	BL Project Start	BL Project Finish
A25481	Prepare Method Statement (Gravity Walls)	48.0	08-Dec-14	04-Feb-15
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		280.0	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		107.3	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		54.0	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		395.4	26-Sep-14	10-Oct-15
4.1 Middle Portal Subcontract & Procurement		199.0	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 [ELS]	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		300.4	03-Dec-14	29-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		37.9	29-Dec-14	28-Feb-15
DDA Submission		37.9	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		181.2	23-Feb-15	28-Jul-15
DDA Submission		181.2	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

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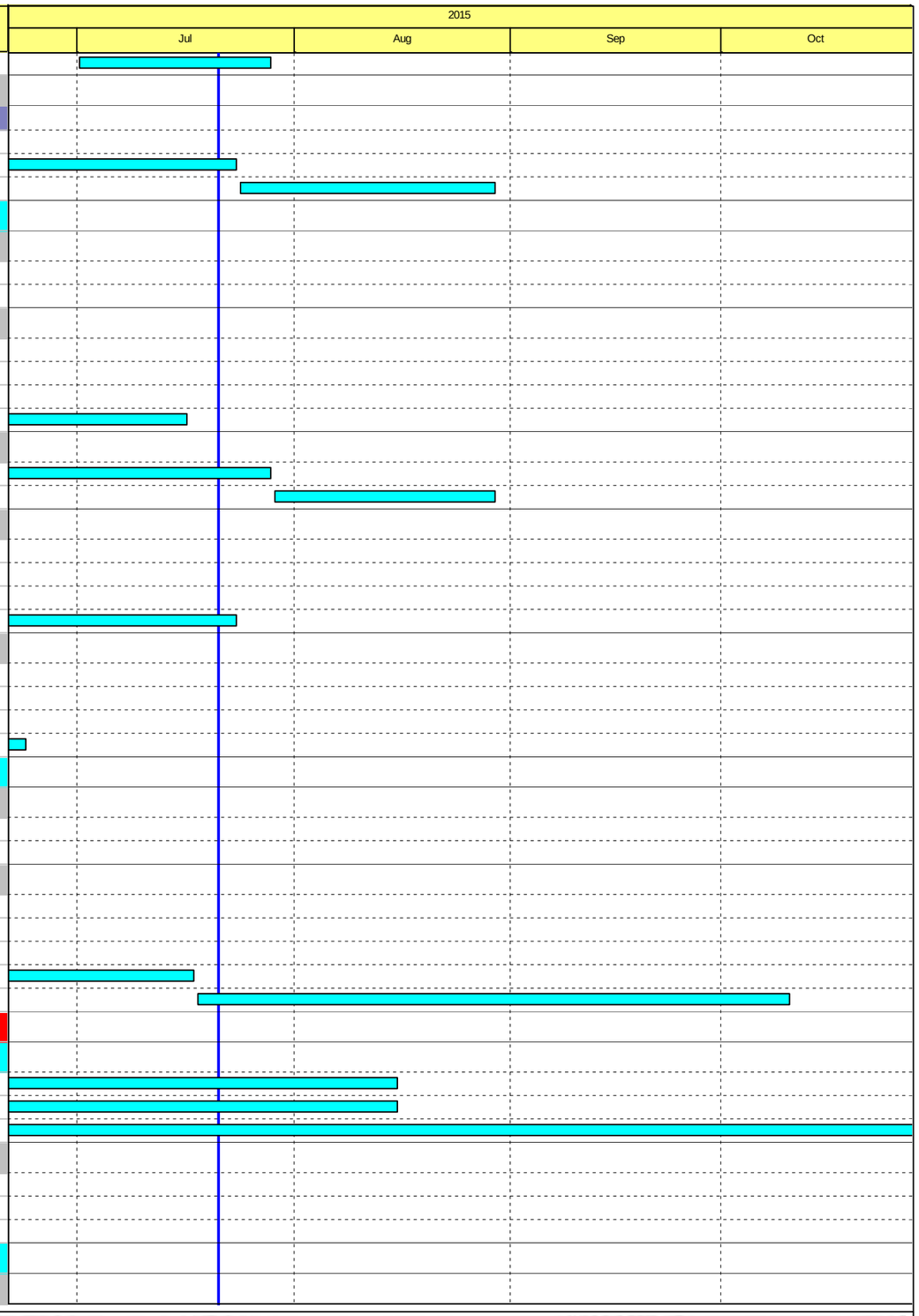
A3	N/A	3 of 8

Activity ID	Activity Name	Working Duration	BL Project Start	BL Project Finish
DSN29097	ER/IP's Approval	28.0	01-Jul-15	28-Jul-15
Mid Vent Junction Internal Structure		109.0	21-Apr-15	29-Aug-15
DDA Submission		109.0	21-Apr-15	29-Aug-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
DSN29104	Preparation for resubmission to ER/ICE/IP with ICE Certification	32.0	24-Jul-15	29-Aug-15
4.3 Middle Portal Method Statement Submission		346.8	14-Oct-14	29-Aug-15
Cavern Blasting Method Statement		267.0	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		215.8	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's Approval	28.0	12-Jun-15	16-Jul-15
Cavern Permanent Lining		97.2	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 - ELS		76.4	12-Feb-15	23-Jul-15
A25509	Prepare Method Statement [ELS]	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's Approval	28.0	19-Jun-15	23-Jul-15
Mid Vent Building Construction		144.8	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's Approval	28.0	20-May-15	23-Jun-15
4.5 Middle Portal Works		310.0	26-Sep-14	10-Oct-15
Middle Portal: CLP Substation		269.5	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		297.0	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; 69m	70.0	18-Jul-15	10-Oct-15
5 North Portal Area		679.0	20-Jan-14	02-Dec-15
5.1 North Portal Subcontract & Procurement		679.0	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		382.7	25-Nov-14	15-Sep-15
North Tunnel Curved Section Southbound Temp Support For Enlargement		249.0	25-Nov-14	06-May-15



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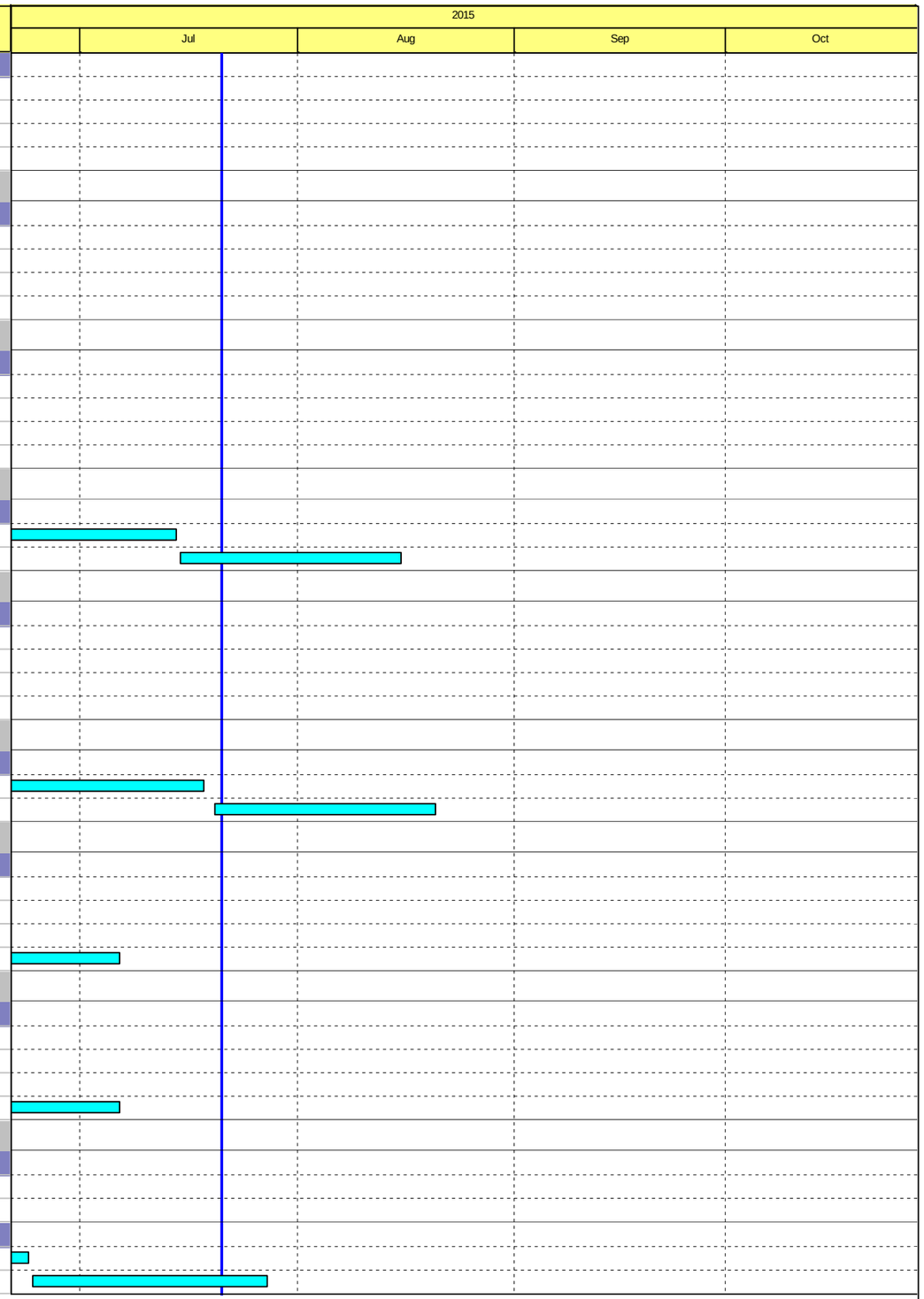
Activity ID	Activity Name	Working Duration	BL Project Start	BL Project Finish
DDA Submission		249.0	25-Nov-14	06-May-15
FL2022145	Preparation for formal submission to ER/ICE/IP	56.0	25-Nov-14	31-Jan-15
FL2022146	IPs'/ ER's Review	28.0	02-Feb-15	09-Mar-15
FL2022147	Preparation for resubmission to ER/ICE/IP 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		233.8	13-Jan-15	04-Jun-15
DDA Submission		233.8	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)		162.7	13-Jan-15	04-Jun-15
DDA Submission		162.7	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)		243.0	27-Jan-15	06-Jul-15
DDA Submission		243.0	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)		232.0	27-Jan-15	06-Jul-15
DDA Submission		232.0	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)		184.6	20-Dec-14	15-Sep-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		184.6	24-Mar-15	15-Sep-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



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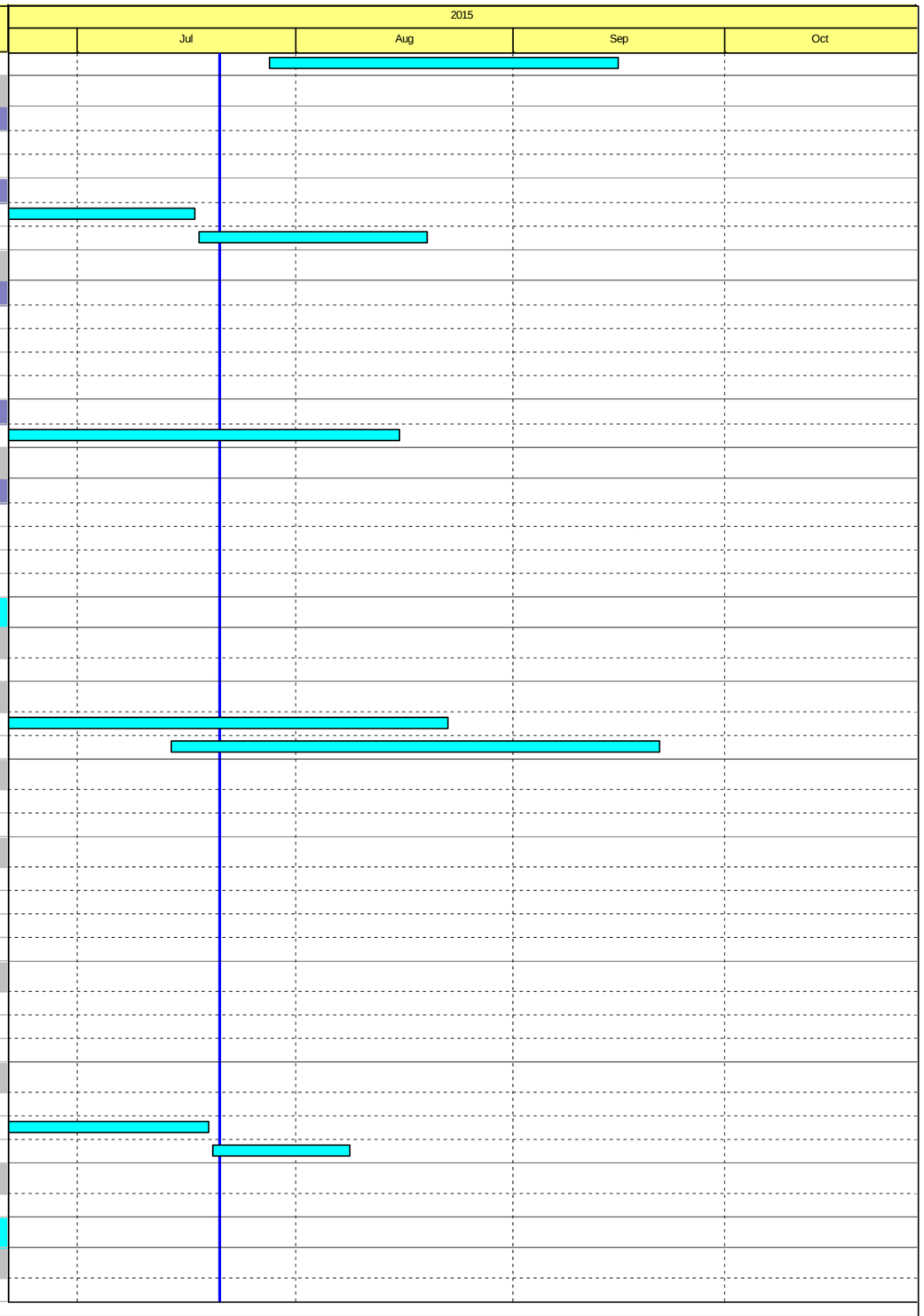
FL2022211	Preparation for resubmission to ER/ICE/IP with ICE Certification	43.0	28-Jul-15	15-Sep-15
Bored Tunnel Cross Passages Permanent Lining (Rock)		196.6	20-Dec-14	19-Aug-15
AIP Submission		34.0	20-Dec-14	03-Feb-15
FL2022215	Preparation for resubmission to ER/ICE/IP with ICE Certification	12.0	20-Dec-14	06-Jan-15
FL2022216	ER/IP's Approval	28.0	07-Jan-15	03-Feb-15
DDA Submission		196.6	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		361.1	27-Nov-14	15-Aug-15
AIP Submission		261.1	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		259.1	03-Dec-14	25-Apr-15
DDA Submission		259.1	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		280.0	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		44.0	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		280.0	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		92.8	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		140.0	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	03-Oct-15
CLP Substation		151.0	07-Oct-14	14-Feb-15
N21060	Sub-station Construction	110.0	07-Oct-14	14-Feb-15



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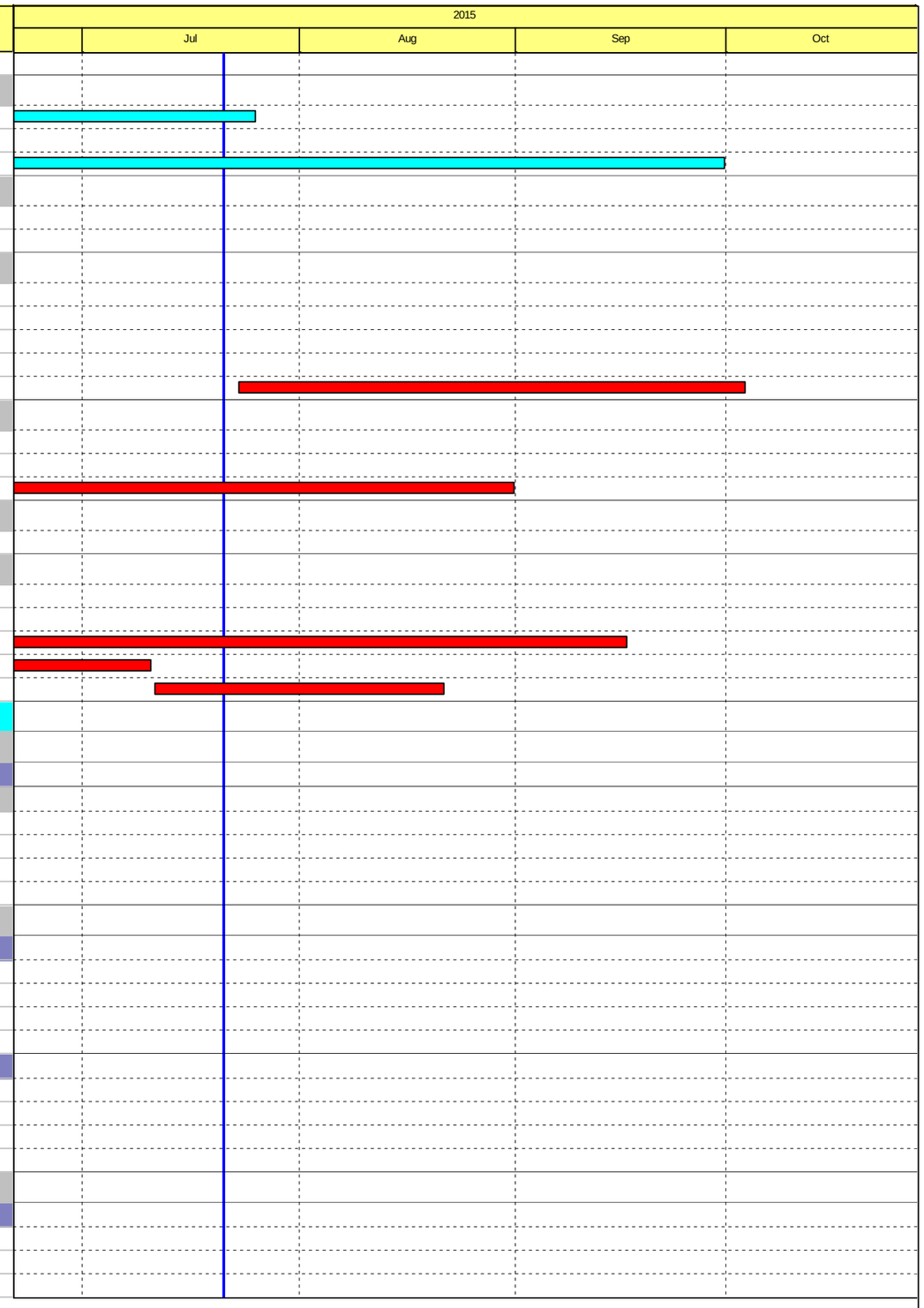
Activity ID	Activity Name	Working Duration	BL Project Start	BL Project Finish
N21090	Energization	1.0	14-Feb-15	14-Feb-15
North Portal: Site Formation		366.0	23-Oct-14	30-Sep-15
N20505	Permanent Slope Formation (Remaining)	200.0	08-Nov-14	25-Jul-15
N20635	NB: Stage 2 Excavation from +38mPD to +18mPD 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		122.0	08-Nov-14	06-May-15
SC01310	Site Installation and Logistics for TBM Works	60.0	08-Nov-14	20-Jan-15
TD1000	Conveyor System Construction	75.0	26-Jan-15	06-May-15
Southbound Tunnel (Mined Excavation) inc Enlargement		339.7	06-Dec-14	03-Oct-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
TD0910	SB - Invert Grouting	60.0	23-Jul-15	03-Oct-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)		125.3	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:		272.0	20-Dec-14	15-Aug-15
5.62 Administration Building: Design Submission		202.3	20-Dec-14	12-May-15
Admin. Building - Foundation Design		202.3	20-Dec-14	12-May-15
DDA Submission		202.3	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		248.0	09-Jan-15	28-May-15
Method Statement for Admin.Building Construction		104.0	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		120.0	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 Demolition & 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



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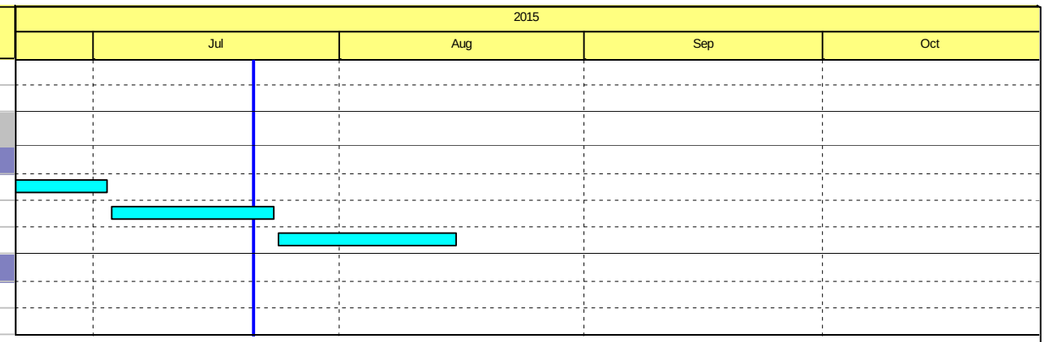
Activity ID	Activity Name	Working Duration	BL Project Start	BL Project Finish
N21305	TTMS Reviewed & Comment	12.0	13-Feb-15	02-Mar-15
N21315	Notification to RMO	6.0	03-Mar-15	09-Mar-15
5.65 Administration Building: Works		134.0	10-Mar-15	15-Aug-15
Administration Building:Demolition		38.0	01-Jun-15	15-Aug-15
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
SV2945	Demolish Existing Building (AB3 - GLL 36508)	18.0	24-Jul-15	15-Aug-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



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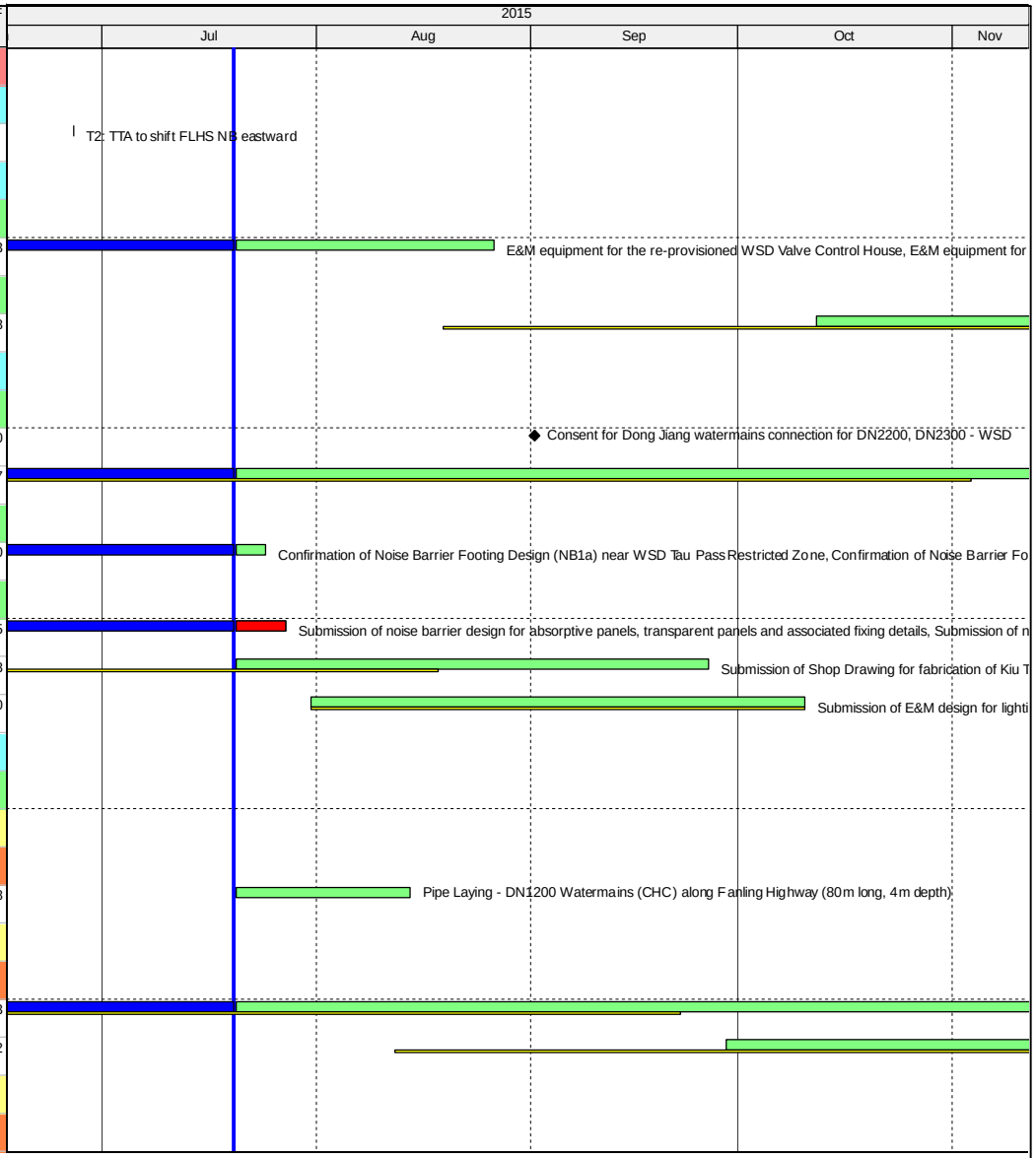
Contract 3

Activity ID	Activity Name	OD	RD	Start	Finish	TF
3-Month Rolling Programme 2015-07-21						
Major Milestones and Events						
MS-2000B	T2: TTA to shift FLHS NB eastward	1	0	27-Jun-15 A	27-Jun-15 A	
Major Procurement & Delivery						
Water Supply Pipeworks						
MM-1060	E&M equipment for the re-provisioned WSD Valve Control House	60	33	27-Apr-15 A	26-Aug-15	13
Footbridge Steel Truss						
MM-3050	Fabrication of footbridge steel truss (Kiu Tau Footbridge)	125	125	12-Oct-15	16-Mar-16	58
Design and Submissions						
Statutory Approval						
PRE-1200	Consent for Dong Jiang watermains connection for DN2200, DN2300 - WSD	0	0		01-Sep-15*	0
PRE-1050	Submission & approval of CDIA report for construction of temporary platform for segment erection works	185	114	27-Nov-14 A	02-Dec-15	7
Design Confirmation						
PRE-1220	Confirmation of Noise Barrier Footing Design (NB1a) near WSD Tau Pass Restricted Zone	45	5	09-Apr-14 A	24-Jul-15	90
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	7	11-Mar-14 A	27-Jul-15	-15
PRE-2050	Submission of Shop Drawing for fabrication of Kiu Tau Footbridge Steelworks	60	60	20-Jul-15	26-Sep-15	68
PRE-2030	Submission of E&M design for lighting of Kiu Tau Footbridge	60	60	31-Jul-15	10-Oct-15	250
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	23	20-Feb-14 A	14-Aug-15	218
Fanling Highway Zone 2 between CH7130 and CH7290						
At-Grade Roadworks (160m)						
FHW-2110B	Noise Barrier NB71 - Footing adjacent to SB lane (96m) (under VO.79)	341	118	26-Jul-14 A	07-Dec-15	13
FHW-2200	Noise Barrier NB67 - Mini-Piling adjacent to NB lane (CSD: 36 nos) together with Pile Test	118	118	29-Sep-15	25-Feb-16	2
Fanling Highway Zone 3 between CH7290 and CH7380						
At-Grade Roadworks (130m)						



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FHW-3130	Noise Barrier NB71 - Footing adjacent to SB lane (130m) Including pile cap	324	34	23-May-14 A	27-Aug-15	132
FHW-3210	Noise Barrier NB69 - Mini-Piling adjacent to NB lane (CSD: 32nos)	74	74	20-Jul-15	15-Oct-15	2
FHW-3160	Road Formation, Kerb and Pavement (Eastern Side: FLH SB Slow lane and hard should)	90	90	24-Jul-15	09-Nov-15	132
FHW-3150*	Pipe Laying - DN600, DN1200 Watermains (CHB &CHC) along Fanling Highway (90m long, 3m depth)	150	94	07-Jun-14 A	09-Nov-15	147
FHW-3220	Noise Barrier NB69 - Footing adjacent to NB lane (108m)	90	90	16-Oct-15	02-Feb-16	7
Miscellaneous Works for Facilitating Traffic Diversion of Fanling Highway						
FHW-M-1040	Demolition of a certain section of Central Barrier & Make Good of Road Pavement for further Traffic Diversion	54	0	23-Mar-15 A	20-Jun-15 A	
Fanling Highway North Portion between CH7470 and CH7925						
Fanling Highway Zone 4 between CH7380 and CH7470						
At-Grade Roadworks (90m)						
FHW-4130*	Pipe Laying - DN600 & DN1200 Watermains (CHB &CHC) along Fanling Highway (90m long, 3m depth)	60	12	27-Nov-14 A	01-Aug-15	229
Fanling Highway Zone 5 between CH7470 and CH7600 (Provision of Kiu Tau Footbridge)						
Kiu Tau Footbridge Reprovision (East)						
FHW-5000C2	KT-P2 - Piling Works (3 out of 6 nos of Pile) - Phase 2, conflict with existing TWSRE	15	15	25-Sep-15	14-Oct-15	4
FHW-5000E	KT-P4 - Piling Works (8 out of 8 nos of Pile) - Phase 2, conflict with temp cycle track/ existing tree	40	40	15-Oct-15	01-Dec-15	30
FHW-5010D	KT-P3 - Pile Cap & Pier	70	70	15-Oct-15	08-Jan-16	4
FHW-5010C	KT-P2 - Pile Cap & Pier	70	70	15-Oct-15	08-Jan-16	4
At-Grade Road Works (130m)						
FHW-5120C	Preparation Works for Implementation of TTA Scheme E3A	45	45	04-Aug-15	24-Sep-15	4
FHW-5120D	Implementation of TTA - Scheme E3A (shifting TWSR East westward, at the existing ramp of Kiu Tau Footbridge)	0	0	25-Sep-15		4
Fanling Highway Zone 7 between CH7660 and CH7925						
At-Grade Roadworks (265m)						
FHW-7100	Site Formation, Preparation Works & Tree Transplant	127	62	30-Aug-13 A	30-Sep-15	30
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		14-Aug-15	589
WSD Works						
DN450 Fire Mains (CHA)						

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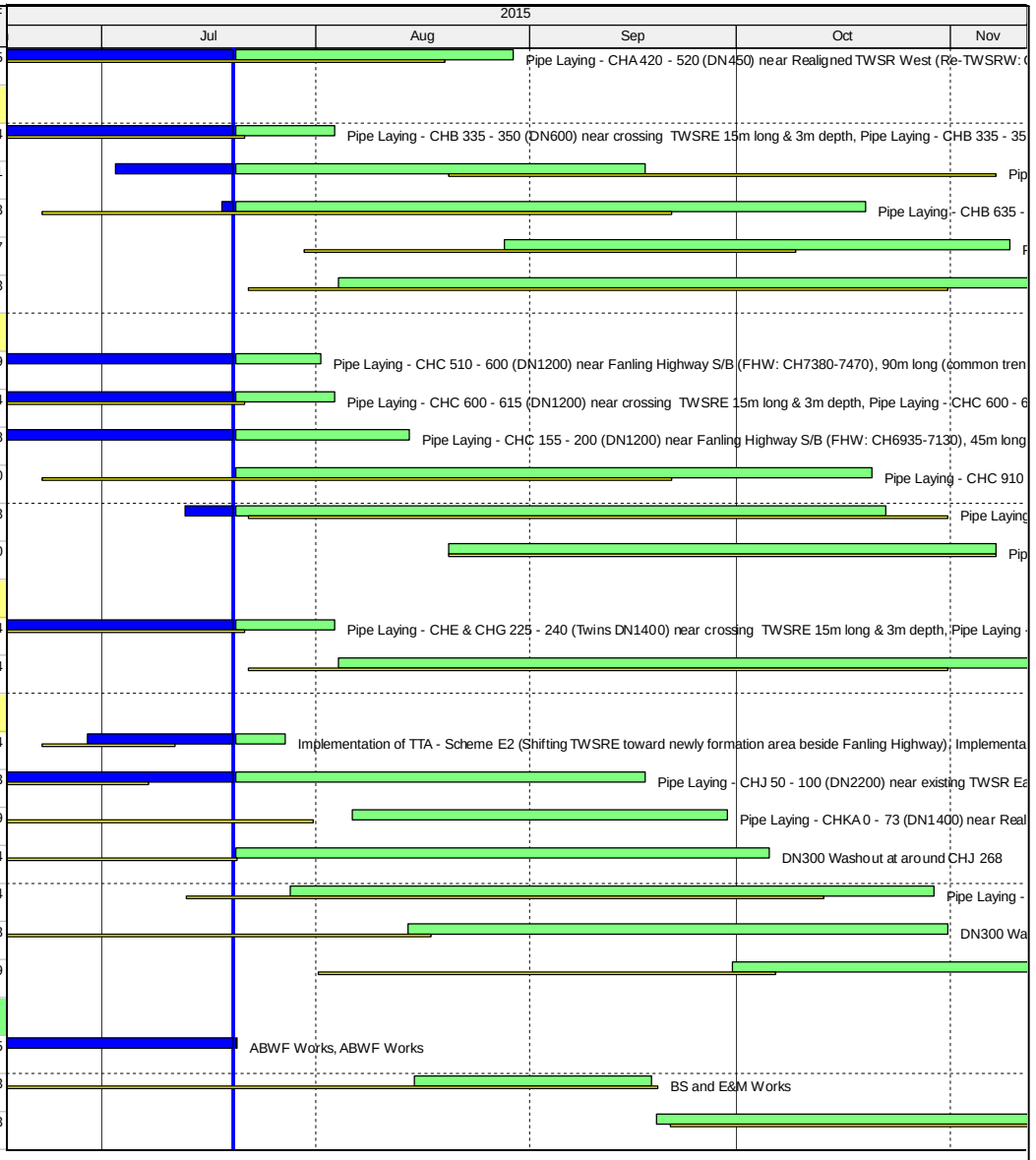
WA-1050	Pipe Laying - CHA 420 - 520 (DN450) near Realigned TWSR West (Re-TWSRW: CH530 - 640), 100m long & 2m depth	70	36	29-May-15 A	29-Aug-15	5
DN600 Water Mains (CHB)						
WB-1030A	Pipe Laying - CHB 335 - 350 (DN600) near crossing TWSRE 15m long & 3m depth	30	13	09-Jun-15 A	03-Aug-15	4
WB-1080	Pipe Laying - CHB 700 - 756 (DN600) near Realigned TWSR East (along Roundabout), 56m long & GL	66	52	03-Jul-15 A	17-Sep-15	41
WB-1070	Pipe Laying - CHB 635 - 700 (DN600) near Realigned TWSR East (TWSRE: CH380-456), 65m long & GL	78	77	18-Jul-15 A	19-Oct-15	13
WB-1010	Pipe Laying - CHB 153 - 245 (DN600) near Fanling Highway S/B (FHW: CH7290-7380), 92m long (common trench with NB)	60	60	28-Aug-15	09-Nov-15	147
WB-1030C	Pipe Laying - CHB 350 - 450 (DN600) from Portal AB7/AD9/AC12 to Portal AB8	85	85	04-Aug-15	13-Nov-15	613
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	12	27-Nov-14 A	01-Aug-15	229
WC-1090A	Pipe Laying - CHC 600 - 615 (DN1200) near crossing TWSRE 15m long & 3m depth	30	13	09-Jun-15 A	03-Aug-15	4
WC-1050A	Pipe Laying - CHC 155 - 200 (DN1200) near Fanling Highway S/B (FHW: CH6935-7130), 45m long, 4m depth	120	23	15-Oct-14 A	14-Aug-15	218
WC-1130	Pipe Laying - CHC 910 - 980 (DN1200) near Realigned TWSR East (TWSRE: CH380-456), 70m long & GL	78	78	20-Jul-15*	20-Oct-15	0
WC-1090C	Pipe Laying - CHC 615 - 720 (DN1200) from Portal AB7/AD9/AC12 to Portal AB8	85	79	13-Jul-15 A	22-Oct-15	273
WC-1140	Pipe Laying - CHC 980 - 1030 (DN1200) near Realigned TWSR East (along Roundabout), 50m long & GL	66	66	20-Aug-15	07-Nov-15	0
Twin DN1400 Water Mains (CHE & CHG)						
WE-1030	Pipe Laying - CHE & CHG 225 - 240 (Twins DN1400) near crossing TWSRE 15m long & 3m depth	30	13	09-Jun-15 A	03-Aug-15	4
WE-1050	Pipe Laying - CHE & CHG (Twins DN1400) from Portal AB7/AD9/AC12 to Portal AB8	85	85	04-Aug-15	13-Nov-15	84
DN2300 Water Mains and Leakage Collection System (CHJ & CHKA/CHK)						
WJ-1000	Implementation of TTA - Scheme E2 (Shifting TWSRE toward newly formation area beside Fanling Highway)	17	7	29-Jun-15 A	27-Jul-15	14
WJ-1010C	Pipe Laying - CHJ 50 - 100 (DN2200) near existing TWSR East, 50m long & 6m depth	75	52	08-Jun-15 A	17-Sep-15	3
WJ-1020B	Pipe Laying - CHKA 0 - 73 (DN1400) near Realigned TWSR East, 73m long & 4m depth	55	55	06-Aug-15	29-Sep-15	59
WJ-1100	DN300 Washout at around CHJ 268	65	65	20-Jul-15	05-Oct-15	34
WJ-1010B	Pipe Laying - CHJ 10 - 50 (DN2200) crossing existing TWSR East, 40m long & 6m depth	78	78	28-Jul-15	29-Oct-15	14
WJ-1110	DN300 Washout at CHJ 155	65	65	14-Aug-15	31-Oct-15	3
WJ-1020A	Pipe Laying - CHK 0 - 80 (DN1400) near RealignedTWSR East, 80m long & 4m depth	55	55	30-Sep-15	04-Dec-15	49
Kau Lung Hang Valve Control & Telemetry House Reprovision						
VCTH-1040	ABWF Works	70	1	06-Jan-15 A	20-Jul-15	35
VCTH-1010	BS and E&M Works	30	30	15-Aug-15	18-Sep-15	13
VCTH-1020	Testing and Commissioning	60	60	19-Sep-15	01-Dec-15	13



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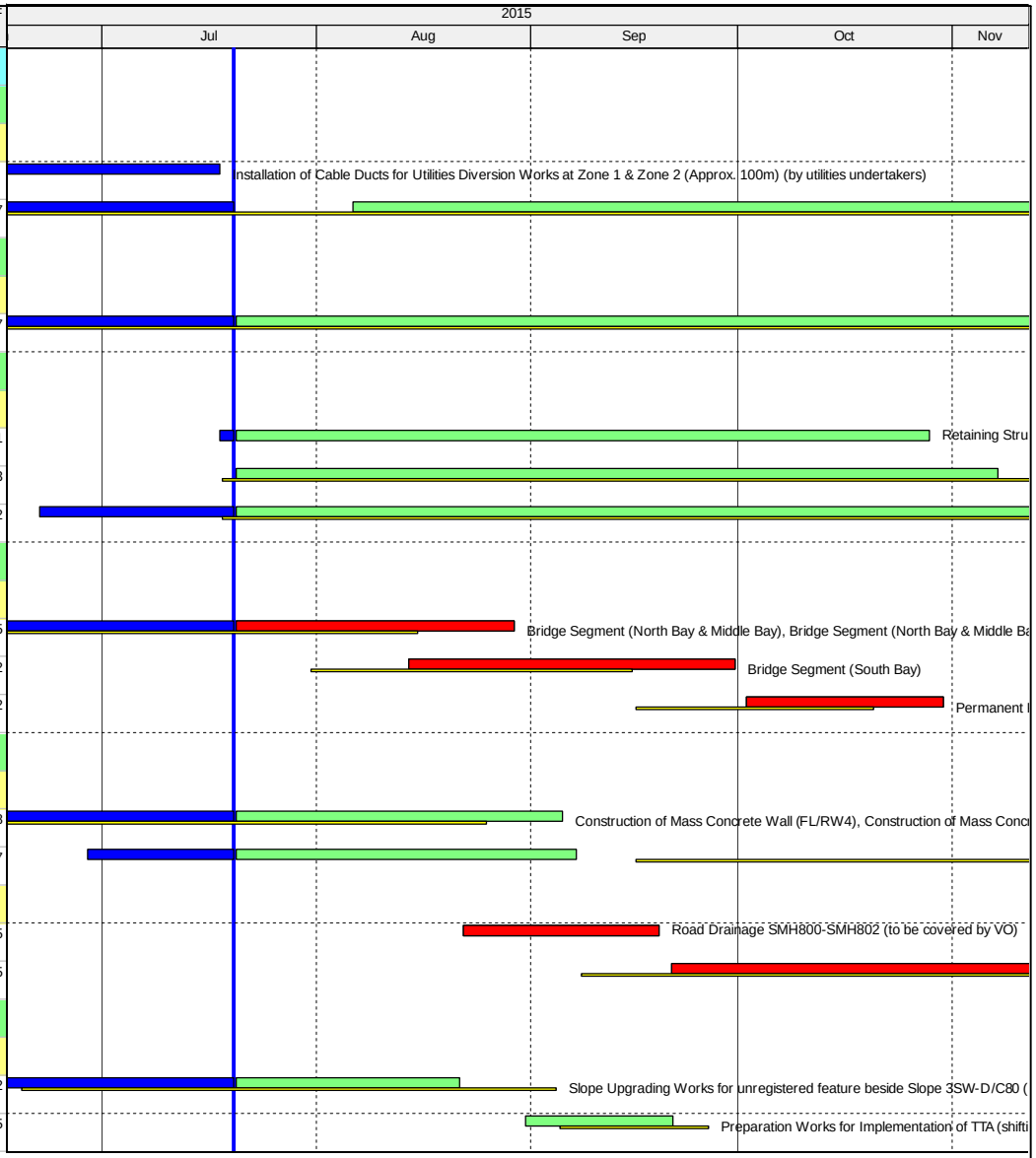
	Stage 1A - Realignment of Tai Wo Service Road West (KD-7)					
	TWSRW Zone 1 betweeen CH100 and CH155					
	At-Grade Roadworks					
TWSRW-1150	Installation of Cable Ducts for Utilities Diversion Works at Zone 1 & Zone 2 (Approx. 100m) (by utilities undertakers)	167	0	22-Oct-14 A	18-Jul-15 A	
TWSRW-1160	Road Formation, Road Drainage, Kerb, Planter & Pavement	286	108	15-Nov-14 A	12-Dec-15	27
	TWSRW Zone 2 betweeen CH155 and CH280					
	At-Grade Roadworks					
TWSRW-2120	Road Formation, Road Drainage, Kerb, Planter and Pavement	165	123	16-Oct-14 A	12-Dec-15	27
	TWSRW Zone 3 betweeen CH280 and CH315					
	At-Grade Roadworks					
TWSRW-3130	Retaining Structure RW3 (to be covered by VO)	85	84	18-Jul-15 A	28-Oct-15	11
TWSRW-3110	Installation of Cable Ducts for Utilities Diversion Works at Zone 2 (Approx. 120m) (by utilities undertakers)	111	111	20-Jul-15*	07-Nov-15	33
TWSRW-3120	Road Formation, Road Drainage, Kerb, Planter and Pavement	181	148	22-Jun-15 A	14-Jan-16	2
	TWSRW Zone 4 betweeen CH315 and CH376					
	Construction of Bridge E					
TWSRW-4070	Bridge Segment (North Bay & Middle Bay)	80	36	01-Apr-15 A	29-Aug-15	-25
TWSRW-4080	Bridge Segment (South Bay)	40	40	14-Aug-15	30-Sep-15	-22
TWSRW-4090	Permanent Prestressing & Abutment Wall	24	24	02-Oct-15	30-Oct-15	-22
	TWSRW Zone 5 betweeen CH376 and CH520					
	Construction of Retaining Structures					
TWSRW-5070	Construction of Mass Concrete Wall (FL/RW4)	70	42	15-Jun-15 A	05-Sep-15	58
TWSRW-5080	Retaining Structure along Slope no. 3SW-C/C898 (to be covered by VO. 78)	50	43	29-Jun-15 A	07-Sep-15	57
	At-Grade Roadworks					
TWSRW-5110B	Road Drainage SMH800-SMH802 (to be covered by VO)	25	25	22-Aug-15	19-Sep-15	-25
TWSRW-5100	Noise Barrier NB2 - Footing and Retaining Structure adjacent to Realigned TWSR West (66m)	98	98	21-Sep-15	19-Jan-16	-25
	TWSRW Zone 6 betweeen CH520 and CH530					
	At-Grade Roadworks					
TWSRW-6110	Slope Upgrading Works for unregistered feature beside Slope 3SW-D/C80 (to be Covered by VO. 68)	65	29	22-May-15 A	21-Aug-15	12
TWSRW-6100	Preparation Works for Implementation of TTA (shifting TWSRW traffic towards the edge of extended box culvert	19	19	31-Aug-15	21-Sep-15	5



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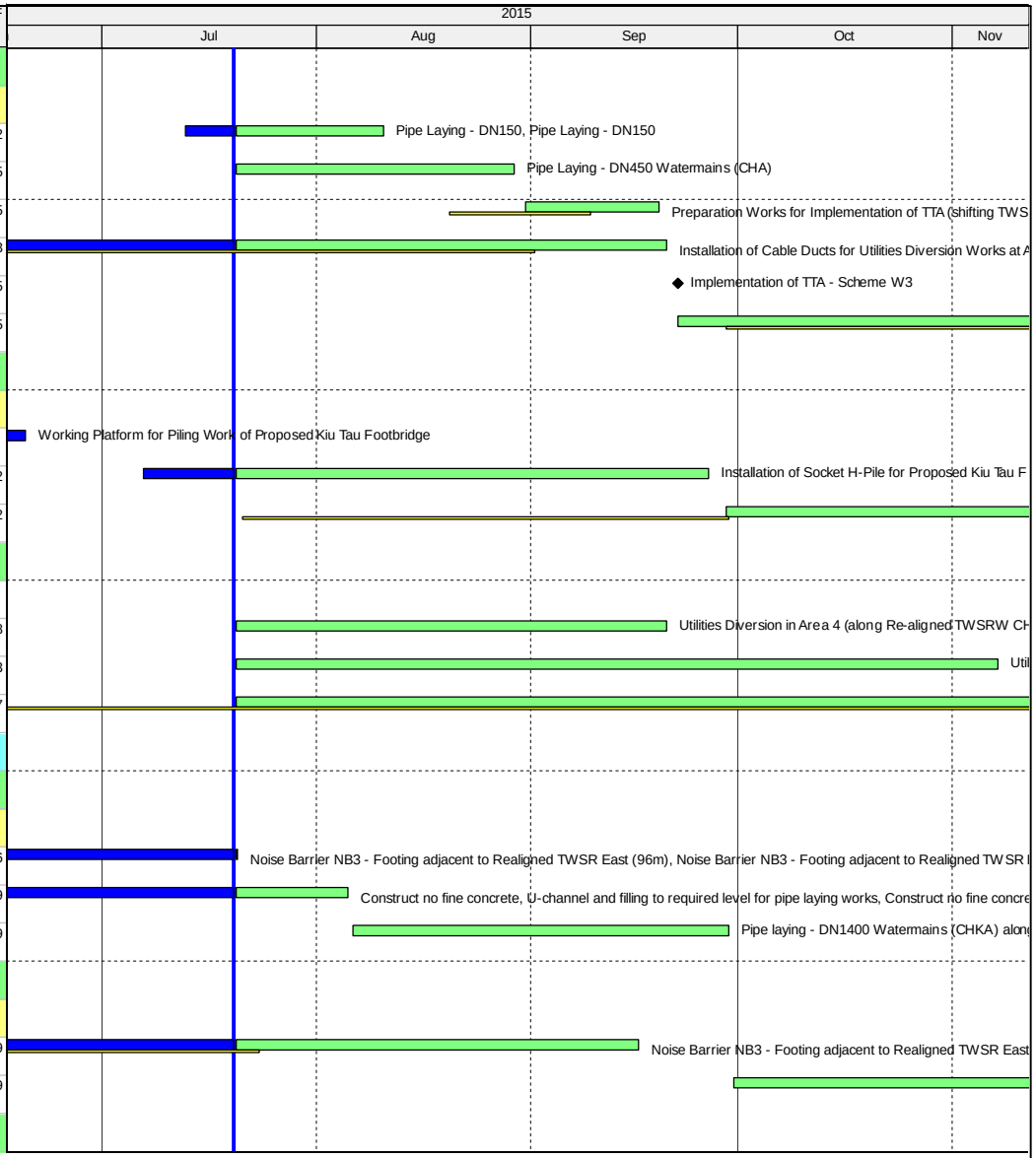
	TWSRW Zone 7 betweeen CH530 and CH640					
	At-Grade Roadworks					
TWSRW-7160	Pipe Laying - DN150	25	19	13-Jul-15 A	10-Aug-15	22
TWSRW-7120*	Pipe Laying - DN450 Watermains (CHA)	70	36	29-May-15 A	29-Aug-15	5
TWSRW-7100	Preparation Works for Implementation of TTA (shifting TWSRW traffic towards the cut-slope)	18	18	31-Aug-15	19-Sep-15	5
TWSRW-7140	Installation of Cable Ducts for Utilities Diversion Works at Area 4 (Approx. 150m) (by utilities undertakers)	233	63	28-Jan-15 A	20-Sep-15	8
TWSRW-7110	Implementation of TTA - Scheme W3	0	0	22-Sep-15		5
TWSRW-7150	Remaining Road Drainage, Road Formation, Kerb, Planter and Pavement (incl. Zone 6 & Zone 7)	90	90	22-Sep-15	11-Jan-16	5
	TWSRW Zone 8 betweeen CH640 and CH695					
	Kiu Tau Footbridge Reprovision (West)					
TWSRW-8010A	Working Platform for Piling Work of Proposed Kiu Tau Footbridge	24	0	11-May-15 A	20-Jun-15 A	
TWSRW-8010B	Installation of Socket H-Pile for Proposed Kiu Tau Footbridge (13 nos of Pile)	75	60	07-Jul-15 A	26-Sep-15	2
TWSRW-8020	Construction of Pile Cap and Abutment	45	45	29-Sep-15	21-Nov-15	2
	Remainder of the Works					
TWSRW-9010*	Utilities Diversion in Area 1 (along Re-aligned TWSRW CH100 - CH280)	167	0	22-Oct-14 A	18-Jul-15 A	
TWSRW-9040*	Utilities Diversion in Area 4 (along Re-aligned TWSRW CH530 - CH640)	233	63	28-Jan-15 A	20-Sep-15	8
TWSRW-9020*	Utilities Diversion in Area 2 (along Re-aligned TWSRW CH 280 - CH315)	111	111	20-Jul-15	07-Nov-15	33
TWSRW-9030	Utilities Diversion in Area 3 (along existing TWSRW, Approx. 150m) (by utilities undertakers)	170	170	20-Jul-15	05-Jan-16	7
	Stage N4A & N4B - Realignment of Tai Wo Service Road East (KD-13 & KD-14)					
	TWSRE Zone 1 between CH100 and CH270					
	At-Grade Roadworks					
TWSRE-1120	Noise Barrier NB3 - Footing adjacent to Realigned TWSR East (96m)	110	1	29-Dec-14 A	20-Jul-15	396
TWSRE-1150	Construct no fine concrete, U-channel and filling to required level for pipe laying works	30	15	06-Jan-15 A	05-Aug-15	49
TWSRE-1140*	Pipe laying - DN1400 Watermains (CHKA) along Realigned TWSR East	55	55	06-Aug-15	29-Sep-15	59
	TWSRE Zone 2 between CH270 and CH380					
	At-Grade Roadworks					
TWSRE-2010	Noise Barrier NB3 - Footing adjacent to Realigned TWSR East (48m)	110	51	03-Mar-15 A	16-Sep-15	89
TWSRE-2030B*	Pipe laying - DN1400 Watermains (CHK) along Realigned TWSR East	55	55	30-Sep-15	04-Dec-15	49
	TWSRE Zone 3 between CH380 and CH456					



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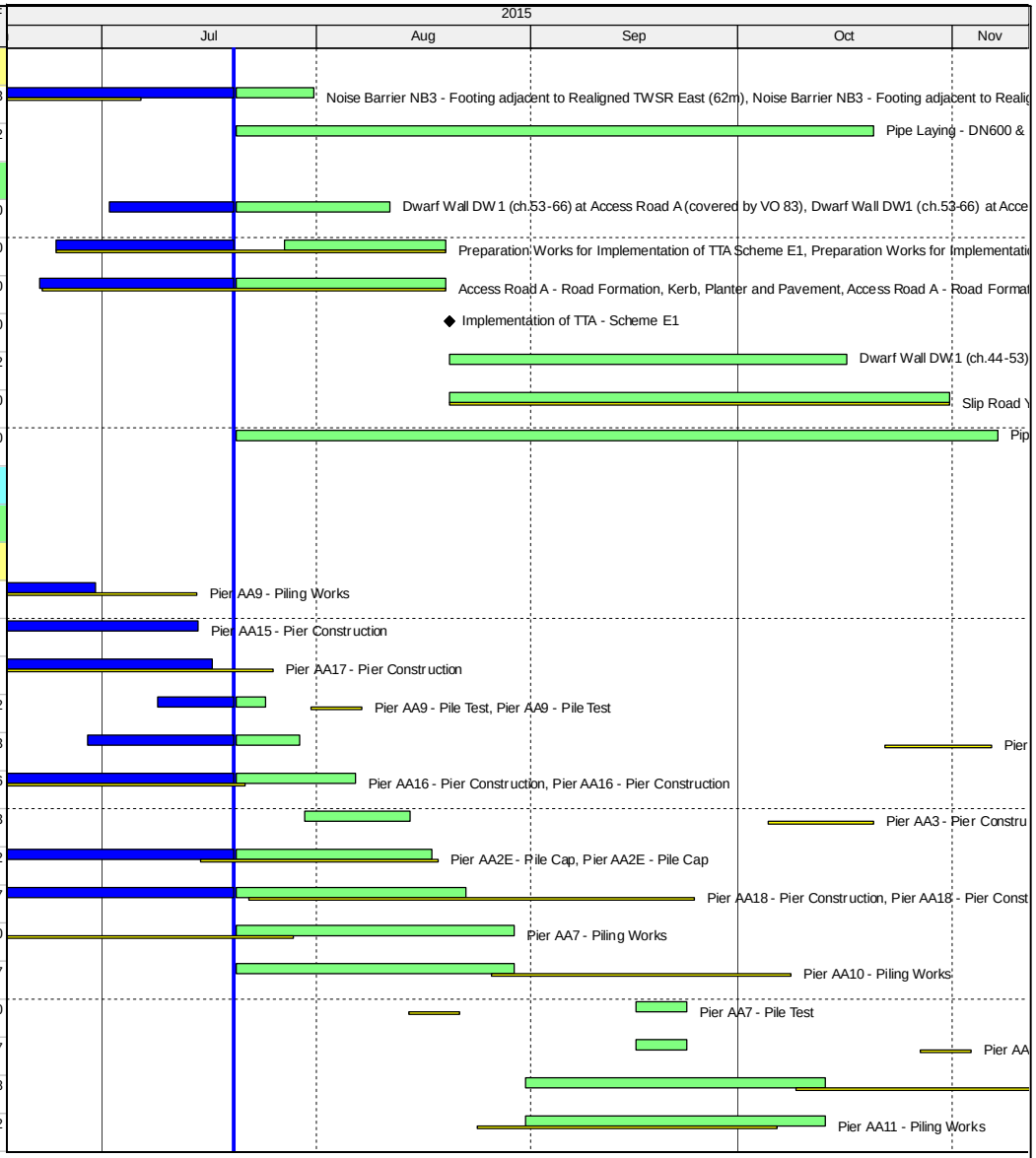
	At-Grade Roadworks					
TWSRE-3010	Noise Barrier NB3 - Footing adjacent to Realigned TWSR East (62m)	85	11	19-Mar-15 A	31-Jul-15	3
TWSRE-3020A*	Pipe Laying - DN600 & DN1200 Watermains (CHB & CHC) along Realigned TWSR East	78	78	18-Jul-15 A	20-Oct-15	12
	Roundabout A, Slip Road and Access Road					
TWSRE-4100A	Dwarf Wall DW1 (ch.53-66) at Access Road A (covered by VO 83)	40	20	02-Jul-15 A	11-Aug-15	0
TWSRE-4080	Preparation Works for Implementation of TTA Scheme E1	42	21	24-Jun-15 A	19-Aug-15	0
TWSRE-4060B	Access Road A - Road Formation, Kerb, Planter and Pavement	44	27	22-Jun-15 A	19-Aug-15	0
TWSRE-4090	Implementation of TTA - Scheme E1	0	0	20-Aug-15		0
TWSRE-4100B	Dwarf Wall DW1 (ch.44-53) at Access Road A (covered by VO 83)	48	48	20-Aug-15	16-Oct-15	12
TWSRE-4030B	Slip Road Y (CH100-CH230) - Road Formation, Remaining Road Drainage, Kerb, Planter and Pavement	60	60	20-Aug-15	31-Oct-15	0
TWSRE-4040B*	Pipe laying - DN600 & DN1200 Watermains (CHB & CHC) along Roundabout A	66	93	03-Jul-15 A	07-Nov-15	0
	Stage 1C - Viaduct Structure & TCSS Civil Provisions (KD-9)					
	Foundation & Pier Construction					
	Bridge A					
BA-09-1000	Pier AA9 - Piling Works	36	0	30-May-15 A	30-Jun-15 A	
BA-15-1030	Pier AA15 - Pier Construction	31	0	14-Feb-15 A	15-Jul-15 A	
BA-17-1030	Pier AA17 - Pier Construction	24	0	05-Feb-15 A	17-Jul-15 A	
BA-09-1010	Pier AA9 - Pile Test	7	5	09-Jul-15 A	24-Jul-15	122
BA-04-1030	Pier AA4 - Pier Construction	14	9	29-Jun-15 A	29-Jul-15	113
BA-16-1030	Pier AA16 - Pier Construction	35	16	29-Apr-15 A	06-Aug-15	6
BA-03-1030	Pier AA3 - Pier Construction	14	14	30-Jul-15	14-Aug-15	113
BA-02-1020A	Pier AA2E - Pile Cap	30	25	04-May-15 A	17-Aug-15	42
BA-18-1030	Pier AA18 - Pier Construction	56	30	08-May-15 A	22-Aug-15	107
BA-07-1000	Pier AA7 - Piling Works	36	36	20-Jul-15	29-Aug-15	10
BA-10-1000	Pier AA10 - Piling Works	36	36	20-Jul-15	29-Aug-15	137
BA-07-1010	Pier AA7 - Pile Test	7	7	16-Sep-15	23-Sep-15	10
BA-10-1010	Pier AA10 - Pile Test	7	7	16-Sep-15	23-Sep-15	137
BA-08-1000	Pier AA8 - Piling Works	36	36	31-Aug-15	13-Oct-15	138
BA-11-1000	Pier AA11 - Piling Works	36	36	31-Aug-15	13-Oct-15	52



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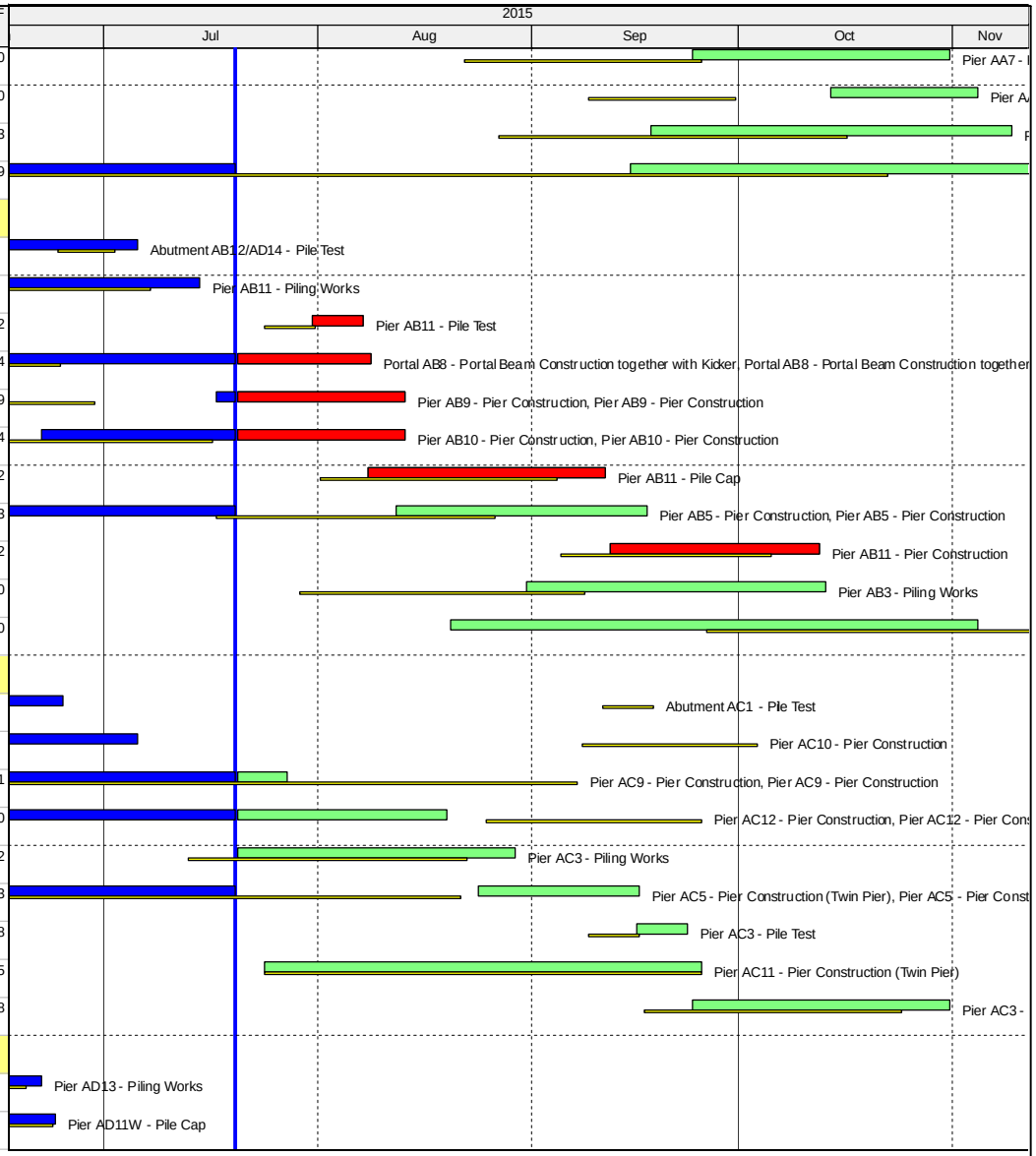
BA-07-1020	Pier AA7 - Pile Cap	30	30	24-Sep-15	31-Oct-15	10
BA-02-1000	Pier AA2W - Piling Works	18	18	14-Oct-15	04-Nov-15	60
BA-12-1030	Pier AA12 - Pier Construction	42	42	18-Sep-15	09-Nov-15	53
BA-05-1030	Pier AA5 - Pier Construction (Twin Pier)	27	52	29-Oct-14 A	17-Nov-15	59
Bridge B						
BB-12-1010	Abutment AB12/AD14 - Pile Test	7	0	12-May-15 A	06-Jul-15 A	
BB-11-1000	Pier AB11 - Piling Works	24	0	15-Jun-15 A	15-Jul-15 A	
BB-11-1010	Pier AB11 - Pile Test	7	7	31-Jul-15	07-Aug-15	-32
BB-08-1050	Portal AB8 - Portal Beam Construction together with Kicker	26	18	13-Jun-15 A	08-Aug-15	-64
BB-09-1030	Pier AB9 - Pier Construction	24	22	17-Jul-15 A	13-Aug-15	-69
BB-10-1030	Pier AB10 - Pier Construction	25	22	22-Jun-15 A	13-Aug-15	-54
BB-11-1020	Pier AB11 - Pile Cap	30	30	08-Aug-15	11-Sep-15	-32
BB-05-1030	Pier AB5 - Pier Construction	35	32	29-Apr-15 A	17-Sep-15	53
BB-11-1030	Pier AB11 - Pier Construction	24	24	12-Sep-15	12-Oct-15*	-32
BB-03-1000	Pier AB3 - Piling Works	36	36	31-Aug-15	13-Oct-15	60
BB-06-1040	Pier AB6W - Pier Construction	63	63	20-Aug-15	04-Nov-15	40
Bridge C						
BC-01-1010	Abutment AC1 - Pile Test	7	0	08-Jun-15 A	25-Jun-15 A	
BC-10-1030	Pier AC10 - Pier Construction	21	0	01-Jun-15 A	06-Jul-15 A	
BC-09-1030	Pier AC9 - Pier Construction	28	7	02-Mar-15 A	27-Jul-15	51
BC-12-1030	Pier AC12 - Pier Construction	28	27	10-Jun-15 A	19-Aug-15	40
BC-03-1000	Pier AC3 - Piling Works	36	36	20-Jul-15	29-Aug-15	52
BC-05-1030	Pier AC5 - Pier Construction (Twin Pier)	38	21	22-Dec-14 A	16-Sep-15	33
BC-03-1010	Pier AC3 - Pile Test	7	7	16-Sep-15	23-Sep-15	58
BC-11-1030	Pier AC11 - Pier Construction (Twin Pier)	55	55	24-Jul-15*	25-Sep-15	55
BC-03-1020	Pier AC3 - Pile Cap	30	30	24-Sep-15	31-Oct-15	58
Bridge D						
BD-13-1000	Pier AD13 - Piling Works	12	0	26-May-15 A	22-Jun-15 A	
BD-11-1020B	Pier AD11W - Pile Cap	30	0	25-Apr-15 A	24-Jun-15 A	



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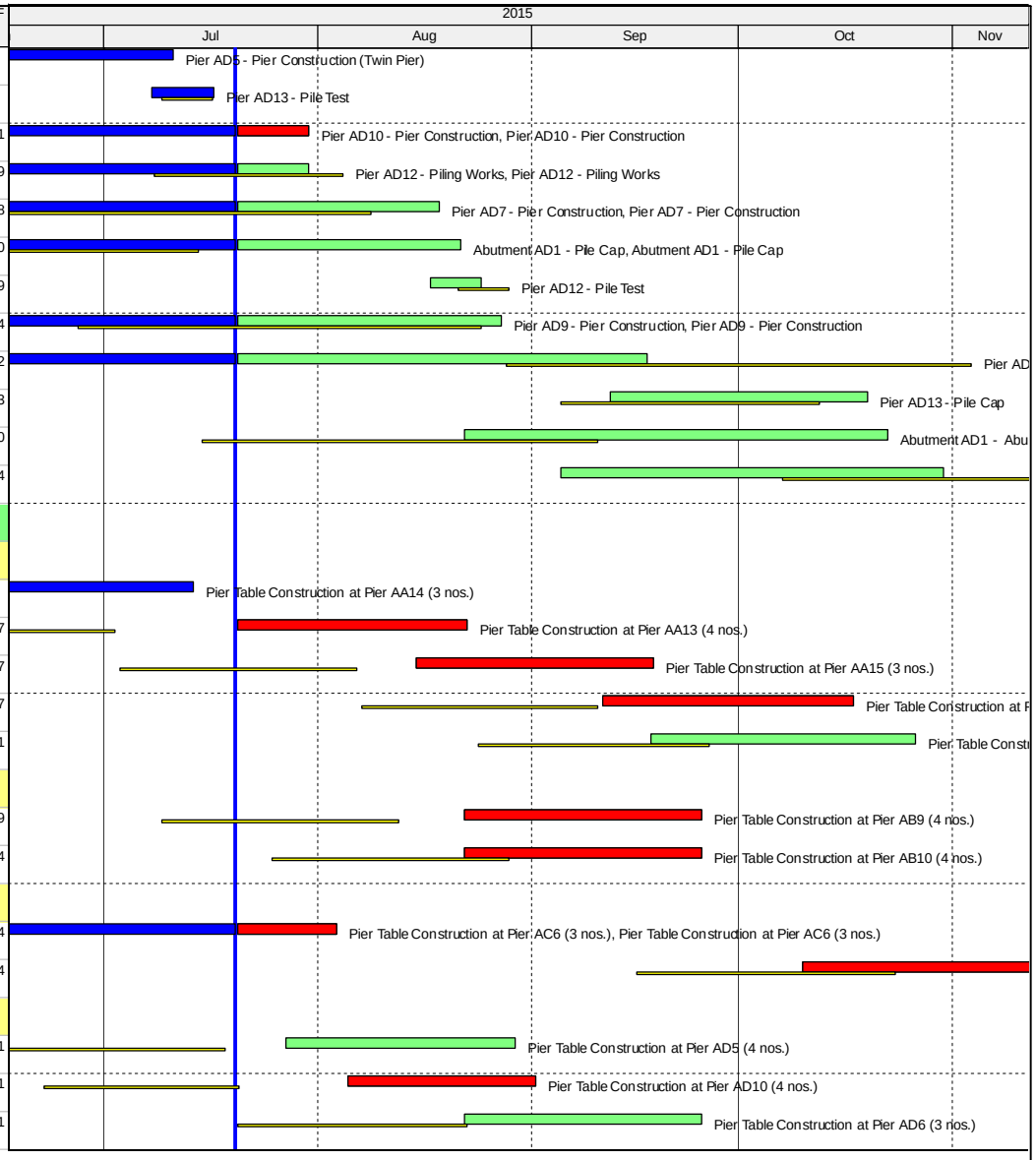
BD-05-1030	Pier AD5 - Pier Construction (Twin Pier)	37	0	29-Jan-15 A	11-Jul-15 A	
BD-13-1010	Pier AD13 - Pile Test	7	0	08-Jul-15 A	17-Jul-15 A	
BD-10-1030	Pier AD10 - Pier Construction	24	10	28-May-15 A	30-Jul-15	-71
BD-12-1000	Pier AD12 - Piling Works	24	10	11-Jun-15 A	30-Jul-15	69
BD-07-1030	Pier AD7 - Pier Construction	32	26	04-Feb-15 A	18-Aug-15	68
BD-01-1020	Abutment AD1 - Pile Cap	30	29	11-May-15 A	21-Aug-15	310
BD-12-1010	Pier AD12 - Pile Test	7	7	17-Aug-15	24-Aug-15	69
BD-09-1030	Pier AD9 - Pier Construction	49	34	05-May-15 A	27-Aug-15	54
BD-08-1030	Pier AD8 - Pier Construction (Twin Pier)	55	52	13-May-15 A	17-Sep-15	62
BD-13-1020	Pier AD13 - Pile Cap	30	30	12-Sep-15	19-Oct-15	23
BD-01-1030	Abutment AD1 - Abutment Construction	50	50	22-Aug-15	22-Oct-15	310
BD-09-1040	Portal AB7/AD9/AC12 - Portal Beam Construction together with Kicker	45	45	05-Sep-15	30-Oct-15	54
Pier Table Construction						
Bridge A						
PA-1140	Pier Table Construction at Pier AA14 (3 nos.)	30	0	19-May-15 A	14-Jul-15 A	
PA-1130	Pier Table Construction at Pier AA13 (4 nos.)	30	30	20-Jul-15	22-Aug-15	-17
PA-1150	Pier Table Construction at Pier AA15 (3 nos.)	30	30	15-Aug-15	18-Sep-15	-17
PA-1160	Pier Table Construction at Pier AA16 (3 nos.)	30	30	11-Sep-15	17-Oct-15	-17
PA-1170	Pier Table Construction at Pier AA17 (3 nos.)	30	30	18-Sep-15	26-Oct-15	1
Bridge B						
PB-1090	Pier Table Construction at Pier AB9 (4 nos.)	30	30	22-Aug-15	25-Sep-15	-69
PB-1100	Pier Table Construction at Pier AB10 (4 nos.)	30	30	22-Aug-15	25-Sep-15	-54
Bridge C						
PC-1060	Pier Table Construction at Pier AC6 (3 nos.)	30	13	26-May-15 A	03-Aug-15	-14
PC-1090	Pier Table Construction at Pier AC9 (3 nos.)	30	30	10-Oct-15	14-Nov-15	-4
Bridge D						
PD-1050	Pier Table Construction at Pier AD5 (4 nos.)	30	30	27-Jul-15	29-Aug-15	1
PD-1100	Pier Table Construction at Pier AD10 (4 nos.)	24	24	05-Aug-15	01-Sep-15	-71
PD-1060	Pier Table Construction at Pier AD6 (3 nos.)	30	30	22-Aug-15	25-Sep-15	1



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

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

CEDD Contract No. CV/2012/09

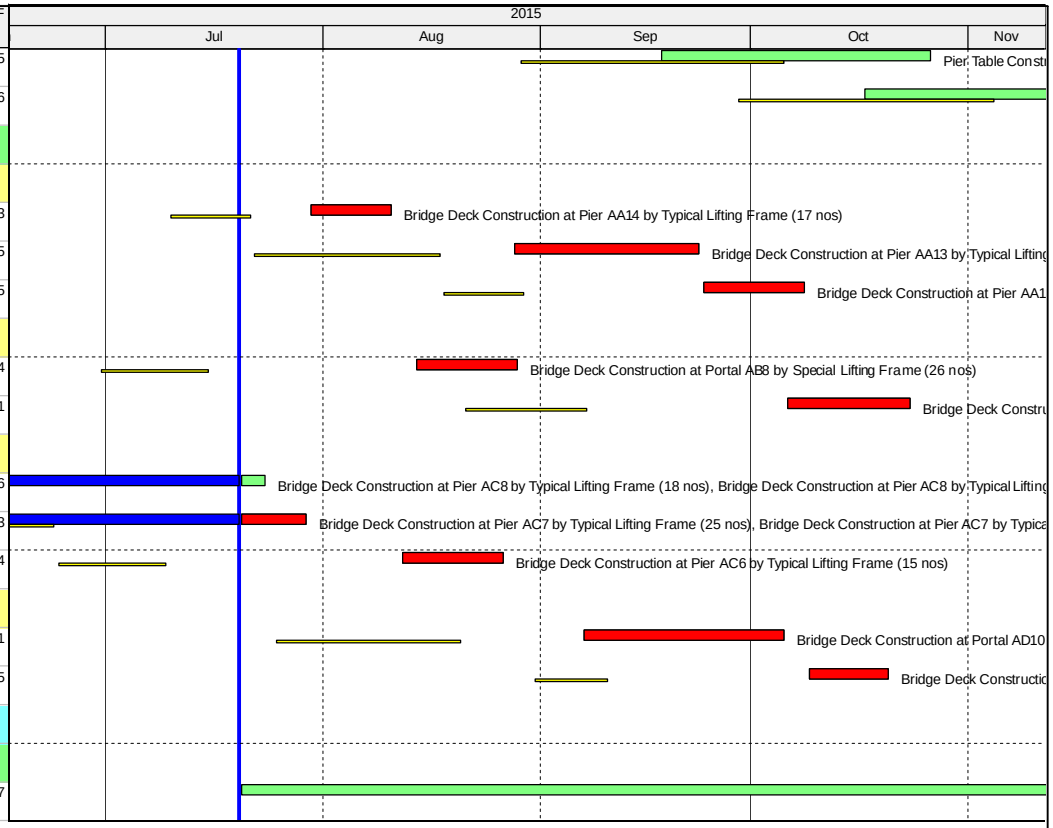
Liantang / Heung Yuen Wai BCP - Site Formation & Infrastructure Works, Contract 3

3-Month Rolling Programme

3-Month Rolling Programme updated to 2015-07-21

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

Activity ID	Activity Name	OD	RD	Start	Finish	TF
PD-1040	Pier Table Construction at Pier AD4 (3 nos.)	30	30	18-Sep-15	26-Oct-15	25
PD-1070	Pier Table Construction at Pier AD7 (3 nos.)	30	30	17-Oct-15	21-Nov-15	26
Viaduct Bridge Segement Erection						
Bridge A						
EA-1140	Bridge Deck Construction at Pier AA14 by Typical Lifting Frame (17 nos)	10	10	30-Jul-15	10-Aug-15	-13
EA-1130	Bridge Deck Construction at Pier AA13 by Typical Lifting Frame (23 nos)	23	23	28-Aug-15	23-Sep-15	-15
EA-1150	Bridge Deck Construction at Pier AA15 by Typical Lifting Frame (17 nos)	11	11	24-Sep-15	08-Oct-15	-15
Bridge B						
EB-1080	Bridge Deck Construction at Portal AB8 by Special Lifting Frame (26 nos)	13	13	14-Aug-15	28-Aug-15	-64
EB-1090	Bridge Deck Construction at Pier AB9 by Special Lifting Frame (38 nos)	15	15	06-Oct-15	23-Oct-15	-71
Bridge C						
EC-1080	Bridge Deck Construction at Pier AC8 by Typical Lifting Frame (18 nos)	25	4	08-May-15 A	23-Jul-15	1206
EC-1070	Bridge Deck Construction at Pier AC7 by Typical Lifting Frame (25 nos)	12	9	06-Jun-15 A	29-Jul-15	-13
EC-1060	Bridge Deck Construction at Pier AC6 by Typical Lifting Frame (15 nos)	13	13	12-Aug-15	26-Aug-15	-14
Bridge D						
ED-1100	Bridge Deck Construction at Portal AD10 by Special Lifting Frame (56 nos)	23	23	07-Sep-15	05-Oct-15	-71
ED-1050	Bridge Deck Construction at Pier AD5 by Typical Lifting Frame (12 nos)	10	10	09-Oct-15	20-Oct-15	-15
Section VI - Works in Portion FH9 (KD-6A)						
Major Works						
S6-2000	Construction of Abutment AB12/AD14 (including Piling, Pile Cap & Abutment construction)	276	247	06-Feb-15 A	23-May-16	117



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

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

CEDD Contract No. CV/2012/09

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

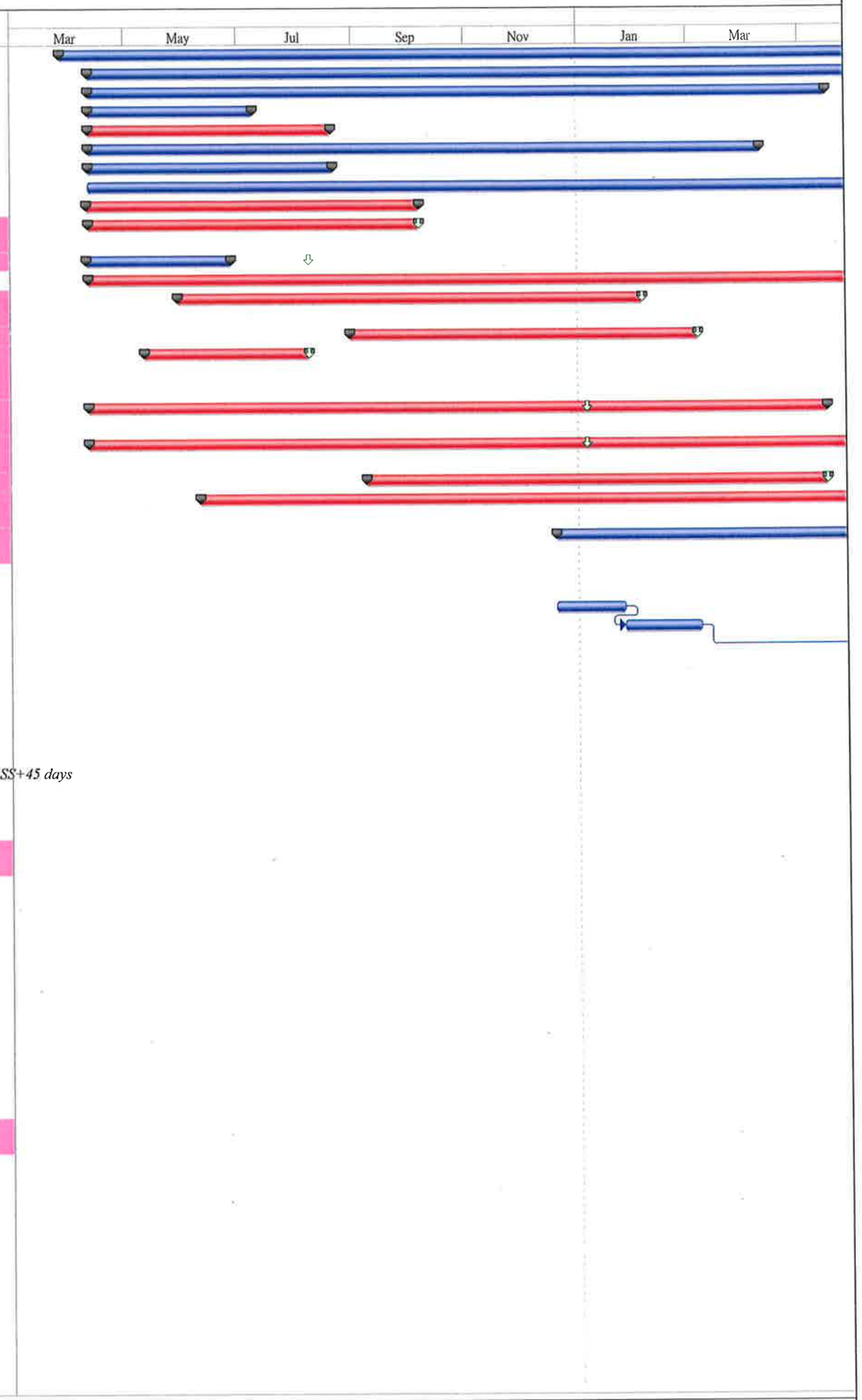
3-Month Rolling Programme

3-Month Rolling Programme updated to 2015-07-21

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

Contract 5

ID	WBS	Task Name	Duration	Start	Finish	Predecessors
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	4
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	5SS
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	4
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	1511 days	Fri 12/4/13	Wed 31/5/17	
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	74SS+13 days
100	4.2	Section II of the Works - All laboratory tests for Section I	188 days	Sat 31/8/13	Thu 6/3/14	97
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	24,25,26
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	4
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	4
140	4.6	Section VII of the Works - All works within Area CRD	249 days	Mon 9/9/13	Thu 15/5/14	8
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	6,7,18
211	4.8	Section IX of the Works - All works within Area BCPB - EOTO7 completion 19 October 2015	669 days	Fri 20/12/13	Mon 19/10/15	7
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	181
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	213
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	212FS+7 days,214
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	738SS
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	181
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*	*217FS+52 days,215SS+45 days*
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	215FS-46 days
221	*4.8.7.3*	*site formation works (B18-B22)*	*200 days*	*Sat 7/3/15*	*Tue 22/9/15*	*219SS*
222	*4.8.8*	*chain link fence (Drg.1002C, 1032B, 1033B)*	*27 days*	*Wed 23/9/15*	*Mon 19/10/15*	*221*
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	8
224	4.9.1	ISSUED EOT5	125 days	Thu 5/6/14	Tue 7/10/14	
225	4.9.2	Claim No. 013 - VO No. 028 - Site Possession from DC/2011/06 (Portion A) (from Area C8 to D2)	0 days	Tue 16/9/14	Tue 16/9/14	180
226	4.9.3	Received Variation Order No. 035 for CLP Substation	0 days	Mon 21/7/14	Mon 21/7/14	
227	4.9.4	Filling Works, Drainage & Irrigation System	21 days	Tue 16/9/14	Mon 6/10/14	
229	4.9.5	South West Works for CLP Sub-Station (VO No. 035) (Area C1, C3, C4, C5, C6)	64 days	Mon 4/8/14	Mon 6/10/14	
233	4.9.6	Handing over CLP Substation Area	0 days	Tue 7/10/14	Tue 7/10/14	228FS+1 day
234	4.9.7	VO 073 for Secondary Boundary Fencing extend to BCPC	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*	*235FS+2 days*
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	235FS+2 days
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	237
239	4.10	Section XI of the Works - All works within Area BCPD	514 days	Mon 14/7/14	Wed 9/12/15	
240	4.10.1	South West Works for additional 132kV (at Areas D1 & D2) at BCPD	439 days	Fri 15/8/14	Tue 27/10/15	
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	241FS+13 days
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***	***217***
244	4.10.1.4	site clearance, take initial survey	10 days	Thu 15/1/15	Sat 24/1/15	243
245	4.10.1.5	tree felling / transplant	14 days	Sun 25/1/15	Sat 7/2/15	244
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	245
247	4.10.1.7	PVO, Construct Special Manhole No.9937	60 days	Sat 28/2/15	Tue 28/4/15	246
248	4.10.1.8	lay sewer FHM511 to 515	45 days	Wed 29/4/15	Fri 12/6/15	247

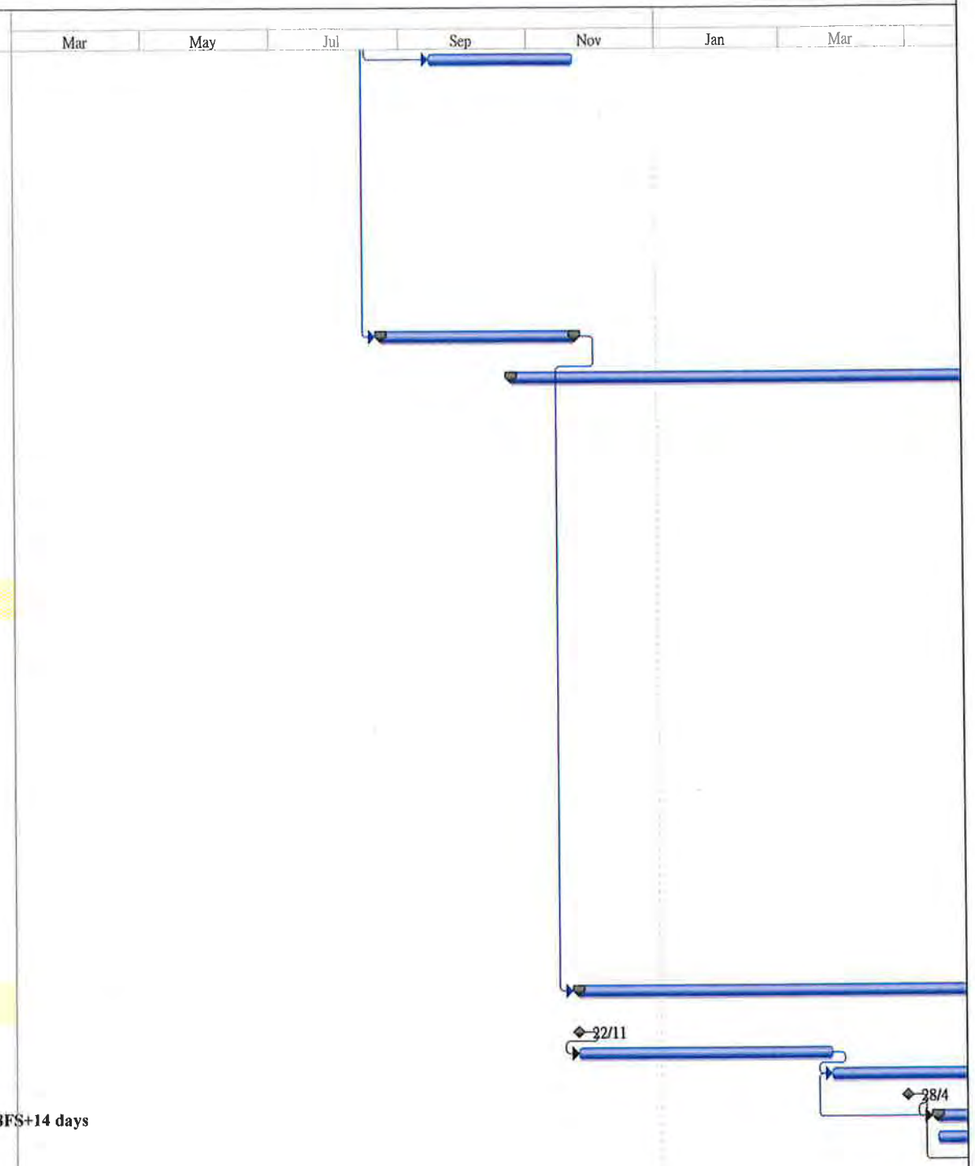


ID	WBS	Task Name	Duration	Start	Finish	Predecessors
249	4.10.1.9	lay sewer STP-FMH520 & 515	35 days	Sat 13/6/15	Fri 17/7/15	248
250	4.10.1.10	fill trench from laid sewer to drainage formation	10 days	Sat 18/7/15	Mon 27/7/15	249
251	4.10.1.11	lay drainage SMH9961 to 9966 & 9936 to 9937	30 days	Tue 28/7/15	Wed 26/8/15	250
252	4.10.1.12	filling of areas D1 & D2 to +15.3 with D2 soil cement slope	35 days	Wed 29/4/15	Tue 2/6/15	247
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	253
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	253
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	253FS+24 days
257	4.10.1.17	Secondary Boundary Fencing ChA0 to ChA125 (Bay 1 to 16)	40 days	Mon 27/4/15	Fri 5/6/15	256FS-10 days
258	4.10.1.18	Secondary Boundary Fencing Ch1436 to Ch1520 (Bay 185 to 197)	40 days	Fri 18/9/15	Tue 27/10/15	283FS+9 days
259	4.10.1.19	irrigation system at west D1 & D2	7 days	Wed 3/6/15	Tue 9/6/15	252
260	4.10.1.20	additional 132kV (at Areas D1 & D2)	7 days	Wed 10/6/15	Tue 16/6/15	259
261	**4.10.2**	**South West Works for Areas D1 & D2**	**398 days**	**Fri 3/10/14**	**Wed 4/11/15**	
262	4.10.2.1	site clearance, take initial survey	10 days	Fri 3/10/14	Sun 12/10/14	181FS+7 days
263	4.10.2.2	tree felling / transplant	25 days	Mon 13/10/14	Thu 6/11/14	262
264	4.10.2.3	fill trench to formation for Plug-FMH501-502-STP (approx. to +11)	20 days	Fri 7/11/14	Wed 26/11/14	263
265	4.10.2.4	*lay sewer Plug-FMH501-502-STP*	14 days	Sat 18/7/15	Fri 31/7/15	249,280
266	4.10.2.5	*complete filling for Areas D1 & D2 to formation area*	28 days	Sat 18/7/15	Fri 14/8/15	263FS-7 days,265SS
267	4.10.2.6	*lay drainage SMH9941 to 9943-9931*	20 days	Sat 1/8/15	Thu 20/8/15	265
268	4.10.2.7	*lay drainage SMH9952 to 9953*	10 days	Fri 21/8/15	Sun 30/8/15	267,260SS-5 days
269	4.10.2.8	*lay drainage SMH9930 to 9935*	30 days	Mon 31/8/15	Tue 29/9/15	268
270	4.10.2.9	*lay drainage SMH9702A to 9935*	10 days	Wed 30/9/15	Fri 9/10/15	269
271	4.10.2.10	*lay drainage CP25-SMH9701A-9902-9702A*	10 days	Sat 10/10/15	Mon 19/10/15	270
272	4.10.2.11	*lay drainage SMH9922 to 9930*	30 days	Tue 6/10/15	Wed 4/11/15	271FS-14 days
273	4.10.2.12	*water pipe DN250 CHL 150 to 335.749*	18 days	Mon 31/8/15	Thu 17/9/15	268
274	4.10.2.13	*rising main CHC*	18 days	Sun 20/9/15	Wed 7/10/15	269FS-10 days
275	**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**	**217**
276	**4.10.4**	**South West Work for Construction of Depressed Road**	**223 days**	**Sun 8/2/15**	**Fri 18/9/15**	
277	4.10.4.1	UU for 11kV & LV lay ducts across & underneath underpass	1 day	Mon 2/3/15	Mon 2/3/15	241FS+42 days,275FS+47 days
278	4.10.4.2	structural work for Bay 16015-16012	40 days	Sun 8/2/15	Thu 19/3/15	245
279	4.10.4.3	structural work for Bay 16011-16008	60 days	Tue 10/3/15	Fri 8/5/15	278FS-10 days
280	4.10.4.4	structural work for Bay 16007-16004	55 days	Wed 29/4/15	Mon 22/6/15	279FS-10 days
281	4.10.4.5	structural work for Bay 16003-16001	60 days	Tue 23/6/15	Fri 21/8/15	280
282	4.10.4.6	drainage work inside depressed road (Bay 16015-16008)	18 days	Tue 4/8/15	Fri 21/8/15	279,281FF
283	4.10.4.7	drainage work inside depressed road (Bay 16007-16001)	18 days	Sat 22/8/15	Tue 8/9/15	281,282
284	4.10.4.8	backfill western side of depressed road	14 days	Sat 22/8/15	Fri 4/9/15	281
285	4.10.4.9	irrigation system next to depressed road	14 days	Sat 5/9/15	Fri 18/9/15	284
286	**4.10.5**	**South West Work for Access Road**	**82 days**	**Sat 19/9/15**	**Wed 9/12/15**	
287	4.10.5.1	completion of drainage SMH9922 to 9930, water pipe & rising main & backfill western side of depressed road	0 days	Wed 4/11/15	Wed 4/11/15	272,274,284
288	***4.10.5.2***	***UU for 132kV, 11kV & LV***	***7 days***	***Sat 19/9/15***	***Fri 25/9/15***	***285***
289	***4.10.5.3***	***UU for PCCW***	***7 days***	***Sat 26/9/15***	***Fri 2/10/15***	***288***
290	*4.10.5.4*	*backfill to road formation with SRT98%*	*14 days*	*Sat 3/10/15*	*Fri 16/10/15*	*289*
291	*4.10.5.5*	*sub-base laying*	*7 days*	*Sat 17/10/15*	*Fri 23/10/15*	*290*
292	*4.10.5.6*	*kerb bedding, laying & backing before bituminous material*	*14 days*	*Sat 24/10/15*	*Fri 6/11/15*	*291*
293	***4.10.5.7***	***AC - lay DBM & base course***	***7 days***	***Sat 7/11/15***	***Fri 13/11/15***	***292***
294	*4.10.5.8*	*backfill footpath formation*	*7 days*	*Sat 7/11/15*	*Fri 13/11/15*	*292*
295	*4.10.5.9*	*street lighting ducts, drawpits & controller*	*7 days*	*Sat 14/11/15*	*Fri 20/11/15*	*294*
296	***4.10.5.10***	***UU for CLP (lighting)***	***7 days***	***Sat 21/11/15***	***Fri 27/11/15***	***295***
297	*4.10.5.11*	*footpath paving*	*7 days*	*Sat 28/11/15*	*Fri 4/12/15*	*296*
298	***4.10.5.12***	***AC - lay wearing course***	***10 days***	***Mon 30/11/15***	***Wed 9/12/15***	***296FS+2 days,293FS+14 days***
299	**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**	**179**
300	**4.10.7**	**Works at Areas D4 to D9 (shown in Section VIII)**	**449 days**	**Mon 14/7/14**	**Mon 5/10/15**	
301	4.10.7.1	Retaining Wall BCP/RW2B	92 days	Mon 14/7/14	Mon 13/10/14	182SS
316	4.10.7.2	install 150UPVC perforated pipe behind retaining wall	4 days	Fri 17/10/14	Mon 20/10/14	197SS
317	4.10.7.3	install geotextile filter & backfill D4, B6 & A4 to +15.0	28 days	Tue 21/10/14	Mon 17/11/14	198SS
318	4.10.7.4	site formation work for Areas D4 to D6	45 days	Tue 4/11/14	Thu 18/12/14	317FS-14 days
319	4.10.7.5	soil cement slopes for Areas D4 to D6	21 days	Fri 5/12/14	Thu 25/12/14	318FS-14 days
320	4.10.7.6	site formation work for Areas D7 to D9	60 days	Fri 19/12/14	Mon 16/2/15	319FS-7 days
321	*4.10.7.7*	*PVO - U/J-Channel along Patoral Road (approx. 1200m)*	*150 days*	*Sat 9/5/15*	*Mon 5/10/15*	
322	**4.11**	**Section XII of the Works - All works within Area LMH**	**635 days**	**Thu 22/8/13**	**Mon 18/5/15**	**74**
491	**4.12**	**Section XIII of the Works - Works not covered in any other Sections**	**983 days**	**Thu 22/8/13**	**Sat 30/4/16**	**74**
492	*4.12.1*	*Submissions*	*70 days*	*Thu 22/8/13*	*Wed 30/10/13*	

Revision 1
Tue 28/7/15

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

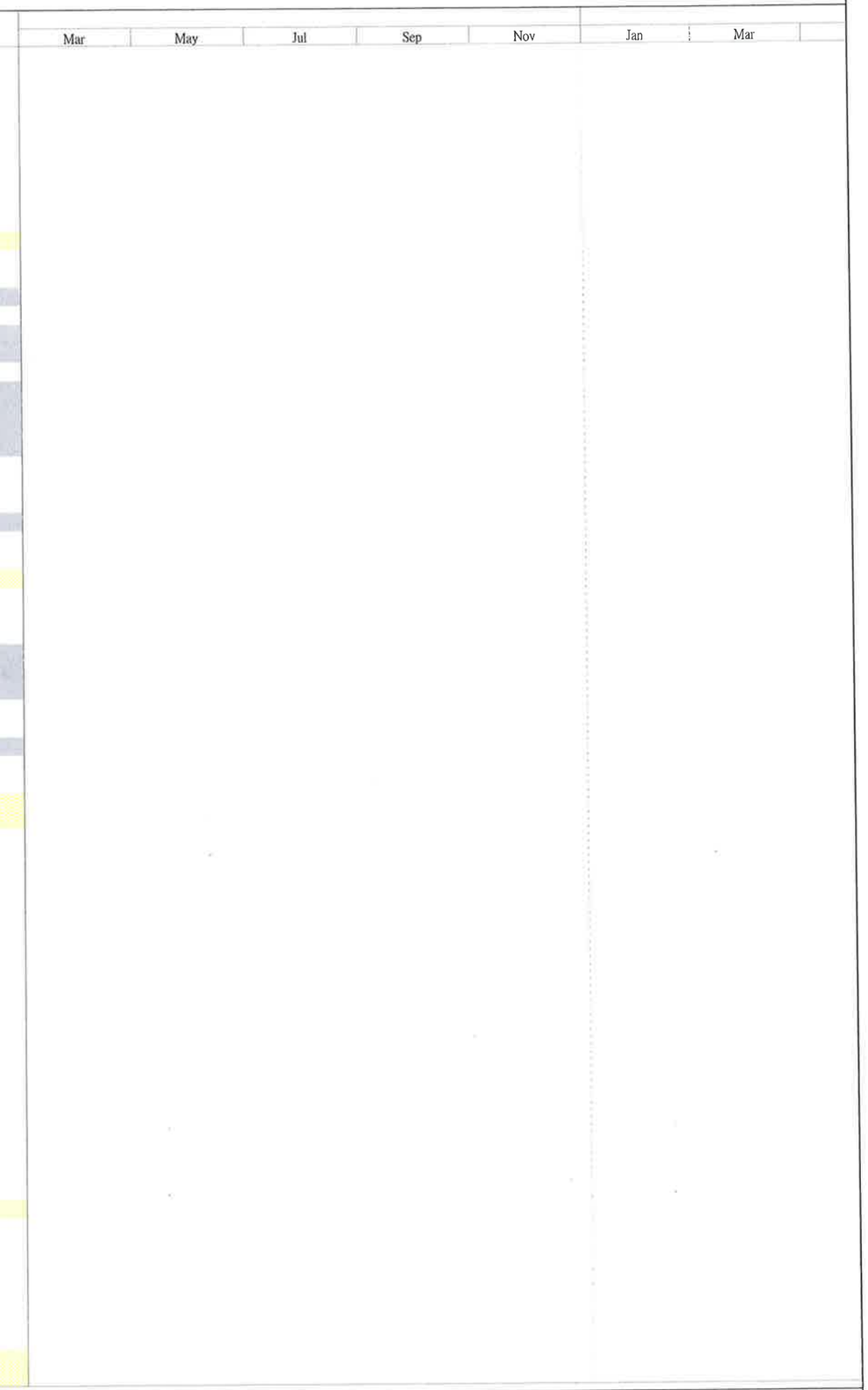
ID	WBS	Task Name	Duration	Start	Finish	Predecessors
493	4.12.2	Approval of Submissions	68 days	Mon 16/9/13	Fri 22/11/13	492SS+25 days
494	4.12.3	VO.080 Additional Footpath adjacent to the Eastern Side of Chuk Yuen Village Re-site Area	1 day	Tue 5/5/15	Tue 5/5/15	
495	4.12.4	Submissions	14 days	Wed 6/5/15	Tue 19/5/15	494
496	4.12.5	Approval of Submissions	7 days	Wed 20/5/15	Tue 26/5/15	495
497	4.12.6	Temporarty works and excavation	20 days	Wed 27/5/15	Mon 15/6/15	496
498	4.12.7	Base slab	25 days	Tue 16/6/15	Fri 10/7/15	496FS+20 days
499	4.12.8	Wall Stem	20 days	Sun 26/7/15	Fri 14/8/15	498FS+15 days
500	4.12.9	Backfilling	20 days	Sat 15/8/15	Thu 3/9/15	499
501	4.12.10	DN150 watermain & Utilities Laying	14 days	Mon 14/9/15	Sun 27/9/15	500FS+10 days
502	4.12.11	Surfacing & U-Channel	7 days	Mon 28/9/15	Sun 4/10/15	501
503	4.12.12	Reinstatement of Gabion	14 days	Mon 5/10/15	Sun 18/10/15	502
504	4.12.13	Type 2 Railing	5 days	Mon 5/10/15	Fri 9/10/15	502
505	**4.12.14**	**Temporary Traffic Arrangement (TTA) Scheme for Works at existing LMH Rd**	**92 days**	**Fri 23/8/13**	**Fri 22/11/13**	**492SS+1 day**
509	**4.12.15**	**Lin Ma Hang Road Widening Section**	**920 days**	**Thu 24/10/13**	**Sat 30/4/16**	
510	4.12.15.1	PVO - Additional U-Channel along both Side of existing LMH Road 600m x 2) (Advanced works commenced)	0 days	Sat 27/6/15	Sat 27/6/15	
511	**4.12.15.2**	**VO.061 Addition al Rising Main at LMH Road**	**0 days**	**Wed 31/12/14**	**Wed 31/12/14**	
512	**4.12.15.3**	**place order for HDPE pipes**	**0 days**	**Tue 6/1/15**	**Tue 6/1/15**	**511FS+2 days**
513	***4.12.15.4***	***arrival of HDPE pipes***	***80 days***	***Tue 6/1/15***	***Thu 26/3/15***	***512***
514	**4.12.15.5**	**RECEIVE VO 053 ADDITIONAL CROSS ROAD DUCTS FOR EXISTING IRRIGATION PIPES**	**0 days**	**Tue 7/10/14**	**Tue 7/10/14**	
515	**4.12.15.6**	**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**	
516	**4.12.15.7**	**1 Works from chainage 190 to chainage 380 (west side carriageway & footpath)**	**231 days**	**Sun 24/8/14**	**Sat 11/4/15**	
517	4.12.15.7.1	TTA for ch 310-380(west)	0 days	**Sun 24/8/14**	Sun 24/8/14	
518	4.12.15.7.2	earthwork to lay drainage & waterwork	21 days	Sun 24/8/14	Sat 13/9/14	517
519	4.12.15.7.3	drainage & waterwork + backfill for CLP	45 days	Sun 14/9/14	Tue 28/10/14	518
520	***4.12.15.7.4***	***VO053 - crossing no. 1(whole), 2 (west)***	***18 days***	***Wed 29/10/14***	***Sat 15/11/14***	***519,514***
521	***4.12.15.7.5***	***UU for ch 190-380 (132kV,11kV,LV)***	***19 days***	***Sun 16/11/14***	***Thu 4/12/14***	***520***
522	4.12.15.7.6	filling works to formation of road (include SRT98%)	7 days	Fri 5/12/14	Thu 11/12/14	521
523	4.12.15.7.7	street lighting drawpits & crossroads	7 days	Fri 12/12/14	Thu 18/12/14	522
524	4.12.15.7.8	kerb bedding, laying & backing before bituminous material	9 days	Fri 19/12/14	Sat 27/12/14	523
525	4.12.15.7.9	filling works to formation of footpath	4 days	Sun 28/12/14	Wed 31/12/14	524
526	***4.12.15.7.10***	***UU for CLP (lighting)***	***5 days***	***Thu 1/1/15***	***Mon 5/1/15***	***525***
527	***4.12.15.7.11***	***UU for ch 190-380 (PCCW)***	***7 days***	***Tue 6/1/15***	***Mon 12/1/15***	***526***
528	4.12.15.7.12	irrigation system	7 days	Tue 13/1/15	Mon 19/1/15	527
529	4.12.15.7.13	preparation works to formation of footpath	3 days	Mon 19/1/15	Wed 21/1/15	528FS-1 day
530	4.12.15.7.14	footpath paving	9 days	Thu 22/1/15	Fri 30/1/15	529
531	***4.12.15.7.15***	***VO.061 for renewal of rising main***	***6 days***	***Fri 27/3/15***	***Wed 1/4/15***	***513***
532	4.12.15.7.16	sub-base laying for road	5 days	Thu 2/4/15	Mon 6/4/15	531
533	***4.12.15.7.17***	***AC - lay DBM & base course***	***5 days***	***Tue 7/4/15***	**Sat 11/4/15**	***524,532***
534	**4.12.15.8**	**1 Works from chainage 380 to chainage 580 (west side carriageway & footpath)**	**402 days**	**Fri 22/11/13**	**Mon 29/12/14**	**505**
535	4.12.15.8.1	TTA for ch 380-580(west)	0 days	**Fri 22/11/13**	Fri 22/11/13	
536	4.12.15.8.2	watermain (include issue of alignment and laying)	120 days	Sat 23/11/13	Sat 22/3/14	535
537	4.12.15.8.3	drainage (pipe, manholes & gullies)	155 days	Sun 23/3/14	Sun 24/8/14	536
538	**4.12.15.8.4**	**Received Variation Order Nos. 040 & 042**	**0 days**	**Mon 28/4/14**	**Mon 28/4/14**	
539	**4.12.15.8.5**	**construct DN450mm pipe with concrete surround**	**28 days**	Mon 12/5/14	Sun 8/6/14	**537SS+50 days,538FS+14 days**
540	4.12.15.8.5.1	low stream pipe & catchpit at western side	28 days	Mon 12/5/14	Sun 8/6/14	
541	**4.12.15.8.6**	**construct 1900x950 box culvert with manholes SMH8052A & B**	**49 days**	Mon 9/6/14	Sun 27/7/14	**538,540**
542	4.12.15.8.6.1	support existing DN150mm sewer pipe & watermain	7 days	Mon 9/6/14	Sun 15/6/14	
543	4.12.15.8.6.2	construct box culvert	14 days	Mon 16/6/14	Sun 29/6/14	542
544	4.12.15.8.6.3	construct manholes	28 days	Mon 30/6/14	Sun 27/7/14	543
545	4.12.15.8.7	found existing cables affected construction of gullies & discuss with CLP	18 days	Sat 26/7/14	Tue 12/8/14	537FF-12 days,544FS-2 days
546	4.12.15.8.8	complete preparation work & fill footpath for 132kV, 11kV & LV	8 days	Wed 13/8/14	Wed 20/8/14	545
547	**4.12.15.8.9**	**UU - 132kV+11kV & LV**	**35 days**	**Thu 21/8/14**	**Wed 24/9/14**	**546**
548	4.12.15.8.10	temporary connection of cables	3 days	Thu 25/9/14	Sat 27/9/14	547
549	**4.12.15.8.11**	**960x650 box culvert (low stream & west catchpit)**	**7 days**	Sun 28/9/14	Sat 4/10/14	**548**
551	4.12.15.8.12	construct outstanding drainage & gullies	7 days	Wed 1/10/14	Tue 7/10/14	550FS-4 days
552	4.12.15.8.13	filling work to formation of road (include SRT98%)	5 days	Wed 8/10/14	Sun 12/10/14	551
553	***4.12.15.8.14***	***VO053 - crossing no. 3, 4 (west)***	***10 days***	**Mon 13/10/14**	**Wed 22/10/14**	***514FS+6 days***
554	4.12.15.8.15	complete filling work to formation of road (include SRT98%)	5 days	Thu 23/10/14	Mon 27/10/14	553
555	4.12.15.8.16	street lighting drawpits & crossing at ch 523	4 days	Mon 27/10/14	Thu 30/10/14	554FS-1 day
556	***4.12.15.8.17***	***UU for CLP (lighting)***	***5 days***	**Fri 31/10/14**	**Tue 4/11/14**	***555***



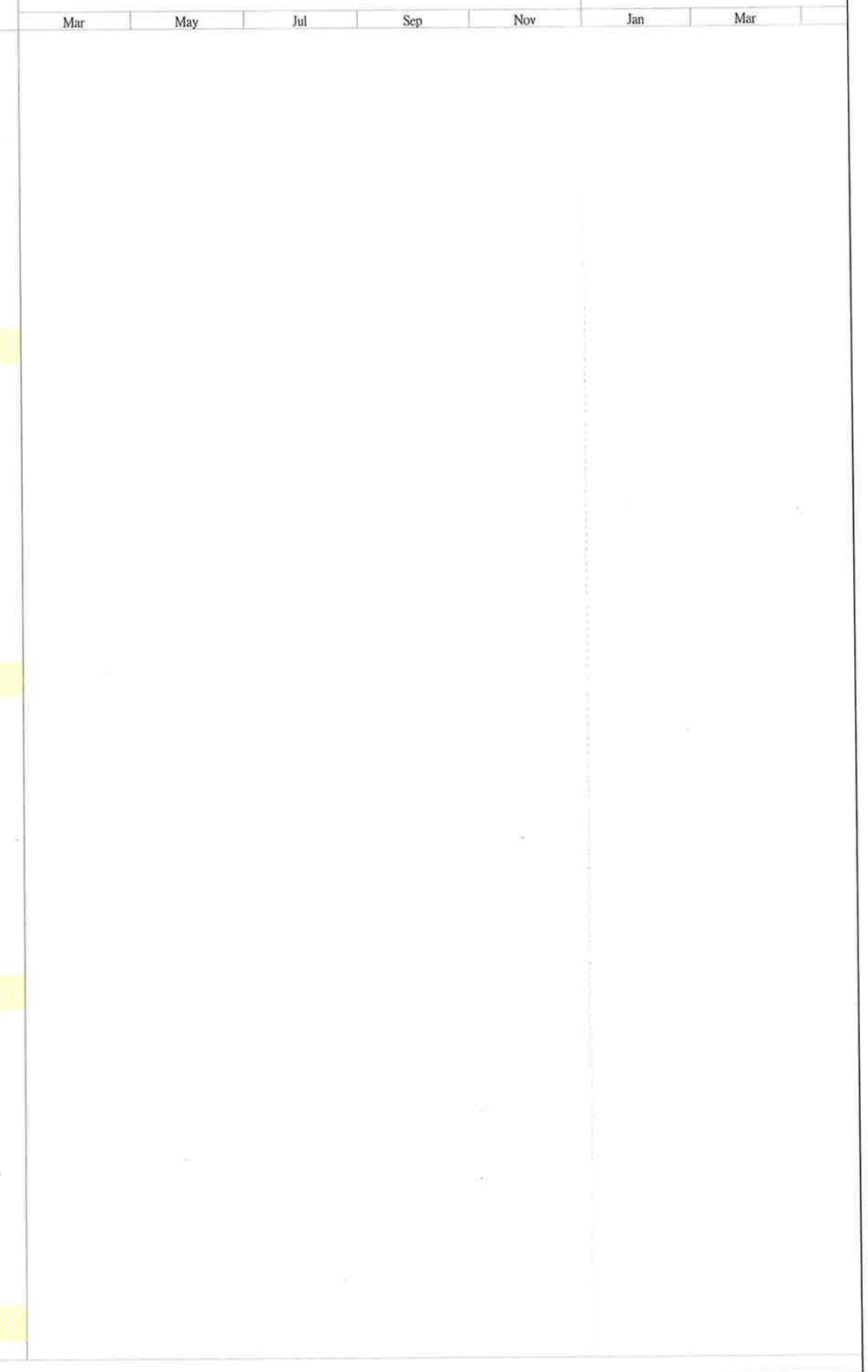
Revision 1
Tue 28/7/15

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

ID	WBS	Task Name	Duration	Start	Finish	Predecessors
557	*4.12.15.8.18*	*sub-base laying for road*	*4 days*	Wed 5/11/14	Sat 8/11/14	*556*
558	*4.12.15.8.19*	*kerb bedding, laying & backing before bituminous material*	*12 days*	Sat 8/11/14	Wed 19/11/14	*557FS-1 day*
559	*4.12.15.8.20*	*filling works to formation of footpath*	*5 days*	Thu 20/11/14	Mon 24/11/14	*558*
560	***4.12.15.8.21***	***UU for ch 380-580 (PCCW)***	***14 days***	**Tue 25/11/14**	**Mon 8/12/14**	***559***
561	*4.12.15.8.22*	*irrigation system*	*4 days*	Tue 9/12/14	Fri 12/12/14	*560*
562	*4.12.15.8.23*	*preparation works to formation of footpath*	*3 days*	Sat 13/12/14	Mon 15/12/14	*561*
563	*4.12.15.8.24*	*footpath paving*	*14 days*	Tue 16/12/14	Mon 29/12/14	*562*
564	***4.12.15.8.25***	***AC - lay DBM & base course***	***5 days***	**Thu 20/11/14**	**Mon 24/11/14**	***558***
565	**4.12.15.9**	**2 Works from ch 380-580 (east side carriageway)**	**318 days**	**Wed 26/11/14**	**Sat 10/10/15**	**564FS+2 days**
566	4.12.15.9.1	TTA for ch 380-580 (east)	0 days	**Wed 26/11/14**	Wed 26/11/14	
567	4.12.15.9.2	remove existing pavement	4 days	*Thu 27/11/14*	*Sun 30/11/14*	566
568	4.12.15.9.3	PVO: 2 nos. U-Channel Drainage Crossing	14 days	Mon 1/12/14	Sun 14/12/14	567
569	***4.12.15.9.4***	***VO.061 for rising main***	***40 days***	***Fri 27/3/15***	***Tue 5/5/15***	***513,568***
570	4.12.15.9.5	Waterworks - 150T FH, 150T Irrigation & 150T	14 days	Wed 6/5/15	Tue 19/5/15	569
571	4.12.15.9.6	VO053 - crossing no. 2, 3, 4, 5 (east)	20 days	Wed 13/5/15	Mon 1/6/15	570FS-7 days
572	***4.12.15.9.7***	***PVO - Revised Design of VO.061 for Rising Mains***	***40 days***	***Fri 19/6/15***	***Tue 28/7/15***	
573	*4.12.15.9.8*	***Re-construction: VO.061 for Rising Mains*	*30 days*	*Wed 29/7/15*	*Thu 27/8/15*	*572*
574	4.12.15.9.9	**Re-construction: Waterworks - 150T FH, 150T Irrigation & 150T	10 days	Fri 28/8/15	Sun 6/9/15	573
575	***4.12.15.9.10***	*****Re-construction: RVO053 - crossing no. 2, 3, 4, 5 (east)***	***10 days***	***Mon 31/8/15***	***Wed 9/9/15***	***574FS-7 days***
576	4.12.15.9.11	**Re-construction: PVO: 2 nos. U-Channel Drainage Crossing	10 days	Fri 28/8/15	Sun 6/9/15	573
577	*4.12.15.9.12*	middle stream box culvert 960x650	*14 days*	*Mon 31/8/15*	*Sun 13/9/15*	*576FS-7 days*
578	*4.12.15.9.13*	middle stream DN450mm pipe	*12 days*	*Mon 7/9/15*	*Fri 18/9/15*	*577FS-7 days*
579	*4.12.15.9.14*	street light crossing at ch 523	*4 days*	*Sat 19/9/15*	*Tue 22/9/15*	*575,578*
580	4.12.15.9.15	SRT Formation level	5 days	Wed 23/9/15	Sun 27/9/15	579
581	*4.12.15.9.16*	sub-base & east kerbing	*8 days*	*Mon 28/9/15*	*Mon 5/10/15*	*575,580*
582	***4.12.15.9.17***	***AC - lay DBM & base course***	***5 days***	***Tue 6/10/15***	**Sat 10/10/15**	***581***
583	**4.12.15.10**	**3 Works from ch 190-380 (east side carriageway)**	**60 days**	**Wed 29/7/15**	**Sat 26/9/15**	**516FS+2 days**
584	4.12.15.10.1	TTA for ch 190-380 (east)	0 days	**Wed 29/7/15**	Wed 29/7/15	
585	*4.12.15.10.2*	remove existing pavement	*4 days*	*Wed 29/7/15*	*Sat 1/8/15*	*584*
586	*4.12.15.10.3*	*VO.061 for rising main*	*25 days*	*Sun 2/8/15*	*Wed 26/8/15*	*585*
587	4.12.15.10.4	Waterworks - 150T FH, 150T x 2	14 days	Thu 27/8/15	Wed 9/9/15	586
588	4.12.15.10.5	RVO053 - crossing no. 1 (east)	6 days	Mon 7/9/15	Sat 12/9/15	587FS-3 days
589	4.12.15.10.6	PVO: 2 nos. U-Channel Drainage Crossing	10 days	Thu 27/8/15	Sat 5/9/15	586
590	*4.12.15.10.7*	street light crossings at ch 287, 350	*4 days*	*Thu 3/9/15*	*Sun 6/9/15*	*589FS-3 days*
591	*4.12.15.10.8*	PCCW crossings at ch 350	2 days	*Sat 5/9/15*	*Sun 6/9/15*	590FF
592	4.12.15.10.9	SRT Formation level	5 days	Mon 7/9/15	Fri 11/9/15	591
593	*4.12.15.10.10*	sub-base & east kerbing	*10 days*	*Sat 12/9/15*	*Mon 21/9/15*	*590,592*
594	**4.12.15.10.11**	**AC - lay DBM & base course**	**5 days**	**Tue 22/9/15**	**Sat 26/9/15**	**593**
595	**4.12.15.11**	**2,3,7 Works from chainage 580 to chainage 785 (west side carriageway & footpath)**	**265 days**	**Sun 5/10/14**	**Fri 26/6/15**	
596	**4.12.15.11.1**	**UU for ch 580-785 (132kV,11kV,LV)**	**21 days**	**Sun 5/10/14**	**Sat 25/10/14**	**549**
597	*4.12.15.11.2*	*VO.091 Water Mains Diversion*	*50 days*	*Fri 8/5/15*	*Fri 26/6/15*	
598	4.12.15.11.3	TTA for ch 580-785(west)	0 days	**Wed 26/11/14**	Wed 26/11/14	565SS
599	*4.12.15.11.4*	*earthwork to lay drainage & waterwork*	*10 days*	*Thu 27/11/14*	*Sat 6/12/14*	*598*
600	*4.12.15.11.5*	*drainage & waterwork*	*120 days*	*Sun 7/12/14*	*Sun 5/4/15*	*599*
601	***4.12.15.11.6***	***VO053 - crossing no. 5, 6, 7&8 & Ducts along ch613-700 (west)***	***14 days***	***Mon 6/4/15***	***Sun 19/4/15***	***600***
602	*4.12.15.11.7*	*filling works to formation of road (include SRT98%)*	*7 days*	*Mon 20/4/15*	*Sun 26/4/15*	*601*
603	*4.12.15.11.8*	*street lighting drawpits & crossings ch760,785*	*5 days*	*Mon 27/4/15*	*Fri 1/5/15*	*602*
604	*4.12.15.11.9*	*sub-base laying for road*	*5 days*	*Sat 2/5/15*	*Wed 6/5/15*	*603*
605	*4.12.15.11.10*	*kerb bedding, laying & backing before bituminous material*	*9 days*	*Thu 7/5/15*	*Fri 15/5/15*	*604*
606	*4.12.15.11.11*	*filling works to formation of footpath*	*4 days*	*Sat 16/5/15*	*Tue 19/5/15*	*605*
607	***4.12.15.11.12***	***UU for CLP (lighting)***	***5 days***	***Wed 20/5/15***	***Sun 24/5/15***	***606***
608	***4.12.15.11.13***	***UU for ch 580-785 (PCCW)***	***14 days***	***Mon 25/5/15***	***Sun 7/6/15***	***606,607***
609	*4.12.15.11.14*	*irrigation system*	*5 days*	*Mon 8/6/15*	*Fri 12/6/15*	*608*
610	*4.12.15.11.15*	*preparation works to formation of footpath*	*3 days*	*Sat 13/6/15*	*Mon 15/6/15*	*609*
611	*4.12.15.11.16*	*footpath paving*	*7 days*	*Tue 16/6/15*	*Mon 22/6/15*	*610*
612	***4.12.15.11.17***	***AC - lay DBM & base course***	***5 days***	***Sat 16/5/15***	**Wed 20/5/15**	***605***
613	**4.12.15.12**	**4,5,6 Works from ch 580-785 (east side carriageway)**	**58 days**	**Fri 22/5/15**	**Sun 19/7/15**	**612FS+2 days**
614	4.12.15.12.1	TTA for ch 580-785 (east)	0 days	**Fri 22/5/15**	Fri 22/5/15	
615	4.12.15.12.2	remove existing pavement	5 days	Sat 23/5/15	Wed 27/5/15	614
616	**4.12.15.12.3**	**VO.061 for rising main**	**20 days**	**Thu 28/5/15**	**Tue 16/6/15**	**615**
617	**4.12.15.12.4**	**VO053 - crossing no. 5, 6, 7&8 (east)**	**14 days**	**Fri 12/6/15**	**Thu 25/6/15**	**616FS-5 days**
618	4.12.15.12.5	street lighting crossings at ch 760, 785	7 days	Wed 24/6/15	Tue 30/6/15	617FS-2 days
619	4.12.15.12.6	sub-base & east kerbing	14 days	Wed 1/7/15	Tue 14/7/15	618
620	**4.12.15.12.7**	**AC - lay DBM & base course**	**5 days**	**Wed 15/7/15**	**Sun 19/7/15**	**619**
621	**4.12.15.13**	**5 Works from chainage 125 to chainage 190 (west side carriageway & footpath)**	**62 days**	**Mon 28/9/15**	**Sun 29/11/15**	**594FS+2 days**



ID	WBS	Task Name	Duration	Start	Finish	Predecessors
622	4.12.15.13.1	TTA for ch 125-190 (west)	0 days	**Mon 28/9/15**	Mon 28/9/15	
623	*4.12.15.13.2*	*earthwork to lay drainage & waterwork*	*3 days*	*Tue 29/9/15*	*Thu 1/10/15*	*622*
624	*4.12.15.13.3*	*drainage & waterwork + backfill for CLP*	*18 days*	*Thu 1/10/15*	*Sun 18/10/15*	*623FS-1 day*
625	***4.12.15.13.4***	***UU for ch 125-190 (132kV,11kV,LV)***	***8 days***	***Mon 19/10/15***	***Mon 26/10/15***	***624***
626	*4.12.15.13.5*	*filling works to formation of road (include SRT98%)*	*7 days*	*Sun 25/10/15*	*Sat 31/10/15*	*625FS-2 days*
627	*4.12.15.13.6*	*street lighting drawpits & crossing at ch 154*	*3 days*	*Sun 1/11/15*	*Tue 3/11/15*	*626*
628	*4.12.15.13.7*	*irrigation system*	*4 days*	*Mon 2/11/15*	*Thu 5/11/15*	*627FS-2 days*
629	***4.12.15.13.8***	***UU for CLP (lighting)***	***3 days***	***Fri 6/11/15***	***Sun 8/11/15***	***628***
630	*4.12.15.13.9*	*sub-base laying*	*3 days*	*Mon 9/11/15*	*Wed 11/11/15*	*629*
631	*4.12.15.13.10*	*kerb bedding, laying & backing before bituminous material*	*5 days*	*Thu 12/11/15*	*Mon 16/11/15*	*630*
632	*4.12.15.13.11*	*filling works to formation of footpath*	*3 days*	*Mon 16/11/15*	*Wed 18/11/15*	*631FS-1 day*
633	***4.12.15.13.12***	***UU for ch 125-190 (PCCW)***	***5 days***	***Thu 19/11/15***	***Mon 23/11/15***	***632***
634	*4.12.15.13.13*	*footpath paving*	*7 days*	*Mon 23/11/15*	*Sun 29/11/15*	*633FS-1 day*
635	***4.12.15.13.14***	***AC - lay DBM & base course***	***4 days***	***Tue 17/11/15***	**Fri 20/11/15**	***631***
636	**4.12.15.14**	**7 Works from chainage 80 to chainage 125 (west side carriageway & footpath)**	**67 days**	**Sat 21/11/15**	**Wed 27/1/16**	**635FS+1 day**
637	4.12.15.14.1	TTA for ch 80-125(west)	0 days	**Sat 21/11/15**	Sat 21/11/15	
638	*4.12.15.14.2*	*earthwork to lay drainage & waterwork*	*3 days*	Sun 22/11/15	Tue 24/11/15	*637*
639	*4.12.15.14.3*	*drainage & waterwork + backfill for CLP*	*18 days*	Wed 25/11/15	Sat 12/12/15	*638*
640	***4.12.15.14.4***	***UU for ch 80-190 (132kV,11kV,LV)***	***6 days***	**Sun 13/12/15**	**Fri 18/12/15**	***639***
641	*4.12.15.14.5*	*filling works to formation of road (include SRT98%)*	*7 days*	Sat 19/12/15	Fri 25/12/15	*640*
642	*4.12.15.14.6*	*street lighting drawpits & crossing at ch 98*	*3 days*	Sat 26/12/15	Mon 28/12/15	*641*
643	*4.12.15.14.7*	*irrigation system*	*3 days*	Tue 29/12/15	Thu 31/12/15	*642*
644	***4.12.15.14.8***	***UU for CLP (lighting)***	***3 days***	**Fri 1/1/16**	**Sun 3/1/16**	***643***
645	*4.12.15.14.9*	*sub-base laying*	*3 days*	Mon 4/1/16	Wed 6/1/16	*644*
646	*4.12.15.14.10*	*kerb bedding, laying & backing before bituminous material*	*5 days*	Thu 7/1/16	Mon 11/1/16	*645*
647	*4.12.15.14.11*	*filling works to formation of footpath*	*4 days*	Tue 12/1/16	Fri 15/1/16	*646*
648	***4.12.15.14.12***	***UU for ch 80-190 (PCCW)***	***4 days***	**Sat 16/1/16**	**Tue 19/1/16**	***647***
649	*4.12.15.14.13*	*footpath paving*	*8 days*	Wed 20/1/16	Wed 27/1/16	*648*
650	***4.12.15.14.14***	***AC - lay DBM & base course***	***4 days***	**Tue 12/1/16**	**Fri 15/1/16**	***646***
651	**4.12.15.15**	**4 Works from chainage 125 to chainage 190 (east side carriageway & footpath)**	**42 days**	**Sat 16/1/16**	**Sat 27/2/16**	**650FS+1 day**
652	4.12.15.15.1	TTA for ch 125-190 (east)	0 days	**Sat 16/1/16**	Sat 16/1/16	
653	***4.12.15.15.2***	***VO.061 for rising main***	***7 days***	**Sun 17/1/16**	**Sat 23/1/16**	***652***
654	*4.12.15.15.3*	*filling works to formation of road (include SRT98%)*	*4 days*	Sat 23/1/16	Tue 26/1/16	*653FS-1 day*
655	*4.12.15.15.4*	*street lighting drawpits & crossing at ch 154*	*3 days*	Wed 27/1/16	Fri 29/1/16	*654*
656	*4.12.15.15.5*	*irrigation system*	*3 days*	Sat 30/1/16	Mon 1/2/16	*655*
657	***4.12.15.15.6***	***UU for CLP (lighting)***	***3 days***	**Tue 2/2/16**	**Thu 4/2/16**	***656***
658	*4.12.15.15.7*	*sub-base laying*	*2 days*	Fri 5/2/16	Sat 6/2/16	*657,656*
659	*4.12.15.15.8*	*kerb bedding, laying & backing before bituminous material*	*5 days*	Sun 7/2/16	Thu 11/2/16	*658*
660	*4.12.15.15.9*	*filling works to formation of footpath*	*3 days*	Fri 12/2/16	Sun 14/2/16	*659*
661	***4.12.15.15.10***	***UU for ch 125-200 (PCCW/HGC)***	***5 days***	**Mon 15/2/16**	**Fri 19/2/16**	***660***
662	*4.12.15.15.11*	*footpath paving*	*8 days*	Sat 20/2/16	Sat 27/2/16	*661*
663	***4.12.15.15.12***	***AC - lay DBM & base course***	***4 days***	**Fri 12/2/16**	**Mon 15/2/16**	***659***
664	**4.12.15.16**	**6 Works from chainage 80 to chainage 125 (east side carriageway & footpath)**	**40 days**	**Tue 16/2/16**	**Sun 27/3/16**	**663FS+1 day**
665	4.12.15.16.1	TTA for ch 80-125 (east)	0 days	**Tue 16/2/16**	Tue 16/2/16	
666	***4.12.15.16.2***	***VO.061 for rising main***	***7 days***	**Wed 17/2/16**	**Tue 23/2/16**	***665***
667	*4.12.15.16.3*	*filling works to formation of road (include SRT98%)*	*5 days*	Mon 22/2/16	Fri 26/2/16	*666FS-2 days*
668	*4.12.15.16.4*	*street lighting drawpits & crossing at ch 98*	*3 days*	Fri 26/2/16	Sun 28/2/16	*667FS-1 day*
669	*4.12.15.16.5*	*irrigation system*	*3 days*	Mon 29/2/16	Wed 2/3/16	*668*
670	***4.12.15.16.6***	***UU for CLP (lighting)***	***3 days***	**Thu 3/3/16**	**Sat 5/3/16**	***669***
671	*4.12.15.16.7*	*sub-base laying*	*3 days*	Sun 6/3/16	Tue 8/3/16	*670*
672	*4.12.15.16.8*	*kerb bedding, laying & backing before bituminous material*	*5 days*	Wed 9/3/16	Sun 13/3/16	*671*
673	*4.12.15.16.9*	*filling works to formation of footpath*	*3 days*	Mon 14/3/16	Wed 16/3/16	*672*
674	***4.12.15.16.10***	***UU for ch 80-125 (PCCW/HGC)***	***4 days***	**Thu 17/3/16**	**Sun 20/3/16**	***673***
675	*4.12.15.16.11*	*footpath paving*	*7 days*	Mon 21/3/16	Sun 27/3/16	*674*
676	***4.12.15.16.12***	***AC - lay DBM & base course***	***3 days***	**Mon 14/3/16**	**Wed 16/3/16**	***672***
677	**4.12.15.17**	**Rising manholes & drawpit covers & Lay wearing course (with TTA)**	**44 days**	**Fri 18/3/16**	**Sat 30/4/16**	**676FS+1 day**
678	*4.12.15.17.1*	*Chainage 80 to Chainage 180 (west side)*	4 days	Fri 18/3/16	Mon 21/3/16	



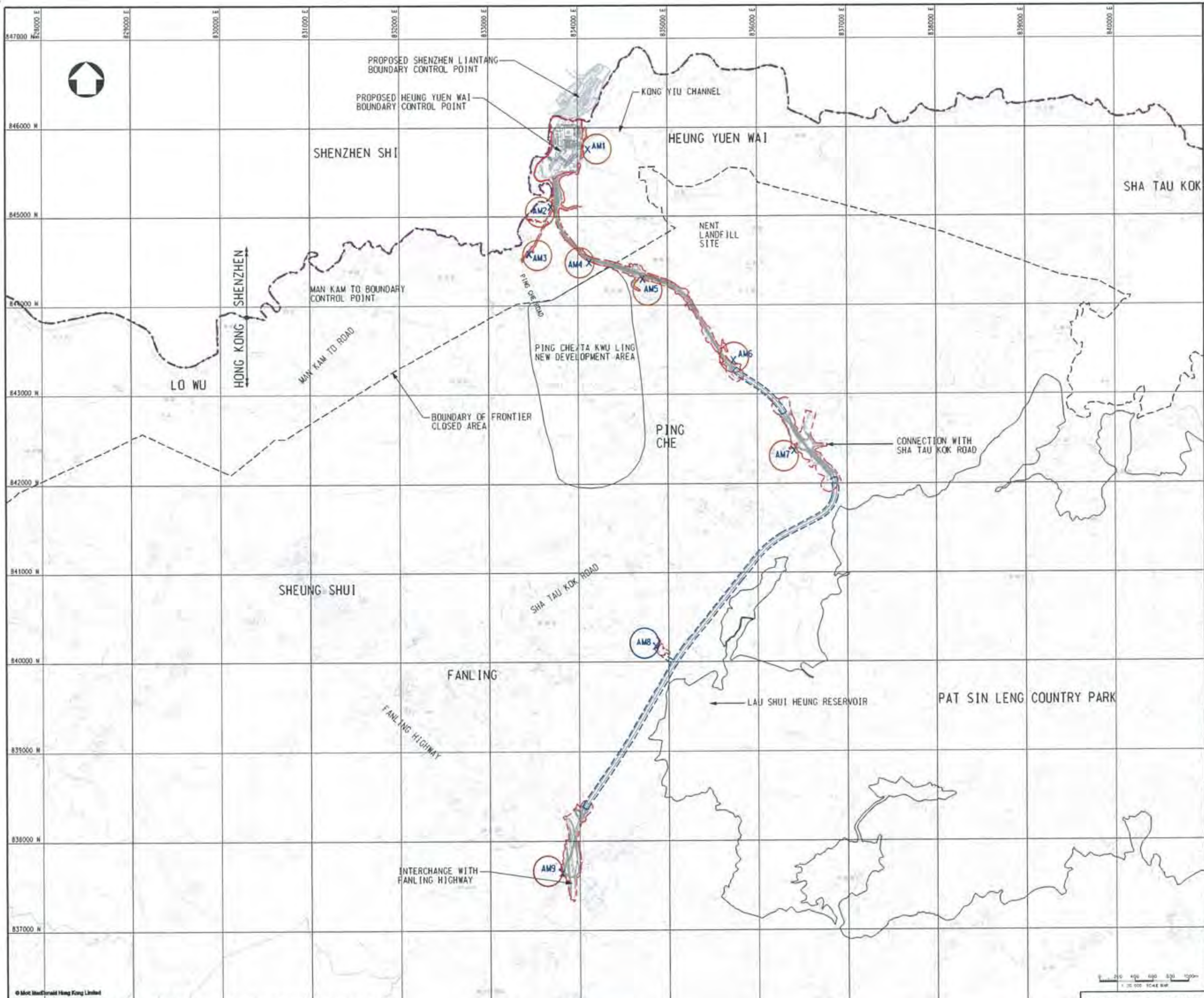
ID	WBS	Task Name	Duration	Start	Finish	Predecessors
679	*4.12.15.17.2*	*Chainage 80 to Chainage 180 (east side)*	2 days	Tue 22/3/16	Wed 23/3/16	678
680	*4.12.15.17.3*	*Chainage 180 to Chainage 280 (west side)*	4 days	Thu 24/3/16	Sun 27/3/16	679
681	*4.12.15.17.4*	*Chainage 180 to Chainage 280 (east side)*	4 days	Mon 28/3/16	Thu 31/3/16	680
682	*4.12.15.17.5*	*Chainage 280 to Chainage 380 (west side)*	4 days	Fri 1/4/16	Mon 4/4/16	681
683	*4.12.15.17.6*	*Chainage 280 to Chainage 380 (east side)*	2 days	Tue 5/4/16	Wed 6/4/16	682
684	*4.12.15.17.7*	*Chainage 380 to Chainage 480 (west side)*	4 days	Thu 7/4/16	Sun 10/4/16	683
685	*4.12.15.17.8*	*Chainage 380 to Chainage 480 (east side)*	2 days	Mon 11/4/16	Tue 12/4/16	684
686	*4.12.15.17.9*	*Chainage 480 to Chainage 580 (west side)*	4 days	Wed 13/4/16	Sat 16/4/16	685
687	*4.12.15.17.10*	*Chainage 480 to Chainage 580 (east side)*	2 days	Sun 17/4/16	Mon 18/4/16	686
688	*4.12.15.17.11*	*Chainage 580 to Chainage 680 (west side)*	4 days	Tue 19/4/16	Fri 22/4/16	687
689	*4.12.15.17.12*	*Chainage 580 to Chainage 680 (east side)*	2 days	Sat 23/4/16	Sun 24/4/16	688
690	*4.12.15.17.13*	*Chainage 680 to Chainage 785 (west side)*	4 days	Mon 25/4/16	Thu 28/4/16	689
691	*4.12.15.17.14*	*Chainage 680 to Chainage 785 (east side)*	2 days	Fri 29/4/16	Sat 30/4/16	690
692	**4.12.15.18**	**Eastern Footpath from ch 380-580)**	**98 days**	**Sun 11/10/15**	**Sat 16/1/16**	**565**
693	*4.12.15.18.1*	*remove existing pavement*	*3 days*	Sun 11/10/15	Tue 13/10/15	
694	*4.12.15.18.2*	*upper stream box culvert 960x650*	*14 days*	Wed 14/10/15	Tue 27/10/15	*693*
695	*4.12.15.18.3*	*upper stream DN450mm pipe*	*12 days*	Wed 28/10/15	Sun 8/11/15	*694*
696	*4.12.15.18.4*	***VO053 - crossing no. 2, 3, 4, 5 (east footpath)***	***5 days***	**Mon 9/11/15**	**Fri 13/11/15**	***695***
697	*4.12.15.18.5*	*filling works to formation of footpath*	*5 days*	Sat 14/11/15	Wed 18/11/15	*696*
698	*4.12.15.18.6*	*street light crossing at ch523*	*5 days*	Thu 19/11/15	Mon 23/11/15	*697*
699	*4.12.15.18.7*	***UU for CLP (lighting)***	***5 days***	**Sun 29/11/15**	**Thu 3/12/15**	***698FS+5 days***
700	*4.12.15.18.8*	*sub-base & edging*	*6 days*	Fri 4/12/15	Wed 9/12/15	*699*
701	*4.12.15.18.9*	***UU for ch 380-580 (PCCW/HGC)***	***14 days***	**Thu 10/12/15**	**Wed 23/12/15**	***700***
702	*4.12.15.18.10*	*construct edging*	*10 days*	Thu 24/12/15	Sat 2/1/16	*701*
703	*4.12.15.18.11*	*footpath paving*	*14 days*	Sun 3/1/16	Sat 16/1/16	*702*
704	**4.12.15.19**	**Eastern Footpath from ch 190-380)**	**71 days**	**Sun 27/9/15**	**Sun 6/12/15**	**583**
705	*4.12.15.19.1*	*remove existing pavement*	*3 days*	Sun 27/9/15	Tue 29/9/15	
706	*4.12.15.19.2*	***VO053 - crossing no. 2 (east footpath)***	***3 days***	**Wed 30/9/15**	**Fri 2/10/15**	***705***
707	*4.12.15.19.3*	*filling works to formation of footpath*	*5 days*	Sat 3/10/15	Wed 7/10/15	*706*
708	*4.12.15.19.4*	*street light crossings at ch287,350*	*7 days*	Thu 8/10/15	Wed 14/10/15	*707*
709	*4.12.15.19.5*	***UU for CLP (lighting)***	***5 days***	**Thu 15/10/15**	**Mon 19/10/15**	***708***
710	*4.12.15.19.6*	*sub-base & edging*	*6 days*	Tue 20/10/15	Sun 25/10/15	*709*
711	*4.12.15.19.7*	***UU for ch 190-380 (PCCW/HGC)***	***20 days***	**Mon 26/10/15**	**Sat 14/11/15**	***710***
712	*4.12.15.19.8*	*construct edging*	*9 days*	Sun 15/11/15	Mon 23/11/15	*711*
713	*4.12.15.19.9*	*footpath paving*	*13 days*	Tue 24/11/15	Sun 6/12/15	*712*
714	**4.12.15.20**	**Eastern Footpath from ch 580-785)**	**71 days**	**Mon 20/7/15**	**Mon 28/9/15**	**613**
715	*4.12.15.20.1*	*remove existing pavement*	*3 days*	*Mon 20/7/15*	*Wed 22/7/15*	
716	*4.12.15.20.2*	***VO053 - crossing no. 5, 6, 7&8 (east footpath)***	***7 days***	***Thu 23/7/15***	***Wed 29/7/15***	***715***
717	*4.12.15.20.3*	*filling works to formation of footpath*	*5 days*	*Thu 30/7/15*	*Mon 3/8/15*	*716*
718	*4.12.15.20.4*	*street light crossings at ch760,785*	*7 days*	*Tue 4/8/15*	*Mon 10/8/15*	*717*
719	*4.12.15.20.5*	***UU for CLP (lighting)***	***5 days***	***Tue 11/8/15***	***Sat 15/8/15***	***718***
720	*4.12.15.20.6*	*sub-base & edging*	*6 days*	*Sun 16/8/15*	*Fri 21/8/15*	*719*
721	*4.12.15.20.7*	***UU for ch 580-785 (PCCW/HGC)***	***14 days***	***Sat 22/8/15***	***Fri 4/9/15***	***720***
722	*4.12.15.20.8*	*construct edging*	*10 days*	*Sat 5/9/15*	*Mon 14/9/15*	*721*
723	*4.12.15.20.9*	*footpath paving*	*14 days*	*Tue 15/9/15*	*Mon 28/9/15*	*722*
724	**4.12.15.21**	**Construction of retaining wall RW8 - CH0 to 22 (3 bays)**	**70 days**	**Tue 30/12/14**	**Mon 9/3/15**	**534**
726	*4.12.15.22*	*Site Formation works for ArchSD Depot (Drg. 1001B)*	*60 days*	*Tue 10/3/15*	*Fri 8/5/15*	*724*
727	**4.12.15.23**	**Archaeological survey (Sections T1 to T3)(Drg. 6403A)**	**147 days**	**Thu 24/10/13**	**Wed 19/3/14**	
733	4.13	Section XIV of the Works - Trees preservation and protection	730 days	Fri 12/4/13	Sat 11/4/15	4
741	4.14	Section XV of the Works - Landscape soft works (including transplant trees to permanent locations)	209 days	Thu 5/11/15	Tue 31/5/16	
745	4.15	Section XVI of the Works - Establishment works for landscape soft works	365 days	Wed 1/6/16	Wed 31/5/17	733,741

Revision 1
Tue 28/7/15

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

Appendix D

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



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

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Client

CEDD CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT

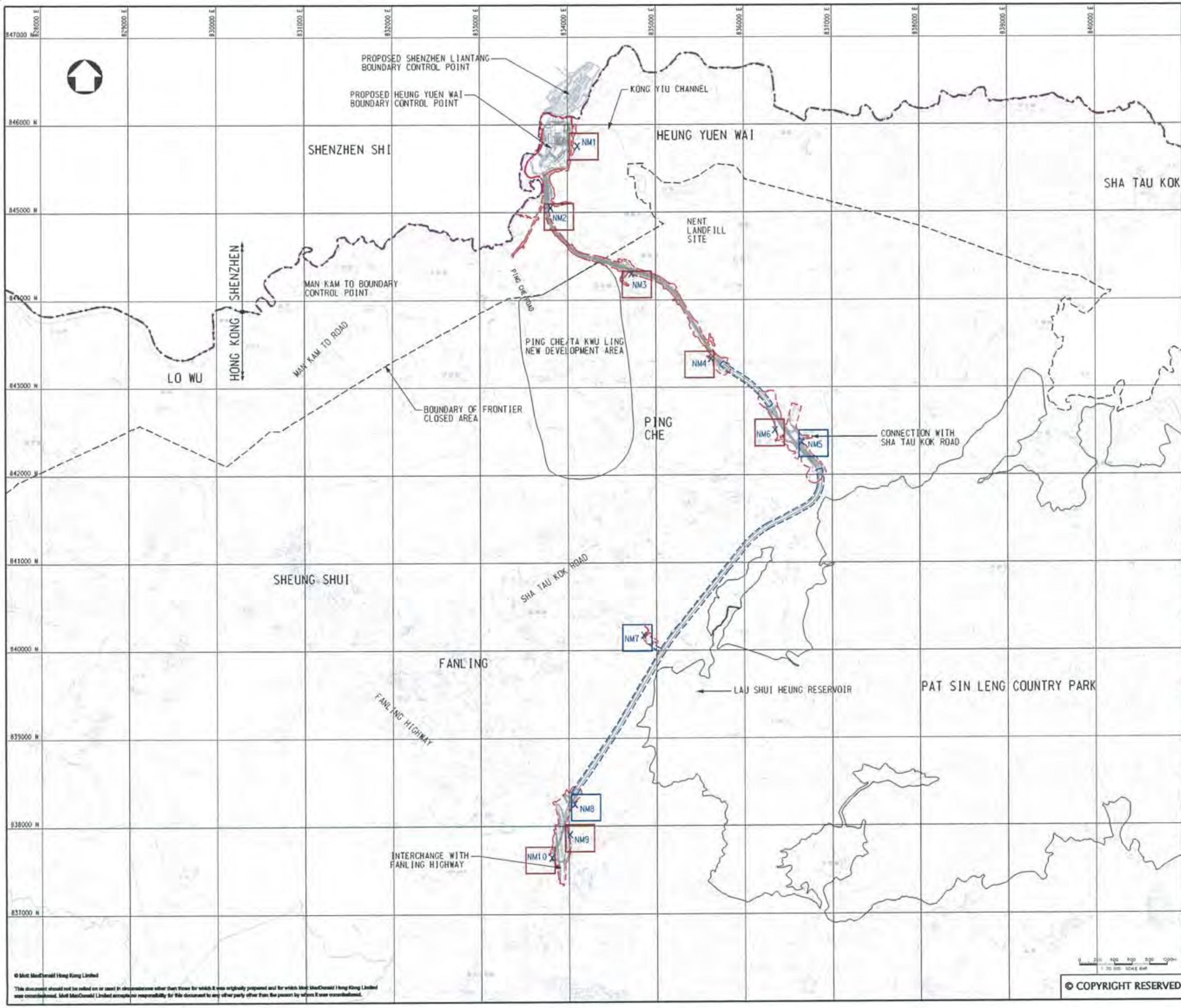
Project

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

Title

PROPOSED LOCATION OF CONSTRUCTION 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
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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20/F Two Landmark East
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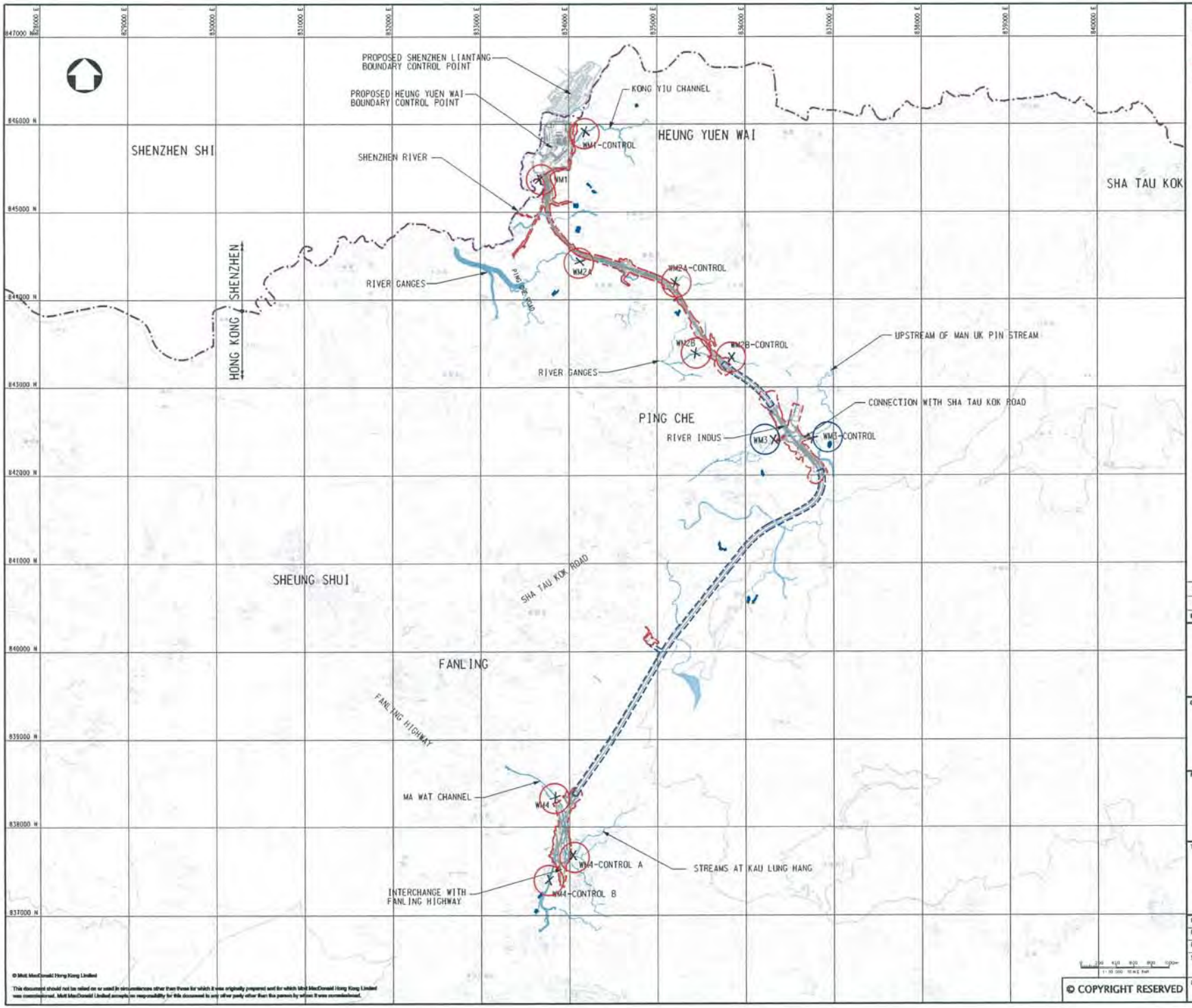
Project

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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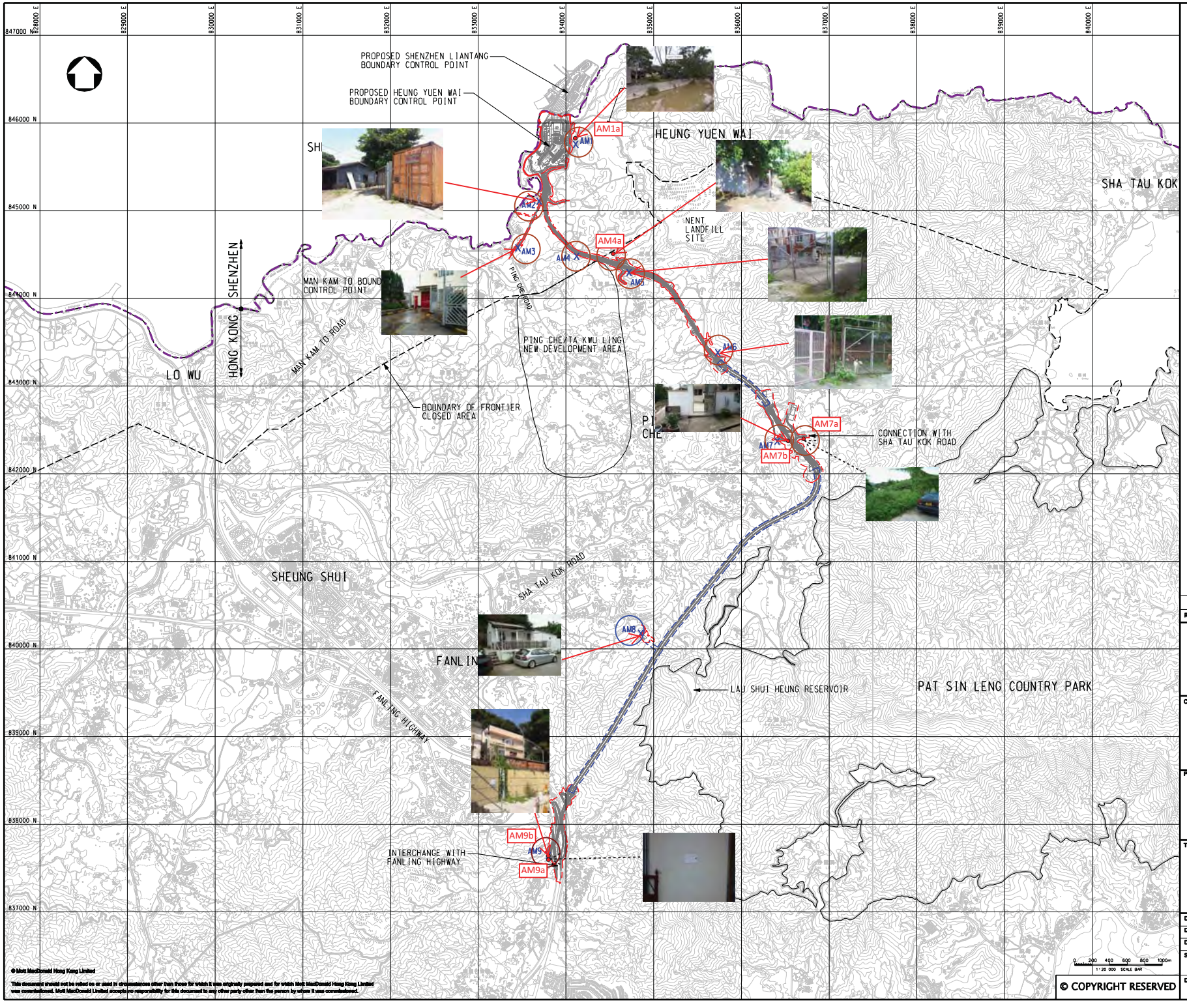
Title: LOCATIONS OF PROPOSED WATER QUALITY MONITORING STATIONS

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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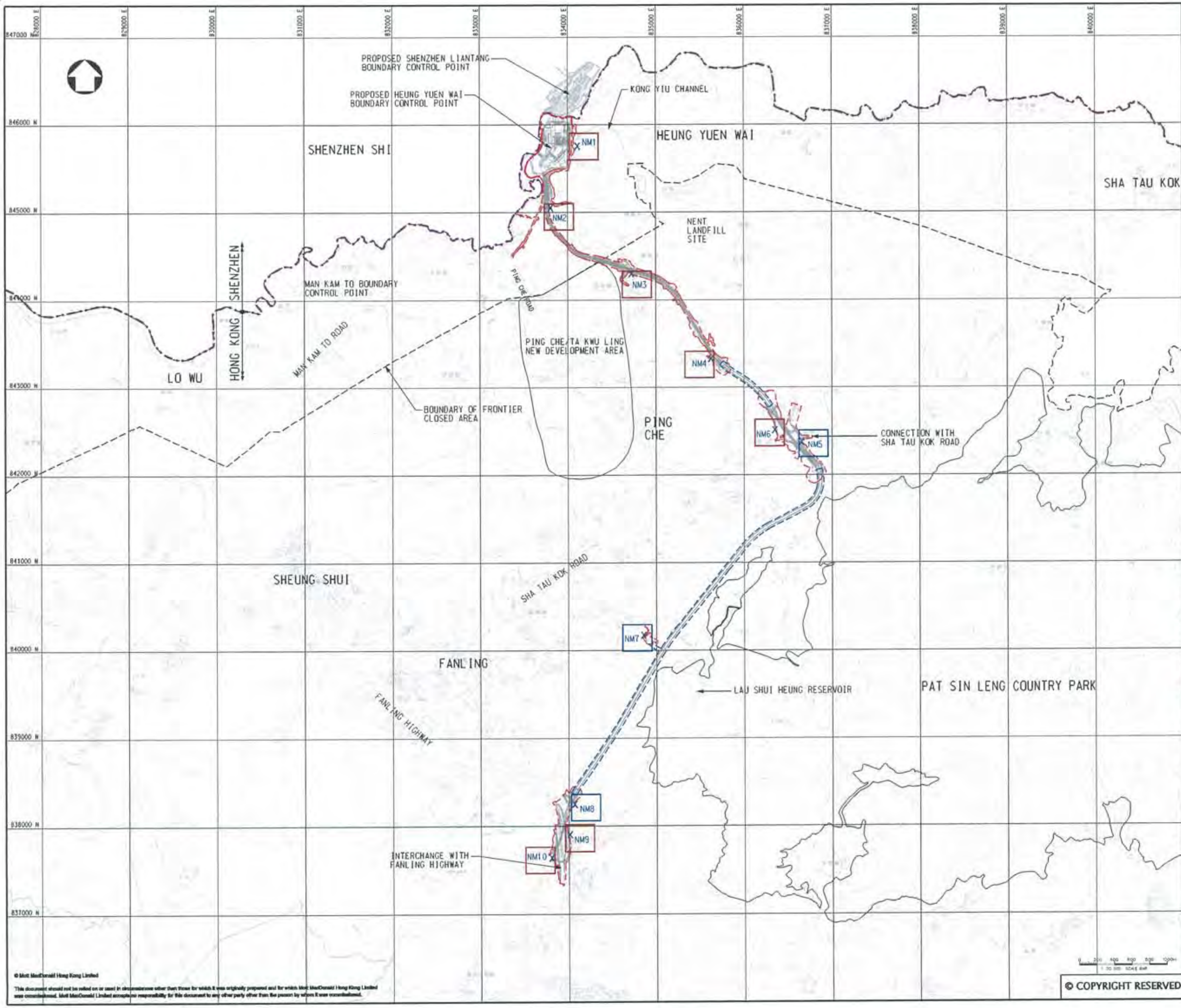
Title

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



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

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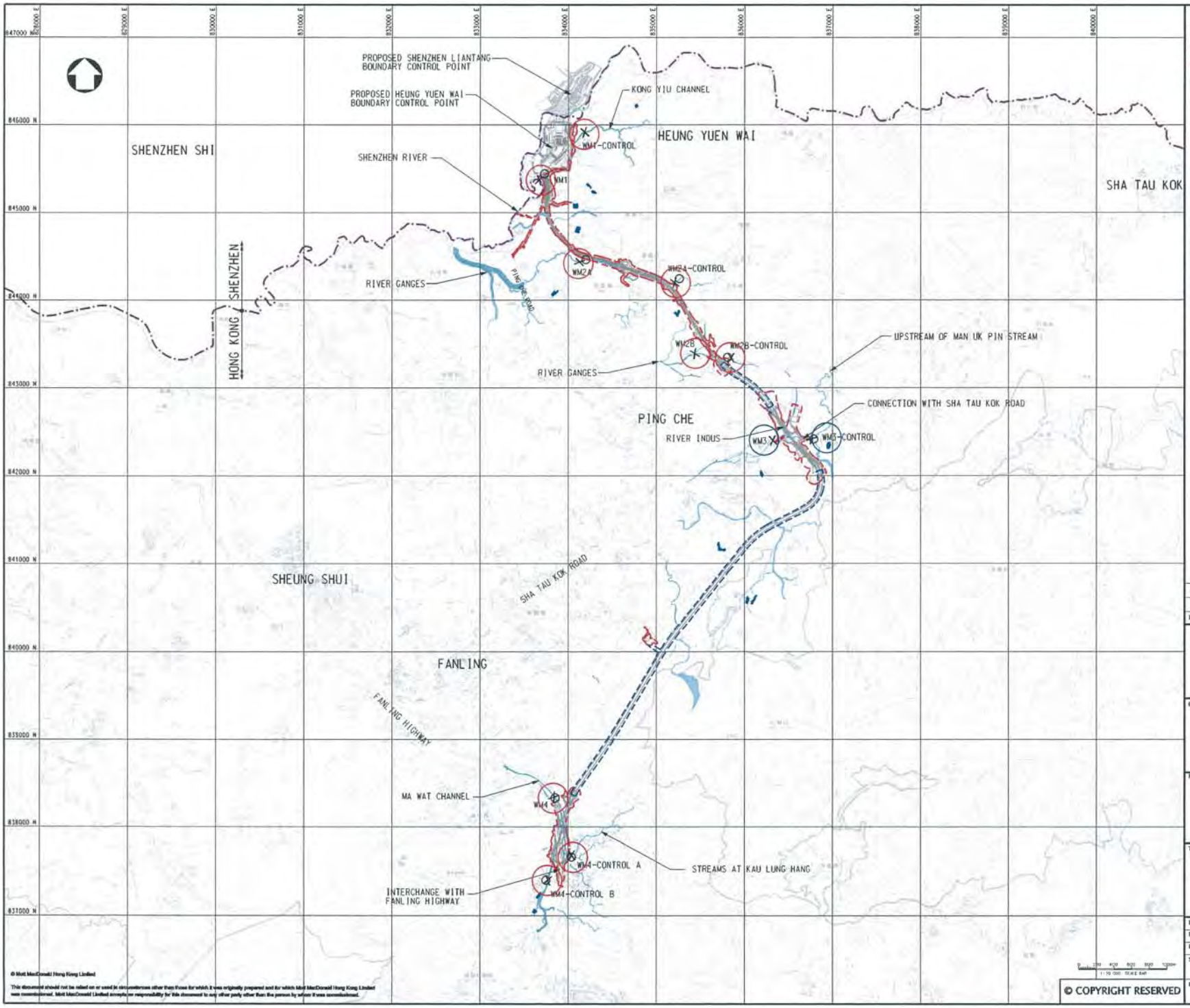
Client: CEDD CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT

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 — 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

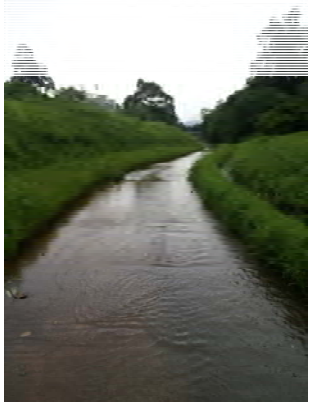
Title

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
Location ID : AM1a

Date of Calibration: 24/6/2015
Next Calibration Date: 24/8/2015
Technician: Keung Chi Young

CONDITIONS

Sea Level Pressure (hPa)	1005.3	Corrected Pressure (mm Hg)	753.975
Temperature (°C)	28.3	Temperature (K)	301

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	12.0	1.634	49	48.54	Slope = 34.5987
13	4.9	4.9	9.8	1.476	45	44.58	Intercept = -7.5049
10	3.9	3.9	7.8	1.317	38	37.64	Corr. coeff. = 0.9984
7	2.5	2.5	5.0	1.055	29	28.73	
5	1.7	1.7	3.4	0.870	23	22.78	

Calculations :

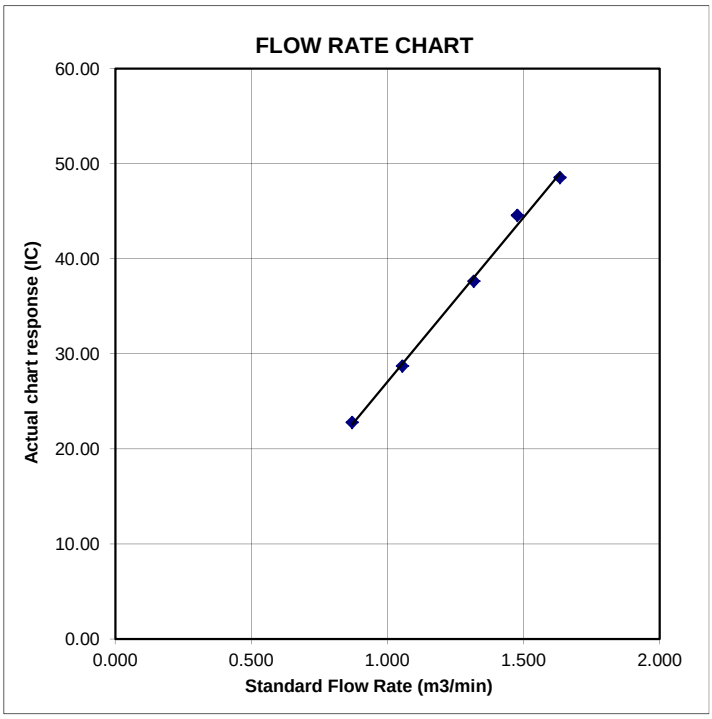
Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

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: 24/6/2015
Next Calibration Date: 24/8/2015
Technician: Keung Chi Young

CONDITIONS

Sea Level Pressure (hPa)	1005.3	Corrected Pressure (mm Hg)	753.975
Temperature (°C)	28.3	Temperature (K)	301

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	1.578	53	52.50	Slope = 34.3296
13	4.4	4.4	8.8	1.399	46	45.57	Intercept = -2.2451
10	3.5	3.5	7.0	1.248	40	39.62	Corr. coeff. = 0.9981
7	2.1	2.1	4.2	0.967	32	31.70	
5	1.3	1.3	2.6	0.761	24	23.77	

Calculations :

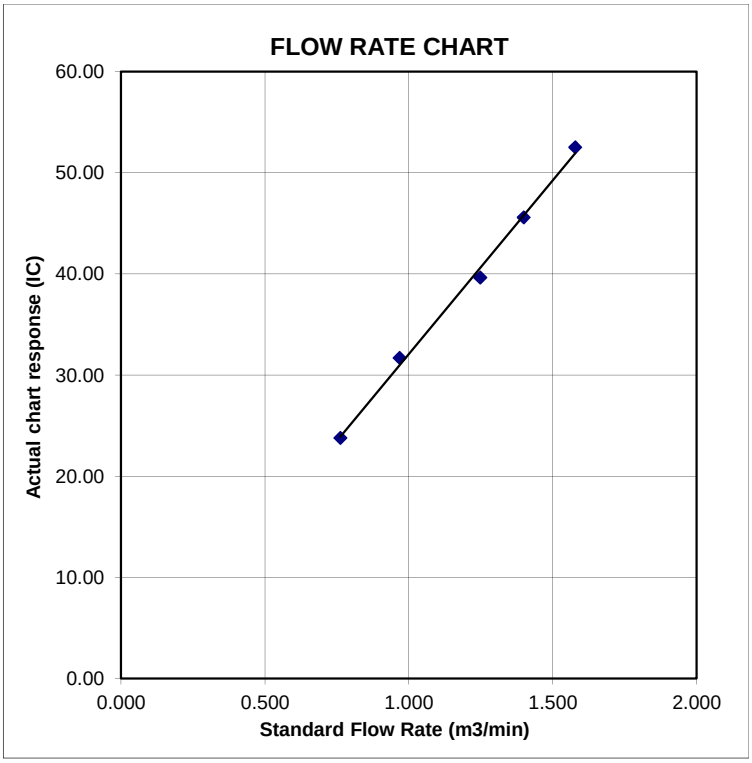
Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

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: 24/6/2015
Next Calibration Date: 24/8/2015
Technician: Keung Chi Young

CONDITIONS

Sea Level Pressure (hPa)	1005.3	Corrected Pressure (mm Hg)	753.975
Temperature (ºC)	28.3	Temperature (K)	301

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	1.713	55	54.48	Slope = 30.7637
13	5.2	5.2	10.4	1.521	50	49.53	Intercept = 1.7281
10	4	4	8.0	1.334	42	41.60	Corr. coeff. = 0.9972
7	2.5	2.5	5.0	1.055	34	33.68	
5	1.3	1.3	2.6	0.761	26	25.75	

Calculations :

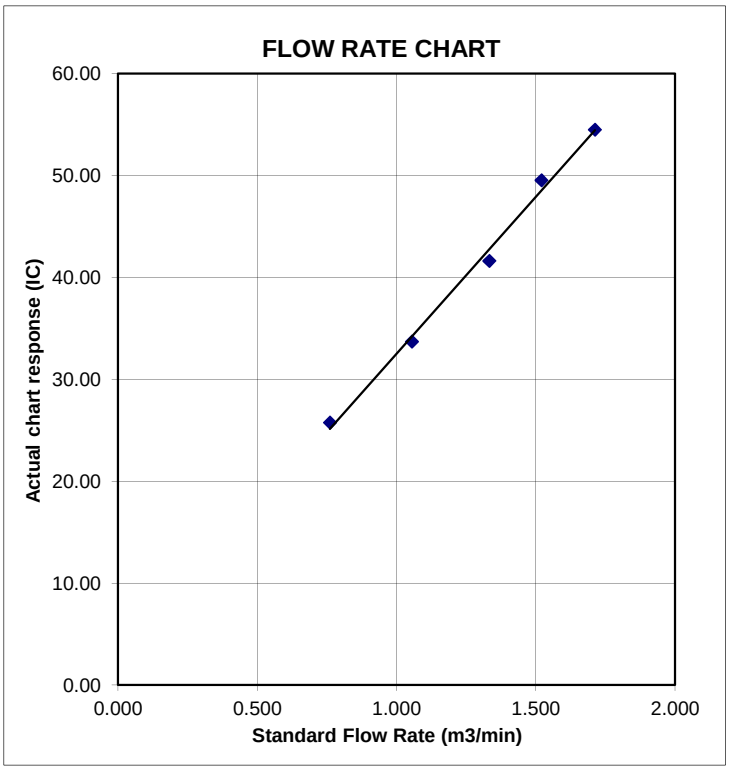
Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

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: 24/6/2015
Next Calibration Date: 24/8/2015
Technician: C Y Keung

CONDITIONS

Sea Level Pressure (hPa)	1005.3	Corrected Pressure (mm Hg)	753.975
Temperature (°C)	28.3	Temperature (K)	301

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	1.383	56	55.47	Slope = 34.6832
13	3.4	3.4	6.8	1.230	50	49.53	Intercept = 7.0968
10	2.6	2.6	5.2	1.076	44	43.58	Corr. coeff. = 0.9968
7	1.5	1.5	3.0	0.818	37	36.65	
5	1.0	1.0	2.0	0.668	30	29.72	

Calculations :

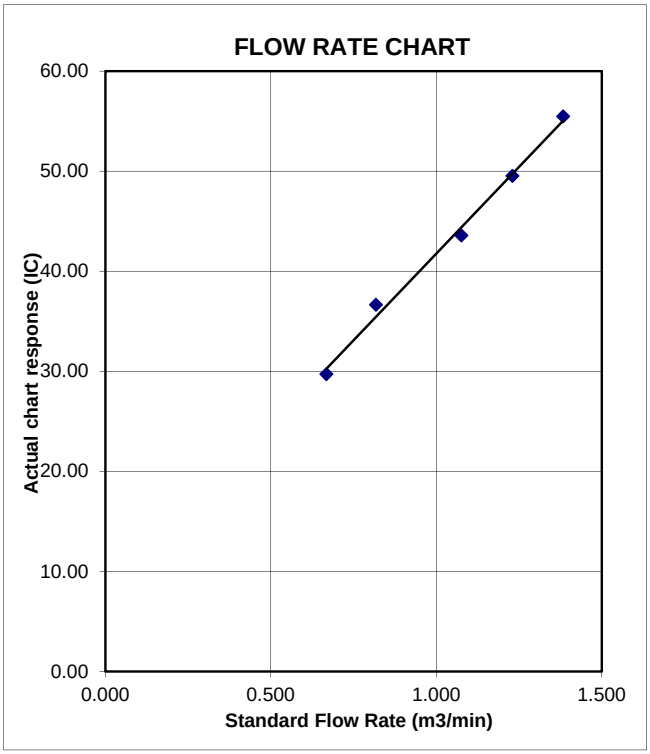
Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

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: 24/6/2015
Next Calibration Date: 24/8/2015
Technician: C Y Keung

CONDITIONS

Sea Level Pressure (hPa)	1005.3	Corrected Pressure (mm Hg)	753.975
Temperature (°C)	28.3	Temperature (K)	301

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	1.700	61	60.42	Slope = 34.7670
13	5.3	5.3	10.6	1.535	55	54.48	Intercept = 1.4600
10	4.1	4.1	8.2	1.351	49	48.54	Corr. coeff. = 0.9970
7	2.5	2.5	5.0	1.055	40	39.62	
5	1.6	1.6	3.2	0.844	30	29.72	

Calculations :

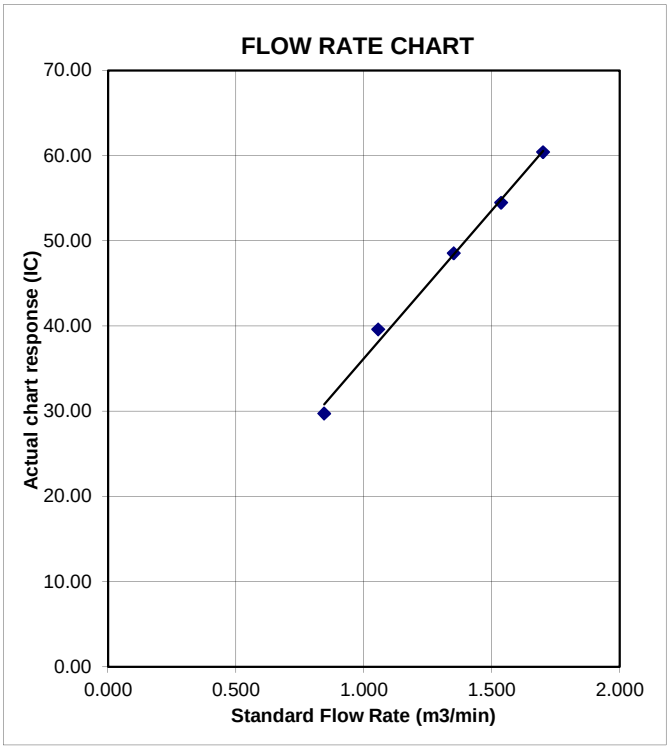
Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

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:	24/6/2015
Location ID : AM9b		Next Calibration Date:	24/8/2015
		Technician:	Keung Chi Young

CONDITIONS

Sea Level Pressure (hPa)	1005.3	Corrected Pressure (mm Hg)	753.975
Temperature (ºC)	28.3	Temperature (K)	301

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	6.5	6.5	13.0	1.700	56	55.47
13	5	5	10.0	1.491	48	47.55
10	3.7	3.7	7.4	1.283	43	42.59
7	2.7	2.7	5.4	1.096	35	34.67
5	1.2	1.2	2.4	0.731	25	24.76

LINEAR REGRESSION

Slope = 31.6602
Intercept = 1.1022
Corr. coeff. = 0.9971

Calculations :

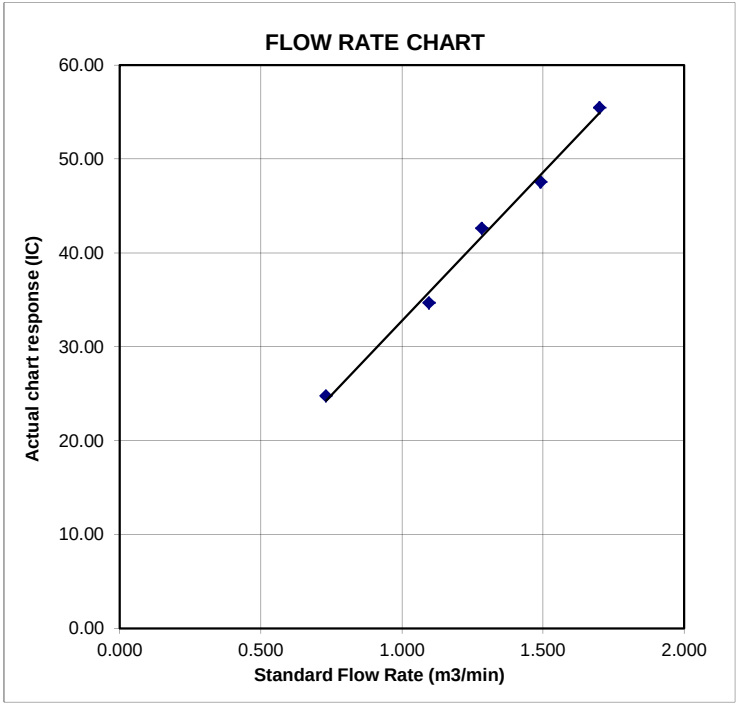
Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

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

For subsequent calculation of sampler flow:

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

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



TISCH Environmental

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

ORIFICE TRANSFER STANDARD CERTIFICATION WORKSHEET TE-5025A

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

PLATE OR Run #	VOLUME START (m3)	VOLUME STOP (m3)	DIFF VOLUME (m3)	DIFF TIME (min)	METER DIFF Hg (mm)	ORFICE DIFF H2O (in.)
1	NA	NA	1.00	1.4880	3.2	2.00
2	NA	NA	1.00	1.0510	6.4	4.00
3	NA	NA	1.00	0.9360	7.9	5.00
4	NA	NA	1.00	0.8920	8.8	5.50
5	NA	NA	1.00	0.7360	12.7	8.00

DATA TABULATION

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

CALCULATIONS

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

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

For subsequent flow rate calculations:

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

Equipment Calibration Record

Equipment Calibrated:

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

Standard Equipment:

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

Equipment Calibration Results:

Calibration Date: 4 January 2015

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

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

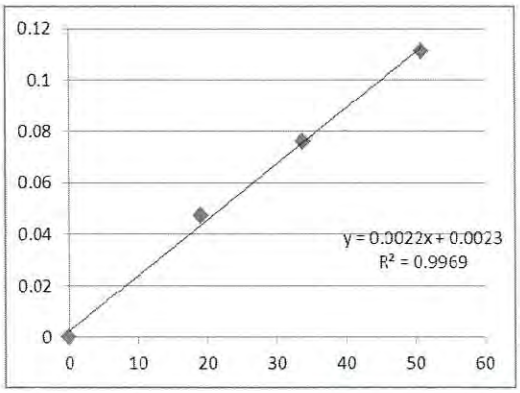
Sensitivity Adjustment Scale Setting (After Calibration) 588 (CPM)

Linear Regression of Y or X

Slope (K-factor): 0.0022

Correlation Coefficient 0.9969

Date of Issue 6 January 2015



Operator : Donald Kwok Signature : Date : 6 January 2015

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

TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

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

CONDITIONS

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

CALIBRATION ORIFICE

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

CALIBRATION

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

Calculations :

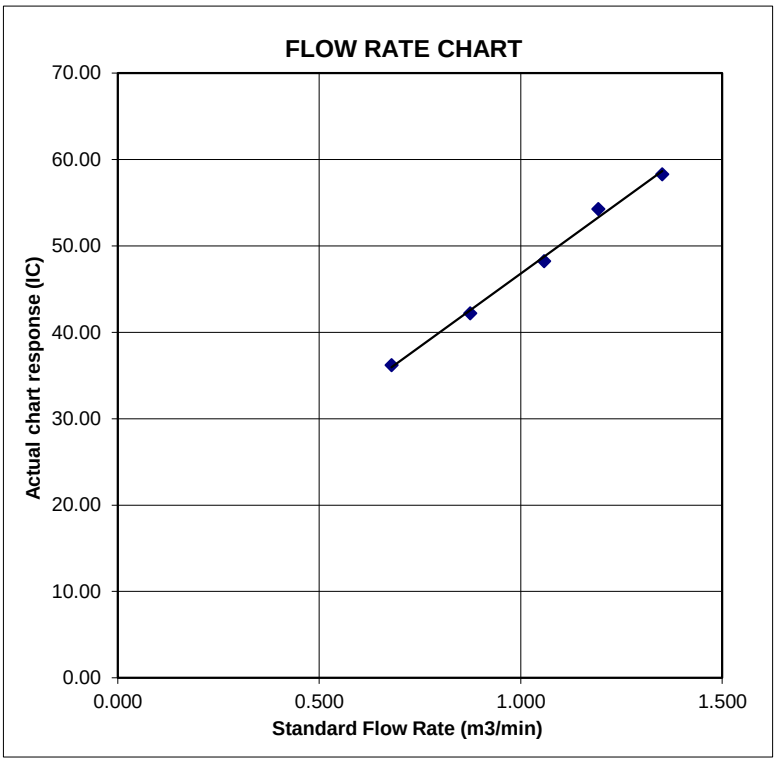
Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

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

For subsequent calculation of sampler flow:

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

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



Equipment Calibration Record

Equipment Calibrated:

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

Standard Equipment:

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

Equipment Calibration Results:

Calibration Date: 4 January 2015

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

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

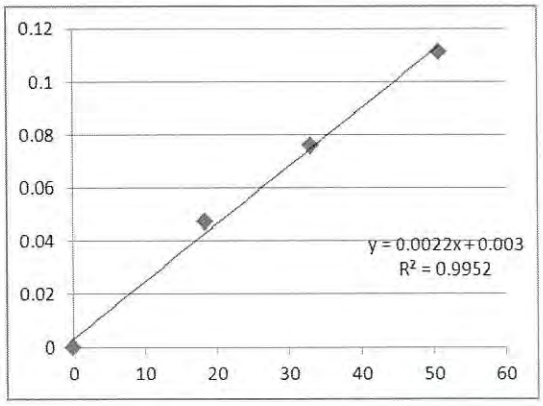
Sensitivity Adjustment Scale Setting (After Calibration) 533 (CPM)

Linear Regression of Y or X

Slope (K-factor): 0.0022

Correlation Coefficient 0.9952

Date of Issue 6 January 2015



Operator : Donald Kwok Signature : Date : 6 January 2015

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

TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

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

CONDITIONS

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

CALIBRATION ORIFICE

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

CALIBRATION

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

Calculations :

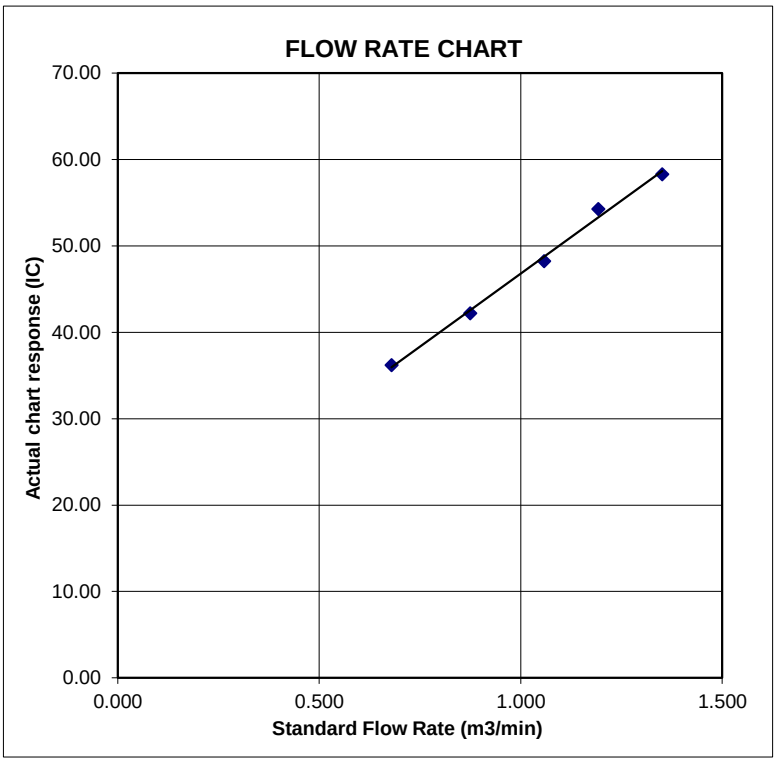
Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

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

For subsequent calculation of sampler flow:

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

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



Equipment Verification Report (TSP)

Equipment Calibrated:

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

Standard Equipment:

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

Equipment Verification Results:

Testing Date: 5 April 2015

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

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

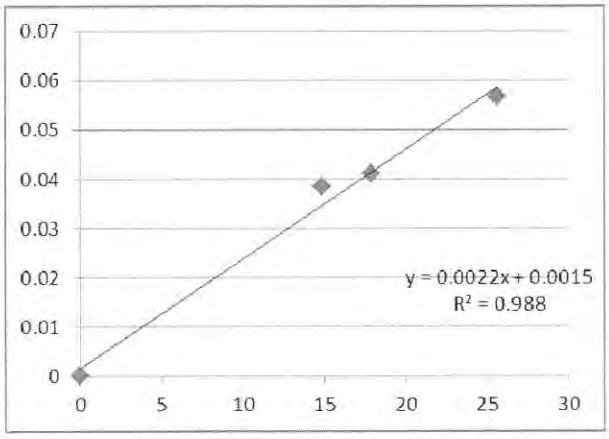
Sensitivity Adjustment Scale Setting (After Calibration) 602 (CPM)

Linear Regression of Y or X

Slope (K-factor): 0.0022

Correlation Coefficient 0.9940

Date of Issue 20 April 2015



Remarks:

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

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

Operator : Donald Kwok Signature : Date : 20 April 2015

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

TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

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

CONDITIONS

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

CALIBRATION ORIFICE

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

CALIBRATION

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

Calculations :

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

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

Qstd = standard flow rate

IC = corrected chart respones

I = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

Ta = actual temperature during calibration (deg K)

Pstd = actual pressure during calibration (mm Hg)

For subsequent calculation of sampler flow:

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

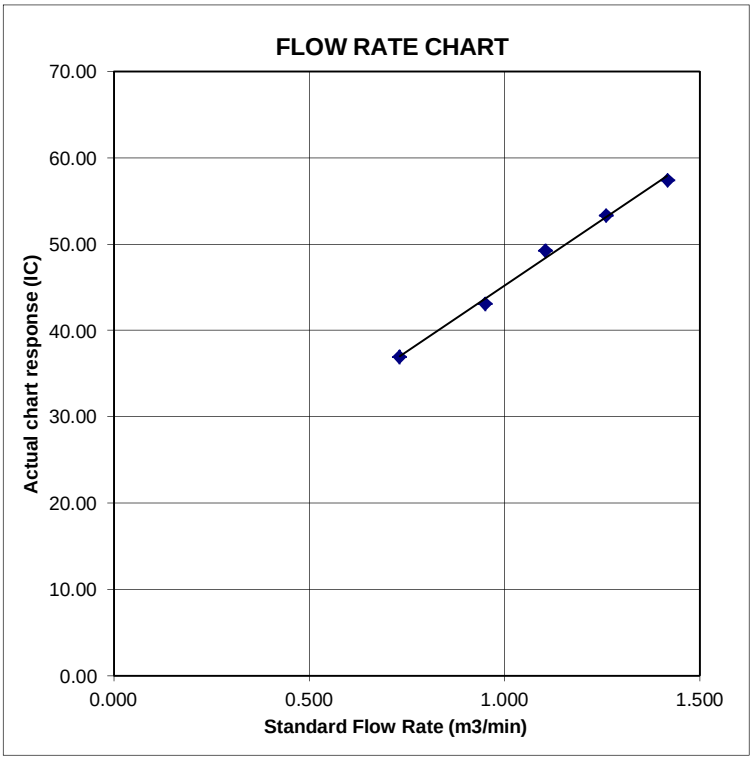
m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure



Equipment Verification Report (TSP)

Equipment Calibrated:

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

Standard Equipment:

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

Equipment Verification Results:

Testing Date: 5 April 2015

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

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

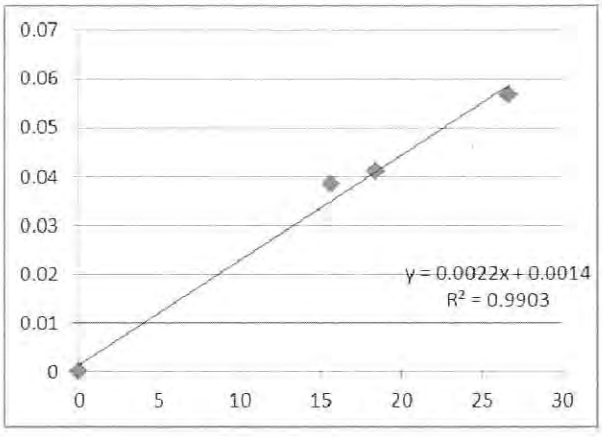
Sensitivity Adjustment Scale Setting (After Calibration) 701 (CPM)

Linear Regression of Y or X

Slope (K-factor): 0.0022

Correlation Coefficient 0.9951

Date of Issue 20 April 2015



Remarks:

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

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

Operator : Donald Kwok Signature : Date : 20 April 2015

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

TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

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

CONDITIONS

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

CALIBRATION ORIFICE

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

CALIBRATION

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

Calculations :

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

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

Qstd = standard flow rate

IC = corrected chart respones

I = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

Ta = actual temperature during calibration (deg K)

Pstd = actual pressure during calibration (mm Hg)

For subsequent calculation of sampler flow:

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

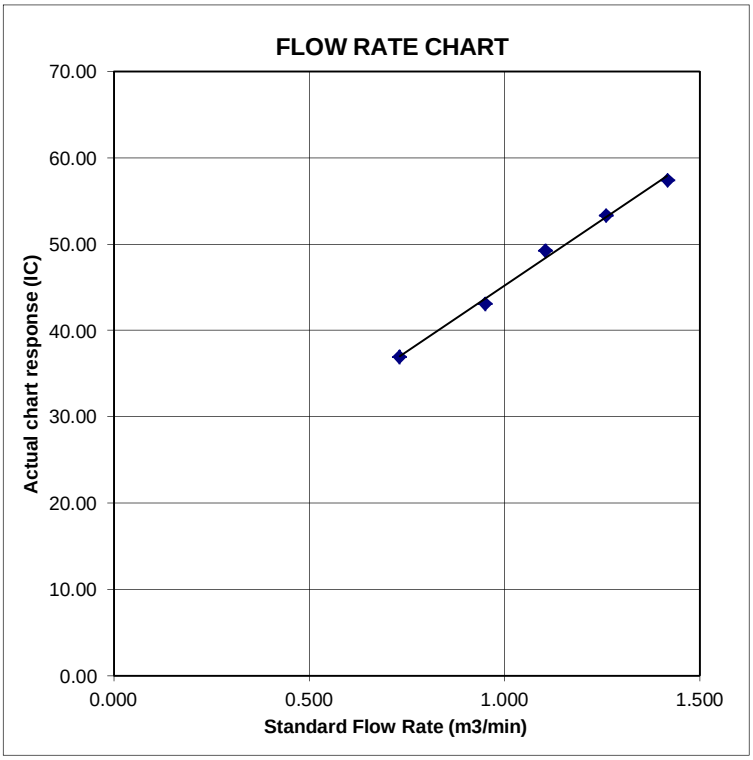
m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure



SIBATA (EQ111)

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

CALIBRATION CERTIFICATE

Date: May 11, 2015

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

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

Sincerely

SIBATA SCIENTIFIC TECHNOLOGY LTD.

Hong

For Kentaro Togo
Overseas Sales Division

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

Certificate of Calibration
校正證書

Certificate No. : C151969
證書編號

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

Description / 儀器名稱	:	Integrating Sound Level Meter (EQ006)
Manufacturer / 製造商	:	Brüel & Kjær
Model No. / 型號	:	2238
Serial No. / 編號	:	2285762
Supplied By / 委託者	:	Action-United Environmental Services and Consulting Unit A, 20/F., Gold King Industrial Building, 35-41 Tai Lin Pai Road, Kwai Chung, N.T.

TEST CONDITIONS / 測試條件

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

TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 11 April 2015

TEST RESULTS / 測試結果

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

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

Tested By 測試 : K C Lee, Project Engineer

Certified By 核證 : K M Wu, Engineer

Date of Issue 簽發日期 : 14 April 2015

Sun Creation Engineering Limited – Calibration & Testing Laboratory
c/o 4/F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
輝創工程有限公司 – 校正及檢測實驗所
c/o 香港新界屯門興安里一號青山灣機樓四樓
Tel/電話: 2927 2606 Fax/傳真: 2744 8986 E-mail/電郵: callab@suncreation.com Website/網址: www.suncreation.com

Certificate of Calibration
校正證書

Certificate No. : C151969
證書編號

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

2. Self-calibration using laboratory acoustic calibrator was performed before the test from 6.1.1.2 to 6.4.

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

4. Test equipment :

Equipment ID	Description	Certificate No.
CL280	40 MHz Arbitrary Waveform Generator	C150014
CL281	Multifunction Acoustic Calibrator	DC130171

5. Test procedure : MA101N.

6. Results :

6.1 Sound Pressure Level

6.1.1 Reference Sound Pressure Level

6.1.1.1 Before Self-calibration

UUT Setting				Applied Value		UUT Reading (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	
50 - 130	L_{AFP}	A	F	94.00	1	94.3

6.1.1.2 After Self-calibration

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
50 - 130	L_{AFP}	A	F	94.00	1	94.1	± 0.7

6.1.2 Linearity

UUT Setting				Applied Value		UUT Reading (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	
50 - 130	L_{AFP}	A	F	94.00	1	94.1 (Ref.)
				104.00		104.0
				114.00		114.0

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

Sun Creation Engineering Limited - Calibration & Testing Laboratory
c/o 4/F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
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c/o 香港新界屯門興安里一號青山灣機樓四樓
Tel/電話: 2927 2606 Fax/傳真: 2744 8986 E-mail/電郵: callab@suncreation.com Website/網址: www.suncreation.com

Certificate of Calibration
校正證書

Certificate No. : C151969
證書編號

6.2 Time Weighting

6.2.1 Continuous Signal

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

6.2.2 Tone Burst Signal (2 kHz)

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Burst Duration		
30 - 110	L_{AFP}	A	F	106.0	Continuous	106.0	Ref.
	L_{AFMax}				200 ms	104.9	-1.0 ± 1.0
	L_{ASP}		S		Continuous	106.0	Ref.
	L_{ASMax}				500 ms	101.9	-4.1 ± 1.0

6.3 Frequency Weighting

6.3.1 A-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
50 - 130	L_{AFP}	A	F	94.00	31.5 Hz	55.1	-39.4 ± 1.5
					63 Hz	68.0	-26.2 ± 1.5
					125 Hz	77.9	-16.1 ± 1.0
					250 Hz	85.4	-8.6 ± 1.0
					500 Hz	90.8	-3.2 ± 1.0
					1 kHz	94.1	Ref.
					2 kHz	95.3	+1.2 ± 1.0
					4 kHz	95.1	+1.0 ± 1.0
					8 kHz	93.0	-1.1 (+1.5 ; -3.0)
					12.5 kHz	89.9	-4.3 (+3.0 ; -6.0)

Certificate of Calibration
校正證書

Certificate No. : C151969
證書編號

6.3.2 C-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
50 - 130	L_{CFP}	C	F	94.00	31.5 Hz	91.4	-3.0 ± 1.5
					63 Hz	93.4	-0.8 ± 1.5
					125 Hz	93.9	-0.2 ± 1.0
					250 Hz	94.1	0.0 ± 1.0
					500 Hz	94.1	0.0 ± 1.0
					1 kHz	94.1	Ref.
					2 kHz	93.9	-0.2 ± 1.0
					4 kHz	93.3	-0.8 ± 1.0
					8 kHz	91.1	-3.0 (+1.5 ; -3.0)
					12.5 kHz	88.0	-6.2 (+3.0 ; -6.0)

6.4 Time Averaging

UUT Setting				Applied Value					UUT Reading (dB)	IEC 60804 Type 1 Spec. (dB)
Range (dB)	Parameter	Frequency Weighting	Integrating Time	Frequency (kHz)	Burst Duration (ms)	Burst Duty Factor	Burst Level (dB)	Equivalent Level (dB)		
30 - 110	L_{Aeq}	A	10 sec.	4	1	1/10	110.0	100	100.0	± 0.5
						$1/10^2$		90	90.1	± 0.5
			60 sec.			$1/10^3$		80	79.4	± 1.0
			5 min.			$1/10^4$		70	69.2	± 1.0

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

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

- Uncertainties of Applied Value :

94 dB	: 31.5 Hz - 125 Hz	: ± 0.35 dB
	250 Hz - 500 Hz	: ± 0.30 dB
	1 kHz	: ± 0.20 dB
	2 kHz - 4 kHz	: ± 0.35 dB
	8 kHz	: ± 0.45 dB
	12.5 kHz	: ± 0.70 dB
104 dB : 1 kHz		: ± 0.10 dB (Ref. 94 dB)
114 dB : 1 kHz		: ± 0.10 dB (Ref. 94 dB)
Burst equivalent level		: ± 0.2 dB (Ref. 110 dB continuous sound level)

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

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

Sun Creation Engineering Limited – Calibration & Testing Laboratory
c/o 4/F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
輝創工程有限公司 – 校正及檢測實驗所
c/o 香港新界屯門興安里一號青山灣機樓四樓
Tel/電話: 2927 2606 Fax/傳真: 2744 8986 E-mail/電郵: callab@suncreation.com Website/網址: www.suncreation.com

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

Certificate of Calibration
校正證書

Certificate No. : C153055
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC15-0720) Date of Receipt / 收件日期 : 15 May 2015

Description / 儀器名稱 : Integrating Sound Level Meter (EQ065)
Manufacturer / 製造商 : Brüel & Kjær
Model No. / 型號 : 2238
Serial No. / 編號 : 2337676
Supplied By / 委託者 : Action-United Environmental Services and Consulting
Unit A, 20/F., Gold King Industrial Building,
35-41 Tai Lin Pai Road, Kwai Chung, N.T.

TEST CONDITIONS / 測試條件

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

TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 4 June 2015

TEST RESULTS / 測試結果

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

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

Tested By 測試 : K C Lee, Project Engineer

Certified By 核證 : K M Wu, Engineer

Date of Issue 簽發日期 : 5 June 2015

Sun Creation Engineering Limited – Calibration & Testing Laboratory
c/o 4/F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
輝創工程有限公司 – 校正及檢測實驗所
c/o 香港新界屯門興安里一號青山灣機樓四樓
Tel/電話: 2927 2606 Fax/傳真: 2744 8986 E-mail/電郵: callab@suncreation.com Website/網址: www.suncreation.com

Certificate of Calibration
校正證書

Certificate No. : C153055
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. The results presented are the mean of 3 measurements at each calibration point.

3. Test equipment :

Equipment ID	Description	Certificate No.
CL280	40 MHz Arbitrary Waveform Generator	C150014
CL281	Multifunction Acoustic Calibrator	DC130171

4. Test procedure : MA101N.

5. Results :

5.1 Sound Pressure Level

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

5.1.2 Linearity

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

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

5.2 Time Weighting

5.2.1 Continuous Signal

UUT Setting				Applied Value		UUT	IEC 60651
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	Reading (dB)	Type 1 Spec. (dB)
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

Sun Creation Engineering Limited – Calibration & Testing Laboratory
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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. : C153055
證書編號

5.2.2 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

5.3 Frequency Weighting

5.3.1 A-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
50 - 130	L_{AFP}	A	F	94.00	31.5 Hz	54.8	-39.4 ± 1.5
					63 Hz	67.9	-26.2 ± 1.5
					125 Hz	77.8	-16.1 ± 1.0
					250 Hz	85.3	-8.6 ± 1.0
					500 Hz	90.8	-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)

5.3.2 C-Weighting

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

Certificate of Calibration
校正證書

Certificate No. : C153055
證書編號

5.4 Time Averaging

UUT Setting				Applied Value					UUT Reading (dB)	IEC 60804 Type 1 Spec. (dB)
Range (dB)	Parameter	Frequency Weighting	Integrating Time	Frequency (kHz)	Burst Duration (ms)	Burst Duty Factor	Burst Level (dB)	Equivalent Level (dB)		
30 - 110	L_{Aeq}	A	10 sec.	4	1	1/10	110.0	100	100.0	± 0.5
						$1/10^2$		90	89.7	± 0.5
			60 sec.			$1/10^3$		80	79.8	± 1.0
			5 min.			$1/10^4$		70	69.7	± 1.0

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

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

- Uncertainties of Applied Value :

94 dB	: 31.5 Hz - 125 Hz	: ± 0.35 dB
	250 Hz - 500 Hz	: ± 0.30 dB
	1 kHz	: ± 0.20 dB
	2 kHz - 4 kHz	: ± 0.35 dB
	8 kHz	: ± 0.45 dB
	12.5 kHz	: ± 0.70 dB
104 dB	: 1 kHz	: ± 0.10 dB (Ref. 94 dB)
114 dB	: 1 kHz	: ± 0.10 dB (Ref. 94 dB)
Burst equivalent level		: ± 0.2 dB (Ref. 110 dB continuous sound level)

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

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

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. : C152552
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC15-0720) Date of Receipt / 收件日期 : 17 April 2015

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

TEST CONDITIONS / 測試條件

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

TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 8 May 2015

TEST RESULTS / 測試結果

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

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

Tested By 測試 : K C Lee, Project Engineer

Certified By 核證 : K M Wu, Engineer

Date of Issue 簽發日期 : 12 May 2015

Sun Creation Engineering Limited – Calibration & Testing Laboratory
c/o 4/F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
輝創工程有限公司 – 校正及檢測實驗所
c/o 香港新界屯門興安里一號青山灣機樓四樓
Tel/電話: 2927 2606 Fax/傳真: 2744 8986 E-mail/電郵: callab@suncreation.com Website/網址: www.suncreation.com

Certificate of Calibration
校正證書

Certificate No. : C152552
證書編號

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

2. Self-calibration was performed before the test.

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

4. Test equipment :

Equipment ID	Description	Certificate No.
CL280	40 MHz Arbitrary Waveform Generator	C150014
CL281	Multifunction Acoustic Calibrator	DC130171

5. Test procedure : MA101N.

6. Results :

6.1 Sound Pressure Level

6.1.1 Reference Sound Pressure Level

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

6.1.2 Linearity

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

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

6.2 Time Weighting

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

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Certificate of Calibration
校正證書

Certificate No. : C152552
證書編號

6.3 Frequency Weighting

6.3.1 A-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 130	L_A	A	Fast	94.00	63 Hz	67.3	-26.2 ± 1.5
					125 Hz	77.4	-16.1 ± 1.5
					250 Hz	84.9	-8.6 ± 1.4
					500 Hz	90.3	-3.2 ± 1.4
					1 kHz	93.6	Ref.
					2 kHz	94.8	+1.2 ± 1.6
					4 kHz	94.6	+1.0 ± 1.6
					8 kHz	92.6	-1.1 (+2.1 ; -3.1)
					12.5 kHz	89.2	-4.3 (+3.0 ; -6.0)

6.3.2 C-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 130	L_C	C	Fast	94.00	63 Hz	92.7	-0.8 ± 1.5
					125 Hz	93.4	-0.2 ± 1.5
					250 Hz	93.6	0.0 ± 1.4
					500 Hz	93.6	0.0 ± 1.4
					1 kHz	93.6	Ref.
					2 kHz	93.4	-0.2 ± 1.6
					4 kHz	92.8	-0.8 ± 1.6
					8 kHz	90.7	-3.0 (+2.1 ; -3.1)
					12.5 kHz	87.2	-6.2 (+3.0 ; -6.0)

Remarks : - UUT Microphone Model No. : UC-59 & S/N : 07459

- Mfr's Spec. : IEC 61672 Class 1

- Uncertainties of Applied Value :

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

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

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

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

Certificate of Calibration
校正證書

Certificate No. : C151967
證書編號

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

Description / 儀器名稱 : Sound Level Calibrator (EQ084)
Manufacturer / 製造商 : Cesva
Model No. / 型號 : CB-5
Serial No. / 編號 : 030023
Supplied By / 委託者 : Action-United Environmental Services and Consulting
Unit A, 20/F., Gold King Industrial Building,
35-41 Tai Lin Pai Road, Kwai Chung, N.T.

TEST CONDITIONS / 測試條件

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

TEST SPECIFICATIONS / 測試規範

Calibration

DATE OF TEST / 測試日期 : 11 April 2015

TEST RESULTS / 測試結果

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

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

Tested By 測試 : K C Lee, Project Engineer

Certified By 核證 : K M Wu, Engineer

Date of Issue 簽發日期 : 14 April 2015

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Certificate of Calibration
校正證書

Certificate No. : C151967
證書編號

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

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

3. Test equipment :

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

4. Test procedure : MA100N.

5. Results :

5.1 Sound Level Accuracy

5.1.1 Before Adjustment

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

Out of Mfr's Spec.

5.1.2 After Adjustment

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

5.2 Frequency Accuracy

5.2.1 Before Adjustment

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

5.2.2 After Adjustment

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

Certificate of Calibration
校正證書

Certificate No. : C151967
證書編號

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

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

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Sun Creation Engineering Limited
Calibration and Testing Laboratory

Certificate of Calibration
校正證書

Certificate No. : C152550
證書編號

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

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

TEST CONDITIONS / 測試條件

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

TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 7 May 2015

TEST RESULTS / 測試結果

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

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

Tested By 測試 : K C Lee, Project Engineer

Certified By 核證 : K M Wu, Engineer

Date of Issue 簽發日期 : 12 May 2015

Sun Creation Engineering Limited – Calibration & Testing Laboratory
c/o 4/F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
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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. : C152550
證書編號

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

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

3. Test equipment :

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

4. Test procedure : MA100N.

5. Results :

5.1 Sound Level Accuracy

UUT Nominal Value	Measured Value (dB)	Mfr's Spec. (dB)	Uncertainty of Measured Value (dB)
94 dB, 1 kHz	94.0	± 0.2	± 0.2
114 dB, 1 kHz	114.0		

5.2 Frequency Accuracy

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

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

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

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Calibration and Testing Laboratory

Certificate of Calibration
校正證書

Certificate No. : C151968
證書編號

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

Description / 儀器名稱 : Sound Calibrator (EQ083)
Manufacturer / 製造商 : Rion
Model No. / 型號 : NC-74
Serial No. / 編號 : 34246492
Supplied By / 委託者 : Action-United Environmental Services and Consulting
Unit A, 20/F., Gold King Industrial Building,
35-41 Tai Lin Pai Road, Kwai Chung, N.T.

TEST CONDITIONS / 測試條件

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

TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 11 April 2015

TEST RESULTS / 測試結果

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

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

Tested By 測試 : K C Lee, Project Engineer

Certified By 核證 : K M Wu, Engineer

Date of Issue 簽發日期 : 14 April 2015

Sun Creation Engineering Limited – Calibration & Testing Laboratory
c/o 4/F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
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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. : C151968
證書編號

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

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

3. Test equipment :

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

4. Test procedure : MA100N.

5. Results :

5.1 Sound Level Accuracy

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

5.2 Frequency Accuracy

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

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REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

CONTACT:	MR BEN TAM	**WORK ORDER:**	HK1514895
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:	06/05/2015
		DATE OF ISSUE:	13/05/2015

COMMENTS

The performance of the equipment stated in this report is checked with independent reference material and results compared against a calibrated secondary source.
The "Tolerance Limit" quoted is the acceptance criteria applicable for similar equipment used by the ALS Hong Kong laboratory or quoted from relevant international standards.
The "Next Calibration Date" is recommended according to best practice principals as practised by the ALS Hong Kong laboratory or quoted from relevant international standards.

Scope of Test:	Turbidity
Equipment Type:	Turbidimeter
Brand Name:	HACH
Model No.:	2100Q
Serial No.:	12060C018266
Equipment No.:	--
Date of Calibration:	07 May, 2015

NOTES

This is the Final Report and supersedes any preliminary report with this batch number.
Results apply to sample(s) as submitted. All pages of this report have been checked and approved for release.

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

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

Work Order: HK1514895
Sub-batch: 0
Date of Issue: 13/05/2015
Client: ACTION UNITED ENVIRO SERVICES

Equipment Type: Turbidimeter
Brand Name: HACH
Model No.: 2100Q
Serial No.: 12060C018266
Equipment No.: --
Date of Calibration: 07 May, 2015 Date of next Calibration: 07 August, 2015

Parameters:

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

Expected Reading (NTU)	Displayed Reading (NTU)	Tolerance (%)
0	0.08	--
4	4.37	+9.3
40	43.7	+9.3
80	85.9	+7.4
400	427	+6.8
800	870	+8.8
	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

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REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

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

COMMENTS

The performance of the equipment stated in this report is checked with independent reference material and results compared against a calibrated secondary source.
The "Tolerance Limit" quoted is the acceptance criteria applicable for similar equipment used by the ALS Hong Kong laboratory or quoted from relevant international standards.
The "Next Calibration Date" is recommended according to best practice principals as practised by the ALS Hong Kong laboratory or quoted from relevant international standards.

Scope of Test:	pH
Description:	pH Meter
Brand Name:	--
Model No.:	212632
Serial No.:	--
Equipment No.:	--
Date of Calibration:	05 May, 2015

NOTES

This is the Final Report and supersedes any preliminary report with this batch number.
Results apply to sample(s) as submitted. All pages of this report have been checked and approved for release.

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

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

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

Description: pH Meter
Brand Name: --
Model No.: 212632
Serial No.: --
Equipment No.: --
Date of Calibration: 05 May, 2015 Date of next Calibration: 05 August, 2015

Parameters:

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

Expected Reading (pH Unit)	Displayed Reading (pH Unit)	Tolerance (pH unit)
4.0	4.0	0.00
7.0	6.8	-0.20
10.0	10.1	+0.10
	Tolerance Limit (pH Unit)	±0.20

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

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

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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:	HK1514255
SUB-BATCH:	0
LABORATORY:	HONG KONG
DATE RECEIVED:	29/04/2015
DATE OF ISSUE:	09/05/2015

COMMENTS

The performance of the equipment stated in this report is checked with independent reference material and results compared against a calibrated secondary source.
The "Tolerance Limit" quoted is the acceptance criteria applicable for similar equipment used by the ALS Hong Kong laboratory or quoted from relevant international standards.
The "Next Calibration Date" is recommended according to best practice principals as practised by the ALS Hong Kong laboratory or quoted from relevant international standards.

Scope of Test:	Dissolved Oxygen and Temperature
Equipment Type:	Dissolved Oxygen Meter
Brand Name:	YSI
Model No.:	YSI Pro 20
Serial No.:	12C100570
Equipment No.:	--
Date of Calibration:	05 May, 2015

NOTES

This is the Final Report and supersedes any preliminary report with this batch number.
Results apply to sample(s) as submitted. All pages of this report have been checked and approved for release.

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

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

Work Order: HK1514255
Sub-Batch: 0
Date of Issue: 09/05/2015
Client: ACTION UNITED ENVIRO SERVICES

Equipment Type: Dissolved Oxygen Meter
Brand Name: YSI
Model No.: YSI Pro 20
Serial No.: 12C100570
Equipment No.: --
Date of Calibration: 05 May, 2015 Date of next Calibration: 05 August, 2015

Parameters:

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

Expected Reading (mg/L)	Displayed Reading (mg/L)	Tolerance (mg/L)
1.39	1.32	-0.07
4.44	4.43	-0.01
8.12	8.29	+0.17
	Tolerance Limit (mg/L)	±0.20

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

Expected Reading (°C)	Displayed Reading (°C)	Tolerance (°C)
13	13.1	+0.1
23	21.9	-1.1
39	38.6	-0.4
	Tolerance Limit (°C)	±2.0

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

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

Appendix G

Event and Action Plan

Event and Action Plan for Air Quality

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

Event and Action Plan for Construction Noise

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

Event and Action Plan for Water Quality

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

Appendix H

Impact Monitoring Schedule

Impact Monitoring Schedule for the Reporting Period – July 2015

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

Remark:

(a) *24-hr TSP monitoring at AM1 was rescheduled from 24 July 2015 to 28 July 2015 due to power failure*

(b) *24-hr TSP monitoring at AM9b was rescheduled from 4 July 2015 to 6 July 2015 due to power failure.*

	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 – August 2015

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

	Monitoring Day
	Sunday or Public Holiday

Monitoring Location

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

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

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

Appendix I

Database of Monitoring Result

24-hour TSP Monitoring Data

DATE	SAMPLE NUMBER	ELAPSED TIME			CHART READING			AVG TEMP	AVG AIR PRESS	STANDARD FLOW RATE	AIR VOLUME	FILTER WEIGHT (g)		DUST WEIGHT COLLECTED	24-HR TSP ($\mu g/m^3$)
		INITIAL	FINAL	(min)	MIN	MAX	AVG	(℃)	(hPa)	(m^3/min)	(std m^3)	INITIAL	FINAL	(g)	
AM1a - Garden Farm, Tsung Yuen Ha Village															
4-Jul-15	28144	10169.16	10193.16	1440.00	35	35	35.0	28.7	1006.4	1.22	1755	2.8297	2.8981	0.0684	39
7-Jul-15	28159	10193.16	10217.16	1440.00	35	35	35.0	28.8	1005.9	1.22	1755	2.8220	2.8816	0.0596	34
13-Jul-15	28174	10217.16	10241.16	1440.00	35	36	35.5	28.9	1006	1.23	1775	2.8456	2.8784	0.0328	18
18-Jul-15	28184	10241.16	10265.16	1440.00	35	37	36.0	28.8	1005.6	1.25	1796	2.8433	2.9165	0.0732	41
28-Jul-15	28198	10265.16	10289.16	1440.00	33	34	33.5	30.2	1004.6	1.17	1689	2.8466	2.9021	0.0555	33
30-Jul-15	28919	10289.16	10312.79	1417.80	33	35	34.0	28.7	1004.7	1.19	1686	2.8496	2.9077	0.0581	34
AM2 - Village House near Lin Ma Hang Road															
4-Jul-15	28143	5714.05	5737.83	1426.80	33	33	33.0	28.7	1006.4	1.02	1452	2.8387	2.9363	0.0976	67
7-Jul-15	28158	5737.83	5761.66	1429.80	33	34	33.5	28.8	1005.9	1.03	1475	2.8357	2.9288	0.0931	63
13-Jul-15	28175	5761.66	5785.49	1429.80	33	34	33.5	28.9	1006	1.03	1475	2.8555	2.9425	0.0870	59
18-Jul-15	28185	5785.54	5809.33	1427.40	33	34	33.5	28.8	1005.6	1.03	1472	2.8358	3.0063	0.1705	116
24-Jul-15	28199	5809.33	5833.11	1426.80	30	33	31.5	28.8	1005.7	0.97	1389	2.8376	2.8845	0.0469	34
30-Jul-15	28081	5833.11	5856.95	1430.40	32	34	33.0	28.7	1004.7	1.02	1454	2.8970	2.9671	0.0701	48
AM3 - Ta Kwu Ling Fire Service Station of Ta Kwu Ling Village															
4-Jul-15	28145	6803.49	6827.49	1440.00	42	42	42.0	28.7	1006.4	1.30	1866	2.8286	2.9152	0.0866	46
7-Jul-15	28157	6827.50	6851.50	1440.00	42	42	42.0	28.8	1005.9	1.30	1865	2.8326	2.9133	0.0807	43
13-Jul-15	28176	6851.50	6875.50	1440.00	42	42	42.0	28.9	1006	1.30	1865	2.8503	2.9030	0.0527	28
18-Jul-15	28186	6875.50	6899.50	1440.00	42	42	42.0	28.8	1005.6	1.30	1865	2.8370	2.8977	0.0607	33
24-Jul-15	28200	6899.50	6923.50	1440.00	42	42	42.0	28.8	1005.7	1.30	1865	2.8380	2.8882	0.0502	27
30-Jul-15	28082	6923.50	6947.50	1440.00	42	42	42.0	28.7	1004.7	1.29	1865	2.9035	2.9748	0.0713	38
AM7b - Loi Tung Village House															
4-Jul-15	28139	14244.93	14268.93	1440.00	43	47	45.0	28.7	1006.4	1.08	1556	2.8190	2.9026	0.0836	54
7-Jul-15	28155	14268.94	14292.94	1440.00	43	47	45.0	28.8	1005.9	1.08	1555	2.8258	2.8987	0.0729	47
13-Jul-15	28177	14292.94	14316.94	1440.00	36	37	36.5	28.9	1006	0.84	1206	2.8304	2.9284	0.0980	81
18-Jul-15	28187	14316.94	14340.94	1440.00	43	44	43.5	28.8	1005.6	1.04	1493	2.8365	2.9166	0.0801	54
24-Jul-15	28190	14340.94	14364.94	1440.00	44	44	44.0	28.8	1005.7	1.05	1514	2.8459	2.8930	0.0471	31
30-Jul-15	28085	14364.95	14388.95	1440.00	44	44	44.0	28.7	1004.7	1.05	1513	2.8872	2.9485	0.0613	41
AM8 - Po Kat Tsai Village No. 4															
4-Jul-15	28141	8115.28	8139.28	1440.00	49	50	49.5	28.7	1006.4	1.37	1970	2.8064	2.8874	0.0810	41
7-Jul-15	28160	8139.29	8163.29	1440.00	50	50	50.0	28.8	1005.9	1.38	1990	2.8350	2.8977	0.0627	32
13-Jul-15	28178	8163.29	8187.29	1440.00	48	50	49.0	28.9	1006	1.35	1949	2.8449	2.9002	0.0553	28
18-Jul-15	28079	8187.29	8211.29	1440.00	48	48	48.0	28.8	1005.6	1.32	1908	2.8618	2.9198	0.0580	30
24-Jul-15	28080	8211.29	8235.29	1440.00	48	48	48.0	28.8	1005.7	1.32	1908	2.8904	2.9569	0.0665	35

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)	
30-Jul-15	28202	8235.29	8259.29	1440.00	48	49	48.5	28.7	1004.7	1.34	1927	2.8383	2.9048	0.0665	35
AM9b - Nam Wa Po Village House No. 80															
6-Jul-15	28142	15592.99	15616.99	1440.00	34	34	34.0	30.7	1006.1	1.03	1476	2.8263	3.0206	0.1943	132
7-Jul-15	28161	15616.99	15640.99	1440.00	34	34	34.0	28.8	1005.9	1.03	1481	2.8356	2.9114	0.0758	51
13-Jul-15	28179	15640.99	15664.99	1440.00	33	34	33.5	28.9	1006	1.01	1458	2.8262	2.8998	0.0736	50
18-Jul-15	28188	15664.99	15688.99	1440.00	30	31	30.5	28.8	1005.6	0.92	1323	2.8537	2.8908	0.0371	28
24-Jul-15	28201	15688.99	15712.99	1440.00	33	33	33.0	28.8	1005.7	1.00	1436	2.8365	2.8771	0.0406	28
30-Jul-15	28083	15713.00	15737.00	1440.00	33	34	33.5	28.7	1004.7	1.01	1458	2.9163	2.9750	0.0587	40

Remark:

(a) *24-hr TSP monitoring at AM1 was rescheduled from 24 July 2015 to 28 July 2015 due to power failure*

(b) *24-hr TSP monitoring at AM9b was rescheduled from 4 July 2015 to 6 July 2015 due to power failure.*

Construction Noise Monitoring Results, dB(A)

Date	Start Time	1st Leq_{5min}	L10	L90	2nd Leq_{5min}	L10	L90	3rd Leq_{5min}	L10	L90	4th Leq_{5min}	L10	L90	5th Leq_{5min}	L10	L90	6th Leq_{5min}	L10	L90	Leq30	façade correction
NM1 - Tsung Yuen Ha Village House No. 63																					
6-Jul-15	15:32	49.4	52.3	44.9	50.7	53.8	45.4	55.6	59.4	46.8	55.2	61.1	46.6	50.2	52.9	45.3	50.4	53.6	45.4	53	NA
10-Jul-15	14:34	51.2	51.3	47.0	49.9	52.1	48.0	53.2	58.1	47.8	49.4	51.0	47.2	49.4	51.3	47.4	49.8	50.8	47.3	51	NA
16-Jul-15	10:07	53.7	55.8	49.9	53.2	55.9	49.6	54.0	56.5	49.3	53.5	56.7	48.4	54.2	57.1	50.5	55.3	58.4	49.7	54	NA
22-Jul-15	10:06	52.8	54.2	49.7	53.9	57.2	49.1	52.9	54.7	50.2	57.4	60.9	50.9	51.7	53.6	48.1	54.7	58.2	49.5	54	NA
28-Jul-15	11:00	53.3	56.0	50.5	54.4	56.7	50.4	52.4	55.5	48.5	52.2	54.5	49.5	52.2	55.4	47.5	51.4	52.7	46.9	53	NA
NM2 - Village House near Lin Ma Hang Road																					
6-Jul-15	14:17	60.8	60.9	51.9	58.7	62.0	51.9	58.5	61.2	53.1	59.1	61.5	5.8	56.6	58.3	51.7	60.1	63.8	52.7	59	NA
10-Jul-15	13:26	56.9	57.1	53.0	55.9	56.6	50.3	56.1	57.5	51.0	57.5	58.0	49.0	55.1	55.9	48.5	55.3	58.5	48.3	56	NA
16-Jul-15	13:22	58.2	61.8	53.4	61.7	65.2	52.9	61.2	66.6	53.1	59.8	64.4	53.0	59.4	63.1	53.1	58.6	62.9	53.2	60	NA
22-Jul-15	11:28	59.0	59.6	46.4	55.5	53.8	45.4	54.9	58.3	46.0	48.0	49.9	44.4	50.3	50.4	43.8	54.4	56.8	45.6	55	NA
28-Jul-15	11:36	55.4	57.9	43.1	59.6	60.7	43.7	58.6	61.2	46.3	59.2	63.0	44.6	57.7	61.4	45.3	59.0	65.2	45.4	58	NA
NM5– Ping Yeung Village House (façade facing northeast)																					
3-Jul-15	11:02	57.7	63.8	45.3	49.7	53.1	45.0	57.1	62.4	45.7	55.5	62.0	45.9	50.0	52.8	46.1	52.1	55.5	46.5	55	NA
8-Jul-15	10:46	55.9	59.0	48.0	52.7	55.5	47.5	56.1	59.0	49.5	54.9	59.0	48.0	55.2	59.0	47.5	55.3	58.0	48.5	55	NA
14-Jul-15	11:36	60.1	64.3	53.5	58.3	60.7	54.7	57.9	61.5	54.3	55.4	56.7	53.9	59.2	62.0	54.6	56.4	58.6	54.3	58	NA
20-Jul-15	16:16	51.1	54.6	43.7	51.9	54.6	45.1	49.5	52.7	42.3	51.0	54.6	42.8	51.8	55.3	44.2	51.8	54.8	44.1	51	NA
25-Jul-15	9:40	64.8	67.0	59.5	62.7	64.5	58.0	61.5	64.0	58.0	62.9	65.0	58.5	64.3	66.5	59.5	63.4	65.0	58.0	63	NA
31-Jul-15	14:25	52.9	55.8	49.9	54.5	57.4	50.0	54.4	57.4	50.1	54.8	57.3	51.1	53.1	55.3	50.5	54.5	57.1	50.8	54	NA
NM6 – Tai Tong Wu Village House 2																					
3-Jul-15	11:33	61.4	65.9	49.7	62.8	67.1	45.1	61.6	65.9	47.1	62.4	67.2	48.6	64.0	67.3	52.3	61.0	65.3	47.6	62	NA
8-Jul-15	11:26	58.8	62.0	50.0	58.0	61.0	46.0	58.0	61.0	50.0	58.4	61.0	50.0	57.4	60.5	48.5	59.6	62.5	49.0	58	NA
14-Jul-15	11:00	62.1	65.6	54.1	63.2	66.7	54.7	61.5	65.4	52.0	60.3	64.3	51.3	61.9	65.8	50.6	61.5	65.0	54.2	62	NA
20-Jul-15	16:28	67.4	66.5	48.8	53.1	51.5	47.8	52.1	51.2	47.5	58.8	56.6	47.8	61.4	60.1	48.3	58.7	60.9	49.8	62	NA
25-Jul-15	10:25	64.3	64.0	61.5	62.1	63.0	61.0	64.7	65.5	62.0	62.8	63.5	61.5	62.7	63.5	61.5	60.7	64.0	56.0	63	NA
31-Jul-15	11:09	64.0	67.6	55.2	63.5	67.4	54.5	63.5	67.1	54.6	62.4	65.9	55.7	63.2	67.2	53.8	63.9	67.8	53.4	63	NA
NM7 – Po Kat Tsai Village																					
3-Jul-15	10:54	52.9	53.8	50.2	68.1	53.9	50.8	55.5	55.2	50.8	66.2	58.7	51.6	57.1	53.7	50.9	62.8	63.7	52.4	64	NA
8-Jul-15	13:31	61.9	60.0	50.5	65.8	61.7	51.4	57.1	54.9	50.8	57.4	57.4	51.3	66.5	71.4	51.8	59.4	61.5	51.8	63	NA
14-Jul-15	10:20	53.9	55.0	51.1	57.7	58.6	52.2	59.6	63.9	53.3	72.5	73.5	53.0	67.7	66.6	58.6	65.0	67.1	53.2	67	NA
20-Jul-15	17:08	58.6	60.9	55.4	58.9	61.5	54.5	57.9	60.5	53.4	57.9	60.3	53.0	57.8	60.6	53.3	58.9	61.5	55.1	58	NA
25-Jul-15	11:03	53.1	53.8	52.4	58.3	60.3	52.3	51.9	52.5	50.3	53.6	53.9	52.4	69.3	60.8	52.5	62.3	64.0	52.9	63	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
31-Jul-15	10:28	52.7	54.6	49.2	63.1	58.4	5.6	58.0	61.3	51.9	59.9	64.9	51.4	68.8	62.4	52.0	59.5	63.9	51.9	63	NA
NM8 - Village House, Tong Hang																					
6-Jul-15	10:14	59.8	63.0	53.1	58.5	61.7	54.0	58.5	61.4	54.0	57.8	60.6	52.9	56.4	59.2	52.2	56.6	59.5	51.7	58	NA
10-Jul-15	9:12	57.8	60.6	53.2	56.1	58.4	53.2	59.5	61.5	55.9	59.5	61.3	56.3	58.3	60.3	54.6	56.9	59.8	52.9	58	NA
16-Jul-15	10:13	59.9	62.5	53.9	60.3	63.0	54.7	57.8	60.9	51.8	56.8	59.9	50.8	59.9	63.2	52.5	58.6	62.1	52.7	59	NA
22-Jul-15	10:08	59.4	61.7	53.1	61.4	62.8	50.7	57.7	59.9	53.6	57.3	59.3	53.9	57.5	59.6	53.9	58.2	60.2	54.6	59	NA
28-Jul-15	11:09	58.6	61.5	53.7	58.4	61.2	54.2	58.5	61.4	54.0	59.8	63.0	53.1	57.5	60.7	53.0	57.8	60.6	52.9	58	NA
NM9 - Village House, Kiu Tau Village																					
6-Jul-15	10:59	63.9	65.5	55.5	61.8	63.7	54.9	58.7	60.8	54.8	60.3	61.0	54.3	59.3	60.8	54.5	57.2	59.7	52.3	61	NA
10-Jul-15	10:06	59.0	61.0	56.2	58.4	60.4	53.1	57.7	61.1	52.3	60.0	64.2	52.5	58.3	60.3	54.6	57.4	59.9	54.6	59	NA
16-Jul-15	11:06	61.9	64.1	56.4	60.8	62.8	54.0	57.8	61.0	52.3	62.7	65.6	56.8	58.4	59.8	55.9	61.2	62.4	57.3	61	NA
22-Jul-15	11:15	59.6	61.8	52.4	60.7	63.3	53.0	61.1	64.0	52.2	64.3	68.2	52.1	58.0	58.0	53.0	55.5	57.6	51.9	61	NA
28-Jul-15	10:16	62.8	66.0	50.3	62.0	66.2	51.8	58.9	62.6	51.3	57.8	59.6	53.8	57.7	61.1	52.3	58.6	62.1	52.7	60	NA
NM10 - Nam Wa Po Village House No. 80																					
6-Jul-15	13:58	62.8	64.8	57.6	60.5	62.9	56.9	61.7	62.2	56.3	61.7	64.2	57.6	61.5	64.4	57.0	61.5	64.2	57.1	62	65
10-Jul-15	13:16	59.2	60.2	54.4	58.8	61.0	55.1	58.9	60.4	56.6	59.4	60.8	56.9	59.1	60.7	56.2	56.9	58.5	54.5	59	62
16-Jul-15	13:43	61.2	63.6	57.1	62.2	63.5	55.8	62.4	64.5	55.3	62.4	63.3	55.7	60.6	63.5	55.3	61.4	62.7	55.3	62	65
22-Jul-15	13:17	60.3	62.4	56.1	64.3	68.0	57.3	64.6	67.8	57.8	61.4	64.0	55.5	60.8	61.9	56.6	61.5	63.9	57.5	62	65
28-Jul-15	13:13	61.9	63.1	67.6	61.7	63.8	57.7	62.6	65.4	58.3	60.6	62.6	57.4	61.4	62.8	57.9	62.4	64.6	57.4	62	65

Water Quality Monitoring Data for Contract 5

Date	2-Jul-15															
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM1-C	11:06	0.42	30	30.0	6.89	6.8	91.1	90.2	22.7	22.8	7	7.0	15	15.0
			30		6.76		89.3		22.9		7		15	
WM1*	11:37	0.15	32.1	32.1	6.62	6.7	91.1	91.4	45.3	45.7	6.5	6.5	41	40.0
			32		6.7		91.6		46.0		6.5		39	

Date	4-Jul-15															
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM1-C	13:16	0.38	32.3	32.3	6.52	6.5	89.2	88.8	10.0	9.9	7.7	7.7	6	6.5
			32.3		6.43		88.3		9.8		7.7		7	
WM1*	13:51	0.18	32	32.0	6.84	6.8	94.0	93.8	43.6	44.0	7.5	7.5	41	40.5
			32		6.78		93.5		44.4		7.5		40	

Date	6-Jul-15															
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM1-C	15:51	0.35	32.6	32.6	6.42	6.4	88.7	88.4	24.3	23.8	7	7.0	20	20.5
			32.6		6.37		88.1		23.2		7		21	
WM1*	15:16	0.15	32	32.0	6.08	6.1	83.2	83.5	74.1	74.4	6.9	6.9	60	58.5
			32		6.14		83.8		74.6		6.9		57	

Date	8-Jul-15															
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM1-C	14:33	0.38	31	31.0	7.88	7.9	107.0	106.6	15.0	14.9	7.2	7.2	10	10.0
			31		7.82		106.2		14.7		7.2		10	
WM1*	15:04	0.13	31.5	31.5	6.05	6.1	82.1	82.2	77.2	77.5	6.9	6.9	58	59.0
			31.5		6.08		82.3		77.7		6.9		60	

Date	10-Jul-15															
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM1-C	14:43	0.42	31.1	31.1	5.44	5.4	73.9	73.4	119.0	120.0	7.9	7.9	61	59.5

			31.1		5.38		72.9		121.0		7.9		58	
WM1*	14:23	0.15	31.4	31.4	6.2	6.2	84.0	83.6	454.0	459.5	8.2	8.2	223	225.5
			31.4		6.13		83.1		465.0		8.2		228	

Date	**14-Jul-15**													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM1-C	13:45	0.42	33.1	33.1	5.71	5.7	79.7	79.8	38.4	38.6	7.1	7.1	21	22.0
			33.1		5.73		79.9		38.8		7.1		23	
WM1*	14:13	0.10	34.8	34.8	6.85	6.9	98.2	98.7	30.1	29.7	7.9	7.9	24	24.5
			34.8		6.9		99.1		29.2		7.9		25	

Date	**16-Jul-15**													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM1-C	14:24	0.15	31.4	31.4	3.44	3.4	46.8	45.9	overrange	overrange	8.4	8.4	332	329.5
			31.4		3.3		44.9		overrange		8.4		327	
WM1*	14:49	0.18	31	31.0	5.26	5.2	71.6	71.4	97.7	**97.4**	8.6	8.6	58	57.0
			31		5.2		71.1		97.0		8.6		56	

Date	**18-Jul-15**													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM1-C	11:53	0.43	30.8	30.8	5.39	5.4	71.8	71.6	322.0	325.0	8.5	8.5	150	149.0
			30.8		5.36		71.4		328.0		8.5		148	
WM1*	12:25	0.16	31.2	31.2	5.88	5.9	79.2	78.8	633.0	633.5	8.5	8.5	208	209.5
			31.2		5.82		78.4		634.0		8.5		211	

Date	**20-Jul-15**													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM1-C	11:47	0.44	27.3	27.3	6.7	6.7	84.5	83.9	138.0	135.0	8.6	8.6	104	104.0
			27.3		6.6		83.2		132.0		8.6		104	
WM1*	12:26	0.16	27.3	27.3	5.69	5.7	71.2	70.9	195.0	193.0	8.1	8.1	93	92.5
			27.3		5.62		70.6		191.0		8.1		92	

Date	22-Jul-15															
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM1-C	11:06	0.45	27.5	27.5	5.83	5.8	73.9	73.4	219.0	223.0	8.8	8.8	180	179.0
			27.5		5.77		72.8		227.0		8.8		178	
WM1*	12:04	0.23	27.6	27.6	6.22	6.2	79.0	79.3	532.0	533.5	8.5	8.5	275	276.5
			27.6		6.27		79.5		535.0		8.5		278	

Date	25-Jul-15															
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM1-C	12:33	0.45	26.9	26.9	6.86	6.8	85.9	85.2	10.7	10.9	8.8	8.8	5	5.5
			26.9		6.75		84.5		11.0		8.8		6	
WM1*	12:57	0.26	28.1	28.1	7.12	7.1	91.1	90.8	17.0	16.6	8.4	8.4	17	17.5
			28.1		7.08		90.4		16.2		8.4		18	

Date	28-Jul-15															
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM1-C	11:19	0.40	28.8	28.8	7.22	7.2	93.5	93.8	9.6	9.5	8.4	8.4	5	4.5
			28.8		7.27		94.1		9.5		8.4		4	
WM1*	12:16	0.26	30.2	30.2	6.87	6.8	91.2	90.9	29.0	28.7	8.2	8.2	30	30.0
			30.2		6.8		90.6		28.3		8.2		30	

Date	30-Jul-15															
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM1-C	12:03	0.44	26.8	26.8	7.03	7.0	88.2	88.1	11.7	11.6	8.4	8.4	8	7.5
			26.8		7		88.0		11.4		8.4		7	
WM1*	12:31	0.22	27.5	27.5	6.91	6.9	87.6	87.8	50.7	50.1	8.6	8.6	56	55.5
			27.5		6.95		88.0		49.4		8.6		55	

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

Water Quality Monitoring Data for Contract 2 and 3

Date	2-Jul-15													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM4-CA	14:11	0.07	34.4	34.4	7.2	7.2	101.6	101.4	5.6	5.7	7	7.0	2	2.5
			34.4		7.17		101.1		5.9		7		3	
WM4-CB	14:33	0.18	35	35.0	5.97	6.0	85.8	85.5	11.3	11.5	6.7	6.7	19	19.5
			35		5.93		85.1		11.6		6.7		20	
WM4	13:38	0.23	35.7	35.7	7.3	7.3	106.3	106.7	13.3	13.2	6.8	6.8	10	9.5
			35.7		7.35		107.0		13.1		6.8		9	

Date	4-Jul-15													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM4-CA	10:41	0.06	32.9	32.9	7.53	7.5	104.4	103.8	5.6	5.6	7.4	7.4	3	3.5
			32.9		7.44		103.2		5.6		7.4		4	
WM4-CB	11:13	0.17	33.9	33.9	6.8	6.9	96.1	96.8	13.3	13.5	8	8.0	15	15.5
			33.8		6.9		97.5		13.6		8		16	
WM4	11:51	0.25	33.7	33.7	7.28	7.2	101.7	101.3	15.1	15.4	7.6	7.6	13	13.5
			33.7		7.21		100.9		15.6		7.6		14	

Date	6-Jul-15													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM4-CA	12:02	0.10	30.3	30.3	7.8	7.8	103.7	103.4	6.2	6.3	7.3	7.3	5	5.0
			30.3		7.76		103.0		6.4		7.3		5	
WM4-CB	12:28	0.22	31.1	31.1	5.92	5.9	79.8	80.2	10.4	10.3	7	7.0	10	10.0
			31.1		5.97		80.5		10.2		7		10	
WM4	11:32	0.30	31	31.0	7.24	7.3	94.7	96.5	12.8	12.8	7	7.0	17	17.0
			31		7.31		98.3		12.8		7		17	

Date	8-Jul-15													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM4-CA	11:39	0.09	28.6	28.6	7.19	7.2	99.5	99.8	5.8	5.8	7.2	7.2	8	7.5
			28.6		7.24		100.0		5.7		7.2		7	
WM4-CB	12:06	0.17	29.8	29.8	7.4	7.4	102.8	102.9	15.0	15.1	7.1	7.1	15	14.0

			29.8		7.42		103.0		15.2		7.1		13	
WM4	11:08	0.26	29	29.0	7.9	7.8	102.9	102.1	14.3	14.4	7	7.0	14	14.0
			29		7.78		101.2		14.4		7		14	

Date	10-Jul-15													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM4-CA	11:24	0.07	30.4	30.4	8.04	8.0	107.1	106.4	6.5	6.5	8.6	8.6	8	7.5
			30.4		7.94		105.7		6.6		8.6		7	
WM4-CB	11:53	0.17	31.1	31.1	6.02	6.0	81.2	81.4	13.4	13.3	8.0	8.0	11	11.0
			31.1		6.05		81.6		13.1		8.0		11	
WM4	11:00	0.31	30.8	30.8	7.08	7.0	94.4	94.1	19.7	19.6	8.4	8.4	20	20.0
			30.8		6.99		93.7		19.4		8.4		20	

Date	14-Jul-15													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM4-CA	16:43	0.09	32.1	32.1	5.16	5.1	70.4	69.8	5.3	5.3	7.3	7.3	4	3.5
			32.1		5.05		69.1		5.2		7.3		3	
WM4-CB	17:12	0.23	33.1	33.1	3.82	3.8	52.8	53.0	14.4	14.5	7.8	7.8	12	12.5
			33.1		3.85		53.2		14.5		7.8		13	
WM4	16:11	0.25	34.1	34.1	5.85	5.8	83.0	82.6	14.0	14.3	7.6	7.6	12	12.5
			34.1		5.8		82.2		14.5		7.6		13	

Date	16-Jul-15													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM4-CA	11:51	0.09	30.9	30.9	6.6	6.6	88.1	87.9	5.3	5.2	8.8	8.8	6	5.5
			30.9		6.58		87.7		5.1		8.8		5	
WM4-CB	12:16	0.18	30.9	30.9	4.51	4.5	60.6	60.6	16.9	16.8	8.6	8.6	23	22.5
			30.9		4.5		60.5		16.7		8.6		22	
WM4	11:23	0.27	31.2	31.2	5.96	6.0	80.5	80.4	13.3	13.4	8.3	8.3	13	14.0
			31.2		5.95		80.3		13.4		8.3		15	

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

WM4-CA	14:45	0.08	31	31.0	6.21	6.2	83.7	83.4	17.1	17.6	8.6	8.6	4	4.0
			31		6.19		83.1		18.1		8.6		4	
WM4-CB	15:08	0.26	31.1	31.1	4.78	4.8	64.4	64.2	18.6	18.5	8.4	8.4	16	16.0
			31.1		4.75		64.0		18.3		8.4		16	
WM4	14:05	0.24	31.9	31.9	6.76	6.8	92.4	92.5	34.1	33.7	8.4	8.4	36	36.0
			31.9		6.79		92.5		33.2		8.4		36	

Date	**20-Jul-15**													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM4-CA	15:14	0.18	26.8	26.8	6.82	6.8	85.3	85.6	19.5	19.7	8.7	8.7	16	15.5
			26.8		6.86		85.8		19.8		8.7		15	
WM4-CB	15:33	0.47	27.7	27.7	5.18	5.2	65.8	66.1	43.2	43.0	8.4	8.4	32	32.0
			27.7		5.22		66.3		42.8		8.4		32	
WM4	14:41	0.37	27.5	27.5	5.8	5.8	73.4	73.1	70.7	**70.8**	8.6	8.6	51	**51.5**
			27.5		5.75		72.8		70.8		8.6		52	

Date	**22-Jul-15**													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM4-CA	16:01	0.13	27.4	27.4	7.23	7.3	91.1	91.6	6.9	6.9	8.7	8.7	4	4.5
			27.4		7.3		92.0		6.9		8.7		5	
WM4-CB	16:23	0.28	28.2	28.2	5.98	5.9	76.7	76.3	17.0	16.7	0.4	4.4	15	14.5
			28.2		5.91		75.8		16.3		8.4		14	
WM4	15:35	0.30	27.9	27.9	6.57	6.5	83.8	83.0	22.3	22.1	8.4	8.4	16	15.5
			27.9		6.45		82.1		21.8		8.4		15	

Date	**25-Jul-15**													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM4-CA	15:00	0.13	27.2	27.2	6.48	6.5	80.7	80.9	8.3	8.2	8.6	8.6	5	5.0
			27.2		6.52		81.1		8.2		8.6		5	
WM4-CB	15:22	0.40	27.8	27.8	5.54	5.6	71.0	71.5	14.4	14.7	8.2	8.2	12	11.5
			27.8		5.65		71.9		14.9		8.2		11	
WM4	14:28	0.35	27.7	27.7	6.6	6.6	83.9	83.5	33.9	33.7	8.5	8.5	53	**51.5**
			27.7		6.51		83.0		33.5		8.5		50	

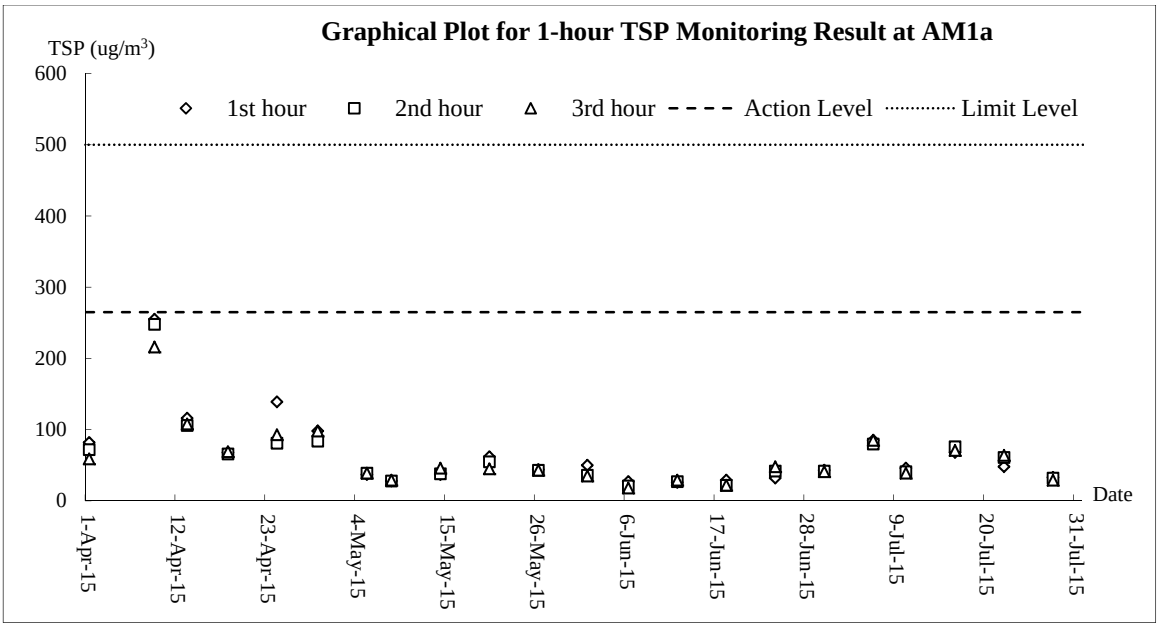
Date	28-Jul-15													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM4-CA	14:13	0.11	30.8	30.8	7.3	7.3	98.2	98.5	6.8	6.7	8.4	8.4	2	2.5
			30.8		7.35		98.7		6.6		8.4		3	
WM4-CB	14:41	0.36	31.2	31.2	6.13	6.1	82.8	82.0	8.9	9.0	8.9	8.9	6	6.0
			31.2		6.04		81.2		9.0		8.9		6	
WM4	13:50	0.32	32.7	32.8	7.48	7.5	103.8	104.1	22.7	23.2	8	8.0	12	12.0
			32.8		7.55		104.3		23.6		8		12	

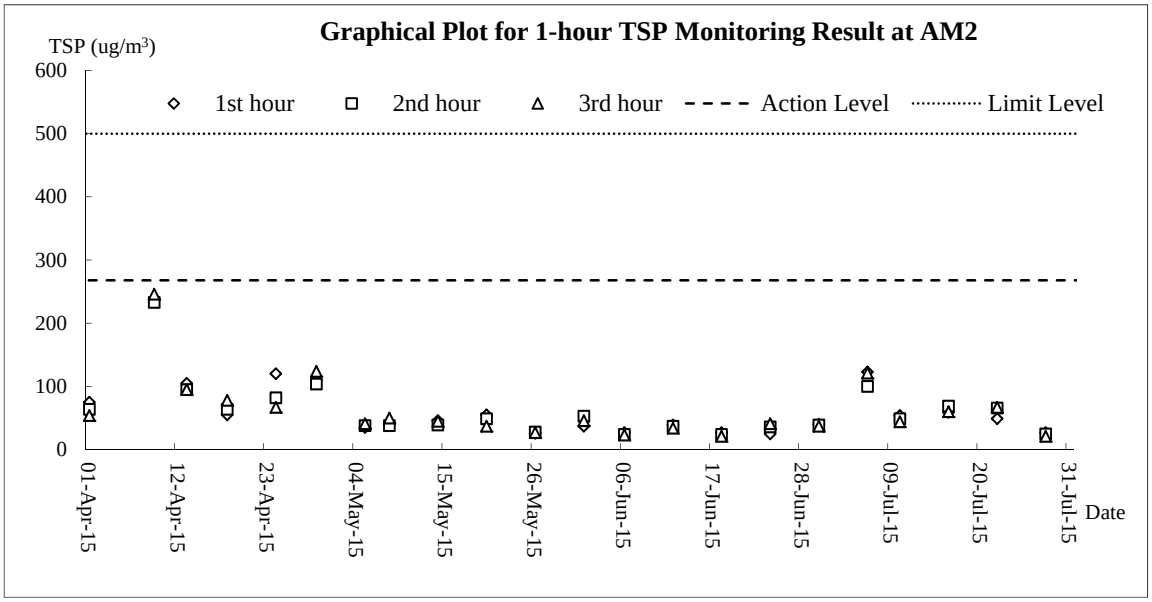
Date	30-Jul-15													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM4-CA	14:34	0.11	28.6	28.6	7.27	7.3	92.7	92.5	5.1	5.2	8.2	8.2	5	5.0
			28.6		7.23		92.2		5.4		8.2		5	
WM4-CB	15:00	0.32	28.9	28.9	5.8	5.8	78.2	77.9	10.2	10.4	7.5	7.5	8	8.0
			28.9		5.74		77.6		10.5		7.5		8	
WM4	14:06	0.30	29.4	29.4	6.76	6.7	88.4	88.0	24.7	25.0	8	8.0	26	26.0
			29.4		6.69		87.6		25.2		8		26	

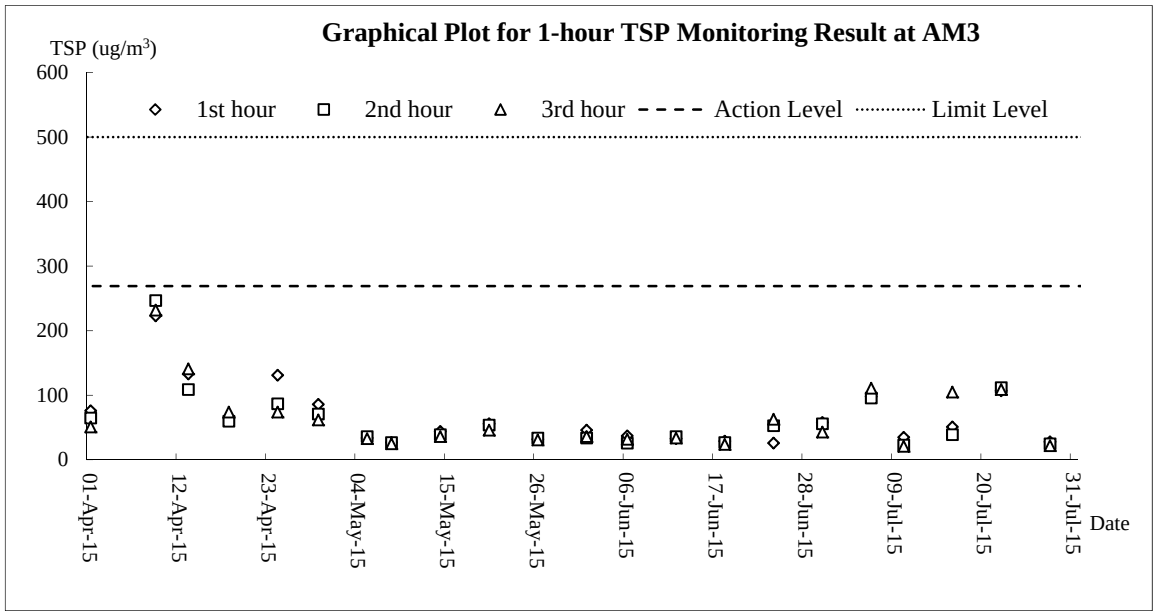
Appendix J

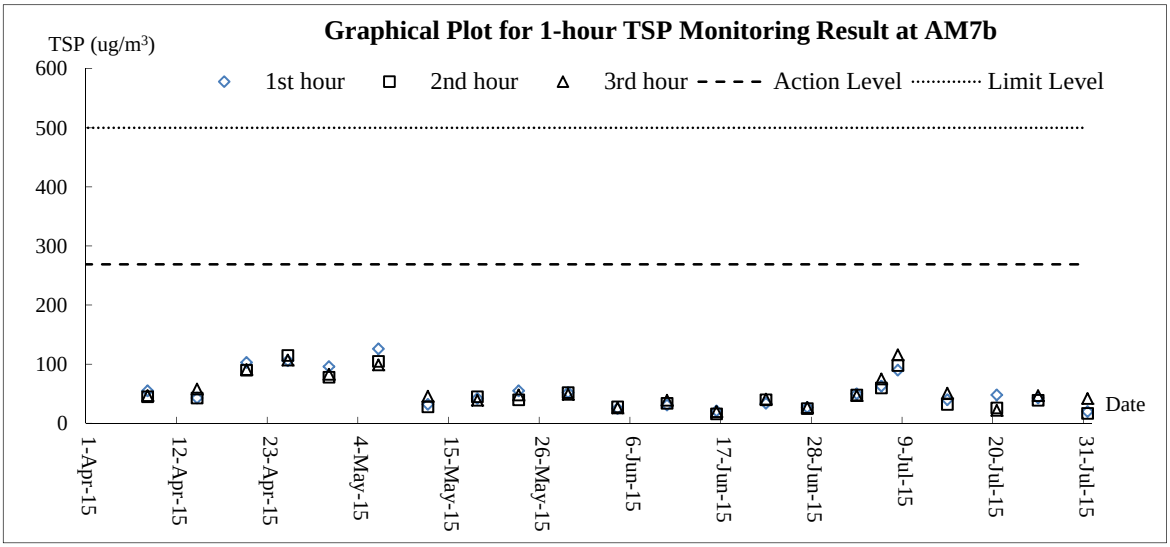
Graphical Plots for Monitoring Result

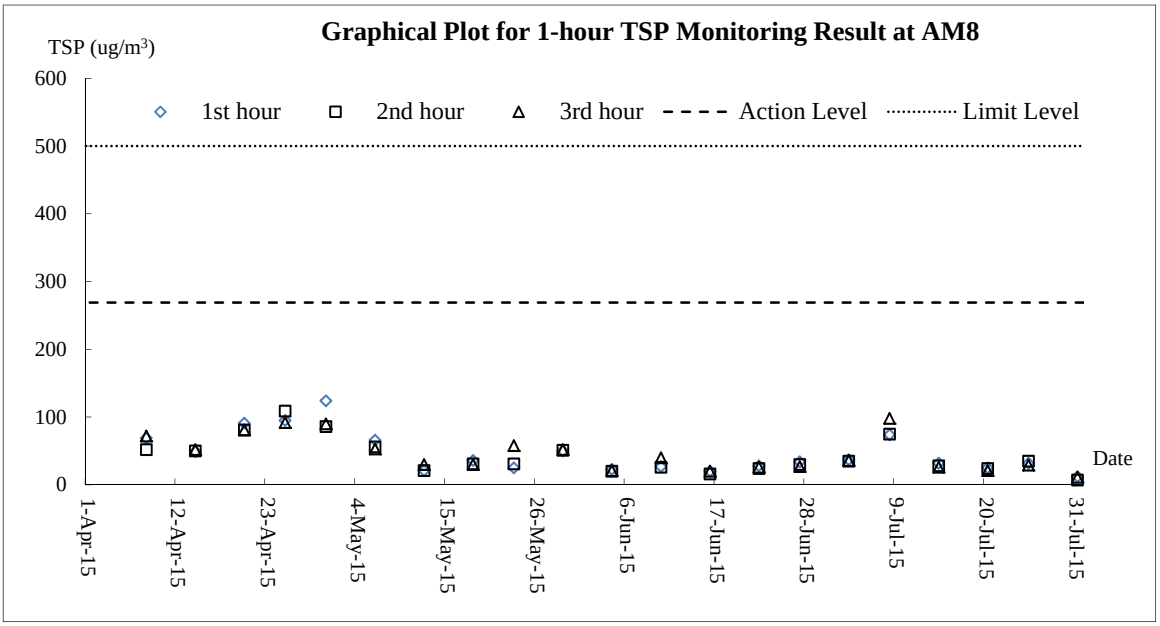
Air Quality – 1-hour TSP

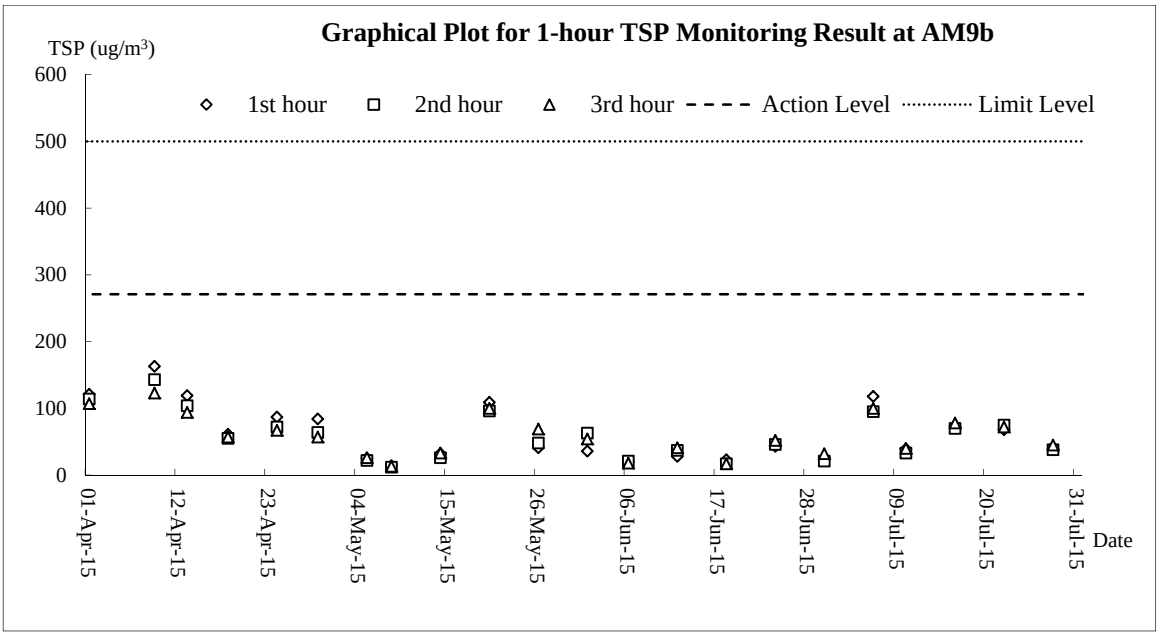




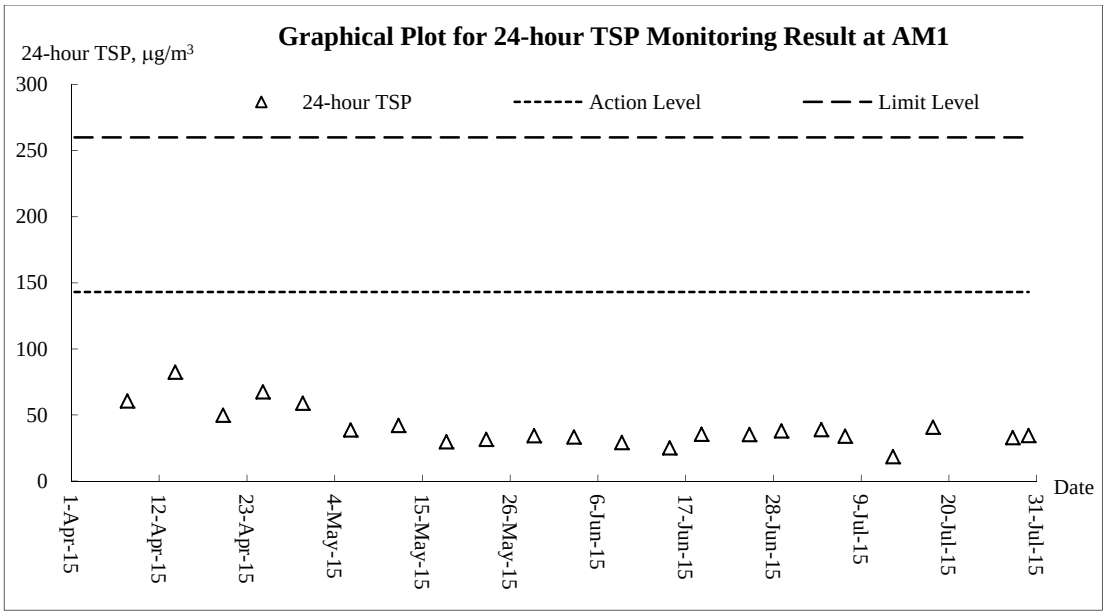


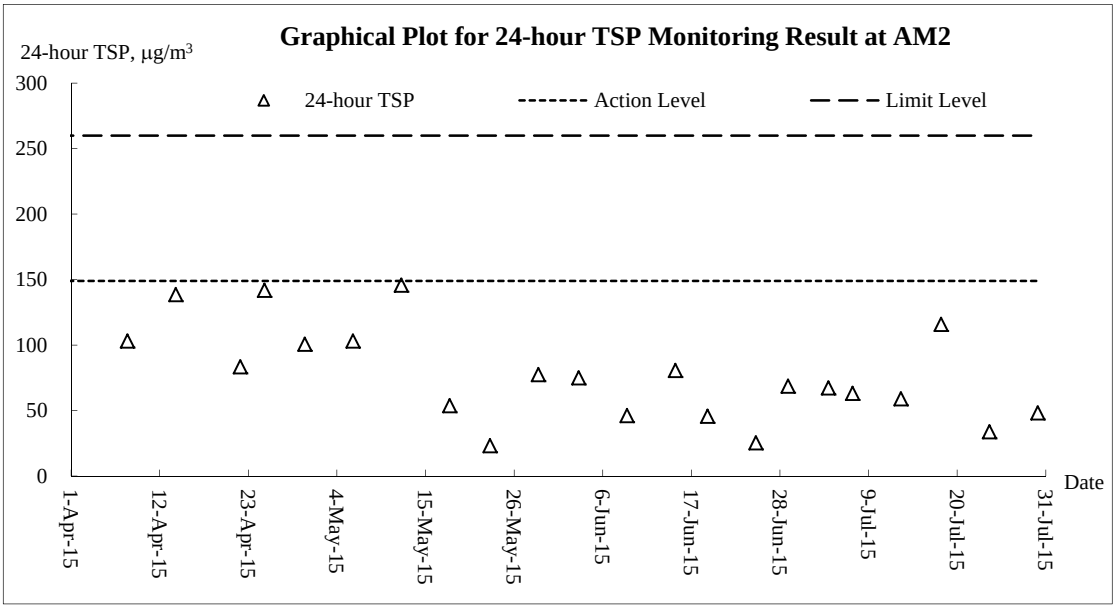

Graphical Plot for 1-hour TSP Monitoring Result at AM7b
TSP (ug/m3)
1st hour
2nd hour
3rd hour
Action Level
Limit Level
600
500
400
300
200
100
0
1-Apr-15
12-Apr-15
23-Apr-15
4-May-15
15-May-15
26-May-15
6-Jun-15
17-Jun-15
28-Jun-15
9-Jul-15
20-Jul-15
31-Jul-15
Date

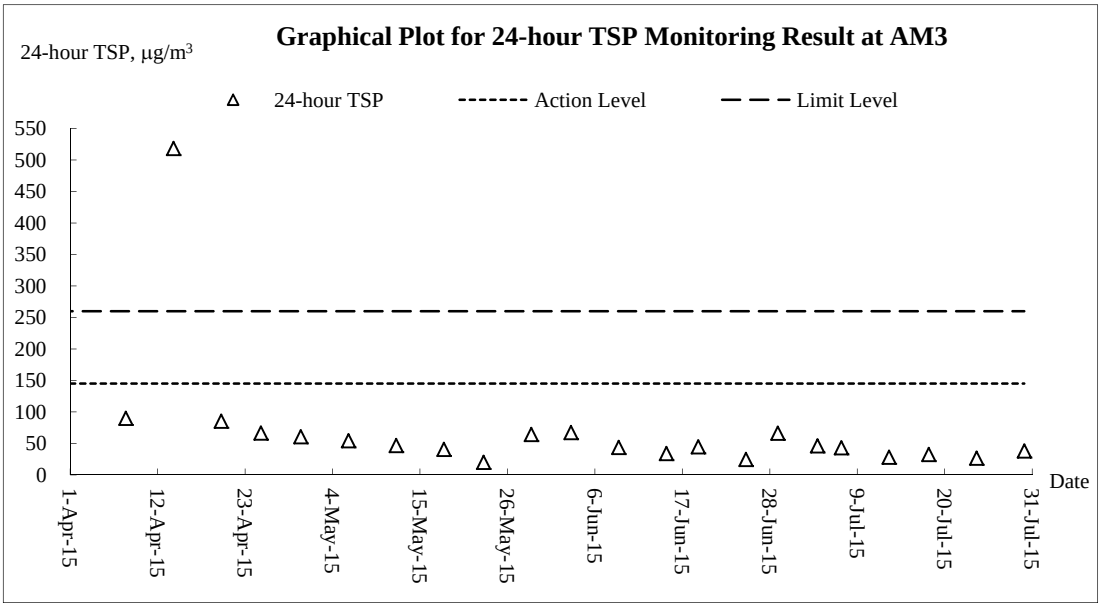

Graphical Plot for 1-hour TSP Monitoring Result at AM8
TSP (ug/m3)
1st hour
2nd hour
3rd hour
Action Level
Limit Level
600
500
400
300
200
100
0
1-Apr-15
12-Apr-15
23-Apr-15
4-May-15
15-May-15
26-May-15
6-Jun-15
17-Jun-15
28-Jun-15
9-Jul-15
20-Jul-15
31-Jul-15
Date

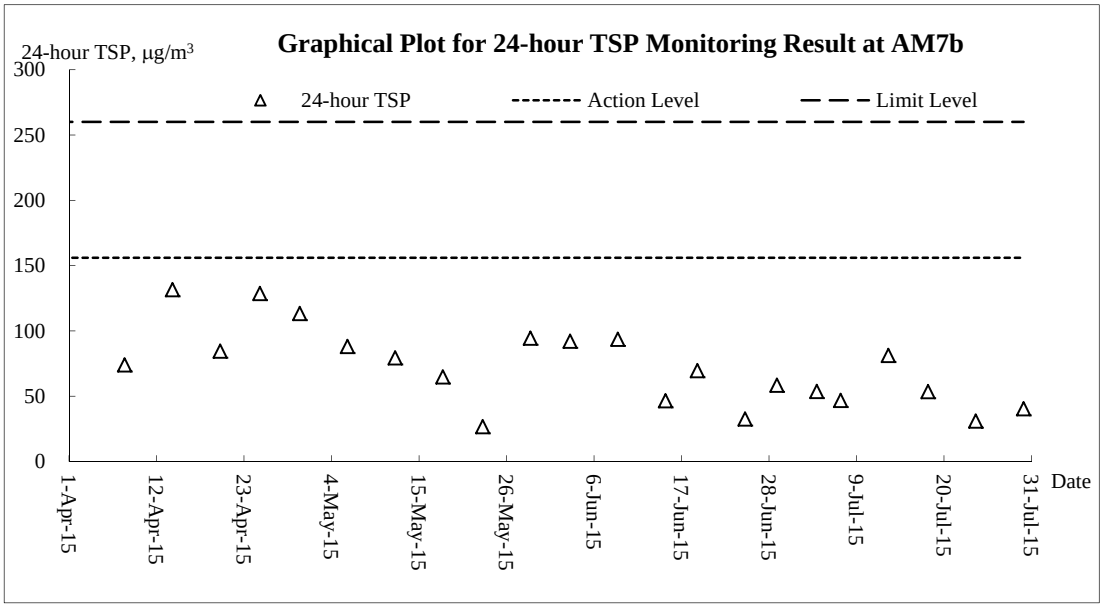

Graphical Plot for 1-hour TSP Monitoring Result at AM9b
TSP (ug/m3)
1st hour
2nd hour
3rd hour
Action Level
Limit Level
600
500
400
300
200
100
0
01-Apr-15
12-Apr-15
23-Apr-15
04-May-15
15-May-15
26-May-15
06-Jun-15
17-Jun-15
28-Jun-15
09-Jul-15
20-Jul-15
31-Jul-15
Date

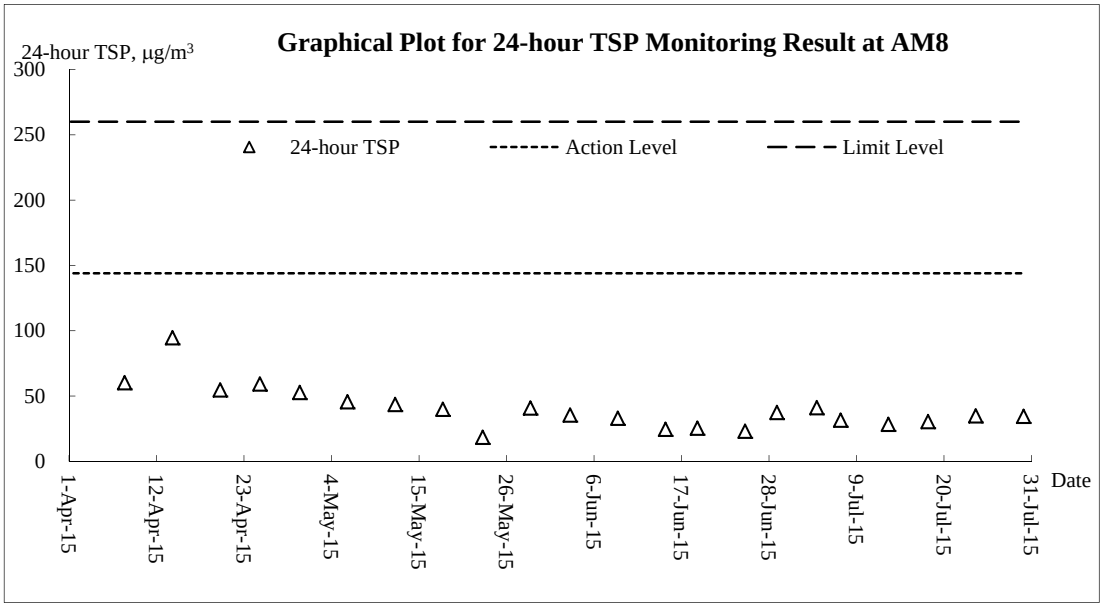
Air Quality – 24-hour TSP

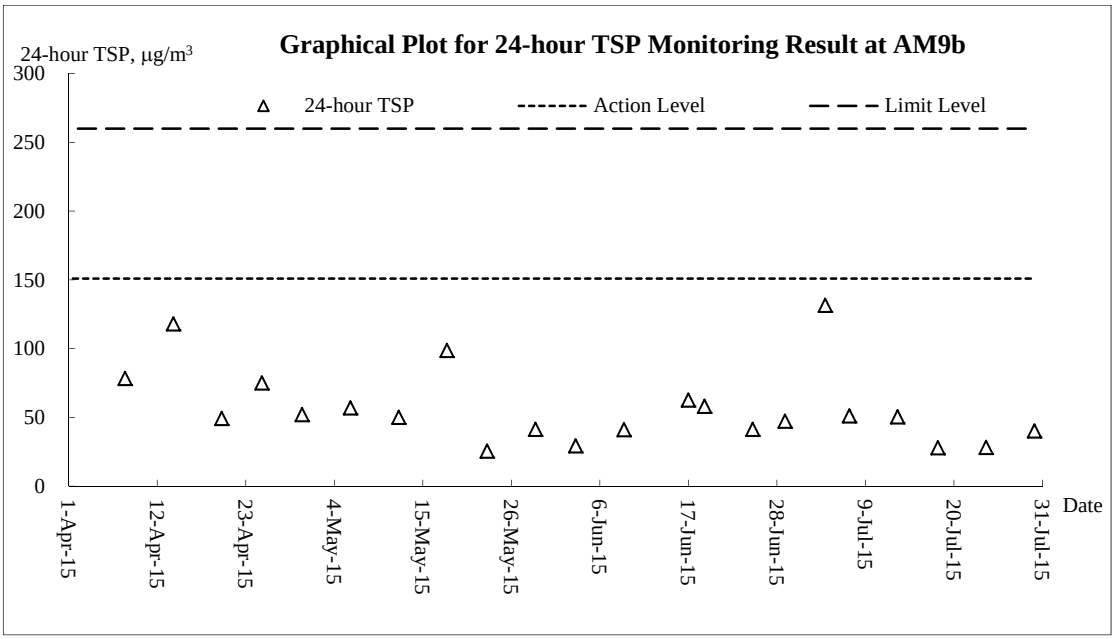




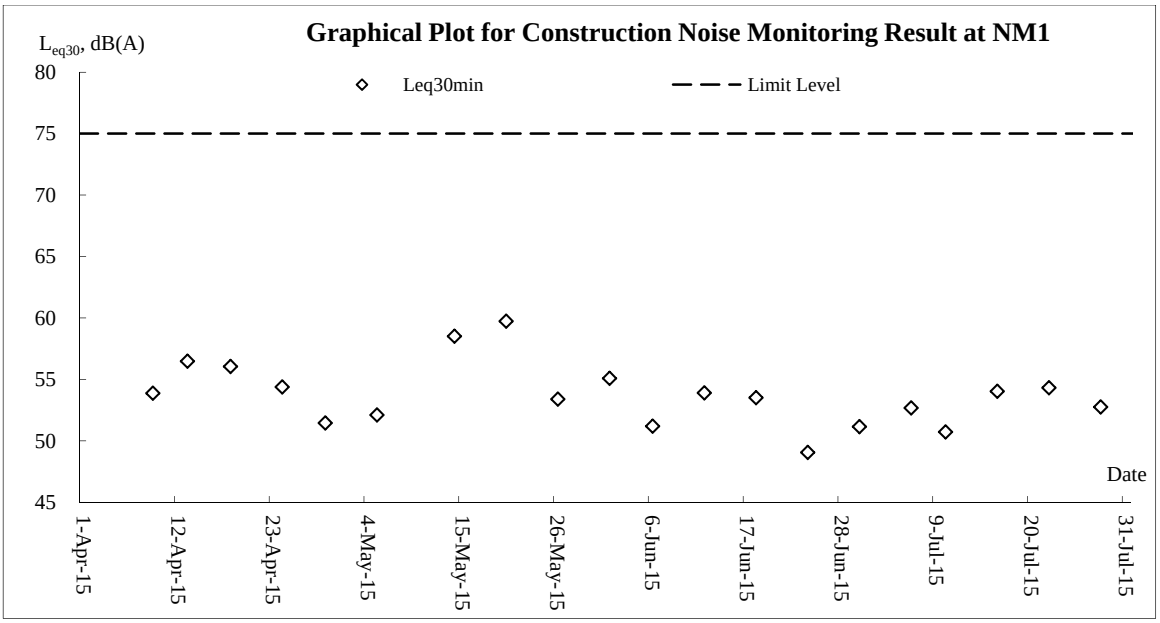


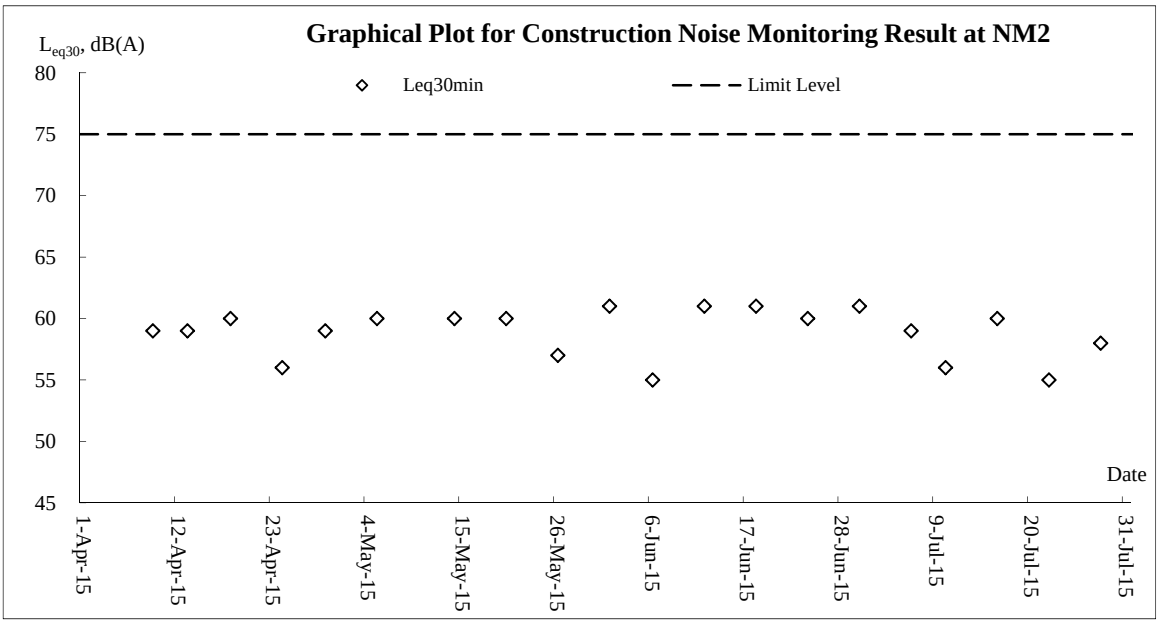

Graphical Plot for 24-hour TSP Monitoring Result at AM7b
24-hour TSP, µg/m³
24-hour TSP
Action Level
Limit Level
300
250
200
150
100
50
0
1-Apr-15
12-Apr-15
23-Apr-15
4-May-15
15-May-15
26-May-15
6-Jun-15
17-Jun-15
28-Jun-15
9-Jul-15
20-Jul-15
31-Jul-15
Date

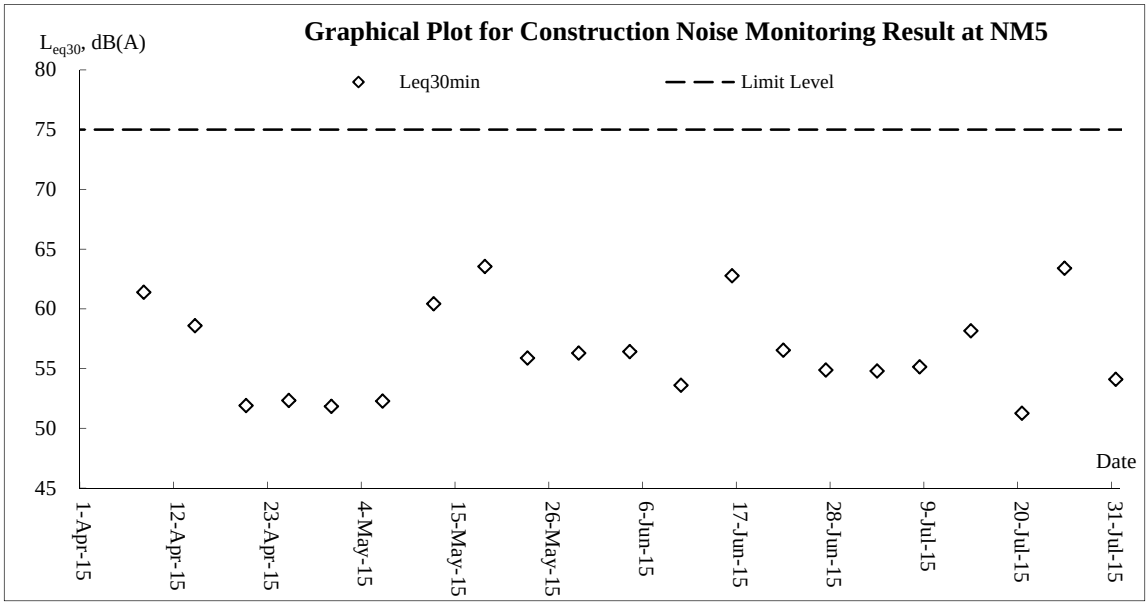

Graphical Plot for 24-hour TSP Monitoring Result at AM8
24-hour TSP, µg/m³
24-hour TSP
Action Level
Limit Level
300
250
200
150
100
50
0
1-Apr-15
12-Apr-15
23-Apr-15
4-May-15
15-May-15
26-May-15
6-Jun-15
17-Jun-15
28-Jun-15
9-Jul-15
20-Jul-15
31-Jul-15
Date

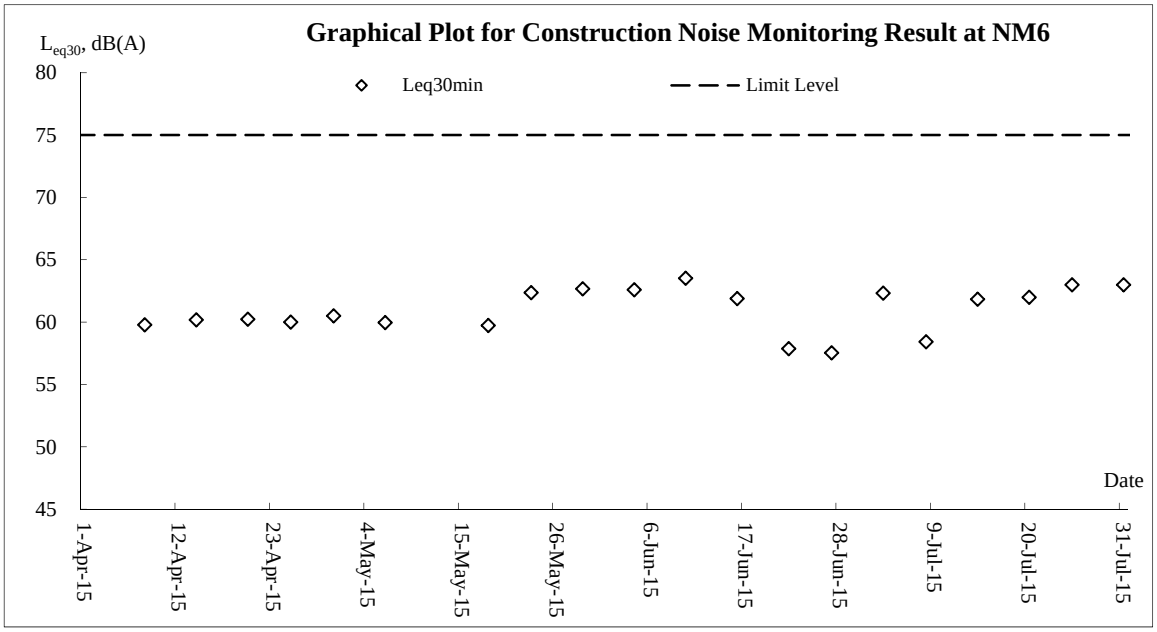

Graphical Plot for 24-hour TSP Monitoring Result at AM9b
24-hour TSP, µg/m³
24-hour TSP
Action Level
Limit Level
300
250
200
150
100
50
0
1-Apr-15
12-Apr-15
23-Apr-15
4-May-15
15-May-15
26-May-15
6-Jun-15
17-Jun-15
28-Jun-15
9-Jul-15
20-Jul-15
31-Jul-15
Date

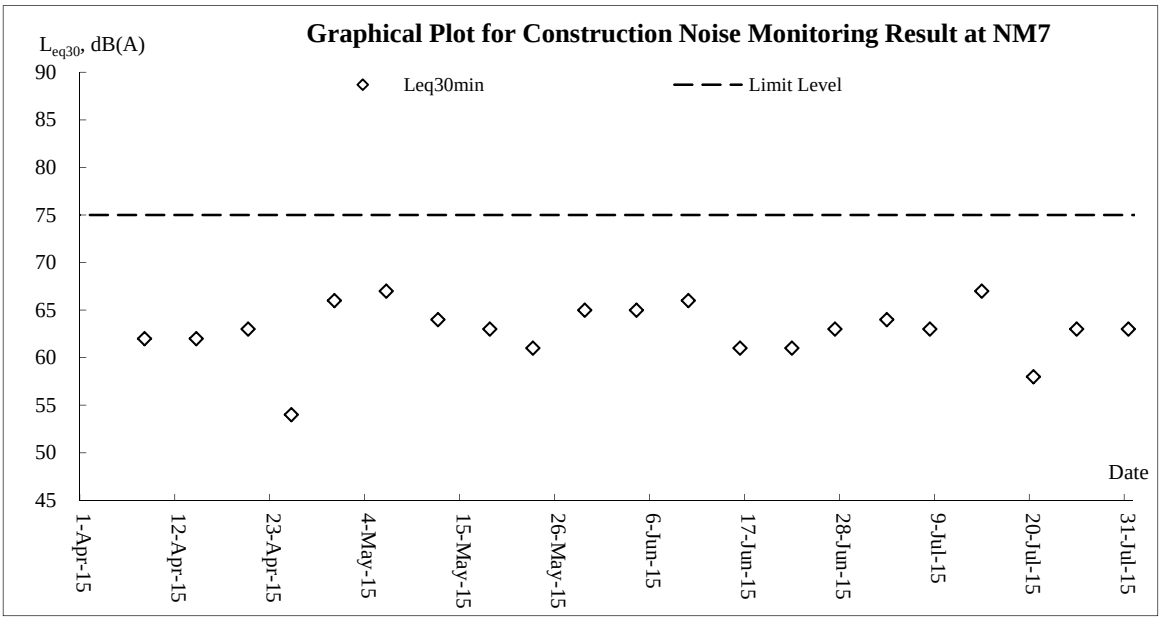
Noise

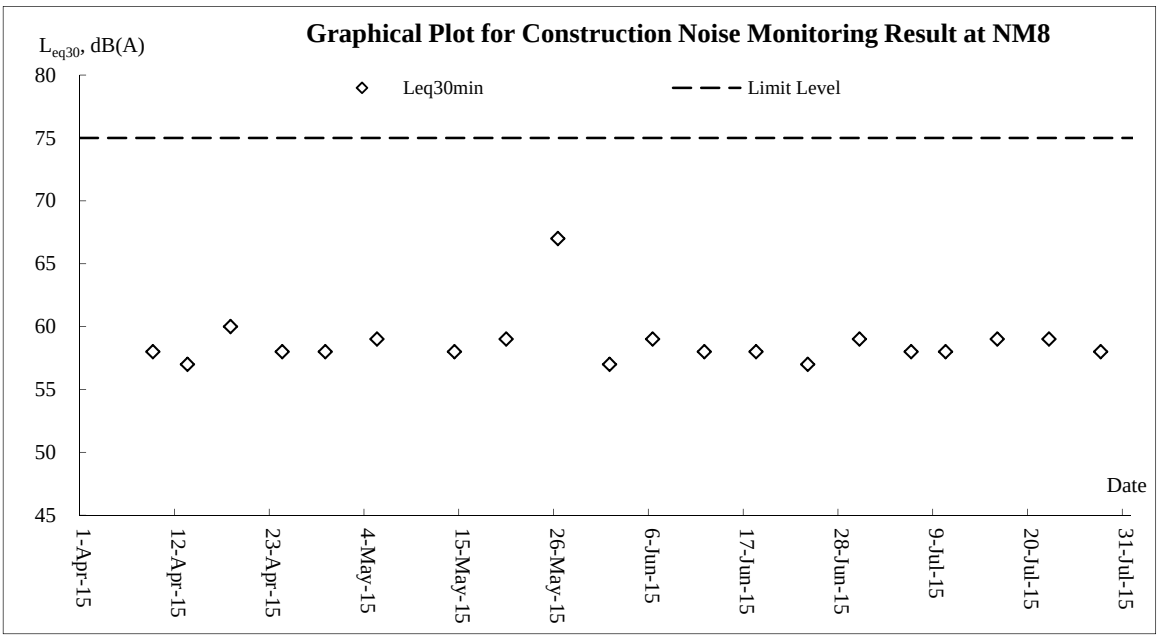

Graphical Plot for Construction Noise Monitoring Result at NM1
L_{eq30}, dB(A)
Leq30min
Limit Level
80
75
70
65
60
55
50
45
Date
1-Apr-15
12-Apr-15
23-Apr-15
4-May-15
15-May-15
26-May-15
6-Jun-15
17-Jun-15
28-Jun-15
9-Jul-15
20-Jul-15
31-Jul-15

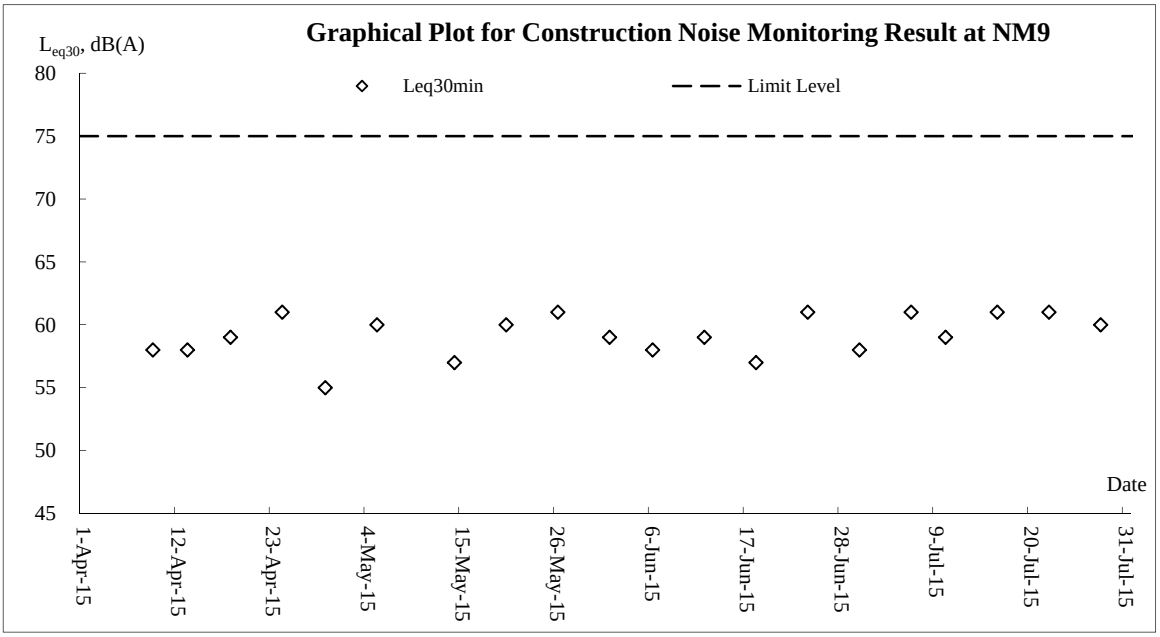

Graphical Plot for Construction Noise Monitoring Result at NM2
L_{eq30}, dB(A)
Leq30min
Limit Level
80
75
70
65
60
55
50
45
Date
1-Apr-15
12-Apr-15
23-Apr-15
4-May-15
15-May-15
26-May-15
6-Jun-15
17-Jun-15
28-Jun-15
9-Jul-15
20-Jul-15
31-Jul-15

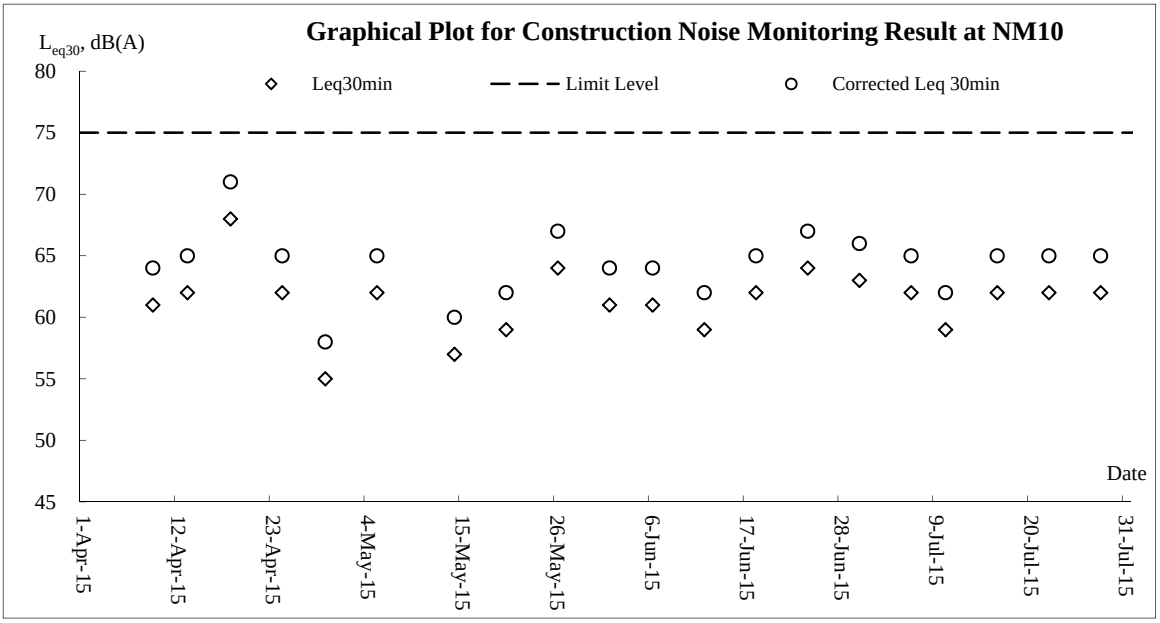

Graphical Plot for Construction Noise Monitoring Result at NM5
L_{eq30}, dB(A)
Leq30min
Limit Level
80
75
70
65
60
55
50
45
Date
1-Apr-15
12-Apr-15
23-Apr-15
4-May-15
15-May-15
26-May-15
6-Jun-15
17-Jun-15
28-Jun-15
9-Jul-15
20-Jul-15
31-Jul-15


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-Apr-15
12-Apr-15
23-Apr-15
4-May-15
15-May-15
26-May-15
6-Jun-15
17-Jun-15
28-Jun-15
9-Jul-15
20-Jul-15
31-Jul-15

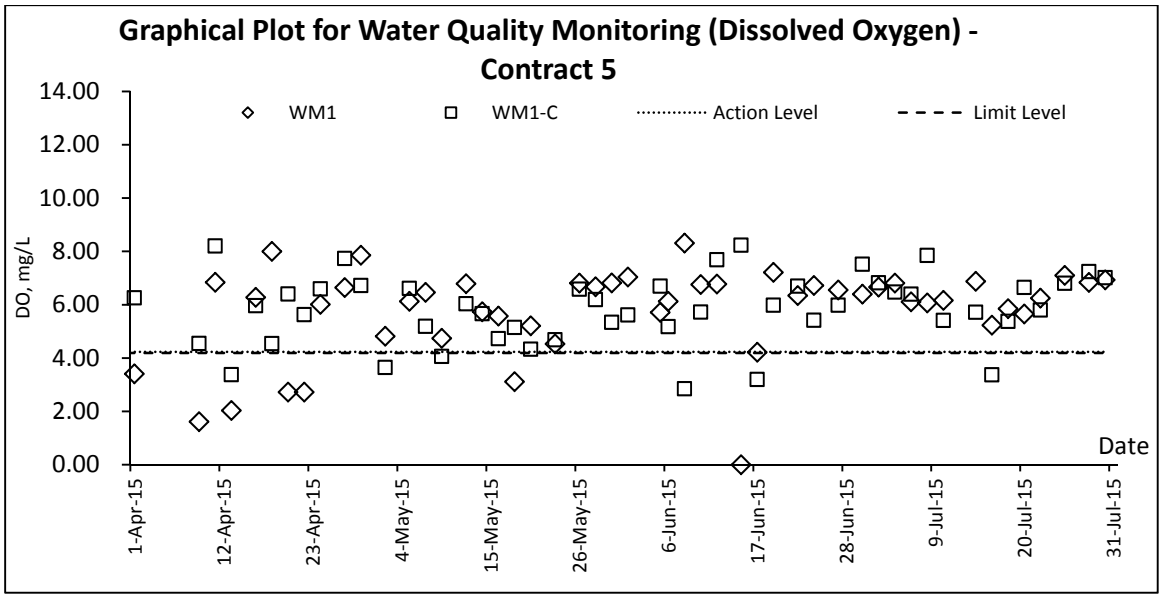

Graphical Plot for Construction Noise Monitoring Result at NM7
L_{eq30}, dB(A)
Leq30min
Limit Level
90
85
80
75
70
65
60
55
50
45
Date
1-Apr-15
12-Apr-15
23-Apr-15
4-May-15
15-May-15
26-May-15
6-Jun-15
17-Jun-15
28-Jun-15
9-Jul-15
20-Jul-15
31-Jul-15

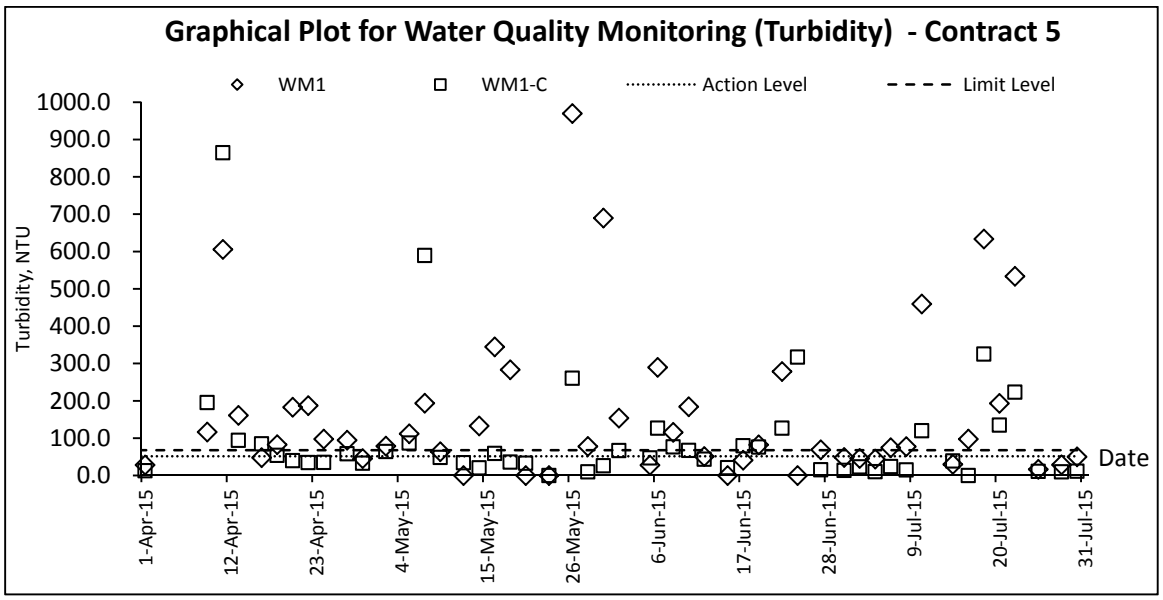

Graphical Plot for Construction Noise Monitoring Result at NM8
L_{eq30}, dB(A)
Leq30min
Limit Level
80
75
70
65
60
55
50
45
Date
1-Apr-15
12-Apr-15
23-Apr-15
4-May-15
15-May-15
26-May-15
6-Jun-15
17-Jun-15
28-Jun-15
9-Jul-15
20-Jul-15
31-Jul-15

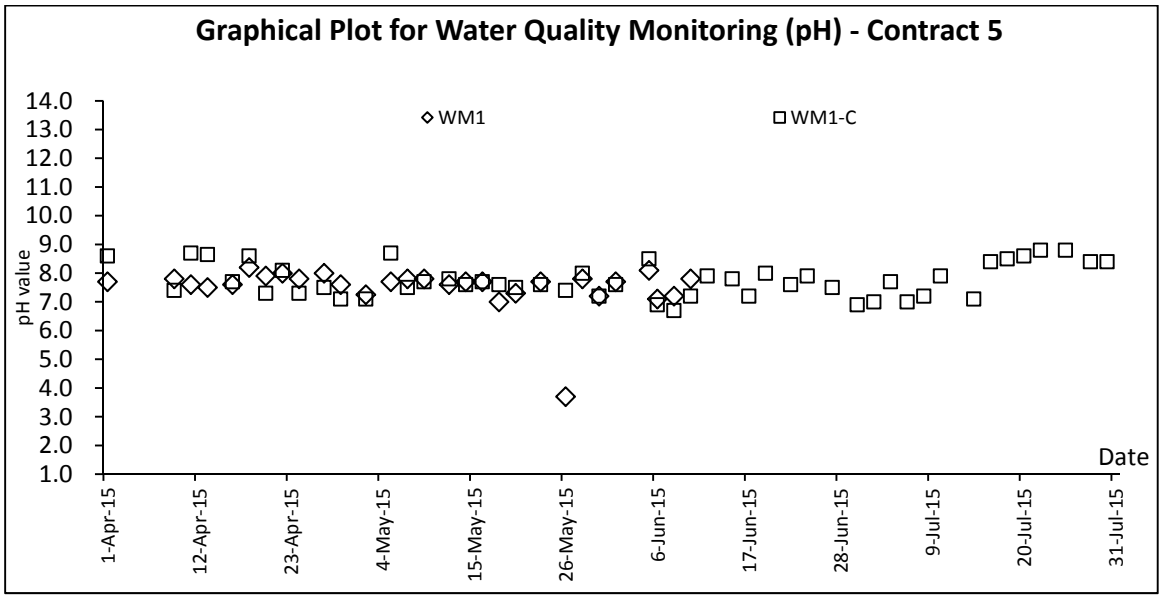

Graphical Plot for Construction Noise Monitoring Result at NM9
L_{eq30}, dB(A)
Leq30min
Limit Level
80
75
70
65
60
55
50
45
Date
1-Apr-15
12-Apr-15
23-Apr-15
4-May-15
15-May-15
26-May-15
6-Jun-15
17-Jun-15
28-Jun-15
9-Jul-15
20-Jul-15
31-Jul-15

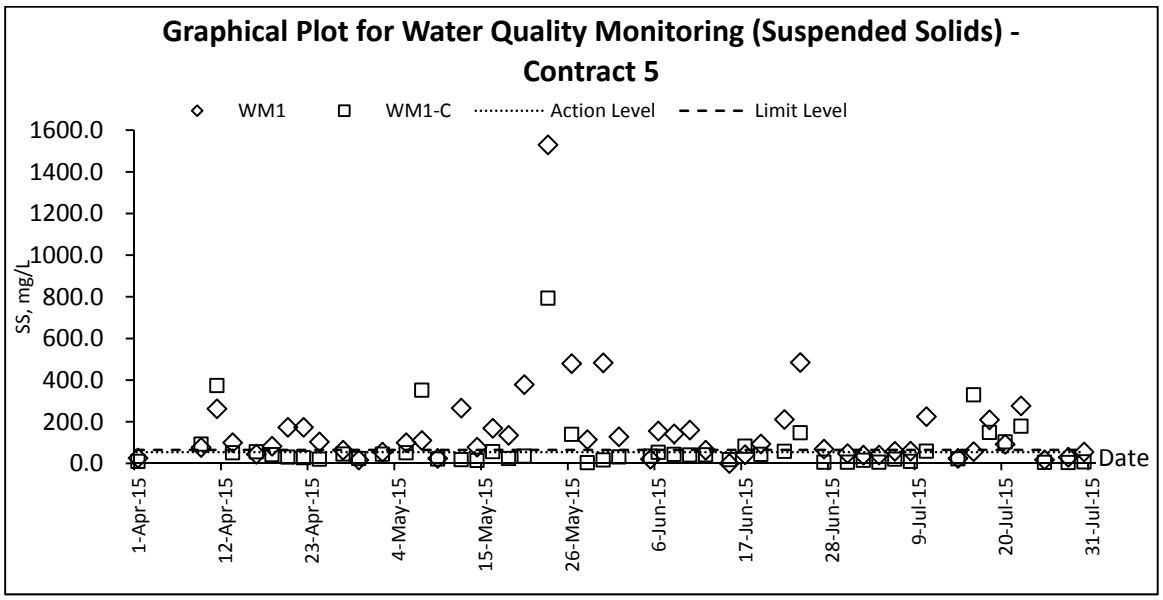

Graphical Plot for Construction Noise Monitoring Result at NM10
L_{eq30}, dB(A)
Leq30min
Limit Level
Corrected Leq 30min
80
75
70
65
60
55
50
45
Date
1-Apr-15
12-Apr-15
23-Apr-15
4-May-15
15-May-15
26-May-15
6-Jun-15
17-Jun-15
28-Jun-15
9-Jul-15
20-Jul-15
31-Jul-15

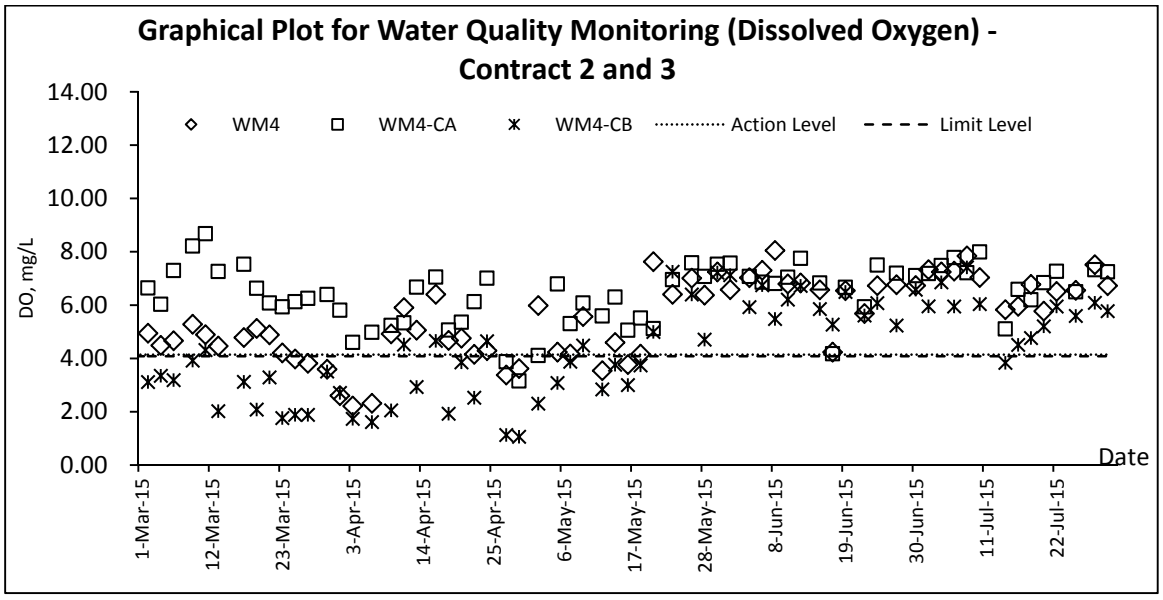
Water Quality

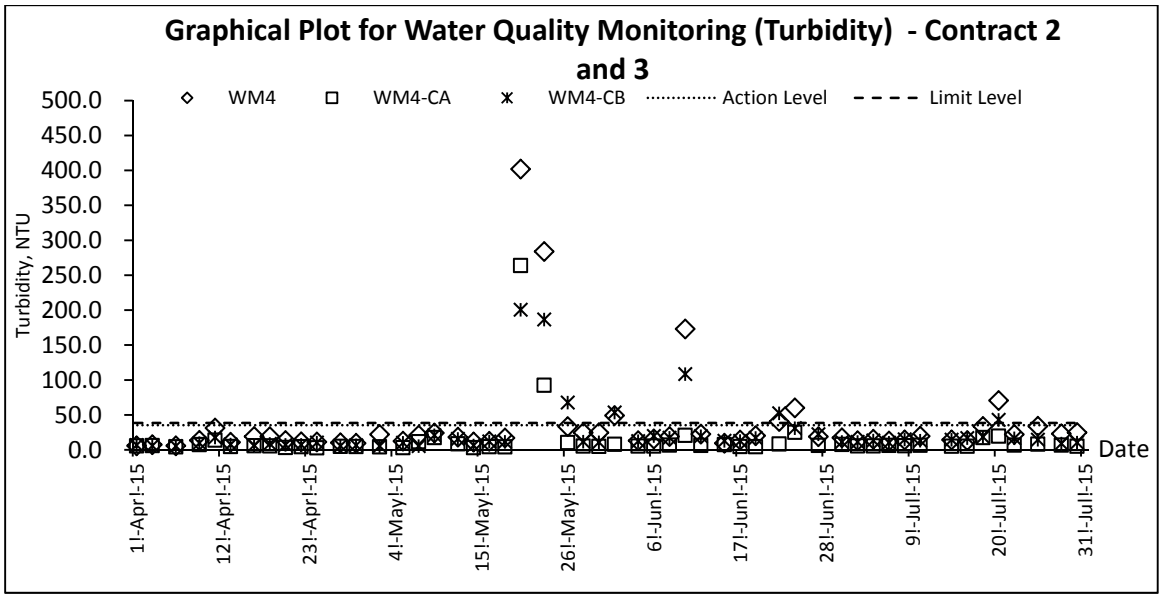


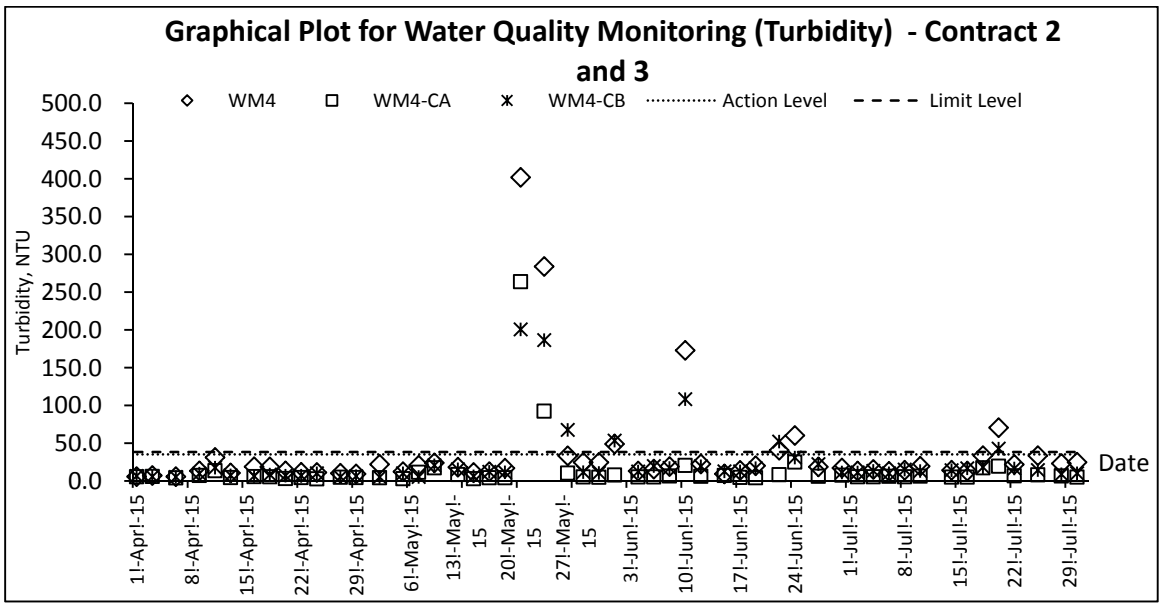


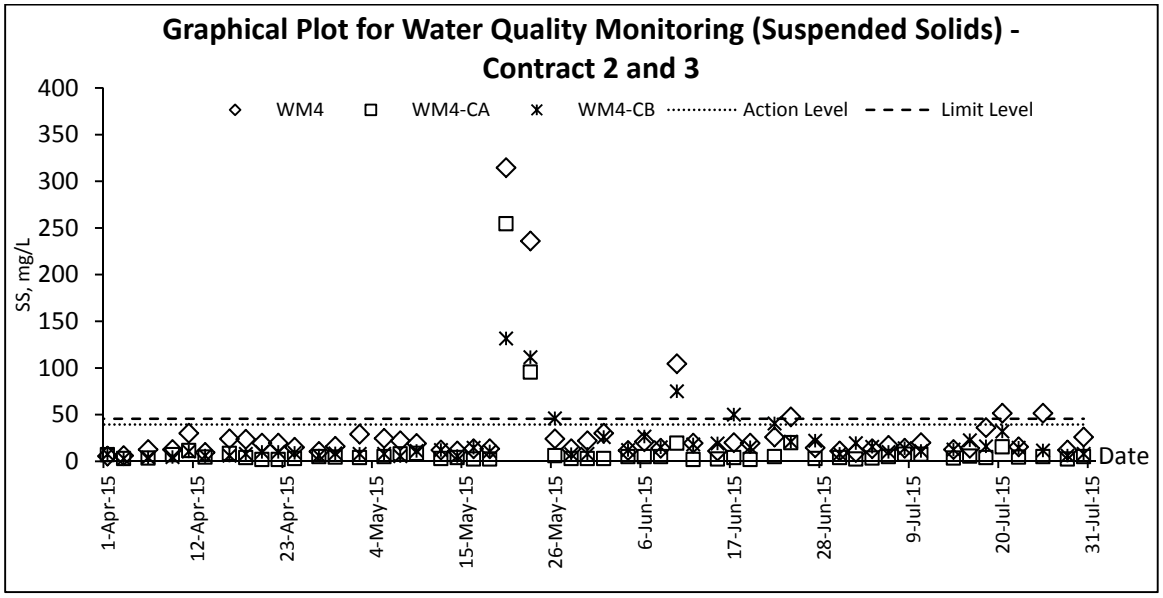



Graphical Plot for Water Quality Monitoring (Suspended Solids) - Contract 5
WM1
WM1-C
Action Level
Limit Level
SS, mg/L
1600.0
1400.0
1200.0
1000.0
800.0
600.0
400.0
200.0
0.0
Date
1-Apr-15
12-Apr-15
23-Apr-15
4-May-15
15-May-15
26-May-15
6-Jun-15
17-Jun-15
28-Jun-15
9-Jul-15
20-Jul-15
31-Jul-15


Graphical Plot for Water Quality Monitoring (Dissolved Oxygen) - Contract 2 and 3
WM4
WM4-CA
WM4-CB
Action Level
Limit Level
DO, mg/L
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
Date
1-Mar-15
12-Mar-15
23-Mar-15
3-Apr-15
14-Apr-15
25-Apr-15
6-May-15
17-May-15
28-May-15
8-Jun-15
19-Jun-15
30-Jun-15
11-Jul-15
22-Jul-15


Graphical Plot for Water Quality Monitoring (Turbidity) - Contract 2 and 3
WM4
WM4-CA
WM4-CB
Action Level
Limit Level
Turbidity, NTU
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
Date
1-Apr-15
12-Apr-15
23-Apr-15
4-May-15
15-May-15
26-May-15
6-Jun-15
17-Jun-15
28-Jun-15
9-Jul-15
20-Jul-15
31-Jul-15


Graphical Plot for Water Quality Monitoring (Turbidity) - Contract 2 and 3
WM4
WM4-CA
WM4-CB
Action Level
Limit Level
Turbidity, NTU
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
Date
1-Apr-15
8-Apr-15
15-Apr-15
22-Apr-15
29-Apr-15
6-May-15
13-May-15
20-May-15
27-May-15
3-Jun-15
10-Jun-15
17-Jun-15
24-Jun-15
1-Jul-15
8-Jul-15
15-Jul-15
22-Jul-15
29-Jul-15


Graphical Plot for Water Quality Monitoring (Suspended Solids) - Contract 2 and 3
WM4
WM4-CA
WM4-CB
Action Level
Limit Level
SS, mg/L
400
350
300
250
200
150
100
50
0
Date
1-Apr-15
12-Apr-15
23-Apr-15
4-May-15
15-May-15
26-May-15
6-Jun-15
17-Jun-15
28-Jun-15
9-Jul-15
20-Jul-15
31-Jul-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-Jul-15	Wed	Mainly fine and very hot. Moderate southerly winds.	0	30.1	7.2	75	S/SW
2-Jul-15	Thu	Mainly fine and very hot. Moderate southerly winds.	Trace	30.9	7.5	74.5	S/SW
3-Jul-15	Fri	Mainly fine and very hot. Moderate southerly winds.	0	30.4	7.2	73.2	S/SW
4-Jul-15	Sat	Mainly fine and very hot. Moderate southerly winds.	0	30	6.5	76.2	E/SE
5-Jul-15	Sun	Mainly fine and very hot. Moderate southerly winds.	0	29.8	8.1	79	E/NE
6-Jul-15	Mon	Mainly fine and very hot. Moderate southerly winds.	Trace	29.1	5.5	73.5	]N
7-Jul-15	Tue	Mainly fine and very hot. Moderate southerly winds.	0	29.4	11.3	59	N/NE
8-Jul-15	Wed	Mainly fine and very hot. Moderate southerly winds.	0	29.2	11.2	58	N
9-Jul-15	Thu	Fresh to strong northwesterly winds, strengthening gradually. Showers will become more frequent in the afternoon.	2	27	9.5	77.2	N/NW
10-Jul-15	Fri	Fresh to strong northwesterly winds, strengthening gradually. Showers will become more frequent in the afternoon.	24.3	29	11.5	75.5	E/NE
11-Jul-15	Sat	Very hot with sunny periods and isolated showers. Mainly cloudy tonight. Light to moderate southerly winds.	0	30.4	5.5	68.5	N
12-Jul-15	Sun	Very hot with sunny periods and isolated showers. Mainly cloudy tonight. Light to moderate southerly winds.	0	31	6	70.7	N
13-Jul-15	Mon	Very hot with sunny periods and isolated showers. Mainly cloudy tonight. Light to moderate southerly winds.	0	30.9	4.1	74.5	S/SW
14-Jul-15	Tue	Very hot with sunny periods and isolated showers. Mainly cloudy tonight. Light to moderate southerly winds.	0	30.8	6.1	74.5	E/SE
15-Jul-15	Wed	Very hot with sunny periods and isolated showers. Mainly cloudy tonight. Light to moderate southerly winds.	Trace	30.6	7	77	E
16-Jul-15	Thu	Very hot with sunny periods and isolated showers. Mainly cloudy tonight. Light to moderate southerly winds.	Trace	29.6	6	79.5	E/SE
17-Jul-15	Fri	Very hot with sunny periods and isolated showers. Mainly cloudy tonight. Light to moderate southerly winds.	12	29.2	5	79.2	W/SW
18-Jul-15	Sat	Cloudy with showers and squally thunderstorms. Showers will be heavy at times. Moderate to fresh easterly winds,	0.2	29.4	8.2	80.7	E
19-Jul-15	Sun	Cloudy with showers and squally thunderstorms. Showers will be heavy at times. Moderate to fresh easterly winds,	Trace	29.9	6.4	Maintenance	E
20-Jul-15	Mon	Cloudy with showers and squally thunderstorms. Showers will be heavy at times. Moderate to fresh easterly winds,	46.2	27.5	5.5	Maintenance	E/SE
21-Jul-15	Tue	Cloudy with showers. Showers will be heavy at first with a few squally thunderstorms. Moderate to fresh southwesterly winds.	51.2	26.1	9.7	89.5	W/SW
22-Jul-15	Wed	Sunny periods and a few showers. Hot in the afternoon. Moderate southerly winds.	19.3	27.1	6.5	87.2	S/SW
23-Jul-15	Thu	Sunny periods and a few showers. Hot in the afternoon. Moderate southerly winds.	45	26.8	11.1	86.7	E/SE
24-Jul-15	Fri	Sunny periods and a few showers. Hot in the afternoon. Moderate southerly winds.	5.7	26.4	13	88	E/SE
25-Jul-15	Sat	Sunny periods and a few showers. Hot in the afternoon. Moderate southerly winds.	9.6	28	7.5	82.5	S/SW
26-Jul-15	Sun	Sunny periods and a few showers. Hot in the afternoon. Moderate southerly winds.	24.9	28.4	9.5	81.2	S
27-Jul-15	Mon	Sunny periods and a few showers. Hot in the afternoon. Moderate southerly winds.	0.3	28.5	10.4	77.5	S
28-Jul-15	Tue	Fine and very hot. Light winds.	Trace	28.8	7	73	E
29-Jul-15	Wed	Fine and very hot. Light winds.	3.7	27.8	8	72.5	E/SE
30-Jul-15	Thu	Fine and very hot. Light winds.	0.6	27.3	7.5	80	E/SE
31-Jul-15	Fri	Fine and very hot. Light winds.	0	27.4	6.8	75	S/SE

Appendix L

Waste Flow Table

Name of Department : CEDD **Contract No./ Work Order No. :** CV/2012/08

Appendix I - Monthly Summary Waste Flow Table for 2015

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

Month	Actual Quantities of Inert C&D Materials Generated / Imported (in '000 m3)						Actual Quantities of Other C&D Materials / Wastes Generated				
	Total Quantities Generated [a+b+c+d]	Broken Concrete (including rock for recycling into aggregates) (a)	Reused in the Contract (b)	Reused in Other Projects (c)	Disposed as Public Fill (d)	Imported C&D Material	Metal (in '000kg)	Paper/ Cardboard Packaging (in '000kg)	Plastic (bottles/containers, plastic sheets/ foams from package material) (in '000kg)	Chemical Waste (in '000kg)	Others (e.g. General Refuse etc.) (in '000m3)
January	66.2666	0.0000	0.0670	65.6529	0.5467	0.1150	0.0000	0.2500	0.0000	0.0000	0.0617
February	57.9980	0.0000	0.0000	57.3858	0.6121	0.3505	3.3200	0.3900	0.0000	0.5280	0.0908
March	66.0198	0.0000	0.3614	65.3359	0.3225	0.0729	0.0000	0.2920	0.0000	0.7040	0.1293
April	49.2562	0.0000	0.2770	48.7725	0.2066	0.1928	0.0000	0.2300	0.0000	0.0000	0.2423
May	41.7957	0.0000	8.7663	32.6095	0.4199	0.8683	0.0000	0.1300	0.0000	2.6400	0.0511
June	32.4389	0.0000	5.2132	26.7733	0.4524	0.9260	0.0000	0.5400	0.0000	0.5280	0.1703
Half-year total	313.7751	0.0000	14.6850	296.5299	2.5602	2.5255	3.3200	1.8320	0.0000	4.4000	0.7454
July	19.5844	0.0000	0.5171	18.2752	0.7922	0.9991	0.0000	0.2500	0.0000	0.8800	0.0496
August	0.0000										
September	0.0000										
October	0.0000										
November	0.0000										
December	0.0000										
Yearly Total	333.3596	0.0000	15.2021	314.8051	3.3524	3.5246	3.3200	2.0820	0.0000	5.2800	0.7950

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

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

Remark:

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

Name of Department: CEDD

Contract No.: CV/2012/09

Monthly Summary Waste Flow Table for 2015 (year)

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper/ cardboard packaging	Plastics (see Note 3)	Chemical Waste	Others, e.g. general refuse
	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in m^3)	(in '000m^3)
Jan	3.864	0.105	0.648	0.000	3.216	0.118	0.000	0.000	0.000	0.040	0.080
Feb	2.429	0.049	1.518	0.000	0.911	0.100	0.000	0.000	0.003	0.900	0.070
Mar	3.713	0.029	0.270	0.000	3.443	0.100	0.000	0.000	0.006	0.000	0.080
Apr	3.597	0.115	2.308	0.000	1.289	0.090	0.003	0.000	0.000	0.000	0.065
May	1.357	0.197	0.108	0.000	1.249	0.100	0.000	0.000	0.012	0.000	0.065
Jun	2.515	0.053	0.840	0.000	1.675	0.125	0.000	0.000	0.030	0.800	0.060
Sub-total	17.475	0.547	5.692	0.000	11.783	0.633	0.003	0.000	0.051	1.740	0.420
Jul	1.177	0.030	0.351	0.000	0.826	1.564	0.000	0.000	0.000	0.000	0.065
Aug											
Sep											
Oct											
Nov											
Dec											
Total	18.652	0.578	6.043	0.000	12.609	2.197	0.003	0.000	0.051	1.740	0.485

Note:

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

Name of Department: CEDD

Monthly Summary Waste Flow Table for 2015

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper/ cardboard packaging	Plastics	Chemical Waste	Others, e.g. general refuse
	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m^3)
JAN	0	0	0	0	0	33.3285	4.16	0.24	0	0	0.42
FEB	0	0	0	0	0	11.82	0.99	0	0	0	0.18
MAR	0	0	0	0	0	8.592	0	0	0	0	0.375
APRIL	0	0	0	0	0	12.81	0	0	0	0	0.04
MAY	0	0	0	0	0	**16.609**	**0**	**0.154**	**0**	**0**	**0**
JUN	0	0	0	0	0	13.676	0	0	0	0	0.015
Sub Total	0	0	0	0	0	96.8355	5.15	0.394	0	0	1.03
JUL	0	0	0	0	0	10.285	0	0	0	0	0.02
AUG											
SEP											
OCT											
NOV											
DEC											
Total	0	0	0	0	0	107.12	5.15	0.394	0	0	1.05

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					

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

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

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

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

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

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