



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.5) – DECEMBER 2013

PREPARED FOR  
CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT  
(CEDD)

Date	Reference No.	Prepared By	Certified By
15 January 2014	TCS00670/13/600/R00111v1	 Ben Tam (Environmental Consultant)	 Tam Tak Wing (Environmental Team Leader)

Version	Date	Remarks
1	8 January 2014	First Submission
2	15 January 2014	Revised against RE requirement on 12 January 2014

15 January 2014

Our ref: 7076192/L15183/R/AB/AW/rw  
Your ref:

AECOM  
8/F, Grand Central Plaza, Tower 2  
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N.T.

**By Email & Post**

Attention: Mr Kelvin LEE

Dear Sirs

**Agreement No. CE 45/2010 (EP)**  
**Liantang/Heung Yuen Wai Boundary Control Point and Associated Works**  
**Independent Environmental Checker – Investigation**  
**Monthly EM&A Report (No. 5) – December 2013**

With reference to the updated Monthly EM&A Report No. 5 for December 2013 (Version 2, ref.: TCS00670/13/600/R00111v1) certified by the ET Leader we received on 15 January 2014, please be noted that we have no adverse comments on the captioned submission. We herewith verify the captioned submission in accordance with Condition 5.4 of the Environmental Permit No. EP-404/2011/A. The previous verification letter (our ref.: 7076192/L15169/R/AB/AW/rw dated 13 January 2014) is superseded by this letter.

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 Ms Winnie MA on tel. 3995 8138 or by email to winnie.ma@smec.com.

Yours faithfully  
For and on behalf of  
SMEC Asia Limited



---

Antony WONG  
Independent Environmental Checker

cc	CEDD/BCP	- Mr Pui Sang LI / Mr Eric CHAN / Mr William CHEUNG	by fax: 2714 0103
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	SRJV	- Mr Edwin AU	by email
	CW	- Mr Daniel HO	by email
	AUES	- Mr TW TAM	by email

## EXECUTIVE SUMMARY

ES01 This is the 5<sup>th</sup> monthly EM&A report presenting the monitoring results and inspection findings for the reporting period from **1 to 31 December 2013** (hereinafter ‘the Reporting Period’).

### ENVIRONMENTAL MONITORING AND AUDIT ACTIVITIES

ES02 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	4	60
	24-hour TSP	4	(*)23
Construction Noise	L <sub>eq(30min)</sub> Daytime	5	25
Water Quality	Water sampling	5	12
Joint Site Inspection / Audit	IEC, ET, the Contractor and RE joint site Environmental Inspection and Auditing	Contract 3	5
		Contract 5	4

Remarks: (\*) Power failure was occurred at AM2 on 20 December 2013.

### BREACH OF ACTION AND LIMIT (A/L) LEVELS

ES03 No exceedances of air quality, construction noise were registered in the Reporting Period. For water quality monitoring, a total of two (2) Limit Level exceedances were recorded on 17 December 2013. The summary of breach of environmental performance is shown below.

Environmental Aspect	Monitoring Parameters	Action Level	Limit Level	Event & Action		
				NOE Issued	Investigation	Corrective Actions
Air Quality	1-hour TSP	0	0	0	0	0
	24-hour TSP	0	0	0	0	0
Construction Noise	L <sub>eq(30min)</sub> Daytime	0	0	0	0	0
Water Quality	DO	0	0	0	0	0
	Turbidity	0	1	1	1	0
	SS	0	1	1	1	0

### ENVIRONMENTAL COMPLAINT

ES04 No environmental complaints were received in the Reporting Period.

### NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTIONS

ES05 No environmental summons or successful prosecutions were recorded in the Reporting Period.

### REPORTING CHANGE

ES06 No reporting changes were made in the Reporting Period.

### SITE INSPECTION

ES07 In the Reporting Period, joint site inspection for Contract 3 to evaluate the site environmental performance has been carried out by the RE, IEC, ET and the Contractor on **4, 11, 18, 23 and 30 December 2013**. No non-compliance was noted.

ES08 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 5, 11, 19 and 24 December 2013. No non-compliance was noted.

**FUTURE KEY ISSUES**

ES09 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.

ES10 During dry season, special attention should be paid on the potential construction dust impact since most of the construction sites are adjacent to villages. The Contractor should fully implement the construction dust mitigation measures properly.

ES11 In addition, the potential water quality impact at the nearby rivers should be highly alerted. The Contractors including Contract 3 and Contract 5 should prevent muddy water and other water pollutants via site surface water runoff get into the Kong Yiu Channel and Ma Wat Channel, water quality mitigation measures should be properly implemented.

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## 1 INTRODUCTION

### 1.1 PROJECT BACKGROUND

- 1.1.1 Civil Engineering and Development Department is the Project Proponent and the Permit Holder of Agreement No. CE 45/2008 (CE) Liantang / Heung Yuen Wai Boundary Control Point and Associated Works, which is a Designated Project to be implemented under Environmental Permit number EP-404/2011/A issued on 28 October 2013.
- 1.1.2 The Project consists of two main components: Construction of a Boundary Control Point (hereinafter referred as “BCP”); and Construction of a connecting road alignment. Layout plan of the Project is shown in *Appendix A*.
- 1.1.3 The proposed BCP is located at the boundary with Shenzhen near the existing Chuk Yuen Village, comprising a main passenger building with passenger and cargo processing facilities and the associated customs, transport and ancillary facilities. The connecting road alignment consists of six main sections:
- 1) Lin Ma Hang to Frontier Closed Area (FCA) Boundary – this section comprises at-grade and viaducts and includes the improvement works at Lin Ma Hang Road;
  - 2) Ping Yeung to Wo Keng Shan – this section stretches from the Frontier Closed Area Boundary to the tunnel portal at Cheung Shan and comprises at-grade and viaducts including an interchange at Ping Yeung;
  - 3) North Tunnel – this section comprises the tunnel segment at Cheung Shan and includes a ventilation building at the portals on either end of the tunnel;
  - 4) Sha Tau Kok Road – this section stretches from the tunnel portal at Wo Keng Shan to the tunnel portal south of Loi Tung and comprises at-grade and viaducts including an interchange at Sha Tau Kok and an administration building;
  - 5) South Tunnel – this section comprises a tunnel segment that stretches from Loi Tung to Fanling and includes a ventilation building at the portals on either end of the tunnel as well as a ventilation building in the middle of the tunnel near Lau Shui Heung;
  - 6) Fanling – this section comprises the at-grade, viaducts and interchange connection to the existing Fanling Highway.
- 1.1.4 Action-United Environmental Services & Consulting has been commissioned as an Independent ET to implement the relevant EM&A program in accordance with the approved EM&A Manual, as well as the associated duties. As part of the EM&A program, the baseline monitoring has carried out between **13 June 2013** and **12 July 2013** for all parameters including air quality, noise and water quality before construction work commencement. The Baseline Monitoring Report summarized the key findings and the rationale behind determining a set of Action and Limit Levels (A/L Levels) from the baseline data. Also, the Project baseline monitoring report which verified by the IEC has been submitted to EPD on **16 July 2013** for endorsement. The major construction works of the Project was commenced on **16 August 2013** in accordance with the EP Section 5.3 stipulation.
- 1.1.5 This is **5<sup>th</sup>** monthly EM&A report presenting the monitoring results and inspection findings for reporting period from **1** to **31 December 2013**.

### 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*

<i>Section 8</i>	<i>Site Inspections</i>
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<i>Section 10</i>	<i>Implementation Status of Mitigation Measures</i>
<i>Section 11</i>	<i>Conclusions and Recommendations</i>



## 2 PROJECT ORGANIZATION AND CONSTRUCTION PROGRESS

### 2.1 CONSTRUCTION CONTRACT PACKAGING

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

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

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

#### Contract 2 (CV/2012/08)

2.1.3 Contract 2 has awarded in December 2013. Construction work is predicted to be commenced in early 2014. Major Scope of Work of the Contract 2 is listed below:

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

#### Contract 3 (CV/2012/09)

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

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

#### Contract 4 (Contract number to be assigned)

2.1.5 Contract 4 has not yet 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 not yet awarded. Major Scope of Work of the Contract 6 will be included below:
- construction of an approximately 4.6km long dual two-lane connecting road (with about 0.6km of at-grade road, 3.3km of viaduct and 0.7km of tunnel) connecting the BCP with the proposed Sha Tau Kok Road Interchange and the associated ventilation buildings;
  - associated diversion/modification works at access roads to the resite of Chuk Yuen Village;
  - provision of sewage collection, treatment and disposal facilities for the BCP and the resite of Chuk Yuen Village;
  - construction of a pedestrian subway linking the BCP to Lin Ma Hang Road;
  - provisioning of the affected facilities including Wo Keng Shan Road garden; and
  - construction of associated footpath, slopes, retaining structures, drainage, sewerage, waterworks, landscaping works and other ancillary works.

**2.2 PROJECT ORGANIZATION**

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

Civil Engineering and Development Department (CEDD)

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

Environmental Protection Department (EPD)

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

Engineer or Engineers Representative (ER)

- 2.2.4 The ER is responsible for overseeing the construction works and for ensuring that the works are undertaken by the Contractor in accordance with the specification and contract requirements. The duties and responsibilities of the ER with respect to EM&A are:
- Monitor the Contractors' compliance with contract specifications, including the implementation and operation of the environmental mitigation measures and their effectiveness
  - Monitor Contractors's, ET's and IEC's compliance with the requirements in the Environmental Permit (EP) and EM&A Manual
  - Facilitate ET's implementation of the EM&A programme
  - Participate in joint site inspection by the ET and IEC
  - Oversee the implementation of the agreed Event / Action Plan in the event of any exceedance
  - Adhere to the procedures for carrying out complaint investigation
  - Liaison with DSD, Engineer/Engineer's Representative, ET, IEC and the Contractor of the "Construction of the DSD's Regulation of Shenzhen River Stage 4 (RSR 4)" Project discussing regarding the cumulative impact issues.

The Contractor(s)

- 2.2.5 There will be one contractor for each individual works contract. The Contractor(s) should report

to the ER. The duties and responsibilities of the Contractor are:

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

Environmental Team (ET)

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

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

Independent Environmental Checker (IEC)

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

- Provide proactive advice to the ER and the Project Proponent on EM&A matters related to the project, independent from the management of construction works, but empowered to audit the environmental performance of construction

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

## 2.3 CONCURRENT PROJECTS

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

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

## 2.4 CONSTRUCTION PROGRESS

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

### Contract 2 (CV/2012/08)

- The contract has not yet commenced.

### Contract 3 (CV/2012/09)

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

- Cable detection and trail trenches
- Tree Felling Works
- Trial Pit Excavation
- Pre-drilling works and piling works
- Extension of box culvert
- Bored pile wall construction
- Erection of site office
- Construction of haul road and temporary soil platform for geotechnical works

### Contract 4 (Contract number to be assigned)

- The contract has not yet awarded.

Contract 5 (CV/2013/03)

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

- Construction of Retaining Wall No.1
- Eastern Lift shaft's piling works
- Piling works at life shaft, Bridge J & footbridge
- Construction of pedestrian subway and pump room at LMH
- Pipe jacking across Kong Yuen River
- Transplantation, Pruning/felling of existing tree
- Drainage works at LMH Road
- Formation Works at BCP Area
- Construction of Depressed Road at BCP3

Contract 6 (CV/2013/08)

- The contract is still yet awarded

**2.5 SUMMARY OF ENVIRONMENTAL SUBMISSIONS**

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

- Project Layout Plans of Contracts 3 and 5
- Landscape Plan
- Topsoil Management Plan
- Environmental Monitoring and Audit Programme
- Baseline Monitoring Report (TCS00690/13/600/R0030v3) for the Project
- Waste Management Plan of the Contracts 3 and 5

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 3	Contract 5	Contract 2, 4 & 6
1	Air pollution Control (Construction Dust) Regulation	Ref. No: 362101 Notification received by EPD on 17 Jul 2013	Ref. No: 359338 Notified EPD on 13 May 2013	--
2	Chemical Waste Producer Registration - Waste Producers Number	No.:5113-634-C3817-01 Valid form 7 Oct 2013 till the end of Contract	No.: 5213-642-S3735-01 Valid form 8 Jun 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	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. 7017914 Valid form 2 Aug 13 till the end of Contract	Account No. 7017351 Valid form 29 Apr 13 till the end of Contract	--
5	Construction Noise Permit	GW-RN0747-13 Valid on 4 Dec 13 till 19 Jan 14	NA	--

### 3 SUMMARY OF IMPACT MONITORING REQUIREMENTS

#### 3.1 GENERAL

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

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

#### 3.2 MONITORING PARAMETERS

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

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

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

**Table 3-1 Summary of EM&A Requirements**

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

#### 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
AM1	Tsung Yuen Ha Village House No. 63	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
AM4a	A village house located at about 160m east side	LMH to Frontier	Contract 6

Station ID	Description	Works Area	Related to the Work Contract
	of the original point AM4	Closed Area	
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
AM7a	Another village (nameless) aligns to Sha Tau Kok Road – Wo Hang Section proximity to Tai Tong Wu Village. The location is about 140m away from the original point AM7	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).

**Table 3-3 Impact Monitoring Stations - Construction Noise**

Station ID	Description	Works Area	Related to the Work Contract
NM1	Tsung Yuen Ha Village House No. 63	BCP	Contract 5
NM2	Village House near Lin Ma Hang Road	Lin Ma Hang to Frontier Closed Area	Contract 5, Contract 6
NM3	Ping Yeung Village House (facade facing northeast)	Ping Yeung to Wo Keng Shan	Contract 6
NM4	Wo Keng Shan Village House	Ping Yeung to Wo Keng Shan	Contract 6
NM5	Village House, Loi Tung	Sha Tau Kok Road	Contract 2, Contract 6
NM6	Tai Tong Wu Village House 2	Sha Tau Kok Rpad	Contract 2, Contract 6
NM7	Po Kat Tsai Village	Po Kat Tsai	Contract 2
NM8	Village House, Tong Hang	Fanling	Contract 2 Contract 3
NM9	Village House, Kiu Tau Village	Fanling	Contract 3
NM10	Nam Wa Po Village House No. 80	Fanling	Contract 3

**Table 3-4 Impact Monitoring Stations - Water Quality**

Station ID	Description	Designated / Alternative Location		Nature of the location	Related to the Work Contract
		Coordinates			
		Easting	Northing		
WM1	Downstream of Kong Yiu Channel	833679	845421	Alternative location located at upstream 51m of the designated location	Contract 5
WM1-Control	Upstream of Kong Yiu Channel	834185	845917	NA	Contract 5
WM2A	Downstream of River Ganges	834204	844471	Alternative location located at downstream 81m of the designated location	Contract 6
WM2A-Control	Upstream of River Ganges	835270	844243	Alternative location located at upstream 78m of the designated location	Contract 6
WM2B	Downstream of River Ganges	835433	843397	NA	Contract 6
WM2B-Control	Upstream of River Ganges	835835	843351	Alternative location located at downstream 31m of the designated location	Contract 6
WM3	Downstream of River Indus	836324	842407	NA	Contract 6

Station ID	Description	Designated / Alternative Location		Nature of the location	Related to the Work Contract
		Coordinates			
		Eastings	Northing		
WM3-Control	Upstream of River Indus	836763	842400	Alternative location located at downstream 26m of the designated location	Contract 6
WM4	Downstream of Ma Wat Channel	833850	838338	Alternative location located at upstream 11m of the designated location	Contract 3
WM4-Control A	Kau Lung Hang Stream	834028	837695	Alternative location located at downstream 28m of the designated location	Contract 3
WM4-Control B	Upstream of Ma Wat Channel	833760	837395	Alternative location located at upstream 15m of the designated location	Contract 3

### 3.4 MONITORING FREQUENCY AND PERIOD

The requirements of impact monitoring are stipulated in *Sections 2.1.6, 3.1.5 and 4.1.6* of the approved *EM&A Manual* and presented as follows.

#### Air Quality Monitoring

3.4.1 Frequency of impact air quality monitoring is as follows:

- 1-hour TSP                      3 times every six days during course of works
- 24-hour TSP                      Once every 6 days during course of works.

#### Noise Monitoring

3.4.2 One set of  $L_{eq(30min)}$  as 6 consecutive  $L_{eq(5min)}$  between 0700-1900 hours on normal weekdays and once every week during course of works. If construction work necessary to carry out at other time periods, i.e. restricted time period (19:00 to 07:00 the next morning and whole day on public holidays) (hereinafter referred as “the restricted hours”), 3 consecutive  $L_{eq(5min)}$  measurement will depended CNP requirements to undertake. Supplementary information for data auditing, statistical results such as  $L_{10}$  and  $L_{90}$  shall also be obtained for reference.

#### Water Quality Monitoring

3.4.3 The water quality monitoring frequency shall be 3 days per week during course of works. The interval between two sets of monitoring shall not be less than 36 hours.

### 3.5 MONITORING EQUIPMENT

#### Air Quality Monitoring

3.5.1 The 24-hour and 1-hour TSP levels shall be measured by following the standard high volume sampling method as set out in the *Title 40 of the Code of Federal Regulations, Chapter 1 (Part 50), Appendix B*. If the ET proposes to use a direct reading dust meter to measure 1-hour TSP levels, it shall submit sufficient information to the IEC to approve.

3.5.2 The filter paper of 24-hour TSP measurement shall be determined by HOKLAS accredited laboratory.

3.5.3 All equipment to be used for air quality monitoring is listed in *Table 3-5*.

**Table 3-5 Air Quality Monitoring Equipment**

Equipment	Model
<b>24-Hr TSP</b>	
High Volume Air Sampler	TISCH High Volume Air Sampler, HVS Model TE-5170
Calibration Kit	TISCH Model TE-5025A
<b>1-Hour TSP</b>	



Equipment	Model
Portable Dust Meter	Sibata LD-3B Laser Dust monitor Particle Mass Profiler & Counter

**Wind Data Monitoring Equipment**

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

**Noise Monitoring**

- 3.5.7 Sound level meter in compliance with the International Electrotechnical Commission Publications 651: 1979 (Type 1) and 804: 1985 (Type 1) specifications shall be used for carrying out the noise monitoring. The sound level meter shall be checked using an acoustic calibrator. The wind speed shall be checked with a portable wind speed meter capable of measuring the wind speed in m s<sup>-1</sup>.
- 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-14 or Rion NL-31
Calibrator	B&K Type 4231
Portable Wind Speed Indicator	Testo Anemometer

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

**Water Quality Monitoring**

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

- a DO level in the range of 0-20 mg/l and 0-200% saturation; and
  - a temperature of between 0 and 45 degree Celsius.
- 3.5.11 A portable pH meter capable of measuring a range between 0.0 and 14.0 should be provided to measure pH under the specified conditions accordingly to the APHA Standard Methods.
- 3.5.12 The instrument should be portable and weatherproof using a DC power source. It should have a photoelectric sensor capable of measuring turbidity between 0-1000 NTU.
- 3.5.13 A portable, battery-operated echo sounder or tape measure will be used for the determination of water depth at each designated monitoring station as appropriate.
- 3.5.14 A water sampler e.g. Kahlsico Water Sampler, which is a transparent PVC cylinder with capacity not less than 2 litres, will be used for water sampling if water depth over than 0.5m. For sampling from very shallow water depths e.g. <0.5 m, water sample collection will be directly from water surface below 100mm use sampling plastic bottle to avoid inclusion of bottom sediment or humus. Moreover, Teflon/stainless steel bailer or self-made sampling buckets maybe used for water sampling. The equipment used for sampling will be depended the sampling location and depth situations.
- 3.5.15 Water samples for laboratory measurement of SS will be collected in high density polythene bottles, packed in ice (cooled to 4 °C without being frozen), and delivered to the laboratory in the same day as the samples were collected.
- 3.5.16 Analysis of suspended solids should be carried out in a HOKLAS or other accredited laboratory. Water samples of about 1L should be collected at the monitoring stations for carrying out the laboratory suspended solids determination. The SS determination work should start within 24 hours after collection of the water samples. The SS analyses should follow the *APHA Standard Methods 2540D* with Limit of Reporting of 2 mg/L.
- 3.5.17 Water quality monitoring equipment used in the impact monitoring is listed in **Table 3-7**. Suspended solids (SS) analysis is carried out by a local HOKLAS-accredited laboratory, namely *ALS Technichem (HK) Pty Ltd*.

**Table 3-7 Water Quality Monitoring Equipment**

Equipment	Model
Water Depth Detector	Eagle Sonar or tape measures
Water Sampler	A 2-litre transparent PVC cylinder with latex cups at both ends or teflon/stainless steel bailer or self-made sampling bucket
Thermometer & DO meter	YSI PRO20 Handheld Dissolved Oxygen Instrument
pH meter	The EcoSense <sup>®</sup> pH10A pen-style instrument
Turbidimeter	Hach 2100Q
Sample Container	High density polythene bottles (provided by laboratory)
Storage Container	'Willow' 33-liter plastic cool box with Ice pad

### 3.6 MONITORING METHODOLOGY

#### 1-hour TSP Monitoring

- 3.6.1 The 1-hour TSP monitor was a brand named "Sibata LD-3B Laser Dust monitor Particle Mass Profiler & Counter" which is a portable, battery-operated laser photometer. The 1-hour TSP meter provides a real time 1-hour TSP measurement based on 90° light scattering. The 1-hour TSP monitor consists of the following:
- (a.) 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 Thermo Andersen Model GS2310 TSP high volume air sampling system, which complied with *EPA Code of Federal Regulation, Appendix B to Part 50*. The High Volume Air Sampler (HVS) consists of the following:

- (a.) An anodized aluminum shelter;
- (b.) A 8"x10" stainless steel filter holder;
- (c.) A blower motor assembly;
- (d.) A continuous flow/pressure recorder;
- (e.) A motor speed-voltage control/elapsed time indicator;
- (f.) A 7-day mechanical timer, and
- (g.) A power supply of 220v/50 Hz

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

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

**Noise Monitoring**

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

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

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

**Water Quality**

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

*Sampling Procedure*

- 3.6.10 A Digital Global Positioning System (GPS) is used to identify the designated monitoring stations prior to water sampling. A portable, battery-operated echo sounder is used for the determination of water depth at each station. At each station, water sample would be collected from 0.1m below water surface or the water surface to prevent the river bed sediment for stirring.
- 3.6.11 The sample container will be rinsed with a portion of the water sample. The water sample then will be transferred to the high-density polythene bottles as provided by the laboratory, labeled with a unique sample number and sealed with a screw cap.

- 3.6.12 Before sampling, general information such as the date and time of sampling, weather condition as well as the personnel responsible for the monitoring would be recorded on the field data sheet.
- 3.6.13 A ‘Willow’ 33-liter plastic cool box packed with ice will be used to preserve the water samples prior to arrival at the laboratory for chemical determination. The water temperature of the cool box is maintained at a temperature as close to 4<sup>0</sup>C 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. Before each round of monitoring, the dissolved oxygen probe would be calibrated by the wet bulb method.
- 3.6.15 A portable EcoSense<sup>®</sup> pH10A pen-style instrument 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. Standard buffer solutions of pH 7 and pH 10 are used for calibration of the instrument before and after measurement.
- 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. StabiCal<sup>®</sup> Standards 10NTU and 100NTU are used for calibration of the instrument before and after measurement.
- 3.6.17 All in-situ measurement equipment are calibrated by HOKLAS accredited laboratory of three month interval.

Laboratory Analysis

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

**3.7 EQUIPMENT CALIBRATION**

- 3.7.1 Calibration of the HVS is performed upon installation and thereafter at bimonthly intervals in accordance with the manufacturer’s instruction using the certified standard calibrator (TISCH Model TE-5025A). Moreover, the Calibration Kit would be calibrated annually. The calibration data are properly documented and the records are maintained by ET for future reference.
- 3.7.2 The 1-hour TSP meter was calibrated by the supplier prior to purchase. Zero response of the equipment would be checked before and after each monitoring event. Annually calibration with the High Volume Sampler (HVS) in same condition would be undertaken by the Laboratory.
- 3.7.3 The sound level meter and calibrator are calibrated and certified by a laboratory accredited under HOKLAS or any other international accreditation scheme at yearly basis.
- 3.7.4 All water quality monitoring equipment would be calibrated by HOKLAS accredited laboratory of three month intervals.
- 3.7.5 The calibration certificates of all monitoring equipment used for the impact monitoring program in the Reporting Period and the HOKLAS accredited certificate of laboratory are attached in **Appendix F**.

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

- 3.8.1 The baseline results form the basis for determining the environmental acceptance criteria for the impact monitoring. According to the approved Environmental Monitoring and Audit Manual,

the air quality, construction noise and water quality criteria were set up, namely Action and Limit levels are listed in *Tables 3-8, 3-9 and 3-10*.

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

Monitoring Station	Action Level ( $\mu\text{g}/\text{m}^3$ )		Limit Level ( $\mu\text{g}/\text{m}^3$ )	
	1-hour TSP	24-hour TSP	1-hour TSP	24-hour TSP
AM1	265	143	500	260
AM2	268	149		
AM3	269	145		
AM4a	267	148		
AM5	268	143		
AM6	269	148		
AM7a	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) <sup>Note 1 &amp; Note 2</sup>

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

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

**Table 3-10 Action and Limit Levels for Water Quality**

Parameter	Performance criteria	Monitoring Location				
		WM1	WM2A	WM2B	WM3	WM4
DO (mg/L)	Action Level	(*)4.23	(**)4.00	(*)4.74	(**)4.00	(*)4.14
	Limit Level	(#)4.19	(**)4.00	(#)4.60	(**)4.00	(#)4.08
Turbidity (NTU)	Action Level	51.3	24.9	11.4	13.4	35.2
	Limit Level	AND 120% of upstream control station of the same day				
SS (mg/L)	Action Level	54.5	14.6	11.8	12.6	39.4
	Limit Level	AND 120% of upstream control station of the same day				
		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 properly 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 3 and 5 and air quality monitoring was performed at 4 relevant designated locations as below:

- AM1 - Tsung Yuen Ha Village House No. 63;
- AM2 - Village House near Lin Ma Hang Road;
- AM3 - Ta Kwu Ling Fire Service Station of Ta Kwu Ling Village; and
- 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 **60** events of 1-hour TSP and **23** events of 24-hours TSP monitoring were carried out and the monitoring results are summarized in *Tables 4-1 to 4-4*. 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 – AM1**

Date	24-hour TSP ( $\mu\text{g}/\text{m}^3$ )	1-hour TSP ( $\mu\text{g}/\text{m}^3$ )				
		Date	Start Time	1 <sup>st</sup> reading	2 <sup>nd</sup> reading	3 <sup>rd</sup> reading
03-Dec-13	58	05-Dec-13	11:07	130	97	81
09-Dec-13	113	11-Dec-13	10:53	211	220	212
14-Dec-13	141	17-Dec-13	11:09	134	105	137
20-Dec-13	109	23-Dec-13	10:32	227	230	220
24-Dec-13	109	28-Dec-13	09:50	173	222	177
30-Dec-13	134					
Average (Range)	<b>111 (58 – 141)</b>	Average (Range)		<b>172 (81 – 230)</b>		

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

Date	24-hour TSP ( $\mu\text{g}/\text{m}^3$ )	1-hour TSP ( $\mu\text{g}/\text{m}^3$ )				
		Date	Start Time	1 <sup>st</sup> reading	2 <sup>nd</sup> reading	3 <sup>rd</sup> reading
03-Dec-13	85	05-Dec-13	11:01	118	116	92
09-Dec-13	117	11-Dec-13	10:42	220	215	203
14-Dec-13	86	17-Dec-13	12:00	101	112	120
*20-Dec-13	NA	23-Dec-13	11:06	265	249	254
24-Dec-13	140	28-Dec-13	09:56	199	237	230
30-Dec-13	144					
Average (Range)	<b>115 (85 – 144)</b>	Average (Range)		<b>182 (92 – 265)</b>		

Remarks: (\*) Power failure was occurred on 20 December 2013.

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

Date	24-hour TSP ( $\mu\text{g}/\text{m}^3$ )	1-hour TSP ( $\mu\text{g}/\text{m}^3$ )				
		Date	Start Time	1 <sup>st</sup> reading	2 <sup>nd</sup> reading	3 <sup>rd</sup> reading
03-Dec-13	93	05-Dec-13	12:23	84	69	74
09-Dec-13	133	11-Dec-13	10:34	244	234	229
14-Dec-13	79	17-Dec-13	12:03	98	92	119
20-Dec-13	139	23-Dec-13	11:21	236	254	240

Date	24-hour TSP ( $\mu\text{g}/\text{m}^3$ )	1-hour TSP ( $\mu\text{g}/\text{m}^3$ )				
		Date	Start Time	1 <sup>st</sup> reading	2 <sup>nd</sup> reading	3 <sup>rd</sup> reading
24-Dec-13	114	28-Dec-13	10:14	221	244	268
30-Dec-13	136					
Average (Range)	<b>116</b> (79 – 139)	Average (Range)		<b>180</b> (69 – 268)		

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

Date	24-hour TSP ( $\mu\text{g}/\text{m}^3$ )	1-hour TSP ( $\mu\text{g}/\text{m}^3$ )				
		Date	Start Time	1 <sup>st</sup> reading	2 <sup>nd</sup> reading	3 <sup>rd</sup> reading
03-Dec-13	104	05-Dec-13	13:11	80	72	76
09-Dec-13	42	11-Dec-13	11:32	208	211	232
14-Dec-13	56	17-Dec-13	10:22	86	154	121
20-Dec-13	78	23-Dec-13	15:15	244	267	258
24-Dec-13	69	28-Dec-13	10:45	134	192	220
30-Dec-13	58					
Average (Range)	<b>68</b> (42 – 104)	Average (Range)		<b>170</b> (72 – 267)		

- 4.2.2 In Reporting period, AM2 power failure occurred on 20 December 2013. Power supply has resumed on 23 December 2013. So, only five events of 24-hour TSP monitoring conducted at AM2.
- 4.2.3 As shown in *Tables 4-1 to 4-4*, the 24-hour and 1-hour TSP monitoring results were below the Action/ Limit Level. No Notification of Exceedances (NOE) of air quality criteria or corrective action was therefore required.
- 4.2.4 Two months interval calibration has been carried out at AM1, AM2 and AM3 in accordance with the EM&A Manual requirements. The updated calibration certificates are attached in *Appendix F*.
- 4.2.5 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 3 and 5 and noise monitoring was performed at 5 relevant designated locations as below:

- NM1 - Tsung Yuen Ha Village House No. 63;
- NM2 - Village House near Lin Ma Hang Road;
- 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 **25** 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, 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 *Tables 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**

Date	NM1 ( $L_{eq30min}$ )	NM2 ( $L_{eq30min}$ )	NM8 ( $L_{eq30min}$ )	NM9 ( $L_{eq30min}$ )	<sup>(*)</sup> NM10 ( $L_{eq30min}$ )
05-Dec-13	57	67	63	63	62
11-Dec-13	55	59	62	64	61
19-Dec-13	55	61	63	62	61
23-Dec-13	52	60	56	71	60
28-Dec-13	55	61	61	63	60
<b>Limit Level</b>	<b>75 dB(A)</b>				

Remarks

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

5.2.2 As shown in *Tables 5-1*, the noise level measured at five (5) designated monitoring locations were below 75dB(A). Furthermore, there were no noise complaints (Action Level exceedance) received by the RE, Contractor or CEDD in the Reporting Period. Therefore, no Action or Limit Level exceedance was triggered and no corrective action was therefore 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 - Contract 3 working site Downstream of Ma Wat Channel
- WM4-Control A - Contract 3 working site Kau Lung Hang Stream
- WM4-Control B - Contract 3 working site Upstream of Ma Wat Channel

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

### 6.2 RESULTS OF WATER QUALITY MONITORING

6.2.1 In the Reporting Period, a total of 12 sampling days were performed for water quality monitoring at Contracts 3 and 5. The key monitoring parameters including Dissolved Oxygen, Turbidity and Suspended Solids are summarized in *Tables 6-1 and 6-2*. Breaches of water quality monitoring criteria are shown in *Table 6-3*. Detailed monitoring database including in-situ measurements and laboratory analysis data are shown in *Appendix I* and the relevant graphical plot are shown in *Appendix J*.

**Table 6-1 Summary of Water Quality Monitoring Results for Contract 3**

Date	Dissolved Oxygen (mg/L)			Turbidity (NTU)			Suspended Solids (mg/L)		
	WM4	WM4-CA	WM4-CB	WM4	WM4-CA	WM4-CB	WM4	WM4-CA	WM4-CB
3-Dec-13	8.8	7.0	7.2	18.5	3.5	3.8	19.0	4.0	8.0
5-Dec-13	7.2	7.8	6.7	7.0	43.9	4.2	7.0	43.5	5.5
7-Dec-13	9.1	6.3	9.5	16.2	8.0	13.5	17.5	5.5	15.5
9-Dec-13	11.4	6.4	10.1	12.4	8.8	4.8	15.5	8.5	5.0
11-Dec-13	8.7	6.6	8.1	7.4	3.0	4.9	8.0	2.0	3.5
13-Dec-13	9.2	8.8	7.1	7.9	7.3	3.8	8.0	16.0	3.5
17-Dec-13	10.4	11.3	6.8	25.5	10.5	16.5	25.0	10.5	13.5
19-Dec-13	7.0	9.0	6.1	13.0	2.6	5.9	10.5	2.0	4.0
21-Dec-13	8.0	7.9	7.3	5.4	13.4	4.5	6.5	9.5	4.5
23-Dec-13	6.8	7.1	10.5	6.7	2.5	4.3	5.0	<2	8.0
28-Dec-13	11.8	11.2	8.7	16.6	3.4	4.1	12.5	<2	2.0
30-Dec-13	10.6	9.0	9.3	7.2	12.6	6.8	5.0	4.0	3.5

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

Date	Dissolved Oxygen (mg/L)		Turbidity (NTU)		Suspended Solids (mg/L)	
	WM1	WM1-Control	WM1	WM1-Control	WM1	WM1-Control
3-Dec-13	7.1	5.6	12.3	6.8	11.5	2.5
5-Dec-13	6.3	6.6	8.2	6.5	5.0	5.0
7-Dec-13	6.5	10.6	8.0	12.3	6.0	20.0
9-Dec-13	8.6	11.5	9.9	5.5	9.5	3.0
11-Dec-13	8.4	9.2	17.4	5.7	13.5	2.5
13-Dec-13	6.5	8.3	7.1	5.2	6.5	4.0
17-Dec-13	8.3	9.7	<b><u>209.0</u></b>	55.6	<b><u>107.5</u></b>	35.0
19-Dec-13	5.6	7.7	18.4	151.0	13.0	112.5
21-Dec-13	7.2	6.7	8.1	8.7	10.5	5.5
23-Dec-13	7.9	7.8	8.4	5.6	6.0	3.0
28-Dec-13	7.4	8.1	15.6	6.5	12.0	<2
30-Dec-13	8.1	5.5	6.9	5.9	3.0	<2

Remark: Bold and underlined indicated Limit Level exceedance

**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	1	0	1	0	2
WM4	0	0	0	0	0	0	0	0
<b>No of Exceedance</b>	0	0	0	1	0	1	0	2

6.2.2 In view of the monitoring results of Dissolved Oxygen (DO), all the measured results were higher than Action Level exceedance and no exceedances were therefore triggered.

6.2.3 Two (2) Limit Level exceedances including parameters turbidity and SS were recorded at WM1 on 17 December 2013. The Notification on Exceedances (NOEs) was issued to all relevant parties upon the results confirmed. The investigation for the cause of exceedance was completed and the result is presented as follow:

- According to the site information provided by SRJV, the site construction activities carried out on 17 Dec 2013 included sheet piling and formworks erection of Retaining Wall No.1, and backfill at BCP Area.
- All the active construction activities under the project are land based and do not disturb the river environment.
- On 14, 15 and 16 Dec before the sampling day, Hong Kong Observatory recorded has raining; moreover the sampling date 17 December 2013 also has raining. As reviewed baseline monitoring data, turbidity and suspended solids of abnormally high result are obtained after rainfall or rainy day. The condition of the river water quality is highly influenced by the rainfall.
- Upon receipt of the NOE, SRJV provided site photograph records dated 17 Dec 2013. Reviewing the provided photograph records, muddy water observed at upstream on Tsung Yuen Ha Village.
- Addition, some soil strain/mark observed at other side of Kong Yiu River of the DSD maintenance access and slope surface which situated outside the Project site boundary.
- SRJV have implemented water mitigation measures such as erection of sand bags barrier along the edge of the river and works area to prevent the storm runoff into the existing river.

6.2.4 Based on above investigation and consider that the exceedance should not be due to the Project works.

**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 3		Contract 5		Total Quantity for the Project
	Quantity	Disposal Location	Quantity	Disposal Location	
C&D Materials (Inert) (in '000m <sup>3</sup> )	0.177	-	0	--	<b>0.177</b>
Reused in this Project (Inert) (in '000 m <sup>3</sup> )	0.030	-	0	--	<b>0.030</b>
Reused in other Projects (Inert) (in '000 m <sup>3</sup> )	0	-	0	--	<b>0</b>
Disposal as Public Fill (Inert) (in '000 m <sup>3</sup> )	0.140	Tuen Mun 38	0	--	<b>0.140</b>

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

Type of Waste	Contract 3		Contract 5		Total Quantity for the Project
	Quantity	Disposal Location	Quantity	Disposal Location	
Recycled Metal (kg)	0	-	11.53	--	<b>11.53</b>
Recycled Paper / Cardboard Packing (kg)	0	-	0	--	<b>0</b>
Recycled Plastic (kg)	0	-	0	--	<b>0</b>
Chemical Wastes (kg)	0	-	0	--	<b>0</b>
General Refuses (in '000m <sup>3</sup> )	0.055	NENT	0.2	NENT	<b>0.255</b>

## 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 3

8.2.1 In the Reporting Period, joint site inspection for Contract 3 to evaluate the site environmental performance has been carried out by the RE, IEC, ET and the Contractor on **4, 11, 18, 23** and **30 December 2013**. No non-compliance was noted.

8.2.2 The findings / deficiencies of **Contract 3** that observed during the weekly site inspection are listed in **Table 8-1**.

**Table 8-1 Site Observations for Contract 3**

Date	Findings / Deficiencies	Follow-Up Status
27 Nov 2013 (last Reporting Period)	<ul style="list-style-type: none"> <li>Free standing chemical was observed at construction site, the Contractor was reminded to provide enough drip tray for all free standing chemical at the construction site.</li> </ul>	<ul style="list-style-type: none"> <li>Free standing chemical container was removed from construction site before site inspection on 4 December 2013</li> </ul>
	<ul style="list-style-type: none"> <li>Fences for tree protection is not enough, the Contractor was reminded to provide enough fence to protect all the trees retained on site.</li> </ul>	<ul style="list-style-type: none"> <li>Tree fence has erected to protect all trees retained on site.</li> </ul>
	<ul style="list-style-type: none"> <li>The Contractor was reminded that the chemical container should be located far from the U-channel to prevent contamination of the riverbody</li> </ul>	<ul style="list-style-type: none"> <li>During site inspection dated 4 December 2013, the chemical container has located far from the U-channel.</li> </ul>
04 Dec 2013	<ul style="list-style-type: none"> <li>Trees to be transplanted or retained should be protected by durable fence and designated as no intrusion zone in Nam Wa Po.</li> </ul>	<ul style="list-style-type: none"> <li>In Nam Wa Po, all trees has fenced off during site inspection on 18 December 2013.</li> </ul>
	<ul style="list-style-type: none"> <li>Oil stain observed at Tai Wo Service Road West. The Contractor is reminded to clear-up and all the working plant used at site should be regular carried out maintainance.</li> </ul>	<ul style="list-style-type: none"> <li>No oil stain has observed at Tai Wo Service Road West during site inspection 11 December 2013.</li> </ul>
11 Dec 2013	<ul style="list-style-type: none"> <li>The Contractor was reminded to prevent oil spilling and clear the oil stain at Nam Wa Po near AM9b monitoring station</li> </ul>	<ul style="list-style-type: none"> <li>No oil stain has observed at Nam Wa Po during site inspection 23 December 2013.</li> </ul>
18 Dec 2013	<ul style="list-style-type: none"> <li>The Contractor should be improvement tree fences to protect on site the retained tree.</li> </ul>	<ul style="list-style-type: none"> <li>Tree fences has improved before site inspection dated 30 December 2013</li> </ul>
	<ul style="list-style-type: none"> <li>The Contractor was recommended improve wheel washing bay to ensure all wastewater collection and delivery to desilting facility.</li> </ul>	<ul style="list-style-type: none"> <li>The improvement work is not yet undertaken and it will be report in the coming month.</li> </ul>
	<ul style="list-style-type: none"> <li>Required the Contractor to provide enough rubbish bins at Nam Wa Po.</li> </ul>	<ul style="list-style-type: none"> <li>Extra rubbish bins or plastic bags has been provided at Nam Wa Po. Also, daily cleaning has followed.</li> </ul>
23 Dec 2013	<ul style="list-style-type: none"> <li>The Contractor is reminded to provide sand bag as water mitigation measure at the drainage trench in Nam Wa Po near Tai Wo Service Road West for desilting runoff from the road.</li> </ul>	<ul style="list-style-type: none"> <li>A sand bag bund has provided at the drainage trench as observed on 30 December 2013 during site inspection.</li> </ul>

Date	Findings / Deficiencies	Follow-Up Status
30 Dec 2013	<ul style="list-style-type: none"> <li>The construction materials were observed located within tree protection zone. The Contractor was required immediately remove those materials.</li> </ul>	<ul style="list-style-type: none"> <li>Will be reported in the coming month</li> </ul>
	<ul style="list-style-type: none"> <li>Water overflow observed in water storage tank. To prevent the wastage, the Contractor should be repaired it to stop the issue.</li> </ul>	
	<ul style="list-style-type: none"> <li>The general refuse, C&amp;D material and trunk waste should be clean-up regular basis</li> </ul>	

8.2.3 Moreover, the general housekeeping such as tidiness of weekly and cleanliness of daily should be maintained in accordance with the PS requirements.

**The Contract 5**

8.2.4 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 **5, 11, 19 and 24 December 2013**. No non-compliance was noted.

8.2.5 The findings / deficiencies of **Contract 5** that observed during the weekly site inspection are listed in **Table 8-2**.

**Table 8-2 Site Observations for Contract 5**

Date	Findings / Deficiencies	Follow-Up Status
28 Nov 2013 (last Reporting Period)	<ul style="list-style-type: none"> <li>Muddy runoff through the gaps of the sandbag bund was suspected at the Metal Bridge (A), the Contractor should maintain the sandbag bund properly.</li> </ul>	<ul style="list-style-type: none"> <li>Sand and cement mortar has been provided at the edge of Metal Bridge (A) during site inspection on 5 December 2013.</li> <li>No muddy water or loose soil are observed at Kaw Liu Village during site inspections.</li> <li>Sand bags has provided at the metal pipe.</li> <li>The Contractor has followed compliance with the chemical waste disposal requirements.</li> </ul>
	<ul style="list-style-type: none"> <li>Muddy water was observed on the public road at both Kaw Liu Village (Photo 3) and Metal Bridge B area (Photo 4), the Contractor was reminded to clean to road regularly to get rid of loose and mud tail.</li> <li>The Contractor was reminded to apply mitigation measure to prevent potential runoff of soil from metal pipe to the river at the Metal Bridge B.</li> <li>At Area BCP7, the Contractor was reminded to treat lubricant oil as chemical waste.</li> </ul>	
05 Dec 2013	<ul style="list-style-type: none"> <li>The Contractor was reminded to remove the stagnant water.</li> </ul>	<ul style="list-style-type: none"> <li>No stagnant water was observed during site inspection 11 December 2013.</li> <li>During site inspection dated 19 December 2013, all chemical containers located on site has been provided drip tray to prevent land contamination.</li> </ul>
	<ul style="list-style-type: none"> <li>Free standing chemical container was observed, the Contractor was reminded to provide drip tray to all chemical containers.</li> </ul>	
11 Dec 2013	<ul style="list-style-type: none"> <li>The Contractor was recommended to build a rock bund or soil bund as desilting facilities around the discharging steel pipeline to prevent water pollution.</li> </ul>	<ul style="list-style-type: none"> <li>A rock bund has built-up during site inspection on 24 December 2013.</li> <li>During site inspection on 19 December 2013, the stockpile of construction material observed is wet.</li> </ul>
	<ul style="list-style-type: none"> <li>Uncover stockpile was observed, the Contractor was reminded to cover the stockpile to prevent fugitive dust emission. Moreover, the Contractor was recommended to build a three-sides</li> </ul>	

Date	Findings / Deficiencies	Follow-Up Status
	shelter, including the top cover, if the cement mixing works will be carried out.	
	<ul style="list-style-type: none"> <li>• Dry haul road was observed, the Contractor was reminded to provide water spraying in regular basis.</li> </ul>	<ul style="list-style-type: none"> <li>• Water spraying frequency eight times per day has followed in accordance with the dust mitigation measures stipulation.</li> </ul>
	<ul style="list-style-type: none"> <li>• A soakaway facility was observed during site inspection, the Contractor was recommended to fence off this zone and provide notification board.</li> </ul>	<ul style="list-style-type: none"> <li>• Fences and signage has been provided at the soakaway facility observed during site inspection in 19 December 2013</li> </ul>
19 Dec 2013	<ul style="list-style-type: none"> <li>• Stagnant water inside containers was observed after rainfall, the Contractor was reminded to cover them or turn the containers upside down to prevent accumulated water.</li> </ul>	<ul style="list-style-type: none"> <li>• During site inspection on 24 December 2013, all not used containers located on site were covered with plastic sheet or turned upside down to prevent accumulated water. Moreover, no stagnant water observed at the using containers.</li> </ul>
	<ul style="list-style-type: none"> <li>• The Contractor was reminded to provide proper labels for all chemical container.</li> </ul>	<ul style="list-style-type: none"> <li>• Relevant label has been provided for chemical container during site inspection on 24 December 2013.</li> </ul>
	<ul style="list-style-type: none"> <li>• Uncovered sand stockpile was observed, the Contractor was reminded to cover the stockpile with impervious sheet or remove it to prevent fugitive dust.</li> </ul>	<ul style="list-style-type: none"> <li>• Still yet rectified and will be reported in the coming month.</li> </ul>
24 Dec 2013	<ul style="list-style-type: none"> <li>• At location Lin Ma Hang, the Contractor should provide water quality mitigation measure for discharge water, and proper mitigation measure has been provided immediately to prevent water pollution.</li> <li>• Disused de-silting pool should be backfilled and also the soakaway path should be minimized or limited to improve its formation.</li> </ul>	<ul style="list-style-type: none"> <li>• Will be reported in the coming month</li> </ul>

8.2.6 Moreover, the general housekeeping such as tidiness of weekly and cleanliness of daily should be maintained in accordance with the PS requirements. Addition, regular basis cleaning the wheel washing bay is reminder. Furthermore, works at Bridge J Area, tree protected fences should be provided to protect all retained tree.

**Other Contracts**

8.2.7 Since the construction works at the Contract 2 and Contract 4 and Contract 6 are not yet commenced, no site inspection is performed for these Contracts.

**9 ENVIRONMENTAL COMPLAINT AND NON-COMPLIANCE**

**9.1 ENVIRONMENTAL COMPLAINT, SUMMONS AND PROSECUTION**

**The Contract 3**

9.1.1 The Liantang/Heung Yuen Wai Boundary Control Point and Associated Works, no environmental complaint, summons and prosecution under the EM&A Programme was received in the Reporting Period. 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
6 Nov 2013 to 30 Nov 2013	Contract 3	0	0	NA
16 Aug 2013 to 30 Nov 2013	Contract 5	0	0	NA
1 – 31 Dec 2013	Contract 3	0	0	NA
	Contract 5	0	0	NA

**Table 9-2 Statistical Summary of Environmental Summons**

Reporting Period	Contract No	Environmental Summons Statistics		
		Frequency	Cumulative	Complaint Nature
6 Nov 2013 to 30 Nov 2013	Contract 3	0	0	NA
16 Aug 2013 to 30 Nov 2013	Contract 5	0	0	NA
1 – 31 Dec 2013	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
6 Nov 2013 to 30 Nov 2013	Contract 3	0	0	NA
16 Aug 2013 to 30 Nov 2013	Contract 5	0	0	NA
1 – 31 Dec 2013	Contract 3	0	0	NA
	Contract 5	0	0	NA

**The Other Contracts**

9.1.2 Since the construction works at the Contract 2, Contract 4 and Contract 6 are 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 3 and 5 in this Reporting Period are summarized in *Table 10-1*.

**Table 10-1 Environmental Mitigation Measures**

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

**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 3**

- Erection of site office
- Cable detection and trial trenches
- Pre-drilling works and piling works
- Tree felling works, waterworks and excavation works
- Dismantling works for abandoned houses
- Slope upgrading works
- Noise barrier installation
- Extension of box culvert
- Construction of haul road and temporary soil platform for geotechnical works
- Laying of concrete pipe works

**Contract 5**

- Construction of retaining wall No.1
- Piling works at life shaft, Bridge J & footbridge
- Construction of pedestrian subway and pump room at LMH
- Pipe jacking across Kong Yuen River
- Formation Works at BCP Area

- Construction of Depressed Road at BCP3
- Transplantation, Pruning/felling of existing tree
- Drainage and Sewerage works at LMH Road

### 10.3 KEY ISSUES FOR THE COMING MONTH

10.3.1 Key issues to be considered in the coming month for Contracts 3 and 5 include:

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

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

## 11 CONCLUSIONS AND RECOMMENDATIONS

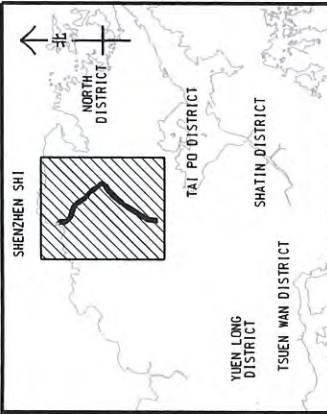
### 11.1 CONCLUSIONS

- 11.1.1 This is 5<sup>th</sup> monthly EM&A report presenting the monitoring results and inspection findings for the Reporting Period from 1 to 31 December 2013.
- 11.1.2 No 24-hour or 1-hour TSP monitoring results that 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, two (2) Limit Level exceedances were recorded on 17 December 2013 at W1. The Notification on Exceedances (NOEs) was issued to all relevant parties. Based on investigation findings to conclude that the exceedance should not be due to the Project works.
- 11.1.5 No environmental complaint, notification of summons or successful prosecution under the EM&A Programme of the Liantang/Heung Yuen Wai Boundary Control Point and Associated Works was received in the reporting period.
- 11.1.6 Four (4) and five (5) events of joint site inspection by the RE, IEC, ET and main-contractor were respectively carried out for Contracts 3 and 5. No non-compliance observed during the site inspection. During dry season, air quality mitigation measures such as increase the water spray frequency (at least eight times per day) in haul road to prevent construction dust emission is reminded. The environmental performance of the Project of Contracts 3 and 5 was therefore considered as satisfactory.
- 11.1.7 Joint site inspection during Reporting Period, five events for Contract 3 and four events for Contract 5 were carried out the RE, IEC, ET and Main-contractor in accordance with the EM&A Manual stipulation. No non-compliance observed during the site inspection. During dry season, air quality mitigation measures such as increase the water spray frequency (at least eight times per day) in haul road to prevent construction dust emission is reminded. The environmental performance of the Project of Contracts 3 and 5 was therefore considered as satisfactory.

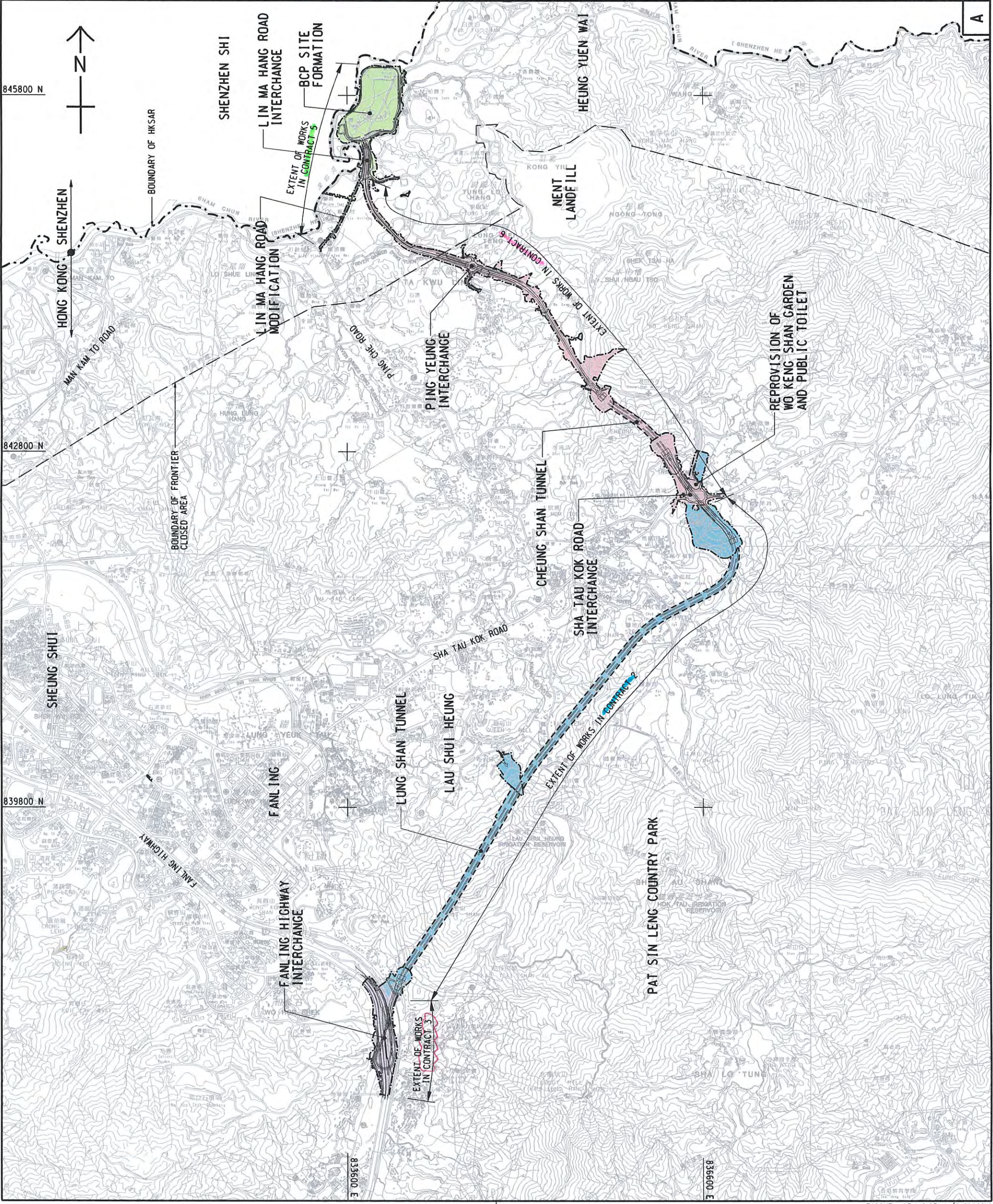
### 11.2 RECOMMENDATIONS

- 11.2.1 During dry season, special attention should be paid on the potential construction dust impact since most of the construction sites are adjacent to villages. The Contractor should fully implement the construction dust mitigation measures properly.
- 11.2.2 Moreover, muddy water and other water quality pollutants via site surface water runoff get into Kong Yiu Channel and Ma Wat Channel to public areas should be avoided. Mitigation measures for water quality should be properly implemented.
- 11.2.3 Construction noise should be a key environmental impact during the works. The noise mitigation measures such as use of quiet plants or temporary noise barrier installation at the construction noise predominate area should be implemented as accordance with the EM&A requirement.
- 11.2.4 Mosquito control measures should be continued to prevent mosquito breeding on site.

**Appendix A**  
**Layout plan of the Project**

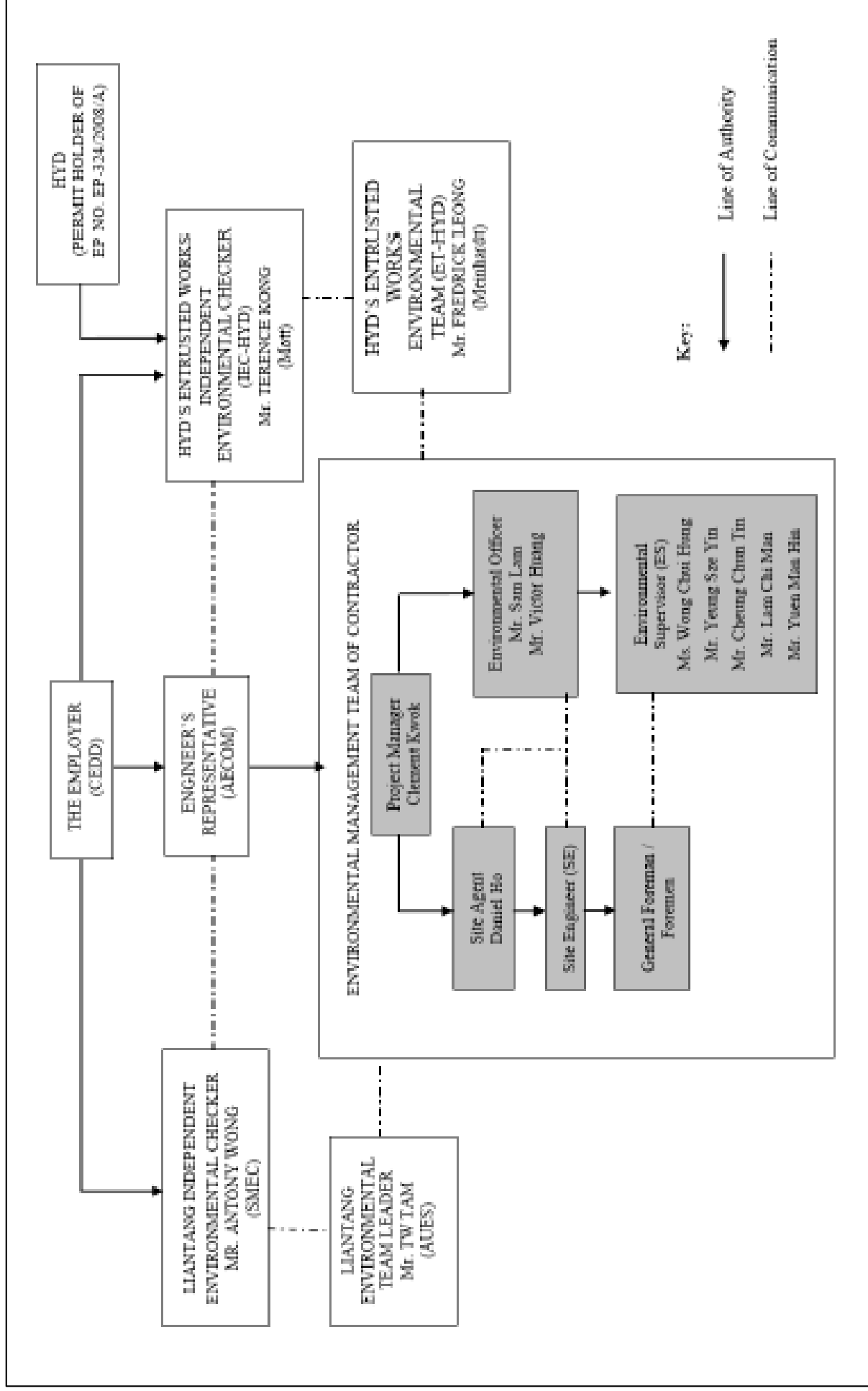


<b>DRGNO.</b> 60212563/PLP/001 圖號編號 圖號編號	
DRAWN BY 繪圖員 ZJ	CHECKED BY 校核員 A1
SCALE 比例尺 1 : 15000	STATUS 狀態 已批核
SHEET NO. IN TOTAL 圖號在總圖中 1 / 1	
UNIT 單位 METRES 公尺	
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## **Appendix B**

### **Organization Chart**



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

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

Organization	Project Role	Name of Key Staff	Tel No	Fax No.
AECOM	Engineer's Representative	Alan Lee	2472 0212	2472 0132
SMEC	Independent Environmental Checker	Antony Wong	3995 8120	3995 8101
Chun Wo	Project Director	Clement Kwok	2638 6136	2638 7077
Chun Wo	Site Agent	Daniel Ho	2638 6144	2638 7077
Chun Wo	Environmental Officer	Mr. Victor Huang	2638 6115	2638 7077
Chun Wo	Environmental Supervisor	Ms. Wong Chui Hing	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*

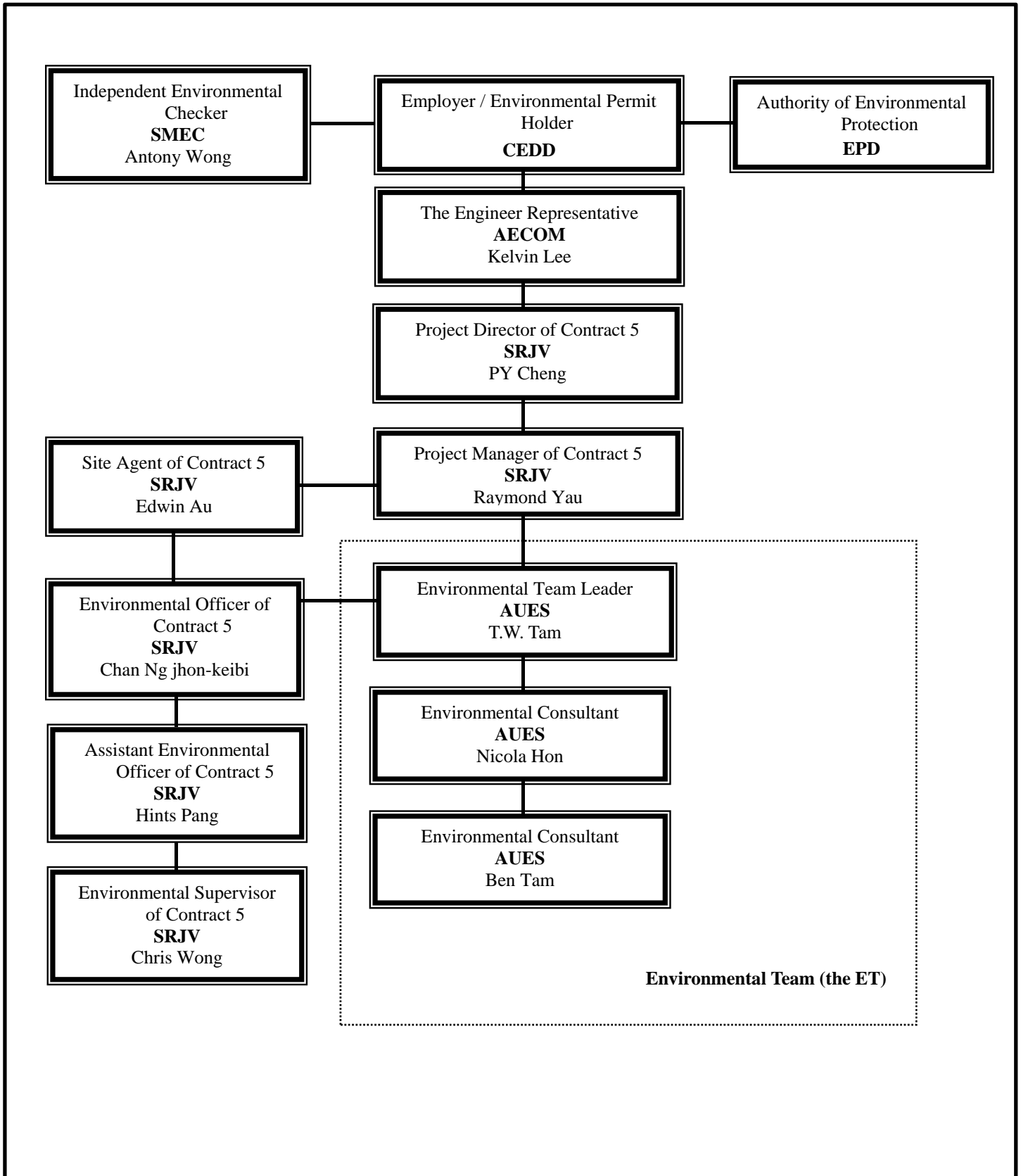
*AECOM (Engineer) – AECOM Asia Co. Ltd.*

*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	3992 9797
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	6090 0183	2403 1162
SRJV	Environmental Supervisor	Chris Wong	6387 4683	2403 1162
AUES	Environmental Team Leader	T. W. Tam	2959 6059	2959 6079
AUES	Environmental Consultant	Nicola Hon	2959 6059	2959 6079
AUES	Environmental Consultant	Ben Tam	2959 6059	2959 6079

Legend:

*CEDD (Employer) – Civil Engineering and Development Department*

*AECOM (Engineer) – AECOM Asia Co. Ltd.*

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

*SMEC (IEC) – SMEC Asia Limited*

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

## **Appendix C**

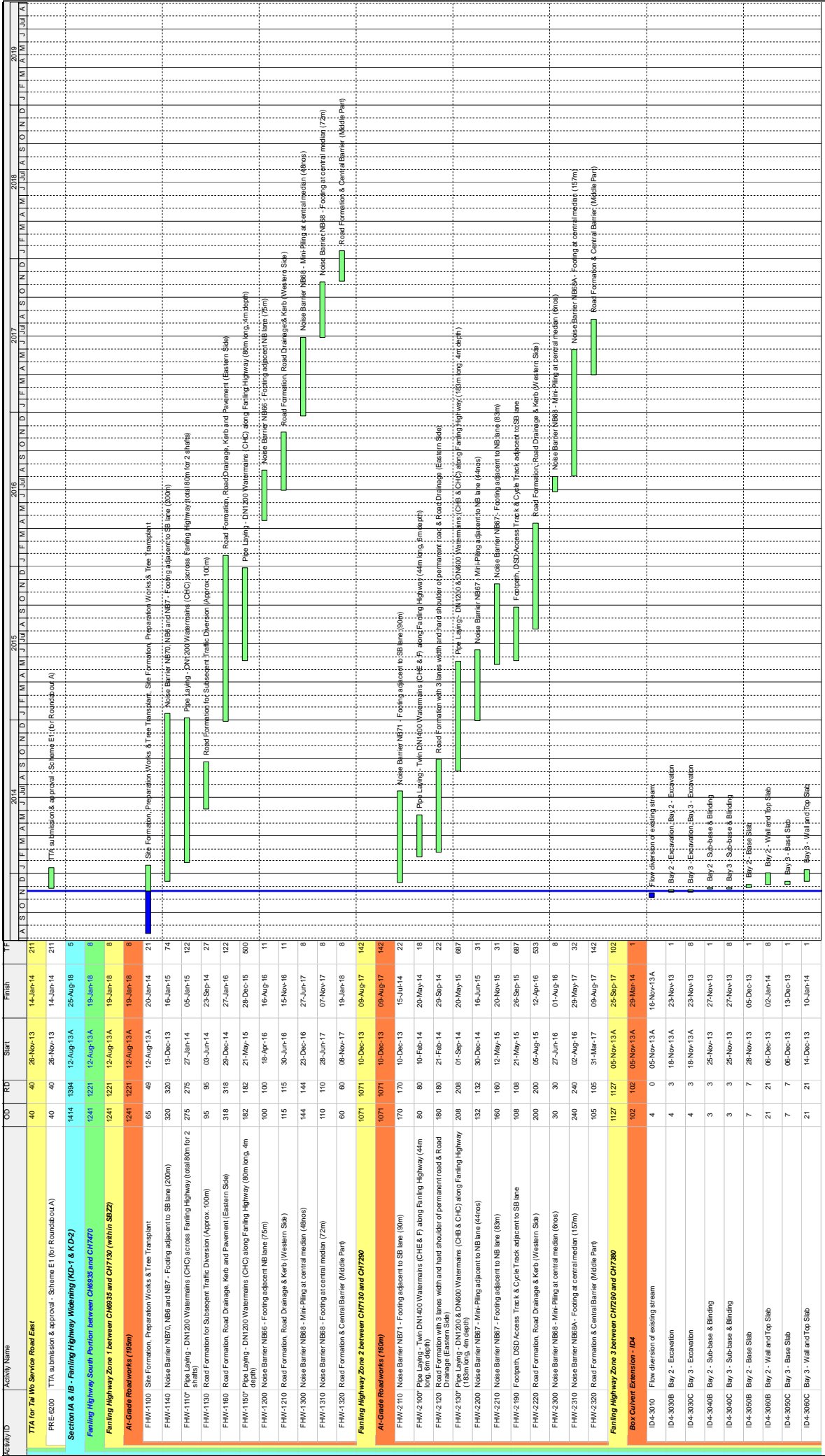
### **Master Construction Programme**

## Contract 3









CEDD Contract No. CV/2012/09			
Liantang / Heung Yuen Wai BCP - Site Formation & Infrastructure Works, Contract 3			
Initial Works Programme Rev 3			
Activity ID	Activity Name	Start	Finish
PRE-0200	TIA submission & approval - Scheme E1 (for Roundabout A)	26-Nov-13	14-Jan-14
14-14	Section IA & IB - Fanning Highway Widening (RD-Y & KD-Z)	28-Nov-13	14-Jan-14
14-14	Section IA & IB - Fanning Highway Widening (RD-Y & KD-Z)	12-Aug-13A	25-Aug-13
14-14	Section IA & IB - Fanning Highway Widening (RD-Y & KD-Z)	12-Aug-13A	19-Jan-13
12-12	Fanning Highway Zone 1 between CH635 and CH730 (within SB22)	12-Aug-13A	19-Jan-13
12-12	Fanning Highway Zone 1 between CH635 and CH730 (within SB22)	12-Aug-13A	19-Jan-13
12-12	Fanning Highway Zone 1 between CH635 and CH730 (within SB22)	12-Aug-13A	19-Jan-13
65	Site Formation, Preparation Works & Tree Transplant	12-Aug-13A	20-Jan-14
320	Noise Barrier NB70 - Footing adjacent to SB lane (200m)	19-Dec-13	16-Jan-15
275	Pipe Laying - DN1200 Watermain (CHC) across Fanning Highway (total 80m for 2 shafts)	27-Jan-14	05-Jan-15
95	Road Formation for Subsequent Traffic Diversion (Approx. 100m)	05-Jun-14	23-Sep-14
318	Road Formation, Road Drainage, Kerb and Pavement (Eastern Side)	29-Dec-14	27-Jan-16
182	Pipe Laying - DN1200 Watermain (CHC) along Fanning Highway (80m long, 4m depth)	21-May-15	28-Dec-15
100	Noise Barrier NB66 - Footing adjacent to NB lane (72m)	18-Aug-16	16-Aug-16
115	Road Formation, Road Drainage & Kerb (Western Side)	30-Jun-16	15-Nov-16
144	Noise Barrier NB68 - Mini-Plug at central median (48m)	23-Dec-16	27-Jun-17
110	Noise Barrier NB68 - Footing at central median (72m)	28-Jun-17	07-Nov-17
60	Road Formation & Central Barrier (Middle Part)	08-Nov-17	19-Jan-18
1071	Fanning Highway Zone 2 between CH730 and CH730	10-Dec-13	09-Aug-17
1071	Fanning Highway Zone 2 between CH730 and CH730	10-Dec-13	09-Aug-17
170	Noise Barrier NB71 - Footing adjacent to SB lane (30m)	10-Dec-13	15-Jul-14
80	Pipe Laying - Twin DN1400 Watermain (CHE & F) along Fanning Highway (4m long, 6m depth)	10-Feb-14	20-May-14
180	Road Formation with 3 lanes with and/or shoulder of permanent road & Road Drainage (Eastern Side)	21-Feb-14	29-Sep-14
208	Pipe Laying - DN1200 & DN600 Watermain (CHB & CHC) along Fanning Highway (183m long, 4m depth)	01-Sep-14	20-May-15
132	Noise Barrier NB67 - Mini-Plug adjacent to NB lane (44m)	30-Dec-14	16-Jun-15
160	Noise Barrier NB67 - Footing adjacent to NB lane (83m)	12-May-15	20-Nov-15
108	Footpath, DSD Access Track & Cycle Track adjacent to SB lane	21-May-15	26-Sep-15
200	Road Formation, Road Drainage & Kerb (Western Side)	05-Aug-15	12-Apr-16
300	Noise Barrier NB68 - Mini-Plug at central median (60m)	30-Jun-16	01-Aug-16
240	Noise Barrier NB68A - Footing at central median (157m)	02-Aug-16	29-May-17
105	Road Formation & Central Barrier (Middle Part)	31-Mar-17	09-Aug-17
1127	Fanning Highway Zone 3 between CH730 and CH730	05-Nov-13A	25-Sep-17
102	Box Culvert Extension - I/A	05-Nov-13A	23-Mar-14
4	Flow diversion of existing stream	05-Nov-13A	16-Nov-13A
4	Bay 2 - Excavation	18-Nov-13A	23-Nov-13
4	Bay 3 - Excavation	18-Nov-13A	23-Nov-13
3	Bay 2 - Sub-base & Binding	25-Nov-13	27-Nov-13
3	Bay 3 - Sub-base & Binding	25-Nov-13	27-Nov-13
7	Bay 2 - Base Slab	28-Nov-13	05-Dec-13
21	Bay 2 - Wall and Top Slab	06-Dec-13	02-Jan-14
7	Bay 3 - Base Slab	06-Dec-13	13-Dec-13
21	Bay 3 - Wall and Top Slab	14-Dec-13	10-Jan-14

Date	Revision	Checked	Approved
21-Dec-13	Rev3	Dennis	Daniel
23-Oct-13	Rev2	Dennis	Daniel
17-Sep-13	Rev1	Dennis	Daniel
09-Jul-13	Rev0	Anselm	Daniel

俊和建築工程有限公司

CHUN WO CONSTRUCTION & ENGINEERING CO., LTD.

Actual Work (Blue bar)

Remaining Work (Green bar)

Summary Bar (Light Green bar)

Critical Remaining Work (Red bar)

Milestone (Black diamond)

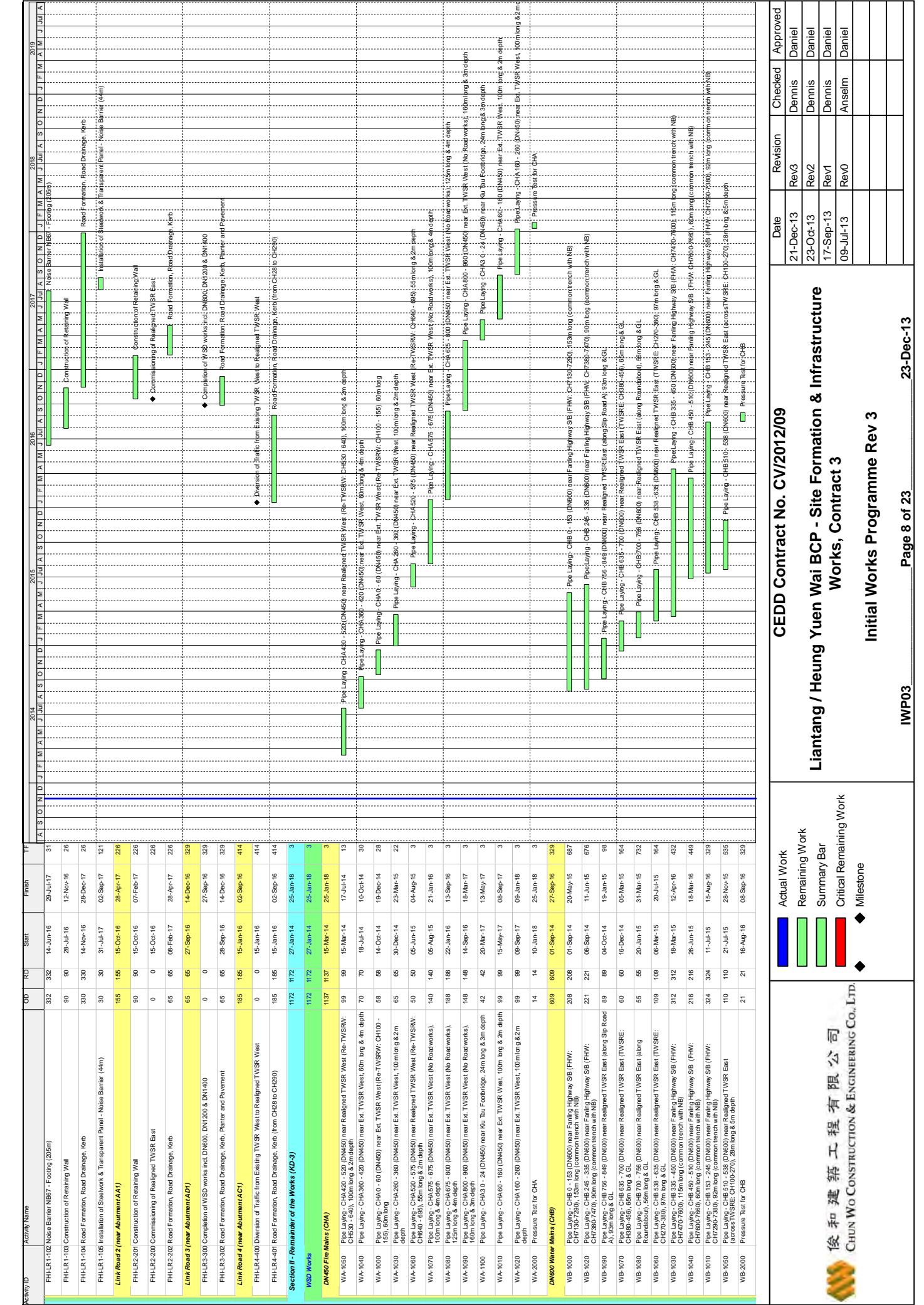
CEDD Contract No. CV/2012/09  
**Liantang / Heung Yuen Wai BCP - Site Formation & Infrastructure Works, Contract 3**  
**Initial Works Programme Rev 3**  
 IWP03  
 Page 4 of 23  
 23-Dec-13









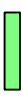






CEDD Contract No. CV/2012/09

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

Initial Works Programme Rev 3

	Actual Work
	Remaining Work
	Summary Bar
	Critical Remaining Work
	Milestone

Date	Revision	Checked	Approved
21-Dec-13	Rev3	Dennis	Daniel
23-Oct-13	Rev2	Dennis	Daniel
17-Sep-13	Rev1	Dennis	Daniel
09-Jul-13	Rev0	Anselm	Daniel





Activity ID	Activity Name	OD	RD	Start	Finish	2016											
						J	F	A	M	J	J	J	A	S	O	N	D
						2015											
						J	F	A	M	J	J	J	A	S	O	N	D
						2014											
						J	F	A	M	J	J	J	A	S	O	N	D
TWSRW-114	Pipe Laying - DN450 & DN1200 Watermain (CHA & CHC)	97	97	26-Aug-14	19-Dec-14												
TWSRW-115	Installation of Cable Ducts for Utilities Diversion Works at Area 1 (Approx. 100m) (by Utilities undertakers)	164	154	20-Dec-14	22-May-15												
TWSRW-116	Road Formation, Road Drainage, Kerb, Planter & Pavement	85	85	23-May-15	02-Sep-15												
	<b>TWSRW Zone 2 between CH156 and CH248</b>																
		514	514	03-Mar-15	09-Dec-15												
	<b>At-Grade Roadworks</b>																
	TWSRW-210 Mass Concrete Wall (FURV3)	35	35	13-Mar-14	26-Apr-14												
	TWSRW-211 Noise Barrier NB2 - Footing adjacent to Realigned TVSR West (60m)	85	85	03-May-14	13-Aug-14												
	TWSRW-212 Road Formation, Road Drainage, Kerb, Planter and Pavement	165	165	23-May-15	09-Dec-15												
	<b>TWSRW Zone 2 between CH280 and CH315</b>																
		299	299	03-May-14	03-May-15												
	<b>At-Grade Roadworks</b>																
		299	299	03-May-14	09-May-15												
	TWSRW-310 Noise Barrier NB1a - Footing adjacent to Realigned TVSR West (31m)	80	80	03-May-14	07-Aug-14												
	TWSRW-311 Installation of Cable Ducts for Utilities Diversion Works at Area 2 (Approx. 120m) (by Utilities undertakers)	187	187	08-Aug-14	10-Feb-15												
	TWSRW-312 Road Formation, Road Drainage, Kerb, Planter and Pavement	65	65	11-Feb-15	09-May-15												
	<b>TWSRW Zone 1 between CH315 and CH328</b>																
		981	554	15-Oct-13A	13-Oct-15												
	<b>Construction of Bridge E</b>																
		461	434	15-Oct-13A	20-May-15												
	TWSRW-400 Implementation of TTA - Scheme W2	0	0	15-Oct-13A													
	TWSRW-401 Cable Diversion and CLIP Underground 11kV Cable Diversion at Area A	10	0	19-Oct-13A	31-Oct-13A												
	TWSRW-402 CLIP Overhead 11kV Cable Diversion at Area B	140	125	04-Nov-13A	30-Apr-14												
	TWSRW-403 Pre-Chilling for EZ	15	15	21-Nov-13	07-Dec-13												
	TWSRW-404 Plant Mobilization & Temp. Works for Piling Works for EZ	18	18	09-Dec-13	31-Dec-13												
	TWSRW-405 Bored Pile Works for EZ	48	48	01-Apr-14	03-Jun-14												
	TWSRW-406 Pre-Chilling for E1	15	15	02-May-14	20-May-14												
	TWSRW-407 Plant Mobilization & Temp. Works for Piling Works for E1	18	18	21-May-14	11-Jun-14												
	TWSRW-408 Pile Test for EZ	14	14	04-Jun-14	19-Jun-14												
	TWSRW-409 Pile Cap for EZ	30	30	20-Jun-14	25-Jul-14												
	TWSRW-410 Bored Pile Works for E1	48	48	03-Jul-14	27-Aug-14												
	TWSRW-411 Pile Test for E1	14	14	28-Aug-14	13-Sep-14												
	TWSRW-412 Pile Cap for E1	30	30	15-Sep-14	21-Oct-14												
	TWSRW-413 Cast In-situ Abutment	80	90	22-Oct-14	06-Feb-15												
	TWSRW-414 Erection of Scaffold Support System for Segment Erection (Work in dry season)	45	45	01-Nov-14	23-Dec-14												
	TWSRW-415 Install Precast Segments on Scaffold Support System	24	24	24-Dec-14	23-Jan-15												
	TWSRW-416 Permanent Prestressing	14	14	07-Feb-15	02-Mar-15												
	TWSRW-417 Remove Scaffold System	18	18	08-Mar-15	23-Mar-15												
	TWSRW-418 Cast In-situ Slitch Joint	45	45	24-Mar-15	20-May-15												
	<b>At-Grade Roadworks</b>																
		120	120	21-May-15	13-Oct-15												
	TWSRW-419 Cast Parapet, Lay Surfacing and Road Furniture for Footpath and Carriageway	120	120	21-May-15	13-Oct-15												
	<b>TWSRW Zone 3 between CH328 and CH329</b>																
		687	617	15-Oct-13A	14-Jun-16												
	<b>Construction of Retaining Structures</b>																
		482	442	15-Oct-13A	15-Jun-15												
	TWSRW-500 Implementation of TTA - Scheme W2	0	0	15-Oct-13A													
	TWSRW-501 Noise Barrier NB2 - Footing and Retaining Structure adjacent to Realigned TVSR West (58m)	85	85	06-Dec-13	25-Mar-14												
	TWSRW-504 Forming of Earth Platform	40	40	26-Dec-13*	20-Feb-14												

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Date	Revision	Checked	Approved
21-Dec-13	Rev3	Dennis	Daniel
23-Oct-13	Rev2	Dennis	Daniel
17-Sep-13	Rev1	Dennis	Daniel
09-Jul-13	Rev0	Anselm	Daniel

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

Activity ID	Activity Name	2014							2015							2016							2017							2018							2019									
		A	S	T	O	N	D	J	J	A	M	J	J	A	M	J	J	A	M	J	J	A	M	J	J	A	M	J	J	A	M	J	J	A	M	J	J	A	M	J	J	A	M	J	J	A
Activity Name	Start	RD	OD	Finish																																										
TWSRV-505 Construction of Bored Pile Wall (4 no. Piles) (with existing access road)	31-Dec-13	48	48	04-Mar-14																																										
TWSRV-506 Removal of grave at Portion FH8	27-Jan-14	25	25	02-Mar-14																																										
TWSRV-507 Permanent Vehicular Access to Lot 61	26-Mar-14	15	15	02-Apr-14																																										
TWSRV-508 Construction of Bored Pile Wall (10 no. Piles) (with earth platform provided)	14-Apr-14	120	120	08-Sep-14																																										
TWSRV-509 Construction of Overhead Cable Diversion	0	0	0	30-Apr-14																																										
TWSRV-505 Construction of Bored Pile Wall (8 no. Piles) and Capping Beam (conflict with overhead cable)	10-Sep-14	112	112	23-Jan-15																																										
TWSRV-507 Construction of Mass Concrete Wall (F LRV4)	24-Jan-15	20	20	16-Feb-15																																										
TWSRV-508 Lagging Wall Construction	24-Jan-15	110	110	15-Jun-15																																										
TWSRV-508 Slope Work incl. 13 nos. Soil Nail for SSV-C/C898 & SSW-D/C29	17-Feb-15	90	90	15-Jun-15																																										
Ac-Grade Roadworks	17-Feb-15	265	265	14-Jan-16																																										
TWSRV-510 Relaying Mass Barrier MB2 - Fining and Retaining Structure adjacent to Road Formation, Road Drainage, Kerb, Planer and Pavement	17-Feb-15	65	65	15-May-15																																										
TWSRV-511 Road Formation, Road Drainage, Kerb, Planer and Pavement	16-Jun-15	175	175	14-Jan-16																																										
TWSRV-508 Slope Work incl. 13 nos. Soil Nail for SSV-C/C898 & SSW-D/C29	27-Jan-14	475	475	11-Sep-15																																										
Box Culvert Extension - BC01	27-Jan-14	49	49	31-Mar-14																																										
TWSRV-600 Flow Diversion of Existing Stream	27-Jan-14	4	4	30-Jan-14																																										
TWSRV-601 Excavation and Sub-base	07-Feb-14	5	5	12-Feb-14																																										
TWSRV-602 Bay 1 - Base Slab	10-Feb-14	14	14	25-Feb-14																																										
TWSRV-603 Bay 2 - Base Slab	18-Feb-14	14	14	05-Mar-14																																										
TWSRV-604 Bay 1 - Wall and Top Slab	26-Feb-14	22	22	22-Mar-14																																										
TWSRV-605 Bay 2 - Wall and Top Slab	08-Mar-14	22	22	31-Mar-14																																										
Construction of Retaining Structures	13-Jul-14	170	170	03-Feb-15																																										
TWSRV-607 Preparation works for implementation of TTA Scheme W4	13-Jul-14	25	25	06-Aug-14																																										
TWSRV-608 Implement TTA Scheme W4 to divert existing TWSRV for bying of DN2200 water main	07-Aug-14	0	0																																											
TWSRV-608 Completion of Pipe Laying of DN2200 water mains across existing TWSRV		0	0																																											
TWSRV-606 Construction of Retaining Wall (FURW2)	18-Dec-14	40	40	03-Feb-15																																										
Ac-Grade Roadworks	22-Jul-15	45	45	11-Sep-15																																										
TWSRV-611 Road Formation, Road Drainage, Kerb, Planer and Pavement	22-Jul-15	45	45	11-Sep-15																																										
Construction of Retaining Structures	02-Dec-13	289	289	03-Nov-14																																										
TWSRV-700 Implementation of TTA - Scheme W2 (Part 2)	02-Dec-13	0	0																																											
TWSRV-701 Slope Cutting and Drainage Channel	02-Dec-13	80	80	14-Mar-14																																										
TWSRV-702 Installation of Soil Nail (129 nos)	15-Mar-14	75	75	18-Jun-14																																										
TWSRV-703 Pipe Laying - DN450 Watermains (CHA)	15-Mar-14	99	99	17-Jul-14																																										
Construction of Retaining Wall (FURW2)	18-Jul-14	90	90	03-Nov-14																																										
Ac-Grade Roadworks	04-Nov-14	341	341	31-Dec-15																																										
TWSRV-710 Implementation of TTA - Scheme W3	04-Nov-14	0	0																																											
TWSRV-711 Filling Works Behind FURW2	04-Nov-14	25	25	02-Dec-14																																										
Installation of Cable Ducts for Utilities Diversion Works at Area 4 (Approx. 150m) (by utilities undertakers)	08-Dec-14	231	231	21-Jul-15																																										
Road Formation, Road Drainage, Kerb, Planer and Pavement	22-Jul-15	135	135	31-Dec-15																																										
Kur Tar Footbridge Reprovision (West)	18-Aug-14	347	347	22-Oct-15																																										
18-Aug-14	321	321	18-Aug-14	18-Sep-15																																										

█ Actual Work  
█ Remaining Work  
█ Summary Bar  
█ Critical Remaining Work  
◆ Milestone

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

Date	Revision	Checked	Approved
21-Dec-13	Rev3	Dennis	Daniel
23-Oct-13	Rev2	Dennis	Daniel
17-Sep-13	Rev1	Dennis	Daniel
09-Jul-13	Rev0	Anselm	Daniel

**俊和建筑工程有限公司**  
**CHUN WO CONSTRUCTION & ENGINEERING Co., LTD.**





Activity ID	Activity Name	OD	RD	Start	Finish
TWSRW-900	Pre-Drilling Works for Socket H-Pile	7	7	18-Aug-14	25-Aug-14
TWSRW-901	Installation of Socket H-Pile for Proposed Rd. Bu Footbridge	75	75	26-Aug-14	24-Nov-14
TWSRW-902	Construction of Pile Cap and Abutment	90	90	25-Nov-14	19-Mar-15
TWSRW-903	Steel Truss Installation at TVSR West	12	12	05-Sep-15	18-Sep-15
<b>At-Grade Roadworks</b>					
TWSRW-910	Fill Replacement Works	175	175	20-Mar-15	22-Oct-15
TWSRW-911	Pipe Laying - DN450 Watermains (CHA)	60	60	20-Mar-15	04-Jun-15
TWSRW-912	Road Formation, Road Drainage, Kerb, Planter and Pavement	50	50	05-Jun-15	04-Aug-15
<b>Remainder of the Works</b>					
TWSRW-920	Utilities Diversion in Area 2 (along Re-aligned TVSRW CH 280 - CH319)	187	187	08-Aug-14	10-Feb-15
TWSRW-921	Utilities Diversion in Area 4 (along Re-aligned TVSRW CH630 - CH640)	231	231	08-Dec-14	22-Jun-15
TWSRW-922	Utilities Diversion in Area 1 (along Re-aligned TVSRW CH100 - CH280)	164	164	20-Dec-14	21-Jul-15
TWSRW-923	Utilities Diversion in Area 3 (along existing TVSRW, Approx. 150m) (by utilities undertrucks)	231	231	24-Mar-15	09-Nov-15
TWSRW-924	Utilities Connection Works at Re-aligned TVSR West	98	98	10-Nov-15	15-Feb-16
<b>Remaining Work for Noise Barriers along realigned TVSR West</b>					
TWSRW-NB-1	Noise Barrier Steelworks & Panel for NB1 (105m) at Zones 1 & 2	279	279	14-Aug-14	28-Jun-15
TWSRW-NB-2	Noise Barrier Steelworks & Panel for NB2 (77m) at Zone 3	60	60	14-Aug-14	25-Oct-14
TWSRW-NB-3	Noise Barrier Steelworks & Panel for NB3 (54m) at Zone 4	20	20	27-Oct-14	18-Nov-14
TWSRW-NB-4	Noise Barrier Steelworks & Panel for NB4 (105m) at Zones 1 & 2	60	60	16-May-15	28-Jul-15
TWSRW-NB-5	Noise Barrier Steelworks & Panel for NB5 (17m) at Zone 5	20	20	16-May-15	13-Jun-15
TWSRW-NB-6	Noise Barrier Steelworks & Panel for NB6 (31m) at Zone 4	60	60	16-May-15	13-Jun-15
<b>Stage N4A &amp; N4B - Realignment of Wai Service Road East (KD-13 &amp; KD-14)</b>					
<b>TVSR Zone 1 between CH100 and CH270</b>					
TWSRE-100	Flow Diversion of Existing Stream	7	0	07-Nov-13A	14-Nov-13A
TWSRE-101	Excavation, Sub-base and Binding	40	9	15-Nov-13A	30-Nov-13
TWSRE-102	Bay 1 - Base Slab	21	21	28-Nov-13	21-Dec-13
TWSRE-103	Bay 2 - Base Slab	21	21	14-Dec-13	10-Jan-14
TWSRE-104	Bay 1 - Wall and Top Slab	35	35	25-Dec-13	11-Feb-14
TWSRE-105	Bay 2 - Wall and Top Slab	35	35	11-Jan-14	27-Feb-14
<b>At-Grade Roadworks</b>					
TWSRE-106	Installation of Mini-Pile for PC01 & PC02 (22m)	382	382	17-Jan-15	25-May-16
TWSRE-107	Noise Barrier NB5 - PC01 & PC02 Pile Cap Construction	66	66	17-Jan-15	15-Apr-15
TWSRE-108	Retaining Wall Construction for FURW5	55	55	16-Apr-15	22-Jun-15
TWSRE-109	Noise Barrier NB5 - Footing adjacent to Realigned TVSR East (6m)	55	55	23-Jun-15	26-Aug-15
TWSRE-110	Road Formation, Road Drainage, Kerb, Planter and Pavement (incl. FL76A, FL76B)	170	170	18-Aug-15	16-Mar-16
<b>TVSR Zone 2 between CH270 and CH380</b>					
TWSRE-111	Noise Barrier NB3 - Footing adjacent to Realigned TVSR East (9m)	511	511	15-Jun-15	15-Oct-16
TWSRE-112	Pipe Laying - DN500 Watermains (CHB, CHK & CHC) along Realigned TVSR East	170	170	15-Jun-15	17-Aug-15
TWSRE-113	Retaining Wall Construction for FURW6	116	116	26-Feb-15	20-Jul-15
TWSRE-114	Road Formation, Road Drainage, Kerb, Planter and Pavement	55	55	27-Aug-15	02-Nov-15
TWSRE-115	Erection of Scaffolding for Demolition Works	90	90	03-Nov-15	25-Feb-16
TWSRE-116	Erection of Scaffolding for Demolition Works	60	60	16-Jun-16	25-Aug-16

Date	Revision	Checked	Approved
21-Dec-13	Rev3	Dennis	Daniel
23-Oct-13	Rev2	Dennis	Daniel
17-Sep-13	Rev1	Dennis	Daniel
09-Jul-13	Rev0	Anselm	Daniel

**CEDD Contract No. CV/2012/09**

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

**Initial Works Programme Rev 3**

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23-Dec-13

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

**Actual Work** (Blue bar)

**Remaining Work** (Green bar)

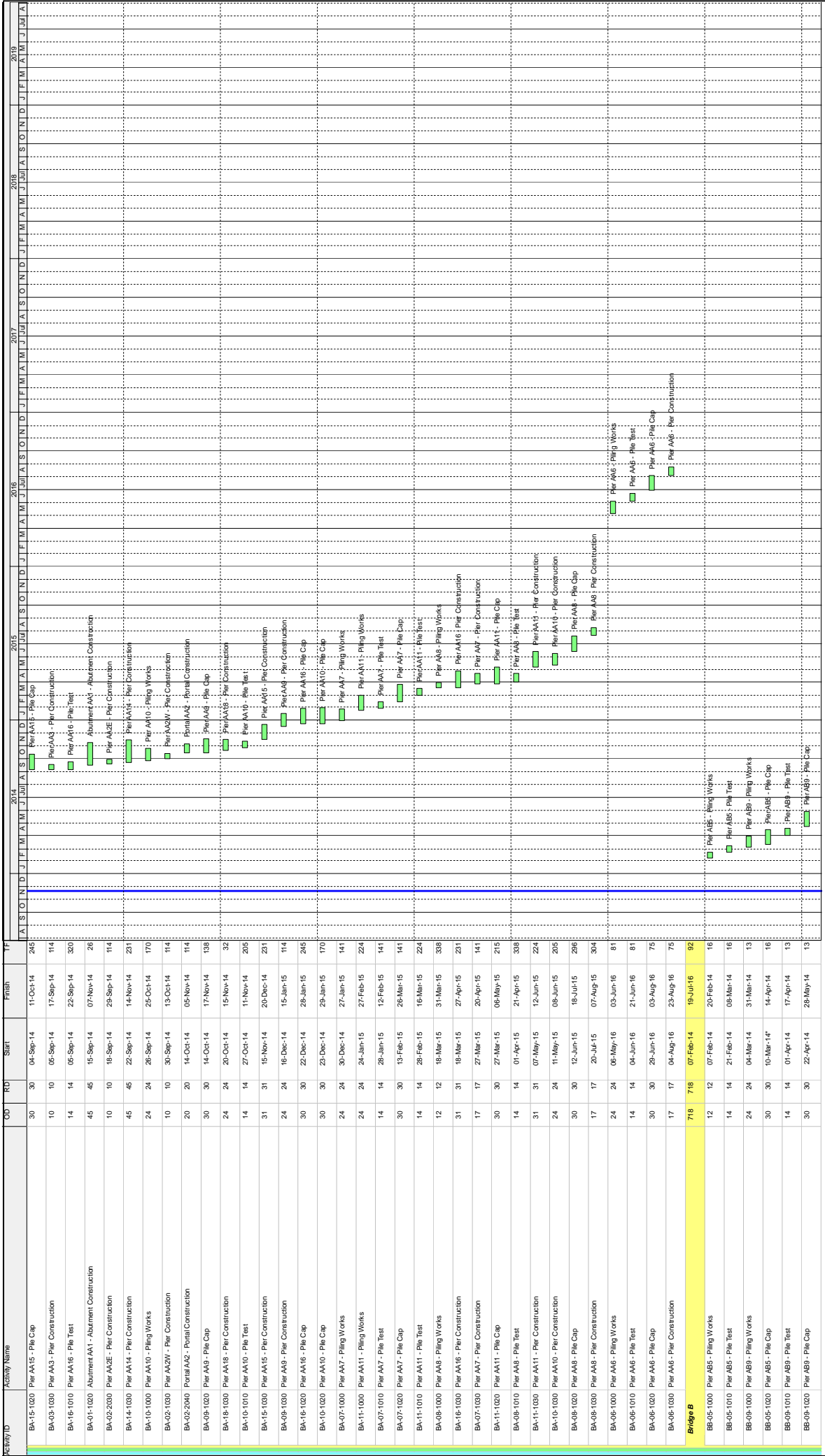
**Summary Bar** (Light Green bar)

**Critical Remaining Work** (Red bar)

**Milestone** (Black diamond)





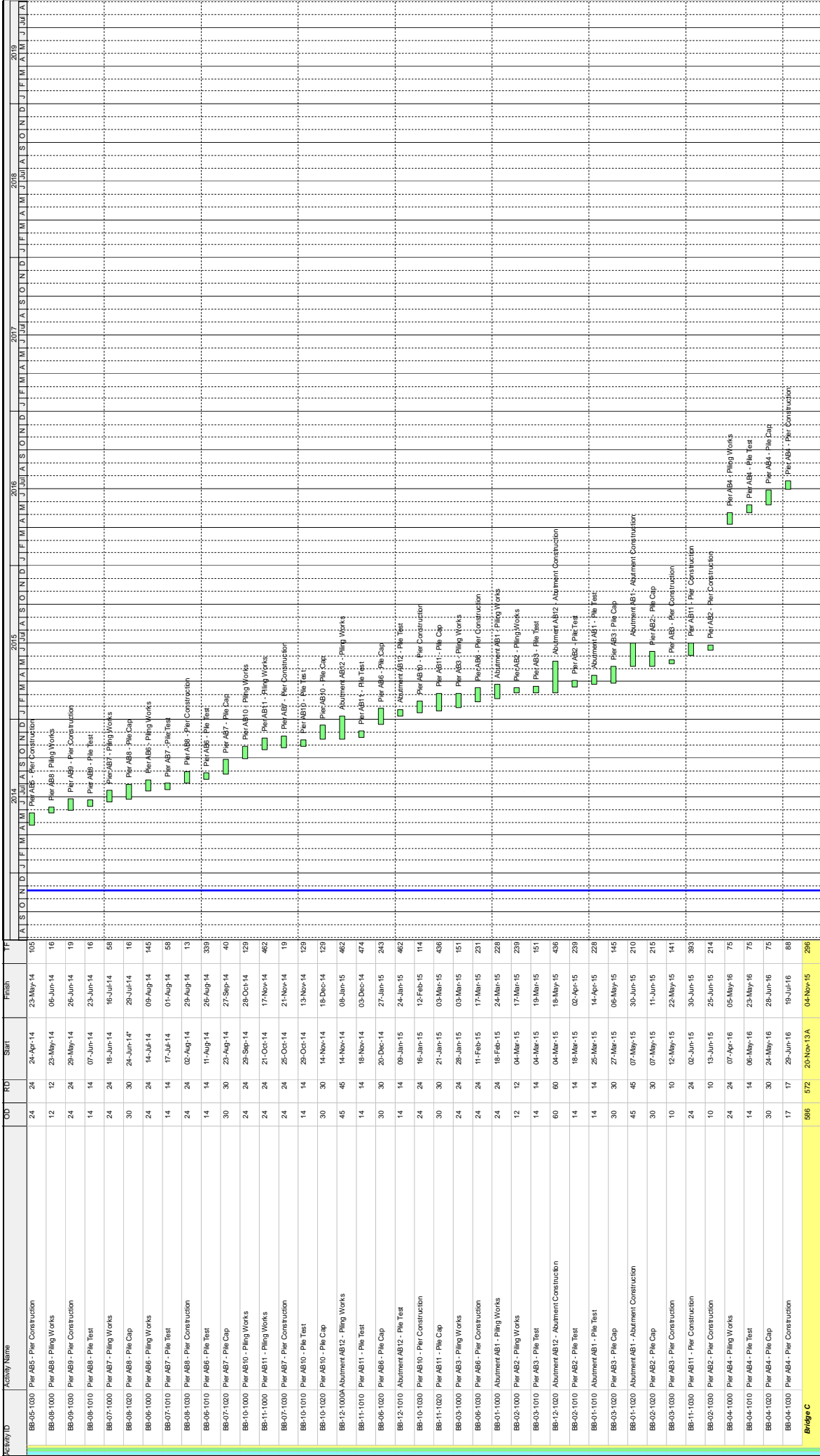


CEDD Contract No. CV/2012/09		Liantang / Heung Yuen Wai BCP - Site Formation & Infrastructure Works, Contract 3		Initial Works Programme Rev 3		IWPO3		Page 16 of 23		23-Dec-13	
Activity ID	Activity Name	OD	RD	Start	Finish	2014	2015	2016	2017	2018	2019
BA-15-1020	Pier AA15 - Pile Cap	30	30	04-Sep-14	11-Oct-14						
BA-03-1030	Pier AA3 - Pier Construction	10	10	05-Sep-14	17-Sep-14						
BA-16-1010	Pier AA16 - Pile Test	14	14	05-Sep-14	22-Sep-14						
BA-01-1020	Abutment AA1 - Abutment Construction	45	45	15-Sep-14	07-Nov-14						
BA-02-2030	Pier AA2E - Pier Construction	10	10	18-Sep-14	29-Sep-14						
BA-14-1030	Pier AA14 - Pier Construction	45	45	22-Sep-14	14-Nov-14						
BA-10-1000	Pier AA10 - Piling Works	24	24	26-Sep-14	25-Oct-14						
BA-02-1030	Pier AA2W - Pier Construction	10	10	30-Sep-14	13-Oct-14						
BA-02-2040	Pier AA2 - Pier Construction	20	20	14-Oct-14	05-Nov-14						
BA-09-1020	Pier AA9 - Pile Cap	30	30	14-Oct-14	17-Nov-14						
BA-18-1030	Pier AA18 - Pier Construction	24	24	20-Oct-14	15-Nov-14						
BA-10-1010	Pier AA10 - Pile Test	14	14	27-Oct-14	11-Nov-14						
BA-15-1030	Pier AA15 - Pier Construction	31	31	15-Nov-14	20-Dec-14						
BA-09-1030	Pier AA9 - Pier Construction	24	24	16-Dec-14	15-Jan-15						
BA-16-1020	Pier AA16 - Pile Cap	30	30	22-Dec-14	28-Jan-15						
BA-10-1020	Pier AA10 - Pile Cap	30	30	29-Dec-14	29-Jan-15						
BA-07-1000	Pier AA7 - Piling Works	24	24	30-Dec-14	27-Jan-15						
BA-11-1000	Pier AA11 - Piling Works	14	14	24-Jan-15	27-Feb-15						
BA-07-1010	Pier AA7 - Pile Test	14	14	28-Jan-15	12-Feb-15						
BA-07-1020	Pier AA7 - Pile Cap	30	30	13-Feb-15	26-Mar-15						
BA-11-1010	Pier AA11 - Pile Test	14	14	28-Feb-15	16-Mar-15						
BA-08-1000	Pier AA8 - Piling Works	12	12	18-Mar-15	31-Mar-15						
BA-16-1030	Pier AA16 - Pier Construction	31	31	18-Mar-15	27-Apr-15						
BA-07-1030	Pier AA7 - Pier Construction	17	17	27-Mar-15	20-Apr-15						
BA-11-1020	Pier AA11 - Pile Cap	30	30	27-Mar-15	06-May-15						
BA-08-1010	Pier AA8 - Pile Test	14	14	01-Apr-15	21-Apr-15						
BA-11-1030	Pier AA11 - Pier Construction	31	31	07-May-15	12-Jun-15						
BA-10-1030	Pier AA10 - Pier Construction	24	24	11-May-15	08-Jun-15						
BA-08-1020	Pier AA8 - Pile Cap	30	30	12-Jun-15	18-Jul-15						
BA-06-1030	Pier AA6 - Pier Construction	17	17	20-Jul-15	07-Aug-15						
BA-06-1000	Pier AA6 - Piling Works	24	24	08-May-16	03-Jun-16						
BA-06-1010	Pier AA6 - Pile Test	14	14	04-Jun-16	21-Jun-16						
BA-06-1020	Pier AA6 - Pile Cap	30	30	29-Jun-16	03-Aug-16						
BA-06-1030	Pier AA6 - Pier Construction	17	17	04-Aug-16	23-Aug-16						
<b>Bridge B</b>		<b>718</b>	<b>718</b>	<b>07-Feb-14</b>	<b>19-Jun-16</b>						
BB-05-1000	Pier AB5 - Piling Works	12	12	07-Feb-14	20-Feb-14						
BB-05-1010	Pier AB5 - Pile Test	14	14	21-Feb-14	08-Mar-14						
BB-09-1000	Pier AB9 - Piling Works	24	24	04-Mar-14	31-Mar-14						
BB-05-1020	Pier AB5 - Pile Cap	30	30	10-Mar-14	14-Apr-14						
BB-09-1010	Pier AB9 - Pile Test	14	14	01-Apr-14	17-Apr-14						
BB-09-1020	Pier AB9 - Pile Cap	30	30	22-Apr-14	28-May-14						

Actual Work  
 Remaining Work  
 Summary Bar  
 Critical Remaining Work  
 Milestone

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

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21-Dec-13	Rev3	Dennis	Daniel
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09-Jul-13	Rev0	Anselm	Daniel



Activity ID	Activity Name	OD	RD	Start	Finish
BB-05-1030	Pier AB5 - Pier Construction	24	24	24-Apr-14	23-May-14
BB-08-1000	Pier AB8 - Piling Works	12	12	23-May-14	06-Jun-14
BB-09-1000	Pier AB9 - Pier Construction	24	24	29-May-14	26-Jun-14
BB-08-1010	Pier AB8 - Pile Test	14	14	07-Jun-14	23-Jun-14
BB-07-1000	Pier AB7 - Piling Works	24	24	18-Jun-14	16-Jul-14
BB-08-1020	Pier AB8 - Pile Cap	30	30	24-Jun-14	29-Jul-14
BB-06-1000	Pier AB6 - Piling Works	24	24	14-Jul-14	09-Aug-14
BB-07-1010	Pier AB7 - Pile Test	14	14	17-Jul-14	01-Aug-14
BB-08-1030	Pier AB8 - Pier Construction	24	24	02-Aug-14	29-Aug-14
BB-06-1010	Pier AB6 - Pile Test	14	14	11-Aug-14	26-Aug-14
BB-07-1020	Pier AB7 - Pile Cap	30	30	29-Aug-14	27-Sep-14
BB-10-1000	Pier AB10 - Piling Works	24	24	29-Sep-14	28-Oct-14
BB-11-1000	Pier AB11 - Piling Works	24	24	21-Oct-14	17-Nov-14
BB-07-1030	Pier AB7 - Pier Construction	24	24	25-Oct-14	21-Nov-14
BB-10-1010	Pier AB10 - Pile Test	14	14	29-Oct-14	13-Nov-14
BB-10-1020	Pier AB10 - Pile Cap	30	30	14-Nov-14	18-Dec-14
BB-12-1000A	Abutment AB12 - Piling Works	45	45	14-Nov-14	08-Jan-15
BB-11-1010	Pier AB11 - Pile Test	14	14	18-Nov-14	03-Dec-14
BB-06-1020	Pier AB6 - Pile Cap	30	30	20-Dec-14	27-Jan-15
BB-12-1010	Abutment AB12 - Pile Test	14	14	09-Jan-15	24-Jan-15
BB-10-1030	Pier AB10 - Pier Construction	24	24	16-Jan-15	12-Feb-15
BB-11-1020	Pier AB11 - Pile Cap	30	30	21-Jan-15	03-Mar-15
BB-07-1030	Pier AB7 - Piling Works	24	24	28-Jan-15	03-Mar-15
BB-06-1030	Pier AB6 - Pier Construction	24	24	11-Feb-15	17-Mar-15
BB-01-1000	Abutment AB1 - Piling Works	24	24	18-Feb-15	24-Mar-15
BB-02-1000	Pier AB2 - Piling Works	12	12	04-Mar-15	17-Mar-15
BB-03-1000	Pier AB3 - Pile Test	14	14	04-Mar-15	19-Mar-15
BB-12-1020	Abutment AB12 - Abutment Construction	60	60	04-Mar-15	18-May-15
BB-02-1010	Pier AB2 - Pile Test	14	14	18-Mar-15	02-Apr-15
BB-01-1010	Abutment AB1 - Pile Test	14	14	25-Mar-15	14-Apr-15
BB-03-1020	Pier AB3 - Pile Cap	30	30	27-Mar-15	06-May-15
BB-01-1020	Abutment AB1 - Abutment Construction	45	45	07-May-15	30-Jun-15
BB-02-1020	Pier AB2 - Pile Cap	30	30	07-May-15	11-Jun-15
BB-03-1030	Pier AB3 - Pier Construction	10	10	12-May-15	22-May-15
BB-11-1030	Pier AB11 - Pier Construction	24	24	02-Jun-15	30-Jun-15
BB-02-1030	Pier AB2 - Pier Construction	10	10	13-Jun-15	25-Jun-15
BB-04-1000	Pier AB4 - Piling Works	24	24	07-Apr-16	05-May-16
BB-04-1010	Pier AB4 - Pile Test	14	14	06-May-16	23-May-16
BB-04-1020	Pier AB4 - Pile Cap	30	30	24-May-16	28-Jun-16
BB-04-1030	Pier AB4 - Pier Construction	17	17	29-Jun-16	19-Jul-16
Bridge C		986	572	20-Nov-13A	04-Nov-15

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09-Jul-13	Rev0	Anselm	Daniel

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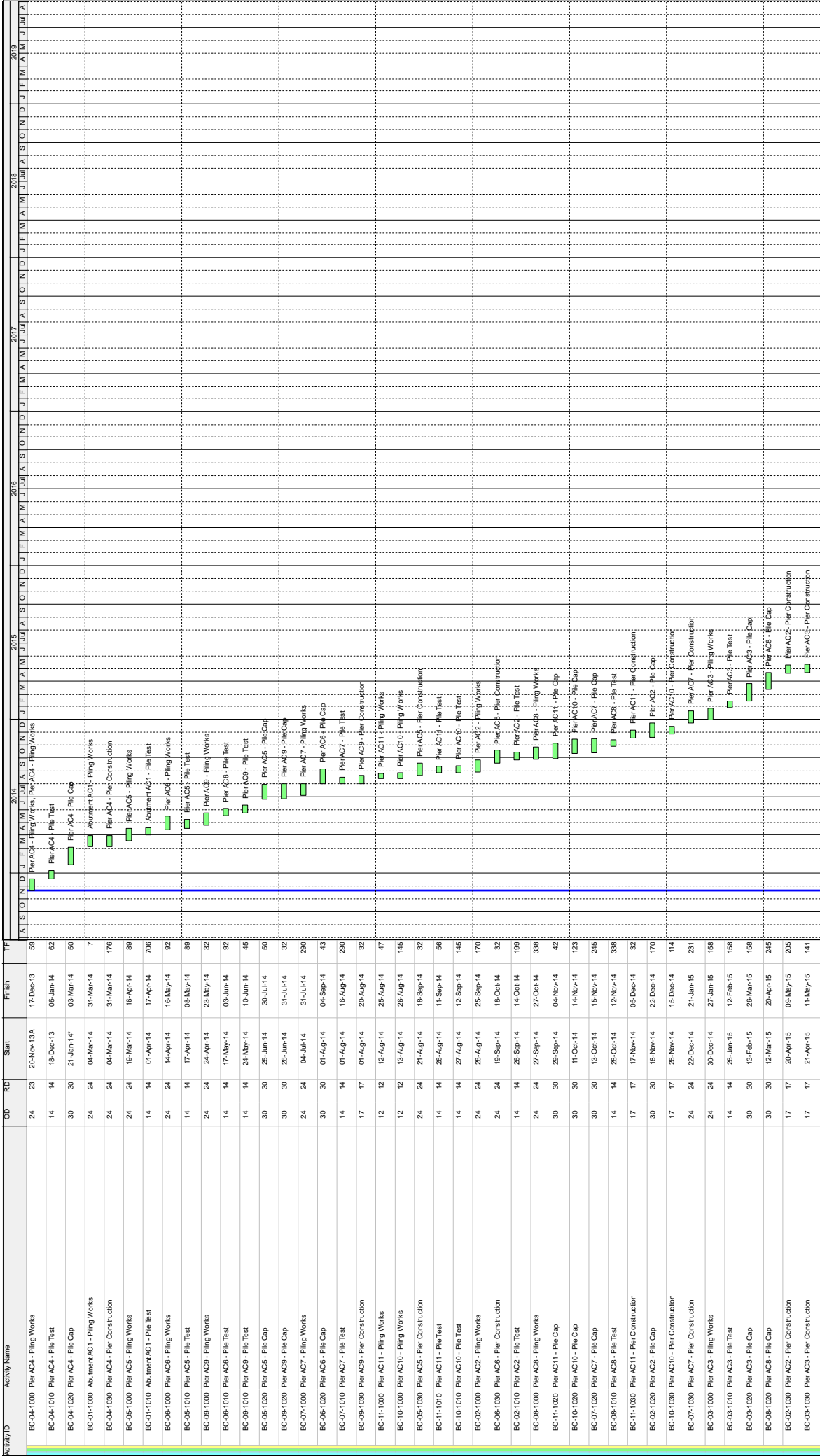
**Liantang / Heung Yuen Wai BCP - Site Formation & Infrastructure Works, Contract 3**

**Initial Works Programme Rev 3**

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Actual Work  
Remaining Work  
Summary Bar  
Critical Remaining Work  
Milestone

俊和建筑工程有限公司  
CHUN WO CONSTRUCTION & ENGINEERING Co., LTD.



Activity ID	Activity Name	OD	RD	Start	Finish	2014	2015	2016	2017	2018	2019	
BC-04-1000	Pier AC4 - Piling Works	24	23	20-Nov-13A	17-Dec-13							
BC-04-1010	Pier AC4 - Pile Test	14	14	18-Dec-13	06-Jan-14							
BC-04-1020	Pier AC4 - Pile Cap	30	30	21-Jan-14	03-Mar-14							
BC-01-1000	Abutment AC1 - Piling Works	24	24	04-Mar-14	31-Mar-14							
BC-04-1030	Pier AC4 - Pier Construction	24	24	04-Mar-14	31-Mar-14							
BC-05-1000	Pier AC5 - Piling Works	24	24	19-Mar-14	16-Apr-14							
BC-01-1010	Abutment AC1 - Pile Test	14	14	01-Apr-14	17-Apr-14							
BC-06-1000	Pier AC6 - Piling Works	24	24	14-Apr-14	16-May-14							
BC-05-1010	Pier AC5 - Pile Test	14	14	17-Apr-14	08-May-14							
BC-09-1000	Pier AC9 - Piling Works	24	24	24-Apr-14	23-May-14							
BC-06-1010	Pier AC6 - Pile Test	14	14	17-May-14	03-Jun-14							
BC-09-1010	Pier AC9 - Pile Test	14	14	24-May-14	10-Jun-14							
BC-05-1020	Pier AC5 - Pile Cap	30	30	25-Jun-14	30-Jul-14							
BC-09-1020	Pier AC9 - Pile Cap	30	30	26-Jun-14	31-Jul-14							
BC-07-1000	Pier AC7 - Piling Works	24	24	04-Jul-14	31-Jul-14							
BC-06-1020	Pier AC6 - Pile Cap	30	30	01-Aug-14	04-Sep-14							
BC-07-1010	Pier AC7 - Pile Test	14	14	01-Aug-14	16-Aug-14							
BC-09-1030	Pier AC9 - Pier Construction	17	17	01-Aug-14	20-Aug-14							
BC-11-1000	Pier AC11 - Piling Works	12	12	12-Aug-14	25-Aug-14							
BC-10-1000	Pier AC10 - Piling Works	12	12	13-Aug-14	26-Aug-14							
BC-05-1030	Pier AC5 - Pier Construction	24	24	21-Aug-14	18-Sep-14							
BC-11-1010	Pier AC11 - Pile Test	14	14	26-Aug-14	11-Sep-14							
BC-10-1010	Pier AC10 - Pile Test	14	14	27-Aug-14	12-Sep-14							
BC-02-1000	Pier AC2 - Piling Works	24	24	28-Aug-14	25-Sep-14							
BC-06-1030	Pier AC6 - Pier Construction	24	24	19-Sep-14	18-Oct-14							
BC-02-1010	Pier AC2 - Pile Test	14	14	26-Sep-14	14-Oct-14							
BC-08-1000	Pier AC8 - Piling Works	24	24	27-Sep-14	27-Oct-14							
BC-11-1020	Pier AC11 - Pile Cap	30	30	29-Sep-14	04-Nov-14							
BC-10-1020	Pier AC10 - Pile Cap	30	30	11-Oct-14	14-Nov-14							
BC-07-1020	Pier AC7 - Pile Cap	30	30	13-Oct-14	15-Nov-14							
BC-08-1010	Pier AC8 - Pile Test	14	14	28-Oct-14	12-Nov-14							
BC-11-1030	Pier AC11 - Pier Construction	17	17	17-Nov-14	05-Dec-14							
BC-02-1020	Pier AC2 - Pile Cap	30	30	18-Nov-14	22-Dec-14							
BC-10-1030	Pier AC10 - Pier Construction	17	17	26-Nov-14	15-Dec-14							
BC-07-1030	Pier AC7 - Pier Construction	24	24	22-Dec-14	21-Jan-15							
BC-03-1000	Pier AC3 - Piling Works	24	24	30-Dec-14	27-Jan-15							
BC-03-1010	Pier AC3 - Pile Test	14	14	28-Jan-15	12-Feb-15							
BC-03-1020	Pier AC3 - Pile Cap	30	30	13-Feb-15	26-Mar-15							
BC-08-1020	Pier AC8 - Pile Cap	30	30	12-Mar-15	20-Apr-15							
BC-02-1030	Pier AC2 - Pier Construction	17	17	20-Apr-15	09-May-15							
BC-03-1030	Pier AC3 - Pier Construction	17	17	21-Apr-15	11-May-15							

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**CEDD Contract No. CV/2012/09**

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

**Initial Works Programme Rev 3**

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Actual Work

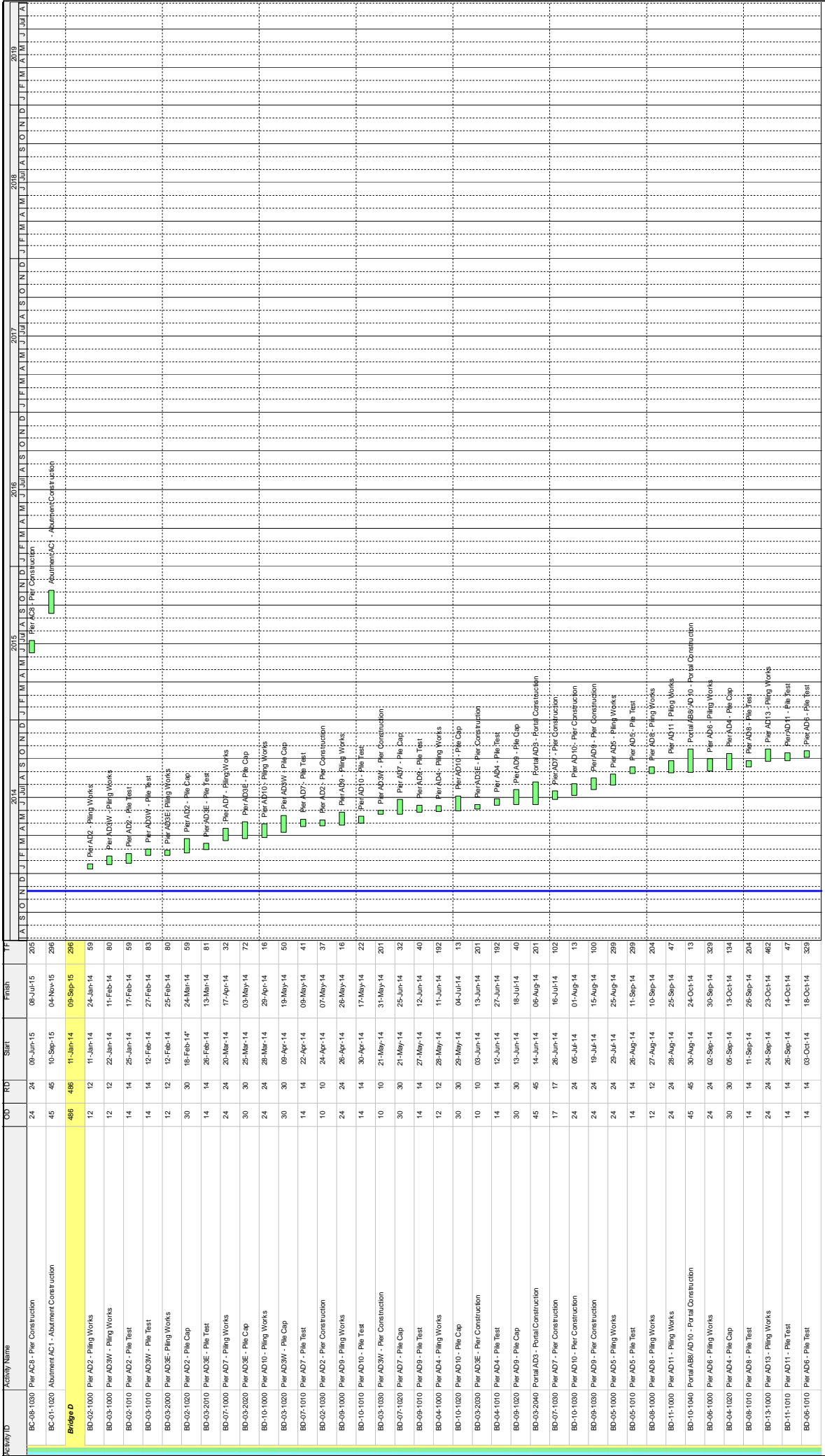
Remaining Work

Summary Bar

Critical Remaining Work

Milestone

俊和建筑工程有限公司  
CHUN WO CONSTRUCTION & ENGINEERING Co., LTD.



### CEDD Contract No. CV/2012/09

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

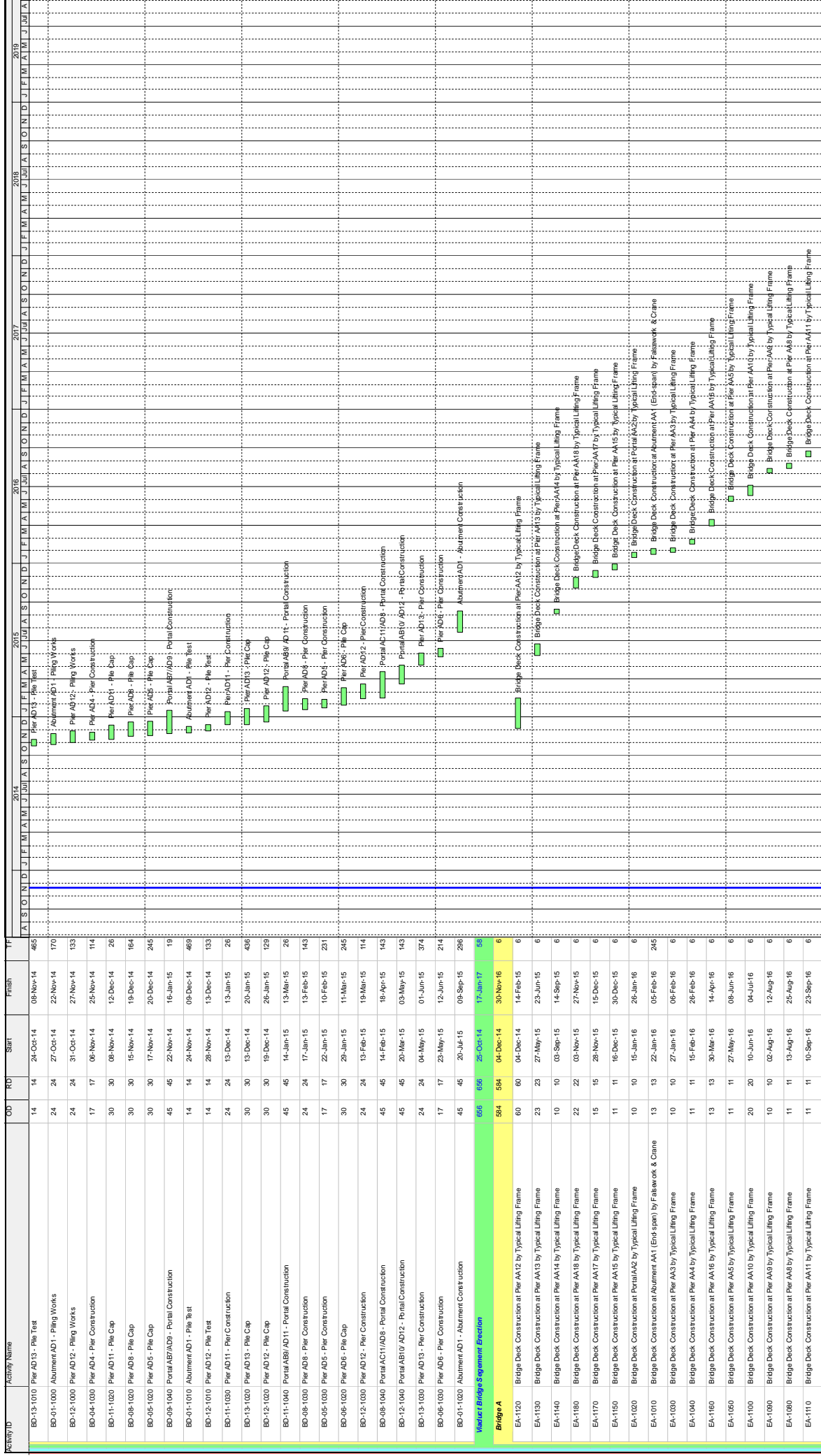
### Initial Works Programme Rev 3

- █ Actual Work
- █ Remaining Work
- █ Critical Remaining Work
- ◆ Milestone

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21-Dec-13	Rev3	Dennis	Daniel
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09-Jul-13	Rev0	Anselm	Daniel

**IWP03** Page 19 of 23 **23-Dec-13**

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



Activity ID	Activity Name	OD	RD	Start	Finish	2014	2015	2016	2017	2018	2019
BD-13-1010	Pier AD13 - Pile Test	14	14	24-Oct-14	08-Nov-14						
BD-01-1000	Abutment AD1 - Piling Works	24	24	27-Oct-14	22-Nov-14						
BD-12-1000	Pier AD12 - Piling Works	24	24	31-Oct-14	27-Nov-14						
BD-04-1030	Pier AD4 - Pier Construction	17	17	06-Nov-14	25-Nov-14						
BD-11-1020	Pier AD11 - Pile Cap	30	30	08-Nov-14	12-Dec-14						
BD-08-1020	Pier AD8 - Pile Cap	30	30	15-Nov-14	19-Dec-14						
BD-05-1020	Pier AD5 - Pile Cap	30	30	17-Nov-14	20-Dec-14						
BD-09-1040	Portal/AB7/AD9 - Portal Construction	45	45	22-Nov-14	16-Jan-15						
BD-01-1010	Abutment AD1 - Pile Test	14	14	24-Nov-14	09-Dec-14						
BD-12-1010	Pier AD12 - Pile Test	14	14	28-Nov-14	13-Dec-14						
BD-11-1030	Pier AD11 - Pier Construction	24	24	13-Dec-14	13-Jan-15						
BD-13-1020	Pier AD13 - Pile Cap	30	30	19-Dec-14	20-Jan-15						
BD-12-1020	Pier AD12 - Pile Cap	30	30	19-Dec-14	26-Jan-15						
BD-11-1040	Portal/AB11/AD11 - Portal Construction	45	45	14-Jan-15	13-Mar-15						
BD-09-1030	Pier AD9 - Pier Construction	24	24	17-Jan-15	13-Feb-15						
BD-05-1030	Pier AD5 - Pier Construction	17	17	22-Jan-15	10-Feb-15						
BD-06-1020	Pier AD6 - Pile Cap	30	30	29-Jan-15	11-Mar-15						
BD-12-1030	Pier AD12 - Pier Construction	24	24	13-Feb-15	19-Mar-15						
BD-09-1040	Portal/AB9/AD9 - Portal Construction	45	45	14-Feb-15	18-Apr-15						
BD-12-1040	Portal/AB12/AD12 - Portal Construction	45	45	20-Mar-15	03-May-15						
BD-13-1030	Pier AD13 - Pier Construction	24	24	04-May-15	01-Jun-15						
BD-06-1030	Pier AD6 - Pier Construction	17	17	23-May-15	12-Jun-15						
BD-01-1020	Abutment AD1 - Abutment Construction	45	45	26-Jul-15	09-Sep-15						
<b>Waialue Bridge Segment Erection</b>		<b>65.6</b>	<b>65.6</b>	<b>26-Oct-14</b>	<b>17-Jan-17</b>						
<b>Bridge A</b>		<b>584</b>	<b>584</b>	<b>04-Dec-14</b>	<b>30-Nov-16</b>						
EA-1120	Bridge Deck Construction at Pier AA12 by Typical Lifting Frame	60	60	04-Dec-14	14-Feb-15						
EA-1130	Bridge Deck Construction at Pier AA13 by Typical Lifting Frame	23	23	27-May-15	23-Jun-15						
EA-1140	Bridge Deck Construction at Pier AA14 by Typical Lifting Frame	10	10	08-Sep-15	14-Sep-15						
EA-1180	Bridge Deck Construction at Pier AA18 by Typical Lifting Frame	22	22	08-Nov-15	27-Nov-15						
EA-1170	Bridge Deck Construction at Pier AA17 by Typical Lifting Frame	15	15	28-Nov-15	15-Dec-15						
EA-1150	Bridge Deck Construction at Pier AA15 by Typical Lifting Frame	11	11	16-Dec-15	30-Dec-15						
EA-1020	Bridge Deck Construction at Portal/AA2 by Typical Lifting Frame	10	10	15-Jan-16	28-Jan-16						
EA-1010	Bridge Deck Construction at Abutment AA1 (End span) by Falsework & Crane	13	13	22-Jan-16	05-Feb-16						
EA-1030	Bridge Deck Construction at Pier AA3 by Typical Lifting Frame	10	10	27-Jan-16	06-Feb-16						
EA-1040	Bridge Deck Construction at Pier AA4 by Typical Lifting Frame	11	11	15-Feb-16	26-Feb-16						
EA-1160	Bridge Deck Construction at Pier AA16 by Typical Lifting Frame	13	13	30-Mar-16	14-Apr-16						
EA-1050	Bridge Deck Construction at Pier AA5 by Typical Lifting Frame	11	11	27-May-16	08-Jun-16						
EA-1100	Bridge Deck Construction at Pier AA10 by Typical Lifting Frame	20	20	10-Jun-16	04-Jul-16						
EA-1080	Bridge Deck Construction at Pier AA8 by Typical Lifting Frame	10	10	02-Aug-16	12-Aug-16						
EA-1090	Bridge Deck Construction at Pier AA9 by Typical Lifting Frame	11	11	13-Aug-16	25-Aug-16						
EA-1110	Bridge Deck Construction at Pier AA11 by Typical Lifting Frame	11	11	10-Sep-16	23-Sep-16						

**CEDD Contract No. CV/2012/09**

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

**Initial Works Programme Rev 3**

**IW03** **Page 20 of 23** **23-Dec-13**

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俊和建筑工程有限公司  
 CHUN WO CONSTRUCTION & ENGINEERING Co., LTD.

Actual Work (Blue bar)  
 Remaining Work (Green bar)  
 Summary Bar (Yellow bar)  
 Critical Remaining Work (Red bar)  
 Milestone (Black diamond)









## Contract 5



ID	WBS	Task Name	Duration	Start	Finish	% Complete	2014									
							Dec	Jan	Feb	Mar	Apr	May	Jun	Jul		
51	2.1.5	Setup and Management of TMLG	50 days	12/4/2013	10/6/2013	100%										
52	2.1.6	Setup and Management of ULG	50 days	12/4/2013	10/6/2013	100%										
53	2.2	Applications to Government Department	73 days	12/4/2013	9/7/2013	100%										
54	2.2.1	Application of excavation permit	73 days	12/4/2013	9/7/2013	100%										
55	2.2.2	Application of Waste water discharge license	37 days	12/4/2013	25/5/2013	100%										
56	2.2.3	Application of chemical waste producer permit	37 days	12/4/2013	25/5/2013	100%										
57	2.2.4	Application of trip ticket system	37 days	12/4/2013	25/5/2013	100%										
58	2.3	Temporary Traffic Arrangement (TTA) Scheme for temp. LMH Rd	109 days	12/4/2013	20/8/2013	100%										
59	2.3.1	Submission / approval of traffic consultant	5 days	12/4/2013	17/4/2013	100%										
60	2.3.2	Preparation of TTA scheme	38 days	18/4/2013	1/6/2013	100%										
61	2.3.3	Comment & approval of TTA scheme by TD & RMO	54 days	3/6/2013	6/8/2013	100%										
62	2.3.4	Obtain roadwork advice from RMO	12 days	7/8/2013	20/8/2013	100%										
63	2.4	Liaison with Utility Undertakers	200 days	12/4/2013	6/12/2013	100%										
64	2.4.1	Obtain most update utility drawings from various utility undertakers	24 days	12/4/2013	10/5/2013	100%										
65	2.4.2	Liaise with various utility undertakers	200 days	12/4/2013	6/12/2013	100%										
66	2.5	Environmental Baseline & Impact Monitoring	110 days	11/4/2013	21/8/2013	100%										
67	2.5.1	Obtain Environmental Permit (EP) -- EP-404/2011	0 days	11/4/2013	11/4/2013	100%										
68	2.5.2	Appointment of ET	0 days	11/4/2013	11/4/2013	100%										
69	2.5.3	Approval of ET from EPD	5 days	13/4/2013	18/4/2013	100%										
70	2.5.4	Preparation of method statement for baseline monitoring by ET	16 days	19/4/2013	8/5/2013	100%										
71	2.5.5	Submision of relevant management plans & reports by Others	29 days	12/4/2013	16/5/2013	100%										
72	2.5.6	Certify the method statement, management plans & reports by ET	13 days	17/5/2013	31/5/2013	100%										
73	2.5.7	Verify the EM&A manual, management plans & reports by IEC	17 days	22/5/2013	10/6/2013	100%										
74	2.5.8	Management plans & reports submitted to EPD three month before commencement of Construction works	81 days	17/5/2013	21/8/2013	100%										
75	2.5.9	Carry out the baseline monitoring and preparation of report	28 days	11/6/2013	15/7/2013	100%										
76	2.5.10	Baseline monitoring report submitted to EPD one month before commencement of Construction works	31 days	16/7/2013	20/8/2013	100%										
77	2.6	General Site Clearance	350 days	12/4/2013	9/6/2014	61%										
78	<b>3</b>	<b>Stage of the Works</b>	<b>149 days</b>	<b>11/4/2013</b>	<b>7/10/2013</b>	<b>100%</b>										
79	<b>3.1</b>	<b>Stage I of the Works - Temporary vehicular bridge B and temporary Lin Ma Hang Road</b>	<b>148 days</b>	<b>12/4/2013</b>	<b>7/10/2013</b>	<b>100%</b>										
80	3.1.1	Submissions	57 days	12/4/2013	19/6/2013	100%										
81	3.1.2	Approval of Submissions	58 days	14/6/2013	21/8/2013	100%										
82	3.1.3	Construction of temporary vehicular bridge "B"	38 days	22/8/2013	7/10/2013	100%										
83	3.1.3.1	Preparation of UBs	8 days	22/8/2013	30/8/2013	100%										
84	3.1.3.2	Construct concrete footings	20 days	24/8/2013	16/9/2013	100%										
85	3.1.3.3	construct main beam for bridge	13 days	17/9/2013	3/10/2013	100%										
86	3.1.3.4	backfill with general fill adjacent to pile caps to form access roads	3 days	4/10/2013	7/10/2013	100%										
87	3.1.4	Construction of temporary Lin Ma Hang Road	38 days	22/8/2013	7/10/2013	100%										
88	3.1.4.1	Section 1 : chainage 100 - 730	38 days	22/8/2013	7/10/2013	100%										
89	3.1.4.2	Section 2 : Chuk Yuen Tsuen (South) Sewage Pumping Station to Existing Lin Ma Hang Road Bridge	38 days	22/8/2013	7/10/2013	100%										
90	<b>3.2</b>	<b>Stage II of the Works - Temporary ArchSD Depot (LMH2)</b>	<b>65 days</b>	<b>11/4/2013</b>	<b>27/6/2013</b>	<b>100%</b>										
91	3.2.1	Liaison with ArchSD	41 days	11/4/2013	29/5/2013	100%										
92	3.2.2	Construction of Temporary ArchSD Depot	24 days	30/5/2013	27/6/2013	100%										
93	3.2.3	Handover of Temporary ArchSD Depot	0 days	27/6/2013	27/6/2013	100%										
94	<b>4</b>	<b>Section of the Works</b>	<b>902 days</b>	<b>12/4/2013</b>	<b>10/4/2016</b>	<b>18%</b>										
95	<b>4.1</b>	<b>Section I of the Works - Ground Investigation field works (Drg. 7101A-7111A)</b>	<b>206 days</b>	<b>30/5/2013</b>	<b>4/2/2014</b>	<b>97%</b>										
96	4.1.1	Submit method statement and specialist	39 days	30/5/2013	16/7/2013	100%										
97	4.1.2	Approve method statement and specialist from ER	39 days	17/7/2013	30/8/2013	100%										
98	4.1.3	56hrs. Inspection pits (IP) & 56hrs. Boreholes (BO)	128 days	22/8/2013	22/1/2014	98%										
99	4.1.4	G.I works including installation of Settlement Plate (SP84 nrs.), Extensometer (EX16 nrs.), Ground Settlement Marker (GSM18nrs.)	136 days	22/8/2013	4/2/2014	95%										

ID	WBS	Task Name	Duration	Start	Finish	% Complete	2014											
							Dec	Jan	Feb	Mar	Apr	May	Jun	Jul				
<b>100</b>	<b>4.2</b>	<b>Section II of the Works - All laboratory tests for Section I</b>	<b>154 days</b>	<b>31/8/2013</b>	<b>6/3/2014</b>	<b>48%</b>												
101	4.2.1	Propose laboratory	36 days	31/8/2013	14/10/2013	100%												
102	4.2.2	Approve laboratory from ER	36 days	15/10/2013	25/11/2013	100%												
103	4.2.3	Laboratory preparation and Carry out laboratory tests	75 days	26/11/2013	26/2/2014	29%												
104	4.2.4	Preparation of lab report	72 days	7/12/2013	6/3/2014	17%												
<b>105</b>	<b>4.3</b>	<b>Section III of the Works - Site formation works for Portions RS1, RS2 &amp; RS3 (see for certificate of completion in letter ref. SRJV/W47/SO/J5/1308/00416 dated 23/8/2013)</b>	<b>74 days</b>	<b>12/5/2013</b>	<b>8/8/2013</b>	<b>100%</b>												
106	4.3.1	General Site Clearance for RS1, RS2, and RS3	12 days	13/5/2013	25/5/2013	100%												
107	4.3.2	Submission & approval of method statement	24 days	13/5/2013	8/6/2013	100%												
108	4.3.3	RS1 - Site formation (1500m <sup>3</sup> ) for re-site and dwarf wall construction (length approx. 84m)	63 days	25/5/2013	8/8/2013	100%												
109	4.3.4	RS2 - Omitted under VO No.1	0 days	12/5/2013	12/5/2013	100%												
110	4.3.5	RS3 - Site formation for re-site and dwarf wall construction (approx. 840m <sup>3</sup> , wall length app. 135m)	62 days	27/5/2013	8/8/2013	100%												
<b>111</b>	<b>4.4</b>	<b>Section IV of the Works - Village house within portion RS4 - 8.25m(L) x 7.88m(W) x 10.3m (H)</b>	<b>223 days</b>	<b>12/4/2013</b>	<b>4/1/2014</b>	<b>76%</b>												
112	4.4.1	Site Instruction from the Engineer	25 days	12/4/2013	11/5/2013	100%												
113	4.4.2	Submissions / Approval of material	37 days	13/5/2013	25/6/2013	100%												
114	4.4.3	Foundation (House 1 to 4)	50 days	1/6/2013	31/7/2013	100%												
115	4.4.4	G/F - Ground beam, slab, wall (House 1 to 4)	43 days	20/6/2013	9/8/2013	100%												
116	4.4.5	1/F - Beam, wall, slab (House 1 to 4)	41 days	31/7/2013	16/9/2013	100%												
117	4.4.6	2/F - Beam, wall, slab (House 1 to 4)	43 days	31/8/2013	22/10/2013	100%												
118	4.4.7	R/F - Beam, slab (House 1 to 4)	20 days	7/10/2013	29/10/2013	75%												
119	4.4.8	SH and Parapet (House 1 to 4)	21 days	16/10/2013	8/11/2013	25%												
120	4.4.9	Building Services (House 1 to 4)	62 days	23/10/2013	4/1/2014	0%												
<b>121</b>	<b>4.5</b>	<b>Section V of the Works-All works within portion RS4 exclude Section IV</b>	<b>223 days</b>	<b>12/4/2013</b>	<b>4/1/2014</b>	<b>8%</b>												
122	4.5.1	Submissions and method statement	31 days	12/4/2013	18/5/2013	100%												
123	4.5.2	Approvals from ER	25 days	26/4/2013	25/5/2013	0%												
124	4.5.3	Construction of footbridge and staircase with mini-piles 8 nos. x Ø273 and staircase (Drg. 2201A to 2207B, 6001B)	195 days	16/5/2013	4/1/2014	0%												
125	4.5.3.1	Mini-piles	50 days	16/5/2013	15/7/2013	0%												
126	4.5.3.2	Pile Caps	44 days	19/6/2013	9/8/2013	0%												
127	4.5.3.3	Abutments	38 days	13/7/2013	26/8/2013	0%												
128	4.5.3.4	Wing walls	39 days	30/7/2013	12/9/2013	0%												
129	4.5.3.5	Mass concrete	34 days	16/8/2013	25/9/2013	0%												
130	4.5.3.6	Remove sheetpiles from abutments	8 days	26/9/2013	5/10/2013	0%												
131	4.5.3.7	Beams	39 days	7/10/2013	20/11/2013	0%												
132	4.5.3.8	Deck	29 days	21/11/2013	24/12/2013	0%												
133	4.5.3.9	Compact fill behind abutments	12 days	7/10/2013	19/10/2013	0%												
134	4.5.3.10	New footpath	18 days	21/10/2013	9/11/2013	0%												
135	4.5.3.11	New staircase	31 days	11/11/2013	16/12/2013	0%												
136	4.5.3.12	Miscellaneous (pedestrian parapet, granite tile etc.)	15 days	17/12/2013	4/1/2014	0%												
<b>137</b>	<b>4.6</b>	<b>Section VII of the Works - All works within Area CRD</b>	<b>205 days</b>	<b>9/9/2013</b>	<b>15/5/2014</b>	<b>5%</b>												
138	4.6.1	Submission of pipe jacking	24 days	9/9/2013	8/10/2013	80%												
139	4.6.2	Approval of submissions of pipe jacking	26 days	23/9/2013	23/10/2013	20%												
140	4.6.3	Remaining works at other portions within CRD	98 days	16/1/2014	15/5/2014	0%												
141	4.6.3.1	Chain link fence, Modified CEDD hoarding Type III & Temporary Boundary Fence	98 days	16/1/2014	15/5/2014	0%												
142	4.6.3.1.1	Temporary Boundary Fence (180m)	98 days	16/1/2014	15/5/2014	0%												
143	4.6.3.1.1.1	discuss & agree the arrangement with HKPF	21 days	16/1/2014	12/2/2014	0%												
144	4.6.3.1.1.2	approval of submission XPM Mesh	21 days	13/2/2014	8/3/2014	0%												
145	4.6.3.1.1.3	place material order for XPM mesh	7 days	10/3/2014	17/3/2014	0%												

ID	WBS	Task Name	Duration	Start	Finish	% Complete	2014									
							Dec	Jan	Feb	Mar	Apr	May	Jun	Jul		
146	4.6.3.1.1.4	arrival of XPM mesh	21 days	18/3/2014	11/4/2014	0%										
147	4.6.3.1.1.5	footings (after filling of B5, B9)	16 days	12/4/2014	30/4/2014	0%										
148	4.6.3.1.1.6	fabricate temporary boundary fence & post	37 days	18/3/2014	30/4/2014	0%										
149	4.6.3.1.1.7	fix temporary boundary fence	20 days	22/4/2014	15/5/2014	0%										
150	4.6.3.1.2	chain link fence (Drg. 1032B) & modified CEDD hoarding Type III (Drg. 1032B) (after filling of Areas B5,B9)	51 days	15/3/2014	15/5/2014	0%										
151	4.6.3.1.2.1	modified CEDD hoarding Type III (after RW2, 2137-2090)	20 days	15/3/2014	8/4/2014	0%										
152	4.6.3.1.2.2	chain link fence (after filling B5,B9)	16 days	26/4/2014	15/5/2014	0%										
153	4.6.4	4 nos. of Ø 1650 pipe jacking LV006 works including jacking / receiving pit at BCP3 (approx. 60m in BQ, 25m in Drg. 8401A)	152 days	24/10/2013	25/4/2014	0%										
154	4.6.4.1	utility detection of the area	2 days	24/10/2013	25/10/2013	0%										
155	4.6.4.2	inspection pits for jacking pit and receiving pit	4 days	26/10/2013	30/10/2013	0%										
156	4.6.4.3	temporary work & excavation for jacking pit	18 days	31/10/2013	20/11/2013	0%										
157	4.6.4.4	temporary work & excavation for receiving pit	18 days	21/11/2013	11/12/2013	0%										
158	4.6.4.5	For jacking the 1st pipe	27 days	21/11/2013	21/12/2013	0%										
159	4.6.4.6	For jacking the 2nd pipe	26 days	23/12/2013	23/1/2014	0%										
160	4.6.4.7	For jacking the 3rd pipe	26 days	24/1/2014	26/2/2014	0%										
161	4.6.4.8	For jacking the 4th pipe	26 days	27/2/2014	28/3/2014	0%										
162	4.6.4.9	Lay HDPE pipes	8 days	29/3/2014	8/4/2014	0%										
163	4.6.4.10	Grout HDPE pipes	8 days	9/4/2014	17/4/2014	0%										
164	4.6.4.11	Remove temporary works and backfilling	7 days	18/4/2014	25/4/2014	0%										
165	4.6.5	132kV Overhead Terminal Pole Relocation	75 days	15/2/2014	15/5/2014	0%										
166	4.6.5.1	fill area for terminal pole installation by CLP 132kV	17 days	15/2/2014	6/3/2014	0%										
167	4.6.5.2	install terminal pole inside & outside site boundary by CLP 132kV	17 days	7/3/2014	26/3/2014	0%										
168	4.6.5.3	ducts laying under DSD Contract by CLP 132kV	32 days	19/3/2014	25/4/2014	0%										
169	4.6.5.4	remove existing cable by CLP 132kV	12 days	26/4/2014	10/5/2014	0%										
170	4.6.5.5	filling for relevant areas	7 days	8/5/2014	15/5/2014	0%										
171	4.7	<b>Section VIII of the Works - All works within Area BCPA</b>	403 days	11/6/2013	11/10/2014	23%										
172	4.7.1	Submission for Site Formation Works & import fill	60 days	11/6/2013	21/8/2013	100%										
173	4.7.2	Approval of submission for Site Formation Works	41 days	22/8/2013	10/10/2013	100%										
174	4.7.3	Approval for sources of import fill	58 days	28/9/2013	5/12/2013	100%										
175	4.7.4	Site formation of land (import fill 121433m3)	217 days	11/10/2013	30/6/2014	10%										
176	4.7.4.1	site formation (A1-A9)	69 days	11/10/2013	31/12/2013	30%										
177	4.7.4.2	site formation (A10-13, A15-20, A23, A24-A25)	73 days	21/1/2014	31/3/2014	0%										
178	4.7.4.3	site formation (A14, A22, A26)	75 days	1/4/2014	30/6/2014	0%										
179	4.7.5	Slope drainage works (Drg. 7156B-7159B)	233 days	21/1/2014	11/10/2014	0%										
180	4.7.5.1	submission of design of sedimentation tank/pond	30 days	21/1/2014	8/2/2014	0%										
181	4.7.5.2	approval of design of sedimentation tank/pond	30 days	10/2/2014	15/3/2014	0%										
182	4.7.5.3	discharge to existing Box Culvert No. 4 & sedimentation tank	14 days	17/3/2014	1/4/2014	0%										
183	4.7.5.4	DN1050 from CP to sedimentation tank	60 days	2/4/2014	13/6/2014	0%										
184	4.7.5.5	shortcreted TC (from A3,A2,A1,A5)	25 days	31/5/2014	30/6/2014	0%										
185	4.7.5.6	shortcreted TC (from A10-13)	25 days	2/7/2014	30/7/2014	0%										
186	4.7.5.7	shortcreted TC (from A10,A15,A19)	21 days	31/7/2014	23/8/2014	0%										
187	4.7.5.8	shortcreted TC (from A20-24A26,A14)	39 days	25/8/2014	11/10/2014	0%										
188	4.7.6	Chain link fence (1120m)	160 days	1/4/2014	11/10/2014	0%										
189	4.7.6.1	chain link fence (A1-5,A10,A15,A19)	84 days	1/4/2014	11/7/2014	0%										
190	4.7.6.2	chain link fence (A4,A9,A14,A26,A24)	49 days	12/7/2014	6/9/2014	0%										
191	4.7.6.3	chain link fence (A21-24)	27 days	8/9/2014	11/10/2014	0%										
192	4.8	<b>Section IX of the Works - All works within Area BCPB</b>	403 days	6/12/2013	11/4/2015	10%										
193	4.8.1	Submission for demolition of existing building structures	30 days	20/12/2013	25/1/2014	100%										
194	4.8.2	Approval of submission for demolish existing building structures	32 days	27/1/2014	7/3/2014	100%										
195	4.8.3	Demolition of existing building structures UPON instruction (Drg. 6152A, 6153A)	97 days	8/3/2014	3/7/2014	0%										
196	4.8.4	Site formation works (import fill 370523m3)	403 days	6/12/2013	11/4/2015	3%										





**Contract No. CV/2013/03 - Liantang/Heung Yuen Wai Boundary Control Point - Site Formation and Infrastructure Works - Contract 5**  
**3 Month Rolling Programme (WP1)**  
**From 20 December 2013 to 19 March 2014**

ID	WBS	Task Name	Duration	Start	Finish	% Complete	2014													
							Dec	Jan	Feb	Mar	Apr	May	Jun	Jul						
251	4.10.5.3	hoarding (after RW1 & 1A)	81 days	6/11/2014	10/2/2015	0%														
252	4.10.6	Site Formation works (import fill 104958m3) including slope drainage works (Drg. 7155B-7159B)	348 days	7/1/2014	5/3/2015	2%														
253	4.10.6.1	D1-D2	69 days	7/1/2014	31/3/2014	10%														
254	4.10.6.2	D3, D10, D11, D17, D12- D14	80 days	27/5/2014	29/8/2014	0%														
255	4.10.6.3	D4, D15, D16	77 days	30/8/2014	1/12/2014	0%														
256	4.10.6.4	D5-D9	76 days	2/12/2014	5/3/2015	0%														
257	4.10.7	Sewerage, Drainage & Water Works (Drg. 1323B, 1305C, 1309A)	299 days	21/10/2013	17/10/2014	0%														
258	4.10.7.1	Sequence 1a - Sewer for FMH511 to Box Culvert No. 3 (DN300)	69 days	21/10/2013	10/1/2014	0%														
259	4.10.7.2	Sequence 1b - Sewer for FMH515 to temp cap after FMH520 (DN300)	19 days	11/1/2014	5/2/2014	0%														
260	4.10.7.3	Sequence 1c - Sewer for temp. cap to connect from BCP (DN300)	21 days	6/2/2014	1/3/2014	0%														
261	4.10.7.4	Sequence 1d - Rising main CHC799.644-650m (2xDN100DI)	30 days	3/3/2014	7/4/2014	0%														
262	4.10.7.5	Sequence 1e - Pipe laying for SMH9930, 9929 to 9922 (DN300-525)	76 days	7/5/2014	5/8/2014	0%														
263	4.10.7.6	Sequence 1aa - Drainage for SMH9937 to 9961 (DN300,450,900)	70 days	11/1/2014	7/4/2014	0%														
264	4.10.7.7	Sequence 1-1 Pipe laying for CP25 to SMH9702, 9702A, 9651 to Pump Room	104 days	21/10/2013	24/2/2014	0%														
265	4.10.7.8	Sequence 1-2 Rising main CHA 0-157.882 (DN400)	112 days	15/11/2013	31/3/2014	0%														
266	4.10.7.9	Sequence 2-1a Watermain CHL229-283(DN250)	21 days	8/4/2014	2/5/2014	0%														
267	4.10.7.10	Sequence 2-1b Watermain CHL150-229(DN250)	30 days	3/5/2014	7/6/2014	0%														
268	4.10.7.11	Sequence 2-2 Pipe laying for SMH9937 to 9930 (DN525,750,900)	49 days	9/6/2014	5/8/2014	0%														
269	4.10.7.12	Sequence 2-3 Drainage for SMH9941, 9952 to 9942 (DN300, 525)	24 days	6/8/2014	2/9/2014	0%														
270	4.10.7.13	Sequence 2-3 Pipe laying for SMH9931 to 9942 (DN450)	16 days	3/9/2014	22/9/2014	0%														
271	4.10.7.14	Sequence 2-4 Watermain CHL283-335.749(DN250)	20 days	23/9/2014	17/10/2014	0%														
272	4.10.8	Irrigation system (sequence 3) adjacent to underpass & depressed road	30 days	28/8/2014	4/10/2014	0%														
273	4.10.9	Irrigation system (sequence 4) next to BCPC	37 days	7/5/2014	19/6/2014	0%														
274	4.10.10	Utilities works (Drg. 1405Auu)	299 days	18/12/2013	15/12/2014	0%														
275	4.10.10.1	(1-2b2) Sequence 1 - allow ducts for 11kV & LV across the underpass	10 days	18/12/2013	30/12/2013	0%														
276	4.10.10.2	Sequence 5a - 132kV	11 days	6/10/2014	17/10/2014	0%														
277	4.10.10.3	Sequence 5b - 11kV	20 days	18/10/2014	10/11/2014	0%														
278	4.10.10.4	Sequence 5c - LV	20 days	11/11/2014	3/12/2014	0%														
279	4.10.10.5	Sequence 5d - PCCW	10 days	4/12/2014	15/12/2014	0%														
280	4.10.11	Road works and Road lighting works (Drg.1205A,1505C,1605B)	94 days	16/12/2014	11/4/2015	0%														
281	4.10.12	Construction of depressed road & underpass-9.3m wide x168m long	198 days	31/12/2013	27/8/2014	0%														
282	4.10.12.1	Bay 16015-16012	42 days	31/12/2013	21/2/2014	0%														
283	4.10.12.2	Bay 16011-16008	42 days	22/2/2014	12/4/2014	0%														
284	4.10.12.3	Bay 16007-16004	42 days	14/4/2014	3/6/2014	0%														
285	4.10.12.4	Bay 16003-16001	42 days	4/6/2014	23/7/2014	0%														
286	4.10.12.5	miscellaneous works	72 days	4/6/2014	27/8/2014	0%														
287	4.11	Section XII of the Works - All works within Area LMH	386 days	22/8/2013	1/12/2014	18%														
288	4.11.1	Submissions for method statement of subway & staircase	58 days	22/8/2013	30/10/2013	100%														
289	4.11.2	Approval of Submissions for method statement of subway & staircase	56 days	30/8/2013	5/11/2013	100%														
290	4.11.3	Construction of retaining wall RW1 - CH0 to 561.053m	176 days	26/9/2013	26/4/2014	49%														
291	4.11.3.1	Bay 1075 to Bay 1068 (8 bays) -H1	65 days	26/9/2013	11/12/2013	100%														
292	4.11.3.2	Bay 1067 to Bay 1060 (8 bays) -H2	66 days	8/10/2013	23/12/2013	88%														
293	4.11.3.3	Bay 1059 to Bay 1052 (8 bays) - H3	75 days	15/11/2013	15/2/2014	69%														
294	4.11.3.4	Bay 1051 to Bay 1044 (8 bays) -H4	63 days	29/11/2013	15/2/2014	75%														
295	4.11.3.5	Bay 1043 to Bay 1036 (8 bays) - H5	63 days	13/12/2013	1/3/2014	50%														
296	4.11.3.6	Bay 1035 to Bay 1028 (8 bays) -H5,H6	67 days	17/1/2014	9/4/2014	32%														
297	4.11.3.7	Bay 1027 to Bay 1020 (8 bays) -H6	63 days	16/12/2013	4/3/2014	13%														
298	4.11.3.8	Bay 1019 to Bay 1012 (8 bays) -H7	85 days	28/12/2013	11/4/2014	38%														
299	4.11.3.9	Bay 1011 to Bay 1004 (8 bays) H7,H8	71 days	30/12/2013	26/3/2014	0%														

ID	WBS	Task Name	Duration	Start	Finish	% Complete
300	4.11.3.10	Bay 1003 to Bay 1001 (3 bays) - H8	26 days	27/3/2014	26/4/2014	0%
301	4.11.4	Construction of retaining wall RW1A-CH561.053 to 612.457m (length approx. .51.4m)	304 days	11/9/2013	13/9/2014	44%
302	4.11.4.1	Bay 1076 to Bay 1078 (base & wall)	40 days	11/9/2013	29/10/2013	100%
303	4.11.4.2	Bay 1079 to Bay 1082 (after divert existing Rd i.e. after Staircase & Lift Shaft)	51 days	16/7/2014	13/9/2014	0%
304	4.11.5	Filling & Slope drainage behind RW1A (involve TTA)	65 days	15/9/2014	1/12/2014	0%
305	4.11.6	Site formation works (import fill 15300m3) including slope drainage works (Drg. 7154B, 7159B)	238 days	24/12/2013	10/10/2014	0%
306	4.11.6.1	site formation (H1-H8) & slope drainage works	128 days	24/12/2013	29/5/2014	0%
307	4.11.6.1.1	fill H1	30 days	24/4/2014	29/5/2014	0%
308	4.11.6.1.2	fill H2	15 days	24/12/2013	11/1/2014	0%
309	4.11.6.1.3	fill H3	15 days	17/2/2014	5/3/2014	0%
310	4.11.6.1.4	fill H4	15 days	17/2/2014	5/3/2014	0%
311	4.11.6.1.5	fill H5	15 days	10/4/2014	26/4/2014	0%
312	4.11.6.1.6	fill H6	15 days	16/4/2014	3/5/2014	0%
313	4.11.6.1.7	fill H7	15 days	12/4/2014	29/4/2014	0%
314	4.11.6.1.8	fill H8	15 days	27/3/2014	14/4/2014	0%
315	4.11.6.2	Remove existing Lin Ma Hang Road	9 days	29/9/2014	10/10/2014	0%
316	4.11.6.3	Fill H9 & B15 for slope	16 days	20/9/2014	10/10/2014	0%
317	4.11.7	Boundary fence & chain link fence on top of slope	42 days	11/10/2014	28/11/2014	0%
318	4.11.8	Drainage works at Lin Ma Hang Road (Drg. 1304B, 1306A, 1307A, 1309A)	200 days	6/11/2013	7/7/2014	3%
319	4.11.8.1	Phase H1 - SM16-9062, 9201 & 9105A-9062, 9054-9062, 9101-9105	200 days	6/11/2013	7/7/2014	8%
320	4.11.8.1.1	Temporary Traffic Arrangement (TTA) Schemes	74 days	6/11/2013	5/2/2014	20%
321	4.11.8.1.1.1	Preparation of TTA scheme	30 days	6/11/2013	10/12/2013	50%
322	4.11.8.1.1.2	Comment & approval of TTA scheme by TD & RMO	30 days	11/12/2013	16/1/2014	0%
323	4.11.8.1.1.3	Obtain roadwork advice from RMO	14 days	17/1/2014	5/2/2014	0%
324	4.11.8.1.2	Pipe laying	126 days	6/2/2014	7/7/2014	0%
325	4.11.8.2	SMH6895-6808, 6804-6808	41 days	10/5/2014	27/6/2014	0%
326	4.11.8.3	Phase H2 - SMH9054,53,52,51,50,49,48,47,46,45,44, 9043	42 days	13/1/2014	5/3/2014	0%
327	4.11.8.4	Phase H3 - SMH9043,42,41,40,39,38,37, 9036 (DN900)	34 days	6/3/2014	15/4/2014	0%
328	4.11.8.5	Phase H4 - SMH9036,35,34,33,32,31,30,9029 (DN900)	26 days	15/3/2014	15/4/2014	0%
329	4.11.8.6	Phase H5 - SMH9029,28,27,26,25,24,23,22,9021 (DN750,900)	35 days	28/4/2014	9/6/2014	0%
330	4.11.8.7	Phase H6 - SMH9021,20,19,18,17,16,15,14,9013 (DN750)	30 days	5/5/2014	9/6/2014	0%
331	4.11.8.8	Phase H7 - SMH9013,12,11,10,09,08,07,06,9005 (DN600,750)	28 days	30/4/2014	3/6/2014	0%
332	4.11.8.9	Phase H8 - SMH9005,04,03,9002 (DN450)	20 days	8/5/2014	30/5/2014	0%
333	4.11.8.10	Phase H8a - SMH9002,9001 (DN300)	7 days	31/5/2014	9/6/2014	0%
334	4.11.9	Water works at Lin Ma Hang Road (Drg. 1914B-1917B)	15 days	26/6/2014	14/7/2014	0%
335	4.11.10	Irrigation System at Lin Ma Hang Road (Drg.1974B, 1976A, 1977A)	30 days	10/6/2014	15/7/2014	0%
336	4.11.10.1	from Phase H2-H8	25 days	10/6/2014	9/7/2014	0%
337	4.11.10.2	for Phase H1	7 days	8/7/2014	15/7/2014	0%
338	4.11.10.3	after Phase H8	10 days	28/6/2014	10/7/2014	0%
339	4.11.11	Utility Works	127 days	16/4/2014	15/9/2014	0%
340	4.11.11.1	CLP - LV (west side of new Lin Ma Hang Road)	83 days	16/4/2014	24/7/2014	0%
341	4.11.11.1.1	from chainage 840 to chainage 1125	13 days	16/4/2014	30/4/2014	0%
342	4.11.11.1.2	from chainage 630 to chainage 840	18 days	10/6/2014	30/6/2014	0%
343	4.11.11.1.3	from chainage 475 to chainage 630	9 days	15/7/2014	24/7/2014	0%
344	4.11.11.1.4	from chainage 1125 to chainage 1270	9 days	8/7/2014	17/7/2014	0%
345	4.11.11.2	CLP - LV (east side of new Lin Ma Hang Road)	31 days	4/7/2014	8/8/2014	0%
346	4.11.11.2.1	from chainage 840 to chainage 1125	13 days	4/7/2014	18/7/2014	0%
347	4.11.11.2.2	from chainage 630 to chainage 840	18 days	19/7/2014	8/8/2014	0%
348	4.11.11.2.3	from chainage 475 to chainage 630	9 days	5/7/2014	15/7/2014	0%

ID	WBS	Task Name	Duration	Start	Finish	% Complete
349	4.11.11.2.4	from chainage 1125 to chainage 1270	9 days	15/7/2014	24/7/2014	0%
350	4.11.11.3	CLP - 11kV (west side of new Lin Ma Hang Road)	79 days	2/5/2014	4/8/2014	0%
351	4.11.11.3.1	from chainage 840 to chainage 1125	13 days	2/5/2014	16/5/2014	0%
352	4.11.11.3.2	from chainage 630 to chainage 840	18 days	2/7/2014	22/7/2014	0%
353	4.11.11.3.3	from chainage 475 to chainage 630	9 days	25/7/2014	4/8/2014	0%
354	4.11.11.3.4	from chainage 1125 to chainage 1270	9 days	18/7/2014	28/7/2014	0%
355	4.11.11.4	CLP - 11kV (east side of new Lin Ma Hang Road)	39 days	16/7/2014	29/8/2014	0%
356	4.11.11.4.1	from chainage 840 to chainage 1125	13 days	19/7/2014	2/8/2014	0%
357	4.11.11.4.2	from chainage 630 to chainage 840	18 days	9/8/2014	29/8/2014	0%
358	4.11.11.4.3	from chainage 475 to chainage 630	9 days	16/7/2014	25/7/2014	0%
359	4.11.11.4.4	from chainage 1125 to chainage 1270	9 days	25/7/2014	4/8/2014	0%
360	4.11.11.5	PCCW (west side of new Lin Ma Hang Road)	94 days	2/5/2014	21/8/2014	0%
361	4.11.11.5.1	from chainage 840 to chainage 1125	21 days	5/6/2014	28/6/2014	0%
362	4.11.11.5.2	from chainage 630 to chainage 840	28 days	2/5/2014	4/6/2014	0%
363	4.11.11.5.3	from chainage 475 to chainage 630	15 days	5/8/2014	21/8/2014	0%
364	4.11.11.5.4	from chainage 1125 to chainage 1270	14 days	29/7/2014	13/8/2014	0%
365	4.11.11.6	HGC (west side of new Lin Ma Hang Road)	75 days	5/6/2014	1/9/2014	0%
366	4.11.11.6.1	from chainage 840 to chainage 1125	13 days	30/6/2014	15/7/2014	0%
367	4.11.11.6.2	from chainage 630 to chainage 840	18 days	5/6/2014	25/6/2014	0%
368	4.11.11.6.3	from chainage 475 to chainage 630	9 days	22/8/2014	1/9/2014	0%
369	4.11.11.6.4	from chainage 1125 to chainage 1270	9 days	20/8/2014	29/8/2014	0%
370	4.11.11.7	NWT (west side of new Lin Ma Hang Road)	68 days	26/6/2014	15/9/2014	0%
371	4.11.11.7.1	from chainage 840 to chainage 1125	13 days	16/7/2014	30/7/2014	0%
372	4.11.11.7.2	from chainage 630 to chainage 840	18 days	26/6/2014	17/7/2014	0%
373	4.11.11.7.3	from chainage 475 to chainage 630	9 days	2/9/2014	12/9/2014	0%
374	4.11.11.7.4	from chainage 1125 to chainage 1270	9 days	4/9/2014	15/9/2014	0%
375	4.11.12	Street lighting work	24 days	30/8/2014	27/9/2014	0%
376	4.11.12.1	west side of new Lin Ma Hang Road	13 days	13/9/2014	27/9/2014	0%
377	4.11.12.2	east side of new Lin Ma Hang Road	24 days	30/8/2014	27/9/2014	0%
378	4.11.13	Roadwork of carriageway (new Lin Ma Hang Road for BCPA)	61 days	18/7/2014	27/9/2014	0%
379	4.11.14	Construction of footpath (for BCPA)	61 days	18/7/2014	27/9/2014	0%
380	4.11.15	Construction of pedestrian subway & pump room (5m x 4.3m x 31m long)	166 days	6/11/2013	26/5/2014	0%
381	4.11.15.1	prepare formation of sheetpiling/excavation	8 days	6/11/2013	14/11/2013	0%
382	4.11.15.2	excavation &/or sheetpiling	28 days	15/11/2013	17/12/2013	0%
383	4.11.15.3	rubble mound	14 days	2/12/2013	17/12/2013	0%
384	4.11.15.4	cast blinding layer	14 days	11/12/2013	27/12/2013	0%
385	4.11.15.5	pump house	24 days	16/12/2013	14/1/2014	0%
386	4.11.15.6	subway 8th bay	20 days	15/1/2014	10/2/2014	0%
387	4.11.15.7	subway 7th bay	20 days	11/2/2014	5/3/2014	0%
388	4.11.15.8	subway 6th bay	15 days	25/2/2014	13/3/2014	0%
389	4.11.15.9	miscellaneous works	61 days	14/3/2014	26/5/2014	0%
390	4.11.16	Construction of staircase with lift shaft with 6 nos. of mini pile	186 days	14/10/2013	26/5/2014	23%
391	4.11.16.1	mini-piles	47 days	14/10/2013	6/12/2013	100%
392	4.11.16.2	lift shaft	33 days	7/12/2013	16/1/2014	10%
393	4.11.16.3	Bay 9	25 days	17/1/2014	18/2/2014	0%
394	4.11.16.4	Staircase	54 days	19/2/2014	23/4/2014	0%
395	4.11.16.5	miscellaneous works	60 days	15/3/2014	26/5/2014	0%
396	4.11.17	1 no. DNI650 pipe jacking LV009 works (120m in BQ, 50m in Drg.) including jacking & receiving pits	121 days	6/11/2013	1/4/2014	0%
397	4.11.17.1	utility detection of the area	3 days	6/11/2013	8/11/2013	0%
398	4.11.17.2	inspection pits for jacking pit and receiving pit	4 days	9/11/2013	13/11/2013	0%
399	4.11.17.3	temporary work & excavation for receiving pit	12 days	28/11/2013	11/12/2013	0%
400	4.11.17.4	temporary work & excavation for jacking pit	12 days	14/11/2013	27/11/2013	0%
401	4.11.17.5	establishment of jacking equipment	12 days	12/12/2013	26/12/2013	0%
402	4.11.17.6	jack pipe and excavate	59 days	27/12/2013	10/3/2014	0%

ID	WBS	Task Name	Duration	Start	Finish	% Complete	2014						
							1st Quarter	Mar	Apr	May	Jun	Jul	
403	4.11.17.7	Lay HDPE pipes	6 days	11/3/2014	17/3/2014	0%							
404	4.11.17.8	Grout HDPE pipes	6 days	18/3/2014	24/3/2014	0%							
405	4.11.17.9	Remove temporary works and backfilling	7 days	25/3/2014	1/4/2014	0%							
406	4.11.18	Construction of retaining wall RW9 - CH0 to 75m (length 75m)	70 days	2/4/2014	25/6/2014	0%							
407	4.11.18.1	drive sheetpile & excavation	9 days	2/4/2014	12/4/2014	0%							
408	4.11.18.2	grade 200 rock fill	9 days	4/4/2014	15/4/2014	0%							
409	4.11.18.3	cast blinding layer	9 days	9/4/2014	18/4/2014	0%							
410	4.11.18.4	Bay 9001-9010	62 days	12/4/2014	25/6/2014	0%							
411	4.11.19	Construction of Bridge J with 6 x Ø 1500 bored piles	177 days	7/12/2013	11/7/2014	0%							
412	4.11.19.1	bored piles	57 days	7/12/2013	17/2/2014	0%							
413	4.11.19.2	pile caps	13 days	18/2/2014	4/3/2014	0%							
414	4.11.19.3	abutment walls	21 days	3/3/2014	26/3/2014	0%							
415	4.11.19.4	falsework for deck	12 days	25/3/2014	8/4/2014	0%							
416	4.11.19.5	deck	45 days	9/4/2014	31/5/2014	0%							
417	4.11.19.6	parapet	33 days	3/6/2014	11/7/2014	0%							
418	4.11.20	Construction of retaining wall RW5 - CH0 to 60m (length 60m)	36 days	27/3/2014	9/5/2014	0%							
419	4.11.20.1	drive sheetpile & excavation	8 days	27/3/2014	4/4/2014	0%							
420	4.11.20.2	grade 200 rock fill	4 days	7/4/2014	10/4/2014	0%							
421	4.11.20.3	cast blinding layer	4 days	11/4/2014	15/4/2014	0%							
422	4.11.20.4	Bay 5001-5008	20 days	16/4/2014	9/5/2014	0%							
423	4.12	<b>Section XIII of the Works - Works not covered in any other Sections</b>	<b>492 days</b>	<b>22/8/2013</b>	<b>11/4/2015</b>	<b>15%</b>							
424	4.12.1	Submissions	58 days	22/8/2013	30/10/2013	100%							
425	4.12.2	Approval of Submissions	57 days	16/9/2013	22/11/2013	100%							
426	4.12.3	<b>Temporary Traffic Arrangement (TTA) Scheme for Works at existing LMH Rd</b>	<b>77 days</b>	<b>23/8/2013</b>	<b>22/11/2013</b>	<b>100%</b>							
427	4.12.3.1	Preparation of TTA scheme	18 days	23/8/2013	12/9/2013	100%							
428	4.12.3.2	Comment & approval of TTA scheme by TD & RMO	45 days	13/9/2013	6/11/2013	100%							
429	4.12.3.3	Obtain roadwork advice from RMO	14 days	7/11/2013	22/11/2013	100%							
430	4.12.4	<b>Northbound of Re-aligned Lin Ma Hang Road (west side)</b>	<b>314 days</b>	<b>23/11/2013</b>	<b>8/12/2014</b>	<b>4%</b>							
431	4.12.4.1	Works from chainage 190 to chainage 310	124 days	23/11/2013	23/4/2014	16%							
432	4.12.4.1.1	Drainage & slope drain	51 days	23/11/2013	23/1/2014	47%							
433	4.12.4.1.2	Waterwork	24 days	24/1/2014	24/2/2014	0%							
434	4.12.4.1.3	Irrigation System	13 days	25/2/2014	11/3/2014	0%							
435	4.12.4.1.4	Roadwork	30 days	12/3/2014	16/4/2014	0%							
436	4.12.4.1.5	Utilities works	29 days	12/3/2014	15/4/2014	0%							
437	4.12.4.1.5.1	11kV	8 days	12/3/2014	20/3/2014	0%							
438	4.12.4.1.5.2	LV	8 days	21/3/2014	29/3/2014	0%							
439	4.12.4.1.5.3	NWT	8 days	31/3/2014	9/4/2014	0%							
440	4.12.4.1.5.4	Highway lighting	5 days	10/4/2014	15/4/2014	0%							
441	4.12.4.1.6	Footpath	7 days	16/4/2014	23/4/2014	0%							
442	4.12.4.2	Works from chainage 380 to chainage 580	163 days	23/11/2013	10/6/2014	3%							
443	4.12.4.2.1	Drainage	60 days	23/11/2013	6/2/2014	10%							
444	4.12.4.2.2	Waterwork	30 days	7/2/2014	13/3/2014	0%							
445	4.12.4.2.3	Irrigation System	15 days	14/3/2014	31/3/2014	0%							
446	4.12.4.2.4	Roadwork	35 days	1/4/2014	13/5/2014	0%							
447	4.12.4.2.5	Utilities works	46 days	1/4/2014	26/5/2014	0%							
448	4.12.4.2.5.1	11kV	13 days	1/4/2014	16/4/2014	0%							
449	4.12.4.2.5.2	LV	13 days	17/4/2014	2/5/2014	0%							
450	4.12.4.2.5.3	NWT	13 days	3/5/2014	17/5/2014	0%							
451	4.12.4.2.5.4	Highway lighting	7 days	19/5/2014	26/5/2014	0%							
452	4.12.4.2.6	Footpath	12 days	27/5/2014	10/6/2014	0%							
453	4.12.4.3	Works from chainage 310 to chainage 380	66 days	14/5/2014	31/7/2014	0%							
454	4.12.4.3.1	Drainage	25 days	14/5/2014	12/6/2014	0%							
455	4.12.4.3.2	Waterwork	10 days	13/6/2014	24/6/2014	0%							
456	4.12.4.3.3	Irrigation System	7 days	25/6/2014	3/7/2014	0%							

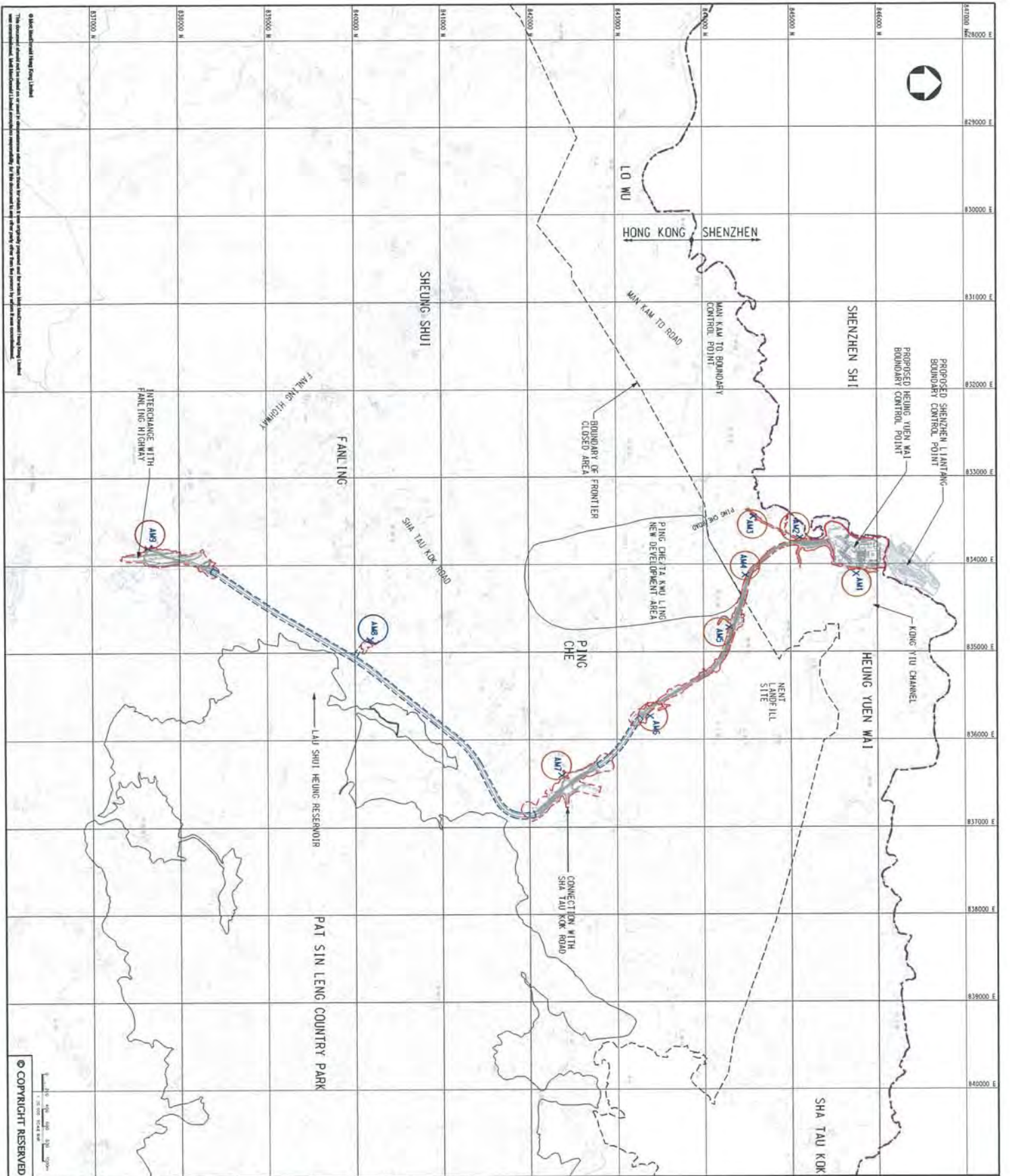
ID	WBS	Task Name	Duration	Start	Finish	% Complete	2014									
							Dec	Jan	Feb	Mar	Apr	May	Jun	Jul		
457	4.12.4.3.4	Roadwork	15 days	4/7/2014	21/7/2014	0%										
458	4.12.4.3.5	Utilities works	19 days	4/7/2014	25/7/2014	0%										
459	4.12.4.3.5.1	11kV	5 days	4/7/2014	9/7/2014	0%										
460	4.12.4.3.5.2	LV	5 days	10/7/2014	15/7/2014	0%										
461	4.12.4.3.5.3	NWT	5 days	16/7/2014	21/7/2014	0%										
462	4.12.4.3.5.4	Highway lighting	4 days	22/7/2014	25/7/2014	0%										
463	4.12.4.3.6	Footpath	5 days	26/7/2014	31/7/2014	0%										
464	4.12.4.4	Works from chainage 580 to chainage 780	174 days	14/5/2014	8/12/2014	0%										
465	4.12.4.4.1	Drainage	60 days	14/5/2014	24/7/2014	0%										
466	4.12.4.4.2	Waterwork	30 days	25/7/2014	28/8/2014	0%										
467	4.12.4.4.3	Irrigation System	15 days	29/8/2014	16/9/2014	0%										
468	4.12.4.4.4	Sewerage	11 days	17/9/2014	29/9/2014	0%										
469	4.12.4.4.5	Roadwork	35 days	30/9/2014	11/11/2014	0%										
470	4.12.4.4.6	Utilities works	46 days	30/9/2014	24/11/2014	0%										
471	4.12.4.4.6.1	11kV	13 days	30/9/2014	16/10/2014	0%										
472	4.12.4.4.6.2	LV	13 days	17/10/2014	31/10/2014	0%										
473	4.12.4.4.6.3	NWT	13 days	1/11/2014	15/11/2014	0%										
474	4.12.4.4.6.4	Highway lighting	7 days	17/11/2014	24/11/2014	0%										
475	4.12.4.4.7	Footpath	12 days	25/11/2014	8/12/2014	0%										
476	4.12.4.5	Works from chainage 80 to chainage 190	89 days	14/5/2014	27/8/2014	0%										
477	4.12.4.5.1	Drainage	30 days	14/5/2014	18/6/2014	0%										
478	4.12.4.5.2	Waterwork	15 days	19/6/2014	7/7/2014	0%										
479	4.12.4.5.3	Irrigation System	10 days	8/7/2014	18/7/2014	0%										
480	4.12.4.5.4	Roadwork	28 days	19/7/2014	20/8/2014	0%										
481	4.12.4.5.5	Utilities works	28 days	19/7/2014	20/8/2014	0%										
482	4.12.4.5.5.1	11kV	8 days	19/7/2014	28/7/2014	0%										
483	4.12.4.5.5.2	LV	8 days	29/7/2014	6/8/2014	0%										
484	4.12.4.5.5.3	NWT	8 days	7/8/2014	15/8/2014	0%										
485	4.12.4.5.5.4	Highway lighting	4 days	16/8/2014	20/8/2014	0%										
486	4.12.4.5.6	Footpath	6 days	21/8/2014	27/8/2014	0%										
487	<b>4.12.5</b>	<b>Southbound of Re-aligned Lin Ma Hang Road (east side)</b>	<b>123 days</b>	<b>12/11/2014</b>	<b>11/4/2015</b>	<b>0%</b>										
488	4.12.5.1	Works from chainage 60 to chainage 200	77 days	12/11/2014	11/2/2015	0%										
489	4.12.5.1.1	Drainage	18 days	12/11/2014	2/12/2014	0%										
490	4.12.5.1.2	Irrigation System	12 days	3/12/2014	16/12/2014	0%										
491	4.12.5.1.3	Roadwork	22 days	17/12/2014	13/1/2015	0%										
492	4.12.5.1.4	Utilities works	35 days	17/12/2014	28/1/2015	0%										
493	4.12.5.1.4.1	11kV	10 days	17/12/2014	29/12/2014	0%										
494	4.12.5.1.4.2	LV	9 days	30/12/2014	9/1/2015	0%										
495	4.12.5.1.4.3	HGC	8 days	10/1/2015	19/1/2015	0%										
496	4.12.5.1.4.4	Highway lighting	8 days	20/1/2015	28/1/2015	0%										
497	4.12.5.1.5	Footpath	12 days	29/1/2015	11/2/2015	0%										
498	4.12.5.2	Works from chainage 400 to chainage 600	72 days	12/11/2014	5/2/2015	0%										
499	4.12.5.2.1	Waterwork	4 days	12/11/2014	15/11/2014	0%										
500	4.12.5.2.2	Irrigation System	4 days	17/11/2014	20/11/2014	0%										
501	4.12.5.2.3	Roadwork	35 days	21/11/2014	2/1/2015	0%										
502	4.12.5.2.4	Utilities works	52 days	21/11/2014	22/1/2015	0%										
503	4.12.5.2.4.1	11kV	13 days	21/11/2014	5/12/2014	0%										
504	4.12.5.2.4.2	LV	13 days	6/12/2014	20/12/2014	0%										
505	4.12.5.2.4.3	HGC	13 days	22/12/2014	7/1/2015	0%										
506	4.12.5.2.4.4	Highway lighting	13 days	8/1/2015	22/1/2015	0%										
507	4.12.5.2.5	Footpath	12 days	23/1/2015	5/2/2015	0%										
508	4.12.5.3	Works from chainage 200 to chainage 400	70 days	15/1/2015	11/4/2015	0%										
509	4.12.5.3.1	Slope drain	4 days	15/1/2015	19/1/2015	0%										
510	4.12.5.3.2	Irrigation System	4 days	20/1/2015	23/1/2015	0%										
511	4.12.5.3.3	Waterwork	3 days	24/1/2015	27/1/2015	0%										

ID	WBS	Task Name	Duration	Start	Finish	% Complete	2014									
							Dec	Jan	Feb	Mar	Apr	May	Jun	Jul		
512	4.12.5.3.4	Roadwork	39 days	28/1/2015	17/3/2015	0%										
513	4.12.5.3.5	Utilities works	51 days	28/1/2015	31/3/2015	0%										
514	4.12.5.3.5.1	11kV	13 days	28/1/2015	11/2/2015	0%										
515	4.12.5.3.5.2	LV	12 days	12/2/2015	28/2/2015	0%										
516	4.12.5.3.5.3	HGC	13 days	2/3/2015	16/3/2015	0%										
517	4.12.5.3.5.4	Highway lighting	13 days	17/3/2015	31/3/2015	0%										
518	4.12.5.3.6	Footpath	12 days	27/3/2015	11/4/2015	0%										
519	4.12.5.4	Works from chainage 600 to chainage 780	70 days	15/1/2015	11/4/2015	0%										
520	4.12.5.4.1	Sewerage	12 days	15/1/2015	28/1/2015	0%										
521	4.12.5.4.2	Irrigation System	7 days	29/1/2015	5/2/2015	0%										
522	4.12.5.4.3	Roadwork	33 days	6/2/2015	19/3/2015	0%										
523	4.12.5.4.4	Utilities works	44 days	6/2/2015	1/4/2015	0%										
524	4.12.5.4.4.1	11kV	11 days	6/2/2015	18/2/2015	0%										
525	4.12.5.4.4.2	LV	11 days	23/2/2015	6/3/2015	0%										
526	4.12.5.4.4.3	HGC	11 days	7/3/2015	19/3/2015	0%										
527	4.12.5.4.4.4	Highway lighting	11 days	20/3/2015	1/4/2015	0%										
528	4.12.5.4.5	Footpath	13 days	26/3/2015	11/4/2015	0%										
529	4.12.6	Archaeological survey (Sections T1 to T3)(Drg. 6403A)	78 days	24/10/2013	24/1/2014	37%										
530	4.12.6.1	AMO Permit issue	0 days	24/10/2013	24/10/2013	100%										
531	4.12.6.2	Notice commencement of excavation to AMO	14 days	24/10/2013	8/11/2013	100%										
532	4.12.6.3	Phase 1 - ch 380 to ch 580 (Section T1)	12 days	9/11/2013	22/11/2013	100%										
533	4.12.6.4	Phase 3 - ch 580 to ch 780 (Section T2 (AWB))	26 days	23/11/2013	23/12/2013	10%										
534	4.12.6.5	Phase 4 - ch 730 to ch 780 (Section T3)	26 days	24/12/2013	24/1/2014	0%										
535	4.12.7	Construction of retaining wall RW8 - CH0 to 22 (3 bays)	57 days	11/6/2014	16/8/2014	0%										
536	4.12.7.1	Bay 8001 to Bay 8003 (3 bays)	57 days	11/6/2014	16/8/2014	0%										
537	4.12.8	Site Formation works for ArchSD Depot (Drg. 1001B)	20 days	18/8/2014	10/9/2014	0%										
538	4.12.9	Existing road to be improved & run-in to the site to be constructed at RS1 (Drg.1203A, 1001B)	90 days	4/8/2014	19/11/2014	0%										
539	4.12.10	Access road to be re-constructed / upgraded at RS3 (Drg/1203)	90 days	20/11/2014	10/3/2015	0%										
540	4.13	<b>Section XIV of the Works - Trees preservation and protection</b>	<b>602 days</b>	<b>12/4/2013</b>	<b>11/4/2015</b>	<b>30%</b>										
541	4.13.1	Submissions	57 days	12/4/2013	19/6/2013	100%										
542	4.13.2	Approval of Submissions	59 days	20/6/2013	28/8/2013	100%										
543	4.13.3	Tree felling/removal works and tree transplanting works	412 days	6/9/2013	17/1/2015	22%										
544	4.13.4	Preservation and Protection of Existing Trees in all Portion of the Site	486 days	29/8/2013	11/4/2015	20%										
545	4.14	<b>Section XV of the Works - Landscape soft works (including transplant trees to permanent locations)</b>	<b>431 days</b>	<b>4/11/2013</b>	<b>11/4/2015</b>	<b>10%</b>										
546	4.15	<b>Section XVI of the Works - Establishment works for landscape soft works</b>	<b>365 days</b>	<b>12/4/2015</b>	<b>10/4/2016</b>	<b>0%</b>										

## **Appendix D**

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





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

PI	NO. TO	DATE	DESCRIPTION	BY	CHKD

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 200 The Landmark East  
 200 The Landmark East  
 200 The Landmark East

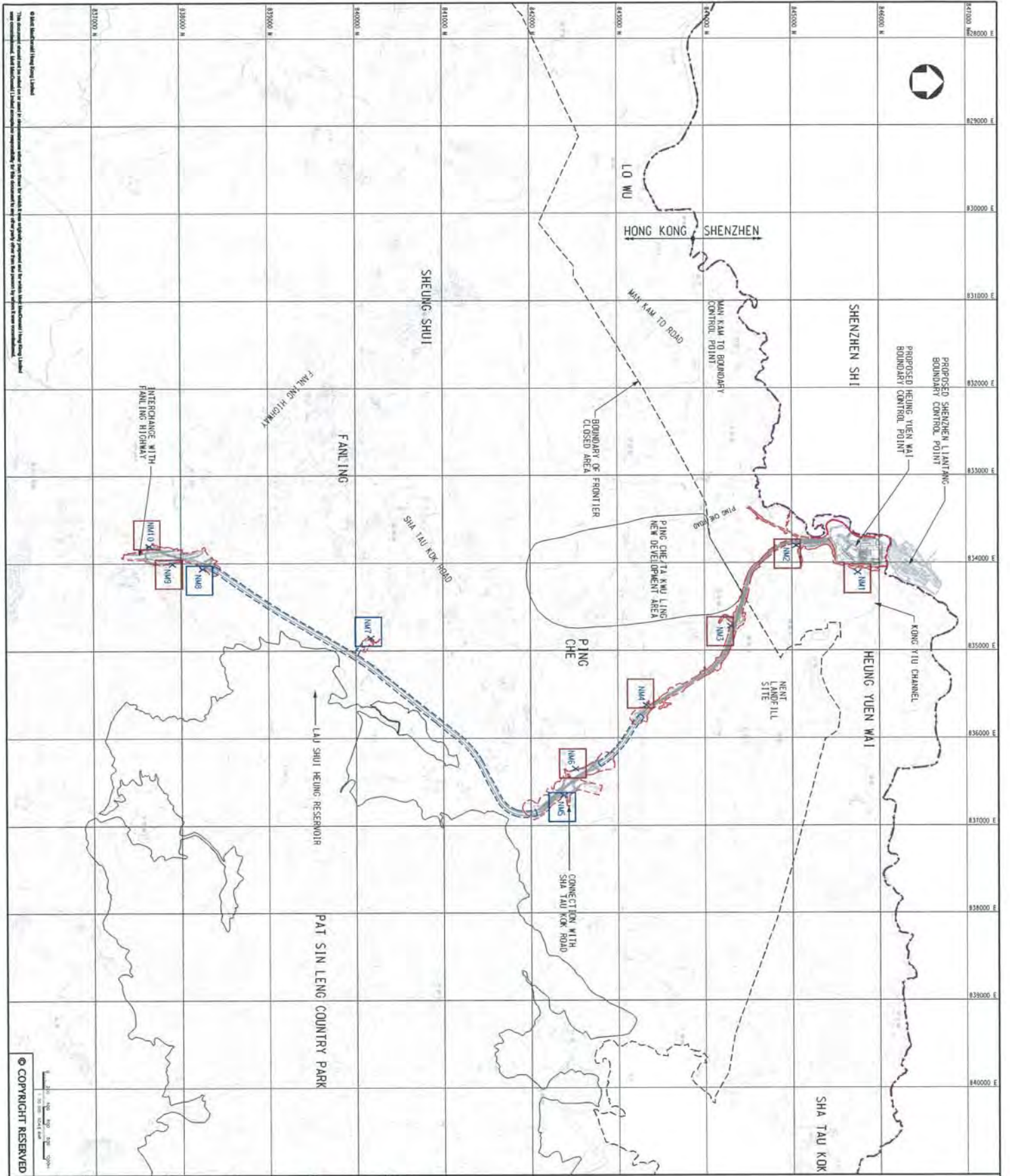
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 AND DEVELOPMENT  
 DEPARTMENT

PROJECT  
 AGREEMENT NO. CE45/2008(CE3)  
 LIANTANG/HENG YUEN WAI BOUNDARY  
 CONTROL POINT AND ASSOCIATED WORKS

TITLE  
 PROPOSED LOCATION OF CONSTRUCTION  
 AIR QUALITY MONITORING STATIONS

Discipline	DC	Eng/CHK	EC
Design	DC		
Draw/CHK	DC		
Check/CHK	DC		
Approval			
Final			
Scale of A1	1:20000		
Scale of A2			
Scale of A3			
Scale of A4			
Scale of A5			
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Scale of A9			
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Scale of A99			
Scale of A100			



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

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 Hong Kong

**CEPD**

CIVIL ENGINEERING  
 AND DEVELOPMENT  
 DEPARTMENT

AGREEMENT NO. CE45/2008(CE)

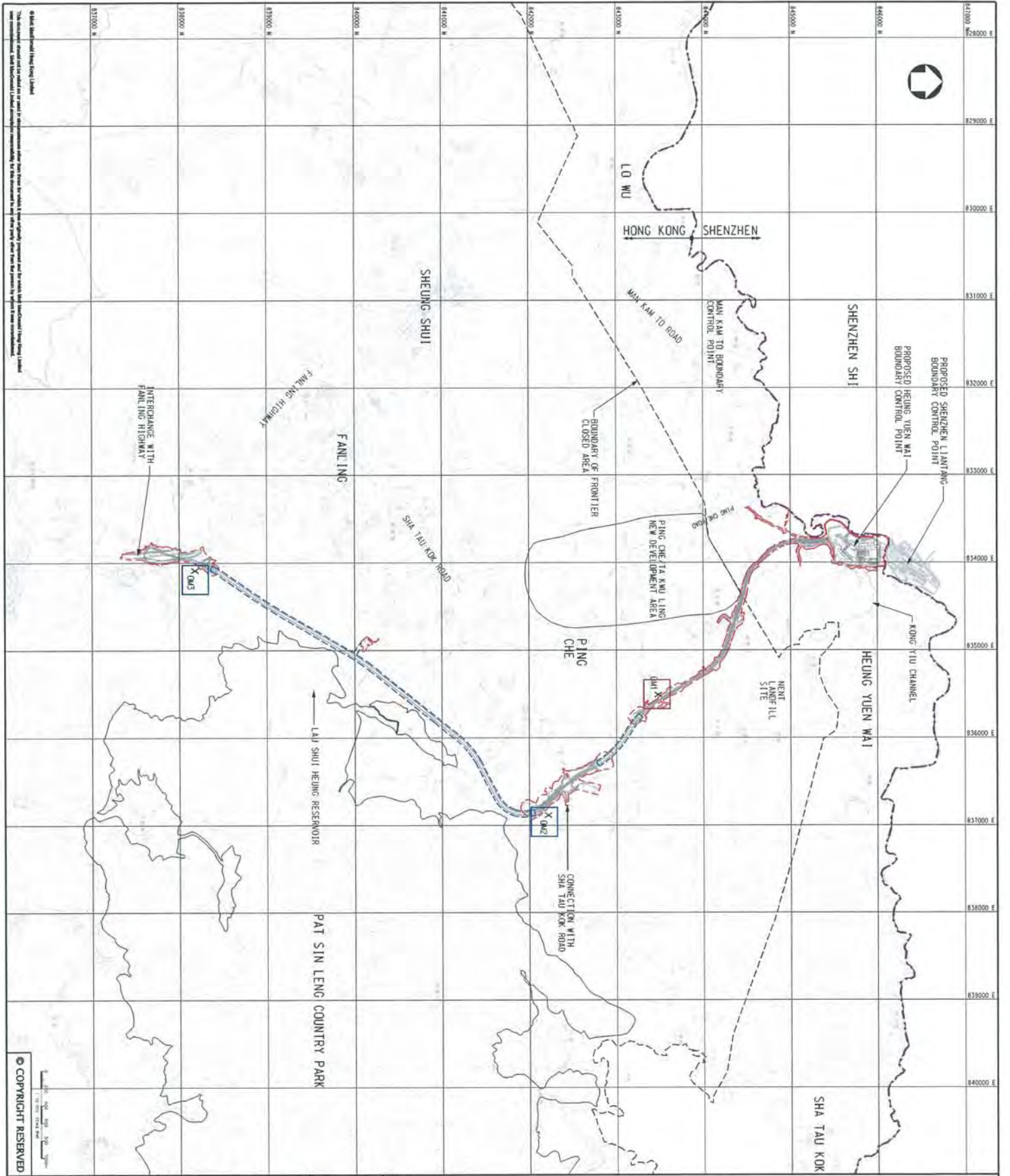
LIAN TANG/HONG YUEN WAI BOUNDARY CONTROL POINT AND ASSOCIATED WORKS

PROPOSED LOCATION OF CONSTRUCTION NOISE MONITORING STATIONS

Client	DC	Project	CE
Design	MHC	Construction	EC
Design	DC	Approval	BT
Scale of A1	1:20000	Project	255228
Scale of A2	1:20000	Scale of A3	1:20000
Scale of A4	1:20000	Scale of A5	1:20000
Scale of A6	1:20000	Scale of A7	1:20000
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Scale of A12	1:20000	Scale of A13	1:20000
Scale of A14	1:20000	Scale of A15	1:20000
Scale of A16	1:20000	Scale of A17	1:20000
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Scale of A24	1:20000	Scale of A25	1:20000
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Scale of A98	1:20000	Scale of A99	1:20000
Scale of A100	1:20000	Scale of A101	1:20000

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FIGURE 3.1



- LEGEND:**
- BOUNDARY OF HKSAR
  - WORKS AREA (ARBOE GROUND)
  - WORKS AREA (TUNNEL)
  - X OPERATIONAL NOISE MONITORING STATIONS

Rev	Date	Drawn	Description	DC	HT
P1	DEC 10	WING	FIRST ISSUE		



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

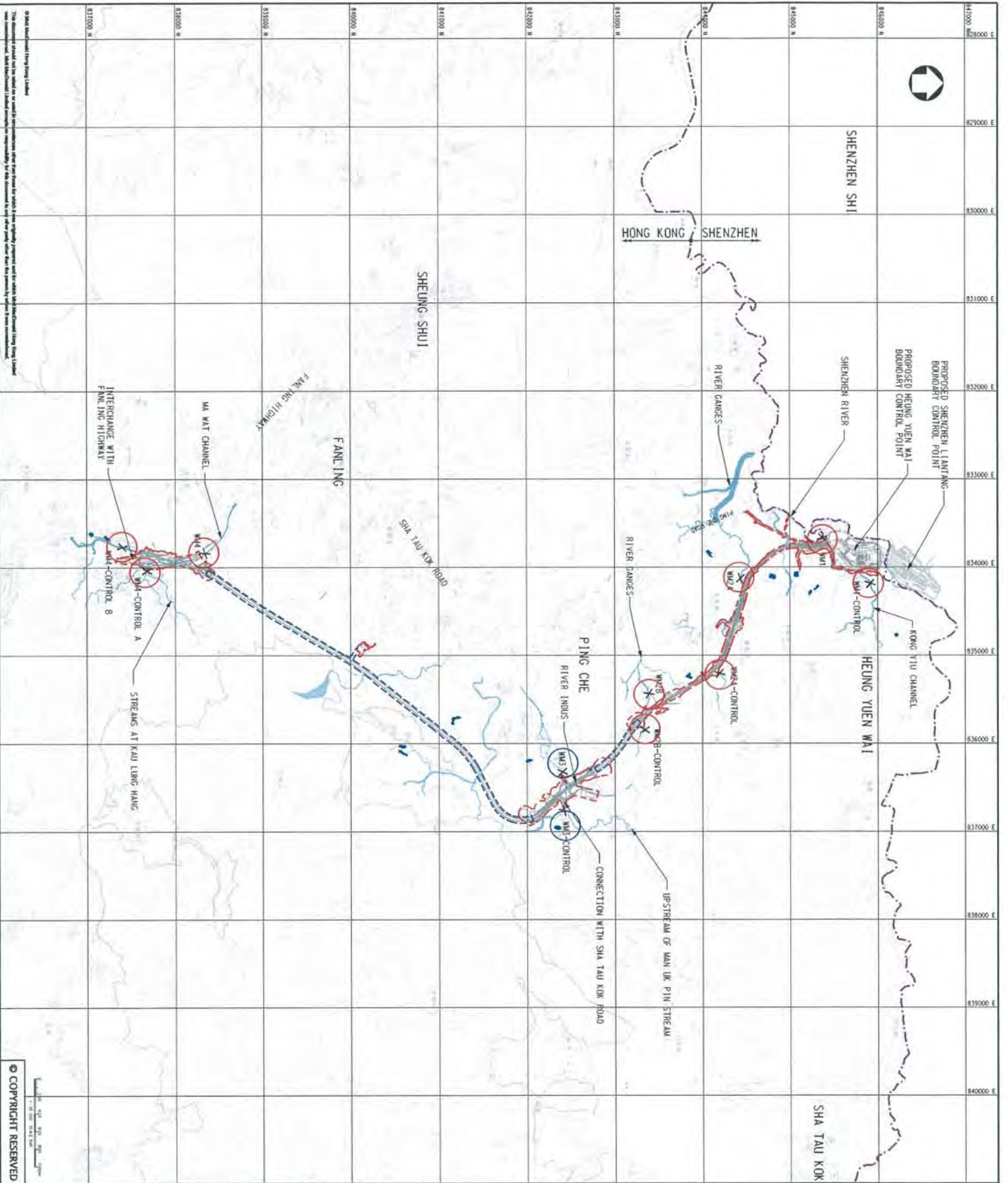
PROPOSED LOCATION OF OPERATIONAL NOISE MONITORING STATIONS

Designated	DC	HT	Proj/CHK	EC
Checked	HT/C		Completion	EC
Design/CHK	DC		Approval	HT

Scale: 1:20000  
 Drawing No: FIDLINE 3.2  
 Status: PRE

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- LEGEND:**
- BOUNDARY OF HKSAR
  - - - LAND REQUIREMENT LIMIT (ABOVE GROUND)
  - - - LAND REQUIREMENT LIMIT (TUNNEL)
  - X MONITORING STATION

MONITORING STATION	CO-ORDINATES
EW1	83168.452 84531.693
MW1	83418.462 84501.642
MW2	83412.153 84432.917
MW3	83555.329 84200.157
MW4	83514.744 83394.606
MW5	83566.878 84343.625
MW6	83623.627 84204.977
MW7	83652.419 84255.507
MW8	83340.783 83944.842
MW9	83408.937 83788.995
MW10	83369.123 83746.936

Rev	Date	Drawn	Description	CHKD	APPD
P2	NOV 10	HC	GENERAL REVISION	HC	HT
T1	OCT 10	HC	FIRST ISSUE	HC	HT



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**CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT**

Project: AGREEMENT NO. CE45/2008 (CE)  
 Liantang/Huang Yuen Wai Boundary Control Point and Associated Works  
 Title: LOCATIONS OF PROPOSED WATER QUALITY MONITORING STATIONS

Checked	HC	Eng. Ck.	EC
Drawn	HT	EC	EC
Design Ck.	HC	Approved	HT

Scale: A4  
 1:20000  
 Date: 25/5/2010  
 Status: PRE  
 Drawing No: FIGURE 4.1  
 Rev: P2

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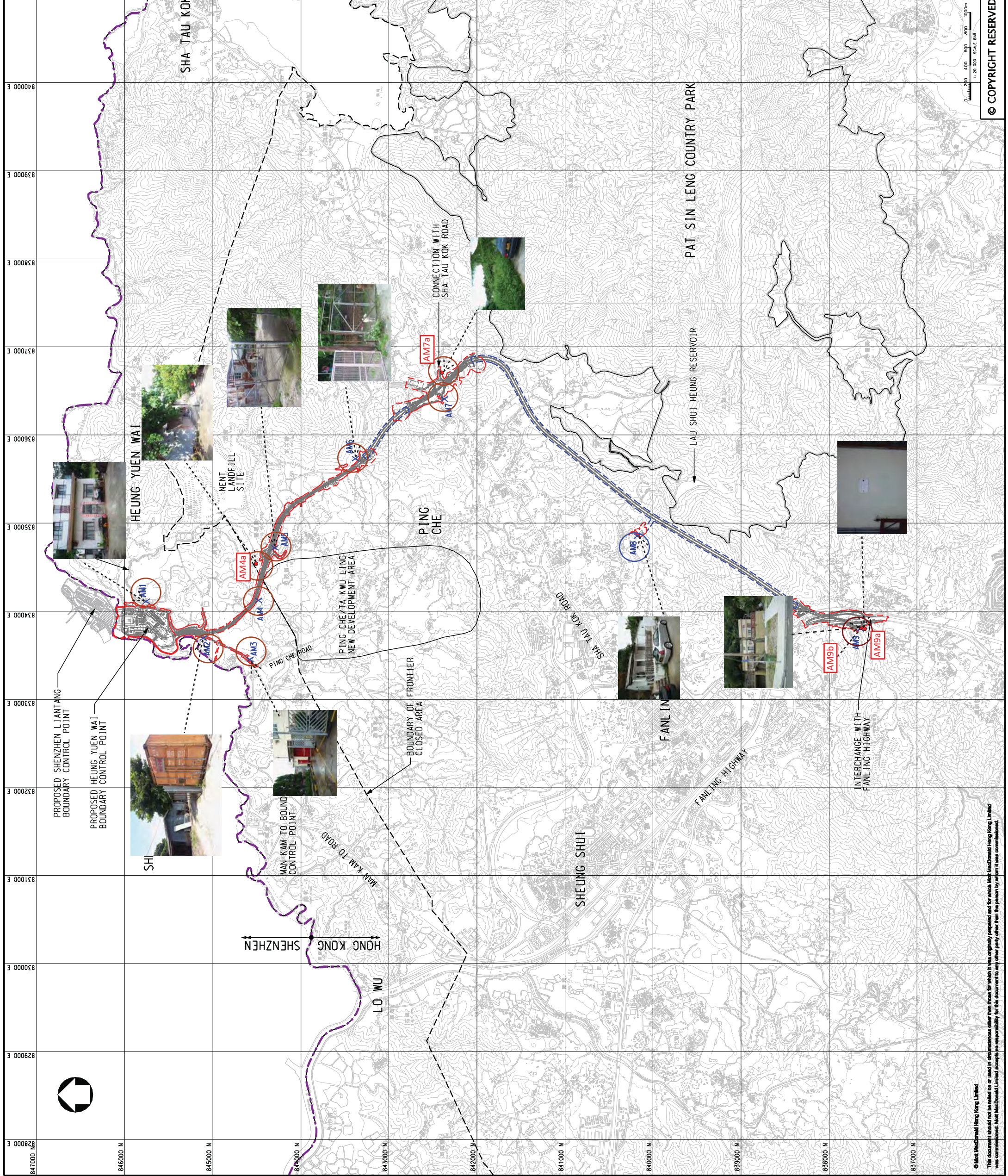
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## **Appendix E**

### **Monitoring Locations for Impact Monitoring**

**LEGEND:**

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



PROPOSED SHENZHEN LIANTANG BOUNDARY CONTROL POINT

PROPOSED HEUNG YUEN WAI BOUNDARY CONTROL POINT

MAN KAM TO BOUND CONTROL POINT

SHI

HEUNG YUEN WAI

NENT LANDFILL SITE

AM1

AM2

AM3

AM4

AM5

AM6

PING CHE ROAD

PING CHE TA K WU LING NEW DEVELOPMENT AREA

BOUNDARY OF FRONTIER CLOSED AREA

MAN KAM TO ROAD

SHEN ZHEN

HONG KONG

LO WU

828000 E

829000 E

830000 E

831000 E

832000 E

833000 E

834000 E

835000 E

836000 E

837000 E

838000 E

839000 E

840000 E

841000 E

842000 E

843000 E

844000 E

845000 E

846000 E

847000 E

AM7a

AM7b

AM8

AM9a

AM9b

CONNECTION WITH SHA TAU KOK ROAD

PAT SIN LENG COUNTRY PARK

LAU SHUI HEUNG RESERVOIR

SHA TAU KOK ROAD

FAN LING

INTERCHANGE WITH FAN LING HIGHWAY

837000 N

838000 N

839000 N

840000 N

841000 N

842000 N

843000 N

844000 N

845000 N

846000 N

847000 N

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Rev	Date	Drawn	Description	Chk'd	App'd

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CIVIL ENGINEERING  
AND DEVELOPMENT  
DEPARTMENT

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

Title  
PROPOSED LOCATION OF CONSTRUCTION  
AIR QUALITY MONITORING STATIONS

Designed	DC	EC
Drawn	MING	EC
Dwg. Chk.	DC	HT

Scale at A1	Project	Status
1:20000	255228	PRE
CAD File J:\255228\report\env\env\10083\016_2.dgn		Rev
Drawing No	FIGURE 2.1	P1

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

PI	ADD TO	NING	FIRST ISSUE	DC	RT
Rev	Date	Drawn	Description	Checked	App'd



2007 The Peak Circle  
1101 New King Street  
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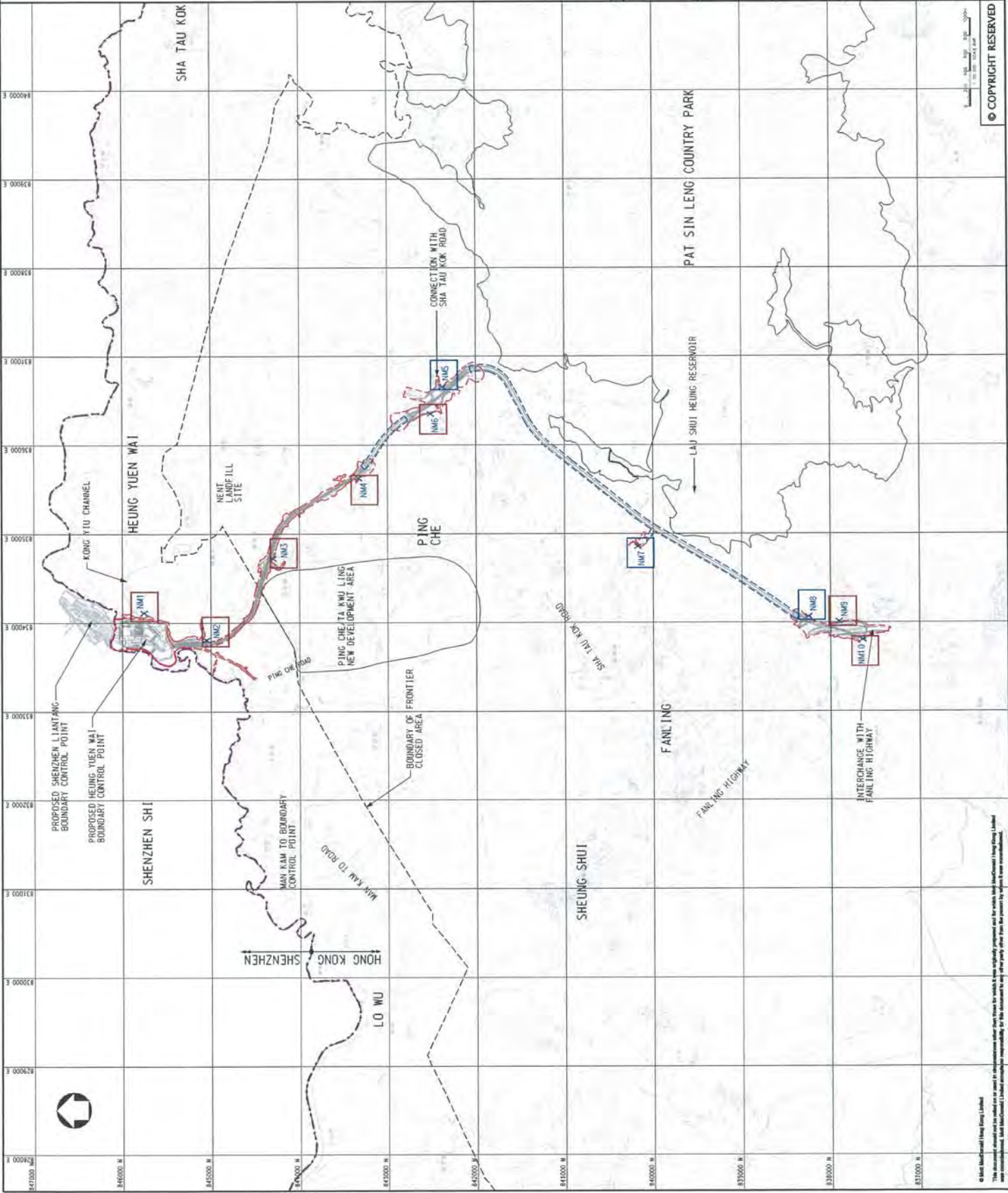
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AND DEVELOPMENT  
DEPARTMENT**

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

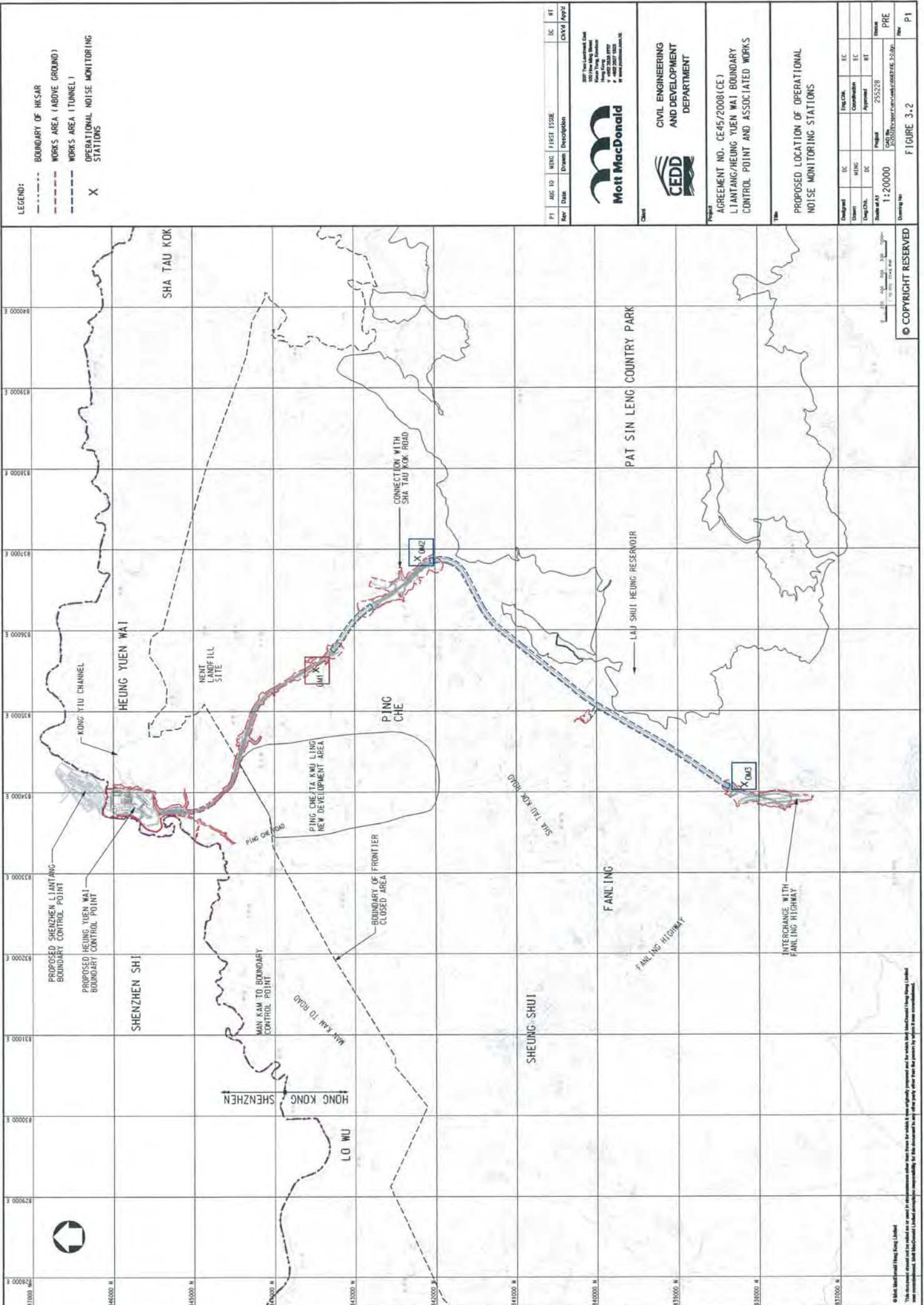
PROPOSED LOCATION OF CONSTRUCTION  
NOISE MONITORING STATIONS

Designated	DC	M/HC	DC	Project	EC	EC
Drawn				255228	EC	EC
Check						
Date of AT	1:20000					
Scale of AT	1:20000			CE-45/2008(CE) (S) (S) (S) (S) (S) (S)		PRE
Drawing No.						PI 1

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**LEGEND:**

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

PI	DATE	REVISION	FIRST ISSUE	DATE	BY

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

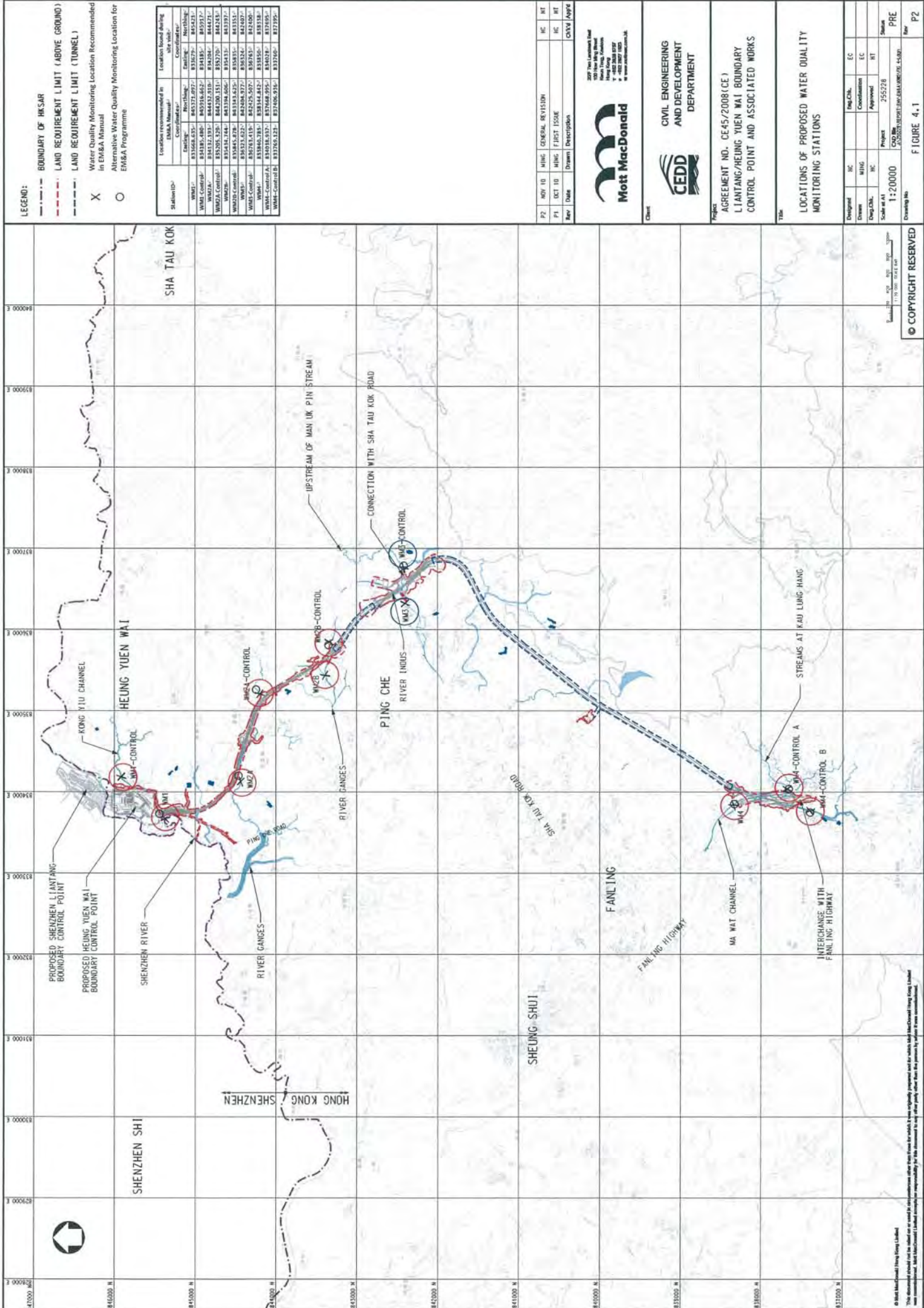
PROPOSED LOCATION OF OPERATIONAL NOISE MONITORING STATIONS

Design No.	DC	HT/C	DC	DC	DC	DC	DC	DC	DC
1:20000									

Scale of A1: 1:20000  
 Date: 25/2/2008  
 Drawing No: CE45/2008(CE)\_3.2  
 Title: FIGURE 3.2  
 File: P1

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**LEGEND:**

- BOUNDARY OF HK SAR
- - - LAND REQUIREMENT LIMIT (ABOVE GROUND)
- - - LAND REQUIREMENT LIMIT (TUNNEL)
- X Water Quality Monitoring Location Recommended in EM&A Manual
- O Alternative Water Quality Monitoring Location for EM&A Programme

Station ID	Location recommended in EM&A Manual		Location based on the site visit	
	Easting	Northing	Easting	Northing
WMA1	837668.435	935772.097	837670	935770
WMA2	841312.183	934452.816	841310	934450
WMA3	852051.326	934200.151	852050	934200
WMA4	837434.744	933358.606	837430	933350
WMA5	835845.878	933348.625	835840	933340
WMA6	837675.415	934252.507	837670	934250
WMA7	837846.783	933144.842	837840	933140
WMA8	834038.937	937668.995	834030	937660
WMA9	837765.427	937668.916	837760	937660

P2	REV 10	HWG	GENERAL REVISION	HC	HT
P1	REV 10	HWG	FIRST ISSUE	HC	HT
Rev	Date	Drawn	Description	CHKD	Appd



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**Civil Engineering and Development Department**

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

Locations of Proposed Water Quality Monitoring Stations

Designed	HC	HWG	EC	EC
Drawn	MHC	HWG	EC	EC
Eng. Chk.	HC	HWG	EC	EC
Scale at A1	1:20000		Project	2552/08
Drawing No.	CE45/2008(CE) BOUNDARY CONTROL POINT AND ASSOCIATED WORKS		Sheet	PRE
	FIGURE 4.1		Rev	P2

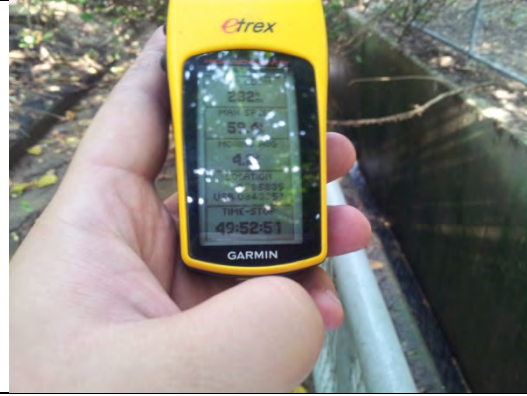
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**Photographic Records for Water Quality Monitoring Location**

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



**Location of WM2B-Control**



**Co-ordinates of WM2B-Control**



**Location of WM2B**



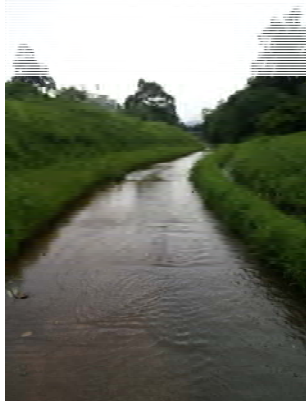
**Co-ordinates of WM2B**



**Location of WM3-Control**



**Co-ordinates of WM3-Control**



**Location of WM3**



**Co-ordinates of WM3**



**Location of WM4-Control A**



**Co-ordinates of WM4-Control A**



**Location of WM4-Control B**



**Co-ordinates of WM4-Control B**



**Location of WM4**



**Co-ordinates of WM4**

## **Appendix F**

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

## TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : Tsung Yuen Ha Village House No. 63  
 Location ID : AM1

Date of Calibration: 2013/12/23  
 Next Calibration Date: 2014/2/23  
 Technician: Keung Chi Young

### CONDITIONS

Sea Level Pressure (hPa) 1022.5  
 Temperature (°C) 17.9

Corrected Pressure (mm Hg) 766.875  
 Temperature (K) 291

### CALIBRATION ORIFICE

Make-> TISCH  
 Model-> 5025A  
 Serial # -> 1941

Qstd Slope -> 2.11662  
 Qstd Intercept -> -0.01714

### CALIBRATION

Plate No.	H2O (L) (in)	H2O (R) (in)	H2O (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION		
							Slope =	Intercept =	Corr. coeff. =
18	6.7	6.6	13.3	1.760	53	53.88	Slope = 46.1783 Intercept = -28.7774 Corr. coeff. = 0.9926		
13	5.8	5.7	11.5	1.637	46	46.77			
10	4.7	4.6	9.3	1.473	36	36.60			
7	3.5	3.4	6.9	1.270	30	30.50			
5	2.5	2.4	4.9	1.071	21	21.35			

**Calculations :**

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

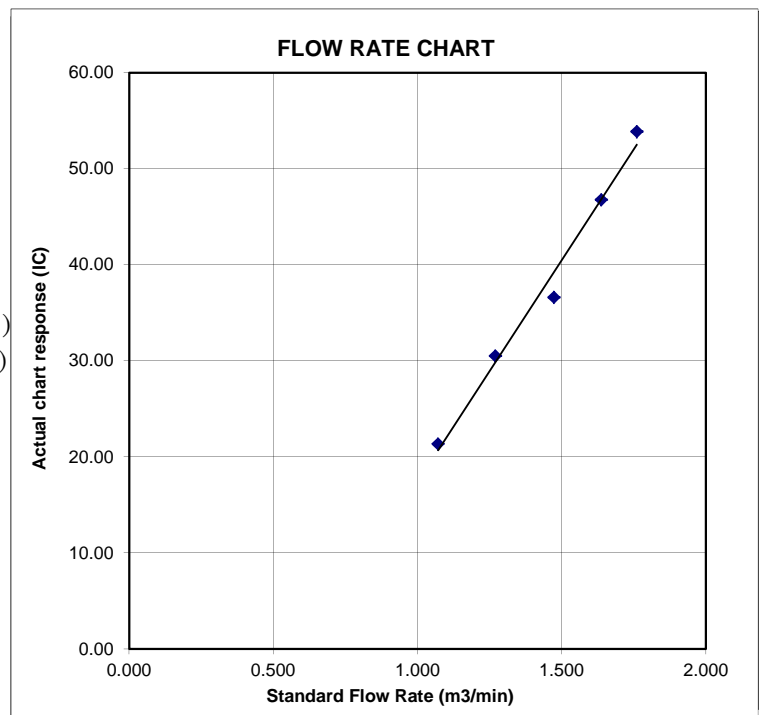
$$IC = I[\text{Sqrt}(Pa/Pstd)(Tstd/Ta)]$$

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

**For subsequent calculation of sampler flow:**

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

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



## TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : Tsung Yuen Ha Village House No. 63  
 Location ID : AM1

Date of Calibration: 26/10/2013  
 Next Calibration Date: 26/12/2013  
 Technician: Ben Tam

### CONDITIONS

Sea Level Pressure (hPa) 1018.3  
 Temperature (°C) 22.0

Corrected Pressure (mm Hg) 763.725  
 Temperature (K) 295

### CALIBRATION ORIFICE

Make-> TISCH  
 Model-> 5025A  
 Serial # -> 1941

Qstd Slope -> 2.11662  
 Qstd Intercept -> -0.01714

### CALIBRATION

Plate No.	H2O (L) (in)	H2O (R) (in)	H2O (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION		
							Slope =	Intercept =	Corr. coeff. =
18	6.7	6.7	13.4	1.751	52	52.39	Slope = 41.6678 Intercept = -21.5030 Corr. coeff. = 0.9978		
13	5.7	5.7	11.4	1.615	45	45.34			
10	4.6	4.6	9.2	1.452	38	38.29			
7	3.3	3.3	6.6	1.231	29	29.22			
5	2.3	2.3	4.6	1.029	22	22.17			

**Calculations :**

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

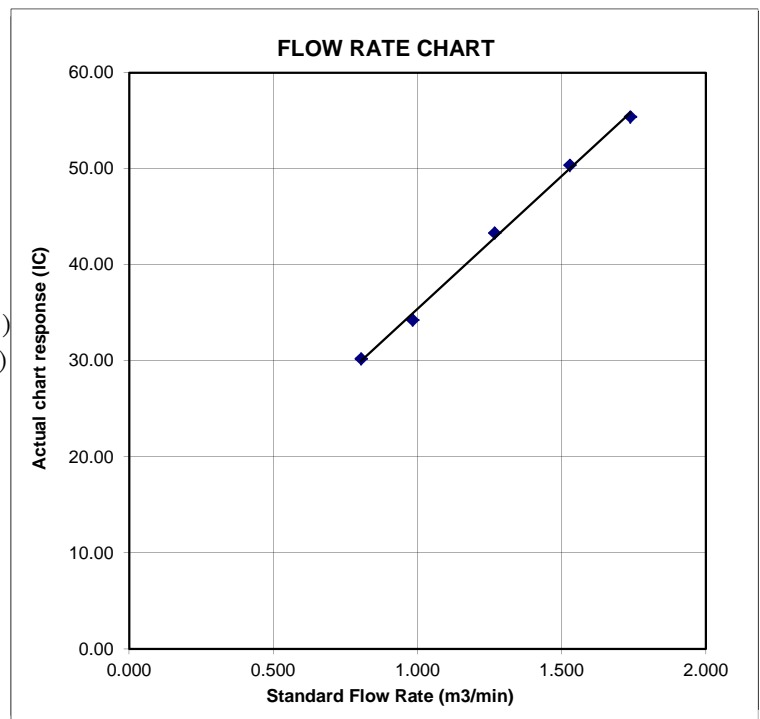
$$IC = I[\sqrt{P_a/P_{std}(T_{std}/T_a)}]$$

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

**For subsequent calculation of sampler flow:**

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

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



## TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

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

Date of Calibration: 2013/12/23  
 Next Calibration Date: 2014/2/23  
 Technician: Keung Chi Young

### CONDITIONS

Sea Level Pressure (hPa)	1022.5	Corrected Pressure (mm Hg)	766.875
Temperature (°C)	17.9	Temperature (K)	291

### CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.11662
Model->	5025A	Qstd Intercept ->	-0.01714
Serial # ->	1941		

### CALIBRATION

Plate No.	H2O (L) (in)	H2O (R) (in)	H2O (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	6.9	6.6	13.5	1.773	57	57.95	Slope = 30.5627 Intercept = 3.9313 Corr. coeff. = 0.9996
13	5.4	5.2	10.6	1.572	51	51.85	
10	4.2	4.1	8.3	1.392	46	46.77	
7	2.8	2.6	5.4	1.124	38	38.63	
5	1.8	1.5	3.3	0.881	30	30.50	

**Calculations :**

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

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

Qstd = standard flow rate

IC = corrected chart responses

I = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

Ta = actual temperature during calibration ( deg K

Pstd = actual pressure during calibration ( mm Hg

**For subsequent calculation of sampler flow:**

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

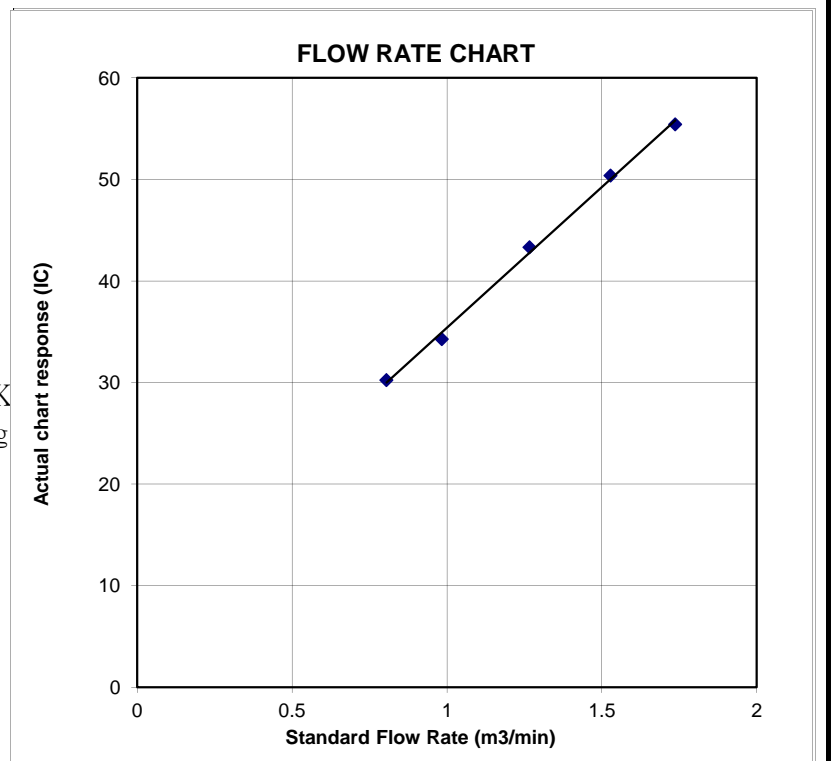
m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure





## TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

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

Date of Calibration: 26/10/2013  
 Next Calibration Date: 26/12/2013  
 Technician: Ben Tam

### CONDITIONS

Sea Level Pressure (hPa)	1018.3	Corrected Pressure (mm Hg)	763.725
Temperature (°C)	22.0	Temperature (K)	295

### CALIBRATION ORIFICE

Make-> TISCH	Qstd Slope ->	2.11662
Model-> 5025A	Qstd Intercept ->	-0.01714
Serial # -> 1941		

### CALIBRATION

Plate No.	H2O (L) (in)	H2O (R) (in)	H2O (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	6.6	6.6	13.2	1.738	55	55.41	Slope = 27.6650 Intercept = 7.7418 Corr. coeff. = 0.9988
13	5.1	5.1	10.2	1.528	50	50.38	
10	3.5	3.5	7.0	1.268	43	43.32	
7	2.1	2.1	4.2	0.984	34	34.26	
5	1.4	1.4	2.8	0.805	30	30.23	

**Calculations :**

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

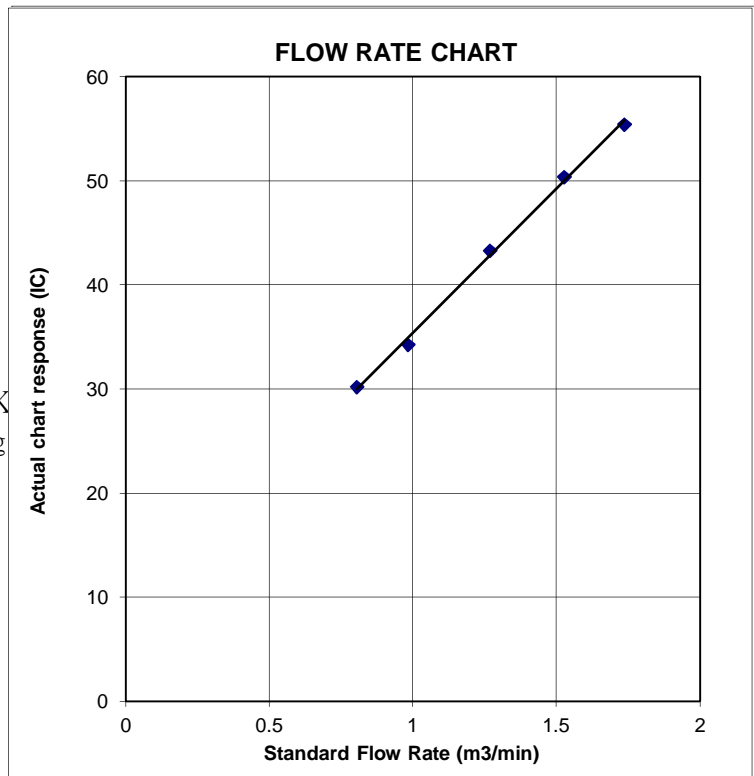
$$IC = I[\text{Sqrt}(Pa/Pstd)(Tstd/Ta)]$$

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

**For subsequent calculation of sampler flow:**

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

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



## TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

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

Date of Calibration: 2013/12/23  
 Next Calibration Date: 2014/2/23  
 Technician: Keung Chi Young

### CONDITIONS

Sea Level Pressure (hPa)	1022.5	Corrected Pressure (mm Hg)	766.875
Temperature (°C)	17.9	Temperature (K)	291

### CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.11662
Model->	5025A	Qstd Intercept ->	-0.01714
Serial # ->	1941		

### CALIBRATION

Plate No.	H2O (L) (in)	H2O (R) (in)	H2O (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	5.3	5.7	11.0	1.601	53	53.88	Slope = 39.0324 Intercept = -9.6422 Corr. coeff. = 0.9968
13	4.9	4.8	9.7	1.504	48	48.80	
10	3.9	4.1	8.0	1.367	42	42.70	
7	2.7	2.9	5.6	1.145	34	34.57	
5	1.8	1.9	3.7	0.932	27	27.45	

**Calculations :**

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

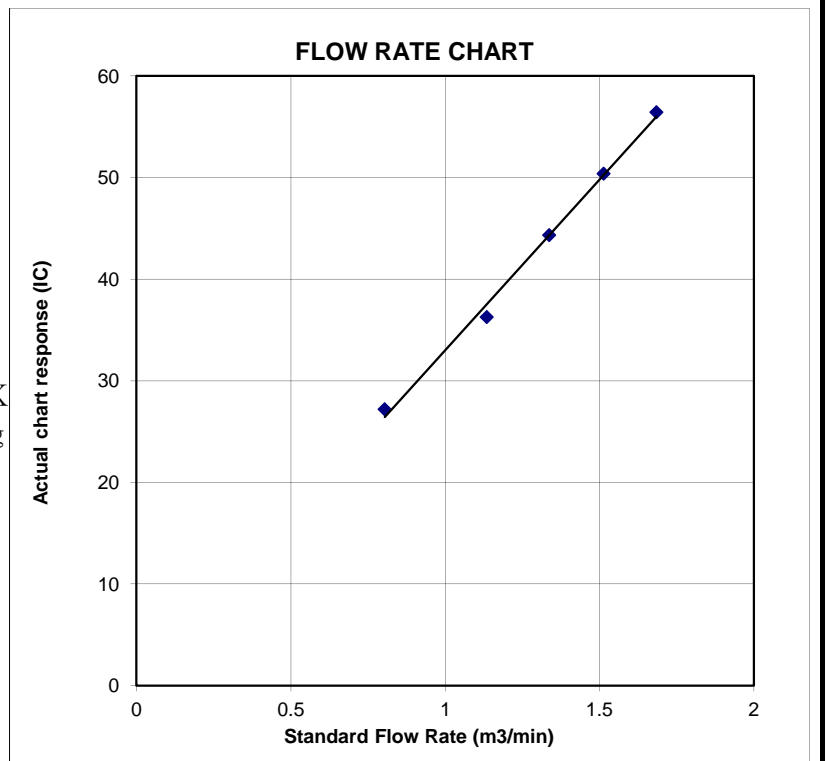
$$IC = I[\sqrt{P_a/P_{std}}(T_{std}/T_a)]$$

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

**For subsequent calculation of sampler flow:**

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

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



## TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

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

Date of Calibration: 26/10/2013  
 Next Calibration Date: 26/12/2013  
 Technician: Ben Tam

### CONDITIONS

Sea Level Pressure (hPa)	1018.3	Corrected Pressure (mm Hg)	763.725
Temperature (°C)	22.0	Temperature (K)	295

### CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.11662
Model->	5025A	Qstd Intercept ->	-0.01714
Serial # ->	1941		

### CALIBRATION

Plate No.	H2O (L) (in)	H2O (R) (in)	H2O (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	6.2	6.2	12.4	1.684	56	56.42	Slope = 33.6390 Intercept = -0.6373 Corr. coeff. = 0.9978
13	5	5	10.0	1.513	50	50.38	
10	3.9	3.9	7.8	1.338	44	44.33	
7	2.8	2.8	5.6	1.135	36	36.27	
5	1.4	1.4	2.8	0.805	27	27.20	

**Calculations :**

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

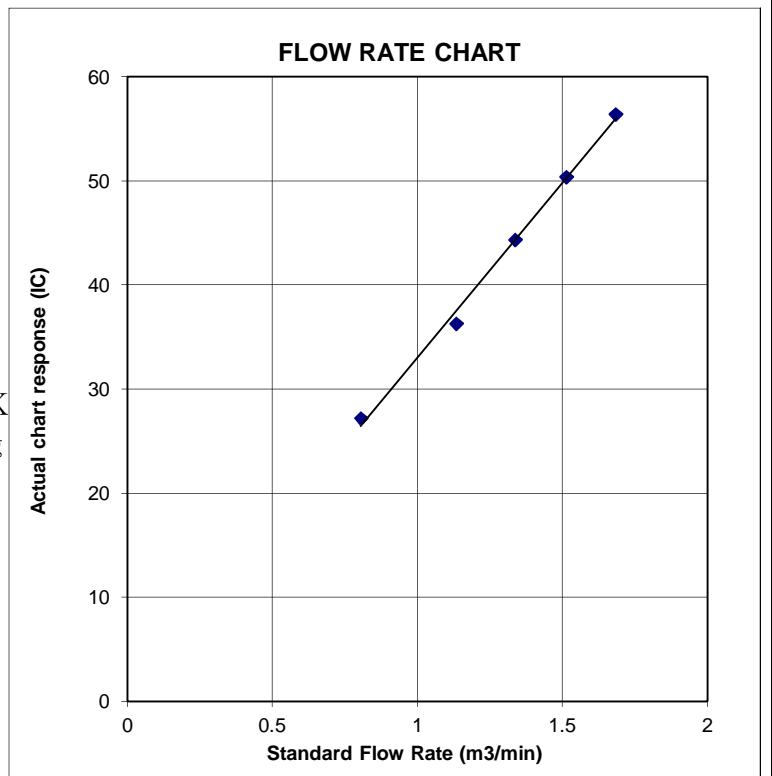
$$IC = I[\text{Sqrt}(Pa/Pstd)(Tstd/Ta)]$$

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

**For subsequent calculation of sampler flow:**

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

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



## TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : Nam Wa Po Village House No. 80

Date of Calibration: 2013/11/6

Location ID : AM9b

Next Calibration Date: 2013/1/6

Technician: Tung Chi Sun

### CONDITIONS

Sea Level Pressure (hPa) 1018.3  
 Temperature (°C) 24.2

Corrected Pressure (mm Hg) 763.725  
 Temperature (K) 297

### CALIBRATION ORIFICE

Make-> TISCH  
 Model-> 5025A  
 Serial # -> 1941

Qstd Slope -> 2.11662  
 Qstd Intercept -> -0.01714

### CALIBRATION

Plate No.	H2O (L) (in)	H2O (R) (in)	H2O (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	6.4	6.4	12.8	1.705	53	53.20	Slope = 32.2697 Intercept = -1.0508 Corr. coeff. = 0.9978
13	5.1	5.1	10.2	1.523	48	48.18	
10	4.1	4.1	8.2	1.366	44	44.17	
7	2.6	2.6	5.2	1.090	34	34.13	
5	1.6	1.6	3.2	0.856	26	26.10	

**Calculations :**

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

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

Qstd = standard flow rate

IC = corrected chart responses

I = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

Ta = actual temperature during calibration ( deg K

Pstd = actual pressure during calibration ( mm Hg

**For subsequent calculation of sampler flow:**

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

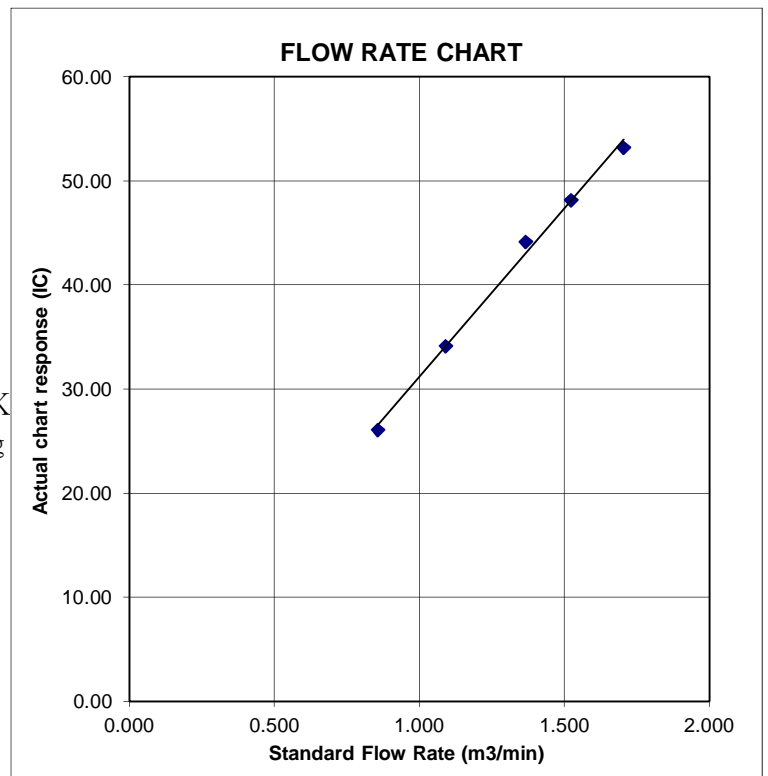
m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure





TISCH ENVIRONMENTAL, INC.  
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 513.467.9009 FAX  
 WWW.TISCH-ENV.COM

AIR POLLUTION MONITORING EQUIPMENT  
 ORIFICE TRANSFER STANDARD CERTIFICATION WORKSHEET TE-5025A

Date - Apr 09, 2013    Roots-meter S/N    0438320    Ta (K) -    296  
 Operator Tisch    Orifice I.D. -    1941    Pa (mm) -    751.84

PLATE OR Run #	VOLUME START (m3)	VOLUME STOP (m3)	DIFF VOLUME (m3)	DIFF TIME (min)	METER DIFF Hg (mm)	ORIFICE DIFF H2O (in.)
1	NA	NA	1.00	1.4710	3.3	2.00
2	NA	NA	1.00	1.0370	6.4	4.00
3	NA	NA	1.00	0.9270	7.9	5.00
4	NA	NA	1.00	0.8840	8.8	5.50
5	NA	NA	1.00	0.7300	12.8	8.00

DATA TABULATION

Vstd	(x axis) Qstd	(y axis)	Va	(x axis) Qa	(y axis)
0.9916	0.6741	1.4113	0.9956	0.6768	0.8874
0.9874	0.9521	1.9959	0.9914	0.9560	1.2549
0.9854	1.0630	2.2315	0.9894	1.0673	1.4030
0.9843	1.1134	2.3405	0.9883	1.1180	1.4715
0.9790	1.3410	2.8227	0.9829	1.3465	1.7747
Qstd slope (m) = 2.11662			Qa slope (m) = 1.32539		
intercept (b) = -0.01714			intercept (b) = -0.01078		
coefficient (r) = 0.99999			coefficient (r) = 0.99999		
y axis = SQRT[H2O(Pa/760)(298/Ta)]			y axis = SQRT[H2O(Ta/Pa)]		

CALCULATIONS

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

$$Qstd = Vstd / \text{Time}$$

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

$$Qa = Va / \text{Time}$$

For subsequent flow rate calculations:

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

$$Qa = 1/m \{ [\text{SQRT}(\text{H2O}(\text{Ta}/\text{Pa}))] - b \}$$

**CALIBRATION CERTIFICATE**

Date: June 20, 2013

Equipment Name	:	Laser Dust Monitor, Model LD-3B
Code No.	:	080000-42
Quantity	:	1 unit
Serial No.	:	366407
Sensitivity	:	0.001 mg/m <sup>3</sup>
Sensitivity Adjustment	:	563 CPM
Scale Setting	:	June 17, 2013

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

Sincerely

**SIBATA SCIENTIFIC TECHNOLOGY LTD.**

Kentaro Togo

Overseas Sales Division

## CALIBRATION CERTIFICATE

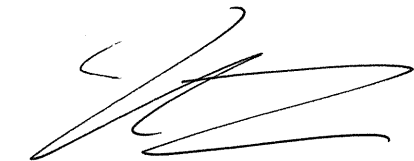
Date: June 20, 2013

Equipment Name	:	Laser Dust Monitor, Model LD-3B
Code No.	:	080000-42
Quantity	:	1 unit
Serial No.	:	366410
Sensitivity	:	0.001 mg/m <sup>3</sup>
Sensitivity Adjustment	:	668 CPM
Scale Setting	:	June 17, 2013

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

Sincerely

**SIBATA SCIENTIFIC TECHNOLOGY LTD.**



Kentaro Togo

Overseas Sales Division

## CALIBRATION CERTIFICATE

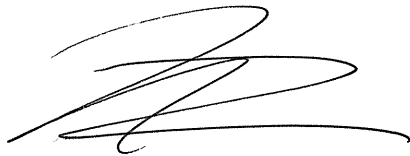
Date: June 20, 2013

Equipment Name	:	Laser Dust Monitor, Model LD-3B
Code No.	:	080000-42
Quantity	:	1 unit
Serial No.	:	366409
Sensitivity	:	0.001 mg/m <sup>3</sup>
Sensitivity Adjustment	:	527 CPM
Scale Setting	:	June 17, 2013

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

Sincerely

**SIBATA SCIENTIFIC TECHNOLOGY LTD.**



Kentaro Togo

Overseas Sales Division



## **CALIBRATION CERTIFICATE**

Date: June 20, 2013

Equipment Name	:	Laser Dust Monitor, Model LD-3B
Code No.	:	080000-42
Quantity	:	1 unit
Serial No.	:	366418
Sensitivity	:	0.001 mg/m <sup>3</sup>
Sensitivity Adjustment	:	664 CPM
Scale Setting	:	June 17, 2013

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

Sincerely

**SIBATA SCIENTIFIC TECHNOLOGY LTD.**



Kentaro Togo

Overseas Sales Division



# Certificate of Calibration 校正證書

Certificate No. : C132568  
證書編號

**ITEM TESTED / 送檢項目 ( Job No. / 序引編號 : IC13-0878 )**

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 :  $(23 \pm 2)^{\circ}\text{C}$       Relative Humidity / 相對濕度 :  $(55 \pm 20)\%$   
Line Voltage / 電壓 : ---

**TEST SPECIFICATIONS / 測試規範**

Calibration check

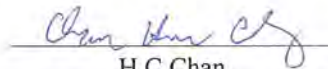
**DATE OF TEST / 測試日期** : 27 April 2013

**TEST RESULTS / 測試結果**

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

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

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

Tested By :   
測試 H C Chan

Certified By :   
核證 K C Lee

Date of Issue : 30 April 2013  
簽發日期

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

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

# Certificate of Calibration

## 校正證書

Certificate No. : C132568  
證書編號

- The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 12 hours, and switched on to warm up for over 10 minutes before the commencement of the test.
- Self-calibration using laboratory acoustic calibrator was performed before the test from 6.1.1.2 to 6.4.
- The results presented are the mean of 3 measurements at each calibration point.
- Test equipment :

Equipment ID	Description	Certificate No.
CL280	40 MHz Arbitrary Waveform Generator	C130019
CL281	Multifunction Acoustic Calibrator	DC110233

- Test procedure : MA101N.

- 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 <sub>AFF</sub>	A	F	94.00	1	93.6

##### 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 <sub>AFF</sub>	A	F	94.00	1	94.0	± 0.7

##### 6.1.2 Linearity

UUT Setting				Applied Value		UUT Reading (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	
50 - 130	L <sub>AFF</sub>	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.

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

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

# Certificate of Calibration

## 校正證書

Certificate No. : C132568  
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 <sub>AFP</sub>	A	F	94.00	1	94.0	Ref.
	L <sub>ASP</sub>		S			94.0	± 0.1
	L <sub>AIP</sub>		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 <sub>AFP</sub>	A	F	106.0	Continuous	106.0	Ref.
	L <sub>AFMax</sub>				200 ms	104.9	-1.0 ± 1.0
	L <sub>ASP</sub>	S	Continuous		106.0	Ref.	
	L <sub>ASMax</sub>		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 <sub>AFP</sub>	A	F	94.00	31.5 Hz	55.1	-39.4 ± 1.5
					63 Hz	67.9	-26.2 ± 1.5
					125 Hz	77.8	-16.1 ± 1.0
					250 Hz	85.3	-8.6 ± 1.0
					500 Hz	90.7	-3.2 ± 1.0
					1 kHz	94.0	Ref.
					2 kHz	95.2	+1.2 ± 1.0
					4 kHz	95.0	+1.0 ± 1.0
					8 kHz	92.9	-1.1 (+1.5 ; -3.0)
					12.5 kHz	89.8	-4.3 (+3.0 ; -6.0)

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

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

# Certificate of Calibration

## 校正證書

Certificate No. : C132568  
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 <sub>CFP</sub>	C	F	94.00	31.5 Hz	91.4	-3.0 ± 1.5
					63 Hz	93.3	-0.8 ± 1.5
					125 Hz	93.8	-0.2 ± 1.0
					250 Hz	94.0	0.0 ± 1.0
					500 Hz	94.0	0.0 ± 1.0
					1 kHz	94.0	Ref.
					2 kHz	93.8	-0.2 ± 1.0
					4 kHz	93.2	-0.8 ± 1.0
					8 kHz	90.9	-3.0 (+1.5 ; -3.0)
					12.5 kHz	87.8	-6.2 (+3.0 ; -6.0)

### 6.4 Time Averaging

UUT Setting				Applied Value					UUT Reading (dB)	IEC 60804 Type 1 Spec. (dB)
Range (dB)	Parameter	Frequency Weighting	Integrating Time	Frequency (kHz)	Burst Duration (ms)	Burst Duty Factor	Burst Level (dB)	Equivalent Level (dB)		
30 - 110	L <sub>Aeq</sub>	A	10 sec.	4	1	1/10	110.0	100	100.0	± 0.5
								90	89.8	± 0.5
								80	79.4	± 1.0
								70	69.2	± 1.0

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

- Uncertainties of Applied Value :

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

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

#### Note :

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

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

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# Certificate of Calibration 校正證書

Certificate No. : C132567  
證書編號

**ITEM TESTED / 送檢項目 ( Job No. / 序引編號 : IC13-0878 )**

Description / 儀器名稱 : Integrating Sound Level Meter (EQ010)  
Manufacturer / 製造商 : Brüel & Kjær  
Model No. / 型號 : 2238  
Serial No. / 編號 : 2285721  
Supplied By / 委託者 : Action-United Environmental Services and Consulting  
Unit A, 20/F., Gold King Industrial Building,  
35-41 Tai Lin Pai Road, Kwai Chung, N.T.

**TEST CONDITIONS / 測試條件**

Temperature / 溫度 :  $(23 \pm 2)^{\circ}\text{C}$       Relative Humidity / 相對濕度 :  $(55 \pm 20)\%$   
Line Voltage / 電壓 : ---

**TEST SPECIFICATIONS / 測試規範**

Calibration check

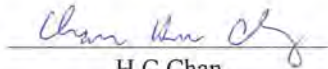
**DATE OF TEST / 測試日期** : 27 April 2013

**TEST RESULTS / 測試結果**

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

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

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

Tested By :   
測試 H C Chan

Certified By :   
核證 K C Lee

Date of Issue : 30 April 2013  
簽發日期

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

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# Certificate of Calibration

## 校正證書

Certificate No. : C132567  
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	C130019
CL281	Multifunction Acoustic Calibrator	DC110233

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 <sub>AFF</sub>	A	F	94.00	1	94.7

##### 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 <sub>AFF</sub>	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 <sub>AFF</sub>	A	F	94.00	1	94.1 (Ref.)
				104.00		104.1
				114.00		114.0

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

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

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# Certificate of Calibration

## 校正證書

Certificate No. : C132567  
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 <sub>AFP</sub>	A	F	94.00	1	94.1	Ref.
	L <sub>ASP</sub>		S			94.1	± 0.1
	L <sub>AIP</sub>		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 <sub>AFP</sub>	A	F	106.0	Continuous	106.0	Ref.
	L <sub>AFMax</sub>				200 ms	105.0	-1.0 ± 1.0
	L <sub>ASP</sub>	S	Continuous		106.0	Ref.	
	L <sub>ASMax</sub>		500 ms		102.0	-4.1 ± 1.0	

### 6.3 Frequency Weighting

#### 6.3.1 A-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
50 - 130	L <sub>AFP</sub>	A	F	94.00	31.5 Hz	54.7	-39.4 ± 1.5
					63 Hz	67.9	-26.2 ± 1.5
					125 Hz	77.9	-16.1 ± 1.0
					250 Hz	85.4	-8.6 ± 1.0
					500 Hz	90.8	-3.2 ± 1.0
					1 kHz	94.1	Ref.
					2 kHz	95.3	+1.2 ± 1.0
					4 kHz	95.1	+1.0 ± 1.0
					8 kHz	92.9	-1.1 (+1.5 ; -3.0)
					12.5 kHz	89.8	-4.3 (+3.0 ; -6.0)

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

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



# Certificate of Calibration

## 校正證書

Certificate No. : C132567  
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 <sub>CFP</sub>	C	F	94.00	31.5 Hz	91.2	-3.0 ± 1.5
					63 Hz	93.3	-0.8 ± 1.5
					125 Hz	93.9	-0.2 ± 1.0
					250 Hz	94.1	0.0 ± 1.0
					500 Hz	94.1	0.0 ± 1.0
					1 kHz	94.1	Ref.
					2 kHz	93.9	-0.2 ± 1.0
					4 kHz	93.3	-0.8 ± 1.0
					8 kHz	91.0	-3.0 (+1.5 ; -3.0)
					12.5 kHz	87.9	-6.2 (+3.0 ; -6.0)

### 6.4 Time Averaging

UUT Setting				Applied Value					UUT Reading (dB)	IEC 60804 Type 1 Spec. (dB)
Range (dB)	Parameter	Frequency Weighting	Integrating Time	Frequency (kHz)	Burst Duration (ms)	Burst Duty Factor	Burst Level (dB)	Equivalent Level (dB)		
30 - 110	L <sub>Aeq</sub>	A	10 sec.	4	1	1/10	110.0	100	99.9	± 0.5
			60 sec.					90	90.0	± 0.5
			5 min.					80	79.9	± 1.0
								70	69.7	± 1.0

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

- Uncertainties of Applied Value :

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

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

#### Note :

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

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

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

Sun Creation Engineering Limited - Calibration & Testing Laboratory

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

輝創工程有限公司 - 校正及檢測實驗室

c/o 香港新界屯門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: callba@suncreation.com Website/網址: www.suncreation.com

# Certificate of Calibration

## 校正證書

Certificate No. : C132979  
證書編號

### ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC13-0878)

Description / 儀器名稱 : Sound Level Meter (EQ068)  
Manufacturer / 製造商 : Rion  
Model No. / 型號 : NL-31  
Serial No. / 編號 : 00410247  
Supplied By / 委託者 : Action-United Environmental Services and Consulting  
Unit A, 20/F., Gold King Industrial Building,  
35-41 Tai Lin Pai Road, Kwai Chung, N.T.

### TEST CONDITIONS / 測試條件

Temperature / 溫度 :  $(23 \pm 2)^{\circ}\text{C}$       Relative Humidity / 相對濕度 :  $(55 \pm 20)\%$   
Line Voltage / 電壓 : ---

### TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 18 May 2013

### TEST RESULTS / 測試結果

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

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

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

Tested By :   
測試 : K C Lee

Certified By :   
核證 : K M Wu

Date of Issue : 20 May 2013  
簽發日期

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

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# Certificate of Calibration

## 校正證書

Certificate No. : C132979  
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	C130019
CL281	Multifunction Acoustic Calibrator	DC110233

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 60651 Type 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
30 - 120	L <sub>A</sub>	A	Fast	94.00	1	94.0	± 0.7

- 6.1.2 Linearity

UUT Setting				Applied Value		UUT Reading (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	
30 - 120	L <sub>A</sub>	A	Fast	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.

- 6.2 Time Weighting

- 6.2.1 Continuous Signal

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
30 - 120	L <sub>A</sub>	A	Fast	94.00	1	94.0	Ref.
			Slow				

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# Certificate of Calibration

## 校正證書

Certificate No. : C132979

證書編號

### 6.2.2 Tone Burst Signal (2 kHz)

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Burst Duration		
20 -110	L <sub>A</sub>	A	Fast	106.00	Continuous	106.0	Ref.
	L <sub>A</sub> max				200 ms	105.1	-1.0 ± 1.0
	L <sub>A</sub>		Slow		Continuous	106.0	Ref.
	L <sub>A</sub> max				500 ms	102.0	-4.1 ± 1.0

### 6.3 Frequency Weighting

#### 6.3.1 A-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 120	L <sub>A</sub>	A	Fast	94.00	31.5 Hz	54.2	-39.4 ± 1.5
					63 Hz	67.7	-26.2 ± 1.5
					125 Hz	77.7	-16.1 ± 1.0
					250 Hz	85.2	-8.6 ± 1.0
					500 Hz	90.7	-3.2 ± 1.0
					1 kHz	94.0	Ref.
					2 kHz	95.2	+1.2 ± 1.0
					4 kHz	95.1	+1.0 ± 1.0
					8 kHz	92.9	-1.1 (+1.5; -3.0)
					12.5 kHz	90.0	-4.3 (+3.0; -6.0)

#### 6.3.2 C-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 120	L <sub>C</sub>	C	Fast	94.00	31.5 Hz	90.9	-3.0 ± 1.5
					63 Hz	93.1	-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	93.9	-0.2 ± 1.0
					4 kHz	93.3	-0.8 ± 1.0
					8 kHz	91.0	-3.0 (+1.5; -3.0)
					12.5 kHz	88.2	-6.2 (+3.0; -6.0)

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

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

# Certificate of Calibration

## 校正證書

Certificate No. : C132979

證書編號

### 6.4 Time Averaging

UUT Setting				Applied Value					UUT Reading (dB)	IEC 60804 Type 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Integrating Time	Freq. (kHz)	Burst Duration (ms)	Burst Duty Factor	Burst Level (dB)	Equivalent Level (dB)		
20 - 110	L <sub>Aeq</sub>	A	10 sec.	4	1	1/10	110.0	100	100.0	± 0.5
						1/10 <sup>2</sup>		90	90.0	± 0.5
			60 sec.			1/10 <sup>3</sup>		80	80.0	± 1.0
			5 min.			1/10 <sup>4</sup>		70	70.0	± 1.0

Remarks : - UUT Microphone Model No. : UC-53A & S/N : 319841

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

- Uncertainties of Applied Value :

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

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

#### Note :

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

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

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

Sun Creation Engineering Limited – Calibration & Testing Laboratory

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

輝創工程有限公司 – 校正及檢測實驗室

c/o 香港新界屯門興安里一號青山灣機樓四樓

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



# Certificate of Calibration 校正證書

Certificate No. : C132229  
證書編號

**ITEM TESTED / 送檢項目** ( Job No. / 序引編號 : IC13-0878 )

Description / 儀器名稱 : Precision Integrating Sound Level Meter (EQ012)  
Manufacturer / 製造商 : Rion  
Model No. / 型號 : NL-14  
Serial No. / 編號 : 10303225  
Supplied By / 委託者 : Action-United Environmental Services and Consulting  
Unit A, 20/F., Gold King Industrial Building,  
35-41 Tai Lin Pai Road, Kwai Chung, N.T.

**TEST CONDITIONS / 測試條件**

Temperature / 溫度 :  $(23 \pm 2)^{\circ}\text{C}$       Relative Humidity / 相對濕度 :  $(55 \pm 20)\%$   
Line Voltage / 電壓 : ---

**TEST SPECIFICATIONS / 測試規範**

Calibration check

**DATE OF TEST / 測試日期** : 15 April 2013

**TEST RESULTS / 測試結果**

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

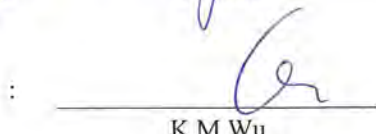
The test equipment used for calibration are traceable to National Standards via :

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

Tested By  
測試

  
K C Lee

Certified By  
核證

  
K M Wu

Date of Issue : 16 April 2013  
簽發日期

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

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

# Certificate of Calibration

## 校正證書

Certificate No. : C132229

證書編號

- The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 12 hours, and switched on to warm up for over 10 minutes before the commencement of the test.
- Self-calibration was performed before the test.
- The results presented are the mean of 3 measurements at each calibration point.

4. Test equipment :

Equipment ID	Description	Certificate No.
CL280	40 MHz Arbitrary Waveform Generator	C130019
CL281	Multifunction Acoustic Calibrator	DC110233

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 60651 Type 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
40 - 100	L <sub>p</sub>	A	Fast	94.00	1	93.8	± 0.7

6.1.2 Linearity

UUT Setting				Applied Value		UUT Reading (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	
60 - 120	L <sub>p</sub>	A	Fast	94.00	1	93.7 (Ref.)
				104.00		103.7
				114.00		113.8

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

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

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Sun Creation Engineering Limited - Calibration & Testing Laboratory

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

輝創工程有限公司 - 校正及檢測實驗室

c/o 香港新界屯門興安里一號青山灣機樓四樓

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

# Certificate of Calibration

## 校正證書

Certificate No. : C132229

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)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
40 - 100	L <sub>p</sub>	A	Fast	94.00	1	93.8	Ref.
			Slow			93.8	± 0.1
			Imp			93.8	± 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)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Burst Duration		
50 - 110	L <sub>p</sub>	A	Fast	106.0	Continuous	106.0	Ref.
	L <sub>Amax</sub>				200 ms	105.2	-1.0 ± 1.0
	L <sub>p</sub>		Slow		Continuous	106.0	Ref.
	L <sub>Amax</sub>				500 ms	102.1	-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)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
40 - 100	L <sub>p</sub>	A	Fast	94.00	31.5 Hz	54.4	-39.4 ± 1.5
					63 Hz	67.7	-26.2 ± 1.5
					125 Hz	77.8	-16.1 ± 1.0
					250 Hz	85.3	-8.6 ± 1.0
					500 Hz	90.6	-3.2 ± 1.0
					1 kHz	93.8	Ref.
					2 kHz	95.0	+1.2 ± 1.0
					4 kHz	94.7	+1.0 ± 1.0
					8 kHz	92.5	-1.1 (+1.5 ; -3.0)
12.5 kHz	89.3	-4.3 (+3.0 ; -6.0)					

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

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



# Certificate of Calibration

## 校正證書

Certificate No. : C132229  
證書編號

### 6.3.2 C-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
40 - 100	L <sub>p</sub>	C	Fast	94.00	31.5 Hz	90.8	-3.0 ± 1.5
					63 Hz	93.0	-0.8 ± 1.5
					125 Hz	93.7	-0.2 ± 1.0
					250 Hz	93.9	0.0 ± 1.0
					500 Hz	93.9	0.0 ± 1.0
					1 kHz	93.9	Ref.
					2 kHz	93.7	-0.2 ± 1.0
					4 kHz	93.0	-0.8 ± 1.0
					8 kHz	90.7	-3.0 (+1.5 ; -3.0)
12.5 kHz	87.5	-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)	Mode	Frequency Weighting	Time Weighting	Frequency (kHz)	Burst Duration (ms)	Burst Duty Factor	Burst Level (dB)	Equivalent Level (dB)		
50 - 110	L <sub>Aeq</sub>	A	10 sec.	4	1	1/10	110.0	100	99.8	± 0.5
								90	89.6	± 0.5
								80	79.3	± 1.0
								70	70.0	± 1.0
			60 sec.							
			5 min.							

Remarks : - UUT Microphone Model No. : UC-53A & S/N : 319944

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

- Uncertainties of Applied Value :

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

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

#### Note :

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

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

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



# Certificate of Calibration 校正證書

Certificate No. : C132565  
證書編號

**ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC13-0878)**

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

**TEST CONDITIONS / 測試條件**

Temperature / 溫度 :  $(23 \pm 2)^\circ\text{C}$       Relative Humidity / 相對濕度 :  $(55 \pm 20)\%$   
Line Voltage / 電壓 : ---

**TEST SPECIFICATIONS / 測試規範**

Calibration check

**DATE OF TEST / 測試日期** : 27 April 2013

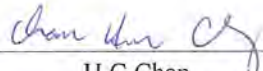
**TEST RESULTS / 測試結果**

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

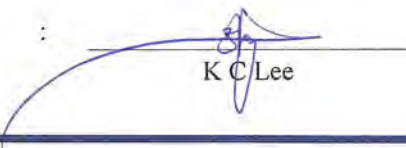
The test equipment used for calibration are traceable to National Standards via :

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

Tested By  
測試

:   
H C Chan

Certified By  
核證

:   
K C Lee

Date of Issue  
簽發日期

: 30 April 2013

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

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

# Certificate of Calibration

## 校正證書

Certificate No. : C132565  
證書編號

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

<u>Equipment ID</u>	<u>Description</u>	<u>Certificate No.</u>
CL130	Universal Counter	C123541
CL281	Multifunction Acoustic Calibrator	DC110233
TST150A	Measuring Amplifier	C120886

- Test procedure : MA100N.

- Results :

### 5.1 Sound Level Accuracy

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

### 5.2 Frequency Accuracy

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

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

### Note :

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

# REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION



**Work Order:** HK1328906  
**Date of Issue:** 24/10/2013  
**Client:** ACTION UNITED ENVIRO SERVICES

**Equipment Type:** Dissolved Oxygen Meter  
**Brand Name:** YSI  
**Model No.:** PRO 20  
**Serial No.:** 12C100570  
**Equipment No.:** --  
**Date of Calibration:** 24 October, 2013      **Date of next Calibration:** 24 January, 2014

**Parameters:**

**Dissolved Oxygen**

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

Expected Reading (mg/L)	Displayed Reading (mg/L)	Tolerance (mg/L)
3.29	3.31	0.02
5.28	5.16	-0.12
8.89	8.85	-0.04
Tolerance Limit ( $\pm$ 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 ( $^{\circ}$ C)	Displayed Reading ( $^{\circ}$ C)	Tolerance ( $^{\circ}$ C)
12.0	11.8	-0.2
20.0	19.0	-1.0
38.5	39.4	0.9
Tolerance Limit ( $\pm$ $^{\circ}$ 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

# REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

**Work Order:** HK1324522  
**Date of Issue:** 13/09/2013  
**Client:** ACTION UNITED ENVIRO SERVICES



**Equipment Type:** Turbidimeter  
**Brand Name:** HACH  
**Model No.:** 2100Q  
**Serial No.:** 11030C008499  
**Equipment No.:** --  
**Date of Calibration:** 12 September, 2013      **Date of next Calibration:** 12 December, 2013

## Parameters:

### Turbidity

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

Expected Reading (NTU)	Displayed Reading (NTU)	Tolerance (%)
0	0.03	--
4	3.82	-4.5
40	42.1	5.3
80	85.8	7.3
400	380	-5.0
800	832	4.0
	Tolerance Limit ( $\pm\%$ )	10.0

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

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

# REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION



**Work Order:** HK1327856  
**Date of Issue:** 17/10/2013  
**Client:** ACTION UNITED ENVIRO SERVICES

**Equipment Type:** Turbidimeter  
**Brand Name:** HACH  
**Model No.:** 2100Q  
**Serial No.:** 12060C018266  
**Equipment No.:** --  
**Date of Calibration:** 16 October, 2013      **Date of next Calibration:** 16 January, 2014

## Parameters:

### Turbidity

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

Expected Reading (NTU)	Displayed Reading (NTU)	Tolerance (%)
0	0.62	--
4	3.94	-1.5
40	37.1	-7.3
80	76.8	-4.0
400	370	-7.5
800	740	-7.5
	Tolerance Limit ( $\pm\%$ )	10.0

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

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

# REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION



**Work Order:** HK1324520  
**Date of Issue:** 13/09/2013  
**Client:** ACTION UNITED ENVIRO SERVICES

**Equipment Type:** pH meter  
**Brand Name:** Eco Sense  
**Model No.:** pH 10A  
**Serial No.:** JC000488  
**Equipment No.:** --  
**Date of Calibration:** 12 September, 2013      **Date of next Calibration:** 12 December, 2013

**Parameters:**

**pH Value**

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

Expected Reading (pH Unit)	Displayed Reading (pH Unit)	Tolerance (pH unit)
4.0	4.03	0.03
7.0	7.06	0.06
10.0	10.04	0.04
Tolerance Limit ( $\pm$ pH unit)		0.20

**Temperature**

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

Expected Reading ( $^{\circ}$ C)	Displayed Reading ( $^{\circ}$ C)	Tolerance ( $^{\circ}$ C)
10.0	10.3	0.3
22.0	21.9	-0.1
38.5	39.6	1.1
Tolerance Limit ( $\pm$ $^{\circ}$ 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

# REPORT OF EQUIPMENT PERFORMANCE CHECK / CALIBRATION



**Work Order:** HK1328984  
**Date of Issue:** 04/11/2013  
**Client:** ACTION UNITED ENVIRO SERVICES

**Equipment Type:** Multimeter  
**Brand Name:** YSI  
**Model No.:** PROFESSIONAL PLUS  
**Serial No.:** 10G101946  
**Equipment No.:** --  
**Date of Calibration:** 01 November, 2013      **Date of next Calibration:** 01 February, 2014

**Parameters:**

**pH Value**

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

Expected Reading (pH Unit)	Displayed Reading (pH Unit)	Tolerance (pH unit)
4.0	3.95	-0.05
7.0	7.04	0.04
10.0	9.83	-0.17
Tolerance Limit ( $\pm$ pH unit)		0.20

**Salinity**

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

Expected Reading (ppt)	Displayed Reading (ppt)	Tolerance (%)
0	0.00	--
10	9.95	-0.5
20	19.05	-4.8
30	29.10	-3.0
Tolerance Limit ( $\pm$ %)		10.0

**Temperature**

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

Expected Reading ( $^{\circ}$ C)	Displayed Reading ( $^{\circ}$ C)	Tolerance ( $^{\circ}$ C)
10.0	9.8	-0.2
22.5	22.2	-0.3
39.0	40.1	1.1
Tolerance Limit ( $\pm$ $^{\circ}$ 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





Hong Kong Accreditation Service  
香港認可處

**Certificate of Accreditation**  
認可證書

*This is to certify that*  
特此證明

**ALS TECHNICHEM (HK) PTY LIMITED**

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

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

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

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

**Environmental Testing**  
環境測試

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

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

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

CHAN Sing Sing, Terence, Executive Administrator  
執行幹事 陳成城  
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Registration Number : **HOKLAS 066**  
註冊號碼：

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



## **Appendix G**

### **Event and Action Plan**

**Event and Action Plan for Air Quality**

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

**Event and Action Plan for Construction Noise**

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

**Event and Action Plan for Water Quality**

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

## **Appendix H**

### **Impact Monitoring Schedule**

**Impact Monitoring Schedule for the Reporting Period**

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

**Air Quality Monitoring Location:**

- Contract 3 – AM9b
- Contract 5 – AM1, AM2 and AM3

**Construction Noise Monitoring Location:**

- Contract 3 – NM8, NM9 and NM10
- Contract 5 – NM1 and NM2

**Water Quality Monitoring Location:**

- Contract 3 – W4 , W4-Control A and W4-Control B
- Contract 5 – W1 and W1-Control

	Monitoring Day
	Sunday or Public Holiday

**Impact Monitoring Schedule for next Reporting Period**

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

Air Quality Monitoring Location:

- Contract 3 – AM9b
- Contract 5 – AM1, AM2 and AM3

Construction Noise Monitoring Location:

- Contract 3 – NM8, NM9 and NM10
- Contract 5 – NM1 and NM2

Water Quality Monitoring Location:

- Contract 3 – W4 , W4-Control A and W4-Control B
- Contract 5 – W1 and W1-Control

	Monitoring Day
	Sunday or Public Holiday



## **Appendix I**

### **Database of Monitoring Result**

**24-Hour TSP Monitoring Data**

DATE	SAMPLE NUMBER	ELAPSED TIME		CHART READING		AVG TEMP (°C)	AVG AIR PRESS (hPa)	STANDARD FLOW RATE (m <sup>3</sup> /min)	AIR VOLUME (std m <sup>3</sup> )	FILTER WEIGHT (g)		DUST WEIGHT COLLECTED (g)	24-hr TSP (µg/m <sup>3</sup> )		
		INITIAL	FINAL	MIN	MAX					INITIAL	FINAL				
<b>AM1 - Tsung Yuen Ha Village House No. 63</b>															
3-Dec-13	26181	7788.02	7811.52	1410.00	42	44	43.0	19.3	1020.1	1.56	2202	2.7175	2.8444	0.1269	58
9-Dec-13	28183	7811.52	7834.62	1386.00	40	45	42.5	18.8	1020.1	1.55	2149	2.8136	3.0567	0.2431	113
14-Dec-13	26240	7834.62	7858.60	1438.80	42	46	44.0	17.9	1020.6	1.59	2286	2.7244	3.0469	0.3225	141
20-Dec-13	26231	7858.60	7882.18	1414.80	43	44	43.5	17.3	1021.1	1.58	2232	2.7233	2.9657	0.2424	109
24-Dec-13	26270	7882.18	7905.67	1409.40	38	42	40.0	17.1	1020.6	1.50	2120	2.7225	2.9539	0.2314	109
30-Dec-13	26276	7905.67	7929.82	1449.00	38	39	38.5	16.8	1020.2	1.47	2132	2.6566	2.9422	0.2856	134
<b>AM2 - Village House near Lin Ma Hang Road</b>															
3-Dec-13	26180	3250.02	3273.70	1420.80	36	37	36.5	19.3	1020.1	1.06	1501	2.7284	2.8567	0.1283	85
9-Dec-13	26184	3273.70	3297.34	1418.40	42	46	44.0	18.8	1020.1	1.33	1890	2.7164	2.9371	0.2207	117
14-Dec-13	26248	3297.34	3320.90	1413.60	42	44	43.0	17.9	1020.6	1.30	1836	2.7364	2.8935	0.1571	86
20-Dec-13	26247	3320.90	3324.03	187.80	<b>Power Failure</b>							2.7367	2.7702	0.0335	<b>#DIV/0!</b>
24-Dec-14	26271	3324.03	3348.35	1459.20	47	48	47.5	17.1	1020.6	1.45	2119	2.7309	3.0286	0.2977	140
30-Dec-13	26277	3348.35	3372.89	1472.40	54	55	54.5	16.8	1020.2	1.69	2482	2.6742	3.0324	0.3582	144
<b>AM3 - Ta Kwu Ling Fire Service Station of Ta Kwu Ling Village</b>															
3-Dec-13	26179	4242.23	4265.45	1393.20	38	39	38.5	19.3	1020.1	1.18	1642	2.7186	2.8714	0.1528	93
9-Dec-13	26224	4265.45	4288.66	1392.60	38	44	41.0	18.8	1020.1	1.25	1747	2.7564	2.9895	0.2331	133
14-Dec-13	28241	4288.66	4311.90	1394.40	38	39	38.5	17.9	1020.6	1.18	1647	2.7234	2.8532	0.1298	79
20-Dec-13	26246	4311.90	4335.20	1398.00	38	39	38.5	17.3	1021.1	1.18	1654	2.7100	2.9399	0.2299	139
24-Dec-13	26272	4335.20	4358.46	1395.60	38	40	39.0	17.1	1020.6	1.26	1763	2.7185	2.9196	0.2011	114
30-Dec-13	26278	4358.46	4381.73	1396.20	39	40	39.5	16.8	1020.2	1.28	1783	2.7980	3.0399	0.2419	136
<b>AM9b - Nam Wa Po Village House No. 80</b>															
3-Dec-13	26178	13272.52	13296.30	1426.80	32	33	32.5	19.3	1020.1	1.05	1502	2.7206	2.8773	0.1567	104
9-Dec-13	26225	13296.30	13320.03	1423.80	30	31	30.5	18.8	1020.1	0.99	1411	2.7486	2.8082	0.0596	42
14-Dec-13	26243	13320.03	13343.95	1435.20	32	34	33.0	17.9	1020.6	1.07	1538	2.7176	2.8039	0.0863	56
20-Dec-14	26245	13343.95	13367.89	1436.40	32	34	33.0	17.3	1021.1	1.07	1541	2.7375	2.8570	0.1195	78
24-Dec-13	26273	13367.89	13391.63	1424.40	31	32	31.5	17.1	1020.6	1.03	1461	2.7062	2.8072	0.1010	69
30-Dec-13	26279	13391.63	13415.40	1426.20	33	34	33.5	16.8	1020.2	1.09	1553	2.7237	2.8145	0.0908	58

**Construction Noise Monitoring Results, (dB)**

Date	Start Time	1 <sup>st</sup> Leq <sub>5min</sub>	L10	L90	2 <sup>nd</sup> Leq <sub>5min</sub>	L10	L90	3 <sup>rd</sup> Leq <sub>5min</sub>	L10	L90	4 <sup>th</sup> Leq <sub>5min</sub>	L10	L90	5 <sup>th</sup> Leq <sub>5min</sub>	L10	L90	6 <sup>th</sup> Leq <sub>5min</sub>	L10	L90	Leq30	façade correction
<b>NM1 - Tsung Yuen Ha Village House No. 63</b>																					
5-Dec-13	11:01	60.7	63.6	54.7	57.6	58.3	51.4	55.3	57.7	51.0	54.4	56.7	48.2	54.0	55.1	48.7	52.1	54.2	47.0	57	NA
11-Dec-13	14:41	55.4	57.3	51.2	55.7	57.7	51.3	55.7	58.2	50.5	53.7	56.0	50.2	52.7	54.6	49.9	54.4	56.9	50.7	55	NA
19-Dec-13	10:30	52.0	55.4	48.9	52.1	56.2	49.1	54.0	56.1	48.3	54.7	58.6	49.8	59.9	60.8	48.8	50.1	53.4	48.3	55	NA
23-Dec-13	11:30	54.8	58.0	49.4	51.6	53.3	47.8	50.0	53.3	48.5	51.7	53.5	44.0	51.2	55.7	44.4	50.8	54.8	43.9	52	NA
28-Dec-13	11:00	54.5	54.6	53.3	54.9	55.9	53.8	53.7	55.8	52.6	54.4	55.4	53.4	56.7	57.3	50.2	57.0	59.2	53.1	55	NA
<b>NM2 - Village House near Lin Ma Hang Road</b>																					
5-Dec-13	11:15	69.6	72.0	61.0	68.0	70.8	62.7	68.3	72.6	53.6	66.3	69.0	55.6	60.3	65.2	45.5	59.4	62.2	43.0	67	NA
11-Dec-13	14:42	58.4	61.6	49.2	60.9	64.8	51.7	59.6	62.7	55.6	58.6	61.2	55.0	57.0	58.5	53.5	56.3	58.1	53.7	59	NA
19-Dec-13	15:24	58.5	63.4	56.3	59.1	64.4	53.9	60.5	62.9	57.7	63.3	66.6	61.2	61.0	67.6	56.4	60.4	64.2	52.7	61	NA
23-Dec-13	11:38	53.4	54.4	47.5	54.1	57.6	45.3	53.7	54.0	45.3	60.2	65.1	44.6	63.8	68.1	45.2	62.8	66.8	46.5	60	NA
28-Dec-13	11:20	63.2	66.7	48.8	51.9	54.9	46.3	55.3	57.8	47.9	61.9	63.4	47.1	61.3	64.6	47.2	63.7	64.6	48.1	61	NA
<b>NM8 - Village House, Tong Hang</b>																					
5-Dec-13	17:24	64.0	65.3	57.3	63.2	66.7	51.8	65.2	69.1	53.9	61.5	64.9	57.6	57.3	59.3	54.6	59.6	62.7	52.8	63	NA
11-Dec-13	17:17	59.2	63.0	49.0	63.6	68.5	50.0	62.6	67.0	50.5	62.7	67.5	50.5	62.0	66.5	49.5	60.8	65.0	49.0	62	NA
19-Dec-13	13:00	64.2	68.2	59.1	64.1	65.7	58.4	63.6	65.0	59.1	61.8	64.4	58.8	61.8	62.3	58.9	58.6	60.1	58.4	63	NA
23-Dec-13	11:38	52.9	55.5	44.0	62.6	64.0	46.5	51.4	54.5	42.0	52.3	55.5	43.0	52.2	56.5	43.0	52.3	57.5	43.5	56	NA
28-Dec-13	15:13	65.1	63.5	51.2	57.3	56.9	50.1	61.5	60.7	52.1	56.6	58.5	51.2	60.1	59.9	50.3	57.0	58.3	50.1	61	NA
<b>NM9 - Village House, Kiu Tau Village</b>																					
5-Dec-13	16:46	63.5	63.9	51.5	66.8	62.7	52.7	61.8	62.6	52.3	58.8	61.8	53.0	58.2	61.4	53.6	60.5	64.2	53.2	63	NA
11-Dec-13	11:30	64.6	68.9	57.4	62.3	64.0	56.6	63.3	66.1	57.4	63.3	66.5	57.5	65.4	69.1	57.2	63.6	66.9	58.1	64	NA
19-Dec-13	13:16	63.8	64.5	62.5	64.0	64.5	63.0	62.8	64.0	61.0	62.2	63.0	61.0	61.0	62.5	59.5	59.7	61.0	57.5	62	NA
23-Dec-13	10:50	72.1	78.0	48.0	75.0	78.5	48.0	75.4	78.5	51.0	49.4	53.5	42.0	52.0	55.5	42.0	49.6	54.0	41.5	71	NA
28-Dec-13	15:00	62.2	63.8	60.2	62.0	63.3	60.4	65.1	69.1	62.5	64.5	66.1	62.3	62.2	63.8	60.2	62.0	63.3	60.4	63	NA
<b>NM10 - Nam Wa Po Village House No. 80</b>																					
5-Dec-13	16:05	58.1	59.4	55.2	59.2	59.0	55.5	59.8	60.9	56.1	58.7	60.3	55.6	58.6	60.2	55.5	57.4	58.5	54.8	59	62
11-Dec-13	11:27	59.0	60.5	57.0	57.6	59.3	55.8	57.9	59.7	55.2	58.5	59.8	56.8	58.5	60.0	56.6	58.7	59.9	57.2	58	61
19-Dec-13	11:25	54.5	56.6	52.0	58.3	60.8	52.0	59.2	62.5	50.0	57.9	63.5	54.0	61.3	64.5	52.0	56.1	58.5	53.0	58	61
23-Dec-13	11:10	59.8	57.5	53.5	55.9	57.5	53.5	55.4	57.0	53.0	55.4	57.0	53.0	55.7	57.0	53.5	56.3	57.5	54.0	57	60
28-Dec-13	17:30	56.2	58.6	53.4	55.8	57.7	53.4	56.3	58.2	53.9	56.6	58.6	53.7	58.0	59.5	53.5	57.5	59.6	54.8	57	60

**Water Quality Monitoring Results**

3-Dec-13														
Date	Location	Time	Depth (m)	Temp (oC)	DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
	WM1-C	11:20	0.35	23.7	5.58	5.6	64.1	64.0	7.0	6.8	7.99	8.0	2	2.5
				23.7	5.56		63.9		6.5	7.97		3		
	WM1	11:35	0.57	18.8	7.12	7.1	74.4	74.2	12.3	12.3	7.81	7.8	11	11.5
				18.0	7.10		74.0		12.2	7.81		12		
	WM4-CA	10:05	0.07	23	7.01	7.0	79.3	79.4	3.5	3.5	8.59	8.6	4	4.0
				23	7.02		79.4		3.4	8.6		4		
	WM4-CB	09:50	0.08	21.5	7.19	7.2	79.3	78.6	3.9	3.8	7.92	7.9	8	8.0
				21.5	7.11		77.9		3.7	7.89		8		
	WM4	10:15	0.12	21.8	8.7	8.8	95.3	95.7	18.0	18.5	7.85	7.9	18	19.0
				21.8	8.8		96.1		19.0	7.87		20		

5-Dec-13														
Date	Location	Time	Depth (m)	Temp (oC)	DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
	WM1-C	11:25	0.40	21.1	6.57	6.6	71.3	72.2	6.6	6.5	8.03	8.0	5	5.0
				21.1	6.71		73.1		6.5	8.02		5		
	WM1	12:06	0.63	24.1	6.09	6.3	71.3	73.5	8.1	8.2	8.12	8.1	5	5.0
				24.1	6.47		75.6		8.3	8.13		5		
	WM4-CA	17:02	0.09	19.8	7.8	7.8	83.8	83.8	42.1	43.9	8.08	8.1	43	43.5
				19.8	7.8		83.7		45.6	8.09		44		
	WM4-CB	16:15	0.11	20.3	6.71	6.7	72.9	73.1	4.3	4.2	8.05	8.1	6	5.5
				20.3	6.77		73.2		4.1	8.05		5		
	WM4	17:30	0.17	19.8	7.21	7.2	77.4	77.6	6.5	7.0	8.36	8.4	7	7.0
				19.8	7.27		77.8		7.5	8.36		7		

7-Dec-13														
Date	Location	Time	Depth (m)	Temp (oC)	DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
	WM1-C	12:05	0.31	16.7	10.66	10.6	107.0	106.2	12.9	12.3	8.19	8.2	21	20.0
				16.7	10.49		105.3		11.7	8.17		19		
	WM1	12:29	0.67	23.3	6.52	6.5	74.5	74.2	8.8	8.0	7.72	7.7	6	6.0
				23.3	6.47		73.9		7.2	7.73		6		
	WM4-CA	13:35	0.09	24.3	6.17	6.3	72.0	73.2	7.8	8.0	8.41	8.4	6	5.5
				24.3	6.39		74.3		8.2	8.42		5		
	WM4-CB	13:48	0.14	23.9	9.5	9.5	107.6	107.0	13.4	13.5	7.83	7.8	16	15.5
				23.9	9.43		106.3		13.6	7.82		15		
	WM4	13:21	0.29	22.7	9.32	9.1	105.8	103.8	15.6	16.2	7.81	7.8	17	17.5
				22.7	8.94		101.8		16.8	7.81		18		

9-Dec-13															
Date	Location	Time	Depth (m)	Temp (oC)	DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)		
	WM1-C	14:04	0.32	21.9	21.9	11.43	11.5	129.3	129.6	5.5	5.5	8.16	8.2	3	3.0
				21.9	11.56		129.8		5.5		8.17		3		
	WM1	14:34	0.68	22.1	22.1	8.61	8.6	96.2	95.3	9.9	10.0	8.02	8.0	9	9.5
				22.1	8.54		94.3		10.0		8.03		10		
	WM4-CA	12:10	0.15	23.5	23.5	6.39	6.4	74.4	74.8	9.4	8.2	7.58	7.6	8	8.5
				23.5	6.46		75.1		8.2		7.57		9		
	WM4-CB	11:40	0.11	24	24.0	9.96	10.1	116.5	116.4	5.3	4.4	7.78	7.8	5	5.0
				24	10.3		116.3		4.4		7.78		5		
	WM4	12:35	0.21	25	25.0	11.66	11.4	133.9	129.8	13.1	11.7	8.1	8.1	15	15.5
				25	11.2		125.7		11.7		8.1		16		

11-Dec-13															
Date	Location	Time	Depth (m)	Temp (oC)	DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)		
	WM1-C	15:12	0.30	19.2	19.2	9.28	9.2	98.3	97.6	5.8	5.7	8.52	8.5	3	2.5
				19.2	9.14		96.8		5.6		8.51		2		
	WM1	15:41	0.77	18.8	18.8	8.44	8.4	88.9	88.4	17.4	17.4	9.23	9.2	14	13.5
				18.8	8.32		87.9		17.3		9.24		13		
	WM4-CA	12:32	0.10	23	23.0	6.64	6.6	76.2	76.1	3.0	2.9	8.21	8.2	2	2.0
				23	6.63		76.0		2.9		8.21		2		
	WM4-CB	11:53	0.10	22.9	22.9	8.03	8.1	90.5	91.3	5.2	4.9	7.89	7.9	4	3.5
				22.9	8.22		92.1		4.6		7.88		3		
	WM4	12:46	0.37	19.8	19.8	8.71	8.7	93.9	93.7	7.3	7.4	7.93	7.9	7	8.0
				19.8	8.69		93.5		7.4		7.92		9		

13-Dec-13															
Date	Location	Time	Depth (m)	Temp (oC)	DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)		
	WM1-C	14:11	0.34	18.2	18.2	8.38	8.3	87.3	86.7	5.2	5.2	8.29	8.3	4	4.0
				18.2	8.26		86.1		5.3		8.28		4		
	WM1	14:33	0.69	18.7	18.7	6.57	6.5	69.0	68.5	7.1	7.1	8.69	8.7	7	6.5
				18.7	6.45		68.0		7.1		8.7		6		
	WM4-CA	16:12	0.11	18.2	18.2	8.88	8.8	93.9	93.3	6.8	7.7	8.46	8.5	16	16.0
				18.2	8.79		92.7		7.7		8.45		16		
	WM4-CB	16:20	0.13	18.9	18.9	7.1	7.1	74.8	74.4	4.0	3.8	8.04	8.0	4	3.5
				18.9	7.06		73.9		3.5		8.05		3		
	WM4	15:57	0.21	18.5	18.5	9.18	9.2	98.6	98.6	7.9	7.8	8.26	8.3	9	8.0
				18.5	9.16		98.5		7.7		8.26		7		

17-Dec-13														
Date	Location	Time	Depth (m)	Temp (oC)	DO (mg/L)	DO (%)	Turbidity (NTU)	pH	SS(mg/L)	DO (mg/L)	DO (%)	Turbidity (NTU)	pH	SS(mg/L)
	WM1-C	11:25	0.54	13.2	9.91	92.8	55.4	8.15	36	9.7	91.1	55.6	8.1	35.0
				13.2	9.58	89.3	55.7	8.14	34					
	WM1	15:02	1.10	13.6	8.35	79.2	210.0	8.19	107	8.3	78.6	209.0	8.2	107.5
				13.6	8.21	78.0	208.0	8.19	108					
	WM4-CA	12:51	0.12	13.3	10.88	102.3	10.9	8.21	10	11.3	105.8	10.5	8.2	10.5
				13.3	11.69	109.3	10.0	8.21	11					
	WM4-CB	10:35	0.37	15.0	6.85	68.8	16.3	8.56	14	6.8	67.5	16.5	8.6	13.5
				15.0	6.82	66.1	16.6	8.55	13					
	WM4	13:12	0.50	12.3	10.22	94.1	25.5	8.07	24	10.4	95.3	24.7	8.1	25.0
				12.3	10.53	96.4	23.8	8.07	26					

19-Dec-13														
Date	Location	Time	Depth (m)	Temp (oC)	DO (mg/L)	DO (%)	Turbidity (NTU)	pH	SS(mg/L)	DO (mg/L)	DO (%)	Turbidity (NTU)	pH	SS(mg/L)
	WM1-C	12:18	0.29	14.4	7.75	74.1	152.0	8.63	113	7.7	73.7	151.0	8.6	112.5
				14.4	7.66	73.3	150.0	8.62	112					
	WM1	12:47	0.83	16.3	5.66	56.8	18.6	8.66	13	5.6	56.6	18.4	8.7	13.0
				16.3	5.57	56.4	18.2	8.66	13					
	WM4-CA	10:33	0.12	14.1	9.04	84.7	2.9	8.68	<2	9.0	84.0	2.6	8.7	<2.0
				14.1	8.89	83.2	2.3	8.68	<2					
	WM4-CB	10:10	0.09	16.3	6.12	61.1	6.0	8.59	4	6.1	60.9	5.9	8.6	4.0
				16.3	6.08	60.7	5.8	8.59	4					
	WM4	10:47	0.27	14.7	6.98	75.0	13.0	8.4	11	7.0	75.4	13.1	8.4	10.5
				14.7	7.08	75.7	13.1	8.4	10					

21-Dec-13														
Date	Location	Time	Depth (m)	Temp (oC)	DO (mg/L)	DO (%)	Turbidity (NTU)	pH	SS(mg/L)	DO (mg/L)	DO (%)	Turbidity (NTU)	pH	SS(mg/L)
	WM1-C	10:37	0.33	16.6	6.77	68.2	8.8	8.59	6	6.7	68.0	8.7	8.6	5.5
				16.6	6.71	67.8	8.7	8.58	5					
	WM1	10:51	0.76	17.2	7.29	74.3	8.0	8.55	11	7.2	73.6	8.1	8.5	10.5
				17.2	7.17	72.9	8.3	8.54	10					
	WM4-CA	13:43	0.14	17.7	7.97	82.2	13.8	8.77	10	7.9	81.8	13.4	8.8	9.5
				17.7	7.91	81.3	12.9	8.77	9					
	WM4-CB	13:59	0.13	19.5	7.29	78.2	4.5	8.39	4	7.3	77.8	4.5	8.4	4.5
				19.5	7.31	77.4	4.4	8.39	5					
	WM4	13:26	0.29	17.6	8.03	82.1	5.4	8.54	7	8.0	81.4	5.4	8.5	6.5
				17.6	7.88	80.7	5.4	8.54	6					

23-Dec-13										
Date	Location	Time	Depth (m)	Temp (oC)	DO (mg/L)	DO (%)	Turbidity (NTU)	pH	SS(mg/L)	
	WM1-C	16:00	0.33	18.8	7.89	82.7	5.6	8.73	3	3.0
				18.8	7.76	81.3	5.6	8.72	3	3.0
	WM1	16:20	0.87	15.9	7.95	78.7	8.4	8.79	6	6.0
				15.9	7.84	77.6	8.4	8.79	6	6.0
	WM4-CA	17:53	0.17	17.5	7.16	73.6	2.5	9.02	<2	<2.0
				17.5	7.02	72.1	2.4	9.01	<2	<2.0
	WM4-CB	13:21	0.19	18.6	10.81	110.2	3.8	8.76	8	8.0
				18.6	10.23	105.1	4.8	8.76	8	8.0
	WM4	17:37	0.24	18.2	6.91	72.1	6.7	8.63	5	5.0
				18.2	6.74	70.4	6.9	8.62	5	5.0

28-Dec-13										
Date	Location	Time	Depth (m)	Temp (oC)	DO (mg/L)	DO (%)	Turbidity (NTU)	pH	SS(mg/L)	
	WM1-C	11:48	0.35	12.1	8.01	73.5	6.3	8.63	<2	<2.0
				12.1	8.16	74.4	6.7	8.62	<2	<2.0
	WM1	12:10	0.82	12.4	7.35	67.6	15.7	8.16	12	12.0
				12.4	7.53	68.6	15.4	8.15	12	12.0
	WM4-CA	15:10	0.12	14.8	10.85	102.5	3.8	8.48	<2	<2.0
				14.8	11.51	107.5	2.9	8.48	<2	<2.0
	WM4-CB	15:22	0.13	15.2	8.59	83.8	4.2	7.85	2	2.0
				15.2	8.74	85.6	3.9	7.85	2	2.0
	WM4	14:52	0.24	14.0	11.5	110.9	16.6	8.25	13	12.5
				14.0	12.1	115.5	14.9	8.26	12	12.5

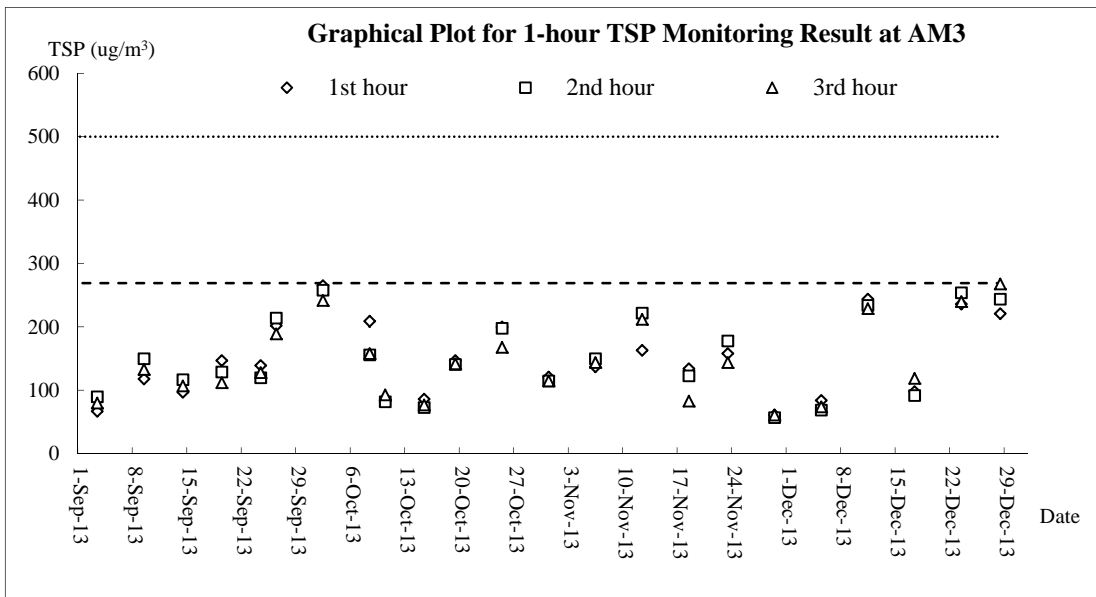
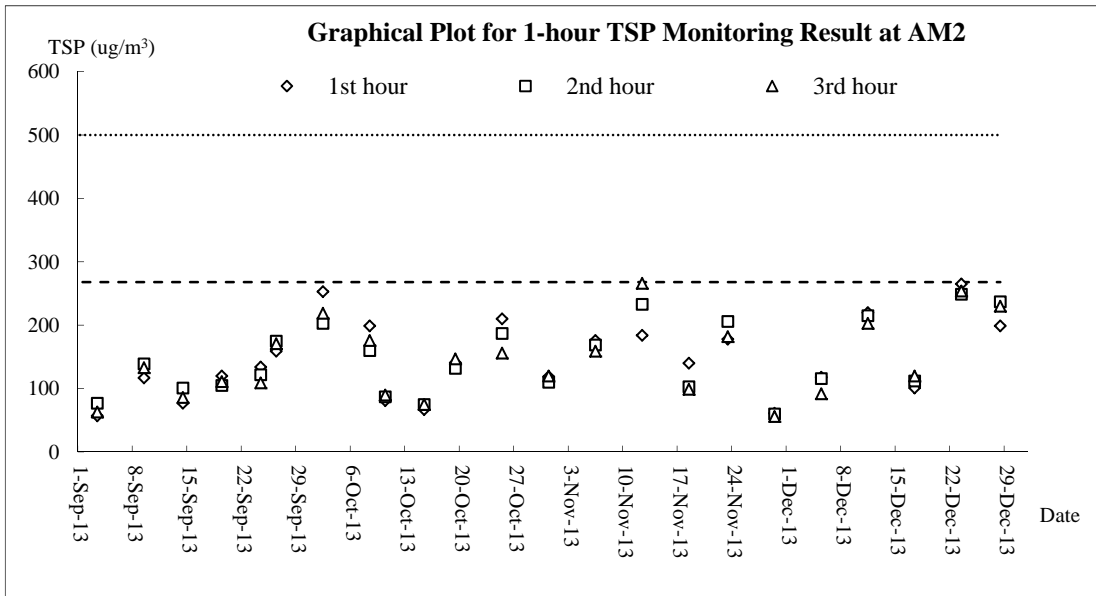
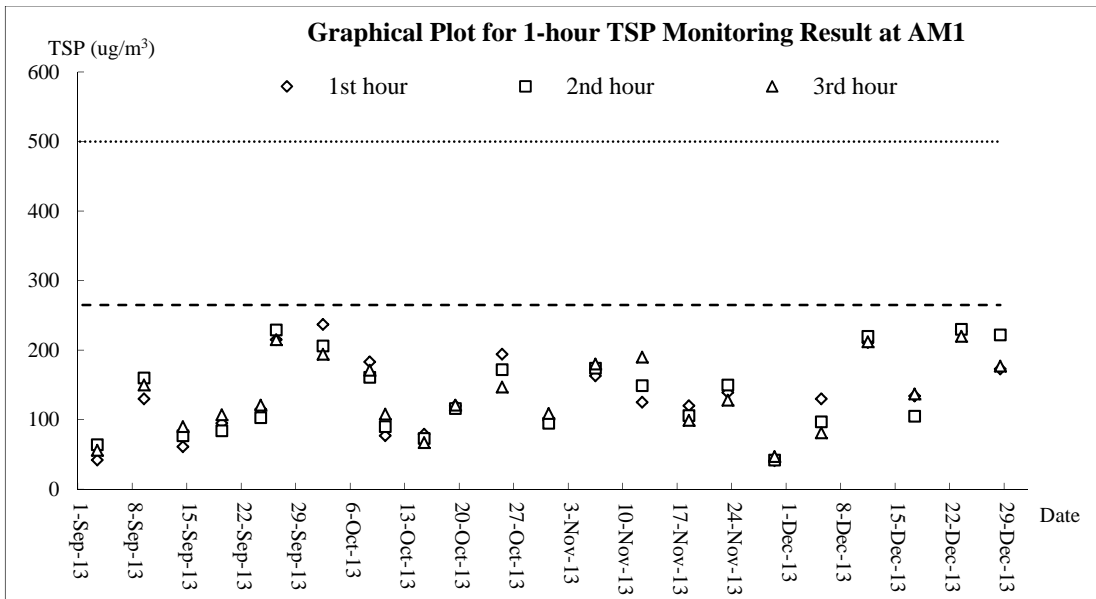
30-Dec-13										
Date	Location	Time	Depth (m)	Temp (oC)	DO (mg/L)	DO (%)	Turbidity (NTU)	pH	SS(mg/L)	
	WM1-C	13:36	0.34	15.3	5.45	59.5	5.9	8.47	<2	2.0
				15.3	5.52	61.1	5.9	8.47	<2	2.0
	WM1	13:52	0.77	15.1	8.12	78.8	6.8	8.14	3	3.0
				15.1	8.05	78.2	6.9	8.14	3	3.0
	WM4-CA	12:07	0.11	16.5	8.97	89.4	12.6	8.35	4	4.0
				16.5	9.01	89.9	12.6	8.35	4	4.0
	WM4-CB	11:43	0.12	17.6	9.33	96.0	7.4	8.13	4	3.5
				17.6	9.18	94.8	6.2	8.12	3	3.5
	WM4	12:35	0.17	17.4	10.36	107.6	7.2	9.11	5	5.0
				17.4	10.81	112.2	7.4	9.11	5	5.0

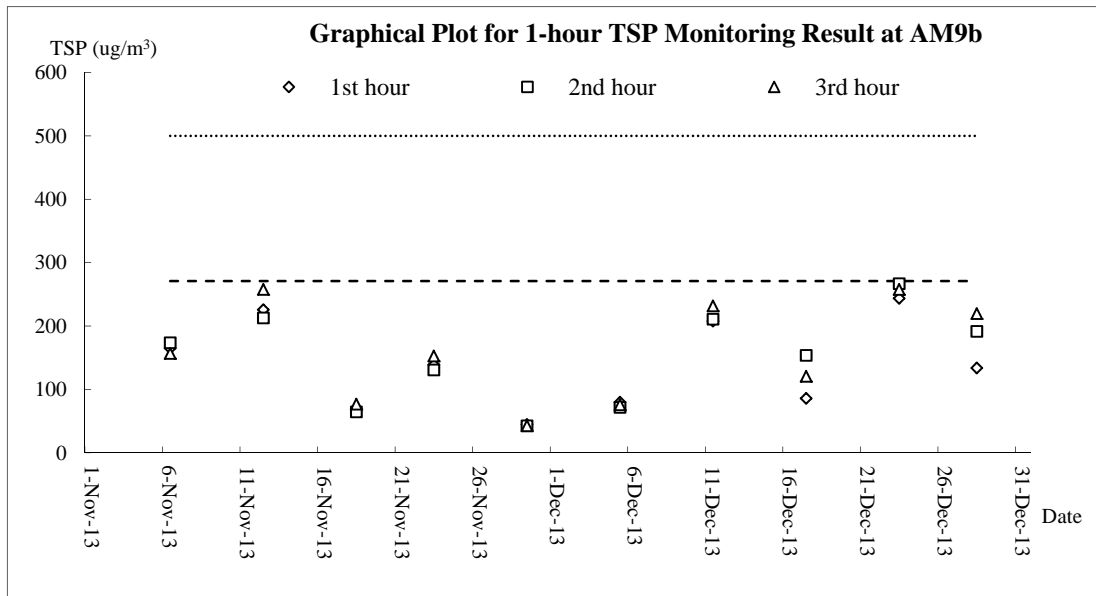
## **Appendix J**

### **Graphical Plots for Monitoring Result**

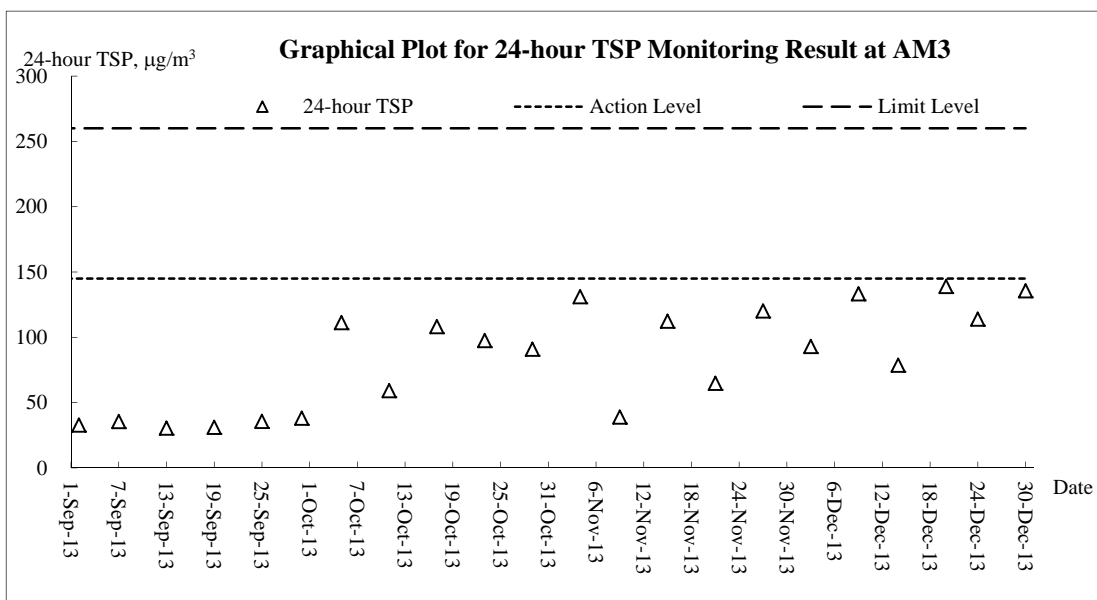
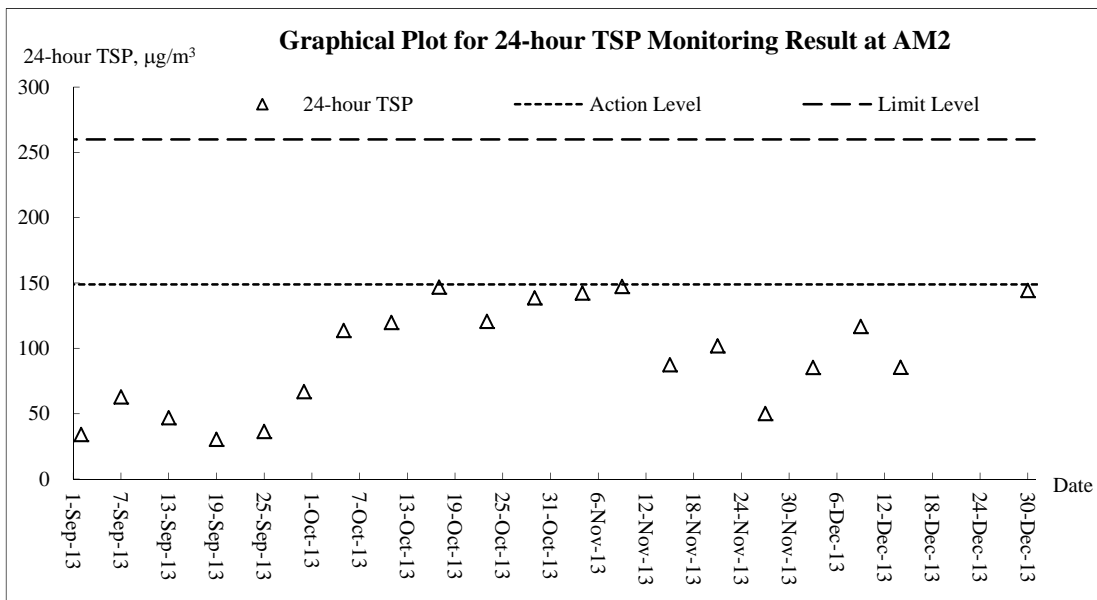
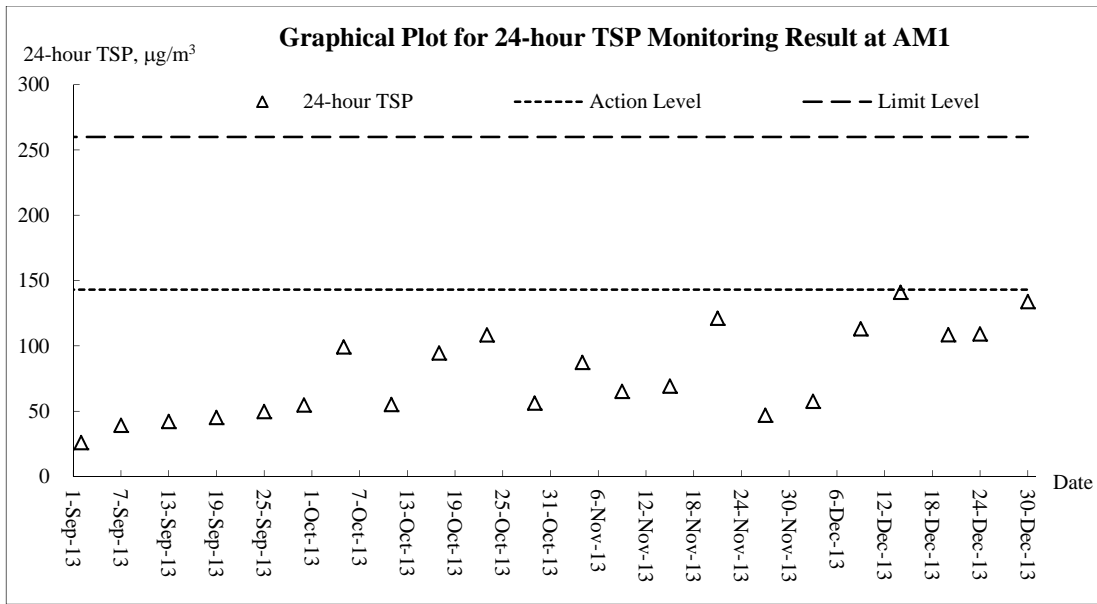


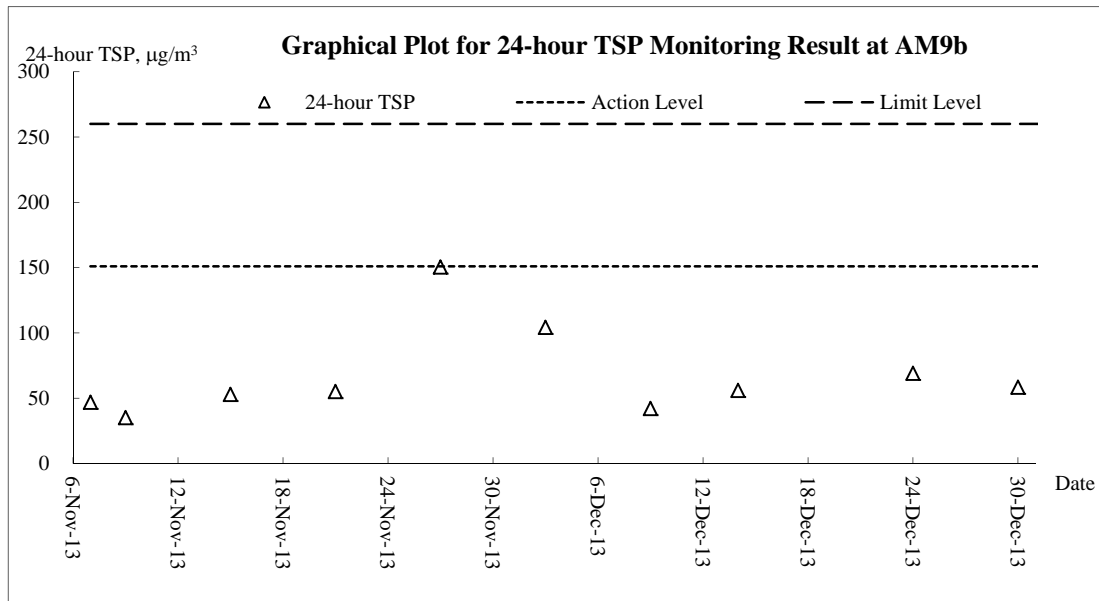
**Air Quality – 1-hour TSP**



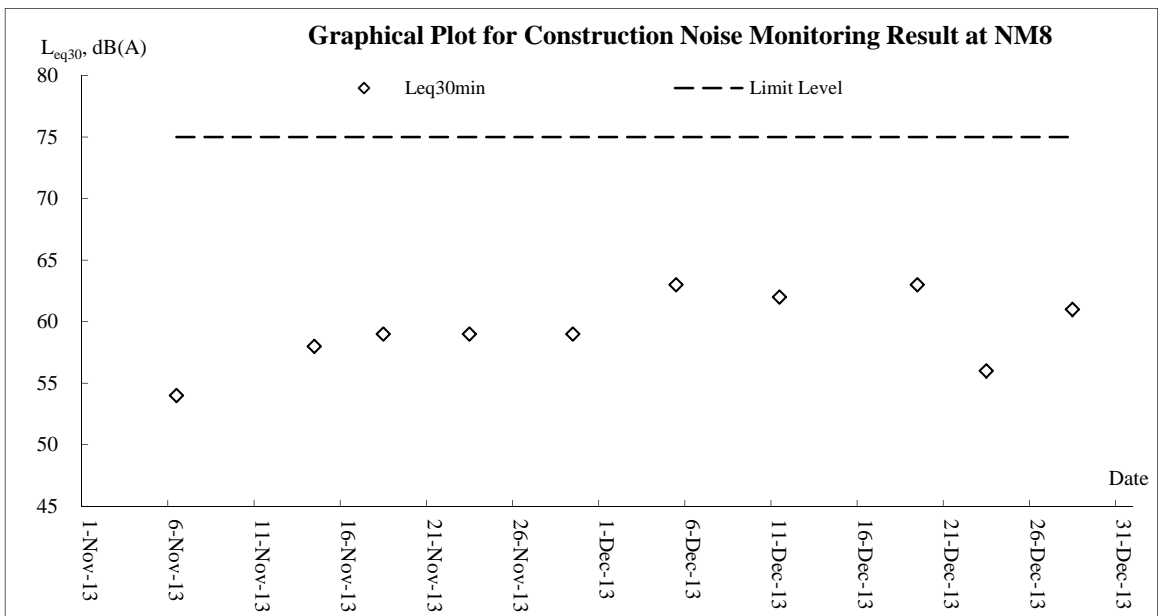
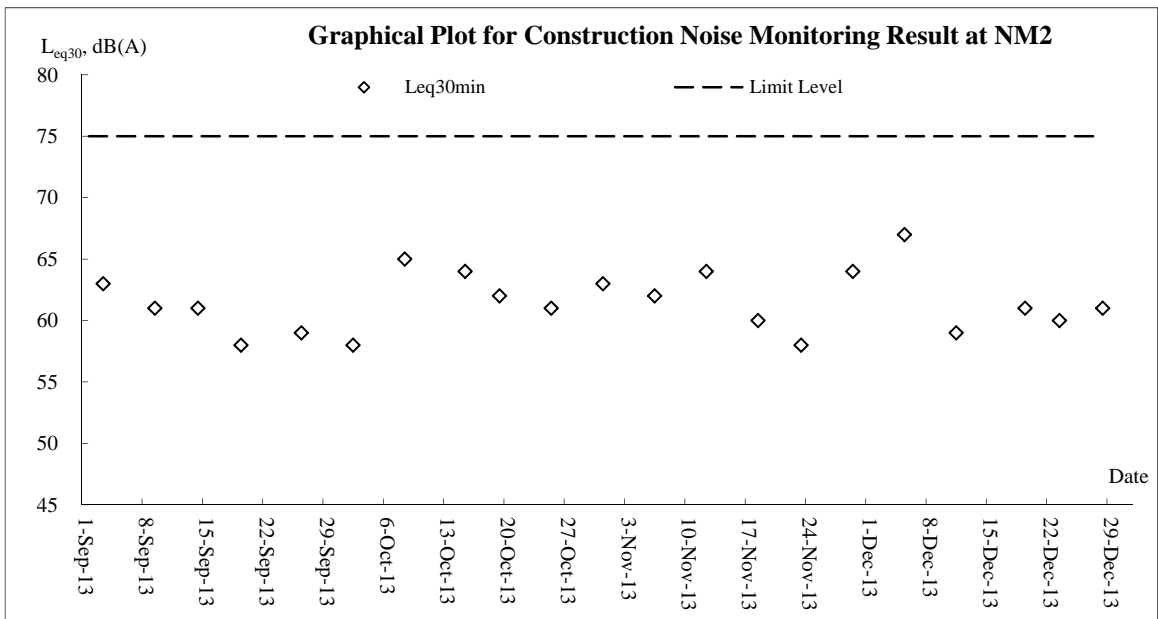
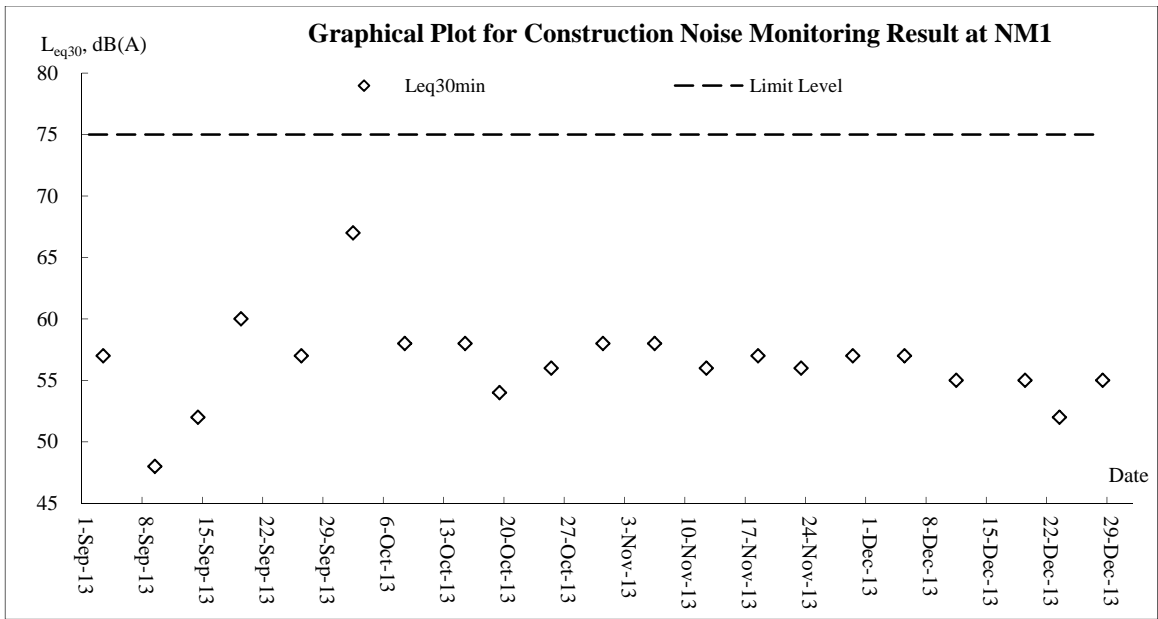


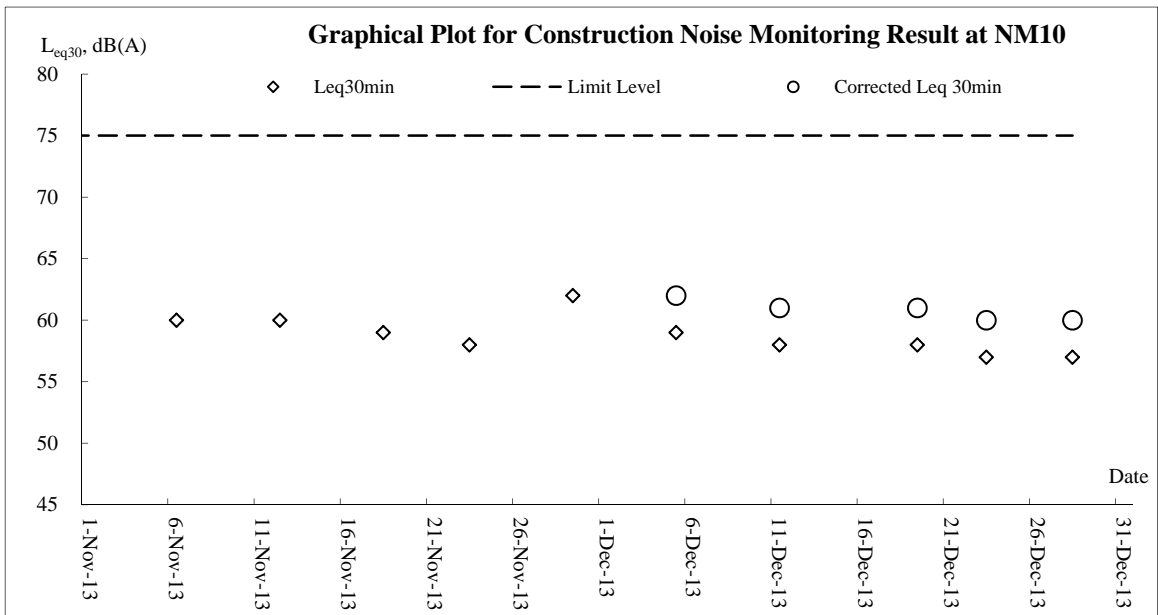
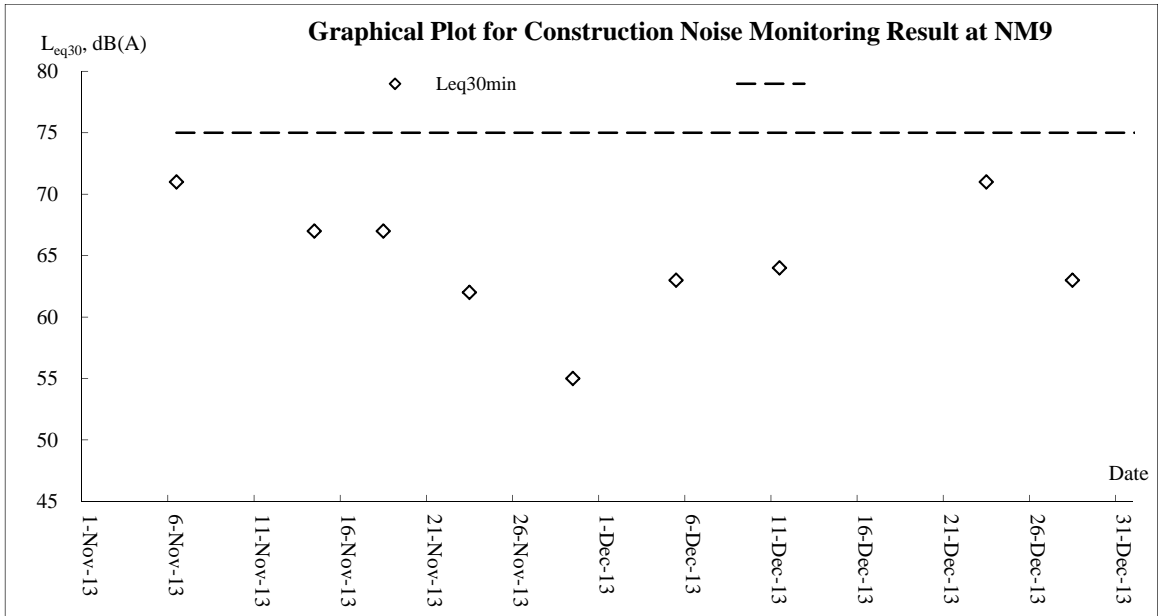
**Air Quality – 24-hour TSP**



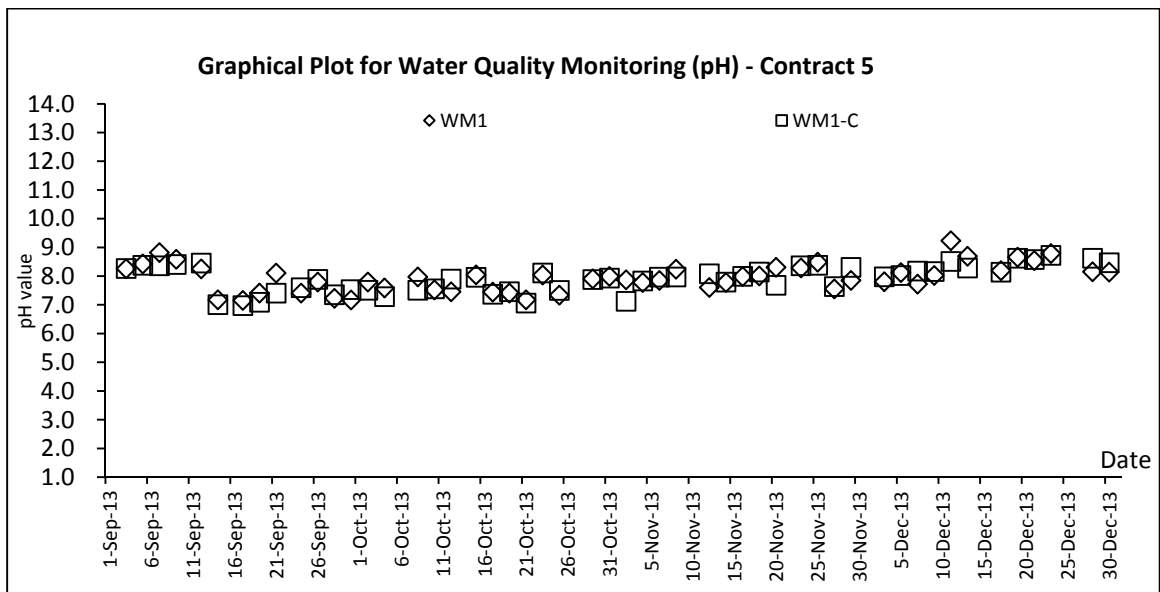
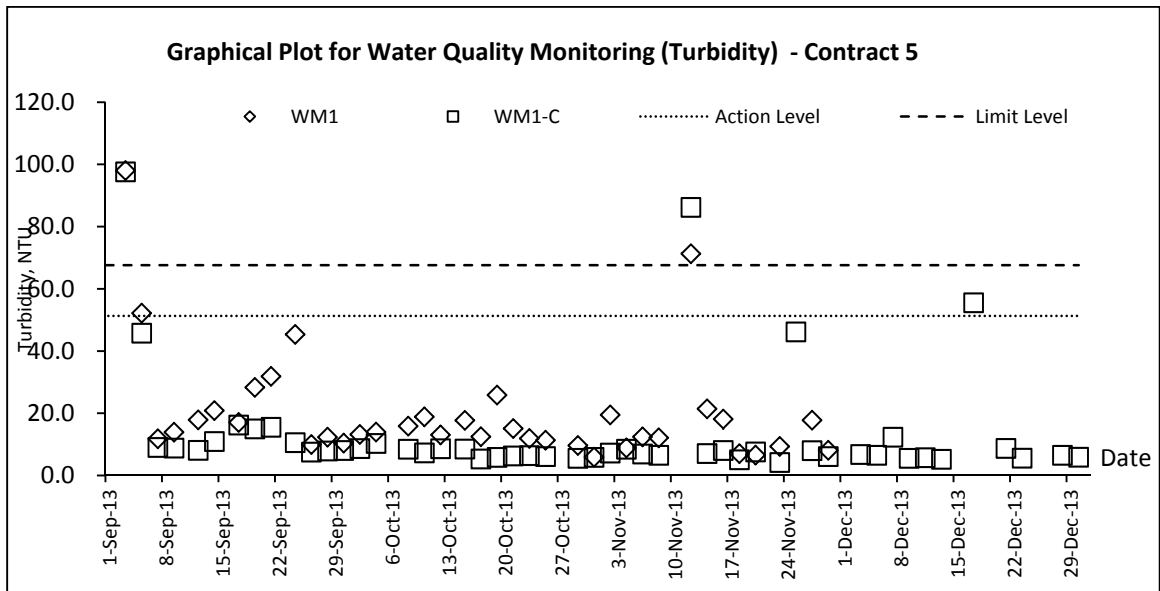
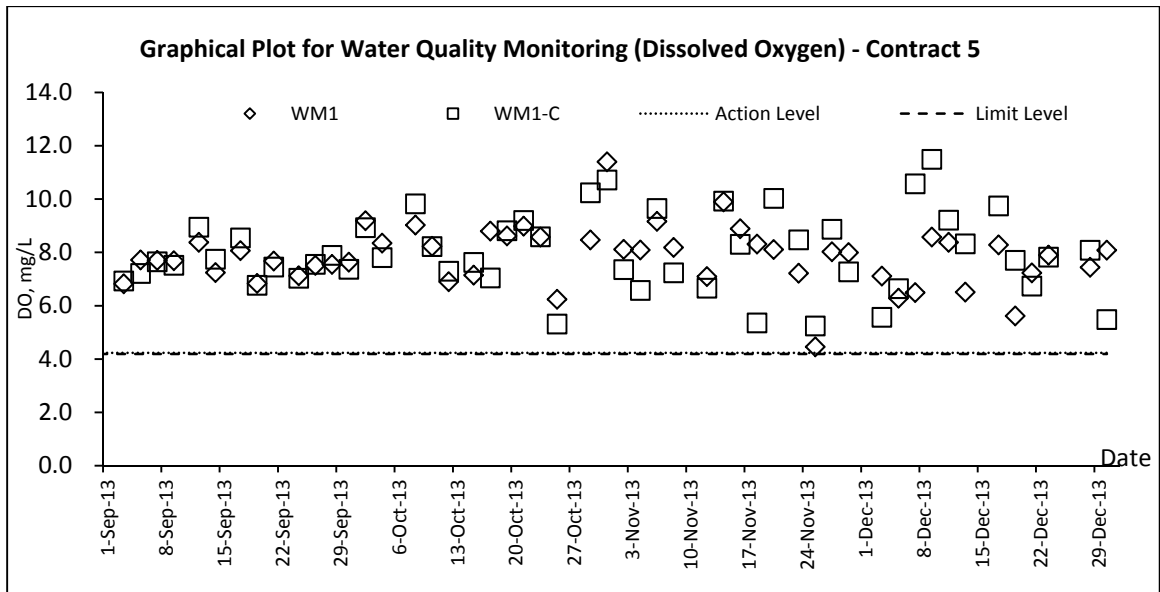


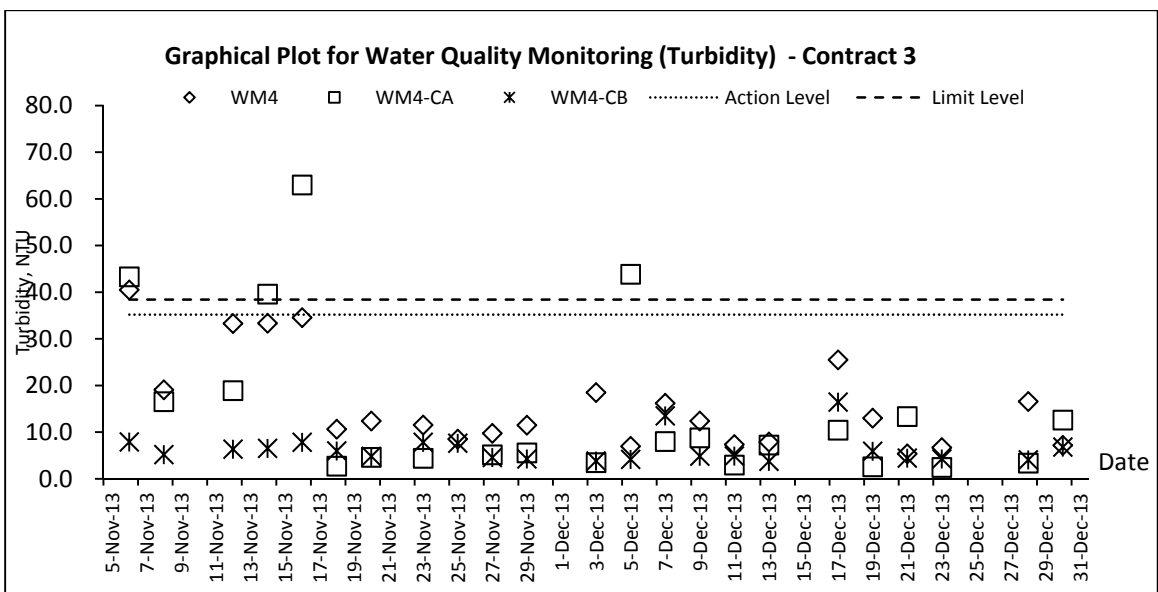
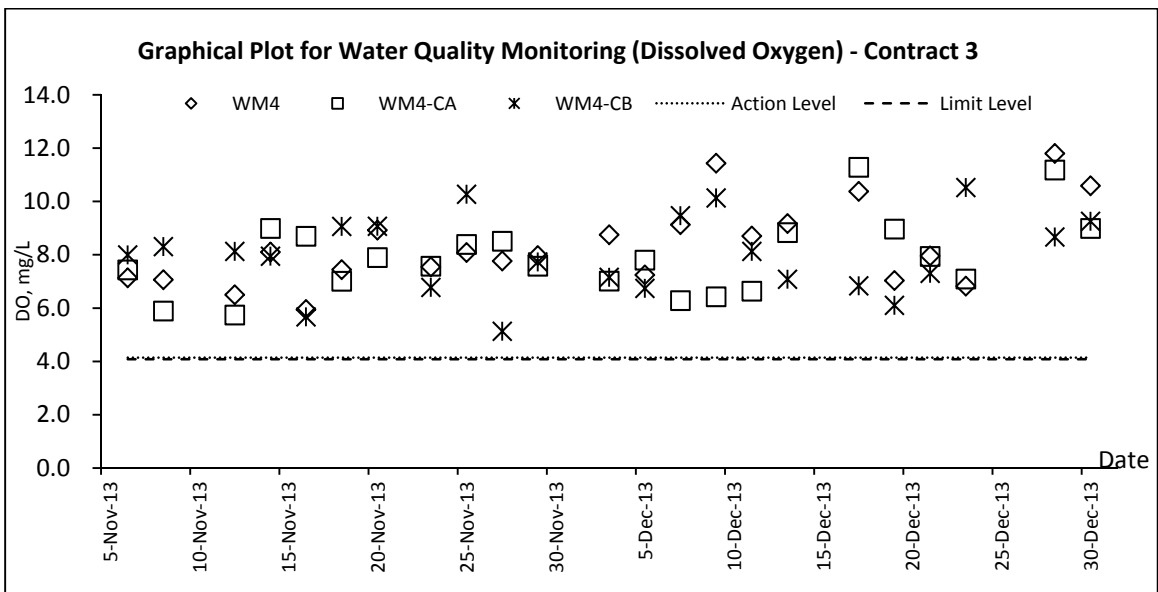
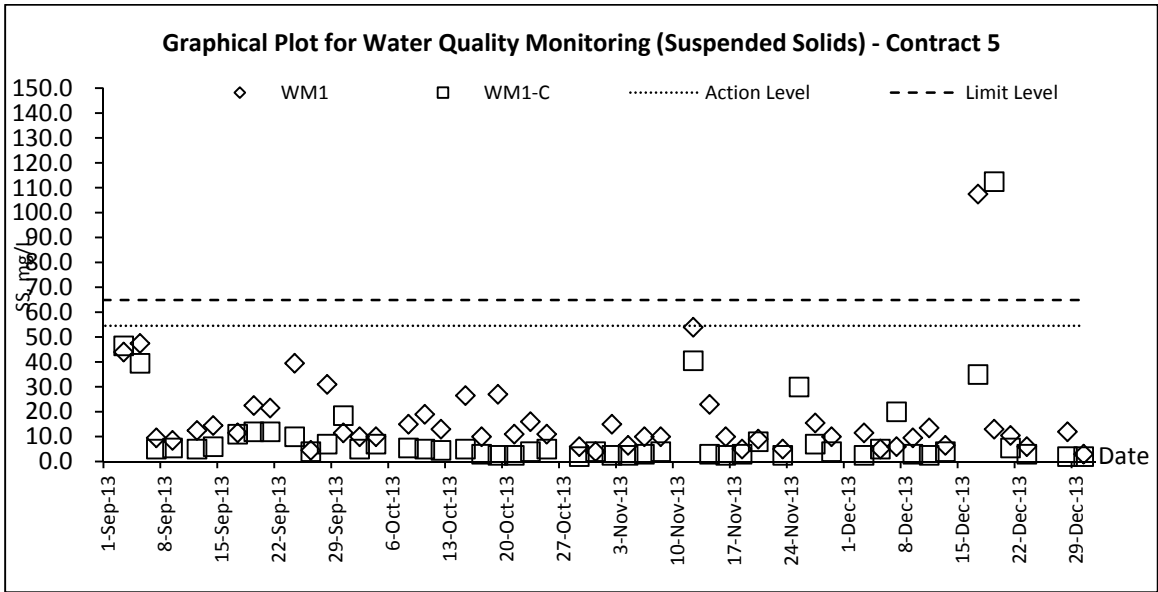
**Noise**



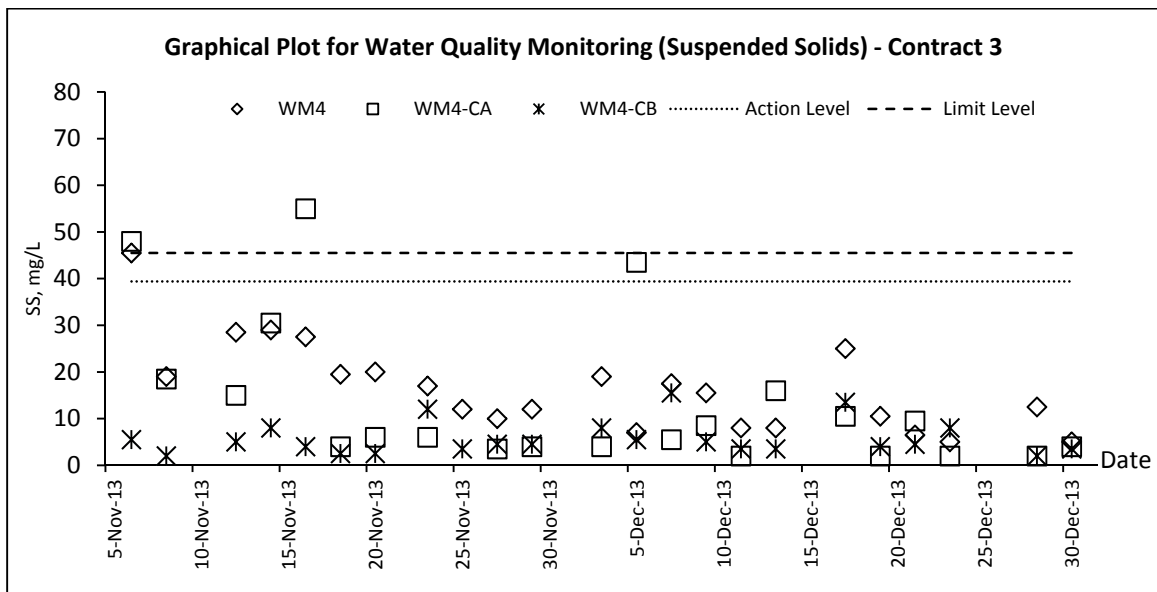
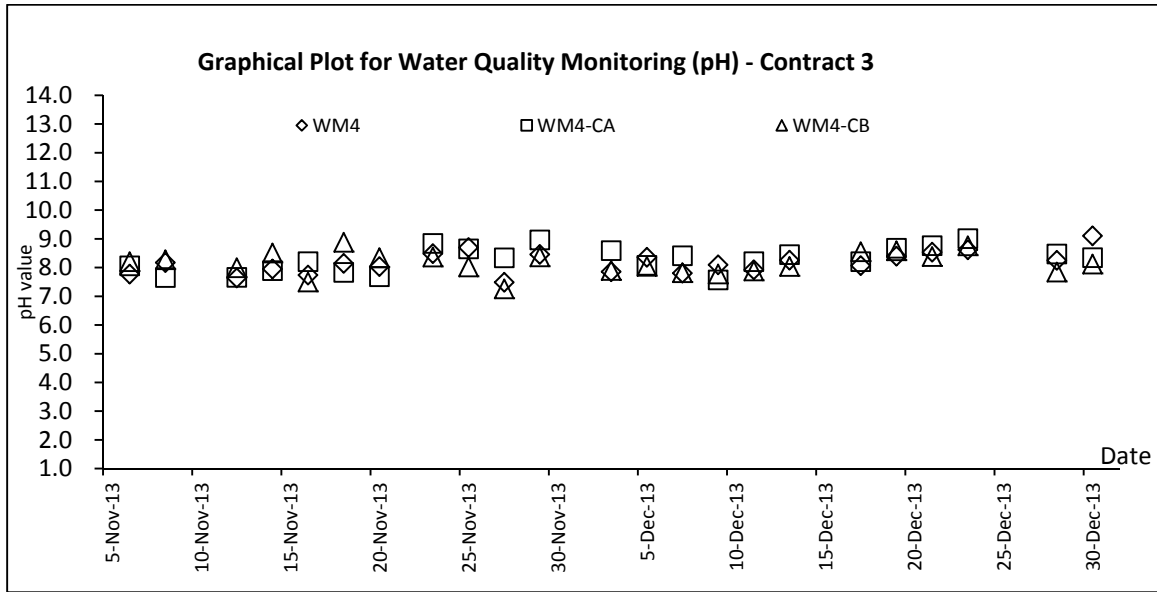


**Water Quality**









## **Appendix K**

### **Meteorological Data**

Date	Weather	Total Rainfall (mm)	Ta Kwu Ling Station				
			Mean Air Temp. (°C)	Wind Speed (km/h)	Mean Relative Humidity (%)	Wind Direction	
1-Dec-13	Sun	Fine and very dry. Moderate north to northeasterly winds.	0	14.1	5.4	***	N/NW
2-Dec-13	Mon	Fine and dry. Moderate east to northeasterly winds.	0	14.7	5.0	57.5	E
3-Dec-13	Tue	Fine and dry. Moderate east to northeasterly winds.	0	16.2	6.5	66.7	E/NE
4-Dec-13	Wed	Fine and dry. Moderate northeasterly winds.	0	15.4	10.1	61	N/NE
5-Dec-13	Thu	Fine and dry. Moderate northeasterly winds.	0	14.4	4.5	60	E/NE
6-Dec-13	Fri	Fine and dry apart from some haze. Moderate northeasterly winds.	0	14	9.7	59.7	N
7-Dec-13	Sat	Fine and dry. Moderate northeasterly winds.	0	15.5	4.4	67.2	N/NW
8-Dec-13	Sun	Fine and dry. Moderate northeasterly winds.	Trace	17.2	7.4	72	E/NE
9-Dec-13	Mon	Cloudy, haze, very dry. Moderate north to northeasterly winds.	0	20.6	7.5	62.5	E/NE
10-Dec-13	Tue	Cloudy, haze, dry, sunny periods. Moderate north to northeasterly winds.	0	19.1	10.4	52	N
11-Dec-13	Wed	Cloudy, dry, haze. Moderate east to northeasterly winds, fresh offshore.	0	17.5	7.5	58.5	N
12-Dec-13	Thu	Cloudy, dry, haze. Moderate east to northeasterly winds, fresh offshore.	Trace	16.2	6.0	59	N
13-Dec-13	Fri	Cloudy, dry, haze. Moderate east to northeasterly winds, fresh offshore.	Trace	16.6	4.4	78	N/NW
14-Dec-13	Sat	Cloudy, dry, haze. Moderate east to northeasterly winds, fresh offshore.	13	17.4	7.0	83.7	N/NW
15-Dec-13	Sun	Cloudy, rain. Fresh northerly winds, occasionally strong offshore and on high ground.	22.7	14.7	4.6	95	N/NW
16-Dec-13	Mon	Cloudy, rain. Fresh northerly winds, occasionally strong offshore and on high ground.	24.8	12.1	10.2	90.5	N/NW
17-Dec-13	Tue	Cloudy, rain. Fresh northerly winds, occasionally strong offshore and on high ground.	27.8	10.8	6.0	94.7	N/NW
18-Dec-13	Wed	Fine, dry, cold. Moderate to fresh northerly winds.	0	10.4	15.0	69	N.NE
19-Dec-13	Thu	Cloudy, dry, fine. Moderate north to northeasterly winds.	0	11.0	12.2	51.5	N
20-Dec-13	Fri	Cloudy, dry, fine. Moderate north to northeasterly winds.	0	11.1	6.4	67.5	N/NW
21-Dec-13	Sat	Fine, dry, cold. Moderate northeasterly winds.	0	12.7	8.2	62.2	N
22-Dec-13	Sun	Fine, dry, cold. Moderate northeasterly winds.	0	11.2	6.0	65.5	N/NW
23-Dec-13	Mon	Fine, dry, cold. Moderate northeasterly winds.	0	11.3	6.4	63.2	N/NW
24-Dec-13	Tue	Fine, dry, cold. Moderate northeasterly winds.	0	11.8	6.1	65.5	N/NW
25-Dec-13	Wed	Fine, very dry, haze, cold. Moderate north to northeasterly winds, fresh at times.	0	13.1	7.4	64	N/NE
26-Dec-13	Thu	Fine, very dry, haze, cold. Moderate north to northeasterly winds.	0	12.4	12.1	55	N/NE
27-Dec-13	Fri	Fine, very dry, haze, cold. Moderate north to northeasterly winds, fresh at times.	0	11.1	13.8	28.7	N/NW
28-Dec-13	Sat	Fine, dry, cloudy. Light to moderate east to northeasterly winds.	0	8.6	7.3	55	E
29-Dec-13	Sun	Fine, very dry, haze, cold. Moderate north to northeasterly winds, fresh at times.	0	9.2	5.0	57.2	E
30-Dec-13	Mon	Fine, dry, cloudy. Light to moderate east to northeasterly winds.	0	10.3	4.5	57.2	N/NW
31-Dec-13	Tue	Fine, dry, cloudy. Light to moderate east to northeasterly winds.	0	11.5	6.1	58	N/NW

Remarks: (\*\*\*) Maintenance

## **Appendix L**

### **Waste Flow Table**

### Monthly Summary Waste Flow Table for December 2013 (year)

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly					
	Total Quantity Generated (in '000m <sup>3</sup> )	Hard Rock and Large Broken Concrete (in '000m <sup>3</sup> )	Reused in the Contract (in '000m <sup>3</sup> )	Reused in other Projects (in '000m <sup>3</sup> )	Disposed as Public Fill (in '000m <sup>3</sup> )	Imported Fill (in '000m <sup>3</sup> )	Metals (in '000m <sup>3</sup> )	Paper/ cardboard packaging (in '000m <sup>3</sup> )	Plastics (see Note 3) (in '000m <sup>3</sup> )	Chemical Waste (in '000m <sup>3</sup> )	Others, e.g. general refuse (in '000m <sup>3</sup> )	
Jan												
Feb												
Mar												
Apr												
May												
Jun												
<b>Sub-total</b>												
Jul												
Aug	0	0	0	0	0	0	0	0	0	0	0	
Sep	0	0	0	0	0	0	0	0	0	0	0.004	
Oct	0	0	0	0	0	0	0	0	0	0	0.003	
Nov	1.351	0	0.473	0	0.878	0	0	0	0	0	0.055	
Dec	0.177	0.007	0.030	0	0.140	0.600	0	0	0	0	0.055	
<b>Total</b>	<b>1.528</b>	<b>0.007</b>	<b>0.503</b>	<b>0</b>	<b>1.018</b>	<b>0.600</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0.117</b>	

**Note:**

1. Assume the density of soil fill is 2 ton/m<sup>3</sup>.
2. Assume the density of rock and broken concrete is 2.5 ton/m<sup>3</sup>.
3. Assume each truck of C&D wastes is 5m<sup>3</sup>.
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.

Name of Department: CEDD

## Monthly Summary Waste Flow Table for 2013

Month	Actual Quantities of Inert C&D Materials Generated Monthly				Actual Quantities of C&D Wastes Generated Monthly							
	Total Quantity Generated (in '000m <sup>3</sup> )	Hard Rock and Large Broken Concrete (in '000m <sup>3</sup> )	Reused in the Contract (in '000m <sup>3</sup> )	Reused in other Projects (in '000m <sup>3</sup> )	Disposed as Public Fill (in '000m <sup>3</sup> )	Imported Fill (in '000m <sup>3</sup> )	Metals (in '000kg)	Paper/ cardboard packaging (in '000kg)	Plastics (in '000kg)	Chemical Waste (in '000kg)	Others, e.g. general refuse (in '000m <sup>3</sup> )	
JAN	--	--	--	--	--	--	--	--	--	--	--	
FEB	--	--	--	--	--	--	--	--	--	--	--	
MAR	--	--	--	--	--	--	--	--	--	--	--	
APRIL	0	0	0	0	0	0	0	0	0	0	0	
MAY	0	0	0	0	0	0	0	0	0	0	0	
JUN	0	0	0	0	0	0	0	0	0	0	0	
<b>Sub Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	
JUL	0	0	0	0	0	0	0	0	0	0	0.005	
AUG	0	0	0	0	0	0.771	0	0	0	0	0	
SEP	0	0	0	0	0	0.415	1.38	0	0	0	0.085	
OCT	0	0	0	0	0	24.770	7.02	0	0	0	1.060	
NOV	0	0	0	0	0	18.325	1.89	0	0	0	0.890	
<b>DEC</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4.76</b>	<b>11.53</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0.2</b>	
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>49.041</b>	<b>21.82</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2.24</b>	

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
  - 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?
<b>Air Quality Impact (Construction)</b>							
3.6.1.1	2.1	<p><b>General Dust Control Measures</b></p> <p>The following dust suppression measures should be implemented:</p> <ul style="list-style-type: none"> <li>■ 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</li> <li>■ 80% of stockpile areas should be covered by impervious sheets</li> <li>■ Speed of trucks within the site should be controlled to about 10 km/hr</li> <li>■ All haul roads within the site should be paved to avoid dust emission due to vehicular movement</li> </ul>	To minimize adverse dust emission generated from various construction activities of the works sites	Contractor	Construction Works Sites	During Construction	EIA Recommendation and Air Pollution Control (Construction Dust) Regulation
3.6.1.2	2.1	<p><b>Best Practice for Dust Control</b></p> <p>The relevant best practices for dust control as stipulated in the Air Pollution Control (Construction Dust) Regulation should be adopted to further reduce the construction dust impacts of the Project. These best practices include:</p> <p><i>Good site management</i></p> <ul style="list-style-type: none"> <li>■ The Contractor should maintain high standard of housekeeping to prevent emission of fugitive dust.</li> <li>■ 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.</li> <li>■ Any piles of materials accumulated on or around the work areas should be cleaned up regularly.</li> <li>■ 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.</li> <li>■ The material should be handled properly to prevent fugitive dust emission before cleaning.</li> </ul> <p><i>Disturbed Parts of the Roads</i></p> <ul style="list-style-type: none"> <li>■ Each and every main temporary access should be paved with</li> </ul>	To minimize adverse dust emission generated from various construction activities of the works sites	Contractor	Construction Works Sites	During Construction	EIA Recommendation and Air Pollution Control (Construction Dust) Regulation



EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to implement the measure?	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve?
		<p>concrete, bituminous hardcore materials or metal plates and kept clear of dusty materials; or</p> <ul style="list-style-type: none"> <li>Unpaved parts of the road should be sprayed with water or a dust suppression chemical so as to keep the entire road surface wet.</li> </ul> <p><i>Exposed Earth</i></p> <ul style="list-style-type: none"> <li>Exposed earth should be properly treated by compaction, hydroseeding, vegetation planting or seeding with latex, vinyl, bitumen within six months after the last construction activity on the site or part of the site where the exposed earth lies.</li> </ul> <p><i>Loading, Unloading or Transfer of Dusty Materials</i></p> <ul style="list-style-type: none"> <li>All dusty materials should be sprayed with water immediately prior to any loading or transfer operation so as to keep the dusty material wet.</li> </ul> <p><i>Debris Handling</i></p> <ul style="list-style-type: none"> <li>Any debris should be covered entirely by impervious sheeting or stored in a debris collection area sheltered on the top and the three sides.</li> <li>Before debris is dumped into a chute, water should be sprayed so that it remains wet when it is dumped.</li> </ul> <p><i>Transport of Dusty Materials</i></p> <ul style="list-style-type: none"> <li>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.</li> </ul> <p><i>Wheel washing</i></p> <ul style="list-style-type: none"> <li>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.</li> </ul> <p><i>Use of vehicles</i></p> <ul style="list-style-type: none"> <li>Immediately before leaving the construction site, every vehicle should be washed to remove any dusty materials from its body and wheels.</li> <li>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.</li> </ul>					

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to implement the measure?	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve?
		<p><i>Site hoarding</i></p> <ul style="list-style-type: none"> <li>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.</li> </ul> <p><i>Blasting</i></p> <ul style="list-style-type: none"> <li>The areas within 30m from the blasting area should be wetted with water prior to blasting.</li> </ul>					
<b><u>Air Quality Impact (Operation)</u></b>							
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: <ul style="list-style-type: none"> <li>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.</li> <li>Further odour containment will be achieved by covering or confining the sewage channels, sewage tanks, and equipment with potential odour emission.</li> <li>Proper mixing will be provided at the equalization and sludge holding tanks to prevent sewage septicity.</li> <li>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.</li> </ul>	To minimize potential odour impact from operation of the proposed sewage treatment work at BCP	DSD	BCP	Operation Phase	EIA recommendation
<b><u>Noise Impact (Construction)</u></b>							
4.4.1.4	3.1	<b>Adoption of Quieter PME</b> Use of the recommended quieter PME such as those given in the BS5228: Part 1:2009 and presented in <b>Table 4.14</b> , 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	<p><b>Use of Movable Noise Barrier</b></p> <p>The use of movable barrier for certain PME can further alleviate the construction noise impacts. In general, a 5 dB(A) reduction for movable PME and 10 dB(A) for stationary PME can be achieved depending on the actual design of the movable noise barrier. The Contractor shall be responsible for design of the movable noise barrier with due consideration given to the size of the PME and the requirement for intercepting the line of sight between the NSRs and PME. Barrier material with surface mass in excess of 7 kg/m<sup>2</sup> is recommended to achieve the predicted screening effect.</p>	To minimize the construction air-borne noise impact	Contractors	Construction Work Sites	During Construction	EIA recommendation, EIAO and NCO
4.4.1.4	3.1	<p><b>Use of Noise Enclosure/ Acoustic Shed</b></p> <p>The use of noise enclosure or acoustic shed is to cover stationary PME such as air compressor and concrete pump. With the adoption of the noise enclosure, the PME could be completely screened, and noise reduction of 15 dB(A) can be achieved according to the GW-TM.</p>	To minimize the construction air-borne noise impact	Contractors	Construction Work Sites	During Construction	EIA recommendation, EIAO and NCO
4.4.1.4	3.1	<p><b>Use of Noise Insulating Fabric</b></p> <p>Noise insulating fabric can be adopted for certain PME (e.g. drill rig, piling auger etc). The insulating fabric should be lapped such that there are no openings or gaps on the joints. Technical data from manufacturers state that by using the Fabric, a noise reduction of over 10 dB(A) can be achieved on noise level.</p>	To minimize the construction air-borne noise impact	Contractors	Construction Work Sites	During Construction	EIA recommendation, EIAO and NCO

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

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to implement the measure?	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve?
4.5.2.4	3.2	<p>The following noise reduction measures shall be considered as far as practicable during operation:</p> <ul style="list-style-type: none"> <li>• Choose quieter plant such as those which have been effectively silenced;</li> <li>• Include noise levels specification when ordering new plant (including chiller and E/M equipment);</li> <li>• Locate fixed plant/fouler away from any NSRs as far as practicable;</li> <li>• Locate fixed plant in walled plant rooms or in specially designed enclosures;</li> <li>• Locate noisy machines in a basement or a completely separate building;</li> <li>• Install direct noise mitigation measures including silencers, acoustic louvers and acoustic enclosure where necessary; and</li> <li>• 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.</li> </ul>	<p>To minimize the fixed plant noise impact</p>	<p>Managing Authority of the buildings / Contractor</p>	<p>BCP, Administration Building and all ventilation buildings</p>	<p>Before Operation</p>	<p>EIAO and NCO</p>
<b><u>Water Quality Impact (Construction)</u></b>							
5.6.1.1	4.1	<p><b>Construction site runoff and drainage</b></p> <p>The site practices outlined in ProPECC Note PN 1/94 should be followed as far as practicable in order to minimise surface runoff and the chance of erosion. The following measures are recommended to protect water quality and when properly implemented should be sufficient to adequately control site discharges so as to avoid water quality impacts:</p> <ul style="list-style-type: none"> <li>■ 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.</li> <li>■ The dikes or embankments for flood protection should be implemented around the boundaries of earthwork areas.</li> </ul>	<p>To control site runoff and drainage; prevent high sediment loading from reaching the nearby watercourses</p>	<p>Contractor</p>	<p>Construction Works Sites</p>	<p>Construction Phase</p>	<p>Practice Note for Professional Persons on Construction Site Drainage (ProPECC Note PN 1/94)</p>

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to implement the measure?	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve?
		<p>Temporary ditches should be provided to facilitate the runoff discharge into stormwater drainage system through a sediment/silt trap. The sediment/silt traps should be incorporated in the permanent drainage channels to enhance deposition rates, if practical.</p> <ul style="list-style-type: none"> <li>■ 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.</li> <li>■ 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.</li> <li>■ 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.</li> <li>■ 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.</li> <li>■ The overall slope of the site should be kept to a minimum to reduce</li> </ul>					

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to implement the measure?	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve?
		<p>the erosive potential of surface water flows.</p> <ul style="list-style-type: none"> <li>■ 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.</li> <li>■ 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.</li> <li>■ 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.</li> <li>■ 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.</li> <li>■ 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.</li> </ul>					
5.6.1.1	4.1	<p><b>Good site practices for works within water gathering grounds</b> The following conditions should be complied, if there is any works to be carried out within the water gathering grounds:</p>	To minimize water quality impacts to the water gathering grounds	Contractor	Construction Works Sites within the water gathering	Construction Phase	ProPECC Note PN 1/94

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			<p>grounds</p> <ul style="list-style-type: none"> <li>▪ Adequate measures should be implemented to ensure no pollution or siltation occurs to the catchwaters and catchments.</li> <li>▪ 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.</li> <li>▪ All surplus spoil should be removed from water gathering grounds as soon as possible.</li> <li>▪ Temporary drains with silt traps should be constructed at the site boundary before the commencement of any earthworks.</li> <li>▪ Regular cleaning of silt traps should be carried out to ensure proper operation at all time.</li> <li>▪ All excavated or filled surfaces which have the risk of erosion should always be protected from erosion.</li> <li>▪ Facilities for washing the wheels of vehicles before leaving the site should be provided.</li> <li>▪ Any construction plant which causes pollution to catchwaters or catchments due to the leakage of oil or fuel should be removed off site immediately.</li> <li>▪ 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.</li> <li>▪ 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.</li> <li>▪ 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.</li> <li>▪ Drainage plans should be submitted for approval by the Director of</li> </ul>				



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		<p>Water Supplies.</p> <ul style="list-style-type: none"> <li>■ An unimpeded access through the waterworks access road should always be maintained.</li> <li>■ Earthworks near catchwaters or streamcourses should only be carried out in dry season between October and March,</li> <li>■ Advance notice must be given before the commencement of works on site quoting WSD's approval letter reference.</li> </ul>					
5.6.1.2	4.1	<p><b>Good site practices of general construction activities</b> 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.</p>	To minimize water quality impacts	Contractor	All construction works sites	Construction phase	EIA Recommendation
5.6.1.3	4.1	<p><b>Sewage effluent from construction workforce</b> Temporary sanitary facilities, such as portable chemical toilets, should be employed on-site where necessary to handle sewage from the workforce. A licensed contractor should be employed to provide appropriate and adequate portable toilets and be responsible for appropriate disposal and maintenance.</p>	To minimize water quality impacts	Contractor	All construction works sites with on-site sanitary facilities	Construction phase	EIA Recommendation and Water Pollution Control Ordinance (WPCO)
5.6.1.4	4.1	<p><b>Hydrogeological Impact</b> Grout injection works would be conducted before blasting, for sealing a limited area around the tunnel with a grout of a suitable strength for controlling the potential groundwater inflows. The pre-injection grouting method would be supplemented by post-injection grouting where necessary to further enhance the groundwater inflow control. On-site treatment for the groundwater ingress pumped out would be required to remove any contamination by grouting materials before discharge off-site.</p>	To minimize water quality impacts	Contractor	Construction works sites of the drill and blast tunnel	Construction phase	EIA Recommendation and WPCO
<p><b><u>Water Quality Impact (Operation)</u></b></p> <p>No mitigation measure is required.</p>							

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**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 WPCCO
<b><u>Sewage and Sewerage Treatment Impact (Operation)</u></b>							
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 WPCCO
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 WPCCO

**Waste Management Implication (Construction)**

7.6.1.1	6	<p><b>Good Site Practices</b></p> <p>Adverse impacts related to waste management such as potential hazard, air, odour, noise, wastewater discharge and public transport as mentioned in section 3.4.7.2 (ii)(c) of the Study Brief are not expected to arise, provided that good site practices are strictly followed. Recommendations for good site practices during the construction activities include:</p> <ul style="list-style-type: none"> <li>■ 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</li> <li>■ Training of site personnel in proper waste management and chemical handling procedures</li> <li>■ Provision of sufficient waste disposal points and regular collection of waste</li> <li>■ 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</li> <li>■ General refuse shall be removed away immediately for disposal. As</li> </ul>	To minimize adverse environmental impact	Contractor	Construction works sites (general)	Construction Phase	EIA recommendation; Waste Disposal Ordinance; Waste Disposal (Chemical Wastes) (General) Regulation; and ETWB TC(W) No. 19/2005, Environmental Management on Construction Site
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		<p>such odour is not anticipated to be an issue to distant sensitive receivers</p> <ul style="list-style-type: none"> <li>■ Provision of wheel washing facilities before the trucks leaving the works area so as to minimise dust introduction from public road</li> <li>■ Covers and water spraying system should be provided for the stockpiled C&amp;D material to prevent dust impact or being washed away</li> <li>■ Designate different locations for storage of C&amp;D material to enhance reuse</li> <li>■ Well planned programme for transportation of C&amp;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&amp;D material is not anticipated</li> <li>■ 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</li> <li>■ Provision of cover for the stockpile material, sand bag or earth bund as barrier to prevent material from washing away and entering the drains</li> </ul>					
7.6.1.2	6	<p><b>Waste Reduction Measures</b></p> <p>Good management and control can prevent the generation of a significant amount of waste. Waste reduction is best achieved at the planning and design stage, as well as by ensuring the implementation of good site practices. Recommendations to achieve waste reduction include:</p> <ul style="list-style-type: none"> <li>■ 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</li> <li>■ 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</li> <li>■ Proper storage and site practices to minimise the potential for damage or contamination of construction materials</li> <li>■ Plan and stock construction materials carefully to minimise amount</li> </ul>	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?
7.6.1.3	6	<p>of waste generated and avoid unnecessary generation of waste</p> <ul style="list-style-type: none"> <li>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.</li> </ul>	<p><b>C&amp;D Materials</b></p> <p>In order to minimise impacts resulting from collection and transportation of C&amp;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&amp;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&amp;D waste generated from general site clearance and tree felling works would require disposal to the designated landfill site. Other mitigation requirements are listed below:</p> <ul style="list-style-type: none"> <li>A Waste Management Plan should be prepared and implemented in accordance with ETWB TC(W) No. 19/2005 Environmental Management on Construction Site; and</li> <li>In order to monitor the disposal of C&amp;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.</li> </ul>	Contractor	Construction Works Sites (General)	Construction Phase	EIA recommendation; Waste Disposal Ordinance; and ETWB TCW No. 31/2004
7.6.1.4	6	<p><b>General refuse</b></p> <p>General refuse should be stored in enclosed bins or compaction units separated from other C&amp;D material. A reputable waste collector is to be employed by the Contractor to remove general refuse from the site separately. Preferably an enclosed and covered area should be provided to reduce the occurrence of 'wind blown' litter.</p>	<p>To minimize impacts resulting from collection and transportation of general refuse for off-site disposal</p>	Contractor	Construction works sites (General)	Construction phase	Waste Disposal Ordinance and Public Health and Municipal Services Ordinance - Public Cleansing and Prevention of Nuisances Regulation
7.6.1.5	6	<p><b>Chemical waste</b></p> <p>If chemical wastes are produced at the construction site, the Contractor will be required to register with the EPD as a chemical waste producer and to follow the guidelines stated in the <i>Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes</i>. Good quality containers compatible with the chemical wastes should be used, and incompatible chemicals should be stored separately. Appropriate labels should be securely attached on each chemical waste container indicating the corresponding chemical characteristics of the chemical</p>	<p>To minimize impacts resulting from collection and transportation of chemical waste for off-site disposal</p>	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