

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.18) – JANUARY 2015**

**PREPARED FOR
CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT
(CEDD)**

Date	Reference No.	Prepared By	Certified By
11 February 2015	TCS00670/13/600/R0309v2	 Nicola Hon (Environmental Consultant)	 Tam Tak Wing (Environmental Team Leader)

Version	Date	Remarks
1	9 February 2015	First Submission
2	11 February 2015	Amended according to the IEC's comments on 10 February 2015

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

12 February 2015

Our ref: 7076192/L17921/R/AB/AW/FL/rw

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

By Email & Post

Attention: Mr Simon LEUNG

Dear Sirs

**Agreement No. CE 45/2008 (CE)
Liantang/Heung Yuen Wai Boundary Control Point and Associated Works
Independent Environmental Checker – Investigation
Monthly EM&A Report (No. 18) – January 2015**

With reference to the Monthly EM&A Report No. 18 for January 2015 (Version 2) certified by the ET Leader provided to us on 12 February 2015, please be noted that we have no adverse comments on the captioned submission. We herewith verify the captioned submission in accordance with Condition 5.4 of the Environmental Permit No. EP-404/2011/B.

Thank you for your attention and please do not hesitate to contact the undersigned on tel. 3995 8120 or by email to antony.wong@smec.com; or our Mr Francis LEE on tel. 3995 8144 or by email to francis.lee@smec.com.

Yours faithfully
For and on behalf of
SMEC Asia Limited



Antony WONG

Independent Environmental Checker

cc	CEDD/BCP	-	Mr Pui Sang LI / Mr Eric CHAN / Mr William CHEUNG / Mr CM OR	by fax: 3547 1659
	AECOM	-	Mr Pat LAM / Mr Perry YAM	by email
	SRJV	-	Mr Edwin AU	by email
	CW	-	Mr Daniel HO	by email
	DHK	-	Mr Raymond CHENG	by email
	AUES	-	Mr TW TAM	by email

EXECUTIVE SUMMARY

ES01 This is the 18th monthly EM&A report presenting the monitoring results and inspection findings for the reporting period from **1 to 31 January 2015** (hereinafter ‘the Reporting Period’).

ENVIRONMENTAL MONITORING AND AUDIT ACTIVITIES

ES02 To facilitate the project management and implementation, Liantang/Heung Yuen Wai Boundary Control Point and Associated Works of the Project is divided five CEDD contracts including Contract 2 (CV/2012/08), Contract 3 (CV/2012/09), Contract 4 (TCSS), Contract 5 (CV/2013/03) and Contract 6 (CV/2013/08).

ES03 Currently, the construction works has been undertaken for Contract 2, Contract 3 and Contract 5. Environmental monitoring activities under the EM&A programme in the Reporting Period are summarized in the following table.

Environmental Aspect	Environmental Monitoring Parameters / Inspection	Reporting Period	
		Number of Monitoring Locations to undertake	Total Occasions
Air Quality	1-hour TSP	6	90
	24-hour TSP	6	30
Construction Noise	L _{eq(30min)} Daytime	8	40
Water Quality	Water sampling	5	13 ^(*)
Joint Site Inspection / Audit	IEC, ET, the Contractor and RE joint site Environmental Inspection and Auditing	Contract 2	5
		Contract 3	4
		Contract 5	4

^(*) Monitoring day

BREACH OF ACTION AND LIMIT (A/L) LEVELS

ES04 In the Reporting Period, no noise complaint (which is an Action Level exceedance) was registered for the Project. For air quality monitoring, there were a total of six (6) Action Level exceedances of 1-hour TSP and one (1) Action Level exceedance of 24-hour TSP recorded. For water quality monitoring, a total three (3) Limit Level exceedances in DO were recorded at location WM1. The summary of breach of environmental performance is shown below.

Environmental Aspect	Monitoring Parameters	Action Level	Limit Level	Event & Action		
				NOE Issued	Investigation Result	Corrective Actions
Air Quality	1-hour TSP	6	0	6	Investigation in progress	Investigation in progress
	24-hour TSP	1	0	1		
Construction Noise	L _{eq(30min)} Daytime	0	0	0	--	--
Water Quality	DO	0	3	3	Not project related	N/A
	Turbidity	0	0	0		
	SS	0	0	0		

ENVIRONMENTAL COMPLAINT

ES05 In this Reporting Period, three (3) documented environmental complaints was received and lodged for Contracts 2 regarding to dust and soil/muddy water impact. Follow up actions have been undertaken by the Contractor to resolve the complaints and deficiencies in due time. Investigation reports for the complaint had completed and concluded that all the complaints were not related to the Contract and they have been submitted to all relevant parties.

NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTIONS

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

REPORTING CHANGE

ES07 No reporting changes were made in the Reporting Period.

SITE INSPECTION

ES08 In this Reporting Period, joint site inspection to evaluate the site environmental performance at **Contract 2** has been carried out by the RE, IEC, ET and the Contractor on **2, 9, 16, 23 and 30 January 2015**. No non-compliance was noted.

ES09 In the Reporting Period, joint site inspection to evaluate the site environmental performance at **Contract 3** has been carried out by the RE, IEC, ET and the Contractor on **5, 14, 19 and 26 January 2015**. No non-compliance was noted.

ES10 In the Reporting Period, joint site inspection to evaluate the site environmental performance at **Contract 5** has been carried out by the RE, IEC, ET and the Contractor on **8, 15, 22 and 29 January 2015**. No non-compliance was noted.

FUTURE KEY ISSUES

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

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

ES13 Construction noise would be a key environmental issue during construction work of the Project. Noise mitigation measures such as using quiet plants should be implemented in accordance with the EM&A requirement.

Table of Contents

1	INTRODUCTION	1
1.1	PROJECT BACKGROUND	1
1.2	REPORT STRUCTURE	1
2	PROJECT ORGANIZATION AND CONSTRUCTION PROGRESS	3
2.1	CONSTRUCTION CONTRACT PACKAGING	3
2.2	PROJECT ORGANIZATION	4
2.3	CONCURRENT PROJECTS	6
2.4	CONSTRUCTION PROGRESS	6
2.5	SUMMARY OF ENVIRONMENTAL SUBMISSIONS	7
3	SUMMARY OF IMPACT MONITORING REQUIREMENTS	10
3.1	GENERAL	10
3.2	MONITORING PARAMETERS	10
3.3	MONITORING LOCATIONS	10
3.4	MONITORING FREQUENCY AND PERIOD	12
3.5	MONITORING EQUIPMENT	13
3.6	MONITORING METHODOLOGY	15
3.7	EQUIPMENT CALIBRATION	16
3.8	DERIVATION OF ACTION/LIMIT (A/L) LEVELS	17
3.9	DATA MANAGEMENT AND DATA QA/QC CONTROL	18
4	AIR QUALITY MONITORING	19
4.1	GENERAL	19
4.2	AIR QUALITY MONITORING RESULTS IN REPORTING MONTH	19
5	CONSTRUCTION NOISE MONITORING	21
5.1	GENERAL	21
5.2	NOISE MONITORING RESULTS IN REPORTING MONTH	21
6	WATER QUALITY MONITORING	22
6.1	GENERAL	22
6.2	RESULTS OF WATER QUALITY MONITORING	22
7	WASTE MANAGEMENT	25
7.1	GENERAL WASTE MANAGEMENT	25
7.2	RECORDS OF WASTE QUANTITIES	25
8	SITE INSPECTION	26
8.1	REQUIREMENTS	26
8.2	FINDINGS / DEFICIENCIES DURING THE REPORTING MONTH	26
9	ENVIRONMENTAL COMPLAINT AND NON-COMPLIANCE	29
9.1	ENVIRONMENTAL COMPLAINT, SUMMONS AND PROSECUTION	29
10	IMPLEMENTATION STATUS OF MITIGATION MEASURES	31
10.1	GENERAL REQUIREMENTS	31
10.2	TENTATIVE CONSTRUCTION ACTIVITIES IN THE COMING MONTH	31
10.3	KEY ISSUES FOR THE COMING MONTH	32
11	CONCLUSIONS AND RECOMMENDATIONS	34
11.1	CONCLUSIONS	34
11.2	RECOMMENDATIONS	34

LIST OF TABLES

TABLE 3-1	SUMMARY OF EM&A REQUIREMENTS
TABLE 3-2	IMPACT MONITORING STATIONS - AIR QUALITY
TABLE 3-3	IMPACT MONITORING STATIONS - CONSTRUCTION NOISE
TABLE 3-4	IMPACT MONITORING STATIONS - WATER QUALITY
TABLE 3-5	AIR QUALITY MONITORING EQUIPMENT
TABLE 3-6	CONSTRUCTION NOISE MONITORING EQUIPMENT
TABLE 3-7	WATER QUALITY MONITORING EQUIPMENT
TABLE 3-8	ACTION AND LIMIT LEVELS FOR AIR QUALITY MONITORING
TABLE 3-9	ACTION AND LIMIT LEVELS FOR CONSTRUCTION NOISE
TABLE 3-10	ACTION AND LIMIT LEVELS FOR WATER QUALITY
TABLE 4-1	SUMMARY OF 24-HOUR AND 1-HOUR TSP MONITORING RESULTS – AM1A
TABLE 4-2	SUMMARY OF 24-HOUR AND 1-HOUR TSP MONITORING RESULTS – AM2
TABLE 4-3	SUMMARY OF 24-HOUR AND 1-HOUR TSP MONITORING RESULTS – AM3
TABLE 4-4	SUMMARY OF 24-HOUR AND 1-HOUR TSP MONITORING RESULTS – AM7A
TABLE 4-5	SUMMARY OF 24-HOUR AND 1-HOUR TSP MONITORING RESULTS – AM8
TABLE 4-6	SUMMARY OF 24-HOUR AND 1-HOUR TSP MONITORING RESULTS – AM9B
TABLE 5-1	SUMMARY OF CONSTRUCTION NOISE MONITORING RESULTS
TABLE 6-1	SUMMARY OF WATER QUALITY MONITORING RESULTS FOR CONTRACT 3
TABLE 6-2	SUMMARY OF WATER QUALITY MONITORING RESULTS FOR CONTRACT 5
TABLE 6-3	BREACHES OF WATER QUALITY MONITORING CRITERIA IN REPORTING PERIOD
TABLE 7-1	SUMMARY OF QUANTITIES OF INERT C&D MATERIALS
TABLE 7-2	SUMMARY OF QUANTITIES OF C&D WASTES
TABLE 8-1	SITE OBSERVATIONS FOR CONTRACT 2
TABLE 8-2	SITE OBSERVATIONS FOR CONTRACT 3
TABLE 8-3	SITE OBSERVATIONS FOR CONTRACT 5
TABLE 9-1	STATISTICAL SUMMARY OF ENVIRONMENTAL COMPLAINTS
TABLE 9-2	STATISTICAL SUMMARY OF ENVIRONMENTAL SUMMONS
TABLE 9-3	STATISTICAL SUMMARY OF ENVIRONMENTAL PROSECUTION
TABLE 10-1	ENVIRONMENTAL MITIGATION MEASURES

LIST OF APPENDICES

APPENDIX A	LAYOUT PLAN OF THE PROJECT
APPENDIX B	ORGANIZATION CHART
APPENDIX C	3-MONTH ROLLING CONSTRUCTION PROGRAM
APPENDIX D	DESIGNATED MONITORING LOCATIONS AS RECOMMENDED IN THE APPROVED EM&A MANUAL
APPENDIX E	MONITORING LOCATIONS FOR IMPACT MONITORING
APPENDIX F	CALIBRATION CERTIFICATE OF MONITORING EQUIPMENT AND HOKLAS-ACCREDITATION CERTIFICATE OF THE TESTING LABORATORY
APPENDIX G	EVENT AND ACTION PLAN
APPENDIX H	IMPACT MONITORING SCHEDULE
APPENDIX I	DATABASE OF MONITORING RESULT
APPENDIX J	GRAPHICAL PLOTS FOR MONITORING RESULT
APPENDIX K	METEOROLOGICAL DATA
APPENDIX L	WASTE FLOW TABLE
APPENDIX M	IMPLEMENTATION SCHEDULE FOR ENVIRONMENTAL MITIGATION MEASURES

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/B granted on 24 December 2014.
- 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 **18th** monthly EM&A report presenting the monitoring results and inspection findings for reporting period from **1** to **31 January 2015**.

1.2 REPORT STRUCTURE

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

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

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

2 PROJECT ORGANIZATION AND CONSTRUCTION PROGRESS

2.1 CONSTRUCTION CONTRACT PACKAGING

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

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

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

Contract 2 (CV/2012/08)

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

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

Contract 3 (CV/2012/09)

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

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

Contract 4 (Contract number to be assigned)

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

Contract 5 (CV/2013/03)

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

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

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

Contract 6 (CV/2013/08)

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

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

2.2 PROJECT ORGANIZATION

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

Civil Engineering and Development Department (CEDD)

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

Environmental Protection Department (EPD)

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

Engineer or Engineers Representative (ER)

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

- Monitor the Contractors' compliance with contract specifications, including the implementation and operation of the environmental mitigation measures and their effectiveness
- Monitor Contractors's, ET's and IEC's compliance with the requirements in the Environmental Permit (EP) and EM&A Manual
- Facilitate ET's implementation of the EM&A programme
- Participate in joint site inspection by the ET and IEC
- Oversee the implementation of the agreed Event / Action Plan in the event of any exceedance
- Adhere to the procedures for carrying out complaint investigation
- Liaison with DSD, Engineer/Engineer's Representative, ET, IEC and the Contractor of the "Construction of the DSD's 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/B);
- (c) Widening of Fanling Highway – Tai Hang to Wo Hop Shek Interchange – Contract No. HY/2012/06;
- (d) Construction of cross-boundary vehicular and pedestrian bridges (total 5 numbers) across the Shenzhen River; and
- (e) Construction of BCP facilities in Shenzhen.

2.4 CONSTRUCTION PROGRESS

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

Contract 2 (CV/2012/08)

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

- | | |
|-----------------|---|
| Mid-Vent Portal | <ul style="list-style-type: none">• Sub-station construction and CLP installation• Top heading canopies and bench excavation• Blast Door installation completion |
| North Portal | <ul style="list-style-type: none">• Sub-station construction• Permanent slope formation• Excavation stage 2• Site installation for TBM works• Top heading excavation (canopies) for Southbound |
| South Portal | <ul style="list-style-type: none">• Sub-station construction and CLP installation• Permanent and temporary Cut Slope• Tree transplanting and removal• Wheel washer and weight bridge installation + pavement works• Site formation and temporary drainage works |

Contract 3 (CV/2012/09)

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

- Erection of temporary support at DSD nullah
- Pile cap for Bridge E
- Abutment construction for Bridge E
- Cable detection and trial trenches
- Catch fence erection
- Filling Works at Tong Hang East
- Lagging wall and capping beam for bored pile wall
- Storm drains laying
- Water pipes laying
- Construction of noise barriers
- Pier construction
- Pile cap works
- Piling works
- Pre-drilling
- Construction of valve control and telemetry house
- Retaining structure construction
- Road works at Fanling Highway
- Socket H-pile installation
- Utilities duct laying
- Tree felling works

Contract 4 (Contract number to be assigned)

- The contract has not yet been awarded.

Contract 5 (CV/2013/03)

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

- Bituminous laying at proposed Lin Ma Hang (LMH) road
- Construction of Eastern pedestrian subway and pump room at LMH
- Deck construction works at Bridge J
- Construction of retaining wall No.1 & 5
- Drainage works at existing / proposed Lin Ma Hang Road
- Drainage works at BCP area
- Water works at existing / proposed Lin Ma Hang Road
- Formation Works at BCP Area
- Pruning/ felling/ transplanting of existing tree
- Environmental impact monitoring
- Soil cement slope along BCP Area.
- Installation of underground utilities at proposed LMH road.
- Dismantling of asbestos at BCP4
- Road works (kerb laying) for proposed LMH Road
- Utility laying (132kV & 11kV) at existing LMH road

Contract 6 (CV/2013/08)

- The contract has not yet been awarded

2.5 SUMMARY OF ENVIRONMENTAL SUBMISSIONS

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

- Project Layout Plans of Contracts 2, 3 and 5
- Landscape Plan
- Topsoil Management Plan
- Environmental Monitoring and Audit Programme

- Baseline Monitoring Report (TCS00690/13/600/R0030v3) for the Project
- Waste Management Plan of the Contracts 3 and 5
- Contamination Assessment Plan (CAP) for Po Kat Tsai, Loi Tung and the workshops in Fanling
- Contamination Assessment Report (CAR) for Po Kat Tsai, Loi Tung and the workshops in Fanling
- Vegetation Survey Report

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

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

Item	Description	License/Permit Status	
Contract 2			
1	Air pollution Control (Construction Dust) Regulation	Ref No.: 368864	31 Dec 2013
2	Chemical Waste Producer Registration	North Portal Waste Producers Number: No. 5213-652-D2523-01	Valid from 25 Mar 2014
		Mid-Vent Portal Waste Producers Number: No. 5213-634-D2524-01	Valid from 25 Mar 2014
		South Portal Waste Producers Number: No. 5213-634-D2526-01	Valid from 9 Apr 2014
3	Water Pollution Control Ordinance - Discharge License	No.WT00018374-2014	Valid from 3 Mar 2014 to 28 Feb 2019
		No.: W5/1I389	Valid from 28 Mar 2014 to 31 Mar 2019
		No.: W5/1I390	Valid from 24 Mar 2014 to 31 Mar 2019 Surrendered, effective 19 June 2014
		No.: W5/1I391	Valid from 28 Mar 2014 to 31 Mar 2019
		No.: W5/1I392	Valid from 28 Mar 2014 to 31 Mar 2019
4	Waste Disposal Regulation - Billing Account for Disposal of Construction Waste	Account No. 7019105	Valid from 8 Jan 2014
5	Construction Noise Permit	GW-RN0693-14	Valid 11 Nov 2014 - 10 May 2015
		GW-RN0656-14	Valid 27 Oct 2014 - 21 Apr 2015
		GW-RN0704-14	Valid 1 Dec 2014 - 31 Jan 2015
		GW-RN0778-14	Valid 29 Dec 2014 - 28 Jun 2015
		GW-RN0020-15	Valid 21 Jan 2015 - 18 Feb 2015
Contract 3			

Item	Description	License/Permit Status	
1	Air pollution Control (Construction Dust) Regulation	Ref. No: 362101	Notification received by EPD on 17 Jul 2013
2	Chemical Waste Producer Registration	Waste Producers Number: No.:5113-634-C3817-01	Valid form 7 Oct 2013 till the end of Contract
3	Water Pollution Control Ordinance - Discharge License	No.:WT00016832 – 2013	Valid from 28 Aug 13 to 31 Aug 2018
4	Waste Disposal Regulation - Billing Account for Disposal of Construction Waste	Account No. 7017914	Valid form 2 Aug 13 till the end of Contract
5	Construction Noise Permit	GW-RN0445-14	Valid on 28 Jul 2014 till 25 Jan 2015
		GW-RN0485-14	Valid on 7 Aug 2014 till 5 Feb 2015
		GW-RN0684-14	Valid on 16 Nov 2014 till 26 Apr 2015
		GW-RN0720-14	Valid on 21 Nov 2014 till 3 Jan 2015
		GW-RN0810-14	Valid on 4 Jan 2015 till 15 Feb 2015
		GW-RN0022-15	Valid on 25 Jan 2015 till 22 Feb 2015
		GW-RN0045-15	Valid on 31 Jan 2015 till 28 Feb 2015
Contract 5			
1	Air pollution Control (Construction Dust) Regulation	Ref. No: 359338	Notified EPD on 13 May 2013
2	Chemical Waste Producer Registration	Waste Producers Number No.: 5213-642-S3735-01	Valid form 8 Jun 2013 till the end of Contract
3	Water Pollution Control Ordinance - Discharge License	No.: W5/1G44/1	Valid from 8 Jun 13 to 30 Jun 2018
4	Waste Disposal Regulation - Billing Account for Disposal of Construction Waste	Account No. 7017351	Valid form 29 Apr 13 till the end of Contract
5	Construction Noise Permit	NA	NA

3 SUMMARY OF IMPACT MONITORING REQUIREMENTS

3.1 GENERAL

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

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

3.2 MONITORING PARAMETERS

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

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

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

Table 3-1 Summary of EM&A Requirements

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

3.3 MONITORING LOCATIONS

3.3.1 The designated monitoring locations as recommended in the *EM&A Manual* are shown in *Appendix D*. As the access to some of the designated monitoring locations was questionable due to safety reason or denied by the landlords, alternative locations therefore have had proposed. The proposed alternative monitoring locations has updated in the revised EM&A Programme which verified by IEC and certified by ET Leader prior submitted to EPD on 10 July 2013. *Table 3-2*, *Table 3-3* and *Table 3-4* are respectively listed the air quality, construction noise and water quality monitoring locations for the Project and a map showing these monitoring stations is presented in *Appendix E*.

Table 3-2 Impact Monitoring Stations - Air Quality

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

Station ID	Description	Works Area	Related to the Work Contract
AM4a	A village house located at about 160m east side of the original point AM4	LMH to Frontier Closed Area	Contract 6
AM5	Ping Yeung Village House	Ping Yeung to Wo Keng Shan	Contract 6
AM6	Wo Keng Shan Village House	Ping Yeung to Wo Keng Shan	Contract 6
AM7b [@]	Loi Tung Village House	Sha Tau Kok Road	Contract 2
AM8	Po Kat Tsai Village No. 4	Po Kat Tsai	Contract 2
AM9b [#]	Nam Wa Po Village House No. 80	Fanling	Contract 3

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

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

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

Table 3-3 Impact Monitoring Stations - Construction Noise

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

Table 3-4 Impact Monitoring Stations - Water Quality

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

Station ID	Description	Coordinates of Designated / Alternative Location		Nature of the location	Related to the Work Contract
WM2A-Control	Upstream of River Ganges	835 270	844 243	Alternative location located at upstream 78m of the designated location	Contract 6
WM2B	Downstream of River Ganges	835 433	843 397	NA	Contract 6
WM2B-Control	Upstream of River Ganges	835 835	843 351	Alternative location located at downstream 31m of the designated location	Contract 6
WM3	Downstream of River Indus	836 324	842 407	NA	Contract 6
WM3-Control	Upstream of River Indus	836 763	842 400	Alternative location located at downstream 26m of the designated location	Contract 6
WM4	Downstream of Ma Wat Channel	833 850	838 338	Alternative location located at upstream 11m of the designated location	Contract 3
WM4-Control A	Kau Lung Hang Stream	834 028	837 695	Alternative location located at downstream 28m of the designated location	Contract 3
WM4-Control B	Upstream of Ma Wat Channel	833760	837395	Alternative location located at upstream 15m of the designated location	Contract 3

3.4 MONITORING FREQUENCY AND PERIOD

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

Air Quality Monitoring

3.4.1 Frequency of impact air quality monitoring is as follows:

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

Noise Monitoring

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

Water Quality Monitoring

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

3.5 MONITORING EQUIPMENT

Air Quality Monitoring

- 3.5.1 The 24-hour and 1-hour TSP levels shall be measured by following the standard high volume sampling method as set out in the *Title 40 of the Code of Federal Regulations, Chapter 1 (Part 50), Appendix B*. If the ET proposes to use a direct reading dust meter to measure 1-hour TSP levels, it shall submit sufficient information to the IEC to approve.
- 3.5.2 The filter paper of 24-hour TSP measurement shall be determined by HOKLAS accredited laboratory.
- 3.5.3 All equipment to be used for air quality monitoring is listed in **Table 3-5**.

Table 3-5 Air Quality Monitoring Equipment

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

Wind Data Monitoring Equipment

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

Noise Monitoring

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

Table 3-6 Construction Noise Monitoring Equipment

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

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

Water Quality Monitoring

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

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

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

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

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

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

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

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

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

Table 3-7 Water Quality Monitoring Equipment

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

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

3.6 MONITORING METHODOLOGY

1-hour TSP Monitoring

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

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

24-hour TSP Monitoring

- 3.6.3 The equipment used for 24-hour TSP measurement is Tisch Environmental, Inc. Model TE-5170 TSP high volume air sampling system, which complied with *EPA Code of Federal Regulation, Appendix B to Part 50*. The High Volume Air Sampler (HVS) consists of the following:
- An anodized aluminum shelter;
 - A 8”x10” stainless steel filter holder;
 - A blower motor assembly;
 - A continuous flow/pressure recorder;
 - A motor speed-voltage control/elapsed time indicator;
 - A 7-day mechanical timer, and
 - A power supply of 220v/50 Hz
- 3.6.4 The HVS is operated and calibrated on a regular basis in accordance with the manufacturer’s instruction using Tisch Calibration Kit Model TE-5025A. Calibration would carry out in two month interval.
- 3.6.5 24-hour TSP is collected by the ET on filters of HVS and quantified by a local HOKLAS accredited laboratory, ALS Technichem (HK) Pty Ltd (ALS), upon receipt of the samples. The ET keep all the sampled 24-hour TSP filters in normal air conditioned room conditions, i.e. 70% RH (Relative Humidity) and 25°C, for six months prior to disposal.

Noise Monitoring

- 3.6.6 Noise measurements were taken in terms of the A-weighted equivalent sound pressure level (L_{eq}) measured in decibels dB(A). Supplementary statistical results (L_{10} and L_{90}) were also obtained for reference.
- 3.6.7 During the monitoring, all noise measurements would be performed with the meter set to FAST response and on the A-weighted equivalent continuous sound pressure level (L_{eq}). $Leq_{(30min)}$ in six consecutive $Leq_{(5min)}$ measurements will use as the monitoring parameter for the time period between 0700-1900 hours on weekdays; and also $Leq_{(15min)}$ in three consecutive $Leq_{(5min)}$ measurements would be used as monitoring parameter for other time periods (e.g. during restricted hours), if necessary.

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

Water Quality

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

Sampling Procedure

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

In-situ Measurement

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

Laboratory Analysis

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

3.7 EQUIPMENT CALIBRATION

- 3.7.1 Calibration of the HVS is performed upon installation and thereafter at bimonthly intervals in accordance with the manufacturer’s instruction using the certified standard calibrator (TISCH Model TE-5025A). Moreover, the Calibration Kit would be calibrated annually. The calibration data are properly documented and the records are maintained by ET for future reference.
- 3.7.2 The 1-hour TSP meter was calibrated by the supplier prior to purchase. Zero response of the equipment would be checked before and after each monitoring event. Annually calibration with the High Volume Sampler (HVS) in same condition would be undertaken by the Laboratory.

- 3.7.3 The sound level meter and calibrator are calibrated and certified by a laboratory accredited under HOKLAS or any other international accreditation scheme at yearly basis.
- 3.7.4 All water quality monitoring equipment would be calibrated by HOKLAS accredited laboratory of three month intervals.
- 3.7.5 The calibration certificates of all monitoring equipment used for the impact monitoring program in the Reporting Period and the HOKLAS accredited certificate of laboratory are attached in *Appendix F*.

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

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

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

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

Table 3-9 Action and Limit Levels for Construction Noise

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

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

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

Table 3-10 Action and Limit Levels for Water Quality

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

Remarks:

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

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

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

3.8.2 Should non-compliance of the environmental quality criteria occurs, remedial actions will be triggered according to the Event and Action Plan which presented in **Appendix G**.

3.9 DATA MANAGEMENT AND DATA QA/QC CONTROL

3.9.1 All monitoring data will be handled by the ET's in-house data recording and management system. The monitoring data recorded in the equipment will be downloaded directly from the equipment at the end of each monitoring day. The downloaded monitoring data will input into a computerized database maintained by the ET. The laboratory results will be input directly into the computerized database and checked by personnel other than those who input the data.

3.9.2 For monitoring parameters that require laboratory analysis, the local laboratory shall follow the QA/QC requirements as set out under the HOKLAS scheme for the relevant laboratory tests.

4 AIR QUALITY MONITORING

4.1 GENERAL

4.1.1 In the Reporting Period, construction works under the project have been commenced in Contracts 2, 3 and 5 and air quality monitoring was performed at **6** relevant designated locations as below:

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

4.1.2 The air quality monitoring schedule is presented in *Appendix H* and the monitoring results are summarized in the following sub-sections.

4.2 AIR QUALITY MONITORING RESULTS IN REPORTING MONTH

4.2.1 In the Reporting Period, a total of **90** events of 1-hour TSP and **30** events of 24-hours TSP monitoring were carried out and the monitoring results are summarized in *Tables 4-1 to 4-6*. The detailed 24-hour TSP monitoring data are presented in *Appendix I* and the relevant graphical plots are shown in *Appendix J*.

Table 4-1 Summary of 24-hour and 1-hour TSP Monitoring Results – AM1a

Date	24-hour TSP ($\mu\text{g}/\text{m}^3$)	1-hour TSP ($\mu\text{g}/\text{m}^3$)				
		Date	Start Time	1 st reading	2 nd reading	3 rd reading
5-Jan-15	42	3-Jan-15	12:58	69	78	70
10-Jan-15	88	9-Jan-15	10:32	200	193	133
16-Jan-15	81	15-Jan-15	10:38	122	131	143
22-Jan-15	85	21-Jan-15	10:09	248	217	256
28-Jan-15	46	27-Jan-15	12:47	171	304	379
Average (Range)	68 (42 – 88)	Average (Range)		181 (69 – 379)		

Remark: *Bold and italic value indicated Action Level exceedance.*

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

Date	24-hour TSP ($\mu\text{g}/\text{m}^3$)	1-hour TSP ($\mu\text{g}/\text{m}^3$)				
		Date	Start Time	1 st reading	2 nd reading	3 rd reading
5-Jan-15	68	3-Jan-15	13:08	91	100	92
10-Jan-15	139	9-Jan-15	10:05	209	195	141
16-Jan-15	134	15-Jan-15	10:32	104	105	118
22-Jan-15	204	21-Jan-15	09:59	228	193	202
23-Jan-15	90	27-Jan-15	13:01	172	266	282
Average (Range)	127 (68 – 204)	Average (Range)		167 (91 – 282)		

Remark: *Bold and italic value indicated Action Level exceedance.*

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

Date	24-hour TSP ($\mu\text{g}/\text{m}^3$)	1-hour TSP ($\mu\text{g}/\text{m}^3$)				
		Date	Start Time	1 st reading	2 nd reading	3 rd reading
5-Jan-15	57	3-Jan-15	13:11	68	70	66
10-Jan-15	118	9-Jan-15	09:57	257	257	141
16-Jan-15	138	15-Jan-15	10:27	106	116	191
22-Jan-15	88	21-Jan-15	09:50	219	221	234

Date	24-hour TSP ($\mu\text{g}/\text{m}^3$)	1-hour TSP ($\mu\text{g}/\text{m}^3$)				
		Date	Start Time	1 st reading	2 nd reading	3 rd reading
28-Jan-15	35	27-Jan-15	13:14	191	236	239
Average (Range)	87 (35 – 138)	Average (Range)		174 (66 – 257)		

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

Date	24-hour TSP ($\mu\text{g}/\text{m}^3$)	1-hour TSP ($\mu\text{g}/\text{m}^3$)				
		Date	Start Time	1 st reading	2 nd reading	3 rd reading
5-Jan-15	76	5-Jan-15	09:55	110	91	82
10-Jan-15	139	10-Jan-15	10:20	202	154	149
16-Jan-15	76	16-Jan-15	09:38	89	77	91
22-Jan-15	96	22-Jan-15	09:14	140	110	83
28-Jan-15	99	28-Jan-15	09:35	113	112	104
Average (Range)	97 (76 – 139)	Average (Range)		114 (77 – 202)		

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

Date	24-hour TSP ($\mu\text{g}/\text{m}^3$)	1-hour TSP ($\mu\text{g}/\text{m}^3$)				
		Date	Start Time	1 st reading	2 nd reading	3 rd reading
5-Jan-15	50	5-Jan-15	14:17	70	65	69
10-Jan-15	72	10-Jan-15	10:36	156	133	134
16-Jan-15	87	16-Jan-15	08:51	87	98	97
22-Jan-15	85	22-Jan-15	09:38	57	58	68
28-Jan-15	36	28-Jan-15	09:58	91	73	65
Average (Range)	66 (36 – 87)	Average (Range)		88 (57 – 156)		

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

Date	24-hour TSP ($\mu\text{g}/\text{m}^3$)	1-hour TSP ($\mu\text{g}/\text{m}^3$)				
		Date	Start Time	1 st reading	2 nd reading	3 rd reading
5-Jan-15	63	3-Jan-15	13:09	78	80	87
10-Jan-15	87	9-Jan-15	09:01	199	176	187
16-Jan-15	82	15-Jan-15	09:01	124	107	102
22-Jan-15	78	21-Jan-15	13:21	363	357	366
28-Jan-15	60	27-Jan-15	13:23	139	145	149
Average (Range)	74 (60 – 87)	Average (Range)		177 (78 – 366)		

Remark: *Bold and italic value indicated Action Level exceedance.*

4.2.2 In the Reporting Period, one (1) Action Level exceedance of 24-hour TSP monitoring was recorded at AM2 on 22 January 2015. Moreover, a total of six (6) Action Level exceedances of 1-hour TSP, namely 2 exceedances at AM1 and 1 exceedance at AM2 on 28 January 2015 and 3 Action Level exceedances at AM9b on 22 January 2015 were recorded. NOEs were issued to relevant parties upon confirmation of the monitoring result and investigation for the cause of exceedance is being carried out by the ET.

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

5 CONSTRUCTION NOISE MONITORING

5.1 GENERAL

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

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

5.1.2 The noise monitoring schedule is presented in **Appendix H** and the monitoring results are summarized in the following sub-sections.

5.2 NOISE MONITORING RESULTS IN REPORTING MONTH

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

Table 5-1 Summary of Construction Noise Monitoring Results

Construction Noise Level ($L_{eq,30min}$), dB(A)									
Date	NM1	NM2	NM8	NM9	NM10 ^(*)	Date	NM5	NM6	NM7
3-Jan-15	51	58	58	55	64	5-Jan-15	53	59	58
9-Jan-15	52	62	65	59	72	10-Jan-15	56	60	60
15-Jan-15	52	59	57	70	67	16-Jan-15	63	55	59
21-Jan-15	44	62	57	56	68	22-Jan-15	53	60	59
27-Jan-15	56	59	58	56	65	28-Jan-15	54	63	72
Limit Level	75 dB(A)								

Remarks

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

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

6 WATER QUALITY MONITORING

6.1 GENERAL

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

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

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

6.2 RESULTS OF WATER QUALITY MONITORING

6.2.1 In the Reporting Period, a total of **13** sampling days were performed for water quality monitoring for Contracts 3 and 5 of the Project. 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-Jan-15	7.43	7.18	5.81	17.1	639.5	9.5	20.0	301.5	2.0
5-Jan-15	6.25	7.34	4.54	19.0	8.3	7.5	20.5	7.0	6.5
7-Jan-15	5.94	6.21	5.15	14.7	5.1	7.8	17.0	3.0	9.5
9-Jan-15	7.98	7.87	7.90	13.0	4.4	7.5	13.0	2.5	9.5
13-Jan-15	7.72	8.73	7.74	24.6	9.2	20.0	20.5	4.5	8.0
15-Jan-15	5.98	7.75	4.16	12.8	2.9	6.2	8.5	2.0	5.5
17-Jan-15	7.90	9.26	7.08	30.5	17.3	25.9	29.0	4.0	11.0
19-Jan-15	8.85	8.62	8.17	34.2	33.5	26.9	17.5	20.0	12.0
21-Jan-15	7.17	7.38	5.13	14.7	33.5	10.5	18.5	25.0	6.0
24-Jan-15	6.65	7.88	7.09	15.0	2.7	5.9	20.5	3.0	7.5
27-Jan-15	7.30	7.50	5.22	27.7	14.1	14.9	33.0	4.5	8.0
29-Jan-15	6.39	6.99	4.88	24.6	11.3	10.3	11.5	5.0	4.0
31-Jan-15	6.87	7.84	5.87	20.3	8.6	13.1	20.5	9.5	11.0

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-Jan-15	5.67	8.88	5.5	7.3	3.5	2.0
5-Jan-15	4.59	8.17	13.9	6.5	13.0	4.5
7-Jan-15	4.93	6.13	12.4	11.2	8.5	10.5
9-Jan-15	4.90	9.25	8.8	7.7	14.5	5.0
13-Jan-15	8.23	9.42	244.5	258.5	138.0	117.0
15-Jan-15	5.07	8.14	38.4	27.6	13.0	6.0
17-Jan-15	5.21	7.23	32.6	29.2	8.0	7.0
19-Jan-15	4.47	7.58	29.7	30.6	11.5	8.0
21-Jan-15	0.44	6.97	27.8	10.8	9.0	3.5
24-Jan-15	5.64	6.82	10.4	11.1	12.5	7.0
27-Jan-15	3.16	7.31	14.4	17.0	13.5	7.5
29-Jan-15	4.02	8.42	20.3	21.1	10.0	5.5

Date	Dissolved Oxygen (mg/L)		Turbidity (NTU)		Suspended Solids (mg/L)	
	WM1	WM1-Control	WM1	WM1-Control	WM1	WM1-Control
31-Jan-15	6.98	7.43	14.9	18.2	14.5	6.0

Remark: bold and underline value 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	3	0	0	0	0	0	3
WM4	0	0	0	0	0	0	0	0
No of Exceedance	0	3	0	0	0	0	0	3

6.2.2 During the water quality monitoring, all measured results recorded at WM4 were compliance with the performance criteria.

6.2.3 For WM1, all measured results of turbidity and suspended solids were recorded below the performance criteria. However, three (3) Limit Levels exceedance of dissolved oxygen was recorded on 21, 27 and 29 January 2015. NOE was issued to relevant parties upon confirmation of the monitoring result. The investigation for the cause of exceedance was completed and submitted to relevant parties. The investigation results are summarized in below.

Investigation Result for Exceedance at WM1 on 10, 27 and 31 December 2014 (last Reporting Period)

6.2.4 According to the site information provided by the Contractor, Construction of Bridge J, Drainage work and Formation work at BCP area were conducted on 10, 27 and 31 December 2014. The active construction works under the Contract were not close to the WM1 and no direct water discharge was made into the river near WM1.

6.2.5 On 10 December 2014, cloudy water was observed at WM1 and throughout the river course during the course of monitoring. Moreover, cloudy water discharged from a sedimentation tank into the river was observed near WM1. During joint site inspection by the RE, Contractor, IEC and ET on 23 December 2014, as confirmed by the Contractor, there were no construction works conducted near WM1 and the concerned sedimentation tank was not belonged to the Contract.

6.2.6 On 27 December 2014, water sampling was carried out after rain, the water quality in the river was deteriorated by high water flow rate and cloudy water was observed at WM1 and throughout the river. Moreover, cloudy water discharged from a sedimentation tank into the river was observed near WM1. On 31 December 2014, clear water discharge from the sedimentation tank was observed near WM1 during the course of monitoring. However, it was found that the water discharge hose was hanged at around 0.5m above ground and the discharge water flushed the loose soil nearby the river course and then entered the existing stream.

6.2.7 During joint site inspection by the RE, Contractor, IEC and ET on 15 January 2015, it was noted that concerned sedimentation tank was idled. As advised by the Contractor, that sedimentation tank was not belonged to the Contract but it will be removed off site soon.

6.2.8 Based on the above investigation, it was considered that the exceedances on 10, 27 and 31 December 2014 were due to other external sources and unlikely related to the works under the Contract.

Investigation Result for Exceedance at WM1 on 21, 27 and 29 January 2015

6.2.9 According to the site information provided by the Contractor (SRJV), Construction of Bridge J,

Drainage work and Formation work at BCP area was conducted on 21, 27 and 31 January 2015. The active construction works under the Contract were not close to the WM1.

- 6.2.10 During of the course of water sampling, no water discharge in to the river course was observed near WM1. According to the photo records and field data sheet recorded by the ET, dead fish were observed near WM1 on 21 January 2015 and algae were observed at upstream of WM1 on 27 and 29 January 2015.
- 6.2.11 During site inspection on 22 and 29 January 2015, it was noted that a flow diversion at downstream of WM1 was in place to facilitate further downstream construction works by others. Very slow water flow was observed via the diversion due to limited water flow during the dry season.
- 6.2.12 As advised by the SRJV, no organic pollution resulting in high BOD was caused by the works of C5. However, algae were observed growing in the water body and were considered together with the dead fishes as the major factor resulting to low DO level.
- 6.2.13 In view of the monitoring results on 27 and 29 January 2015, there was a trend of improving DO level in water. No exceedances were recorded during monitoring on 2 and 4 February 2015.

7 WASTE MANAGEMENT

7.1 GENERAL WASTE MANAGEMENT

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

7.2 RECORDS OF WASTE QUANTITIES

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

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

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

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

Type of Waste	Contract 2		Contract 3		Contract 5		Total Quantity
	Quantity	Disposal Location	Quantity	Disposal Location	Quantity	Disposal Location	
C&D Materials (Inert) (in '000m ³)	66.2666	--	3.864	--	0	--	70.1306
Reused in this Project (Inert) (in '000 m ³)	0.0670	--	0.648	--	0	--	0.715
Reused in other Projects (Inert) (in '000 m ³)	65.6529	C5	0	--	0	--	65.6529
Disposal as Public Fill (Inert) (in '000 m ³)	0.5467	Tuen Mun 38	3.216	Tuen Mun 38	0	--	3.7627

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

Type of Waste	Contract 2		Contract 3		Contract 5		Total Quantity
	Quantity	Disposal Location	Quantity	Disposal Location	Quantity	Disposal Location	
Recycled Metal ('000kg)	0	-	0	-	4.16	--	4.16
Recycled Paper / Cardboard Packing ('000kg)	0.2500	Licensed collector	0	-	0	--	0.2500
Recycled Plastic ('000kg)	0	-	0	-	0	--	0
Chemical Wastes ('000m ³)	0	-	0.040	Licensed collector	0	--	0.040
General Refuses ('000m ³)	0.0617	NENT	0.080	NENT	0.42	NENT	0.5617

8 SITE INSPECTION

8.1 REQUIREMENTS

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

8.2 FINDINGS / DEFICIENCIES DURING THE REPORTING MONTH

The Contract 2

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

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

Table 8-1 Site Observations for Contract 2

Date	Findings / Deficiencies	Follow-Up Status
2 January 2015	<ul style="list-style-type: none"> As a reminder, dust mitigation measures should be applied for the haul road at South Portal area to reduce dust generation during dry season. 	<ul style="list-style-type: none"> Not required for reminder.
9 January 2015	<ul style="list-style-type: none"> Dust emitted from the tunnel was observed. The contractor was reminded to provide mitigation measures to prevent dust generation. (Mid-Vent) 	<ul style="list-style-type: none"> No dust emission was observed during site inspection on 16 January 2015.
16 January 2015	<ul style="list-style-type: none"> Free standing chemical containers were observed, the Contractor should provide drip trays for all chemical containers. (North Portal) 	<ul style="list-style-type: none"> Free standing chemical containers were removed before site inspection on 23 January 2015.
23 January 2015	<ul style="list-style-type: none"> As a reminder, dust mitigation measures should be applied for the haul road to minimize dust generation. (South Portal) As a reminder, waste skip was observed full. The contractor was reminded to clean more frequency. (North Portal) 	<ul style="list-style-type: none"> Not required for reminder. Not required for reminder.
30 January 2015	<ul style="list-style-type: none"> The contractor was reminded to provide proper maintenance for the plants to prevent dark smoke emission. (North Portal) Dust mitigation measures should be applied for bore pile works to reduce dust generation. (North Portal) 	<ul style="list-style-type: none"> Not required for reminder. Not required for reminder.

The Contract 3

8.2.3 In the Reporting Period, joint site inspection for Contract 3 to evaluate the site environmental performance has been carried out by the RE, IEC, ET and the Contractor on **5, 14, 19 and 26 January 2015**. No non-compliance was noted.

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

Table 8-2 Site Observations for Contract 3

Date	Findings / Deficiencies	Follow-Up Status
5 January 2015	<ul style="list-style-type: none"> • Dark smoke was emitted from an air compressor, the Contractor should check the condition of the air compress and if maintenance is required. (SA11) • Drip tray should be provided for the air compressor. (SA11) • Chemical containers should be placed with drip tray underneath (SA11) • Sand bags/ sand bund should be provided for the construction area with nearby the river to river to avoid surface runoff. (SA11) 	<ul style="list-style-type: none"> • The described air compressor has been removed off site during site inspection on 14 January 2015. • The described air compressor has been removed off site during site inspection on 14 January 2015. • Drip tray has been provided for all chemical containers in SA11 as observed in site inspection on 14 January 2015. • Sand bags have been provided for the construction area nearby the river to avoid surface runoff as observed in site inspection on 14 January 2015.
14 January 2015	<ul style="list-style-type: none"> • Wastewater leakage from the wastewater treatment tanks was observed, the Contractor should rectify the disconnected outlet hose from the wastewater facility. • As a reminder, the Contractor was reminded to provide drip tray for all chemical containers with proper label. 	<ul style="list-style-type: none"> • The leakage problem of the wastewater treatment tanks has been rectified as observed in site inspection on 19 January 2015. • Not required for reminder.
19 January 2015	<ul style="list-style-type: none"> • The Contractor should provide proper fence for the retained trees and keep them away from construction materials. (SA11) • As a reminder, the Contractor was reminded to cover the sand stockpile or removed them a.s.a.p. 	<ul style="list-style-type: none"> • Construction materials closed to the retained tree have been removed as observed in site inspection on 26 January 2015. • Not required for reminder.
26 January 2015	<ul style="list-style-type: none"> • Construction wastes and chemical containers were mixed together on a drip tray, the Contractor should sort the wastes and place them in proper area. (SA12) • Opened slope was observed adjacent to the river, the Contractor should cover slope with tarpaulin. (SA14) • As a reminder, the Contractor was reminded to provide water spraying at the site exit. (SA2) 	<ul style="list-style-type: none"> • Construction waste has been removed from the chemical storage area as observed in site inspection on 2 February 2015 • The opened slope adjacent to the river has been covered with tarpaulin as observed in site inspection on 2 February 2015 • Not required for reminder.

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

The Contract 5

8.2.6 In the Reporting Period, joint site inspection for Contract 5 to evaluate the site environmental

performance has been carried out by the RE, IEC, ET and the Contractor on **8, 15, 22** and **29 January 2015**. No non-compliance was noted.

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

Table 8-3 Site Observations for Contract 5

Date	Findings / Deficiencies	Follow-Up Status
8 January 2015	No adverse environmental issues were observed.	NA
15 January 2015	<ul style="list-style-type: none"> • Muddy trails were observed at the site exit/entrance, the Contractor should clean up the muddy trails on the public road and ensure every vehicles are washed to remove mud from its wheel and body before leaving the site. (Location: BCP) • Free standing chemical containers were observed, the Contractor should provide drip tray for chemical container to avoid oil leakage. (Location: Steel fixing area) 	<ul style="list-style-type: none"> • No muddy trails were observed at the site exit/entrance as observed in site inspection on 22 January 2015 • The chemical containers were removed. as observed in site inspection on 22 January 2015
22 January 2015	<ul style="list-style-type: none"> • Dust control should be implemented due to the soil retained on road surface was observed at the site entrance near 1500 pipe. 	<ul style="list-style-type: none"> • Watering on the dry haul road was provided to minimise fugitive dust as observed in site inspection on 29 January 2015
29 January 2015	<ul style="list-style-type: none"> • As a reminder, the Contractor should review the vehicle washing procedure to prevent muddy trails on public road. (Location: BCP2 site entrance/exit) 	<ul style="list-style-type: none"> • Not required for reminder.

8.2.8 Overall, general housekeeping such as daily site tidiness and cleanliness should be maintained for all Contracts. For chemical waste management, the Contractor was reminded to set up proper storage area for all chemical waste before dispose of site.

Other Contracts

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

9 ENVIRONMENTAL COMPLAINT AND NON-COMPLIANCE

9.1 ENVIRONMENTAL COMPLAINT, SUMMONS AND PROSECUTION

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

- 8 January 2015 - A complaint was received from the 1823 hotline on 8 January 2015. The complainant complained that the vehicles left the construction site brought a lot of sand and dust which caused fugitive dust problem in the adjacent Sha Tau Kok Road (near Tai Tong Wu Village). Moreover, the Contractor's site staff provided water spraying onto the Sha Tau Kok Road posed a danger when vehicles passed by. The complainant requested the Contractor to ensure all vehicles are thoroughly washed before leaving the site. The case has been settled by the Contractor.
- 20 January 2015 - A complaint was received and lodged from the EPD on 20 January 2015. The complainant complained large amount of dump trucks passed in and out and muddy water sprayed from the exit of construction site. It caused nuisance to the public when vehicles passed by the muddy water in Sha Tau Kok Road every day. The case has been settled by the Contractor.
- 21 January 2015 - A complaint was received from the 1823 hotline on 21 January 2015. The complainant complained that large amount of vehicle passed in and out the construction site arising construction dust and fugitive dust problem in the adjacent Sha Tau Kok Road – Ma Mei Ha. It was noted that road sweeper was deployed on the concerned road at 8am, however, the complainant suspected that the early duty of the road sweeper could not cater when construction activities started in later time period. The Contractor was requested to increase the cleaning frequency on the concerned road, preferably during working hour of construction site, to ensure the construction dust problem would be resolved. The case has been settled by the Contractor.

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

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

Table 9-1 Statistical Summary of Environmental Complaints

Reporting Period	Contract No	Environmental Complaint Statistics		
		Frequency	Cumulative	Complaint Nature
19 May 2014 –31 Dec 2014	Contract 2	0	8	(3) Water Quality (3) Construction Dust (2) Noise
06 Nov 2013 –31 Dec 2014	Contract 3	0	3	(1) Construction Dust (2) Water quality
16 Aug 2013 –31 Dec 2014	Contract 5	0	2	(1) Construction Dust
1 – 31 Jan 2015	Contract 2	3	11	(4) Water Quality (5) Construction Dust (2) Noise
	Contract 3	0	3	(1) Construction Dust (2) Water quality
	Contract 5	0	2	(2) Construction Dust

Table 9-2 Statistical Summary of Environmental Summons

Reporting Period	Contract No	Environmental Summons Statistics		
		Frequency	Cumulative	Complaint Nature
19 May 2014 –31 Dec 2014	Contract 2	0	0	NA
06 Nov 2013 –31 Dec 2014	Contract 3	0	0	NA
16 Aug 2013 –31 Dec 2014	Contract 5	0	0	NA
1 – 31 Jan 2015	Contract 2	0	0	NA
	Contract 3	0	0	NA
	Contract 5	0	0	NA

Table 9-3 Statistical Summary of Environmental Prosecution

Reporting Period	Contract No	Environmental Prosecution Statistics		
		Frequency	Cumulative	Complaint Nature
19 May 2014 –31 Dec 2014	Contract 2	0	0	NA
06 Nov 2013 –31 Dec 2014	Contract 3	0	0	NA
16 Aug 2013 –31 Dec 2014	Contract 5	0	0	NA
1 – 31 Jan 2015	Contract 2	0	0	NA
	Contract 3	0	0	NA
	Contract 5	0	0	NA

The Other Contracts

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

10 IMPLEMENTATION STATUS OF MITIGATION MEASURES

10.1 GENERAL REQUIREMENTS

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

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

Table 10-1 Environmental Mitigation Measures

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

10.2 TENTATIVE CONSTRUCTION ACTIVITIES IN THE COMING MONTH

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

Contract 2

- | | |
|-----------------|--|
| Wide-Project | <ul style="list-style-type: none"> Tree Felling/Remedial works (Form 1) |
| Mid-Vent Portal | <ul style="list-style-type: none"> Sub-station construction and CLP installation Drill and Blast Full Face |
| North Portal | <ul style="list-style-type: none"> Sub-station construction Permanent Slope formation Platform excavation for bench excavation Conveyor Belt System construction Permanent Slope formation Bench excavation Top heading canopies for Northbound |
| South Portal | <ul style="list-style-type: none"> Sub-station construction and CLP installation Temporary Cut Slope Temporary soil nails Temporary drainage works Pavement works |

Contract 3

- Abutment construction for Bridge E
- Pier table construction
- Box culvert inlet structure construction
- Cable detection and trial trenches
- Water pipes laying
- Storm drains laying
- Demolition of central barrier at Fanling Highway
- EM& works for valve control & telemetry house
- Erection of temporary support at DSD nullah
- Filling works at Tong Hang East
- Lagging wall and capping beam for bored pile wall
- Laying of water pipes for fire fighting
- Construction of noise barriers
- Pier construction
- Pile cap works
- Pre-drilling
- Piling works for viaduct
- Retaining structure construction
- Road works at Fanling Highway
- Socket H-pile installation
- Tree felling works
- Utilities duct laying
- Viaduct segment erection

Contract 5

- Construction of retaining wall No.2b
- Construction of retaining wall No.5
- Construction of soil cement slope along BCP Area
- Road works (kerb laying) for proposed LMH Road
- Formation Works at BCP Area
- Piling works at footbridge
- Installation of precast and vehicular parapet of Bridge J.
- Construction of Depressed Road at BCP3
- Construction of Western pedestrian subway and emergency staircase at Lin Ma Hang
- Filing Works for ArcHD permanent office
- Drainage works at proposed and exiting LMH Road
- Water works at proposed and existing LMH Road
- Drainage works at BCP area
- Irrigation system at proposed and existing LMH Road
- Installation of Underground utilities (CLP cables) at proposed LMH road
- Removal and disposal of asbestos materials

10.3 KEY ISSUES FOR THE COMING MONTH

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

- Implementation of control measures for rainstorm;
- Regular clearance of stagnant water during wet season;
- Implementation of dust suppression measures at all times;
- Potential wastewater quality impact due to surface runoff;
- Potential fugitive dust quality impact due from the dry/loose/exposure soil surface/dusty

material;

- Disposal of empty engine oil containers within site area;
- Ensure dust suppression measures are implemented properly;
- Sediment catch-pits and silt removal facilities should be regularly maintained;
- Management of chemical wastes;
- Discharge of site effluent to the nearby wetland, stockpiling or disposal of materials, and any dredging or construction area at this area are prohibited;
- Follow-up of improvement on general waste management issues; and
- Implementation of construction noise preventative control measures

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

11 CONCLUSIONS AND RECOMMENDATIONS

11.1 CONCLUSIONS

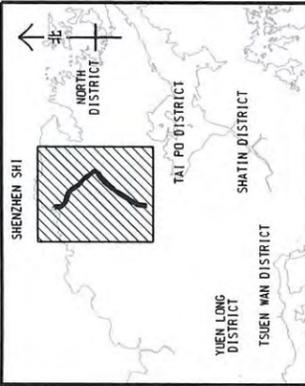
- 11.1.1 This is 18th monthly EM&A report presenting the monitoring results and inspection findings for the Reporting Period from 1 to 31 January 2015.
- 11.1.2 For air quality monitoring, there were a total of six (6) Action Level exceedances of 1-hour TSP and one (1) Action Level exceedance of 24-hour TSP recorded. NOE was issued to relevant parties upon confirmation of the monitoring result. Investigation report cause of exceedance is being conducted by the ET.
- 11.1.3 No noise complaint (which is an Action Level exceedance) was received and no construction noise measurement results that exceeded the Limit Level were recorded in the Reporting Period. No NOEs or the associated corrective actions were therefore issued.
- 11.1.4 For water quality monitoring, no exceedance was triggered in WM4. For location WM1, a total three (3) Limit Level exceedances in DO were recorded. Investigation report cause of exceedance has been conducted by the ET which concluded that the exceedances were not project related.
- 11.1.5 No notification of summons or successful prosecution under the EM&A Programme of the Project was received in the reporting period for Contract 2, 3 and 5.
- 11.1.6 In this Reporting Period, three (3) documented environmental complaints was received and lodged for Contracts 2 regarding to dust and soil/muddy water impact. Follow up actions have been undertaken by the Contractor to resolve the complaints and deficiencies in due time. Investigation reports for the complaint had completed and concluded that all the complaints were not related to the Contract and they have been submitted to all relevant parties.
- 11.1.7 During the Reporting Period, five (5), four (4) and four (4) events of joint site inspection by the RE, IEC, ET and Main-contractor were carried out for Contracts 2, 3 and 5 respectively in accordance with the EM&A Manual stipulation. No non-compliance observed during the site inspection.

11.2 RECOMMENDATIONS

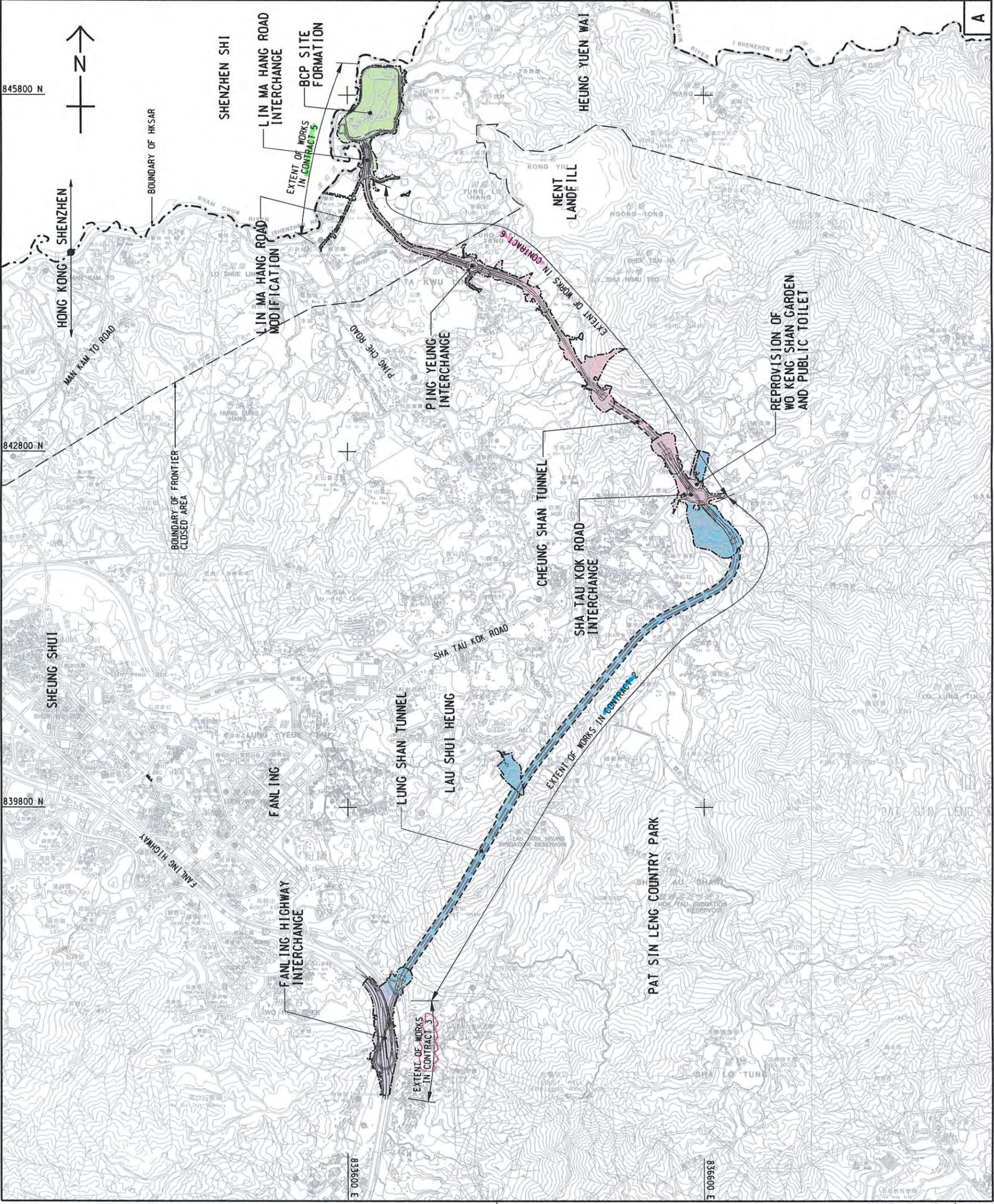
- 11.2.1 During dry season, special attention should be paid on the potential construction dust impact since most of the construction sites are adjacent to villages. The Contractor should fully implement the construction dust mitigation measures properly.
- 11.2.2 Muddy water or other water pollutants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

Appendix A

Layout plan of the Project



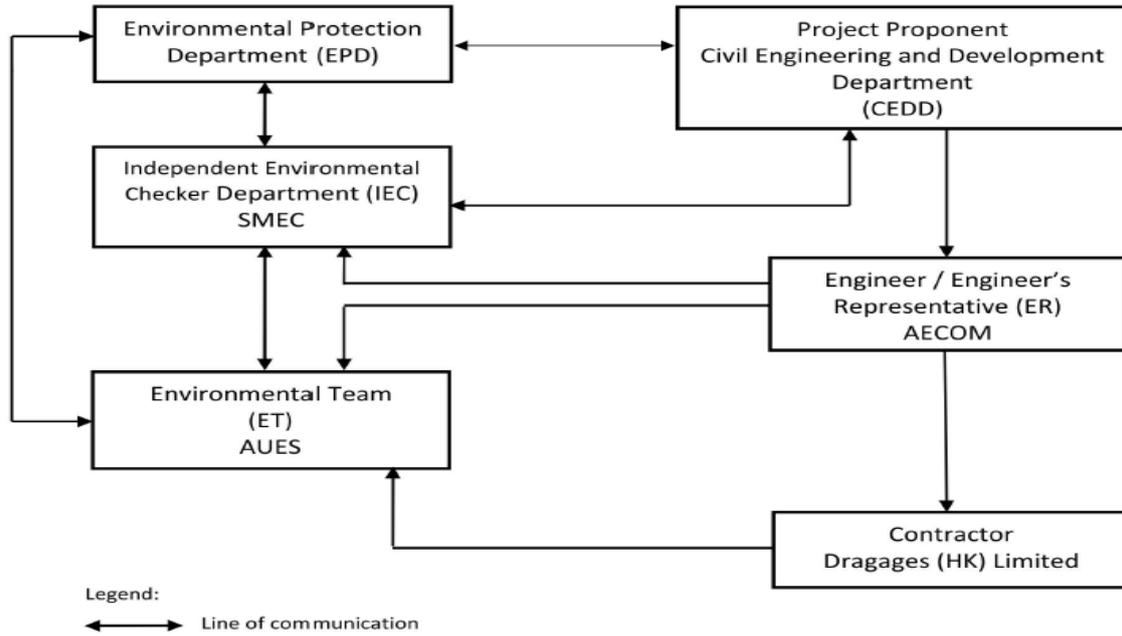
土木工程拓展署 Civil Engineering and Development Department	
LANTAU/HEUNG YUEN WAI BOUNDARY CONTROL POINT AND ASSOCIATED WORKS (SITE FORMATION AND INFRASTRUCTURES) - DESIGN AND CONSTRUCTION	
PROJECT LAYOUT PLAN	
DRGNO. 60212563/PLP/001 圖紙編號	CONTRACT NO. P.C.P. - 0000 合約編號
DRAWN BY ZJ 繪圖員	CHECKED BY 校核員
SCALE 1 : 15000 縮尺	DATE 日期
© COPYRIGHT RESERVED 版權保留	



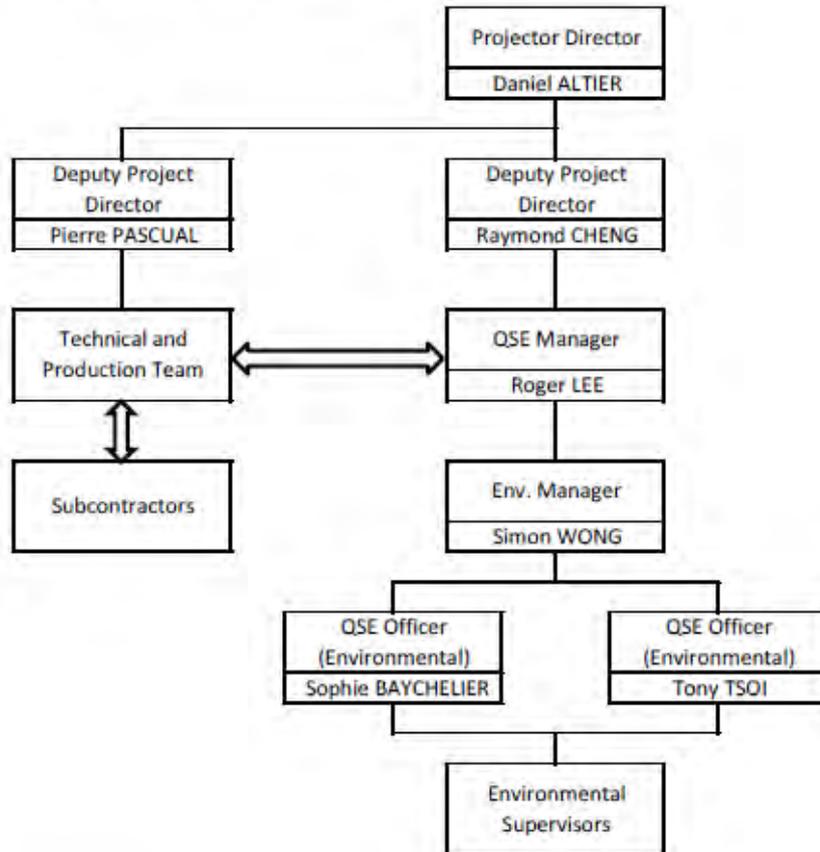
Appendix B

Organization Chart

Project Organization Structure



Structure Within Dragages (HK) Limited



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

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

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

Legend:

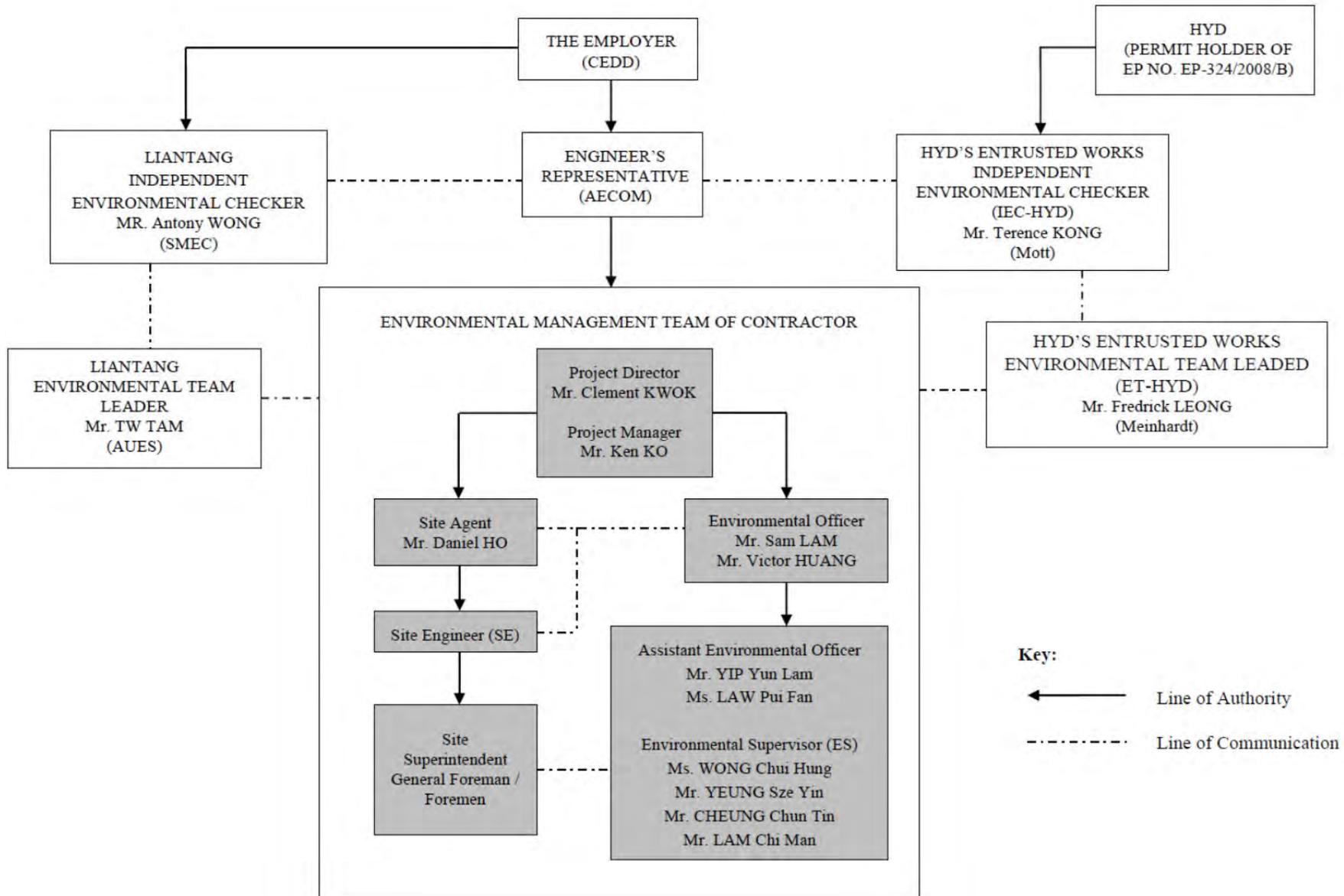
CEDD (Employer) – Civil Engineering and Development Department

AECOM (Engineer) – AECOM Asia Co. Ltd.

DHK(Main Contractor) –Dragages Hong Kong Ltd.

SMEC (IEC) – SMEC Asia Limited

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



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

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

Organization	Project Role	Name of Key Staff	Tel No	Fax No.
AECOM	Engineer's Representative	Alan Lee	2171 3300	2171 3498
SMEC	Independent Environmental Checker	Antony Wong	3995 8120	3995 8101
Chun Wo	Project Director	Clement Kwok	3758 8735	2638 7077
Chun Wo	Project Manager	Ken Ko	2638 6136	2638 7077
Chun Wo	Site Agent	Daniel Ho	2638 6144	2638 7077
Chun Wo	Environmental Officer	Sam Lam/ Victor Huang	2638 6115	2638 7077
Chun Wo	Assistant Environmental Officer	Yip Yun Lam Law Pui Fan	2638 6125	2638 7077
AUES	Environmental Team Leader	T. W. Tam	2959 6059	2959 6079
AUES	Environmental Consultant	Nicola Hon	2959 6059	2959 6079
AUES	Environmental Consultant	Ben Tam	2959 6059	2959 6079

Legend:

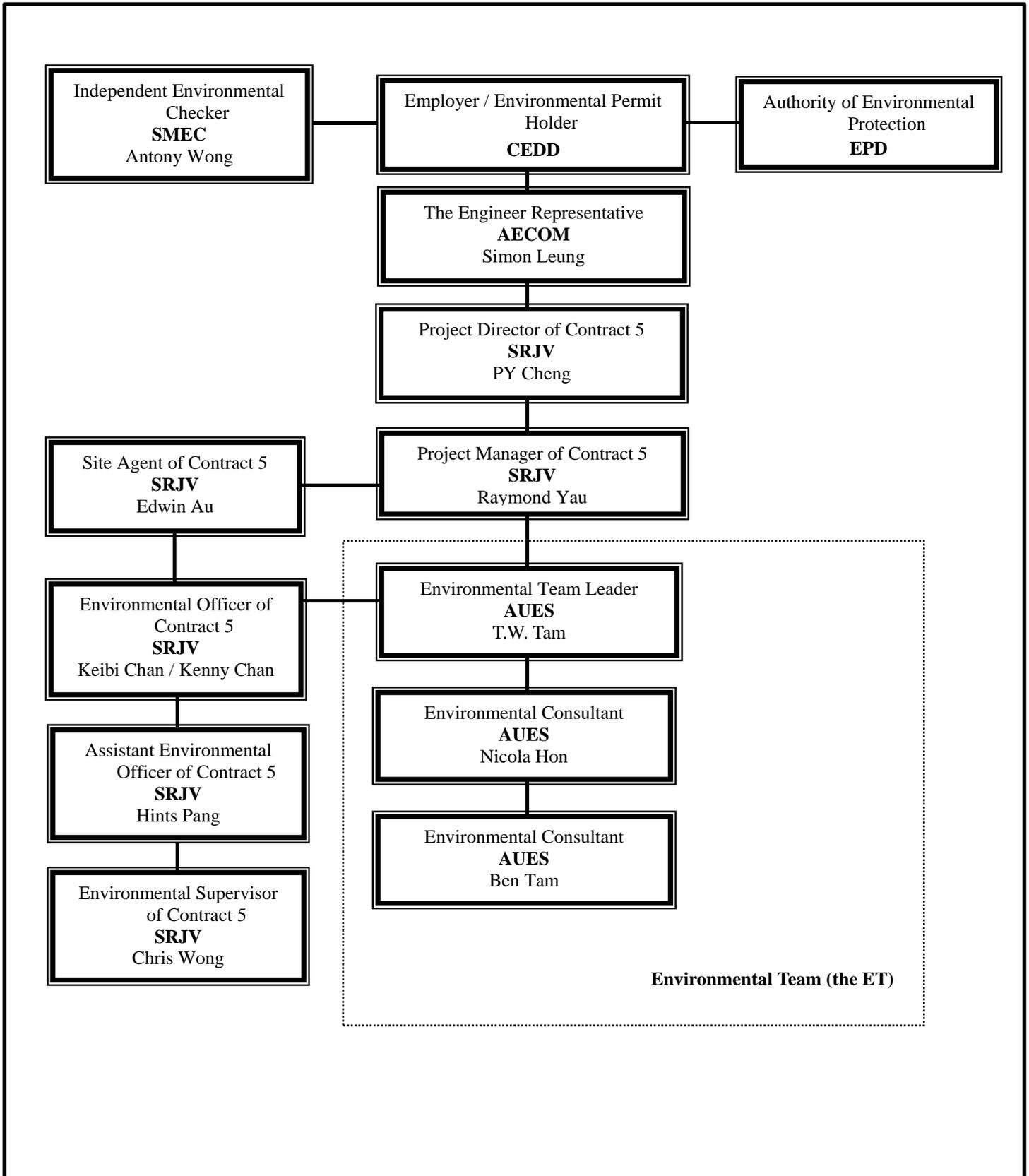
CEDD (Employer) – Civil Engineering and Development Department

AECOM (Engineer) – AECOM Asia Co. Ltd.

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

SMEC (IEC) – SMEC Asia Limited

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



Environmental Management Organization – CV/2013/03

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

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

Legend:

CEDD (Employer) – Civil Engineering and Development Department

AECOM (Engineer) – AECOM Asia Co. Ltd.

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

SMEC (IEC) – SMEC Asia Limited

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

Appendix C

3-month rolling construction program

Contract 2

Activity ID	Activity Name	Working Duration	BL Project Start	BL Project Finish	2015			
					Jan	Feb	Mar	Apr
Total		946	20-Jan-14	30-Mar-17				
HKLTH Works Programme update 20-Jan-2015 [wpc]		946	20-Jan-14	30-Mar-17				
2 General		908	04-Feb-14	23-Feb-17				
Ground Investigation		231	13-Mar-14	19-Dec-14				
GI Works		231	13-Mar-14	19-Dec-14				
DSN018605	GI: Field Works (including pre-drilling works)	200	13-Mar-14	13-Nov-14				
DSN018606	GI: Tests & Reports (Contract Boreholes)	30	14-Nov-14	18-Dec-14				
DSN018607	KD2: Sect. II (Completion of Geotechnical investigation fieldworks + laboratory tests) (Contract Boreholes)	0		19-Dec-14				
Geotechnical Interpretative Report 2nd Revision		257	22-Sep-14	25-Feb-15				
DDA Submission		257	22-Sep-14	25-Feb-15				
GIR21021890	Preparation of DDA for formal submission to ER/ICE/IP	65	22-Sep-14	08-Dec-14				
GIR21021940	IPs/ ER's Review	28	09-Dec-14	13-Jan-15				
GIR21021960	Preparation of DDA with ICE Certification for resubmission to ER/ICE/IP	13	14-Jan-15	28-Jan-15				
GIR21022050	ER/IP's Approval	28	29-Jan-15	25-Feb-15				
Project Wide E&M		908	04-Feb-14	23-Feb-17				
E&M Design Works for Civil Design Interface		467	04-Feb-14	18-Feb-15				
PD.AE.1060	Overall Technical Review of E&M System	260	04-Feb-14	16-Dec-14				
PD.AE.1070	Review Civil Design Submission on Tunnel Space Proofing & Vent Buildings	260	04-Feb-14	16-Dec-14				
PD.AE.1130	E&M Spatial Study and Structural Provisions Check for Ventilation Buildings	110	29-Aug-14	10-Jan-15				
PD.AE.1140	E&M Spatial Study and Structural Provisions Check for Administration Building	125	20-Sep-14	18-Feb-15				
PD.AE.1150	Design Verification and Development for Tunnel Ventilation System	170	07-May-14	26-Nov-14				
E&M Design & Engineering Works		397	21-Jul-14	29-Aug-15				
Engineering Design Submission		230	21-Jul-14	30-Apr-15				
PD.FS.DS	Fire Service System Submission and Approval by the Engineer	230	21-Jul-14	30-Apr-15				
PD.CM.DS	CMCS System Submission and Approval by the Engineer	230	21-Jul-14	30-Apr-15				
PD.EC.DS.a	Environmental Control System Submission and Approval by the Engineer	230	21-Jul-14	30-Apr-15				
PD.EL.DS	Electrical System Submission and Approval by the Engineer	230	21-Jul-14	30-Apr-15				
PD.EV.DS	ELV System Submission and Approval by the Engineer	230	21-Jul-14	30-Apr-15				
PD.PD.DS	Plumbing & Drainage System Submission and Approval by the Engineer	230	21-Jul-14	30-Apr-15				
Shop Drawing & Builder's Drawing Submission		191	17-Dec-14	29-Aug-15				
PD.DW.1000	Shop Drawings & Builder's Drawings Preparation	176	17-Dec-14	27-Jul-15				
PD.DW.1010	Shop Drawings & Builder's Drawings Submission & Approval	177	22-Jan-15	29-Aug-15				
Equipment Selection & Submission		278	01-Nov-14	09-Oct-15				
PD.PQ.1150	Tunnel Ventilation System Submission and Approval by the Engineer	228	07-Nov-14	15-Aug-15				
PD.PQ.1910	P&D System Submission and Approval by the Engineer	169	01-Nov-14	30-May-15				
PD.PQ.2010	FS System Submission and Approval by the Engineer	278	01-Nov-14	09-Oct-15				
Manufacturing & Delivery of Major Equipment		588	02-Mar-15	23-Feb-17				
PD.PD.MD	Manufacturing and Delivery of P&D System	409	28-Mar-15	15-Aug-16				
PD.PQ.1040	Manufacturing and Delivery of ELV/CMCS/LAN/TEL System	588	02-Mar-15	23-Feb-17				
3 South Portal Area		326	26-Aug-14	29-Jun-15				
3.1 South Portal Subcontract & Procurement		326	26-Aug-14	29-Jun-15				
SPS&P0050	Subcontract : Tunnel Spoil Disposal	60	26-Aug-14	06-Nov-14				
SPS&P0060	Subcontract : Ventilation Building Foundation Works	60	29-Jan-15	16-Apr-15				
SPS&P0070	Subcontract : Retaining Wall Structure Works	60	17-Apr-15	29-Jun-15				
3.2 South Portal Design Submission		181	15-Oct-14	27-May-15				
South Portal: South Portal Site Formation		28	22-Oct-14	18-Nov-14				
DDA Submission		28	22-Oct-14	18-Nov-14				
DSN019970	ER/IP's Approval	28	22-Oct-14	18-Nov-14				

 MAIN CONTRACTOR 香港寶嘉 Dragages Hong Kong <small>A member of the Bouygues Construction group</small>						 CLIENT 土木工程拓展署 Civil Engineering and Development Department			 THE ENGINEER AECOM CONTRACTOR'S DESIGNER ATKINS		PROJECT Contract No. CV/2012/08 Liantang/Heung Yuen Wai Boundary Control Point Site Formation and Infrastructure Works Contract 2		DOCUMENT NO. LTH/DHK/PGR/PW/PLP/00019/A		
A Monthly Report No.13 20/01/2015 RAN RBS/SJO PPL/DAL						TITLE Monthly Report No.13 3-Months Rolling Programme (Works Programme Rev. C)		DOC. STATUS FOR INFO.	CREATION DATE 20/01/2015	REVISION A					
REV DESCRIPTION DATE PREPARED CHECKED APPROVED						PAPER SIZE A3		SCALE N/A	PAGE 1 of 8						

Activity ID	Activity Name	Working Duration	BL Project Start	BL Project Finish	2014	2015			
						Jan	Feb	Mar	Apr
South Portal: Temp Support For Retaining Wall									
DDASubmission									
DSN03310	ER/IP's Approval	28	15-Oct-14	11-Nov-14					
South Portal: Ventilation Buildings - Foundation Design									
DDASubmission									
DSN07870	IPs/ ER's Review	28	27-Oct-14	28-Jan-15					
DSN07890	Preparation for resubmission to ER/ICE/IP with ICE Certification	27	28-Nov-14	31-Dec-14					
DSN07990	ER/IP's Approval	28	01-Jan-15	28-Jan-15					
South Portal: Temp Works For Mined Tunnelling									
DDASubmission									
DSN010680	ER/IP's Approval	28	30-Oct-14	26-Nov-14					
South Portal: Temp Works For D&B Tunnelling									
DDASubmission									
DSN010200	IPs/ ER's Review	28	22-Oct-14	22-Nov-14					
DSN010220	Preparation for resubmission to ER/ICE/IP with ICE Certification	28	24-Nov-14	27-Dec-14					
DSN010320	ER/IP's Approval	28	28-Dec-14	24-Jan-15					
South Tunnel Permanent Lining									
AIP Submission									
STPL1023510	ER/IP's Approval	28	17-Oct-14	13-Nov-14					
DDASubmission									
STPL1023520	Preparation for formal submission to ER/ICE/IP	48	18-Feb-15	22-Apr-15					
South Tunnel Internal Structures									
AIP Submission									
STIS1L1023510	ER/IP's Approval	28	17-Oct-14	13-Nov-14					
DDASubmission									
STIS1L1023520	Preparation for formal submission to ER/ICE/IP	45	30-Mar-15	27-May-15					
Cross Passages -Temp Works D&B Tunnel - Soft Ground									
DDASubmission									
DSN26930	Preparation for formal submission to ER/ICE/IP	50	27-Jan-15	28-Mar-15					
DSN26980	IPs/ ER's Review	28	30-Mar-15	06-May-15					
CBAR South Tunnels									
A26040c	Preparation and Submission of CBAR - 2nd Submission	30	22-Oct-14	25-Nov-14					
A26040d	ER/IP's Review & Approval of CBAR	28	26-Nov-14	30-Dec-14					
CIA- South Portal & South D&B Tunnels inc Mid Vent Junction & CP									
SC01140	Draft Report	31	14-Nov-14	14-Dec-14					
SC01175	*Final CIA Report (14d)	21	15-Dec-14	04-Jan-15					
As-Built Drawings [Contractor's Design/ Contractor's Alternative Design]									
SC1630	As-Built Drawings Submission - Temporary Vehicular Bridge	60	15-Oct-14	13-Dec-14					
3.3 South Portal Method Statement Submission									
South Portal: Temporary Slopeworks									
FL2022084	Engineer's Approval	28	29-Oct-14	29-Nov-14					
South Portal: Earthworks & Bulk Excavation Works									
FL2022092	Engineer's Approval	28	29-Oct-14	29-Nov-14					
South Portal: Site Drainage Management									
FL2022088	Engineer's Approval	28	29-Oct-14	29-Nov-14					
South Portal: Tunnel Mechanical Excavation									
FL2022093	Prepare Method Statement	48	24-Jan-15	24-Mar-15					
FL2022094	Engineer's Comment	28	25-Mar-15	30-Apr-15					

 MAIN CONTRACTOR 香港寶嘉 Dragages Hong Kong <small>A member of the Bouygues Construction group</small>						 CLIENT 土木工程拓展署 Civil Engineering and Development Department				 THE ENGINEER AECOM CONTRACTOR'S DESIGNER ATKINS		PROJECT Contract No. CV/2012/08 Liantang/Heung Yuen Wai Boundary Control Point Site Formation and Infrastructure Works Contract 2		DOCUMENT NO. LTH/DHK/PGR/PW/PLP/00019/A		
A Monthly Report No.13 20/01/2015 RAN RBS/SJO PPL/DAL						CONTRACTOR'S DESIGNER		TITLE Monthly Report No.13 3-Months Rolling Programme (Works Programme Rev. C)		DOC. STATUS FOR INFO.	CREATION DATE 20/01/2015	REVISION A				
REV DESCRIPTION DATE PREPARED CHECKED APPROVED						PAPER SIZE A3		SCALE N/A		PAGE 2 of 8						

Activity ID	Activity Name	Working Duration	BL Project Start	BL Project Finish	2014	2015						
						Jan	Feb	Mar	Apr			
South Tunnels: Blasting Method Statement					160	13-Oct-14	28-Apr-15					
FL2022101	Preparation and Submission of Blasting Method Statement	135	13-Oct-14	25-Mar-15								
FL2022104	Engineer's/IP's Review & Approval	113	06-Dec-14	28-Apr-15								
South Portal: Bored Piling Works					76	24-Jan-15	30-Apr-15					
A25485	Prepare Method Statement	48	24-Jan-15	24-Mar-15								
A25486	Engineer's Comment	28	25-Mar-15	30-Apr-15								
South Portal: Pilecap, Footings & Tie beams					128	27-Oct-14	31-Mar-15					
A2330	Prepare Method Statement	48	27-Oct-14	20-Dec-14								
A2340	Engineer's Comment	28	22-Dec-14	26-Jan-15								
A2350	Re-submission Method Statement	24	27-Jan-15	26-Feb-15								
A2360	Engineer's Approval	28	27-Feb-15	31-Mar-15								
South Portal: Permanent Retaining Walls					128	08-Dec-14	18-May-15					
A25481	Prepare Method Statement	48	08-Dec-14	04-Feb-15								
A25482	Engineer's Comment	28	05-Feb-15	12-Mar-15								
A25483	Re-submission Method Statement	24	13-Mar-15	14-Apr-15								
A25484	Engineer's Approval	28	15-Apr-15	18-May-15								
3.5 South Portal Works					280	08-Oct-14	23-May-15					
South Portal: CLP Substation					109	18-Oct-14	28-Feb-15					
SCLP2060	Sub-station Construction + CLP Installation	106	18-Oct-14	28-Feb-15								
SCLP2090	Energization	1	28-Feb-15	28-Feb-15								
South Portal: Tree Transplant & Felling					24	08-Oct-14	04-Nov-14					
SV2155	Tree Felling Remaining	24	08-Oct-14	04-Nov-14								
South Portal: Slopeworks					165	15-Oct-14	23-May-15					
SV2680	Temp.Access Road (~+26.0 >> +57.0)	18	15-Oct-14	04-Nov-14								
SV2690	Permanent Cut Slope (+68.0 to approx +45.0mPD)	55	05-Nov-14	10-Jan-15								
SV2700	Temporary Slope Cut below +45.0mPD (soft) w/Soil Nails	48	12-Jan-15	14-Mar-15								
SV2701 dwp	Temporary Slope Cut below +45.0mPD (soft) w/Soil Nails	48	16-Mar-15	18-May-15								
SV2702dwp	Temporary Soil Nails between +44.6mPd to +26.7mPD	71	16-Feb-15	23-May-15								
4 Middle Portal Area					394	03-Jul-14	11-Aug-15					
4.1 Middle Portal Subcontract & Procurement					205	05-Feb-15	11-Aug-15					
MPS&P0040	Subcontract : Tunnel Linin g Works	60	05-Feb-15	23-Apr-15								
MPS&P0050	Subcontract : Tunnel Linin g Formworks (Design, Fabrication, Delivery, & On-Site Assembly)	150	05-Feb-15	11-Aug-15								
MPS&P0060	Subcontract : Ventilation B uilding Foundation Works	60	12-Feb-15	30-Apr-15								
4.2 Middle Portal Design Submission					308	03-Jul-14	13-Jun-15					
Mid Vent Building - Foundation					193	03-Jul-14	11-Feb-15					
DDASubmission					193	03-Jul-14	11-Feb-15					
DSN29062	Preparation for formal submission to ER/ICE/IP	108	03-Jul-14	08-Nov-14								
DSN29063	IPs/ ER's Review	28	10-Nov-14	11-Dec-14								
DSN29064	Preparation for resubmission to ER/ICE/IP with ICE Certification	26	12-Dec-14	14-Jan-15								
DSN29065	ER/IP's Approval	28	15-Jan-15	11-Feb-15								
Mid Vent Adit Permanent Lining					56	31-Oct-14	04-Feb-15					
DDASubmission					56	31-Oct-14	04-Feb-15					
DSN29075	IPs/ ER's Review	28	31-Oct-14	02-Dec-14								
DSN29076	Preparation for resubmission to ER/ICE/IP with ICE Certification	28	03-Dec-14	07-Jan-15								
DSN29077	ER/IP's Approval	28	08-Jan-15	04-Feb-15								
Mid Vent Adit Internal Structure					49	16-Apr-15	13-Jun-15					
DDASubmission					49	16-Apr-15	13-Jun-15					
DSN29082	Preparation for formal submission to ER/ICE/IP	49	16-Apr-15	13-Jun-15								
Mid Vent Adit/Junction - Temp Works For D&B Tunnelling					195	25-Sep-14	28-Feb-15					

 MAIN CONTRACTOR 香港寶嘉 Dragages Hong Kong <small>A member of the Bouygues Construction group</small>						 CLIENT 土木工程拓展署 Civil Engineering and Development Department				 THE ENGINEER AECOM CONTRACTOR'S DESIGNER ATKINS		PROJECT Contract No. CV/2012/08 Liantang/Heung Yuen Wai Boundary Control Point Site Formation and Infrastructure Works Contract 2		DOCUMENT NO. LTH/DHK/PGR/PW/PLP/00019/A		
A Monthly Report No.13 20/01/2015 RAN RBS/SJO PPL/DAL						TITLE Monthly Report No.13 3-Months Rolling Programme (Works Programme Rev. C)		DOC. STATUS FOR INFO.	CREATION DATE 20/01/2015	REVISION A	PAPER SIZE A3	SCALE N/A	PAGE 3 of 8			

Activity ID	Activity Name	Working Duration	BL Project Start	BL Project Finish	2014	2015						
						Jan	Feb	Mar	Apr			
DDASubmission					195	25-Sep-14	28-Feb-15					
DSN29086	Preparation for formal submission to ER/ICE/IP	49	25-Sep-14	22-Nov-14								
DSN29087	IPs/ ER's Review	28	24-Nov-14	27-Dec-14								
DSN29088	Preparation for resubmission to ER/ICE/IP with ICE Certification	29	29-Dec-14	31-Jan-15								
DSN29089	ER/IP's Approval	28	01-Feb-15	28-Feb-15								
Mid Vent Adit/Junction Permanent Lining & Backfill					228	08-Oct-14	24-Apr-15					
AIP Submission					28	08-Oct-14	04-Nov-14					
DSN29093	ER/IP's Approval	28	08-Oct-14	04-Nov-14								
DDASubmission					49	23-Feb-15	24-Apr-15					
DSN29094	Preparation for formal submission to ER/ICE/IP	49	23-Feb-15	24-Apr-15								
Mid Vent Junction Internal Structure					28	22-Oct-14	18-Nov-14					
AIP Submission					28	22-Oct-14	18-Nov-14					
DSN29101	ER/IP's Approval	28	22-Oct-14	18-Nov-14								
CBAR Cavern					63	29-Sep-14	12-Dec-14					
A26020c1	Preparation and Submission of CBAR - 2nd Submission	39	29-Sep-14	14-Nov-14								
A26020d1	ER/IP's Review & Approval of CBAR	28	15-Nov-14	12-Dec-14								
4.3 Middle Portal Method Statement Submission					180	14-Oct-14	20-May-15					
Cavern Blasting Method Statement					172	14-Oct-14	03-Mar-15					
FL2022107	Preparation and Submission of Blasting Method Statement	90	14-Oct-14	29-Jan-15								
FL2022108	Engineer's/IP's Review & Approval	90	12-Nov-14	03-Mar-15								
Middle Ventilation Adit Lining Works					54	05-Feb-15	13-May-15					
A25513	Prepare Method Statement	48	05-Feb-15	09-Apr-15								
A25514	Engineer's Comment	28	10-Apr-15	13-May-15								
Mid Vent Bldg. Foundation					76	12-Feb-15	20-May-15					
A25509	Prepare Method Statement	48	12-Feb-15	16-Apr-15								
A25510	Engineer's Comment	28	17-Apr-15	20-May-15								
Mid Vent Building Construction					76	14-Jan-15	20-Apr-15					
FL5900	Prepare Method Statement for Mid Vent Building Construction	48	14-Jan-15	13-Mar-15								
FL5910	Engineer's Comment	28	14-Mar-15	20-Apr-15								
4.5 Middle Portal Works					168	16-Sep-14	23-Apr-15					
Middle Portal: CLP Substation					127	26-Sep-14	07-Feb-15					
TSS3P2060	Sub-station Construction + CLP Installation	110	26-Sep-14	06-Feb-15								
TSS3P2090	Energization	1	07-Feb-15	07-Feb-15								
Middle Portal: Portal Formation					50	16-Sep-14	14-Nov-14					
MV2817	Excavation for Site Installation (Tunneling Works) upto (+22.0mPD)	50	16-Sep-14	14-Nov-14								
Adit Construction - Mid Portal					155	14-Oct-14	23-Apr-15					
MV2490dwp2a	Top Heading Canopies & Bench Excavation Ch24>Ch70	91	14-Oct-14	29-Jan-15								
MV2490dwp3	Blast door installation + Noise Measurement and 24Hr permit approval	30	30-Jan-15	05-Mar-15								
MV2490dwp4	D&B Full Face Ch70>Ch133; 63m	41	06-Mar-15	23-Apr-15								
5 North Portal Area					946	20-Jan-14	30-Mar-17					
5.0 North Portal Site Possession Contract Dates					0	18-Dec-14	18-Dec-14					
A1910	LS9 (near North Vent)	0	18-Dec-14									
5.1 North Portal Subcontract & Procurement					946	20-Jan-14	30-Mar-17					
North Portal: TBM Procurement & Delivery					946	20-Jan-14	30-Mar-17					
DSN027980	TBM Procurement, Fabrication & Delivery	405	20-Jan-14	28-Feb-15								
DSN027981	Conveyor Belt System Procurement & Delivery	90	03-Nov-14	31-Jan-15								
N21410a	Precast Segment Fabrication (1.6m Ring) - Temporary Segments	190	30-Sep-14	23-May-15								
N21410b	Precast Segment Fabrication (2.2m Ring)	715	01-Nov-14	30-Mar-17								

 MAIN CONTRACTOR 香港寶嘉 Dragages HongKong <small>A member of the Bouygues Construction group</small>						 CLIENT 土木工程拓展署 Civil Engineering and Development Department				 THE ENGINEER		PROJECT Contract No. CV/2012/08 Liantang/Heung Yuen Wai Boundary Control Point Site Formation and Infrastructure Works Contract 2		DOCUMENT NO. LTH/DHK/PGR/PW/PLP/00019/A		
A Monthly Report No.13 20/01/2015 RAN RBS/SJO PPL/DAL						 CONTRACTOR'S DESIGNER		TITLE Monthly Report No.13 3-Months Rolling Programme (Works Programme Rev. C)		DOC. STATUS FOR INFO.	CREATION DATE 20/01/2015	REVISION A				
REV	DESCRIPTION	DATE	PREPARED	CHECKED	APPROVED			PAPER SIZE A3	SCALE N/A	PAGE 4 of 8						

Activity ID	Activity Name	Working Duration	BL Project Start	BL Project Finish	2014	2015				
						Jan	Feb	Mar	Apr	
5.2 North Portal Design Submission										
North Tunnel Curved Section - N/B & S/B- Temp Support in Rock					28	05-Oct-14	01-Nov-14			
DDA Submission					28	05-Oct-14	01-Nov-14			
FL2022144	ER/IP's Approval	28	05-Oct-14	01-Nov-14						
North Tunnel Curved Section Southbound Temp Support For Enlargement					136	25-Nov-14	06-May-15			
DDA Submission					136	25-Nov-14	06-May-15			
FL2022145	Preparation for formal submission to ER/ICE/IP	56	25-Nov-14	31-Jan-15						
FL2022146	IPs/ ER's Review	28	02-Feb-15	09-Mar-15						
FL2022147	Preparation for resubmission to ER/ICE/IP with ICE Certification	22	10-Mar-15	08-Apr-15						
FL2022148	ER/IP's Approval	28	09-Apr-15	06-May-15						
Bored Tunnel Segmental Lining					45	10-Oct-14	01-Dec-14			
DDA Submission					45	10-Oct-14	01-Dec-14			
FL2022159	Preparation for resubmission to ER/ICE/IP with ICE Certification	21	10-Oct-14	03-Nov-14						
FL2022160	ER/IP's Approval	28	04-Nov-14	01-Dec-14						
Bored Tunnel OHVD Slab					146	09-Oct-14	07-May-15			
AIP Submission					28	09-Oct-14	05-Nov-14			
FL2022164	ER/IP's Approval	28	09-Oct-14	05-Nov-14						
DDA Submission					146	13-Jan-15	07-May-15			
FL2022165	Preparation for formal submission to ER/ICE/IP	42	13-Jan-15	05-Mar-15						
FL2022166	IPs/ ER's Review	28	06-Mar-15	11-Apr-15						
FL2022167	Preparation for resubmission to ER/ICE/IP with ICE Certification	21	13-Apr-15	07-May-15						
Bored Tunnel Internal Structure (except OHVD Slab)					144	05-Oct-14	07-May-15			
AIP Submission					28	05-Oct-14	01-Nov-14			
FL2022172	ER/IP's Approval	28	05-Oct-14	01-Nov-14						
DDA Submission					83	13-Jan-15	07-May-15			
FL2022173	Preparation for formal submission to ER/ICE/IP	42	13-Jan-15	05-Mar-15						
FL2022174	IPs/ ER's Review	28	06-Mar-15	11-Apr-15						
FL2022175	Preparation for resubmission to ER/ICE/IP with ICE Certification	21	13-Apr-15	07-May-15						
Bored Tunnel/ D&B Tunnel Transition - Headwall Structure (N/B & S/B)					210	25-Oct-14	14-Jul-15			
AIP Submission					28	25-Oct-14	21-Nov-14			
FL2022180	ER/IP's Approval	28	25-Oct-14	21-Nov-14						
DDA Submission					95	17-Mar-15	14-Jul-15			
FL2022181	Preparation for formal submission to ER/ICE/IP	95	17-Mar-15	14-Jul-15						
Northbound TBM Dismantling Cavern Temporary Works					92	03-Jan-15	28-Apr-15			
DDA Submission					92	03-Jan-15	28-Apr-15			
FL2022185	Preparation for formal submission to ER/ICE/IP	42	03-Jan-15	24-Feb-15						
FL2022186	IPs/ ER's Review	28	25-Feb-15	28-Mar-15						
FL2022187	Preparation for resubmission to ER/ICE/IP with ICE Certification	22	30-Mar-15	28-Apr-15						
Bored Tunnel Cross Passages Temp Works (Soft Ground)					68	27-Jan-15	06-May-15			
DDA Submission					68	27-Jan-15	06-May-15			
FL2022197	Preparation for formal submission to ER/ICE/IP	50	27-Jan-15	28-Mar-15						
FL2022198	IPs/ ER's Review	28	30-Mar-15	06-May-15						
Bored Tunnel Cross Passages Temp Works (Rock)					53	27-Jan-15	06-May-15			
DDA Submission					53	27-Jan-15	06-May-15			
FL2022201	Preparation for formal submission to ER/ICE/IP	50	27-Jan-15	28-Mar-15						
FL2022202	IPs/ ER's Review	28	30-Mar-15	06-May-15						
Bored Tunnel Cross Passages Permanent Lining (Soft Ground)					278	27-Sep-14	23-Jun-15			
AIP Submission					167	27-Sep-14	03-Feb-15			
FL2022205	Preparation for formal submission to ER/ICE/IP	42	27-Sep-14	17-Nov-14						

 MAIN CONTRACTOR 香港寶嘉 Dragages Hong Kong <small>A member of the Bouygues Construction group</small>						 CLIENT 土木工程拓展署 Civil Engineering and Development Department			 THE ENGINEER AECOM CONTRACTOR'S DESIGNER ATKINS		PROJECT Contract No. CV/2012/08 Liantang/Heung Yuen Wai Boundary Control Point Site Formation and Infrastructure Works Contract 2		DOCUMENT NO. LTH/DHK/PGR/PW/PLP/00019/A		
A Monthly Report No.13 20/01/2015 RAN RBS/SJO PPL/DAL						DOC. STATUS FOR INFO.		CREATION DATE 20/01/2015		REVISION A					
REV DESCRIPTION DATE PREPARED CHECKED APPROVED						PAPER SIZE A3		SCALE N/A		PAGE 5 of 8					

Activity ID	Activity Name	Working Duration	BL Project Start	BL Project Finish	2015				
					2014	Jan	Feb	Mar	Apr
FL2022206	IPs/ ER's Review	28	18-Nov-14	19-Dec-14					
FL2022207	Preparation for resubmission to ER/ICE/IP with ICE Certification	12	20-Dec-14	06-Jan-15	█				
FL2022208	ER/IP's Approval	28	07-Jan-15	03-Feb-15		█			
DDA Submission		72	24-Mar-15	23-Jun-15					
FL2022209	Preparation for formal submission to ER/ICE/IP	72	24-Mar-15	23-Jun-15				█	
Bored Tunnel Cross Passages Permanent Lining (Rock)		259	27-Sep-14	17-Jul-15					
AIP Submission		167	27-Sep-14	03-Feb-15					
FL2022213	Preparation for formal submission to ER/ICE/IP	42	27-Sep-14	17-Nov-14					
FL2022214	IPs/ ER's Review	28	18-Nov-14	19-Dec-14					
FL2022215	Preparation for resubmission to ER/ICE/IP with ICE Certification	12	20-Dec-14	06-Jan-15	█				
FL2022216	ER/IP's Approval	28	07-Jan-15	03-Feb-15		█			
DDA Submission		92	24-Mar-15	17-Jul-15					
FL2022217	Preparation for formal submission to ER/ICE/IP	92	24-Mar-15	17-Jul-15				█	
Bored Tunnel Cross Passages Internal Structures		129	27-Nov-14	16-Apr-15					
AIP Submission		129	27-Nov-14	16-Apr-15					
FL2022221	Preparation for formal submission to ER/ICE/IP	42	27-Nov-14	17-Jan-15	█				
FL2022222	IPs/ ER's Review	28	19-Jan-15	23-Feb-15		█			
FL2022223	Preparation for resubmission to ER/ICE/IP with ICE Certification	21	24-Feb-15	19-Mar-15			█		
FL2022224	ER/IP's Approval	28	20-Mar-15	16-Apr-15				█	
Temp Pre-Cast Reinforced Box for TBM Segment Del in Curved Section		127	03-Dec-14	25-Apr-15					
DDA Submission		127	03-Dec-14	25-Apr-15					
FL2022229	Preparation for formal submission to ER/ICE/IP	42	03-Dec-14	23-Jan-15	█				
FL2022230	IPs/ ER's Review	28	24-Jan-15	28-Feb-15		█			
FL2022231	Preparation for resubmission to ER/ICE/IP with ICE Certification	24	02-Mar-15	28-Mar-15			█		
FL2022232	ER/IP's Approval	28	29-Mar-15	25-Apr-15				█	
CBAR North Tunnel (D&B Section & Cross Passages)		28	22-Oct-14	18-Nov-14					
A26030b	ER/IP's Review & Approval of CBAR	28	22-Oct-14	18-Nov-14					
Construction Impact Assessment - Bored Tunnel		105	21-Oct-14	27-Dec-14					
FL21140	Draft Report	31	21-Oct-14	20-Nov-14					
FL21175	*Final CIA Report	37	21-Nov-14	27-Dec-14	█				
Waterworks Impact Assessment - Existing WSD Nam Chung Water Tunnel		44	15-Oct-14	04-Dec-14					
FL2022245	Preparation for resubmission to ER/ICE/IP with ICE Certification	20	15-Oct-14	06-Nov-14					
FL2022246	ER/IP's Approval	28	07-Nov-14	04-Dec-14					
5.3 North Portal Method Statement Submission		191	03-Oct-14	13-Apr-15					
North Tunnel (D&B Section) Blasting Method Statement		169	03-Oct-14	24-Jan-15					
FL2022109	Preparation and Submission of Blasting Method Statement	70	03-Oct-14	23-Dec-14	█				
FL2022110	Engineer's IP's Review & Approval	60	13-Nov-14	24-Jan-15		█			
MS for TBM On-Site Assembly		151	27-Oct-14	14-Feb-15					
FL4875	Prepare & Submit Method Statement	24	27-Oct-14	22-Nov-14					
FL4880	ER's Comment for Method Statement	30	23-Nov-14	22-Dec-14	█				
FL4885	Prepare & Re-submit Method Statement	18	23-Dec-14	15-Jan-15		█			
FL4890	ER's Approval for Method Statement	30	16-Jan-15	14-Feb-15			█		
MS for TBM Launching		140	02-Dec-14	13-Apr-15					
FL2022061	Prepare & Submit Method Statement	40	02-Dec-14	20-Jan-15	█				
FL2022062	ER's Comment for Method Statement	30	21-Jan-15	19-Feb-15		█			
FL2022063	Prepare & Re-submit Method Statement	18	23-Feb-15	14-Mar-15			█		
FL2022064	ER's Approval for Method Statement	30	15-Mar-15	13-Apr-15				█	
MS for TBM Excavation		90	02-Dec-14	26-Mar-15					
FL2875	Prepare & Submit Method Statement	24	02-Dec-14	31-Dec-14	█				
FL2880	ER's Comment for Method Statement	30	01-Jan-15	30-Jan-15		█			

 MAIN CONTRACTOR 香港寶嘉 Dragages Hong Kong <small>A member of the Bouygues Construction group</small>					 CLIENT 土木工程拓展署 Civil Engineering and Development Department					 THE ENGINEER AECOM CONTRACTOR'S DESIGNER ATKINS					PROJECT Contract No. CV/2012/08 Liantang/Heung Yuen Wai Boundary Control Point Site Formation and Infrastructure Works Contract 2					DOCUMENT NO. LTH/DHK/PGR/PW/PLP/00019/A				
A Monthly Report No.13 20/01/2015 RAN RBS/SJO PPL/DAL										DOC. STATUS FOR INFO. CREATION DATE 20/01/2015 REVISION A														
REV DESCRIPTION DATE PREPARED CHECKED APPROVED										PAPER SIZE A3 SCALE N/A PAGE 6 of 8														

Activity ID	Activity Name	Working Duration	BL Project Start	BL Project Finish	2014	2015			
						Jan	Feb	Mar	Apr
FL2885	Prepare & Re-submit Method Statement	18	31-Jan-15	24-Feb-15					
FL2890	ER's Approval for Method Statement	30	25-Feb-15	26-Mar-15					
North Portal: WSD Tunnel Instrumentation					65	18-Oct-14	05-Jan-15		
FL2022474	ER's Comment for Method Statement	30	18-Oct-14	16-Nov-14					
FL2022484	Prepare & Re-submit Method Statement	18	17-Nov-14	06-Dec-14					
FL2022494	ER's Approval for Method Statement	30	07-Dec-14	05-Jan-15					
5.5 North Portal Works					525	29-Apr-14	30-Sep-15		
Engineer's Principal Site Office & Contractor's Site Office					25	01-Nov-14	29-Nov-14		
N21564	Construction of Core and Material Store	25	01-Nov-14	29-Nov-14					
CLP Substation					125	07-Oct-14	14-Feb-15		
N21060	Sub-station Construction	110	07-Oct-14	14-Feb-15					
N21090	Energization	1	14-Feb-15	14-Feb-15					
North Portal: Strengthening Works for WSD Tunnel					32	20-Nov-14	30-Dec-14		
DSN018310	Instrument Installation	18	08-Dec-14	30-Dec-14					
NV3345a1	KD-11 Stage III Completion of strengthening works inside existing Nam Chung water tunnel.	0		20-Nov-14					
North Portal: Site Formation					525	29-Apr-14	30-Sep-15		
N20495	Permanent Slope Formation for TBM Site Installation	150	29-Apr-14	07-Nov-14					
N20505	Permanent Slope Formation (Remaining)	200	08-Nov-14	25-Jul-15					
N20635	NB: Stage 2 Excavation from +38mPD to +18mPD w/10 rows Soil Nail	74	23-Oct-14	20-Jan-15					
N20655	NB: Stage 3 Permanent Slope from +75mPD to +30mPD	192	21-Jan-15	30-Sep-15					
N21562	KD-12 Stage IV Completion of site clearance in Portions CR5A, CR6A and TA-1	0		19-Dec-14					
North Portal: Site Installation for TBM					99	08-Nov-14	06-May-15		
SC01310	Site Installation and Logistics for TBM Works	60	08-Nov-14	20-Jan-15					
TD1000	Conveyor Belt System Construction	75	26-Jan-15	06-May-15					
Southbound Tunnel (Mined Excavation) inc Enlargement					200	26-Aug-14	06-May-15		
DB6370a	Top Heading Excavation (Canopies) (Ch6,450>Ch6,415) (35m) [P21: 4850 to 4815]	80	26-Aug-14	28-Nov-14					
DB6370b	Blast door installation + Noise Measurement and 24Hr permit approval	30	06-Nov-14	05-Dec-14					
DB6370c	Top Heading Excavation (Canopies) (Ch6,415>Ch6,355) (60m) [P21: 4815 to 4755]	72	06-Dec-14	02-Mar-15					
DB6370d	Platform excavation for bench excavation	22	12-Feb-15	09-Mar-15					
DB6370e	Bench Excavation (Ch6,450>Ch6,355) (95m) [P21: 4850 to 4755]	48	10-Mar-15	06-May-15					
Northbound Tunnel (Mined Excavation)					76	02-Mar-15	30-May-15		
DB6400a	Top Heading Canopies (Ch6446>Ch6410); 36m; [P20: 4824 to 4788]	76	02-Mar-15	30-May-15					
TBM On-Site Assembly					65	02-Mar-15	18-May-15		
TD0990	TBM On-site Assembly and T&C	65	02-Mar-15	18-May-15					
5.6 Administration Building:					218	20-Dec-14	12-May-15		
5.62 Administration Building: Design Submission					218	20-Dec-14	12-May-15		
Admin. Building - Foundation Design					218	20-Dec-14	12-May-15		
DDA Submission					218	20-Dec-14	12-May-15		
DSN29107	Preparation for formal submission to ER/ICE/IP	35	20-Dec-14	02-Feb-15					
DSN29108	IPs/ ER's Review	28	03-Feb-15	10-Mar-15					
DSN29109	Preparation for resubmission to ER/ICE/IP with ICE Certification	21	11-Mar-15	08-Apr-15					
DSN29110	ER/IP's Approval	28	09-Apr-15	12-May-15					
5.63 Administration Building: Method Statement Submission					76	09-Jan-15	27-Apr-15		
Method Statement for Admin. Building Construction					76	14-Jan-15	20-Apr-15		
A1990	Prepare Method Statement for Administration Building Construction	24	14-Jan-15	10-Feb-15					
A2000	ER's Comment	28	11-Feb-15	18-Mar-15					
AD2190	Re-submission Method Statement for Building Construction	24	19-Mar-15	20-Apr-15					
MS for Administration Building: Demolition					64	09-Jan-15	27-Apr-15		
SV2905	Prepare & Submit Demolition Plan & Method Statement	24	09-Jan-15	05-Feb-15					

MAIN CONTRACTOR 					CLIENT 					THE ENGINEER 					PROJECT Contract No. CV/2012/08 Liantang/Heung Yuen Wai Boundary Control Point Site Formation and Infrastructure Works Contract 2					DOCUMENT NO. LTH/DHK/PGR/PW/PLP/00019/A		
CONTRACTOR'S DESIGNER 					TITLE Monthly Report No.13 3-Months Rolling Programme (Works Programme Rev. C)					DOC. STATUS FOR INFO.		CREATION DATE 20/01/2015		REVISION A								
REV		DESCRIPTION		DATE	PREPARED	CHECKED	APPROVED	PAPER SIZE A3		SCALE N/A		PAGE 7 of 8										

Activity ID	Activity Name	Working Duration	BL Project Start	BL Project Finish	2015			
					Jan	Feb	Mar	Apr
SV2910	ER's Comment for Demolition Plan & Method Statement	30	06-Feb-15	07-Mar-15				
SV2915	Prepare & Re-submit Demolition Plan & Method Statement	18	09-Mar-15	28-Mar-15				
SV2920	ER's Approval for Demolition & Method Statement	30	29-Mar-15	27-Apr-15				
5.64 Administration Building: General Submission								
Administration Building: Egress/Ingress								
N21275	Appoint Consultant for TTMs	12	02-Jan-15	15-Jan-15				
N21285	Prepare & Submit Temp. Traffic Management Scheme	12	16-Jan-15	29-Jan-15				
N21295	TMLG Meeting	12	30-Jan-15	12-Feb-15				
N21305	TTMS Reviewed & Comment	12	13-Feb-15	02-Mar-15				
N21315	Notification to RMO	6	03-Mar-15	09-Mar-15				
5.65 Administration Building: Works								
Administration Building: Site Formation								
AD2000	Site Hoarding	24	31-Mar-15	04-May-15				
AD2050	U/U Diversion & Drainage Diversion (if required)	36	10-Mar-15	24-Apr-15				

						MAIN CONTRACTOR  香港寶嘉 Dragages Hong Kong <small>A member of the Bouygues Construction group</small>	CLIENT  土木工程拓展署 Civil Engineering and Development Department	THE ENGINEER  CONTRACTOR'S DESIGNER 	PROJECT Contract No. CV/2012/08 Liantang/Heung Yuen Wai Boundary Control Point Site Formation and Infrastructure Works Contract 2	DOCUMENT NO. LTH/DHK/PGR/PW/PLP/00019/A	
A	Monthly Report No.13	20/01/2015	RAN	RBS/SJO	PPL/DAL				DOC. STATUS FOR INFO.	CREATION DATE 20/01/2015	REVISION A
REV	DESCRIPTION	DATE	PREPARED	CHECKED	APPROVED				PAPER SIZE A3	SCALE N/A	PAGE 8 of 8

Contract 3

Activity ID	Activity Name	OD	RD	Start	Finish	TF	2015					
							Jan	Feb	Mar	Apr	May	
3-Month Rolling Programme 2015-01-21												
Key Dates (Contractual)												
KD-0010	Commencement of Works	0	0	31-Jul-13 A								
Dependent Milestones from Other Contracts												
MS-0100	Completion of Temporary Vehicular Bridge by C2 Contractor	0	0	24-Jan-15*	-122		◆	Completion of Temporary Vehicular Bridge by C2 Contractor				
Major Milestones and Events												
MS-2000A2	T1b: TTA to shift FLHS SB eastward to the widened pavement (shift 2 lanes)	1	1	08-Feb-15	08-Feb-15	1			█	T1b: TTA to shift FLHS SB eastward to the widened pavement (shift 2 lanes)		
MS-2000A3	T1c: TTA to shift FLHS SB eastward to the widened pavement (shift 3 lanes)	1	1	01-Mar-15	01-Mar-15	2			█	T1c: TTA to shift FLHS SB eastward to the widened pavement (shift 3 lanes)		
MS-2000B	T2: TTA to shift FLHS NB eastward	1	1	08-Mar-15	08-Mar-15	3			█	T2: TTA to shift FLHS NB eastward		
Major Procurement & Delivery												
Water Supply Pipeworks												
MM-1060	E&M equipment for the re-provisioned WSD Valve Control House	60	60	20-Jan-15	10-Apr-15	61					█	E&M equipment for the re-provisio
Precast Bridge Segment Lifting Frames and Precast Yard												
MM-2040	Deliver to Site and assembly works	44	0	28-Sep-14 A	16-Jan-15 A						█	Deliver to Site and assembly works
MM-2050	Certification of lifting frame	18	18	20-Jan-15	09-Feb-15	33					█	Certification of lifting frame
Design and Submissions												
Statutory Approval												
PRE-1040	Submission & approval of temporary works on nullah for construction of pad footing of Bridge E - DSD	40	0	11-Sep-14 A	08-Jan-15 A						█	Submission & approval of temporary works on nullah for construction of pad footing of Bridge E - DSD
PRE-1210	Consent for Dong Jiang watermians connection for DN1400 - WSD	0	0		20-Jan-15*	-15					◆	Consent for Dong Jiang watermians connection for DN1400 - WSD
PRE-1510	Confirmation of Revised Retaining Structure along Slope no. 3SW-C/C898	0	0		20-Jan-15*	236					◆	Confirmation of Revised Retaining Structure along Slope no. 3SW-C/C898
PRE-1500	Confirmation of Noise Barrier Footing Design for NB71 (CH7150 to CH7290)	70	14	17-Apr-14 A	04-Feb-15	30					█	Confirmation of Noise Barrier Footing Design for NB71 (CH7150 to CH7290), Confirmation of Noise Barrier Fo
PRE-1220	Consent for construction of noise barrier (NB1a) within WSD Tau Pass Restricted Zone - WSD	45	21	09-Apr-14 A	12-Feb-15	170					█	Consent for construction of noise barrier (NB1a) within WSD Tau Pass Restricted Zone - WSD, Cons
Method Statement and Design (Major) Approved by AECOM												
PRE-2020	Submission of noise barrier design for absorptive panels, transparent panels and associated fixing details	60	30	11-Mar-14 A	02-Mar-15	106					█	Submission of noise barrier design for absorptive panels, transparent panels and
Contractor's Alternative Design (AD) Submission & Approval												
PRE-4310C	Superstructure Design Package 3 for Bridge A3 (AA10-AA13)	158	0	04-Apr-14 A	12-Jan-15 A						█	Superstructure Design Package 3 for Bridge A3 (AA10-AA13)
PRE-4310A	Superstructure Design Package 9 for Bridge A1 (AA1-AA5)	118	0	16-May-14 A	12-Jan-15 A						█	Superstructure Design Package 9 for Bridge A1 (AA1-AA5)
PRE-4310B	Superstructure Design Package 10 for Bridge A2 (AA6-AA9)	154	0	16-May-14 A	12-Jan-15 A						█	Superstructure Design Package 10 for Bridge A2 (AA6-AA9)
PRE-4310D	Superstructure Design Package 6 for Bridge A4 (AA14-AA18)	108	0	16-May-14 A	12-Jan-15 A						█	Superstructure Design Package 6 for Bridge A4 (AA14-AA18)

 俊和建築工程有限公司 CHUN WO CONSTRUCTION & ENGINEERING CO., LTD.	<ul style="list-style-type: none"> Actual Work Remaining Work Summary Bar Critical Remaining Work Milestone Project Baseline Bar 	CEDD Contract No. CV/2012/09 Liantang / Heung Yuen Wai BCP - Site Formation & Infrastructure Works, Contract 3 3-Month Rolling Programme	3-Month Rolling Programme updated to 2015-01-21			
		3MPR018	Page 1 of 9	26-Jan-15	Date 26-Jan-15	Revision Rev.1

Activity ID	Activity Name	OD	RD	Start	Finish	TF	2015				
							Jan	Feb	Mar	Apr	May
PRE-4320B	Superstructure Design Package 7 for Bridge B2 (AB7-AB12)	196	0	21-May-14 A	12-Jan-15 A		Superstructure Design Package 7 for Bridge B2 (AB7-AB12)				
PRE-4340B	Superstructure Design Package 8 for Bridge D2 (AD6-AD8)	56	0	30-Jul-14 A	12-Jan-15 A		Superstructure Design Package 8 for Bridge D2 (AD6-AD8)				
PRE-4340C	Superstructure Design Package 5 for Bridge D3 (AD9-AD14)	196	0	07-May-14 A	12-Jan-15 A		Superstructure Design Package 5 for Bridge D3 (AD9-AD14)				
Section IA & IB - Fanling Highway Widening (KD-1 & KD-2)											
Fanling Highway South Portion between CH6935 and CH7470											
Fanling Highway Zone 1 between CH6935 and CH7130 (within SBZZ)											
At-Grade Roadworks (195m)											
FHW-1120*	Pipe Laying - DN1200 Watermains (CHC) across Fanling Highway (total 80m for 2 shafts)	275	11	09-Jun-14 A	31-Jan-15	863	Pipe Laying - DN1200 Watermains (CHC) across Fanling Highway (total 80m for 2 shafts)				
FHW-1130*	Pipe Laying - DN1200 Watermains (CHC) along Fanling Highway (80m long, 4m depth)	182	40	20-Feb-14 A	13-Mar-15	783	Pipe Laying - DN1200 Watermains (CHC) along Fanling Highway (80m long, 4m depth)				
Fanling Highway Zone 2 between CH7130 and CH7290											
At-Grade Roadworks (160m)											
FHW-2120*	Pipe Laying - Twin DN1400 Watermains (CHE & G) along Fanling Highway (44m long, 6m depth)	85	20	09-Jul-14 A	11-Feb-15	151	Pipe Laying - Twin DN1400 Watermains (CHE & G) along Fanling Highway (44m long, 6m depth)				
FHW-2110B	Noise Barrier NB71 - Footing adjacent to SB lane (96m) (affected due to design change)	100	171	26-Jul-14 A	22-Aug-15	13	Noise Barrier NB71 - Footing adjacent to SB lane (96m) (affected due to design change)				
FHW-2130*	Pipe Laying - DN1200 & DN600 Watermains (CHB & CHC) along Fanling Highway (183m long, 4m depth)	209	209	14-Feb-15	04-Nov-15	381	Pipe Laying - DN1200 & DN600 Watermains (CHB & CHC) along Fanling Highway (183m long, 4m depth)				
Fanling Highway Zone 3 between CH7290 and CH7380											
At-Grade Roadworks (130m)											
FHW-3130	Noise Barrier NB71 - Footing adjacent to SB lane (130m) Including pile cap	270	81	23-May-14 A	06-May-15	139	Noise Barrier NB71 - Footing adjacent to SB lane (130m) Including pile cap				
FHW-3210	Noise Barrier NB69 - Mini-Piling adjacent to NB lane (CSD: 32nos)	79	79	09-Mar-15	15-Jun-15	3	Noise Barrier NB69 - Mini-Piling adjacent to NB lane (CSD: 32nos)				
FHW-3160	Road Formation, Kerb and Pavement (Eastern Side: FLH SB Slow lane and hard should)	120	120	13-Feb-15	18-Jul-15	139	Road Formation, Kerb and Pavement (Eastern Side: FLH SB Slow lane and hard should)				
FHW-3150*	Pipe Laying - DN600, DN1200 Watermains (CHB & CHC) along Fanling Highway (90m long, 3m depth)	150	141	07-Jun-14 A	18-Jul-15	579	Pipe Laying - DN600, DN1200 Watermains (CHB & CHC) along Fanling Highway (90m long, 3m depth)				
Fanling Highway Zone 4 between CH7380 and CH7470											
At-Grade Roadworks (90m)											
FHW-4120*	Pipe Laying - Twin DN1400 Watermains (CHE & CHG) along Fanling Highway (90m long, 3m depth)	155	20	15-Oct-14 A	11-Feb-15	52	Pipe Laying - Twin DN1400 Watermains (CHE & CHG) along Fanling Highway (90m long, 3m depth)				
FHW-4130*	Pipe Laying - DN600 & DN1200 Watermains (CHB & CHC) along Fanling Highway (90m long, 3m depth)	60	20	27-Nov-14 A	11-Feb-15	808	Pipe Laying - DN600 & DN1200 Watermains (CHB & CHC) along Fanling Highway (90m long, 3m depth)				
Miscellaneous Works for Facilitating Traffic Diversion of Fanling Highway											
FHW-M-1020	Permanent Road Formation with 2 lanes width between CH6935 and CH7130 (Eastern Side) by means of re-construction	45	17	10-Nov-14 A	07-Feb-15	0	Permanent Road Formation with 2 lanes width between CH6935 and CH7130 (Eastern Side) by means of re-construction				
FHW-M-1030	Permanent Road Formation with 3 lanes width between CH6935 and CH7130 (Eastern Side) by means of re-surfacing	12	12	09-Feb-15	28-Feb-15	1	Permanent Road Formation with 3 lanes width between CH6935 and CH7130 (Eastern Side) by means of re-surfacing				
FHW-M-1040	Demolition of a certain section of Central Barrier & Make Good of Road Pavement for further Traffic Diversion	6	6	02-Mar-15	07-Mar-15	2	Demolition of a certain section of Central Barrier & Make Good of Road Pavement for further Traffic Diversion				
Fanling Highway North Portion between CH7470 and CH7925											

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

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

CEDD Contract No. CV/2012/09

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

3-Month Rolling Programme

3MPR018 **Page 2 of 9** **26-Jan-15**

3-Month Rolling Programme updated to 2015-01-21			
Date	Revision	Checked	Approved
26-Jan-15	Rev.1	SL	

Activity ID	Activity Name	OD	RD	Start	Finish	TF	2015				
							Jan	Feb	Mar	Apr	May
Fanling Highway Zone 5 between CH7470 and CH7600 (Provision of Kiu Tau Footbridge)											
Kiu Tau Footbridge Reprovision (East)											
FHW-5000C1	KT-P2 - Piling Works (3 out of 6 nos of Pile) - Phase 1	30	0	04-Oct-14 A	20-Dec-14 A		KT-P2 - Piling Works (3 out of 6 nos of Pile) - Phase 1				
FHW-5000D1	KT-P3 - Piling Works (5 out of 6 nos of Pile) - Phase 1	40	0	06-Oct-14 A	24-Dec-14 A		KT-P3 - Piling Works (5 out of 6 nos of Pile) - Phase 1				
FHW-5000D2	KT-P3 - Piling Works (1 out of 6 nos of Pile) - Phase 2, conflict with temp cycle track/ existing tree	6	0	02-Dec-14 A	24-Dec-14 A		KT-P3 - Piling Works (1 out of 6 nos of Pile) - Phase 2, conflict with temp cycle track/ existing tree				
FHW-5000A1	KT-AB1 - Piling Works (7 out of 12 nos of Pile) - Phase 1	60	0	29-Sep-14 A	14-Jan-15 A		KT-AB1 - Piling Works (7 out of 12 nos of Pile) - Phase 1				
FHW-5080	Additional BFA Facilities - Piling Works (4 out of 4 nos of Pile) - Phase 1, to be covered by VO	20	0	30-Dec-14 A	14-Jan-15 A		Additional BFA Facilities - Piling Works (4 out of 4 nos of Pile) - Phase 1, to be covered by VO				
FHW-5000A2	KT-AB1 - Piling Works (5 out of 12 nos of Pile) - Phase 2, conflict with temp cycle track/ existing tree	25	25	05-Mar-15	02-Apr-15	29	KT-AB1 - Piling Works (5 out of 12 nos of Pile) - Phase 2, conflict with temp cycle track/ existing tree				
FHW-5000E	KT-P4 - Piling Works (8 out of 8 nos of Pile) - Phase 2, conflict with temp cycle track/ existing tree	40	40	08-Apr-15	26-May-15	29	KT-P4 - Piling Works (8 out of 8 nos of Pile) - Phase 2, conflict with temp cycle track/ existing tree				
FHW-5010B	KT-AB2 - Pile Cap & Abutment	105	105	26-Mar-15	04-Aug-15	226	KT-AB2 - Pile Cap & Abutment				
At-Grade Road Works (130m)											
FHW-5120A	Preparation Works for Implementation of TTA Scheme E2	25	25	26-Mar-15	28-Apr-15	52	Preparation Works for Implementation of TTA Scheme E2				
Fanling Highway Zone 7 between CH7660 and CH7925											
At-Grade Roadworks (265m)											
FHW-7100	Site Formation, Preparation Works & Tree Transplant	127	177	30-Aug-13 A	29-Aug-15	4	Site Formation, Preparation Works & Tree Transplant				
Section II - Remainder of the Works (KD-3)											
WSD Works											
DN450 Fire Mains (CHA)											
WA-1030	Pipe Laying - CHA 260 - 360 (DN450) near Ext. TWSR West, 100m long & 2m depth	65	65	09-Mar-15	29-May-15	704	Pipe Laying - CHA 260 - 360 (DN450) near Ext. TWSR West, 100m long & 2m depth				
DN600 Water Mains (CHB)											
WB-1020	Pipe Laying - CHB 245 - 335 (DN600) near Fanling Highway S/B (FHW: CH7380-7470), 90m long (common trench with NB)	60	20	27-Nov-14 A	11-Feb-15	640	Pipe Laying - CHB 245 - 335 (DN600) near Fanling Highway S/B (FHW: CH7380-7470), 90m long (common trench with NB)				
WB-0100	Temporary Local Diversion for DN600 near Abutment AD1 (CHB 0 - 100)	80	22	25-Sep-14 A	13-Feb-15	495	Temporary Local Diversion for DN600 near Abutment AD1 (CHB 0 - 100), Temporary Local Diversion				
WB-1030B	Pipe Laying - CHB 350 - 450 (DN600) from Pier AA4 to Portal AB7/AD9/AC12	30	30	12-Feb-15	25-Mar-15	52	Pipe Laying - CHB 350 - 450 (DN600) from Pier AA4				
DN1200 Water Mains (CHC)											
WC-1030B	Pipe Laying - CHC 100 - 155 (DN1200) across Fanling Highway & associated Grouting Works	46	11	14-Nov-14 A	31-Jan-15	863	Pipe Laying - CHC 100 - 155 (DN1200) across Fanling Highway & associated Grouting Works, Pipe Laying - CHC 1				
WC-1080	Pipe Laying - CHC 510 - 600 (DN1200) near Fanling Highway S/B (FHW: CH7380-7470), 90m long (common trench with NB)	60	20	27-Nov-14 A	11-Feb-15	808	Pipe Laying - CHC 510 - 600 (DN1200) near Fanling Highway S/B (FHW: CH7380-7470), 90m long (common trench with NB)				
WC-1050A	Pipe Laying - CHC 155 - 200 (DN1200) near Fanling Highway S/B (FHW: CH6935-7130), 45m long, 4m depth	120	40	15-Oct-14 A	13-Mar-15	783	Pipe Laying - CHC 155 - 200 (DN1200) near Fanling Highway S/B				
WC-1090B	Pipe Laying - CHC 615 - 720 (DN1200) from Pier AA4 to Portal AB7/AD9/AC12	30	30	12-Feb-15	25-Mar-15	52	Pipe Laying - CHC 615 - 720 (DN1200) from Pier AA4				
WC-1060	Pipe Laying - CHC 235 - 420 (DN1200) near Fanling Highway S/B (FHW: CH7130-7290), 185m long (common trench with NB)	95	95	14-Feb-15	18-Jun-15	495	Pipe Laying - CHC 235 - 420 (DN1200) near Fanling Highway S/B (FHW: CH7130-7290), 185m long (common trench with NB)				



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

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

CEDD Contract No. CV/2012/09

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

3-Month Rolling Programme

3MPR018 **Page 3 of 9** **26-Jan-15**

3-Month Rolling Programme updated to 2015-01-21			
Date	Revision	Checked	Approved
26-Jan-15	Rev.1	SL	

Activity ID	Activity Name	OD	RD	Start	Finish	TF	2015						
							Jan	Feb	Mar	Apr	May		
Twin DN1400 Water Mains (CHE & CHG)													
WE-1000	Pipe Laying - CHE & CHG 0 - 45 (Twins DN1400) near Fanling Highway S/B (FHW: CH7130-7290), 45m long & 6m depth	85	20	09-Jul-14 A	11-Feb-15	151							
WE-1020	Pipe Laying - CHE & CHG 135 - 225 (Twins DN1400) near Fanling Highway S/B (FHW: CH7380-7470), 90m long & 3m depth	155	20	15-Oct-14 A	11-Feb-15	52							
WE-2000A	Pressure Test, for CHE (Stage 1 Diversion)	14	14	12-Feb-15	06-Mar-15	151							
WE-2000B	Pressure Test for CHG (Stage 1 Diversion)	14	14	12-Feb-15	06-Mar-15	202							
WE-2010A	Cleaning & CCTV Inspection for CHE (Stage 1 Diversion)	14	14	07-Mar-15	23-Mar-15	151							
WE-2010B	Cleaning & CCTV Inspection for CHG (Stage 1 Diversion)	14	14	07-Mar-15	23-Mar-15	202							
WE-1040	Pipe Laying - CHE & CHG (Twins DN1400) from Pier AA4 to Portal AB7/AD9/AC12	30	30	12-Feb-15	25-Mar-15	52							
WE-2020A	Installation of Connecting Pipe for Connection to Existing Mains (CHE)	14	14	24-Mar-15	13-Apr-15	151							
WE-2030A	Sterilization and Sampling for CHE (Stage 1 Diversion)	10	10	14-Apr-15	24-Apr-15	151							
DN2300 Water Mains and Leakage Collection System (CHJ & CHKA/CHK)													
WJ-1010A	Pipe Laying - CHJ 0 - 10 (DN2200) near existing TWSR East, 10m long & 6m depth	90	47	13-Oct-14 A	07-Mar-15	89							
WJ-1050	Pipe Laying - CHJ 200 - 292 (DN2300) near Realigned TWSR East (along Access Road A), 92m long & GL	68	53	02-Jan-15 A	28-Mar-15	4							
WJ-1000	Implementation of TTA - Scheme E2 (Shifting TWSRE toward newly formation area beside Fanling Highway)	21	21	09-Mar-15	01-Apr-15	70							
WJ-1020B	Pipe Laying - CHKA 0 - 73 (DN1400) near Realigned TWSR East, 73m long & 4m depth	65	65	10-Feb-15	15-Apr-15	33							
WJ-1010B	Pipe Laying - CHJ 10 - 50 (DN2200) crossing existing TWSR East, 40m long & 6m depth	40	40	02-Apr-15	23-May-15	70							
WJ-1010C	Pipe Laying - CHJ 50 - 100 (DN2200) near existing TWSR East, 50m long & 6m depth	65	65	26-Mar-15	16-Jun-15	16							
WJ-1100	DN300 Washout at around CHJ 268	65	65	30-Mar-15	19-Jun-15	48							
WJ-1020A	Pipe Laying - CHK 0 - 80 (DN1400) near Realigned TWSR East, 80m long & 4m depth	75	75	16-Apr-15	16-Jul-15	27							
Kau Lung Hang Valve Control & Telemetry House Re provision													
VCTH-1040	ABWF Works	70	60	06-Jan-15 A	10-Apr-15	61							
VCTH-1010	BS and E&M Works	120	120	11-Apr-15	02-Sep-15	61							
Stage 1A - Realignment of Tai Wo Service Road West (KD-7)													
Preliminary Works													
TWSRW-1100	Tree Survey, Tree Felling and Transplanting	81	5	16-Oct-13 A	24-Jan-15	-24							
TWSRW Zone 1 between CH100 and CH155													
At-Grade Roadworks													
TWSRW-1150	Installation of Cable Ducts for Utilities Diversion Works at Zone 1 & Zone 2 (Approx. 100m) (by utilities undertakers)	167	77	22-Oct-14 A	06-Apr-15	319							
TWSRW-1160	Road Formation, Road Drainage, Kerb, Planter & Pavement	286	257	15-Nov-14 A	05-Dec-15	33							



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

CEDD Contract No. CV/2012/09

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

3-Month Rolling Programme

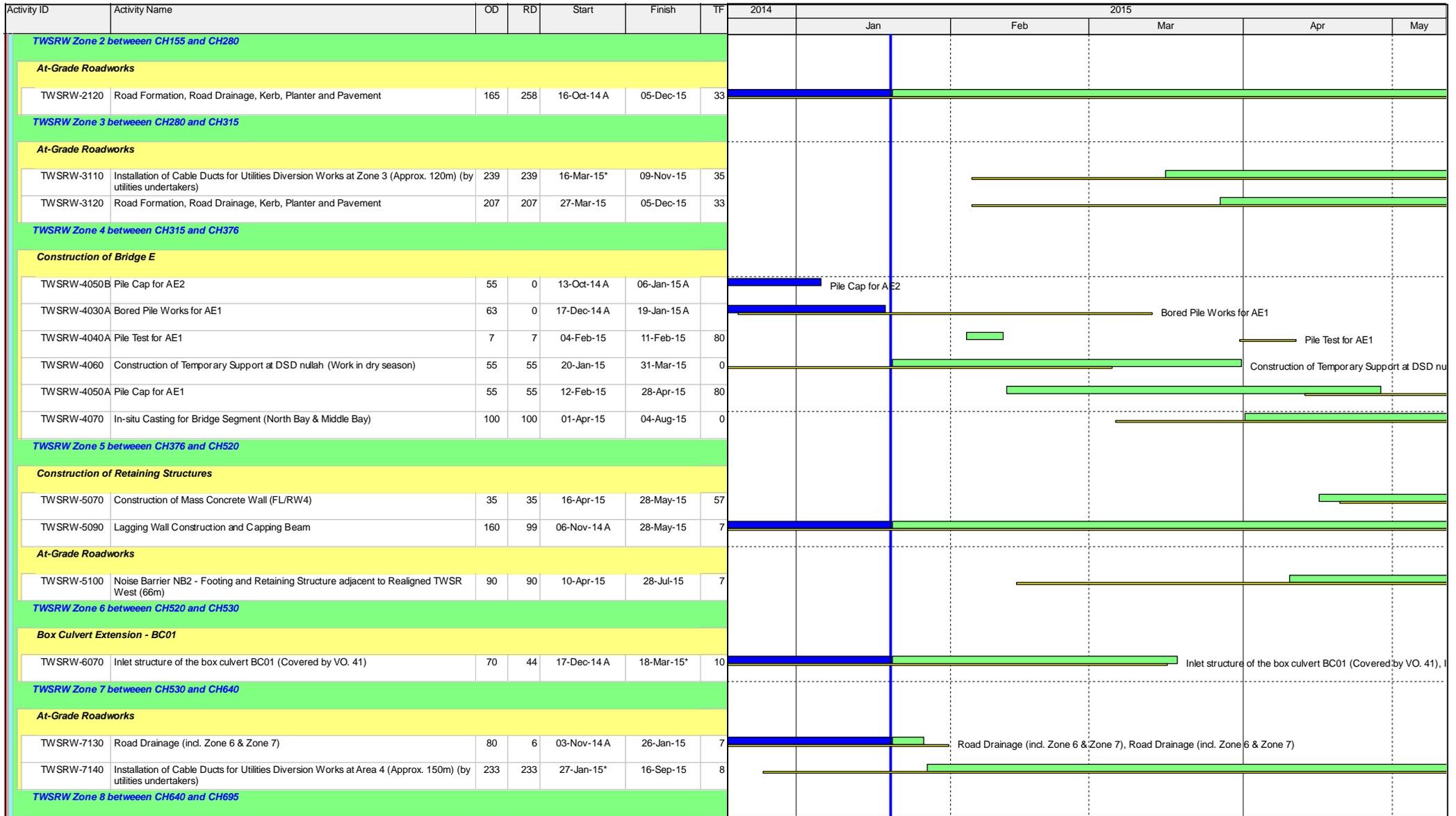
3MPR018

Page 4 of 9

26-Jan-15

3-Month Rolling Programme updated to 2015-01-21

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



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

CEDD Contract No. CV/2012/09

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

3-Month Rolling Programme

3MPR018

Page 5 of 9

26-Jan-15

3-Month Rolling Programme updated to 2015-01-21

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

Activity ID	Activity Name	OD	RD	Start	Finish	TF	2015					
							Jan	Feb	Mar	Apr	May	
Kiu Tau Footbridge Re provision (West)												
TWSRW-8010	Installation of Socket H-Pile for Proposed Kiu Tau Footbridge (14 nos of Ple)	75	75	26-Jan-15	05-May-15	-24						
Remainder of the Works												
TWSRW-9010*	Utilities Diversion in Area 1 (along Re-aligned TWSRW CH100 - CH280)	167	77	22-Oct-14 A	06-Apr-15	319						
TWSRW-9040*	Utilities Diversion in Area 4 (along Re-aligned TWSRW CH530 - CH640)	233	233	27-Jan-15	16-Sep-15	8						
TWSRW-9020*	Utilities Diversion in Area 2 (along Re-aligned TWSRW CH 280 - CH315)	239	239	16-Mar-15	09-Nov-15	35						
TWSRW-9030	Utilities Diversion in Area 3 (along existing TWSRW, Approx. 150m) (by utilities undertakers)	287	287	01-Apr-15*	12-Jan-16	38						
Stage N4A & N4B - Realignment of Tai Wo Service Road East (KD-13 & KD-14)												
Preliminary Works												
TWSRE-4000	Site Formation, Preparation Works & Tree Transplant	65	50	15-Apr-14 A	25-Mar-15	16						
TWSRE Zone 1 between CH100 and CH270												
At-Grade Roadworks												
TWSRE-1150	Construct no fine concrete, U-channel and filling to required level for pipe laying works	30	18	06-Jan-15 A	09-Feb-15	23						
TWSRE-1110	Noise Barrier NB3 - PC01 & PC02 Pile Cap Construction	55	54	19-Jan-15 A	30-Mar-15	445						
TWSRE-1140*	Pipe laying - DN1400 Watermains (CHKA) along Realigned TWSR East	65	65	10-Feb-15	15-Apr-15	33						
TWSRE-1120	Noise Barrier NB3 - Footing adjacent to Realigned TWSR East (96m)	110	92	29-Dec-14 A	19-May-15	437						
TWSRE Zone 2 between CH270 and CH380												
At-Grade Roadworks												
TWSRE-2020	Retaining Wall Construction for FL/RW6	45	0	05-Nov-14 A	05-Jan-15 A							
TWSRE-2030B*	Pipe laying - DN1400 Watermains (CHK) along Realigned TWSR East	75	75	16-Apr-15	16-Jul-15	27						
TWSRE Zone 3 between CH380 and CH456												
At-Grade Roadworks												
TWSRE-3030	Road Drainage	55	22	24-Oct-14 A	13-Feb-15	60						
TWSRE-3010	Noise Barrier NB3 - Footing adjacent to Realigned TWSR East (62m)	85	85	05-Mar-15	18-Jun-15	50						
Roundabout A, Slip Road and Access Road												
TWSRE-4050A*	Pipe laying - DN2300 Watermains (CHJ) along Access Road A	68	53	02-Jan-15 A	28-Mar-15	4						
Stage 1C - Viaduct Structure & TCSS Civil Provisions (KD-9)												
Preliminaries												
B-4040	Erection of Catch Fence at DSD Maintenance Access for AD11	25	0	03-Dec-14 A	20-Dec-14 A							

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

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

Activity ID	Activity Name	OD	RD	Start	Finish	TF	2015				
							Jan	Feb	Mar	Apr	May
B-5010	Provide a Temporary Cycle Track (Scheme 2, along DSD maintenance access)	28	28	24-Jan-15	04-Mar-15	29	Provide a Temporary Cycle Track (Scheme 2, along DSD maintenance access)				
Foundation & Pier Construction											
Bridge A											
BA-16-1010	Pier AA16 - Pile Test	7	1	20-Dec-14 A	20-Jan-15	75	Pier AA16 - Pile Test, Pier AA16 - Pile Test				
BA-13-1030	Pier AA13 - Pier Construction	38	29	06-Nov-14 A	28-Feb-15	21	Pier AA13 - Pier Construction, Pier AA13 - Pier Construction				
BA-18-1020	Pier AA18 - Pile Cap	30	29	19-Jan-15 A	28-Feb-15	103	Pier AA18 - Pile Cap, Pier AA18 - Pile Cap				
BA-14-1030	Pier AA14 - Pier Construction	31	31	20-Nov-14 A	03-Mar-15	5	Pier AA14 - Pier Construction, Pier AA14 - Pier Construction				
BA-04-1020	Pier AA4 - Pile Cap	30	30	26-Jan-15	07-Mar-15	41	Pier AA4 - Pile Cap				
BA-02-1000	Pier AA2W - Piling Works	12	12	05-Mar-15	18-Mar-15	103	Pier AA2W - Piling Works				
BA-10-1000	Pier AA10 - Piling Works	24	24	17-Feb-15	23-Mar-15	233					
BA-02-1020A	Pier AA2E - Pile Cap	30	30	02-Mar-15	09-Apr-15	103	Pier AA2E - Pile Cap				
BA-07-1000	Pier AA7 - Piling Works	24	24	09-Mar-15	09-Apr-15	113	Pier AA7 - Piling Works				
BA-02-1010	Pier AA2W - Pile Test	7	7	09-Apr-15	16-Apr-15	103	Pier AA2W - Pile Test				
BA-16-1020	Pier AA16 - Pile Cap	30	30	09-Mar-15	16-Apr-15	41	Pier AA16 - Pile Cap				
BA-01-1000	Abutment AA1 - Piling Works	24	24	19-Mar-15*	20-Apr-15	200	Abutment AA1 - Piling Works				
BA-10-1010	Pier AA10 - Pile Test	7	7	14-Apr-15	21-Apr-15	233					
BA-15-1030	Pier AA15 - Pier Construction	31	31	20-Mar-15	29-Apr-15	14	Pier AA15 - Pier Construction				
BA-03-1020	Pier AA3 - Pile Cap	30	30	23-Mar-15	30-Apr-15	49	Pier AA3 - Pile Cap				
BA-11-1000	Pier AA11 - Piling Works	24	24	10-Apr-15	08-May-15	88	Pier AA11 - Piling Works				
BA-02-1020B	Pier AA2W - Pile Cap	30	30	17-Apr-15	22-May-15	103	Pier AA2W - Pile Cap				
Bridge B											
BB-06-1020A	Pier AB6E - Pile Cap	30	0	26-Nov-14 A	30-Dec-14 A		Pier AB6E - Pile Cap				
BB-07-1010	Pier AB7 - Pile Test	12	0	19-Sep-14 A	02-Jan-15 A		Pier AB7 - Pile Test				
BB-10-1000	Pier AB10 - Piling Works	24	0	04-Dec-14 A	07-Jan-15 A		Pier AB10 - Piling Works				
BB-09-1010	Pier AB9 - Pile Test	7	0	01-Dec-14 A	09-Jan-15 A		Pier AB9 - Pile Test				
BB-10-1010	Pier AB10 - Pile Test	7	7	23-Jan-15	30-Jan-15	1	Pier AB10 - Pile Test				
BB-07-1020	Pier AB7 - Pile Cap	30	17	05-Jan-15 A	07-Feb-15	-93	Pier AB7 - Pile Cap, Pier AB7 - Pile Cap				
BB-08-1030	Pier AB8W - Pier Construction	24	29	15-Dec-14 A	28-Feb-15	-116	Pier AB8W - Pier Construction, Pier AB8W - Pier Construction				
BB-08-1040	Pier AB8E - Pier Construction	24	29	13-Dec-14 A	28-Feb-15	-116	Pier AB8E - Pier Construction, Pier AB8E - Pier Construction				



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

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

3-Month Rolling Programme

3-Month Rolling Programme updated to 2015-01-21

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

Activity ID	Activity Name	OD	RD	Start	Finish	TF	2014	2015								
								Jan	Feb	Mar	Apr	May				
BD-03-2030	Pier AD3E - Pier Construction	10	10	13-Mar-15	24-Mar-15	23										
BD-09-1030	Pier AD9 - Pier Construction	24	24	02-Mar-15	28-Mar-15	-99										
BD-12-1000	Pier AD12 - Piling Works	24	24	20-Mar-15	21-Apr-15	63										
BD-10-1030	Pier AD10 - Pier Construction	24	24	30-Mar-15	30-Apr-15	-99										
BD-11-1020A	Pier AD11E - Pile Cap	30	30	17-Apr-15	22-May-15	76										
BD-05-1030	Pier AD5 - Pier Construction (Twin Pier)	34	34	17-Apr-15	28-May-15	5										
BD-03-2040	Portal AD3 - Portal Construction	45	45	15-Apr-15	08-Jun-15	23										
Pier Head Construction																
Bridge A																
PA-1130	Pier Head Construction at Pier AA13	34	34	18-Mar-15	30-Apr-15	21										
PA-1140	Pier Head Construction at Pier AA14	34	34	20-Mar-15	04-May-15	5										
Bridge C																
PC-1080	Pier Head Construction at Pier AC8	34	34	20-Jan-15	06-Mar-15	17										
PC-1070	Pier Head Construction at Pier AC7	34	34	12-Mar-15	24-Apr-15	4										
Vaduct Bridge Segment Erection																
Bridge C																
EC-1080	Bridge Deck Construction at Pier AC8 by Typical Lifting Frame (24 nos)	25	25	07-Mar-15	09-Apr-15	17										
Section VI - Works in Portion FH9 (KD-6A)																
Preliminary Preparation Works																
S6-1000	Completion of Temporary Vehicular Bridge by C2 Contractor	0	0		24-Jan-15	1347										
S6-1020	Site Clearance and Site Formation	21	21	20-Jan-15	12-Feb-15	38										

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

Contract 5

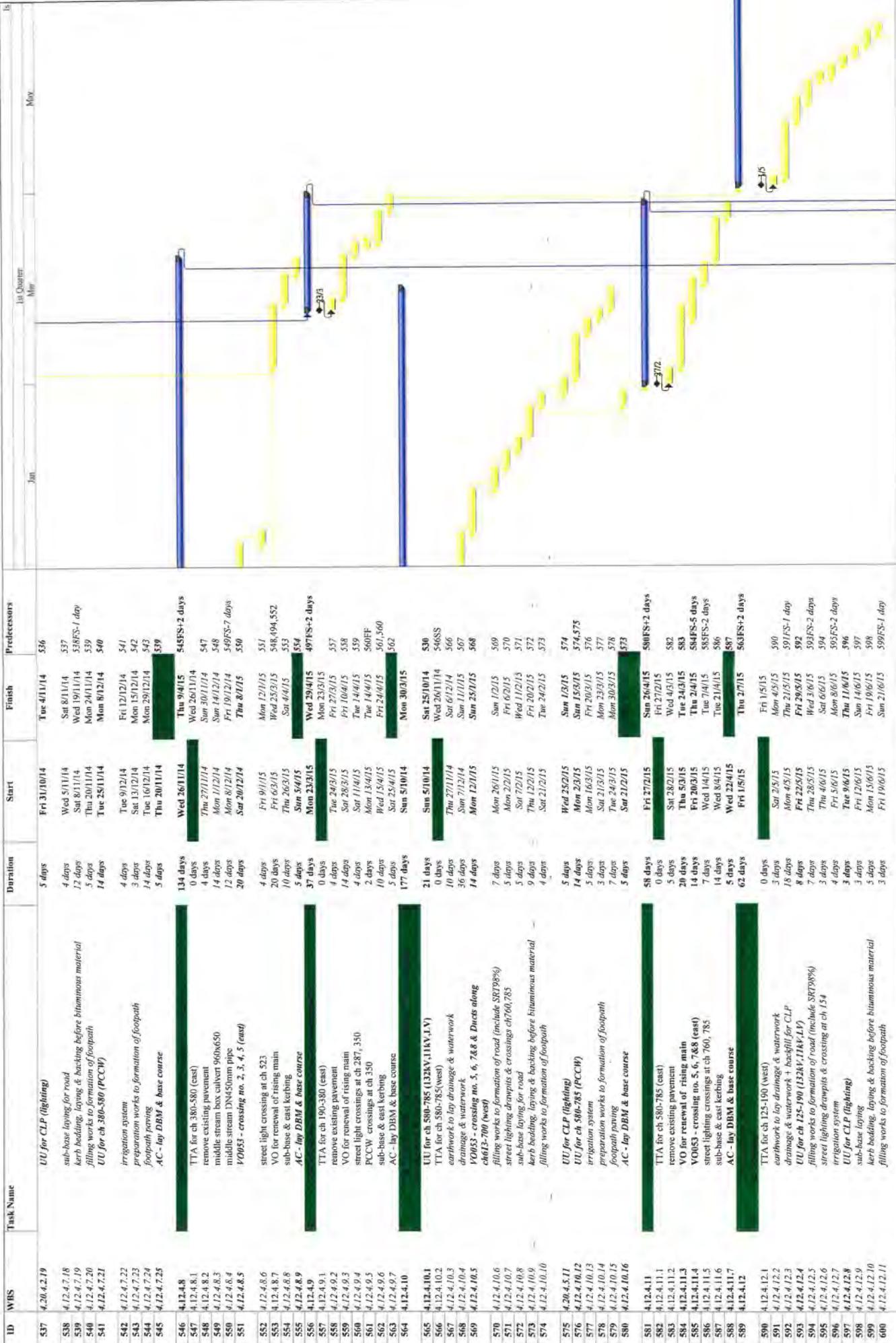
ID	WBS	Task Name	Duration	Start	Finish	Predecessors	1st Quarter		
							Jan	Mar	May
1		Key Dates	1110 days	Thu 28/3/13	Sun 10/4/16				
47		Preliminaries and Stagnary / Contractual Submissions	424 days	Thu 11/4/13	Mon 9/6/14	4			
48	2.1	Site Establishment	399 days	Thu 11/4/13	Thu 15/5/14				
53	2.2	Applications to Government Department	89 days	Fri 12/4/13	Tue 9/7/13				
58	2.3	Temporary Traffic Arrangement (TTA) Scheme for temp. LMH Rd	131 days	Fri 12/4/13	Tue 20/8/13				
63	2.4	Liaison with Utility Undertakers	363 days	Fri 12/4/13	Wed 9/4/14				
66	2.5	Environmental Baseline & Impact Monitoring	132 days	Thu 11/4/13	Wed 21/8/13				
77	2.6	General Site Clearance	424 days	Fri 12/4/13	Mon 9/6/14	5SS			
78	3	Stage of the Works	180 days	Thu 11/4/13	Mon 7/10/13				
94	4	Section I of the Works	1363 days	Fri 12/4/13	Tue 3/1/17				
95	4.1	Section I of the Works - Ground Investigation field works (Drg. 7101A-7111A)	251 days	Thu 30/5/13	Tue 4/2/14	74SS+13 days			
100	4.2	Section II of the Works - All laboratory tests for Section I	188 days	Sat 31/8/13	Thu 6/3/14	97			
105	4.3	Section III of the Works - Site formation works for Portions RS1, RS2 & RS3 (seek for certificate of completion in letter ref. SR1V/W47/SO/45/1308/00416 dated 23/8/2013)	89 days	Sun 12/5/13	Thu 8/8/13	24,25,26			
111	4.4	Section IV of the Works - Village house within portion RS4 - EOT3 completion 15/5/2014	399 days	Fri 12/4/13	Thu 15/5/14	4			
123	4.5	Section V of the Works-All works within portion RS4 exclude Section IV - EOT4 completion 11/4/2015	831 days	Fri 12/4/13	Tue 21/7/15	4			
143	4.6	Section VII of the Works - All works within Area CRD	249 days	Mon 9/9/13	Thu 15/5/14	8			
180	4.7	Section VIII of the Works - All works within Area BCPA - EOT6 completion 2/1/2015	625 days	Tue 11/6/13	Wed 25/2/15	6,7,18			
181	4.7.1	ISSUE OF YO NO. 028 - Revised Works for Retaining Wall BCP/RW2 at BCP	0 days	Fri 13/6/14	Fri 13/6/14				
182	4.7.2	Claim No. 013 - YO No. 028 - Site Possession from DC/2011/06 (Portion B) (from Area D3 to D10)	0 days	Tue 12/8/14	Tue 12/8/14				
183	4.7.3	Claim No. 013 - YO No. 028 - Site Possession from DC/2011/06 (Portion A) (from Area C8 to D2)	0 days	Tue 16/9/14	Tue 16/9/14				
184	4.7.4	Claim No. 009 - Delays due to Delayed Possession of Portion BCP4 of the Site	0 days	Fri 26/9/14	Fri 26/9/14				
185	4.7.5	Retaining Wall BCP/RW2B	92 days	Mon 14/7/14	Mon 13/10/14				
200	4.7.6	install 1500UPVC perforated pipe behind retaining wall	4 days	Fri 17/10/14	Mon 20/10/14	196FS+3 days			
201	4.7.7	install geotextile filter & backfill D4, B6 & A4 to +1.5.0	28 days	Tue 21/10/14	Mon 17/11/14	200			
202	4.7.8	Outstanding site formation work for Area BCPA	200 days	Fri 13/6/14	Mon 29/12/14	181			
203	4.7.9	Slope drainage works (Drg. 7150B-7159B)	625 days	Tue 11/6/13	Wed 25/2/15				
204	4.7.9.1	submission of setting out for slope drain	0 days	Fri 20/6/14	Fri 20/6/14				
205	4.7.9.2	approval of setting out for slope drain (YO No. 048 received on 29/8/2014)	80 days	Tue 11/6/13	Thu 29/8/13				
206	4.7.9.3	submission of design of sedimentation tank/pond	0 days	Wed 20/8/14	Wed 20/8/14				
207	4.7.9.4	approval of design of sedimentation tank/pond (NOT YET)	60 days	Wed 20/8/14	Sat 18/10/14	206			
208	4.7.9.5	DN1050 from A13-A4-A2 (YO 048 received on 29/8/2014)	80 days	Sat 30/8/14	Mon 17/11/14	205			
209	4.7.9.6	Handover from DC/2011/06 for Box Culvert 4	1 day	Tue 18/11/14	Tue 18/11/14	207,208			
210	4.7.9.7	Connect to existing Box Culvert, Box Culvert 4	40 days	Wed 19/11/14	Sun 28/12/14	209			
211	4.7.9.8	discharge from A2, through D6 to existing Box Culvert	35 days	Mon 29/12/14	Sun 12/1/15	210			
212	4.7.9.9	shortcircuit TC	25 days	Sat 12/1/15	Wed 25/2/15	211FS-1 day			
213	4.7.9.10	Chain Link Fence	40 days	Sat 29/11/14	Wed 17/1/15	209FS+10 days			
214	4.8	Section IX of the Works - All works within Area BCPB - EOT07 completion 19 October 2015	669 days	Fri 20/12/13	Mon 19/10/15	7			
215	4.8.1	Claim No. 009 - Delays due to Delayed Possession of Portion BCP4 of the Site - Original 7/3/2014 and possessed on 25/9/2014	0 days	Fri 26/9/14	Fri 26/9/14	184			
216	4.8.2	Submission for demolition of existing building structures	37 days	Fri 20/12/13	Sat 25/1/14				
217	4.8.3	Approval of submission for demolish existing building structures	41 days	Fri 7/3/14	Fri 7/3/14	216			
218	4.8.4	Demolition of existing building structures UPOB instruction (included Asbestos Investigation, Report & Asbestos Abatement)	76 days	Fri 3/10/14	Wed 17/12/14	215FS+7 days,217			
219	4.8.5	Section XIV of the Works - Tree felling/removal works and tree transplanting works at BCP4 (include tree survey etc)	139 days	Fri 26/9/14	Wed 11/2/15	706SS			
220	4.8.6	Claim No. 007 - Delay due to Non-Possession of Parts of Portion BCP3 due to Resistant by Local Resident (NOT YET)	0 days	Wed 14/1/15	Wed 14/1/15	184			
221	4.8.7	Site formation works	330 days	Sun 2/11/14	Sun 27/9/15				
222	4.8.7.1	site formation works (surrounding areas B1-3, B5-6, B9)	175 days	Sat 7/3/15	Fri 28/8/15	220FS+52 days, 218SS+45 days			
223	4.8.7.2	site formation works (B1B-B22)	330 days	Sun 2/11/14	Sun 27/9/15	218FS+40 days			
224	4.8.7.3	site formation works (B1B-B22)	175 days	Sat 7/3/15	Fri 28/8/15	222SS			
225	4.8.8	chain link fence (Drg. 1002C, 1032B, 1033B)	86 days	Sun 26/7/15	Mon 19/10/15	221SS+266 days			
226	4.9	Section X of the Works - All works within Area BCPB - EOT5 completion 7/10/2014	125 days	Thu 5/6/14	Tue 7/10/14	8			
237	4.10	Section XI of the Works - All works within Area BCPD (Revised) - Original 11/4/2015	500 days	Mon 14/7/14	Wed 25/11/15				
238	4.10.1	South West Works for additional 132kV (at Areas D1 & D2) at BCPD fill platform for CLP (132kV) from +12.8 to +1.3	321 days	Fri 15/8/14	Wed 1/7/15				
239	4.10.1.1	ULI for session of overhead post & termination of electricity by CLP (132kV) (Area D2)	47 days	Fri 15/8/14	Tue 3/9/14	239FS+13 days			
240	4.10.1.2	CLP (132kV) (Area D2)	28 days	Tue 14/10/14	Mon 10/11/14				
241	4.10.1.3	Claim No. 007 - Delay due to Non-Possession of Parts of Portion BCP3 due to Resistant by Local Resident - confirmed to possess on 14/1/2015	0 days	Wed 14/1/15	Wed 14/1/15	220			

ID	WBS	Task Name	Duration	Start	Finish	Predecessors
242	4.10.1.4	excavate filling partly areas D1 & D2 to +13.5 for drain DN2100 to Box Culvert No. 3 (assume cut from +10)	14 days	Wed 28/1/15	Thu 10/2/15	241FS+14 days, 183FS+14 days
243	4.10.1.5	lay sewer PH46513, 514, 515, SMH9937 (backfill with laying of irrigation pipe)	31 days	Wed 11/2/15	Fri 13/3/15	242
244	4.10.1.6	lay sewer STP-FMH3520-313	21 days	Sat 14/3/15	Fri 3/4/15	243
245	4.10.1.7	fill trench from laid sewer to drainage formation	14 days	Sat 4/4/15	Fri 17/4/15	244
246	4.10.1.8	lay drainage SMH9961 to 9966 & 9936 to 9937	5 days	Sat 18/4/15	Wed 22/4/15	245
247	4.10.1.9	filling of areas D1 & D2 to +13.3 with D2 soil cement slope	28 days	Thu 23/4/15	Wed 20/5/15	246
248	4.10.1.10	irrigation system at west D1 & D22	28 days	Thu 21/5/15	Wed 17/6/15	247
249	4.10.1.11	additional 132kV (at Areas D1 & D2)	7 days	Thu 18/6/15	Wed 24/6/15	248
250	4.10.1.12	South West Works for Areas D1 & D2	321 days	Fri 3/10/14	Wed 19/8/15	184FS+7 days
251	4.10.2.1	site clearance, take initial survey	21 days	Fri 3/10/14	Thu 23/10/14	
252	4.10.2.2	tree felling / transpiling	45 days	Fri 24/10/14	Sun 7/12/14	
253	4.10.2.3	fill trench for formation for Pipe-FM1501-502-STP (approx. to +11)	5 days	Mon 8/12/14	Fri 12/12/14	
254	4.10.2.4	lay sewer Pipe-FM1501-502-STP	14 days	Sat 13/12/14	Fri 26/1/15	253
255	4.10.2.5	complete filling for Areas D1 & D2 to formation area	70 days	Thu 13/12/14	Fri 20/2/15	253FS+7 days, 255SS
256	4.10.2.6	lay sewer STP-FMH511-512-513	10 days	Thu 12/1/15	Sat 30/2/15	247, 250FS+1 days
257	4.10.2.7	lay drainage SMH9941 to 9943-9931	10 days	Sun 31/3/15	Thu 9/6/15	257
258	4.10.2.8	lay drainage SMH9952 to 9953-9942	10 days	Mon 20/6/15	Mon 29/6/15	258, 250SS+5 days
259	4.10.2.9	lay drainage SMH9937 to 9930	20 days	Tue 30/6/15	Sun 19/7/15	259
260	4.10.2.10	lay drainage SMH9702A to 9935	10 days	Mon 20/7/15	Wed 29/7/15	260
261	4.10.2.11	lay drainage CP25-SM4107014-9902-9702A	21 days	Thu 30/7/15	Wed 19/8/15	261
262	4.10.2.12	lay drainage SMH9922 to 9930	10 days	Thu 6/8/15	Sat 15/8/15	262FS+14 days
263	4.10.2.13	water pipe DN250 CHL 150 to 335.740	21 days	Tue 30/8/15	Mon 20/7/15	259
264	4.10.2.14	rising main CHC	21 days	Fri 10/7/15	Thu 30/7/15	260FS+10 days
265	4.10.2.15	Claim No. 007 - Delay due to Non-Possession of Parts of Portion BCP3 due to Resident by Local Resident	0 days	Wed 14/11/15	Wed 14/11/15	220
266	4.10.3	South West Work for Construction of Depressed Road	188 days	Mon 23/1/15	Sat 5/9/15	
267	4.10.4	structural work for Pump Room	45 days	Tue 5/5/15	Thu 18/6/15	274FF
268	4.10.4.1	rising main CHA underneath depressed road (Bay 16015-16008)	35 days	Mon 23/1/15	Sun 5/4/15	271SS
269	4.10.4.2	rising main CHA underneath depressed road (Bay 16007-16001)	35 days	Mon 6/4/15	Sun 10/5/15	269
270	4.10.4.3	UV for 11kV & LV lay ducts across & underneath underpass	7 days	Mon 23/1/15	Sun 8/3/15	239FS+42 days, 266FS+47 days
271	4.10.4.4	structural work for Bay 16015-16012	45 days	Tue 3/3/15	Thu 16/4/15	269FS+15 days
272	4.10.4.5	structural work for Bay 16011-16008	45 days	Thu 2/4/15	Sat 16/5/15	272FS+15 days
273	4.10.4.6	structural work for Bay 16007-16004	48 days	Sat 25/1/15	Thu 18/6/15	273FS+15 days
274	4.10.4.7	structural work for Bay 16003-16001	48 days	Fri 19/6/15	Thu 18/6/15	274, 268FS+15 days
275	4.10.4.8	drainage work inside depressed road (Bay 16015-16008)	21 days	Thu 16/7/15	Wed 5/8/15	273, 275FF
276	4.10.4.9	drainage work inside depressed road (Bay 16007-16001)	21 days	Thu 6/8/15	Wed 26/8/15	275, 276
277	4.10.4.10	backfill western side of depressed road	10 days	Thu 6/8/15	Sat 15/8/15	275
278	4.10.4.11	irrigation system next to depressed road	31 days	Sun 16/8/15	Sat 5/9/15	278
279	4.10.4.12	completion of drainage SM19922 to 9930, water pipe & rising main & backfill western side of depressed road	102 days	Sat 15/8/15	Wed 25/11/15	263, 265, 278
280	4.10.5	UV for 132kV, 11kV & LV	7 days	Sun 16/8/15	Sat 22/8/15	281
281	4.10.5.1	UV for PCW	7 days	Sun 23/8/15	Sat 29/8/15	282
282	4.10.5.2	backfill to road formation with SPT93% sub-base laying	14 days	Sun 30/8/15	Sat 12/9/15	283
283	4.10.5.3	kerb bedding, laying & backing before bituminous material	7 days	Sun 13/9/15	Sat 10/10/15	284
284	4.10.5.4	AC - lay DBM & base course	14 days	Sun 20/9/15	Sat 3/10/15	285
285	4.10.5.5	backfill footpath formation	14 days	Sun 4/10/15	Sat 17/10/15	286
286	4.10.5.6	street lighting ducts, ducts & controller	12 days	Sun 4/10/15	Thu 15/10/15	286
287	4.10.5.7	UV for CLP (lighting)	14 days	Fri 16/10/15	Thu 29/10/15	288
288	4.10.5.8	footpath paving	14 days	Fri 16/10/15	Thu 29/10/15	288
289	4.10.5.9	AC - lay wearing course	12 days	Fri 30/10/15	Thu 10/11/15	289
290	4.10.5.10	Claim No. 013 - YO No. 026 - Site Possession from DC/2011/06 (Portion B) (from Area D3 to D10)	15 days	Wed 11/11/15	Wed 25/11/15	290
291	4.10.5.11	Works at Area D4 to D9 (shown in Section VIII)	7 days	Fri 13/11/15	Thu 19/11/15	290FS+2 days, 287FS+14 days
292	4.10.5.12	Retaining Wall BCPRW2B	0 days	Tue 12/8/14	Tue 12/8/14	182
293	4.10.6	Works at Area D4 to D9 (shown in Section VIII)	218 days	Mon 16/2/15	Mon 16/2/15	
294	4.10.7	install 1500PVC perforated pipe behind retaining wall	92 days	Mon 14/7/14	Mon 13/10/14	185SS
295	4.10.7.1	site formation work for Areas D4 to D6	4 days	Fri 17/10/14	Mon 20/10/14	200SS
296	4.10.7.2	site formation work for Areas D4 to D6	28 days	Tue 21/10/14	Mon 17/11/14	201SS
297	4.10.7.3	site formation work for Areas D4 to D6	43 days	Tue 4/11/14	Thu 18/12/14	311FS+14 days
298	4.10.7.4	site formation work for Areas D4 to D6	21 days	Fri 5/12/14	Thu 25/12/14	312FS+14 days
299	4.10.7.5	site formation work for Areas D7 to D9	600 days	Fri 19/12/14	Mon 16/2/15	313FS+7 days
300	4.10.7.6	Submissions for method statement of subways & staircase	70 days	Thu 22/8/13	Wed 30/10/13	74
301	4.10.7.7	Approval of Submissions for method statement of subway & staircase	68 days	Fri 30/8/13	Tue 5/11/13	316SS+8 days
302	4.10.7.8	Construction of retaining wall RW1 - CH10 to 561.953m	499 days	Sat 14/9/13	Sun 25/10/15	337SS+1 day
303	4.10.7.9	Bay 1027 to Bay 1068 (8 bays) -H1	120 days	Sat 14/9/13	Sat 11/11/14	319SS+14 days
304	4.10.7.10	Bay 1027 to Bay 1068 (8 bays) -H2	120 days	Sat 28/9/13	Sat 25/11/14	320SS+14 days
305	4.10.7.11	Bay 1027 to Bay 1068 (8 bays) -H3	120 days	Sat 28/9/13	Sat 25/11/14	320SS+14 days
306	4.10.7.12	Bay 1027 to Bay 1068 (8 bays) -H4	120 days	Sat 28/9/13	Sat 25/11/14	320SS+14 days
307	4.10.7.13	Bay 1027 to Bay 1068 (8 bays) -H5	120 days	Sat 28/9/13	Sat 25/11/14	320SS+14 days
308	4.10.7.14	Bay 1027 to Bay 1068 (8 bays) -H6	120 days	Sat 28/9/13	Sat 25/11/14	320SS+14 days
309	4.10.7.15	Bay 1027 to Bay 1068 (8 bays) -H7	120 days	Sat 28/9/13	Sat 25/11/14	320SS+14 days
310	4.10.7.16	Bay 1027 to Bay 1068 (8 bays) -H8	120 days	Sat 28/9/13	Sat 25/11/14	320SS+14 days
311	4.10.7.17	Bay 1027 to Bay 1068 (8 bays) -H9	120 days	Sat 28/9/13	Sat 25/11/14	320SS+14 days
312	4.10.7.18	Bay 1027 to Bay 1068 (8 bays) -H10	120 days	Sat 28/9/13	Sat 25/11/14	320SS+14 days
313	4.10.7.19	Bay 1027 to Bay 1068 (8 bays) -H11	120 days	Sat 28/9/13	Sat 25/11/14	320SS+14 days
314	4.10.7.20	Bay 1027 to Bay 1068 (8 bays) -H12	120 days	Sat 28/9/13	Sat 25/11/14	320SS+14 days
315	4.11	Bay 1027 to Bay 1068 (8 bays) -H13	120 days	Sat 28/9/13	Sat 25/11/14	320SS+14 days
316	4.11.1	Bay 1027 to Bay 1068 (8 bays) -H14	120 days	Sat 28/9/13	Sat 25/11/14	320SS+14 days
317	4.11.2	Bay 1027 to Bay 1068 (8 bays) -H15	120 days	Sat 28/9/13	Sat 25/11/14	320SS+14 days
318	4.11.3	Bay 1027 to Bay 1068 (8 bays) -H16	120 days	Sat 28/9/13	Sat 25/11/14	320SS+14 days
319	4.11.4	Bay 1027 to Bay 1068 (8 bays) -H17	120 days	Sat 28/9/13	Sat 25/11/14	320SS+14 days
320	4.11.5	Bay 1027 to Bay 1068 (8 bays) -H18	120 days	Sat 28/9/13	Sat 25/11/14	320SS+14 days
321	4.11.6	Bay 1027 to Bay 1068 (8 bays) -H19	120 days	Sat 28/9/13	Sat 25/11/14	320SS+14 days
322	4.11.7	Bay 1027 to Bay 1068 (8 bays) -H20	120 days	Sat 28/9/13	Sat 25/11/14	320SS+14 days
323	4.11.8	Bay 1027 to Bay 1068 (8 bays) -H21	120 days	Sat 28/9/13	Sat 25/11/14	320SS+14 days
324	4.11.9	Bay 1027 to Bay 1068 (8 bays) -H22	120 days	Sat 28/9/13	Sat 25/11/14	320SS+14 days
325	4.11.10	Bay 1027 to Bay 1068 (8 bays) -H23	120 days	Sat 28/9/13	Sat 25/11/14	320SS+14 days

ID	WBS	Task Name	Duration	Start	Finish	Predecessors
326	4.1.13.8	Bay 1019 to Bay 1012 (8 bays) -117 (except Bays 1013, 1014-resume relocation of overhead cable)	196 days	Sat 16/11/13	Fri 30/5/14	325SS+14 days
327	4.1.13.9	Bay 1011 to Bay 1005 (7 bays) HT HR (except Bays 1005 to 1006, Bays 1007 & 1008 well-after pipe jacking with HDPE pipe laying)	150 days	Sat 31/5/14	Mon 27/10/14	326
328	4.1.13.10	Relocation of Overhead Cables at Bay 1013 & 1014	0 days	Sat 28/6/14	Sat 28/6/14	328
329	4.1.13.11	complete laying of extended HDPE pipe near Bridge J	45 days	Tue 28/6/14	Mon 11/8/14	328
330	4.1.13.12	Bay 1006 (after laying of HDPE pipe)	45 days	Tue 28/6/14	Mon 11/8/14	329
331	4.1.13.13	Bay 1007 to 1008 (after laying of HDPE pipe)	20 days	Sat 28/6/14	Mon 11/8/14	328
332	4.1.13.14	completion date of east abutment of Bridge J	0 days	Sat 28/6/14	Sat 28/6/14	401
333	4.1.13.15	Bay 1001 & 1005 -118 (after abutment of Bridge J)	50 days	Sun 7/12/14	Sun 25/1/15	333FS+14 days
334	4.1.13.16	Construction of retaining wall RW1A - (D17)	253 days	Fri 13/9/13	Fri 23/5/14	442FF
335	4.1.13.17	filling & slope drainage behind RW1A - (D17)	35 days	Fri 26/9/14	Fri 30/10/14	442FF
339	4.1.13.18	Works from chainage 970 to chainage 1120 (150m)	198 days	Sat 31/5/14	Sun 14/12/14	376
340	4.1.13.19	earthfilling to lay drainage & waterwork (part D1.1, D1.2, B2, H5, part D17)	42 days	Sat 31/5/14	Fri 11/7/14	376
342	4.1.13.2	drainage & waterwork + backfill for CLP	42 days	Sat 12/7/14	Fri 22/8/14	341
343	4.1.13.3	UU - 11A1V & 11V (both sides) ch670-1120	20 days	Sun 27/7/14	Fri 15/8/14	342SS+15 days
344	4.1.13.4	filling works to formation of road (include SRT98%)	51 days	Sun 23/8/14	Sun 12/10/14	343,342
345	4.1.13.5	sub-base laying	19 days	Mon 13/10/14	Wed 22/10/14	344
346	4.1.13.6	kerb bedding, laying & backing before bituminous material	14 days	Thu 23/10/14	Wed 5/11/14	345
347	4.1.13.7	filling works for UU at footpath	10 days	Thu 6/11/14	Sat 15/11/14	346
348	4.1.13.8	UU - (PCCW, HGC) at east side	10 days	Fri 21/11/14	Sun 30/11/14	350,347
349	4.1.13.9	UU - (PCCW, HGC) at west side	10 days	Fri 21/11/14	Sun 30/11/14	350
350	4.1.13.10	AC - lay DBM & base course	5 days	Sun 16/11/14	Thu 20/11/14	347
351	4.1.13.11	street lighting drainage (ch1103), controller (ch1103) & ductings	10 days	Fri 21/11/14	Sun 30/11/14	350
352	4.1.13.12	irrigation system	14 days	Mon 11/12/14	Sun 30/11/14	350
353	4.1.13.13	Works from chainage 920 to chainage 970 (150m)	202 days	Sun 15/6/14	Fri 21/1/15	348SS+15 days
354	4.1.13.14	earthfilling to lay drainage & waterwork (D1.3, part D1.4, H4, H5, part D17)	45 days	Sun 15/6/14	Thu 29/7/14	348SS+15 days
355	4.1.13.2	drainage & waterwork + backfill for CLP	49 days	Wed 30/7/14	Thu 16/9/14	354
356	4.1.13.3	UU - 11A1V & 11V (both sides) ch620-970	8 days	Wed 17/9/14	Wed 24/9/14	355
357	4.1.13.4	filling works to formation of road (include SRT98%)	21 days	Thu 25/9/14	Wed 15/10/14	356
358	4.1.13.5	sub-base laying	10 days	Thu 16/10/14	Sat 25/10/14	357
359	4.1.13.6	kerb bedding, laying & backing before bituminous material	12 days	Sat 25/10/14	Wed 5/11/14	358FS-1 day
360	4.1.13.7	filling works for UU at footpath	4 days	Thu 6/11/14	Sun 9/11/14	359
361	4.1.13.8	UU - (PCCW, HGC) at east side	5 days	Mon 10/11/14	Fri 14/11/14	360
362	4.1.13.9	UU - (PCCW, HGC) at west side	5 days	Mon 10/11/14	Fri 14/11/14	360
363	4.1.13.10	AC - lay DBM & base course	5 days	Mon 10/11/14	Fri 14/11/14	360
364	4.1.13.11	street lighting ductings	7 days	Sat 20/12/14	Fri 26/12/14	363
365	4.1.13.12	irrigation system	7 days	Sat 27/12/14	Fri 9/1/15	364
366	4.1.13.13	Works from chainage 820-1120	7 days	Sat 3/1/15	Fri 9/1/15	364,353
367	4.1.13.14	footpath paving for chainage 820-1120	12 days	Mon 5/1/15	Fri 16/1/15	366FS-5 days
368	4.1.13.15	Works from chainage 675 to chainage 820 (145m)	106 days	Fri 12/12/14	Fri 27/3/15	334FS-45 days
369	4.1.13.16	earthfilling to lay drainage & waterwork (part D1.4, part D1.5, H6, H7, part D16)	28 days	Fri 12/12/14	Thu 8/1/15	334FS-45 days
370	4.1.13.2	drainage & waterwork + backfill for CLP	21 days	Fri 9/1/15	Thu 29/1/15	369
371	4.1.13.3	UU - 11A1V & 11V (both sides) ch 670-820	14 days	Mon 26/1/15	Sun 8/2/15	370FS-4 days
372	4.1.13.4	filling works to formation of road (include SRT98%)	14 days	Sun 8/2/15	Sat 21/2/15	371FS-1 day
373	4.1.13.5	sub-base laying	5 days	Sun 22/2/15	Thu 26/2/15	372
374	4.1.13.6	kerb bedding, laying & backing before bituminous material	7 days	Thu 26/2/15	Wed 4/3/15	373FS-1 day
375	4.1.13.7	AC - lay DBM & base course	5 days	Thu 26/2/15	Mon 9/3/15	374
376	4.1.13.8	filling works to formation of footpath	7 days	Wed 4/3/15	Tue 10/3/15	374FS-1 day
377	4.1.13.9	street lighting ductings	7 days	Mon 9/3/15	Sun 15/3/15	376FS-2 days
378	4.1.13.10	irrigation system	7 days	Sat 14/3/15	Fri 20/3/15	377FS-2 days
379	4.1.13.11	UU - (PCCW, HGC) at east side	7 days	Fri 20/3/15	Thu 26/3/15	378FS-1 day
380	4.1.13.12	UU - (PCCW, HGC) at west side	7 days	Fri 20/3/15	Thu 26/3/15	378
381	4.1.13.13	Works from chainage 475 to chainage 675 (except Bridge J) - alter RWS	77 days	Sun 4/1/15	Sat 21/3/15	334FS-30 days+415FS-44 days
382	4.1.13.14	earthfilling to lay drainage & waterwork (part D1.5, H8, part D16)	7 days	Sun 4/1/15	Sat 10/1/15	382FS-3 days
383	4.1.13.15	drainage & waterwork + backfill for CLP	21 days	Thu 8/1/15	Wed 26/1/15	383FS-2 days
384	4.1.13.16	UU - 11A1V & 11V (both sides) ch 475-675	10 days	Thu 27/1/15	Thu 5/2/15	384FS-2 days
385	4.1.13.17	street lighting crossings (ch668, 543, 504, 477)	10 days	Wed 4/2/15	Fri 13/2/15	384FS-2 days
386	4.1.13.18	filling works to formation of road (include SRT98%)	7 days	Thu 12/2/15	Wed 18/2/15	385FS-2 days
387	4.1.13.19	street lighting drainage (ch668, 631, 596, 543, 504, 493, 477), controller (ch493) & ductings	10 days	Thu 12/2/15	Thu 26/2/15	386FS-2 days
388	4.1.13.20	irrigation system	5 days	Wed 25/2/15	Sun 1/3/15	387FS-2 days
389	4.1.13.21	sub-base laying	5 days	Sun 1/3/15	Thu 5/3/15	388FS-1 day
390	4.1.13.22	kerb bedding, laying & backing before bituminous material	7 days	Thu 5/3/15	Wed 11/3/15	389FS-1 day
391	4.1.13.23	AC - lay DBM & base course	5 days	Thu 12/3/15	Mon 16/3/15	390
392	4.1.13.24	filling works to formation of footpath	5 days	Thu 12/3/15	Mon 16/3/15	390FS-2 days
393	4.1.13.25	UU - (PCCW, HGC) at east side	5 days	Sun 15/3/15	Thu 19/3/15	392FS-2 days
394	4.1.13.26	UU - (PCCW, HGC) at west side	5 days	Sun 15/3/15	Thu 19/3/15	392
395	4.1.13.27	UU for CLP (lighting) - chainage 475-820	5 days	Sat 28/3/15	Sat 14/4/15	381,368

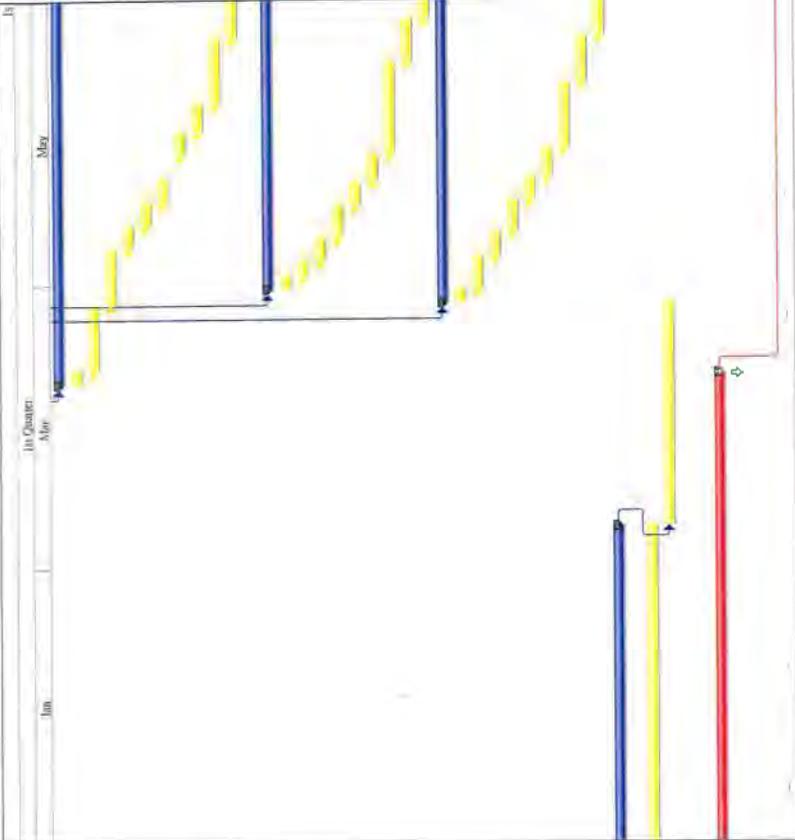
ID	WBS	Task Name	Duration	Start	Finish	Predecessors
396	4.11.13	footpath paving for channage 475-620	5 days	Thu 9/4/15	Mon 13/4/15	395FS+7 days
397	4.11.14	Construction of Bridge-J (ch 597-630)	323 days	Thu 1/4/15	Tue 17/2/15	
398	4.11.14.1	bored piles	73 days	Thu 1/4/15	Thu 12/6/14	
399	4.11.14.2	pile caps	28 days	Fri 13/6/14	Fri 1/8/14	398
400	4.11.14.3	trial panel for revised ribs	85 days	Sat 2/8/14	Fri 2/8/14	399
401	4.11.14.4	abutment walls	20 days	Sun 3/8/14	Sat 22/11/14	400
402	4.11.14.5	falswork for deck	40 days	Sat 13/12/14	Wed 3/1/15	401
403	4.11.14.6	deck	15 days	Thu 22/1/15	Thu 5/2/15	402
404	4.11.14.7	parapet	7 days	Fri 6/2/15	Thu 12/2/15	404
405	4.11.14.8	UV - 11KV & LV (west)	4 days	Mon 9/2/15	Mon 9/2/15	404
406	4.11.14.9	UV - for CLP lighting (east)	4 days	Fri 13/2/15	Fri 13/2/15	406
407	4.11.14.10	UV - HCC (east)	4 days	Sat 14/2/15	Thu 12/2/15	407
408	4.11.14.11	UV - PCCH (east)	5 days	Fri 13/2/15	Thu 12/2/15	405
409	4.11.14.12	watermain (west)	96 days	Fri 13/2/15	Sun 13/1/15	401FS+3 days
410	4.11.15	Construction of retaining wall RMS - Revised (Urg. SK0036A, 0309, 0310, 0115A, 0122A, 0123A)	0 days	Wed 26/1/14	Wed 26/1/14	411SS-20 days
411	4.11.15.1	Latest date to confirm designed details & issue VO on 25/11/2014	15 days	Thu 27/1/14	Thu 11/2/14	412FS-14 days
412	4.11.15.2	drive sheepile & excavation	10 days	Thu 27/1/14	Thu 18/2/14	413FS-3 days
413	4.11.15.3	grade 200 rock fill	64 days	Mon 15/12/14	Mon 16/2/15	414FS-4 days
414	4.11.15.4	cast blinding layer	20 days	Mon 15/12/14	Sun 13/1/15	415FS-7 days
415	4.11.15.5	Bay 5001-5008	423 days	Mon 23/12/13	Wed 18/2/15	
416	4.11.15.6	install DN150 UPVC perforated pipe, lay geotextile filter & backfill RW5	0 days	Fri 21/3/14	Fri 21/3/14	
417	4.11.16	Subways, lift shafts, pump room, staircases	0 days	Tue 11/3/14	Tue 11/3/14	
418	4.11.16.1	STARCASES	106 days	Mon 23/12/13	Mon 7/4/14	418FS-88 days
419	4.11.16.2	ISSUE VO 31 - RE-ALIGN SUBWAY, LIFT SHAFT & WITHIN BCP	45 days	Mon 11/2/14	Sun 15/6/14	420SS+50 days
420	4.11.16.3	Eastern pedestrian lift shaft	55 days	Thu 29/7/14	Wed 27/8/14	422SS+5 days
421	4.11.16.4	Eastern Pump Room & Subway Bay 7	55 days	Fri 4/7/14	Fri 6/6/14	421FS-14 days
422	4.11.16.5	Eastern Subway Barrel Bays 8 & 6	5 days	Mon 2/6/14	Sat 7/6/14	425
423	4.11.16.6	Eastern Subway Barrel Bay 9	156 days	Wed 15/4/14	Tue 3/6/14	420FS+7 days
424	4.11.16.7	Eastern staircase - additional wall	48 days	Mon 11/2/14	Sat 17/2/14	437
425	4.11.16.8	Diversion for Temporary Hoal Road	36 days	Sun 18/1/15	Wed 4/2/15	436
426	4.11.16.9	Western Subway Barrel Bays 5 & 4	18 days	Thu 29/1/15	Wed 18/2/15	435FS-7 days
427	4.11.16.10	Traffic diversion for west Subway (Bays 1-3) & emergency staircase	188 days	Sun 21/9/14	Fri 27/3/15	
428	4.11.16.11	Western pedestrian lift shaft	65 days	Fri 31/10/14	Sat 3/1/15	442
429	4.11.16.12	Western Subway Barrel Bays 0 & 1	25 days	Mon 15/12/14	Thu 8/1/15	443FS-20 days
430	4.11.16.13	Western staircase	5 days	Fri 9/1/15	Thu 13/1/15	444
431	4.11.16.14	Western Subway Barrel Bays 3 & 2	7 days	Wed 14/1/15	Mon 2/2/15	445
432	4.11.16.15	Emergency Staircase at west side	20 days	Wed 14/1/15	Mon 9/2/15	446
433	4.11.16.16	Filling works at west side	7 days	Thu 3/2/15	Thu 24/2/15	447
434	4.11.17	Works from channage 1120 to channage 1270	114 days	Thu 10/2/15	Tue 10/2/15	447
435	4.11.17.1	earth filling adjacent to eastern staircase & Bay 9 (H1, D11, D11 part D17) (CH113b-1270) (after diversion of haul road)	7 days	Thu 10/2/15	Tue 10/2/15	447
436	4.11.17.2	drainage & slope drain (CH1120-1270 west side)	5 days	Mon 15/2/15	Sat 13/2/15	449
437	4.11.17.3	waterwork (CH1120-1270 west side)	5 days	Sun 22/2/15	Thu 26/2/15	450
438	4.11.17.4	backfill for CLP	7 days	Fri 27/2/15	Sat 28/2/15	450
439	4.11.17.5	UV for CLP lighting	7 days	Fri 27/2/15	Thu 5/3/15	452FS-2 days
440	4.11.17.6	UV for PCCH (both sides of new Lin Ma Hang Road)	7 days	Fri 6/3/15	Thu 19/3/15	453
441	4.11.17.7	UV for HCC (east side of new Lin Ma Hang Road)	7 days	Fri 13/3/15	Thu 26/3/15	454
442	4.11.17.8	footpath paving (west side)	10 days	Thu 12/3/15	Sat 14/3/15	455FS-1 day
443	4.11.17.9	footpath paving (east side)	7 days	Wed 18/3/15	Fri 27/3/15	455FS-2 days
444	4.11.17.10	AC - lay wearing course - channage 475-1270	114 days	Sat 26/3/15	Fri 17/10/14	457
445	4.11.17.11	kerb bedding, laying & backing before bituminous material	0 days	Tue 17/14	Tue 17/14	460FS-5 days
446	4.11.17.12	AC - lay DBM & base course	36 days	Thu 26/6/14	Sat 28/6/14	
447	4.11.17.13	filling works to formation of footpath	3 days	Thu 26/6/14	Sat 28/6/14	
448	4.11.17.14	UV for CLP lighting - channage 1120-1270	14 days	Sun 29/6/14	Thu 3/7/14	462
449	4.11.17.15	UV for PCCH (both sides of new Lin Ma Hang Road)	14 days	Fri 18/7/14	Thu 31/7/14	463,465
450	4.11.17.16	UV for HCC (east side of new Lin Ma Hang Road)	14 days	Fri 18/7/14	Thu 17/7/14	463
451	4.11.17.17	footpath paving (west side)	49 days	Fri 18/7/14	Thu 4/8/14	
452	4.11.17.18	footpath paving (east side)	14 days	Fri 18/7/14	Thu 31/7/14	465
453	4.11.17.19	AC - lay wearing course - channage 475-1270	35 days	Fri 1/8/14	Fri 17/10/14	467
454	4.11.17.20	1 no. DN1650 pipe jacking LV909 including jacking & receiving pits	36 days	Fri 1/8/14	Fri 17/10/14	467
455	4.11.17.21	Confirmation of designed details (NOT YET)	14 days	Fri 12/9/14	Thu 25/9/14	468
456	4.11.17.22	Pit construction	14 days	Fri 12/9/14	Thu 25/9/14	468
457	4.11.17.23	utility detection of the area	14 days	Fri 12/9/14	Thu 25/9/14	468
458	4.11.17.24	inspection pits for jacking pit and receiving pit	14 days	Fri 12/9/14	Thu 25/9/14	468
459	4.11.17.25	temporary work & excavation for receiving pit	14 days	Fri 12/9/14	Thu 25/9/14	468
460	4.11.17.26	temporary work & excavation for jacking pit	14 days	Fri 12/9/14	Thu 25/9/14	468
461	4.11.17.27	Jack sleeve Pipes	14 days	Fri 12/9/14	Thu 25/9/14	468
462	4.11.17.28	establishment of jacking equipment	14 days	Fri 12/9/14	Thu 25/9/14	468
463	4.11.17.29	jack pipe and excavate	14 days	Fri 12/9/14	Thu 25/9/14	468
464	4.11.17.30	HDPE pipes	14 days	Fri 12/9/14	Thu 25/9/14	468
465	4.11.17.31	lay HDPE pipes	14 days	Fri 12/9/14	Thu 25/9/14	468

ID	WBS	Task Name	Duration	Start	Finish	Predecessors
471	4.11.19.4.2	great HDPE pipes	14 days	Fri 26/9/14	Thu 9/10/14	470
472	4.11.19.4.3	removes temporary works and backfilling	8 days	Fri 10/10/14	Fri 17/10/14	471
473	4.11.20	Works for Revised DSD Maintenance Access & Slope (SK0301 & SK0313)	50 days	Mon 23/2/15	Mon 13/4/15	
474	4.11.20.1	Latest Date for Confirmation of re-design & Issue of VO	0 days	Mon 23/2/15	Mon 23/2/15	476FS-21 days
475	4.11.20.2	completion of Retaining Wall RW5	0 days	Sun 1/3/15	Sun 1/3/15	410
476	4.11.20.3	earthfilling work behind RW5	14 days	Mon 2/3/15	Sun 15/3/15	475
477	4.11.20.4	cut slope at south side	14 days	Wed 7/3/15	Fri 20/3/15	475SS-5 days
478	4.11.20.5	complete earthwork for DSD maintenance access (with 98%SR7)	7 days	Wed 18/3/15	Thu 24/3/15	477SS-3 days
479	4.11.20.6	kerb bedding, laying & backing before bituminous material	7 days	Wed 25/3/15	Thu 31/3/15	478
480	4.11.20.7	sub-base laying for access	7 days	Wed 25/3/15	Thu 31/3/15	479FS-7 days
481	4.11.20.8	AC - lay DBM & base course	3 days	Wed 14/4/15	Fri 3/4/15	480
482	4.11.20.9	wait bituminous test result	3 days	Sat 4/4/15	Mon 6/4/15	481
483	4.11.20.10	AC - lay wearing course	7 days	Tue 7/4/15	Mon 13/4/15	482
484	4.12	Section XIII of the Works - Works not covered in any other Sections (Revised)	852 days	Thu 22/8/13	Mon 11/12/15	74
485	4.12.1	Submissions	70 days	Thu 22/8/13	Wed 30/10/13	
486	4.12.2	Approval of Submissions	68 days	Mon 16/9/13	Fri 22/11/13	485SS+25 days
487	4.12.3	Temporary Traffic Arrangement (TTA) Scheme for Works at existing LMH Rd	92 days	Fri 23/8/13	Fri 22/11/13	485SS+1 day
491	4.12.4	Re-aligned Lin Ma Hang Road	789 days	Thu 24/10/13	Mon 31/12/14	
492	4.12.4.1	VO FOR RENEWAL OF RISING MAIN (Order confirmed via Email on 31/12/2014)	0 days	Wed 31/12/14	Wed 31/12/14	
493	4.12.4.2	place order for HDPE pipes	0 days	Tue 6/1/15	Tue 6/1/15	492FS+2 days
494	4.12.4.3	arrival of HDPE pipes	59 days	Tue 6/1/15	Tue 5/2/15	493
495	4.12.4.4	RECEIVE VO 063 ADDITIONAL CROSS ROAD DUCTS FOR EXISTING IRRIGATION PIPES	0 days	Tue 7/10/14	Tue 7/10/14	
496	4.12.4.5	RECEIVE VO 062 CABLE DUCTS LAYING FOR PUBLIC LIGHTING SYSTEM AT LIN MA HANG ROAD	0 days	Tue 14/10/14	Tue 14/10/14	
497	4.12.4.6		210 days	Sun 24/8/14	Sat 21/3/15	
498	4.12.4.6.1	TTA for ch 310-380(west)	0 days	Sun 24/8/14	Sun 24/8/14	488
499	4.12.4.6.2	earthwork to lay drainage & waterwork	21 days	Sun 24/8/14	Sat 13/9/14	488
500	4.12.4.6.3	drainage & waterwork + backfill for CLP	45 days	Sun 14/9/14	Tue 28/10/14	499
501	4.12.4.6.4	FORES3 - crossing no. 1(white), 2 (west)	18 days	Wed 29/10/14	Sat 15/11/14	500,495
502	4.12.4.6.5	UU for ch 190-380 (132kV/11kV/LV)	19 days	Sun 16/11/14	Thu 4/12/14	501
503	4.12.4.6.6	filling works to formation of road (include SRT98%)	7 days	Fri 5/12/14	Thu 11/12/14	502
504	4.12.4.6.7	street lighting drainage & crossroads	7 days	Fri 12/12/14	Thu 18/12/14	503
505	4.12.4.6.8	kerb bedding, laying & backing before bituminous material	9 days	Fri 19/12/14	Thu 18/12/14	504
506	4.12.4.6.9	filling works to formation of footpath	4 days	Sun 28/12/14	Wed 31/12/14	505
507	4.12.4.6.10	UU for CLP (lighting)	5 days	Thu 1/1/15	Mon 5/1/15	506
508	4.12.4.6.11	UU for ch 190-380 (PCCW)	7 days	Tue 6/1/15	Mon 12/1/15	507
509	4.12.4.6.12	irrigation system	7 days	Tue 13/1/15	Mon 19/1/15	508
510	4.12.4.6.13	preparation works to formation of footpath	3 days	Mon 19/1/15	Wed 27/1/15	509FS-1 day
511	4.12.4.6.14	footpath paving	9 days	Thu 22/1/15	Fri 30/1/15	510
512	4.12.4.6.15	VO for renewal of rising main	6 days	Fri 6/3/15	Wed 11/3/15	494
513	4.12.4.6.16	sub-base laying for road	5 days	Thu 12/3/15	Mon 16/3/15	512
514	4.12.4.6.17	AC - lay DBM & base course	5 days	Thu 17/3/15	Mon 16/3/15	513
515	4.12.4.7		402 days	Fri 22/1/13	Mon 29/12/14	595,513
516	4.12.4.7.1	TTA for ch 380-580(west)	0 days	Fri 22/1/13	Fri 22/1/13	487
517	4.12.4.7.2	watermain (include issue of alignment and laying)	120 days	Sat 23/1/13	Sat 22/3/14	516
518	4.12.4.7.3	drainage (pipe, manholes & gullies)	155 days	Sun 23/3/14	Sun 24/8/14	517
519	4.12.4.7.4	Received Variation Order Nos. 040 & 042	0 days	Mon 28/4/14	Mon 28/4/14	
520	4.12.4.7.5	construct DN450mm pipe with concrete surround	28 days	Mon 12/5/14	Sun 8/6/14	518SS+50 days,519FS+14 days
521	4.12.4.7.5.1	low stream pipe & catchpit at western side	28 days	Mon 12/5/14	Sun 8/6/14	
522	4.12.4.7.6	construct 1900x950 box culvert with manholes SMH8652A & B	49 days	Mon 9/6/14	Sun 27/7/14	519,521
523	4.12.4.7.6.1	support existing DN150mm sewer pipe & watermain	7 days	Mon 9/6/14	Sun 15/6/14	
524	4.12.4.7.6.2	construct box culvert	14 days	Mon 16/6/14	Sun 29/6/14	523
525	4.12.4.7.6.3	construct manholes	28 days	Mon 30/6/14	Sun 27/7/14	524
526	4.12.4.7.7	found existing cables affected construction of gullies & discuss with CLP	18 days	Sat 26/7/14	Thu 12/8/14	518FF-12 days,525FS-2 days
527	4.12.4.7.8	complete preparation work & fill footpath for 132kV, 11kV & LV	8 days	Wed 13/8/14	Wed 20/8/14	526
528	4.12.4.7.9	temporary connection of cables	35 days	Thu 21/8/14	Wed 24/9/14	527
529	4.12.4.7.10	UU - 132kV+11kV & LV	3 days	Sat 25/9/14	Sat 27/9/14	528
530	4.12.4.7.11	960x650 box culvert (low stream & west catchpit)	7 days	Sun 28/9/14	Tue 7/10/14	529
532	4.12.4.7.12	construct outstanding drainage & gullies	7 days	Wed 1/10/14	Tue 7/10/14	531FS-4 days
533	4.12.4.7.13	filling work to formation of road (include SRT198%)	5 days	Wed 8/10/14	Sun 12/10/14	532
534	4.12.4.7.14	FORES3 - crossing no. 3, 4 (west)	10 days	Mon 13/10/14	Wed 22/10/14	495FS-6 days
535	4.12.4.7.15	complete filling work to formation of road (include SRT98%)	5 days	Thu 23/10/14	Mon 27/10/14	534
536	4.12.4.7.16	street lighting drainage & crossing at ch 523	4 days	Mon 27/10/14	Thu 30/10/14	535FS-1 day



ID	WBS	Task Name	Duration	Start	Finish	Predecessors
601	4.12.4.12.12	UU for ch 125-190 (PCCW)	5 days	Mon 22/06/15	Fri 26/06/15	600
602	4.12.4.12.13	footpath paving	7 days	Fri 26/06/15	Thu 27/11/15	601FS-1 day
603	4.12.4.12.14	AC - lay DBM & base course	4 days	Sat 20/06/15		599
604	4.12.4.13		68 days	Wed 24/06/15	Mon 31/08/15	603FS+1 day
605	4.12.4.13.1	TTA for ch 80-125(west)	0 days		Wed 24/06/15	
606	4.12.4.13.2	earthwork to lay drainage & waterwork	3 days	Thu 25/06/15	Sat 27/06/15	605
607	4.12.4.13.3	drainage & waterwork - backfill for CLP	18 days	Sun 28/06/15	Wed 15/07/15	606
608	4.12.4.13.4	UU for ch 80-190 (132kV, 11kV, L/P)	6 days	Thu 16/07/15	Tue 21/07/15	607
609	4.12.4.13.5	filling works to formation of road (include SRT98%)	7 days	Wed 22/07/15	Tue 28/07/15	608
610	4.12.4.13.6	street lighting drainage & crossing at ch 98	3 days	Wed 29/07/15	Fri 31/07/15	609
611	4.12.4.13.7	irrigation system	3 days	Mon 3/08/15	Mon 3/08/15	610
612	4.12.4.13.7	UU for CLP (lighting)	3 days	Tue 4/08/15	Thu 6/08/15	611
613	4.12.4.13.8	sub-base laying	3 days	Fri 7/08/15	Sun 9/08/15	612
614	4.12.4.13.10	kerb bedding, laying & backing before bituminous material	5 days	Mon 10/08/15	Fri 14/08/15	613
615	4.12.4.13.11	filling works to formation of footpath	4 days	Sat 15/08/15	Tue 18/08/15	614
616	4.12.4.13.12	UU for ch 80-190 (PCCW)	4 days	Wed 19/08/15	Sat 22/08/15	615
617	4.12.4.13.13	footpath paving	9 days	Sun 23/08/15	Mon 31/08/15	616
618	4.12.4.13.14	AC - lay DBM & base course	4 days	Sat 15/08/15		614
619	4.12.4.14		43 days	Wed 19/08/15	Thu 1/10/15	618FS+1 day
620	4.12.4.14.1	TTA for ch 125-190 (east)	0 days		Wed 19/08/15	
621	4.12.4.14.2	VO for renewal of rising main	7 days	Thu 20/08/15	Wed 26/08/15	620
622	4.12.4.14.3	filling works to formation of road (include SRT98%)	4 days	Sat 29/08/15	Sat 29/08/15	621FS-1 day
623	4.12.4.14.4	street lighting drainage & crossing at ch 154	3 days	Sun 30/08/15	Tue 1/09/15	622
624	4.12.4.14.5	irrigation system	3 days	Wed 2/09/15	Fri 4/09/15	623
625	4.12.4.14.6	UU for CLP (lighting)	3 days	Sat 5/09/15	Mon 7/09/15	624
626	4.12.4.14.7	sub-base laying	2 days	Tue 8/09/15	Wed 9/09/15	625, 624
627	4.12.4.14.8	kerb bedding, laying & backing before bituminous material	5 days	Thu 10/09/15	Mon 14/09/15	626
628	4.12.4.14.9	filling works to formation of footpath	3 days	Thu 10/09/15	Thu 17/09/15	627
629	4.12.4.14.10	UU for ch 125-200 (PCCW/HGC)	5 days	Fri 18/09/15	Tue 22/09/15	628
630	4.12.4.14.11	footpath paving	9 days	Wed 23/09/15	Thu 1/10/15	629
631	4.12.4.14.12	AC - lay DBM & base course	4 days	Tue 15/09/15		627
632	4.12.4.15		42 days	Sat 19/09/15	Sat 31/10/15	631FS+1 day
633	4.12.4.15.1	TTA for ch 80-125 (east)	0 days		Sat 19/09/15	
634	4.12.4.15.2	VO for renewal of rising main	7 days	Sun 20/09/15	Sat 26/09/15	633
635	4.12.4.15.3	filling works to formation of road (include SRT98%)	3 days	Fri 25/09/15	Tue 29/09/15	634FS-2 days
636	4.12.4.15.4	street lighting drainage & crossing at ch 98	3 days	Thu 29/09/15	Thu 1/10/15	635FS-1 day
637	4.12.4.15.5	irrigation system	3 days	Fri 2/10/15	Sun 4/10/15	636
638	4.12.4.15.6	UU for CLP (lighting)	3 days	Mon 5/10/15	Wed 7/10/15	637
639	4.12.4.15.7	sub-base laying	3 days	Thu 8/10/15	Sat 10/10/15	638
640	4.12.4.15.8	kerb bedding, laying & backing before bituminous material	5 days	Sun 11/10/15	Thu 15/10/15	639
641	4.12.4.15.9	filling works to formation of footpath	3 days	Fri 16/10/15	Sun 18/10/15	640
642	4.12.4.15.10	UU for ch 80-125 (PCCW/HGC)	4 days	Mon 19/10/15	Thu 22/10/15	641
643	4.12.4.15.11	footpath paving	9 days	Fri 23/10/15	Sat 31/10/15	642
644	4.12.4.15.12	AC - lay DBM & base course	4 days	Fri 16/10/15		640
645	4.12.4.16		62 days	Wed 21/10/15	Mon 21/12/15	644FS+1 day
646	4.12.4.16.1	Chainage 80 to Chainage 180 (west side)	4 days	Wed 21/10/15	Sat 24/10/15	
647	4.12.4.16.2	Chainage 80 to Chainage 180 (east side)	2 days	Sun 25/10/15	Mon 26/10/15	646
648	4.12.4.16.3	Chainage 180 to Chainage 280 (west side)	6 days	Tue 27/10/15	Sun 1/11/15	647
649	4.12.4.16.4	Chainage 180 to Chainage 280 (east side)	5 days	Fri 6/11/15	Fri 6/11/15	648
650	4.12.4.16.5	Chainage 280 to Chainage 380 (west side)	7 days	Sat 7/11/15	Fri 13/11/15	649
651	4.12.4.16.6	Chainage 280 to Chainage 380 (east side)	2 days	Sat 14/11/15	Sun 15/11/15	650
652	4.12.4.16.7	Chainage 380 to Chainage 480 (west side)	7 days	Mon 16/11/15	Sun 22/11/15	651
653	4.12.4.16.8	Chainage 380 to Chainage 480 (east side)	2 days	Mon 23/11/15	Tue 24/11/15	652
654	4.12.4.16.9	Chainage 480 to Chainage 580 (west side)	7 days	Wed 25/11/15	Tue 1/12/15	653
655	4.12.4.16.10	Chainage 480 to Chainage 580 (east side)	2 days	Wed 2/12/15	Thu 3/12/15	654
656	4.12.4.16.11	Chainage 580 to Chainage 680 (west side)	7 days	Thu 4/12/15	Thu 10/12/15	655
657	4.12.4.16.12	Chainage 580 to Chainage 680 (east side)	2 days	Fri 11/12/15	Sat 12/12/15	656
658	4.12.4.16.13	Chainage 680 to Chainage 785 (west side)	7 days	Sun 13/12/15	Sat 19/12/15	657
659	4.12.4.16.14	Chainage 680 to Chainage 785 (east side)	2 days	Sun 20/12/15	Mon 21/12/15	658

ID	WBS	Task Name	Duration	Start	Finish	Predecessors
660	4.12.4.17	Eastern Footpath from ch 380-580	98 days	Fri 10/4/15	Thu 16/7/15	546
661	4.12.4.17.1	remove existing pavement	3 days	Fri 10/4/15	Sun 12/4/15	
662	4.12.4.17.2	upper stream box culvert 960x630	14 days	Mon 13/04/15	Sun 26/4/15	661
663	4.12.4.17.3	upper stream DN150mm pipe	12 days	Mon 27/4/15	Fri 8/5/15	662
664	4.12.4.17.4	PO053 - crossing no. 2, 3, 4, 5 (east footpath)	5 days	Sat 9/5/15	Wed 13/5/15	663
665	4.12.4.17.5	filling works to formation of footpath	5 days	Thu 14/5/15	Mon 18/5/15	664
666	4.12.4.17.6	street light crossing at ch323	5 days	Thu 14/5/15	Sat 23/5/15	665
667	4.12.4.17.7	UU for CLP (lighting)	5 days	Fri 29/5/15	Tue 2/6/15	666FS+5 days
668	4.12.4.17.8	sub-base & edging	6 days	Wed 3/6/15	Mon 8/6/15	667
669	4.12.4.17.9	UU for ch 380-580 (PCCW/HGC)	14 days	Tue 9/6/15	Mon 22/6/15	668
670	4.12.4.17.10	construct edging	10 days	Tue 23/6/15	Thu 2/7/15	669
671	4.12.4.17.11	footpath paving	14 days	Fri 3/7/15	Thu 16/7/15	670
672	4.12.4.18	Eastern Footpath from ch 190-380	71 days	Thu 30/4/15	Thu 9/7/15	556
673	4.12.4.18.1	remove existing pavement	3 days	Thu 30/4/15	Sat 2/5/15	
674	4.12.4.18.2	PO053 - crossing no. 2 (east footpath)	3 days	Sun 3/5/15	Tue 5/5/15	673
675	4.12.4.18.3	filling works to formation of footpath	5 days	Wed 6/5/15	Sun 10/5/15	674
676	4.12.4.18.4	street light crossings at ch287,350	7 days	Mon 11/5/15	Sun 17/5/15	675
677	4.12.4.18.5	UU for CLP (lighting)	5 days	Mon 18/5/15	Fri 22/5/15	676
678	4.12.4.18.6	sub-base & edging	6 days	Sat 23/5/15	Thu 28/5/15	677
679	4.12.4.18.7	UU for ch 190-380 (PCCW/HGC)	20 days	Fri 29/5/15	Wed 17/6/15	678
680	4.12.4.17.10	construct edging	9 days	Thu 18/6/15	Fri 26/6/15	679
681	4.12.4.17.11	footpath paving	13 days	Sat 27/6/15	Thu 9/7/15	680
682	4.12.4.19	Eastern Footpath from ch 580-785	71 days	Mon 27/4/15	Mon 6/7/15	581
683	4.12.4.19.1	remove existing pavement	3 days	Mon 27/4/15	Wed 29/4/15	
684	4.12.4.19.2	PO053 - crossing no. 5, 6, 7&8 (east footpath)	7 days	Thu 30/4/15	Wed 6/5/15	683
685	4.12.4.19.3	filling works to formation of footpath	3 days	Thu 30/4/15	Mon 11/5/15	684
686	4.12.4.19.4	street light crossings at ch760,785	7 days	Thu 30/4/15	Mon 18/5/15	685
687	4.12.4.19.5	UU for CLP (lighting)	5 days	Tue 12/5/15	Sat 23/5/15	686
688	4.12.4.19.6	sub-base & edging	6 days	Tue 19/5/15	Fri 29/5/15	687
689	4.12.4.19.7	UU for ch 580-785 (PCCW/HGC)	14 days	Sat 30/5/15	Fri 12/6/15	688
690	4.20.4.11.10	construct edging	10 days	Sat 13/6/15	Mon 22/6/15	689
691	4.12.4.19.9	footpath paving	14 days	Tue 23/6/15	Mon 6/7/15	690
692	4.12.4.20	Construction of retaining wall RWS - C10 to 22 (3 bays)	70 days	Tue 30/12/14	Mon 9/3/15	515
693	4.12.4.20.1	Bay 8001 to Bay 8003 (3 bays)	70 days	Tue 30/12/14	Mon 9/3/15	
694	4.12.4.21	Site formation works for ArchSD Depot (Drg. 1001/B)	48 days	Tue 10/3/15	Sun 26/4/15	692
695	4.12.4.22	Archaeological survey (Sections T1 to T3)(Drg. 6403A)	147 days	Thu 24/10/13	Wed 19/3/14	
701	4.13	Section XIV of the Works - Trees preservation and protection	730 days	Fri 12/4/13	Sat 11/4/15	4
709	4.14	Section XV of the Works - Landscape soft works (including transplant trees to permanent locations)	126 days	Tue 19/1/15	Mon 4/11/16	
713	4.15	Section XVI of the Works - Establishment works for landscape soft works	365 days	Tue 5/11/16	Tue 3/1/17	701,709



Appendix D

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

LEGEND:

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

PA	REV TO	REV	FIRST ISSUE	DC	WT

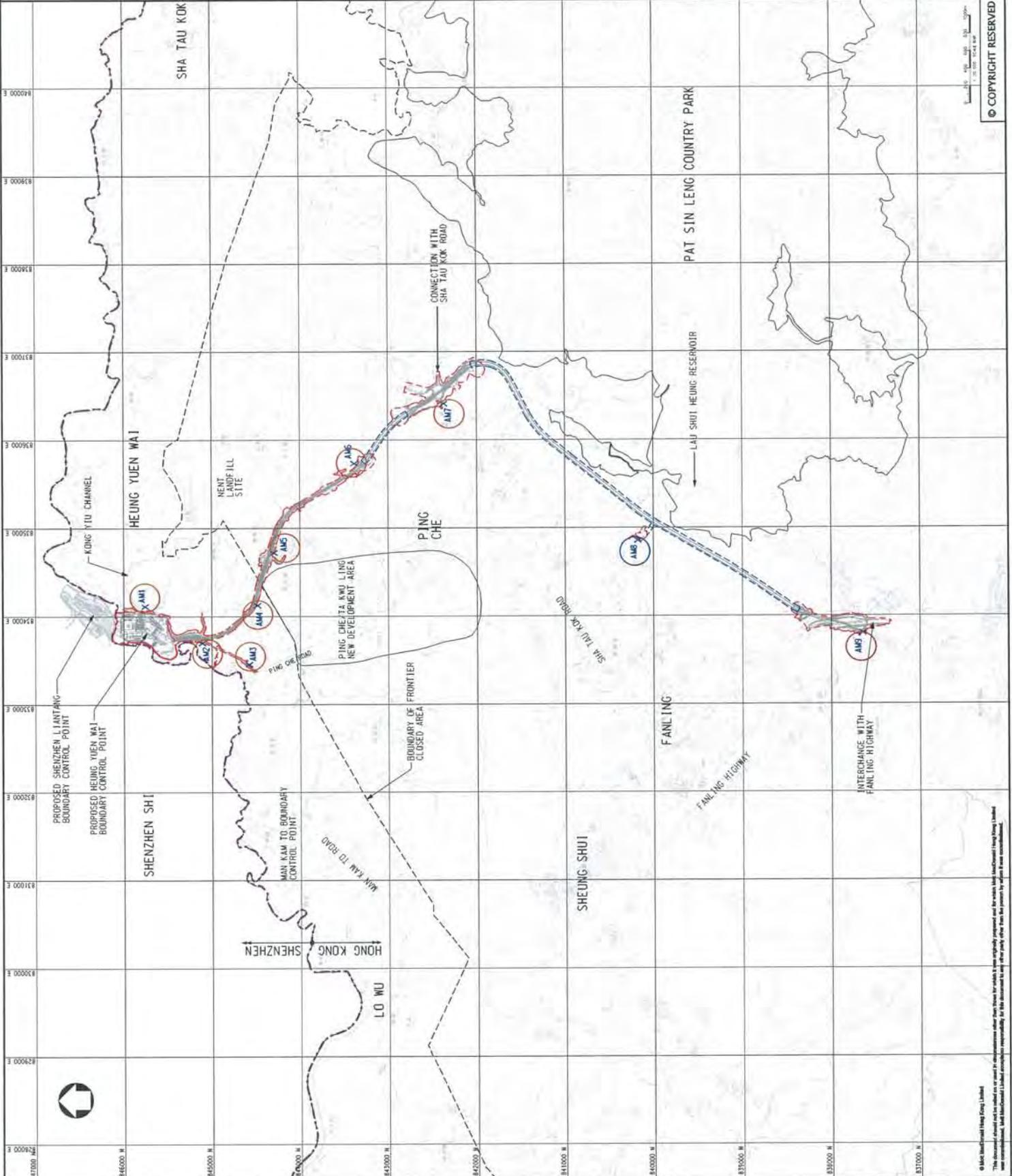


CIVIL ENGINEERING
AND DEVELOPMENT
DEPARTMENT

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

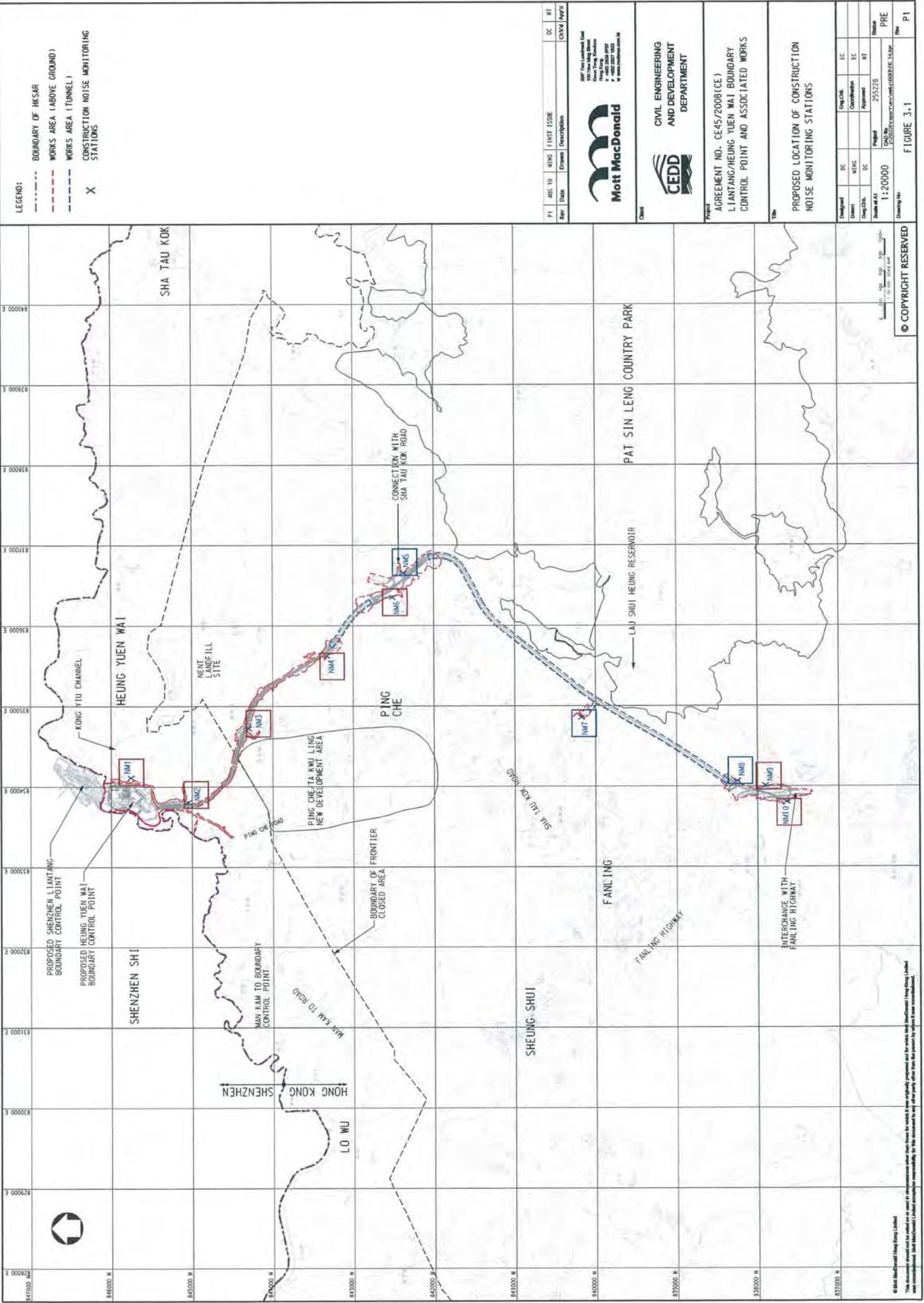
PROPOSED LOCATION OF CONSTRUCTION
AIR QUALITY MONITORING STATIONS

Drawn	DC	Eng. CHK.	EC
Checked	HT/EC	Coordination	EC
Scale at A1	DC	Approval	WT
1:20000		25/2/28	
Project	NO.	Date	Sheet
CE-45/2008(CE)		25/2/28	PRE
Drawing No.	FIGURE 2-1		
	P.1		



© COPYRIGHT RESERVED

This document is the property of Mott MacDonald Limited. It is not to be used for any other project without the prior written consent of Mott MacDonald Limited. All rights reserved.



LEGEND:

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

PI	ADD TO	DATE	BY	DESCRIPTION	DC	RT



CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT

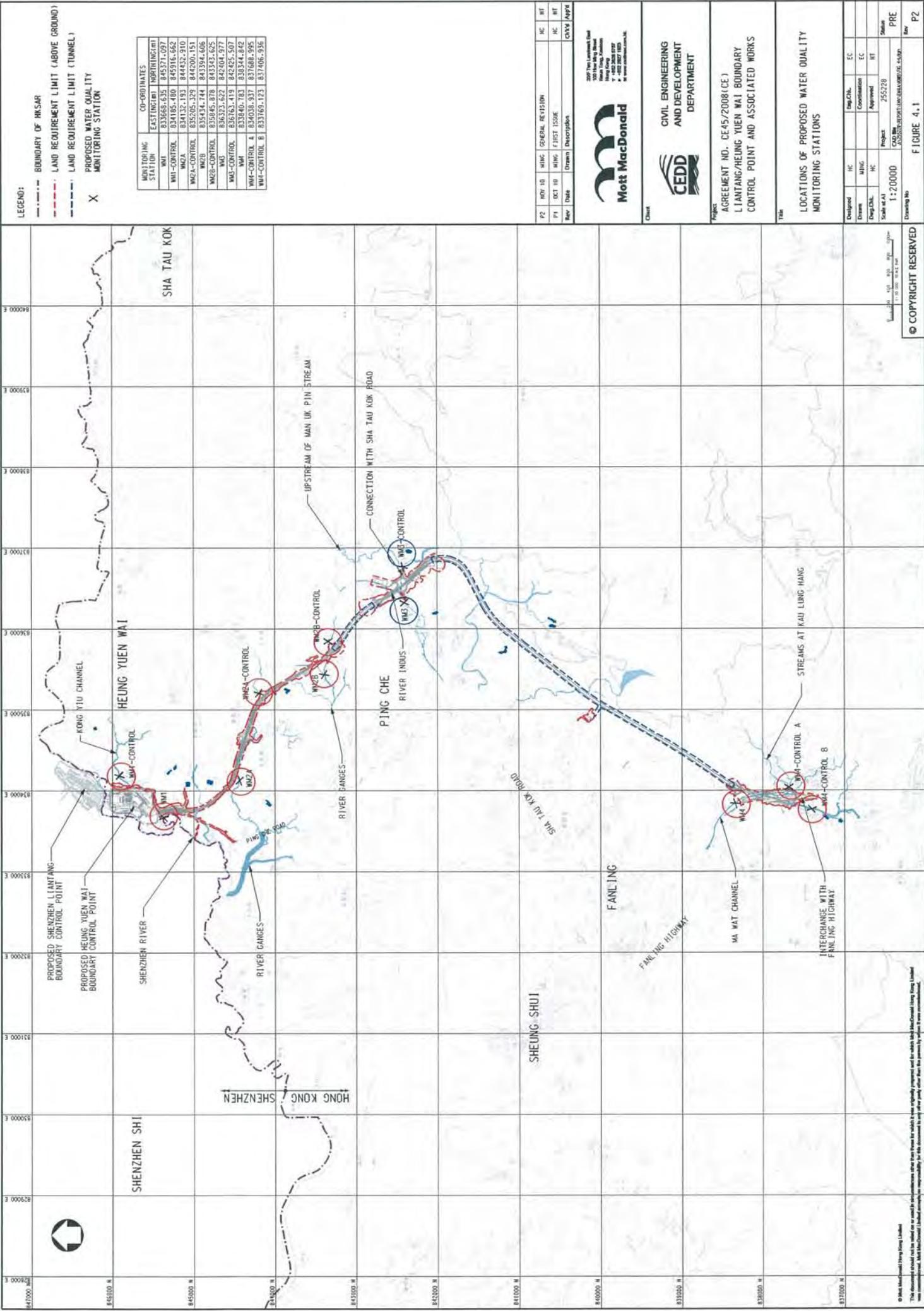
AGREEMENT NO. CE-45/2008(CE)
LIANTANG/HEUNG YUEN WAI BOUNDARY CONTROL POINT AND ASSOCIATED WORKS

PROPOSED LOCATION OF CONSTRUCTION NOISE MONITORING STATIONS

Designated	DC	ME/C	DC							

FIGURE 3-1

© Mott MacDonald / Hong Kong Limited
This document is the property of Mott MacDonald / Hong Kong Limited and is not to be distributed, copied, or used in any way without the prior written consent of Mott MacDonald / Hong Kong Limited.



LEGEND:

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

MONITORING STATION	CO-ORDINATES	
	EASTING (M)	NORTHING (M)
WMA	837683.635	845371.097
WMA-CONTROL 1	834185.460	845916.662
WMA-CONTROL 2	834132.193	844432.910
WMA-CONTROL 3	835505.329	844200.151
WMA-CONTROL 4	835534.744	843394.606
WMA-CONTROL 5	835945.878	843343.625
WMA-CONTROL 6	836323.622	842404.977
WMA-CONTROL 7	836763.419	842425.507
WMA-CONTROL 8	834038.937	837688.995

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



CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT

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

TITLE LOCATIONS OF PROPOSED WATER QUALITY MONITORING STATIONS

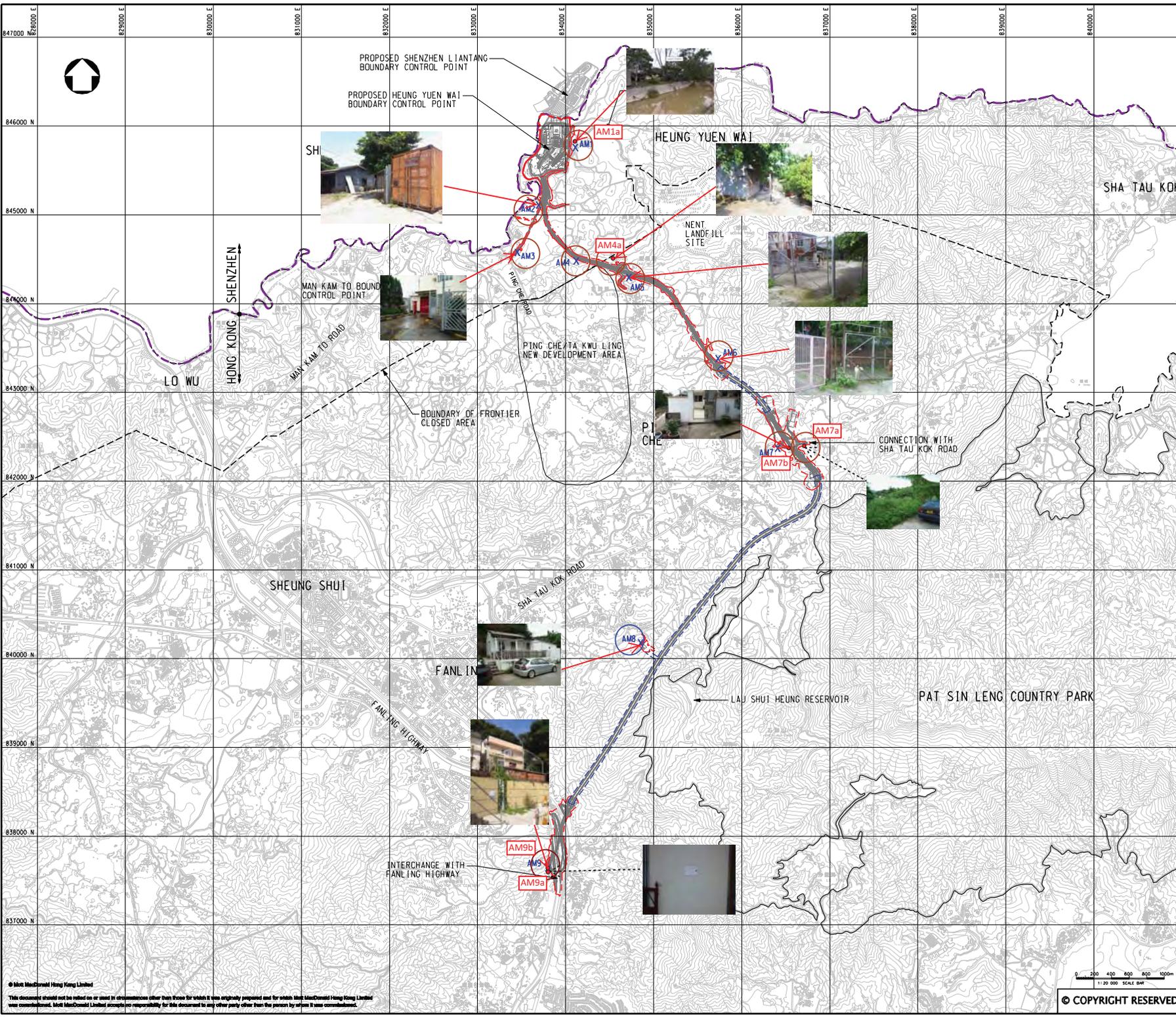
Developed	HC	Eng. Chk.	EC
Drawn	WHG	Coordination	EC
Eng. Chk.	HC	Approved	HT
Scale at A1	1:20000	Project	255228
Scale at A3		CDU No.	PRE
Drawing No.		ASSISTANT PROJECT ENGINEER	4499
		Rev	P2

© COPYRIGHT RESERVED

This document should not be used for any purpose other than that for which it was originally prepared and for which Mott MacDonald is responsible. It is the property of Mott MacDonald and its contents should not be disclosed to any third party without the prior written consent of Mott MacDonald.

Appendix E

Monitoring Locations for Impact Monitoring



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

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

20F Two Landmark East
100 Housiang Street
Kowloon, Kowloon
Hong Kong
T +852 2518 5757
F +852 2827 1823
W www.mottmac.com.hk

Client

CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT

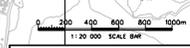
Project
 AGREEMENT NO. CE45/2008(CE)
 LIANTANG/HEUNG YUEN WAI BOUNDARY CONTROL POINT AND ASSOCIATED WORKS

Title
 PROPOSED LOCATION OF CONSTRUCTION AIR QUALITY MONITORING STATIONS

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

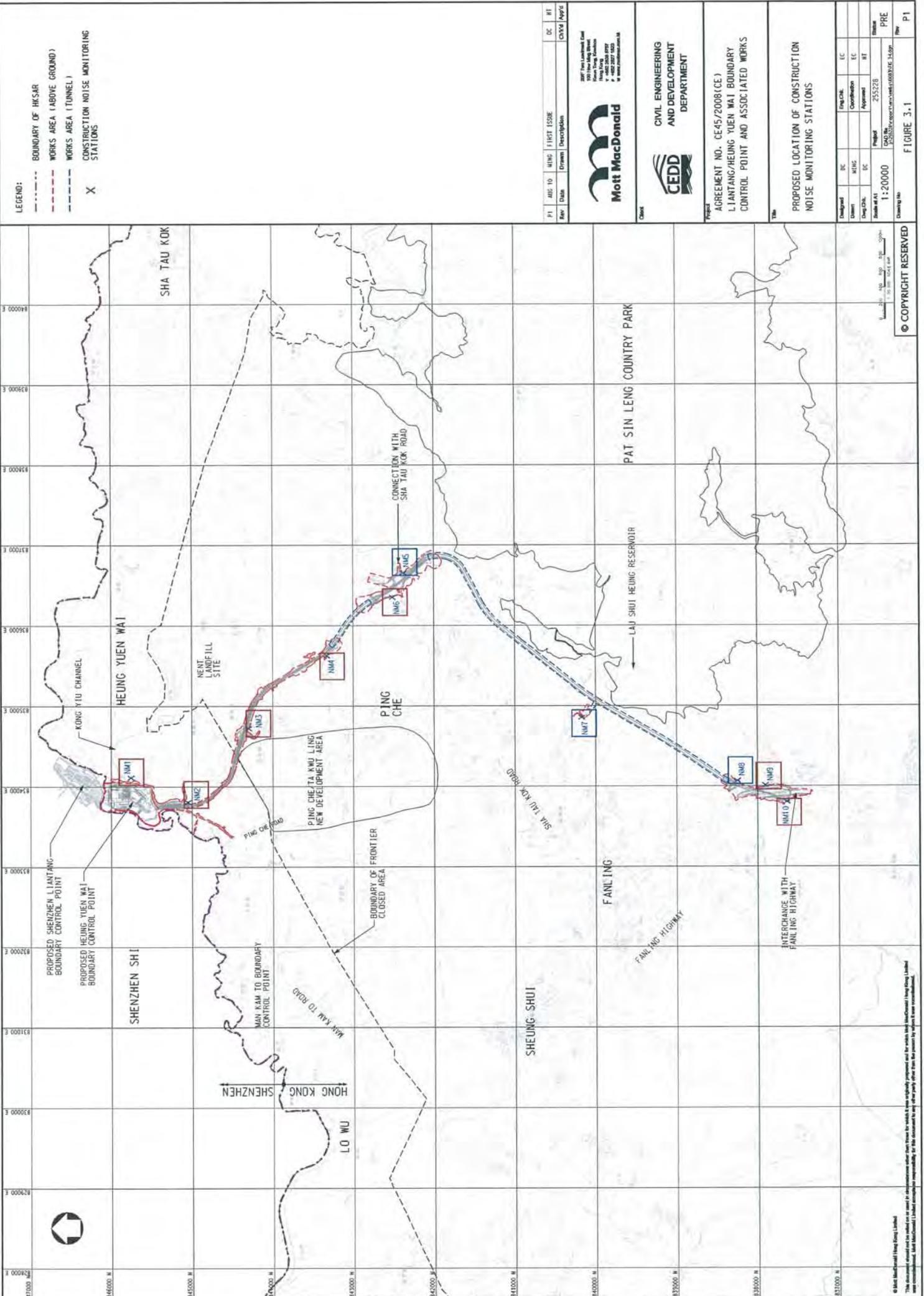
© Mott MacDonald Hong Kong Limited

This document should not be relied on or used in circumstances other than those for which it was originally prepared and for which Mott MacDonald Hong Kong Limited was commissioned. Mott MacDonald Limited accepts no responsibility for this document to any other party other than the person by whom it was commissioned.



© COPYRIGHT RESERVED

FIGURE 2.1



LEGEND:

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

PI	ADD TO	DATE	BY	DESCRIPTION	DC	RT



CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT

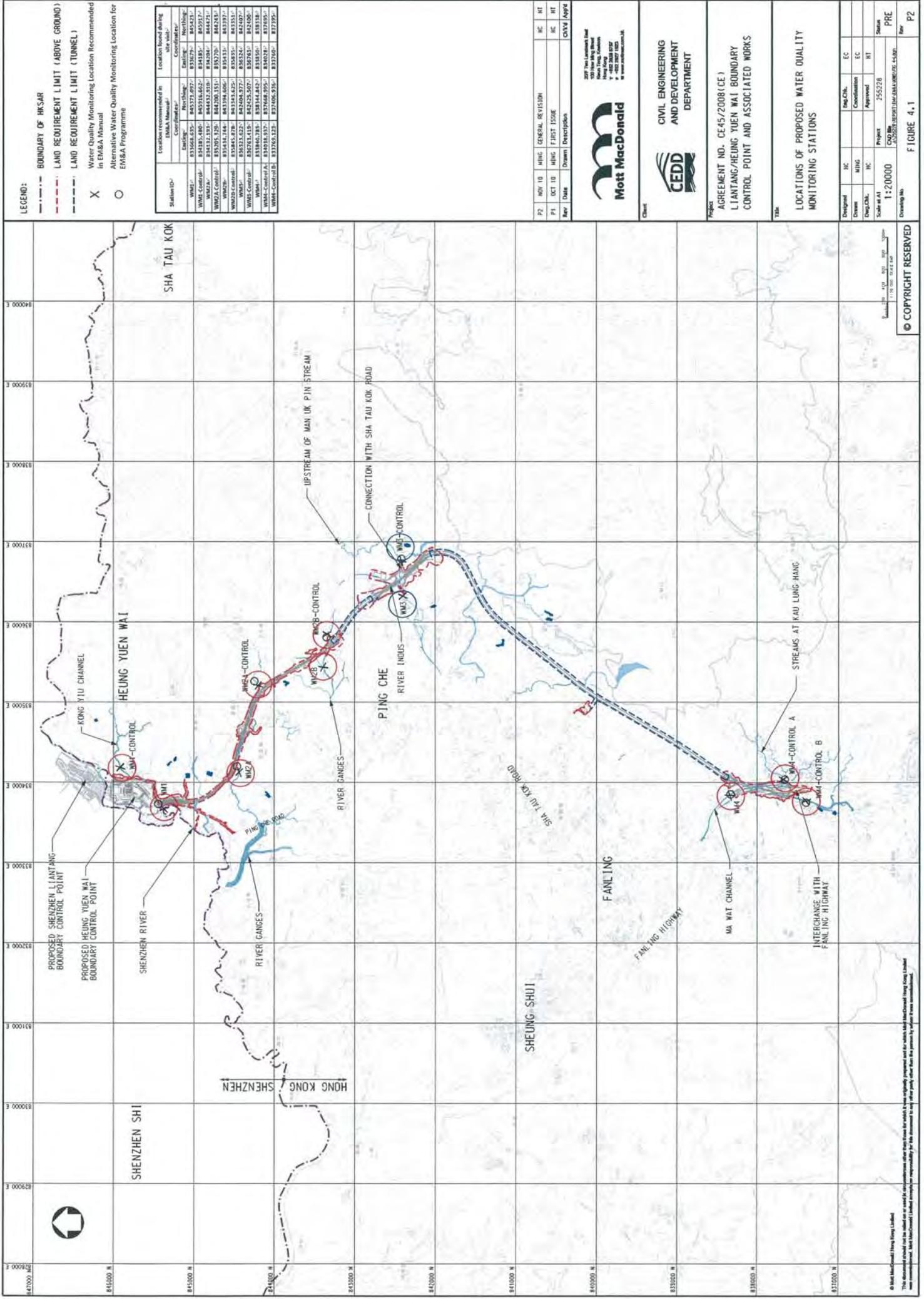
AGREEMENT NO. CE-45/2008(CE)
LIANTANG/HEUNG YUEN WAI BOUNDARY CONTROL POINT AND ASSOCIATED WORKS

PROPOSED LOCATION OF CONSTRUCTION NOISE MONITORING STATIONS

Designated	DC	M/HC	DC	Project	EC
Drawn				255228	EC
Checked					BT
Scale at A1	1:20000		Scale at A2	1:20000	Scale
Drawing No.	CE45/2008(CE)M&D/CE/45/016		Revision	PRE	Rev
				P1	

© COPYRIGHT RESERVED

Mott MacDonald (Hong Kong) Limited
This document is the property of Mott MacDonald (Hong Kong) Limited and is not to be distributed, copied, or used in any way without the prior written consent of Mott MacDonald (Hong Kong) Limited.



LEGEND:

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

Station ID	Location recommended in EM&A Manual		Location based on the site visit	
	Easting	Northing	Easting	Northing
WMA1	83366.433	845372.097	83367	845373
WMA2	84412.183	844452.816	84412	844453
WMA3	85205.326	844200.331	85205	844201
WMA4	83484.744	843358.606	83485	843359
WMA5	83585.878	843348.625	83586	843349
WMA6	83765.415	842528.507	83765	842529
WMA7	83846.283	838144.842	83846	838145
WMA8	834038.937	837668.595	834039	837669
WMA9	83765.427	837606.916	83766	837607

P2	REV 10	HWG	GENERAL REVISION	HC	HT
P1	1001	HWG	FIRST ISSUE	HC	HT
Rev	Date	Drawn	Description	CHKD	Appd



207 The Landmark
 200 Hong Kong Road
 Causeway Bay
 Hong Kong
 T +852 2807 1000
 F +852 2807 1001
 www.mottmacdonald.com.hk

**Civil Engineering
 AND DEVELOPMENT
 DEPARTMENT**

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

Scale at A1
 1:20000

Project
 CE45/2008(CE) LIANTANG/HEUNG YUEN WAI BOUNDARY CONTROL POINT AND ASSOCIATED WORKS

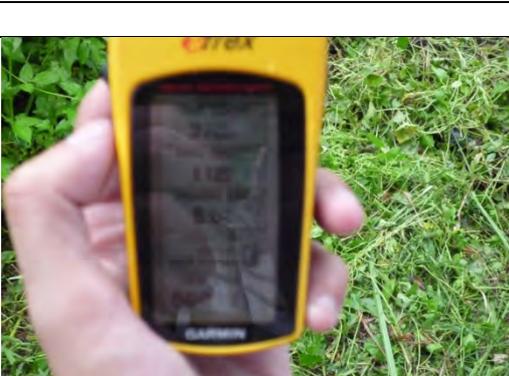
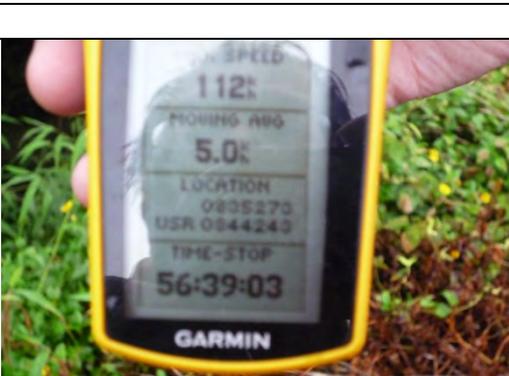
Drawn No.
 F1000

Designed	HC	HWG	EC	EC
Drawn	MHC	HWG	EC	EC
Eng. Chk.	HC	HWG	EC	EC
Scale at A1	1:20000	Project	255228	Sheet
Drawn No.	F1000	Project	CE45/2008(CE) LIANTANG/HEUNG YUEN WAI BOUNDARY CONTROL POINT AND ASSOCIATED WORKS	PRE
		Drawn No.	F1000	Rev

© COPYRIGHT RESERVED

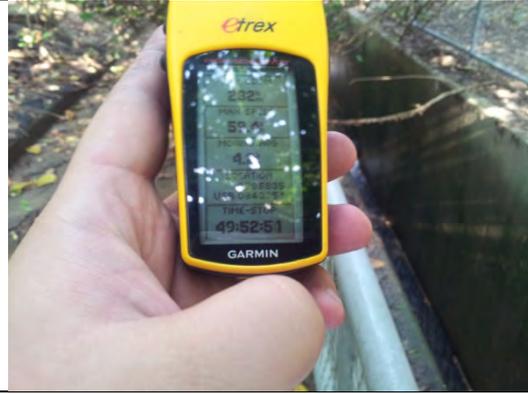
FIGURE 4.1

Photographic Records for Water Quality Monitoring Location

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



Location of WM2B-Control



Co-ordinates of WM2B-Control



Location of WM2B



Co-ordinates of WM2B



Location of WM3-Control



Co-ordinates of WM3-Control



Location of WM3



Co-ordinates of WM3



Location of WM4-Control A



Co-ordinates of WM4-Control A



Location of WM4-Control B



Co-ordinates of WM4-Control B



Location of WM4



Co-ordinates of WM4

Appendix F

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

TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

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

Date of Calibration: 22/12/2014
 Next Calibration Date: 22/2/2015
 Technician: Keung Chi Young

CONDITIONS

Sea Level Pressure (hPa) 1024.3
 Temperature (°C) 13.6

Corrected Pressure (mm Hg) 768.225
 Temperature (K) 287

CALIBRATION ORIFICE

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

Qstd Slope -> 2.00757
 Qstd Intercept -> -0.01628

CALIBRATION

Plate No.	H2O (L) (in)	H2O (R) (in)	H2O (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	6.2	6.2	12.4	1.806	53	54.34	Slope = 31.1457 Intercept = -3.7613 Corr. coeff. = 0.9930
13	4.5	4.5	9.0	1.540	42	43.06	
10	3.4	3.4	6.8	1.340	36	36.91	
7	2.2	2.2	4.4	1.079	28	28.71	
5	1.0	1.0	2.0	0.730	20	20.50	

Calculations :

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

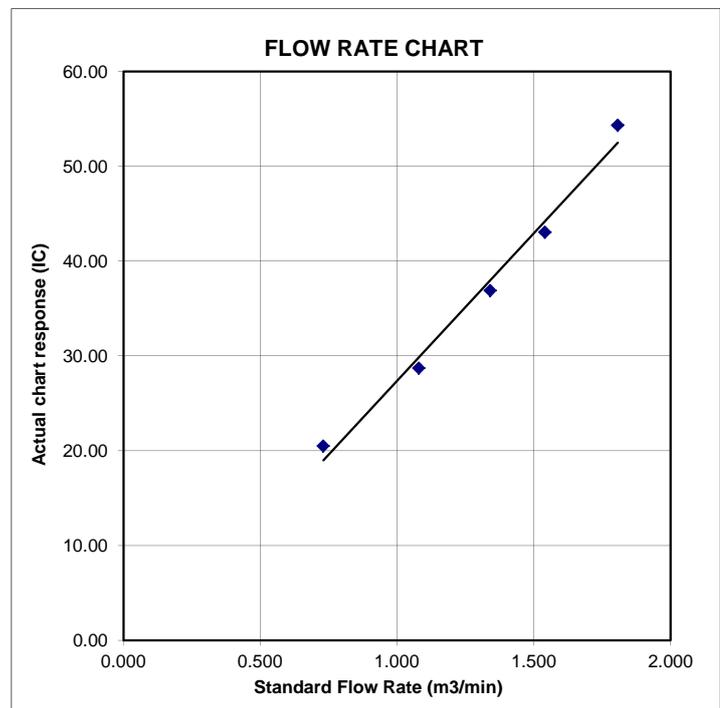
$$IC = I[\text{Sqrt}(Pa/Pstd)(Tstd/Ta)]$$

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

For subsequent calculation of sampler flow:

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

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



TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

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

Date of Calibration: 22/12/2014
 Next Calibration Date: 22/2/2015
 Technician: Keung Chi Young

CONDITIONS

Sea Level Pressure (hPa)	1024.3	Corrected Pressure (mm Hg)	768.225
Temperature (°C)	13.6	Temperature (K)	287

CALIBRATION ORIFICE

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

CALIBRATION

Plate No.	H2O (L) (in)	H2O (R) (in)	H2O (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	6.2	6.2	12.4	1.806	54	55.36	Slope = 34.0890 Intercept = -5.0583 Corr. coeff. = 0.9958
13	4.9	4.9	9.8	1.607	50	51.26	
10	4	4	8.0	1.452	43	44.08	
7	2.5	2.5	5.0	1.150	34	34.86	
5	1.6	1.6	3.2	0.922	25	25.63	

Calculations :

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

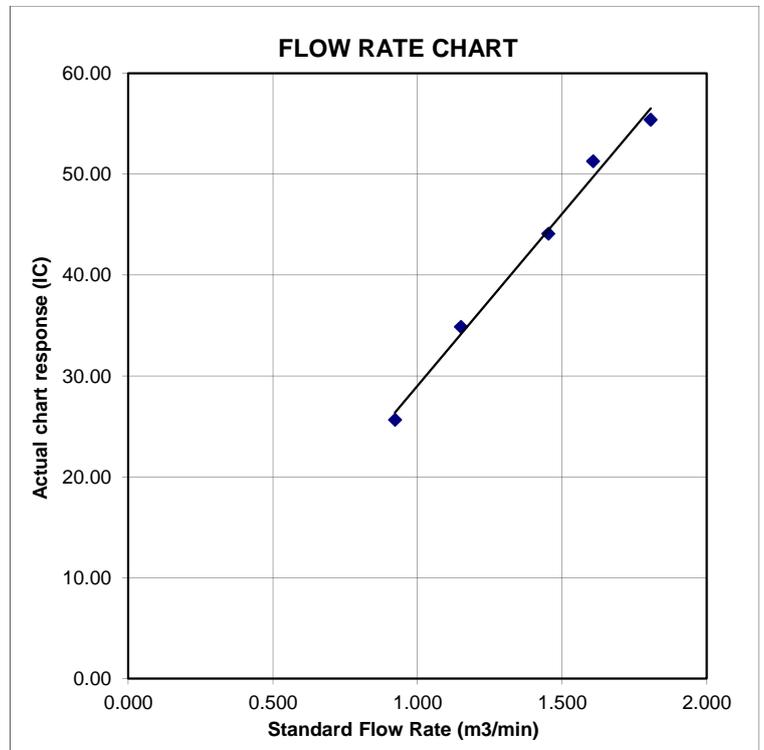
$$IC = I[\text{Sqrt}(Pa/Pstd)(Tstd/Ta)]$$

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: 22/12/2014
 Next Calibration Date: 22/2/2015
 Technician: Keung Chi Young

CONDITIONS

Sea Level Pressure (hPa)	1024.3	Corrected Pressure (mm Hg)	768.225
Temperature (°C)	13.6	Temperature (K)	287

CALIBRATION ORIFICE

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

CALIBRATION

Plate No.	H2O (L) (in)	H2O (R) (in)	H2O (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	6	6	12.0	1.777	54	55.36	Slope = 32.4294 Intercept = -1.8195 Corr. coeff. = 0.9990
13	4.7	4.7	9.4	1.574	48	49.21	
10	3.5	3.5	7.0	1.359	42	43.06	
7	2.4	2.4	4.8	1.127	34	34.86	
5	1.5	1.5	3.0	0.893	26	26.66	

Calculations :

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

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

Qstd = standard flow rate

IC = corrected chart responses

I = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

Ta = actual temperature during calibration (deg K)

Pstd = actual pressure during calibration (mm Hg)

For subsequent calculation of sampler flow:

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

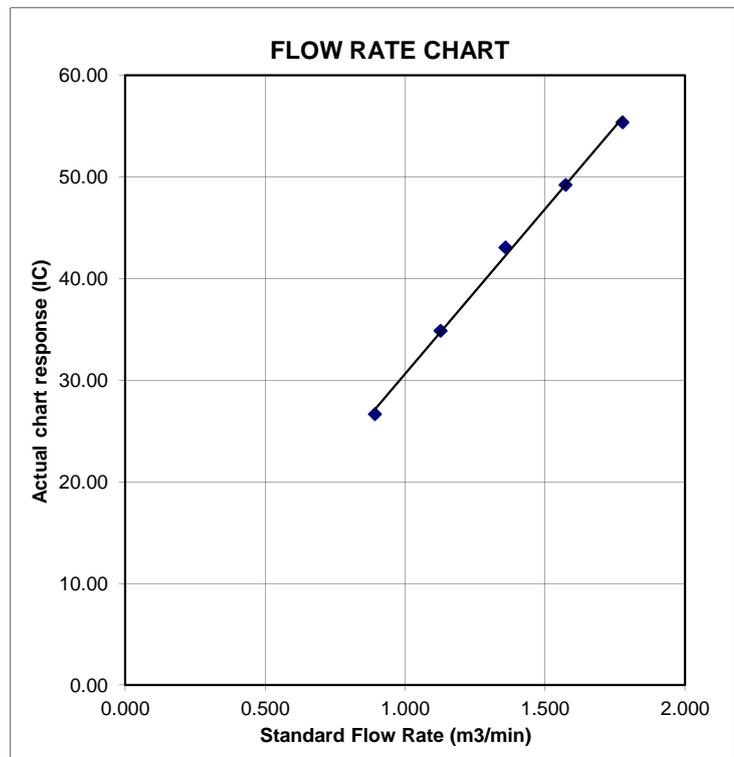
m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure



TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : Village House of Loi Tung Village

Date of Calibration: 22/12/2014

Location ID : AM7b

Next Calibration Date: 22/2/2015

Technician: C Y Keung

CONDITIONS

Sea Level Pressure (hPa) 1024.3
 Temperature (°C) 13.6

Corrected Pressure (mm Hg) 768.225
 Temperature (K) 287

CALIBRATION ORIFICE

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

Qstd Slope -> 2.00757
 Qstd Intercept -> -0.01628

CALIBRATION

Plate No.	H2O (L) (in)	H2O (R) (in)	H2O (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	4.1	4.1	8.2	1.470	54	55.36	Slope = 32.9961 Intercept = 6.3241 Corr. coeff. = 0.9958
13	3.5	3.5	7.0	1.359	49	50.23	
10	2.5	2.5	5.0	1.150	43	44.08	
7	1.7	1.7	3.4	0.950	38	38.96	
5	1.0	1.0	2.0	0.730	29	29.73	

Calculations :

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

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

Qstd = standard flow rate

IC = corrected chart responses

I = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

Ta = actual temperature during calibration (deg K)

Pstd = actual pressure during calibration (mm Hg)

For subsequent calculation of sampler flow:

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

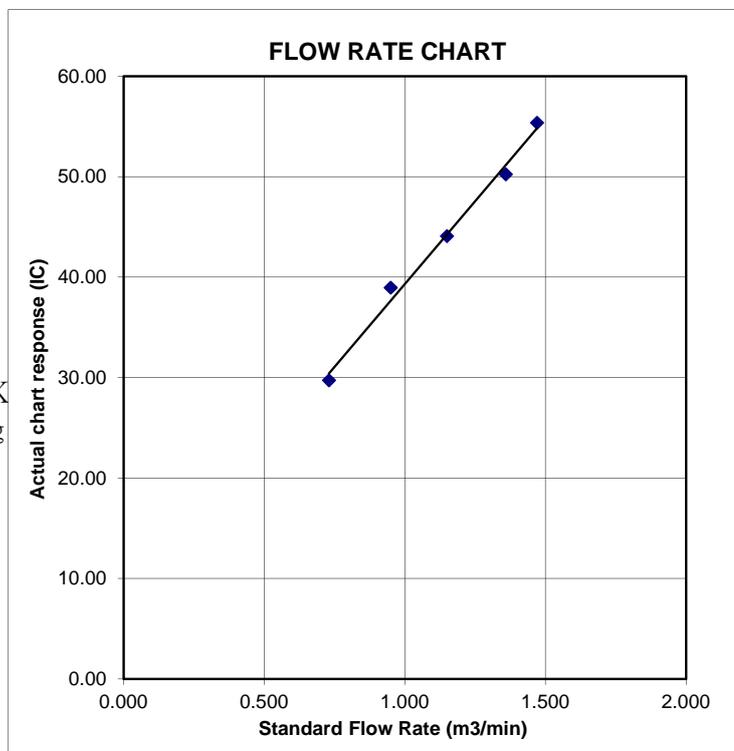
m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure



TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

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

Date of Calibration: 22/12/2014
 Next Calibration Date: 22/2/2015
 Technician: C Y Keung

CONDITIONS

Sea Level Pressure (hPa)	1024.3	Corrected Pressure (mm Hg)	768.225
Temperature (°C)	13.6	Temperature (K)	287

CALIBRATION ORIFICE

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

CALIBRATION

Plate No.	H2O (L) (in)	H2O (R) (in)	H2O (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION		
							Slope =	Intercept =	Corr. coeff. =
18	6.2	6.2	12.4	1.806	62	63.56	Slope = 33.3134 Intercept = 3.5911 Corr. coeff. = 0.9988		
13	4.8	4.8	9.6	1.590	56	57.41			
10	3.8	3.8	7.6	1.416	49	50.23			
7	2.2	2.2	4.4	1.079	38	38.96			
5	1.4	1.4	2.8	0.863	32	32.81			

Calculations :

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

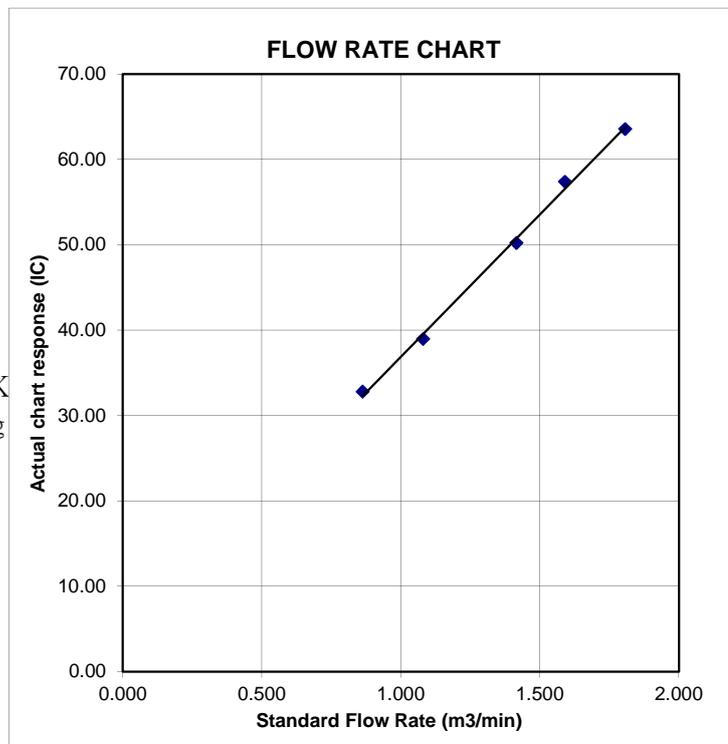
$$IC = I[\text{Sqrt}(Pa/Pstd)(Tstd/Ta)]$$

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: 22/12/2014
Location ID : AM9b	Next Calibration Date: 22/2/2015
	Technician: Keung Chi Young

CONDITIONS

Sea Level Pressure (hPa)	1024.3	Corrected Pressure (mm Hg)	768.225
Temperature (°C)	13.6	Temperature (K)	287

CALIBRATION ORIFICE

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

CALIBRATION

Plate No.	H2O (L) (in)	H2O (R) (in)	H2O (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	6.5	6.5	13.0	1.849	56	57.41	Slope = 31.9064 Intercept = -1.5182 Corr. coeff. = 0.9998
13	5	5	10.0	1.623	49	50.23	
10	3.7	3.7	7.4	1.397	42	43.06	
7	2.4	2.4	4.8	1.127	34	34.86	
5	1.5	1.5	3.0	0.893	26	26.66	

Calculations :

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

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

Qstd = standard flow rate

IC = corrected chart responses

I = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

T_a = actual temperature during calibration (deg K)

P_{std} = 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

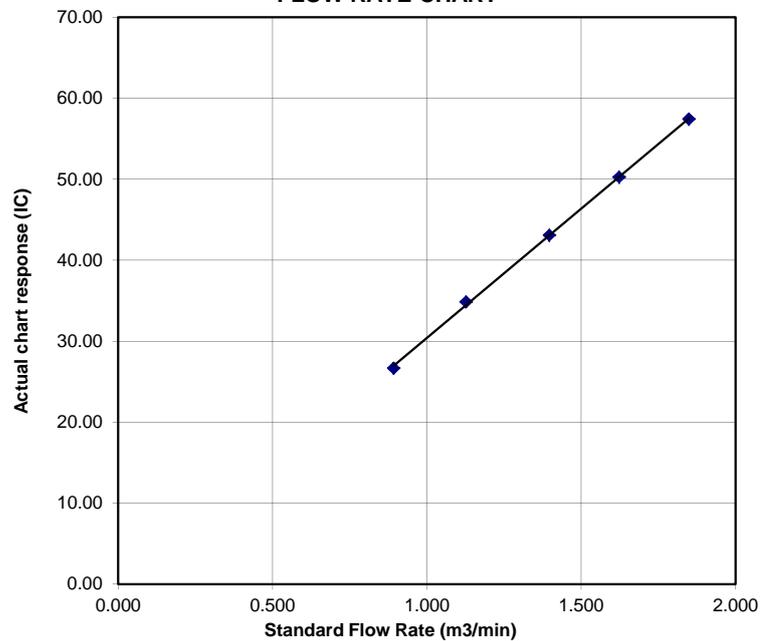
b = sampler intercept

I = chart response

T_{av} = daily average temperature

P_{av} = daily average pressure

FLOW RATE CHART





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

ORIFICE TRANSFER STANDARD CERTIFICATION WORKSHEET TE-5025A

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

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

DATA TABULATION

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

CALCULATIONS

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

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

For subsequent flow rate calculations:

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

CALIBRATION CERTIFICATE

Date: February 26, 2014

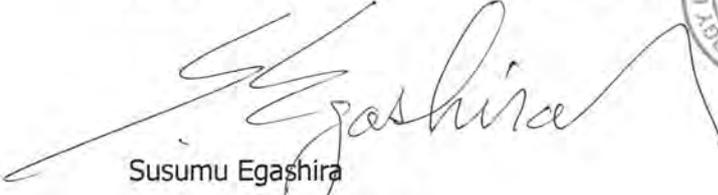
Equipment Name	:	Laser Dust Monitor, Model LD-3B
Code No.	:	080000-42
Quantity	:	1 unit
Serial No.	:	3Y6502
Sensitivity	:	0.001 mg/m ³
Sensitivity Adjustment	:	563 CPM
Scale Setting	:	February 25, 2014

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

Sincerely

SIBATA SCIENTIFIC TECHNOLOGY LTD.




Susumu Egashira
Overseas Sales Division

CALIBRATION CERTIFICATE

Date: May 30, 2014

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

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

Sincerely

SIBATA SCIENTIFIC TECHNOLOGY LTD.



Kentaro Togo

Overseas Sales Division

CALIBRATION CERTIFICATE

Date: May 30, 2014

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

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

Sincerely

SIBATA SCIENTIFIC TECHNOLOGY LTD.



Kentaro Togo
Overseas Sales Division

CALIBRATION CERTIFICATE

Date: May 30, 2014

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

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

Sincerely

SIBATA SCIENTIFIC TECHNOLOGY LTD.



Kentaro Togo

Overseas Sales Division

Equipment Calibration Record

Equipment Calibrated:

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

Standard Equipment:

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

Equipment Calibration Results:

Calibration Date: 4 January 2015

Hour	Time	Mean Temp °C	Mean Pressure (hPa)	Concentration in mg/m ³ (Standard Equipment)	Total Count (Calibrated Equipment)	Count/Minute (Total Count/60min)
1hr19min	10:00 ~ 11:19	17.3	1017.0	0.076	2637	33.3
2hr15min	11:25 ~ 13:40	17.3	1017.0	0.111	6771	50.2
2hr06min	15:40 ~ 17:46	17.3	1017.0	0.047	2331	18.5

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

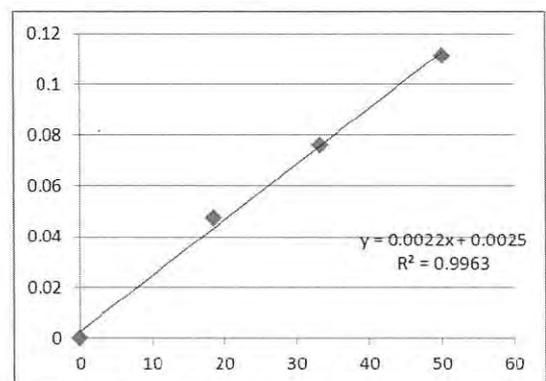
Sensitivity Adjustment Scale Setting (After Calibration) 592 (CPM)

Linear Regression of Y or X

Slope (K-factor): 0.0022

Correlation Coefficient 0.9963

Date of Issue 6 January 2015



Operator : Donald Kwok Signature : [Signature] Date : 6 January 2015

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

TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

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

CONDITIONS

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

CALIBRATION ORIFICE

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

CALIBRATION

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

Calculations :

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

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

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:

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

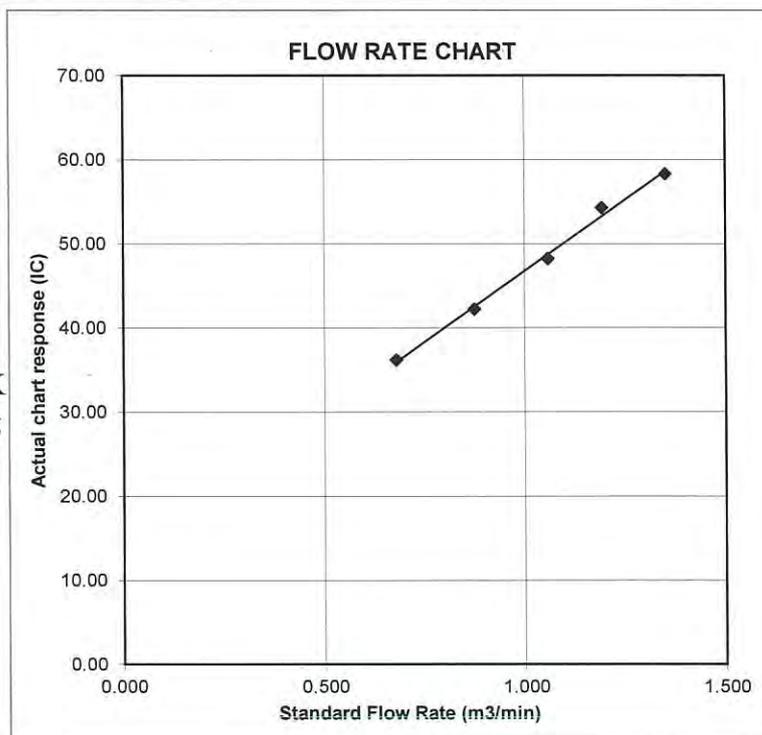
m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure



Equipment Calibration Record

Equipment Calibrated:

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

Standard Equipment:

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

Equipment Calibration Results:

Calibration Date: 4 January 2015

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

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

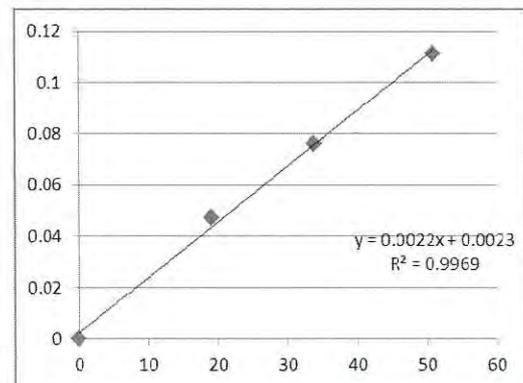
Sensitivity Adjustment Scale Setting (After Calibration) 588 (CPM)

Linear Regression of Y or X

Slope (K-factor): 0.0022

Correlation Coefficient 0.9969

Date of Issue 6 January 2015



Operator: Donald Kwok Signature: [Signature] Date: 6 January 2015

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

TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

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

Date of Calibration: 10-Nov-14
 Next Calibration Date: 10-Feb-15

CONDITIONS

Sea Level Pressure (hPa) 1017.3
 Temperature (°C) 23.3

Corrected Pressure (mm Hg) 762.975
 Temperature (K) 296

CALIBRATION ORIFICE

Make-> TISCH
 Model-> 5025A
 Calibration Date-> 7-Apr-14

Qstd Slope -> 2.00757
 Qstd Intercept -> -0.01628
 Expiry Date-> 7-Apr-15

CALIBRATION

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

Calculations :

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

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

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:

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

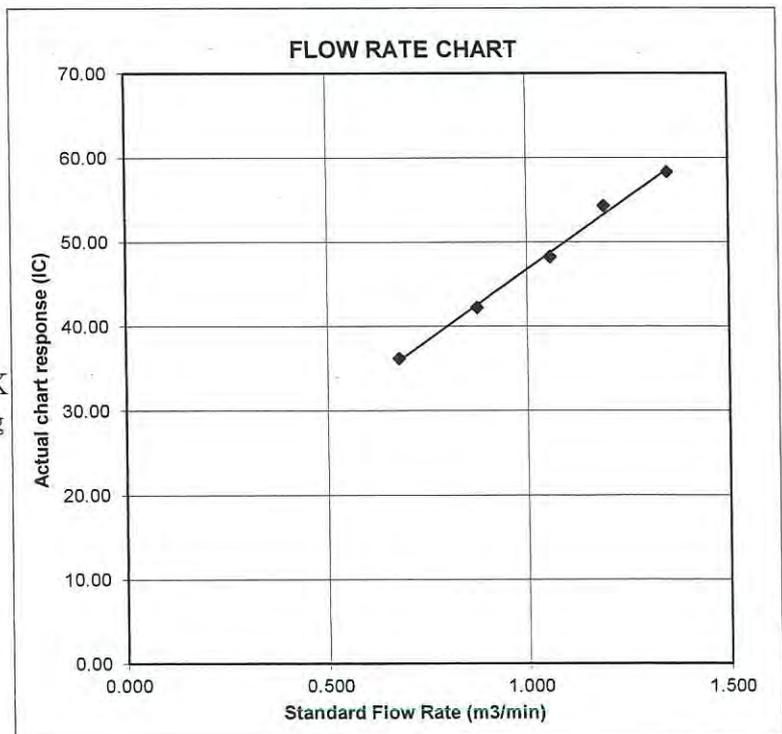
m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure





Certificate of Calibration

校正證書

Certificate No. : C142545
證書編號

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

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

TEST CONDITIONS / 測試條件

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

TEST SPECIFICATIONS / 測試規範

Calibration check

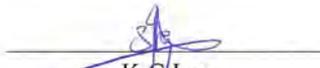
DATE OF TEST / 測試日期 : 26 April 2014

TEST RESULTS / 測試結果

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

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

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

Tested By : 
 測試 : K C Lee
 Project Engineer

Certified By : 
 核證 : K M Wu
 Engineer

Date of Issue : 29 April 2014
 簽發日期

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

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. : C142545

證書編號

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

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

4. Test procedure : MA100N.

5. Results :

5.1 Sound Level Accuracy

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

5.2 Frequency Accuracy

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

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

Note :

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



輝創工程有限公司

Sun Creation Engineering Limited

Calibration and Testing Laboratory

Certificate of Calibration 校正證書

Certificate No. : C142221

證書編號

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

Note :

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

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

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

Sun Creation Engineering Limited - Calibration & Testing Laboratory

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

輝創工程有限公司 - 校正及檢測實驗室

c/o 香港新界屯門興安里一號青山灣機樓四樓

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



Certificate of Calibration 校正證書

Certificate No. : C142223
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC14-0853) Date of Receipt / 收件日期 : 28 March 2014
Description / 儀器名稱 : Sound Level Meter (EQ011)
Manufacturer / 製造商 : Rion
Model No. / 型號 : NL-52
Serial No. / 編號 : 01121362
Supplied By / 委託者 : Action-United Environmental Services and Consulting
Unit A, 20/F., Gold King Industrial Building,
35-41 Tai Lin Pai Road, Kwai Chung, N.T.

TEST CONDITIONS / 測試條件

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

TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 8 April 2014

TEST RESULTS / 測試結果

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

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

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

Tested By : 
測試 : K C Lee
Project Engineer

Certified By : 
核證 : K M Wu
Engineer

Date of Issue : 10 April 2014
簽發日期

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

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

Certificate of Calibration

校正證書

Certificate No. : C142223
證書編號

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 :

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

5. Test procedure : MA101N.

6. Results :

- 6.1 Sound Pressure Level

- 6.1.1 Reference Sound Pressure Level

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
30 - 130	L _A	A	Fast	94.00	1	93.9	± 1.1

- 6.1.2 Linearity

UUT Setting				Applied Value		UUT Reading (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	
30 - 130	L _A	A	Fast	94.00	1	93.9 (Ref.)
				104.00		103.9
				114.00		113.9

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

- 6.2 Time Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
30 - 130	L _A	A	Fast	94.00	1	93.9	Ref.
			Slow			93.9	± 0.3

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

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而批准。

Sun Creation Engineering Limited - Calibration & Testing Laboratory

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

輝創工程有限公司 - 校正及檢測實驗室

c/o 香港新界屯門興安里一號青山灣機樓四樓

Tel/電話: 2927 2606

Fax/傳真: 2744 8986

E-mail/電郵: callab@suncreation.com

Website/網址: www.suncreation.com

Certificate of Calibration

校正證書

Certificate No. : C142223
證書編號

6.3 Frequency Weighting

6.3.1 A-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 130	L _A	A	Fast	94.00	63 Hz	67.7	-26.2 ± 1.5
					125 Hz	77.7	-16.1 ± 1.5
					250 Hz	85.2	-8.6 ± 1.4
					500 Hz	90.6	-3.2 ± 1.4
					1 kHz	93.9	Ref.
					2 kHz	95.1	+1.2 ± 1.6
					4 kHz	94.9	+1.0 ± 1.6
					8 kHz	92.8	-1.1 (+2.1 ; -3.1)
					12.5 kHz	89.4	-4.3 (+3.0 ; -6.0)

6.3.2 C-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 130	L _A	C	Fast	94.00	63 Hz	93.0	-0.8 ± 1.5
					125 Hz	93.7	-0.2 ± 1.5
					250 Hz	93.9	0.0 ± 1.4
					500 Hz	93.9	0.0 ± 1.4
					1 kHz	93.9	Ref.
					2 kHz	93.7	-0.2 ± 1.6
					4 kHz	93.1	-0.8 ± 1.6
					8 kHz	90.9	-3.0 (+2.1 ; -3.1)
					12.5 kHz	87.5	-6.2 (+3.0 ; -6.0)

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

- Mfr's Spec. : IEC 61672 Class 1

- Uncertainties of Applied Value :

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

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

Note :

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

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

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



輝創工程有限公司

Sun Creation Engineering Limited

Calibration and Testing Laboratory

Certificate of Calibration

校正證書

Certificate No. : C142224

證書編號

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

Date of Receipt / 收件日期 : 28 March 2014

Description / 儀器名稱 : Sound Level Meter (EQ013)

Manufacturer / 製造商 : Rion

Model No. / 型號 : NL-52

Serial No. / 編號 : 00921191

Supplied By / 委託者 : Action-United Environmental Services and Consulting
Unit A, 20/F., Gold King Industrial Building,
35-41 Tai Lin Pai Road, Kwai Chung, N.T.

TEST CONDITIONS / 測試條件

Temperature / 溫度 : (23 ± 2)°C

Relative Humidity / 相對濕度 : (55 ± 20)%

Line Voltage / 電壓 : ---

TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 8 April 2014

TEST RESULTS / 測試結果

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

All results are within manufacturer's specification.

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

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

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

Tested By

測試


K C Lee
Project Engineer

Certified By

核證


K M Wu
Engineer

Date of Issue

簽發日期

:

10 April 2014

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。

Sun Creation Engineering Limited - Calibration & Testing Laboratory

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

輝創工程有限公司 - 校正及檢測實驗室

c/o 香港新界屯門興安里一號青山灣機樓四樓

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

Certificate of Calibration

校正證書

Certificate No. : C142224

證書編號

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

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

5. Test procedure : MA101N.

6. Results :

- 6.1 Sound Pressure Level

- 6.1.1 Reference Sound Pressure Level

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
30 - 130	L _A	A	Fast	94.00	1	93.7	± 1.1

- 6.1.2 Linearity

UUT Setting				Applied Value		UUT Reading (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	
30 - 130	L _A	A	Fast	94.00	1	93.7 (Ref.)
				104.00		103.7
				114.00		113.7

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

- 6.2 Time Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
30 - 130	L _A	A	Fast	94.00	1	93.7	Ref.
			Slow			93.7	± 0.3

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. : C142224

證書編號

6.3 Frequency Weighting

6.3.1 A-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 130	L _A	A	Fast	94.00	63 Hz	67.4	-26.2 ± 1.5
					125 Hz	77.5	-16.1 ± 1.5
					250 Hz	85.0	-8.6 ± 1.4
					500 Hz	90.4	-3.2 ± 1.4
					1 kHz	93.7	Ref.
					2 kHz	94.9	+1.2 ± 1.6
					4 kHz	94.7	+1.0 ± 1.6
					8 kHz	92.6	-1.1 (+2.1 ; -3.1)
					12.5 kHz	89.3	-4.3 (+3.0 ; -6.0)

6.3.2 C-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 130	L _A	C	Fast	94.00	63 Hz	92.8	-0.8 ± 1.5
					125 Hz	93.5	-0.2 ± 1.5
					250 Hz	93.7	0.0 ± 1.4
					500 Hz	93.7	0.0 ± 1.4
					1 kHz	93.7	Ref.
					2 kHz	93.5	-0.2 ± 1.6
					4 kHz	92.9	-0.8 ± 1.6
					8 kHz	90.7	-3.0 (+2.1 ; -3.1)
					12.5 kHz	87.3	-6.2 (+3.0 ; -6.0)

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

- Mfr's Spec. : IEC 61672 Class 1

- Uncertainties of Applied Value :

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

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

Note :

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

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。

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

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

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

Model : N L - 5 2

Serial No. : 00142580

Microphone No. : 06011

Preamplifier No. : 32608

Condition : Temperature 25 °C

Humidity 30 %RH

Date : March, 12, 2014

Signature : *Y. Narayana*

Pass

1. Frequency weightings (Fig. 1)

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

2. Level linearity error (dB)

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

Frequency weighting : A

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

3. Toneburst response (Time weighted sound level)

Input signal level : 127 dB

Toneburst : Frequency : 4 kHz, duration : 0.25 ms

Frequency weighting : A, Time-weighting : F

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

4. Time weighting I (impulse)

Input signal level : 120 dB

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

Frequency weighting : A

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

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

5. Peak sound level (dB)

Frequency weighting : C

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

6. Response to repeated toneburst

Input signal level : 130.0 dB + 8 dB

Frequency weighting : A, Time-weighting : S

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

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

7. Inherent noise level (dB)

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

8. Instrumental error

84.0 dB ± 0.7 dB

0.0 dB

Applicable standards

JIS C 1509-1 : 2005 Class 1

IEC 61672-1 : 2002 Class 1

ANSI S1.4-1983 Type 1

ANSI S1.43-1997 Type 1

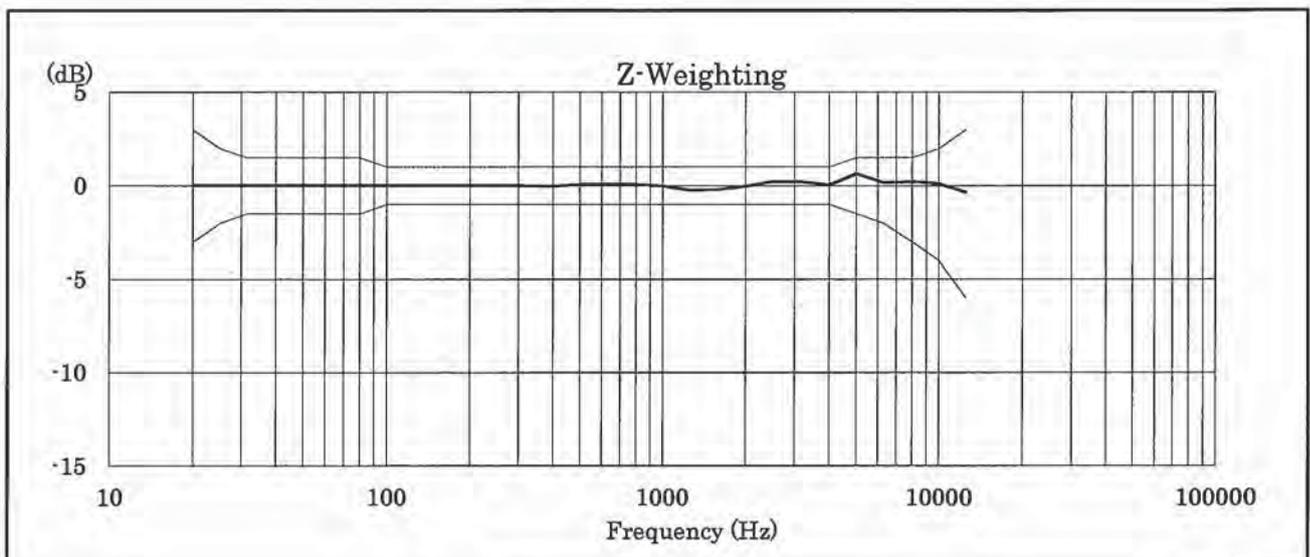
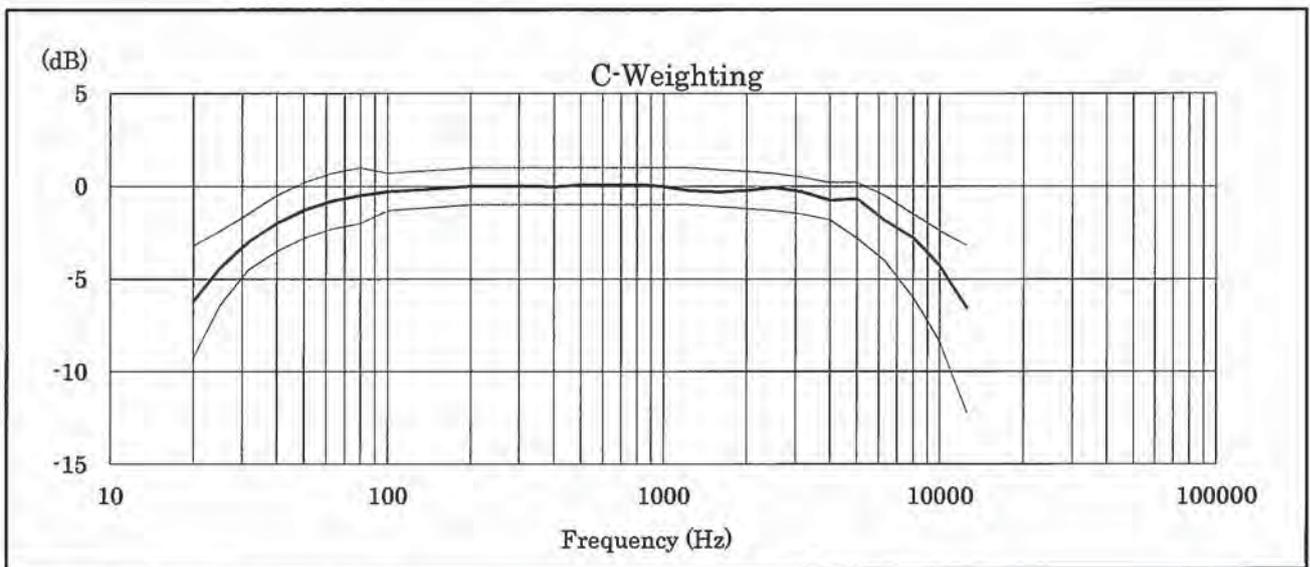
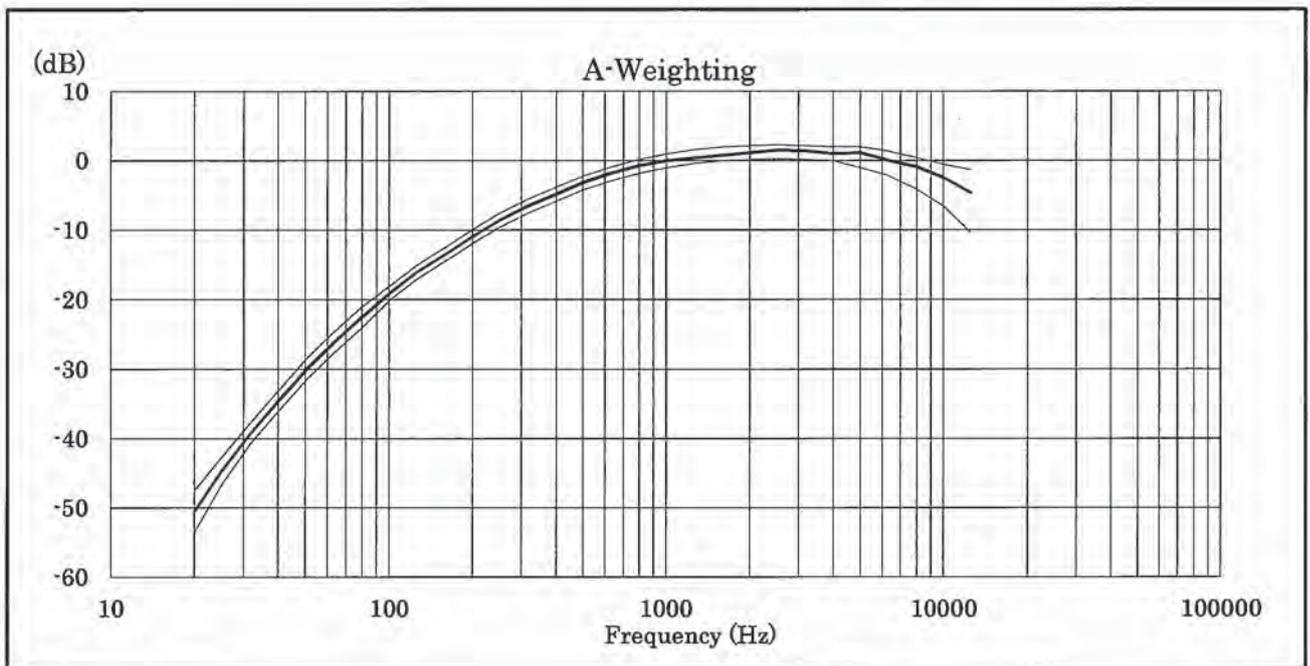
CE marking (EMC Directive 2004/108/EC, Low Voltage Directive 2006/95/EC)

WEEE Directive (2002/96/EC)

Chinese RoHS



Relative free field frequency response





輝創工程有限公司

Sun Creation Engineering Limited

Calibration and Testing Laboratory

Certificate of Calibration

校正證書

Certificate No. : C142547

證書編號

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

Date of Receipt / 收件日期 : 14 April 2014

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

Manufacturer / 製造商 : Rion

Model No. / 型號 : NL-31

Serial No. / 編號 : 00410221

Supplied By / 委託者 : Action-United Environmental Services and Consulting
Unit A, 20/F., Gold King Industrial Building,
35-41 Tai Lin Pai Road, Kwai Chung, N.T.

TEST CONDITIONS / 測試條件

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

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

Line Voltage / 電壓 : ---

TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 26 April 2014

TEST RESULTS / 測試結果

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

All results are within manufacturer's specification.

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

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

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

Tested By :
測試


K C Lee
Project Engineer

Certified By :
核證


K M Wu
Engineer

Date of Issue : 29 April 2014
簽發日期

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

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。

Sun Creation Engineering Limited - Calibration & Testing Laboratory

e/n 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

u/v 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. : C142547

證書編號

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

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

- Test procedure : MA101N.

- Results :

6.1 Sound Pressure Level

6.1.1 Reference Sound Pressure Level

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
30 - 120	L _A	A	Fast	94.00	1	93.8	± 1.1

6.1.2 Linearity

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

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

6.2 Time Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
30 - 120	L _A	A	Fast	94.00	1	93.8	Ref.
			Slow			93.8	± 0.3

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. : C142547

證書編號

6.3 Frequency Weighting

6.3.1 A-Weighting

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

6.3.2 C-Weighting

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

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



輝創工程有限公司

Sun Creation Engineering Limited

Calibration and Testing Laboratory

Certificate of Calibration

校正證書

Certificate No. : C142547

證書編號

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

- Mfr's Spec. : IEC 61672 Class 1

- Uncertainties of Applied Value :

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

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

Note :

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

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

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

Sun Creation Engineering Limited – Calibration & Testing Laboratory

e/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

e/o 香港新界屯門興安里一號青洲灣機樓四樓

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



輝創工程有限公司

Sun Creation Engineering Limited

Calibration and Testing Laboratory

Certificate of Calibration 校正證書

Certificate No. : C142873
證書編號

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

Date of Receipt / 收件日期 : 8 May 2014

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

TEST CONDITIONS / 測試條件

Temperature / 溫度 : (23 ± 2)°C

Relative Humidity / 相對濕度 : (55 ± 20)%

Line Voltage / 電壓 : ---

TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 13 May 2014

TEST RESULTS / 測試結果

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

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

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

Tested By
測試


K C Lee
Project Engineer

Certified By
核證


K M Wu
Engineer

Date of Issue
簽發日期

15 May 2014

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。

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. : C142873

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	C140016
CL281	Multifunction Acoustic Calibrator	DC130171

- 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 _{AFF}	A	F	94.00	1	94.2

6.1.1.2 After Self-calibration

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

6.1.2 Linearity

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

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

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。

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: callab@suncreation.com

Website/網址: www.suncreation.com

Certificate of Calibration

校正證書

Certificate No. : C142873

證書編號

6.2 Time Weighting

6.2.1 Continuous Signal

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

6.2.2 Tone Burst Signal (2 kHz)

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

6.3 Frequency Weighting

6.3.1 A-Weighting

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

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

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

Certificate of Calibration

校正證書

Certificate No. : C142873
證書編號

6.3.2 C-Weighting

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

6.4 Time Averaging

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

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

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

- Uncertainties of Applied Value :

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

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

Note :

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

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

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

Sun Creation Engineering Limited - Calibration & Testing Laboratory

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

輝創工程有限公司 - 校正及檢測實驗室

Room 401, New World Industrial Building, 401, Tsing Shan Wai, Tuen Mun, New Territories, Hong Kong

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



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

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

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

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

COMMENTS

The performance of the equipment stated in this report is checked with independent reference material and results compared against a calibrated secondary source.

The "Tolerance Limit" quoted is the acceptance criteria applicable for similar equipment used by the ALS Hong Kong laboratory or quoted from relevant international standards.

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

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

NOTES

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


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

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

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



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

Date of next Calibration: 07 January, 2015

Parameters:

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

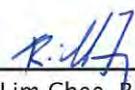
Expected Reading (mg/L)	Displayed Reading (mg/L)	Tolerance (mg/L)
3.00	2.99	-0.01
5.02	4.93	-0.09
8.05	8.01	-0.04
Tolerance Limit (mg/L)		±0.20

Temperature

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

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

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


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



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

REPORT OF EQUIPMENT PERFORMANCE CHECK / CALIBRATION

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

WORK ORDER: HK1500371
LABORATORY: HONG KONG
DATE RECEIVED: 06/01/2015
DATE OF ISSUE: 14/01/2015

COMMENTS

The performance of the equipment stated in this report is checked with independent reference material and results compared against a calibrated secondary source.

The "Tolerance Limit" quoted is the acceptance criteria applicable for similar equipment used by the ALS Hong Kong laboratory or quoted from relevant international standards.

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

Scope of Test: Dissolved Oxygen and Temperature
Description: Multifunctional Meter
Brand Name: YSI
Model No.: Pro 20
Serial No.: 12C100570
Equipment No.: --
Date of Calibration: 06 January, 2015

NOTES

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


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

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

Work Order: HK1500371
Date of Issue: 14/01/2015
Client: ACTION UNITED ENVIRO SERVICES



Description: Multifunctional Meter
Brand Name: YSI
Model No.: Pro 20
Serial No.: 12C100570
Equipment No.: --
Date of Calibration: 06 January, 2015

Date of next Calibration: 06 April, 2015

Parameters:

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

Expected Reading (mg/L)	Displayed Reading (mg/L)	Tolerance (mg/L)
4.58	4.46	-0.12
6.52	6.56	+0.04
8.72	8.74	+0.02
	Tolerance Limit (mg/L)	±0.20

Temperature

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

Reading of Ref. thermometer (°C)	Displayed Reading (°C)	Tolerance (°C)
11.0	11.3	+0.3
20.0	20.6	+0.6
36.0	35.7	-0.3
	Tolerance Limit (°C)	±2.0

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


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



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

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

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

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

COMMENTS

The performance of the equipment stated in this report is checked with independent reference material and results compared against a calibrated secondary source.

The "Tolerance Limit" quoted is the acceptance criteria applicable for similar equipment used by the ALS Hong Kong laboratory or quoted from relevant international standards.

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

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

NOTES

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


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

REPORT OF EQUIPMENT PERFORMANCE CHECK / CALIBRATION



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

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

Date of next Calibration: 24 January, 2015

Parameters:

Turbidity

Method Ref: APHA 21st Ed. 2130B

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

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

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

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



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

REPORT OF EQUIPMENT PERFORMANCE CHECK / CALIBRATION

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

WORK ORDER: HK1500369
LABORATORY: HONG KONG
DATE RECEIVED: 06/01/2015
DATE OF ISSUE: 13/01/2015

COMMENTS

The performance of the equipment stated in this report is checked with independent reference material and results compared against a calibrated secondary source.

The "Tolerance Limit" quoted is the acceptance criteria applicable for similar equipment used by the ALS Hong Kong laboratory or quoted from relevant international standards.

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

Scope of Test: Turbidity
Equipment Type: Turbidimeter
Brand Name: HANNA
Model No.: 2100Q
Serial No.: 12060C018266
Equipment No.: --
Date of Calibration: 13 January, 2015

NOTES

This is the Final Report and supersedes any preliminary report with this batch number.

Results apply to sample(s) as submitted. All pages of this report have been checked and approved for release.


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

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION



Work Order: HK1500369
Date of Issue: 13/01/2015
Client: ACTION UNITED ENVIRO SERVICES

Equipment Type: Turbidimeter
Brand Name: HANNA
Model No.: 2100Q
Serial No.: 12060C018266
Equipment No.: --
Date of Calibration: 13 January, 2015

Date of next Calibration: 13 April, 2015

Parameters:

Turbidity

Method Ref: APHA 21st Ed. 2130B

Expected Reading (NTU)	Displayed Reading (NTU)	Tolerance (%)
0	0.13	--
4	3.98	-0.5
40	41.6	+4.0
80	82.3	+2.9
400	393	-1.8
800	797	-0.4
	Tolerance Limit (%)	±10.0

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

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



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

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

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

WORK ORDER: HK1434242
LABORATORY: HONG KONG
DATE RECEIVED: 21/10/2014
DATE OF ISSUE: 27/10/2014

COMMENTS

The performance of the equipment stated in this report is checked with independent reference material and results compared against a calibrated secondary source.

The "Tolerance Limit" quoted is the acceptance criteria applicable for similar equipment used by the ALS Hong Kong laboratory or quoted from relevant international standards.

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

Scope of Test: pH
Description: pH Meter
Brand Name: --
Model No.: 8685
Serial No.: 1067687
Equipment No.: --
Date of Calibration: 24 October, 2014

NOTES

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


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

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

Work Order: HK1434242
Date of Issue: 27/10/2014
Client: ACTION UNITED ENVIRO SERVICES



Description: pH Meter
Brand Name: --
Model No.: 8685
Serial No.: 1067687
Equipment No.: --
Date of Calibration: 24 October, 2014

Date of next Calibration: 24 January, 2015

Parameters:

pH Value

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

Expected Reading (pH Unit)	Displayed Reading (pH Unit)	Tolerance (pH unit)
4.0	4.0	0.00
7.0	6.9	-0.10
10.0	9.9	-0.10
	Tolerance Limit (pH Unit)	±0.20

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

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

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

Appendix G

Event and Action Plan

Event and Action Plan for Air Quality

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

Event and Action Plan for Construction Noise

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

Event and Action Plan for Water Quality

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

Appendix H

Impact Monitoring Schedule

Impact Monitoring Schedule for the Reporting Period – January 2015

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

	Monitoring Day
	Sunday or Public Holiday

Monitoring Location

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

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

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

Impact Monitoring Schedule for next Reporting Period – February 2015

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

	Monitoring Day
	Sunday or Public Holiday

Monitoring Location

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

Appendix I

Database of Monitoring Result

24-hour TSP Monitoring Data

DATE	SAMPLE NUMBER	ELAPSED TIME			CHART READING			AVG TEMP (°C)	AVG AIR PRESS (hPa)	STANDARD FLOW RATE (m ³ /min)	AIR VOLUME (std m ³)	FILTER WEIGHT (g)		DUST WEIGHT COLLECTED (g)	24-HR TSP (µg/m ³)
		INITIAL	FINAL	(min)	MIN	MAX	AVG					INITIAL	FINAL		
AM1a - Garden Farm, Tsung Yuen Ha Village															
5-Jan-15	27599	9412.82	9436.82	1440.00	44	44	44.0	19	1014.5	1.55	2230	2.7688	2.8619	0.0931	42
10-Jan-15	208918	9436.82	9460.82	1440.00	42	43	42.5	19.2	1023.4	1.51	2168	2.7649	2.9548	0.1899	88
16-Jan-15	208943	9460.82	9484.82	1440.00	42	43	42.5	16.7	1022.4	1.51	2176	2.7451	2.9213	0.1762	81
22-Jan-15	208954	9484.82	9508.82	1440.00	43	45	44.0	17.4	1021.5	1.56	2243	2.8109	3.0019	0.1910	85
28-Jan-15	27637	9508.82	9532.82	1440.00	43	44	43.5	16.9	1018.8	1.54	2218	2.8096	2.9106	0.1010	46
AM2 - Village House near Lin Ma Hang Road															
5-Jan-15	27601	4896.78	4920.70	1435.20	33	35	34.0	19	1014.5	1.16	1660	2.7509	2.8636	0.1127	68
10-Jan-15	208917	4920.70	4944.61	1434.60	34	35	34.5	19.2	1023.4	1.18	1686	2.7471	2.9822	0.2351	139
16-Jan-15	208942	4944.61	4968.36	1425.00	33	34	33.5	16.7	1022.4	1.15	1638	2.7416	2.9614	0.2198	134
22-Jan-15	27615	4973.11	4996.96	1431.00	38	39	38.5	17.4	1021.5	1.30	1856	2.7486	3.1278	0.3792	204
28-Jan-15	27638	4996.96	5020.81	1431.00	34	36	35.0	16.9	1018.8	1.19	1706	2.8091	2.9620	0.1529	90
AM3 - Ta Kwu Ling Fire Service Station of Ta Kwu Ling Village															
5-Jan-15	27598	5942.14	5966.14	1440.00	39	39	39.0	19	1014.5	1.27	1831	2.7578	2.8613	0.1035	57
10-Jan-15	208922	5966.14	5990.14	1440.00	40	40	40.0	19.2	1023.4	1.31	1883	2.7670	2.9893	0.2223	118
16-Jan-15	208941	5990.14	6014.14	1440.00	42	44	43.0	16.7	1022.4	1.41	2026	2.7538	3.0343	0.2805	138
22-Jan-15	27616	6014.14	6038.14	1440.00	42	44	43.0	17.4	1021.5	1.40	2023	2.7386	2.9167	0.1781	88
28-Jan-15	27639	6038.14	6062.14	1440.00	39	42	40.5	16.9	1018.8	1.33	1909	2.8116	2.8790	0.0674	35
AM7b - Loi Tung Village House															
5-Jan-15	27581	13476.67	13500.67	1440.00	34	40	37.0	19	1014.5	0.94	1356	2.7708	2.8740	0.1032	76
10-Jan-15	27600	13500.67	13524.67	1440.00	48	50	49.0	16.2	1023.4	1.32	1905	2.7505	3.0146	0.2641	139
16-Jan-15	208939	13524.68	13548.68	1440.00	38	41	39.5	16.7	1022.4	1.03	1480	2.7544	2.8668	0.1124	76
22-Jan-15	27617	13548.68	13572.68	1440.00	38	42	40.0	17.4	1021.5	1.04	1499	2.7405	2.8844	0.1439	96
28-Jan-15	27640	13572.68	13596.68	1440.00	34	36	35.0	16.8	1018.8	0.89	1277	2.8076	2.9337	0.1261	99
AM8 - Po Kat Tsai Village No. 4															
5-Jan-15	27596	7347.06	7371.06	1440.00	37	38	37.5	19	1014.5	1.03	1483	2.7539	2.8281	0.0742	50
10-Jan-15	27614	7371.06	7395.06	1440.00	38	41	39.5	19.2	1023.4	1.10	1578	2.7439	2.8575	0.1136	72
16-Jan-15	208944	7395.06	7419.06	1440.00	39	40	39.5	16.7	1022.4	1.10	1584	2.7406	2.8792	0.1386	87
22-Jan-15	27618	7419.06	7443.06	1440.00	40	40	40.0	17.4	1021.5	1.11	1603	2.7351	2.8714	0.1363	85
28-Jan-15	27641	7443.06	7467.06	1440.00	40	41	40.5	16.9	1018.8	1.13	1624	2.8129	2.8707	0.0578	36
AM9b - Nam Wa Po Village House No. 80															
5-Jan-15	27597	14906.57	14930.57	1440.00	32	33	32.5	19	1014.5	1.08	1551	2.7747	2.8730	0.0983	63
10-Jan-15	27603	14930.57	14954.57	1440.00	34	35	34.5	19.2	1023.4	1.14	1649	2.7563	2.9003	0.1440	87
16-Jan-15	208938	14954.57	14978.57	1440.00	34	34	34.0	16.7	1022.4	1.13	1632	2.7656	2.8987	0.1331	82
22-Jan-15	27620	14978.57	15002.57	1440.00	34	35	34.5	17.4	1021.5	1.15	1652	2.7857	2.9143	0.1286	78
28-Jan-15	27642	15002.56	15026.56	1440.00	34	34	34.0	16.9	1018.8	1.13	1628	2.8147	2.9121	0.0974	60

Construction Noise Monitoring Results, dB(A)

Date	Start Time	1 st Leq _{5min}	L10	L90	2 nd Leq _{5min}	L10	L90	3 rd Leq _{5min}	L10	L90	4 th Leq _{5min}	L10	L90	5 th Leq _{5min}	L10	L90	6 th Leq _{5min}	L10	L90	Leq30	façade correction
NM1 - Tsung Yuen Ha Village House No. 63																					
3-Jan-15	16:24	49.9	51.8	47.6	55.7	58.8	48.2	50.0	52.5	47.0	49.2	51.2	46.5	48.4	50.5	46.0	50.0	51.2	45.6	51	NA
9-Jan-15	14:37	53.3	55.0	51.1	53.4	55.6	51.0	51.3	52.7	49.9	52.3	54.4	49.4	50.0	51.8	47.4	49.4	51.2	47.2	52	NA
15-Jan-15	10:58	53.7	53.5	49.4	51.0	52.7	48.4	51.8	53.8	48.7	50.2	51.4	48.3	51.0	53.6	48.5	51.8	54.2	48.8	52	NA
21-Jan-15	11:34	46.9	49.7	43.1	43.9	45.0	42.7	44.5	46.2	42.4	42.6	43.7	41.1	43.9	45.1	42.2	43.9	45.5	42.2	44	NA
27-Jan-15	11:28	60.0	49.1	44.7	45.2	46.7	43.0	46.0	48.5	42.2	61.8	55.3	42.3	42.3	44.5	39.5	42.0	44.0	39.4	56	NA
NM2 - Village House near Lin Ma Hang Road																					
3-Jan-15	17:18	60.6	61.6	49.8	58.9	60.5	48.6	57.1	59.9	49.1	55.5	58.8	48.0	57.4	59.1	49.2	57.1	57.0	48.4	58	NA
9-Jan-15	15:23	63.0	67.7	56.2	61.7	63.8	56.2	60.5	64.9	56.0	62.2	66.3	55.9	57.9	57.7	55.4	62.1	67.9	48.4	62	NA
15-Jan-15	11:40	59.5	63.6	46.5	60.7	61.2	46.9	56.2	54.3	45.4	56.3	55.8	44.7	60.5	62.8	47.4	57.7	60.9	48.8	59	NA
21-Jan-15	10:58	58.3	61.5	46.4	59.7	62.2	48.5	66.5	72.3	50.9	61.6	64.7	47.9	56.9	55.9	46.7	57.4	61.0	51.5	62	NA
27-Jan-15	10:25	58.7	62.0	48.0	56.3	59.0	47.2	60.0	64.8	49.2	60.1	63.7	49.6	55.0	58.1	48.5	59.0	59.7	56.5	59	NA
NM5 - Ping Yeung Village House (façade facing northeast)																					
5-Jan-15	11:19	54.5	58.5	46.7	53.1	56.1	44.5	53.7	56.9	46.3	53.1	56.8	44.6	53.6	56.8	44.2	52.1	56.2	53.3	53	NA
10-Jan-15	13:29	59.5	57.5	48.7	54.9	58.4	48.7	53.9	56.4	49.6	54.2	56.9	48.3	54.8	58.0	47.7	53.1	56.2	48.7	56	NA
16-Jan-15	9:45	63.4	66.0	51.9	63.1	66.7	52.5	62.9	66.5	51.0	62.1	65.4	54.8	62.3	65.8	52.0	62.9	66.2	54.8	63	NA
22-Jan-15	11:14	52.5	56.2	43.9	53.2	56.7	45.3	53.5	56.1	45.4	52.7	55.9	43.8	51.8	56.1	43.4	52.2	56.1	40.9	53	NA
28-Jan-15	11:28	53.8	56.4	48.1	54.0	56.7	48.0	56.0	59.3	48.2	52.3	55.9	43.4	52.2	56.4	43.6	53.3	57.2	44.5	54	NA
NM6 - Tai Tong Wu Village House 2																					
5-Jan-15	13:37	59.7	62.7	51.7	60.3	63.2	49.5	58.1	61.8	51.4	59.3	62.8	48.6	59.0	61.8	50.1	59.9	62.9	49.5	59	NA
10-Jan-15	11:24	60.3	62.9	53.8	60.4	63.3	53.6	60.3	63.8	52.4	59.9	63.5	51.0	60.2	63.5	51.0	59.4	62.7	50.3	60	NA
16-Jan-15	10:29	53.1	56.2	46.0	59.1	64.3	47.3	55.4	58.9	48.0	53.0	55.7	47.0	52.9	56.1	44.8	52.5	55.5	47.1	55	NA
22-Jan-15	10:27	59.5	63.0	47.2	60.1	63.4	52.4	58.3	61.9	48.4	61.1	64.7	52.5	62.1	65.7	46.1	59.7	63.0	44.3	60	NA
28-Jan-15	10:44	63.2	66.5	53.8	62.8	66.7	52.4	61.6	65.7	47.9	62.3	66.4	50.9	63.2	66.5	54.6	63.1	66.8	50.9	63	NA
NM7 - Po Kat Tsai Village																					
5-Jan-15	17:50	54.7	57.0	52.4	59.5	60.8	52.2	59.7	62.7	53.5	56.8	58.6	54.0	56.6	58.8	53.3	56.1	58.4	51.9	58	NA
10-Jan-15	10:35	60.0	59.9	52.2	62.7	54.5	51.2	64.3	58.6	50.8	54.5	55.6	52.6	52.9	54.7	51.0	58.1	55.9	50.7	60	NA
16-Jan-15	15:15	53.0	54.6	51.5	56.7	56.1	51.4	54.4	55.7	52.4	60.4	60.6	51.6	60.7	61.0	51.4	61.9	57.8	52.7	59	NA
22-Jan-15	9:35	63.3	62.6	57.0	58.8	59.1	55.0	59.3	59.5	55.6	57.0	58.1	54.1	56.7	57.4	54.6	56.2	57.5	53.1	59	NA
28-Jan-15	10:02	73.2	77.3	56.0	74.0	77.6	56.3	71.8	75.3	55.4	70.3	71.6	55.9	70.4	75.9	56.6	72.6	75.7	56.5	72	NA
NM8 - Village House, Tong Hang																					
3-Jan-15	13:40	58.1	58.7	52.7	55.9	57.2	53.1	55.3	56.7	52.9	55.9	58.1	53.2	59.2	61.4	52.9	60.8	63.2	54.0	58	NA
9-Jan-15	11:23	61.5	64.0	49.5	62.1	64.0	53.5	70.6	71.0	55.0	65.7	70.5	54.5	57.0	59.0	46.5	58.1	60.5	48.5	65	NA
15-Jan-15	11:21	58.1	62.0	49.5	54.9	55.0	50.5	57.1	60.5	49.5	57.3	62.0	50.5	58.0	63.0	48.5	57.1	62.0	48.5	57	NA
21-Jan-15	10:18	55.9	58.2	52.1	56.2	59.5	52.2	56.9	60.1	52.4	58.1	58.7	52.7	55.9	57.2	53.1	55.9	58.1	53.2	57	NA
27-Jan-15	15:12	61.5	61.6	51.5	57.0	60.6	52.5	56.2	58.9	52.9	56.2	59.3	52.2	56.0	57.3	51.3	55.1	57.1	51.9	58	NA
NM9 - Village House, Kiu Tau Village																					
3-Jan-15	13:13	54.4	56.7	49.2	54.1	57.1	49.6	55.7	58.8	49.5	55.5	59.1	49.4	55.1	56.1	49.7	52.8	55.5	48.9	55	NA
9-Jan-15	10:44	64.2	68.5	49.0	57.0	60.5	48.0	57.3	61.0	48.5	54.1	57.5	47.0	57.0	61.5	47.5	53.7	58.0	46.5	59	NA

Date	Start Time	1 st Leq _{5min}	L10	L90	2 nd Leq _{5min}	L10	L90	3 rd Leq _{5min}	L10	L90	4 th Leq _{5min}	L10	L90	5 th Leq _{5min}	L10	L90	6 th Leq _{5min}	L10	L90	Leq30	façade correction
15-Jan-15	10:43	75.5	69.0	50.0	55.3	8.0	49.0	54.7	9.0	49.5	74.3	62.5	49.5	62.1	65.5	48.5	59.9	64.0	49.5	70	NA
21-Jan-15	10:56	55.9	59.7	48.9	58.5	59.3	51.6	54.9	57.0	51.8	55.6	58.1	52.5	54.6	57.4	50.5	55.8	58.0	52.0	56	NA
27-Jan-15	15:46	56.1	58.7	50.4	55.5	57.9	50.3	55.5	58.1	50.4	55.3	57.7	51.3	55.7	59.5	49.4	56.8	58.0	49.3	56	NA
NM10 - Nam Wa Po Village House No. 80																					
3-Jan-15	14:45	62.0	64.1	57.2	61.2	64.3	57.1	60.5	62.9	56.6	62.0	64.7	57.9	60.3	61.7	58.3	61.1	62.7	59.2	61	64
9-Jan-15	9:05	66.2	67.0	64.5	69.6	72.5	64.5	69.7	72.5	64.5	69.5	72.0	65.0	68.3	71.5	64.5	68.3	71.0	65.0	69	72
15-Jan-15	10:04	59.9	61.5	57.5	62.2	64.0	59.0	61.8	63.0	59.0	60.7	61.5	57.5	66.3	69.5	62.0	67.0	69.0	62.5	64	67
21-Jan-15	13:24	64.1	65.8	61.7	65.0	66.8	61.3	64.8	66.0	62.6	64.6	65.7	63.4	64.2	65.0	63.2	65.1	66.3	63.7	65	68
27-Jan-15	13:03	61.4	63.2	57.0	63.4	66.6	57.3	63	66.9	57.4	60.6	62.7	57.5	64	67	58.8	61.3	64.2	56.9	62	65

Water Quality Monitoring Data for Contract 5

Date	3-Jan-15													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM1-C	16:30	0.44	19.9	19.9	8.91	8.9	97.9	97.2	7.2	7.3	8.6	8.6	2	2.0
			19.9		8.85		96.4		7.4		8.6		2	
WM1	16:59	0.47	21.1	21.1	5.65	5.7	63.5	63.9	5.4	5.5	8.3	8.3	4	3.5
			21.1		5.69		64.2		5.6		8.3		3	

Date	5-Jan-15													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM1-C	17:00	0.41	22.4	22.4	8.27	8.2	95.7	94.5	6.5	6.5	8.4	8.4	4	4.5
			22.4		8.06		93.2		6.4		8.4		5	
WM1	17:20	0.44	23.2	23.2	4.68	4.6	58.2	57.1	13.6	13.9	8.1	8.1	12	13.0
			23.1		4.49		55.9		14.1		8.1		14	

Date	7-Jan-15													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM1-C	11:06	0.41	22	22.0	6.14	6.1	70.2	70.2	11.3	11.2	8.7	8.7	10	10.5
			22		6.12		70.2		11.0		8.7		11	
WM1	11:38	0.43	23.6	23.6	4.88	4.9	57.5	57.9	12.2	12.4	8.3	8.3	8	8.5
			23.5		4.97		58.3		12.5		8.3		9	

Date	9-Jan-15													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM1-C	14:52	0.42	17.1	17.1	9.25	9.2	96.0	96.0	7.8	7.7	8	8.0	5	5.0
			17.1		9.24		95.9		7.6		8		5	
WM1	15:16	0.44	17.5	17.5	4.99	4.9	52.2	51.3	8.8	8.8	7.8	7.8	14	14.5
			17.5		4.81		50.3		8.8		7.8		15	

Date	13-Jan-15													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM1-C	13:11	0.53	13.8	13.8	9.39	9.4	90.8	91.1	259.0	258.5	7.8	7.8	120	117.0

			13.8		9.44		91.3		258.0		7.8		114	
WM1	13:42	0.42	13.5	13.5	8.27	8.2	79.4	79.0	241.0	244.5	8.2	8.2	138	138.0
			13.5		8.19		78.5		248.0		8.2		138	

Date	15-Jan-15													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM1-C	11:21	0.49	12.5	12.5	8.21	8.1	77.2	76.6	27.3	27.6	7.7	7.7	6	6.0
			12.5		8.07		75.9		27.9		7.7		6	
WM1	12:11	0.56	13.7	13.7	5.22	5.1	50.4	49.0	39.0	38.4	7.8	7.8	13	13.0
			13.7		4.92		47.6		37.8		7.8		13	

Date	17-Jan-15													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM1-C	11:39	0.48	15.2	15.2	7.28	7.2	72.6	72.1	29.3	29.2	8.3	8.3	7	7.0
			15.2		7.18		71.5		29.0		8.3		7	
WM1	11:57	0.39	15.5	15.5	5.26	5.2	52.7	52.2	32.5	32.6	7.9	7.9	8	8.0
			15.5		5.16		51.7		32.6		7.8		8	

Date	19-Jan-15													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM1-C	10:27	0.48	14.1	14.2	7.45	7.6	72.5	73.9	31.4	30.6	8.5	8.5	8	8.0
			14.2		7.71		75.3		29.7		8.4		8	
WM1	10:58	0.43	14.9	14.9	4.55	4.5	54.1	48.8	29.6	29.7	7.9	7.9	11	11.5
			14.9		4.38		43.4		29.8		7.8		12	

Date	21-Jan-15													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM1-C	13:09	0.47	16.1	16.1	6.99	7.0	71.0	70.8	10.9	10.8	8.7	8.7	3	3.5
			16.1		6.95		70.6		10.6		8.7		4	
WM1	13:40	0.41	15.9	15.9	0.44	0.4	4.5	4.5	27.6	27.8	8	8.0	9	9.0
			15.9		0.44		4.4		28.0		8		9	

Date	24-Jan-15													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM1-C	11:08	0.40	16.3	16.4	6.78	6.8	69.2	69.7	11.2	11.1	8.7	8.6	7	7.0
			16.4		6.85		70.1		10.9		8.5		7	
WM1	11:43	0.51	16.4	16.4	5.66	5.6	57.9	57.7	10.8	10.4	8.2	8.2	12	12.5
			16.4		5.62		57.5		9.9		8.2		13	

Date	27-Jan-15													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM1-C	11:42	0.41	19.8	19.8	7.25	7.3	79.4	80.0	17.4	17.0	8.1	8.0	7	7.5
			19.8		7.36		80.6		16.5		7.9		8	
WM1	11:02	0.75	19.7	19.8	3.15	3.2	34.4	34.4	14.2	14.4	8.2	8.2	13	13.5
			19.8		3.17		34.4		14.5		8.1		14	

Date	29-Jan-15													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM1-C	10:27	0.45	16.6	16.6	8.48	8.4	87.1	86.3	20.7	21.1	8.6	8.5	6	5.5
			16.5		8.35		85.5		21.5		8.4		5	
WM1	10:53	0.53	18.5	18.5	4.02	4.0	43.0	43.1	19.7	20.3	7.8	7.8	10	10.0
			18.5		4.01		43.2		20.8		7.7		10	

Date	31-Jan-15													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM1-C	10:53	0.41	16.1	16.1	7.45	7.4	75.7	75.4	18.0	18.2	8.1	8.1	6	6
			16		7.4		75.0		18.3		8.1		6	
WM1	10:26	0.48	16.7	16.7	6.97	7.0	71.8	71.8	15.0	14.9	8.2	8.2	15	14.5
			16.7		6.98		71.8		14.7		8.2		14	

Water Quality Monitoring Data for Contract 2 and 3

Date	3-Jan-15													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM4-CA	14:56	0.09	20.9	20.9	7.17	7.2	80.3	80.3	644.0	639.5	8.5	8.5	297	301.5
			20.8		7.18		80.3		635.0		8.5		306	
WM4-CB	15:21	0.21	22	22.0	5.75	5.8	65.9	66.3	9.8	9.5	8.2	8.2	2	2.0
			22		5.86		66.7		9.3		8.2		2	
WM4	14:30	0.28	23	23.0	7.4	7.4	85.8	86.0	17.9	17.1	8.4	8.4	20	20.0
			23		7.46		86.2		16.2		8.4		20	

Date	5-Jan-15													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM4-CA	16:01	0.09	22.9	22.9	7.34	7.3	85.4	85.4	8.4	8.3	8.6	8.6	8	7.0
			22.8		7.34		85.4		8.2		8.6		6	
WM4-CB	16:23	0.17	24	24.0	4.62	4.5	54.9	53.6	7.4	7.5	8.2	8.2	6	6.5
			24		4.46		52.2		7.6		8.2		7	
WM4	15:37	0.20	24.4	24.4	6.25	6.2	74.9	74.8	19.1	19.0	8.2	8.2	20	20.5
			24.4		6.24		74.7		18.8		8.2		21	

Date	7-Jan-15													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM4-CA	13:00	0.08	21.9	21.9	6.24	6.2	70.9	70.7	5.1	5.1	8.1	8.1	3	3.0
			21.9		6.17		70.4		5.1		8.1		3	
WM4-CB	13:20	0.17	22.4	22.4	5.14	5.1	59.3	59.3	7.7	7.8	8.1	8.1	10	9.5
			22.4		5.15		59.3		7.8		8.1		9	
WM4	12:38	0.21	22.2	22.2	5.9	5.9	67.9	68.3	14.4	14.7	8.2	8.2	17	17.0
			22.1		5.98		68.6		14.9		8.2		17	

Date	9-Jan-15													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM4-CA	12:07	0.08	19.3	19.3	7.91	7.9	85.9	85.4	4.4	4.4	8.4	8.4	3	2.5
			19.3		7.82		84.8		4.5		8.4		2	

WM4-CB	11:48	0.19	19.7	19.7	7.89	7.9	86.4	86.5	7.6	7.5	8.1	8.1	10	9.5
			19.7		7.9		86.6		7.4		8.1		9	
WM4	11:07	0.27	20.8	20.8	8.05	8.0	89.9	89.1	13.3	13.0	8.5	8.5	12	13.0
			20.7		7.91		88.3		12.7		8.5		14	

Date	13-Jan-15													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM4-CA	10:50	0.09	14.9	14.9	8.7	8.7	86.1	86.3	9.1	9.2	7.8	7.8	5	4.5
			14.8		8.75		86.4		9.3		7.7		4	
WM4-CB	9:40	0.36	15.4	15.4	7.82	7.7	78.2	77.5	20.9	20.0	7.7	7.7	8	8.0
			15.4		7.66		76.7		19.1		7.6		8	
WM4	10:20	0.42	15.3	15.3	7.59	7.7	75.8	77.1	24.3	24.6	7.6	7.6	20	20.5
			15.3		7.85		78.4		24.8		7.6		21	

Date	15-Jan-15													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM4-CA	17:16	0.08	17.8	17.8	7.79	7.7	82.0	81.5	2.9	2.9	9	9.0	<2	2.0
			17.8		7.7		81.0		2.9		9		<2	
WM4-CB	17:49	0.18	18.1	18.1	4.24	4.2	44.9	44.0	6.4	6.2	8.8	8.8	6	5.5
			18.1		4.08		43.1		6.1		8.8		5	
WM4	16:57	0.24	19.3	19.3	6	6.0	65.1	64.9	12.4	12.8	8.9	8.9	10	8.5
			19.3		5.96		64.6		13.1		8.9		7	

Date	17-Jan-15													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM4-CA	13:12	0.09	19.1	19.1	9.23	9.3	99.7	99.9	16.7	17.3	8.8	8.8	4	4.0
			19		9.28		100		17.9		8.8		4	
WM4-CB	13:31	0.18	20.1	20.1	7.1	7.1	78.3	78.1	26.7	25.9	8	8.0	11	11.0
			20.1		7.06		77.9		25.0		7.9		11	
WM4	12:39	0.32	19.2	19.2	7.93	7.9	85.9	85.6	30.3	30.5	7.9	7.9	29	29.0
			19.2		7.86		85.2		30.7		7.8		29	

Date	19-Jan-15													
------	-----------	--	--	--	--	--	--	--	--	--	--	--	--	--

Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM4-CA	12:11	0.09	17.7	17.7	8.72	8.6	91.6	91.1	33.9	33.5	8.3	8.3	20	20.0
			17.7		8.52		90.6		33.1		8.3		20	
WM4-CB	12:36	0.18	19.1	19.1	8.18	8.2	88.5	88.4	27.6	26.9	7.8	7.8	12	12.0
			19.1		8.16		88.2		26.1		7.8		12	
WM4	11:37	0.27	17.2	17.2	8.98	8.9	93.7	93.6	34.6	34.2	7.7	7.7	17	17.5
			17.2		8.72		93.5		33.7		7.6		18	

Date		21-Jan-15													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)		
WM4-CA	16:30	0.09	18.6	18.6	7.4	7.4	79.1	78.9	33.7	33.5	8.5	8.5	25	25.0	
			18.5		7.35		78.7		33.2		8.5		25		
WM4-CB	17:01	0.21	19.2	19.2	5.2	5.1	56.3	55.6	10.7	10.5	7.8	7.8	7	6.0	
			19.2		5.06		54.8		10.3		7.8		5		
WM4	16:06	0.28	20.3	20.3	7.16	7.2	79.2	79.3	15.1	14.7	7.9	7.8	18	18.5	
			20.2		7.17		79.3		14.3		7.7		19		

Date		24-Jan-15													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)		
WM4-CA	14:05	0.09	19.1	19.1	7.89	7.9	85.3	85.2	2.6	2.7	8.2	8.2	3	3.0	
			19.1		7.86		85.0		2.7		8.2		3		
WM4-CB	14:24	0.19	20.1	20.1	7.07	7.1	78.0	78.2	5.8	5.9	7.8	7.8	7	7.5	
			20.1		7.1		78.3		5.9		7.8		8		
WM4	13:44	0.25	20.6	20.6	6.67	6.7	96.6	96.4	15.2	15.0	7.7	7.7	20	20.5	
			20.6		6.63		96.1		14.7		7.7		21		

Date		27-Jan-15													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)		
WM4-CA	14:52	0.09	20.7	20.7	7.56	7.5	84.4	83.7	14.0	14.1	8.2	8.2	4	4.5	
			20.7		7.44		83.0		14.1		8.2		5		
WM4-CB	15:14	0.19	21.9	21.9	5.24	5.2	59.9	59.6	14.8	14.9	7.8	7.8	8	8.0	
			21.9		5.19		59.3		15.0		7.8		8		
WM4	14:37	0.25	22.6	22.6	7.35	7.3	85.1	84.5	27.9	27.7	7.9	7.9	32	33.0	

			22.6		7.25		83.9		27.5		7.8		34	
--	--	--	------	--	------	--	------	--	------	--	-----	--	----	--

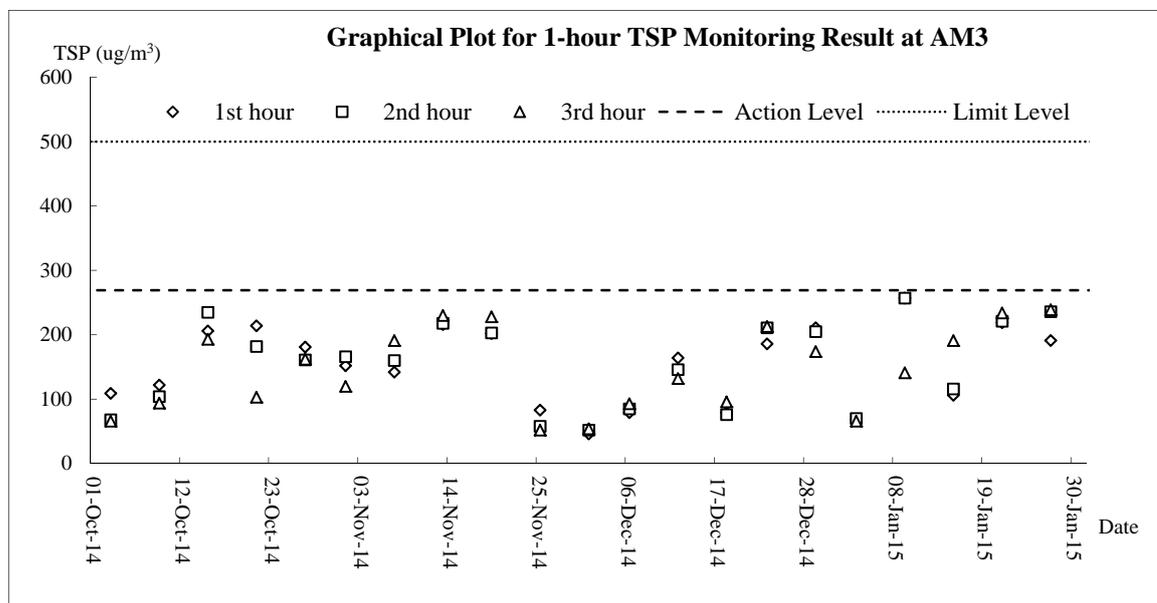
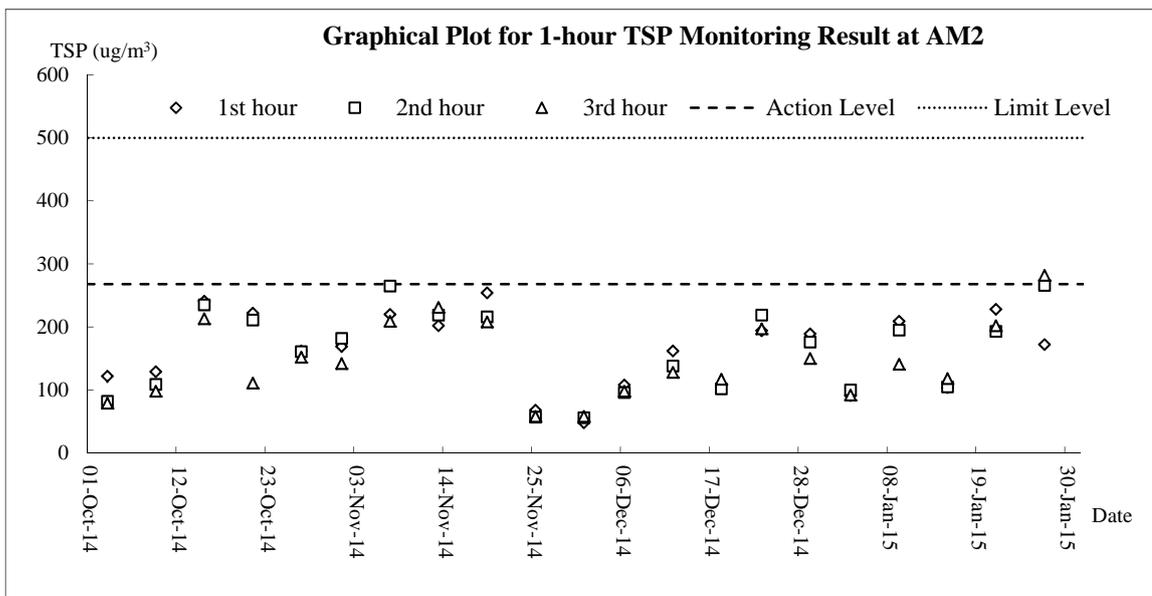
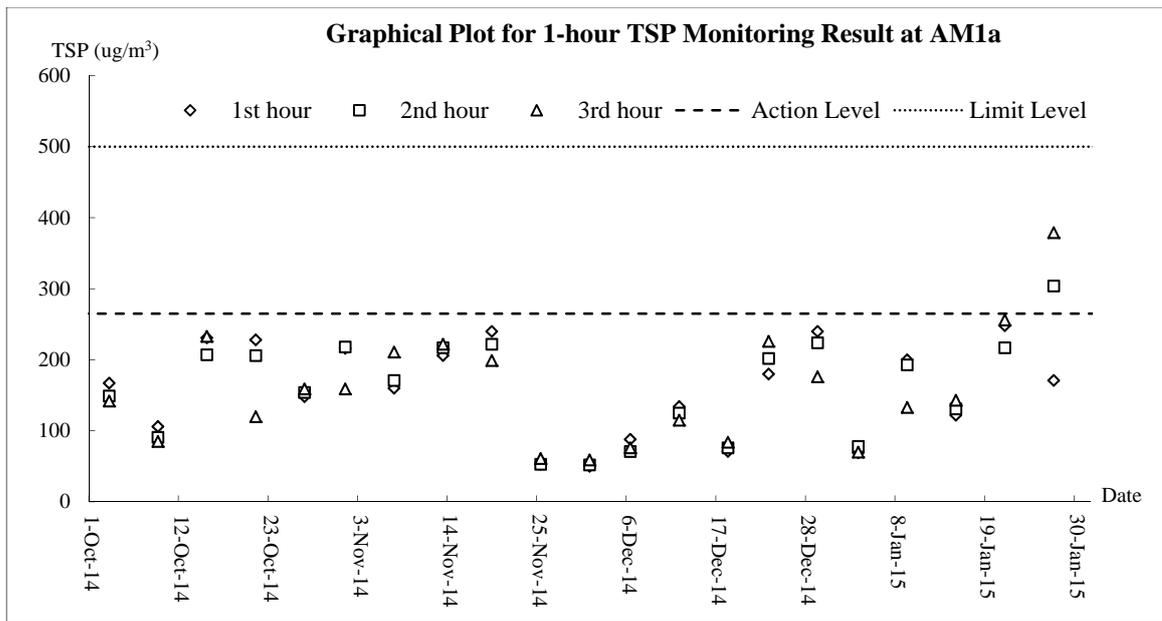
Date	29-Jan-15													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM4-CA	16:13	0.08	20.0	20.0	6.95	7.0	76.5	76.9	11.9	11.3	8.1	8.1	5	5.0
			20.0		7.03		77.3		10.7		8.1		5	
WM4-CB	16:23	0.17	21.4	21.4	4.96	4.9	56.0	55.1	10.0	10.3	7.7	7.7	4	4.0
			21.4		4.79		54.2		10.5		7.6		4	
WM4	15:48	0.26	22.5	22.5	6.41	6.4	74.0	73.8	24.3	24.6	7.6	7.6	11	11.5
			22.5		6.37		73.5		24.8		7.6		12	

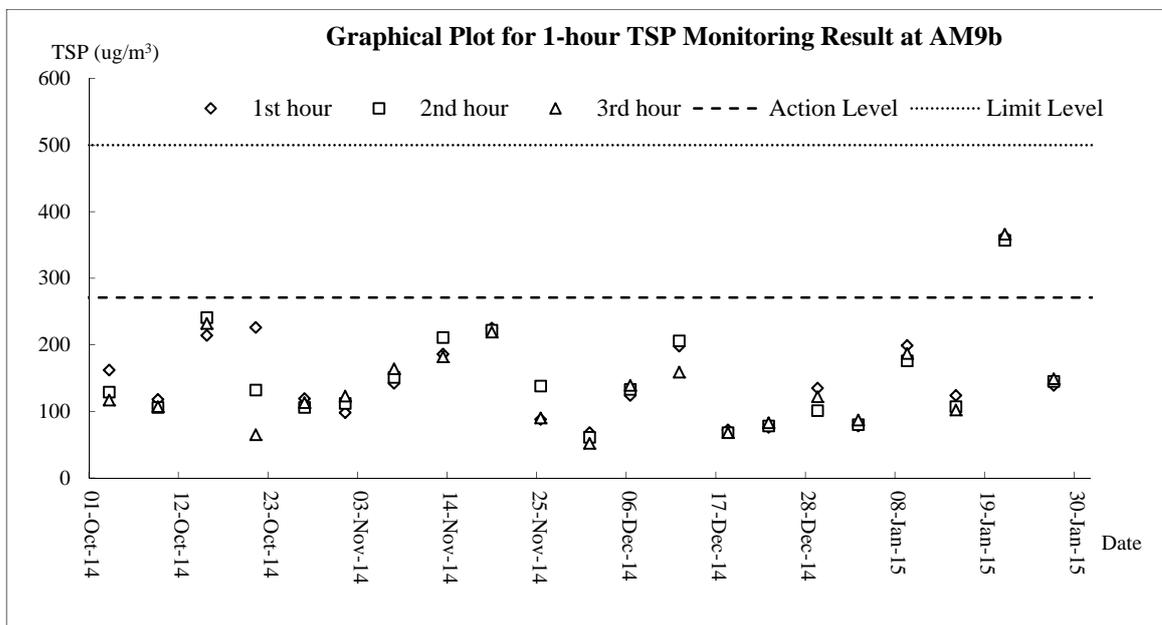
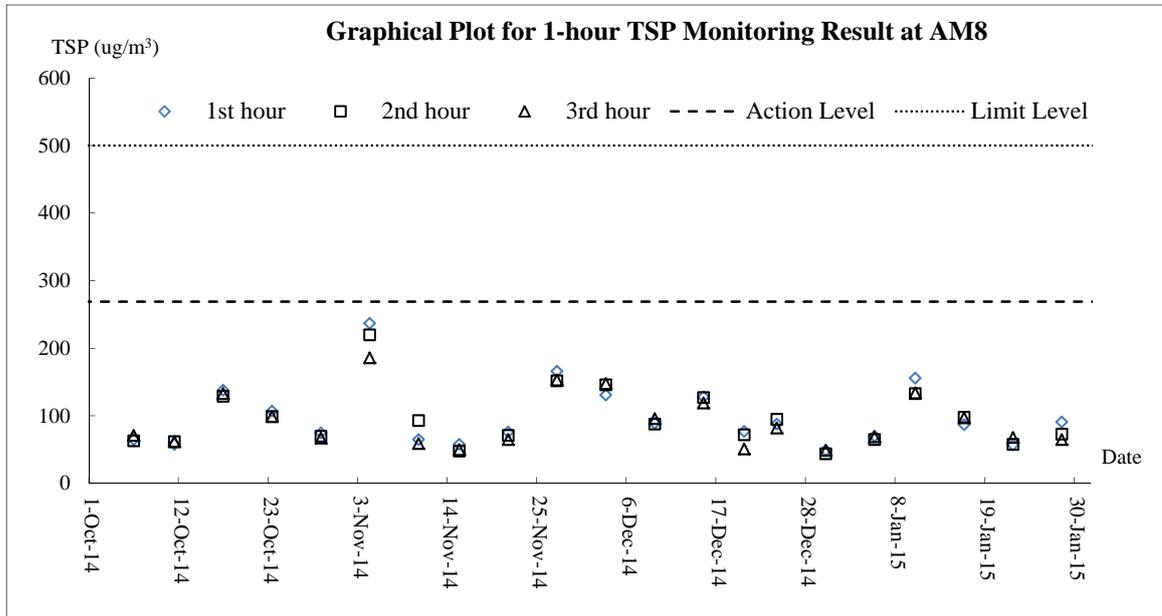
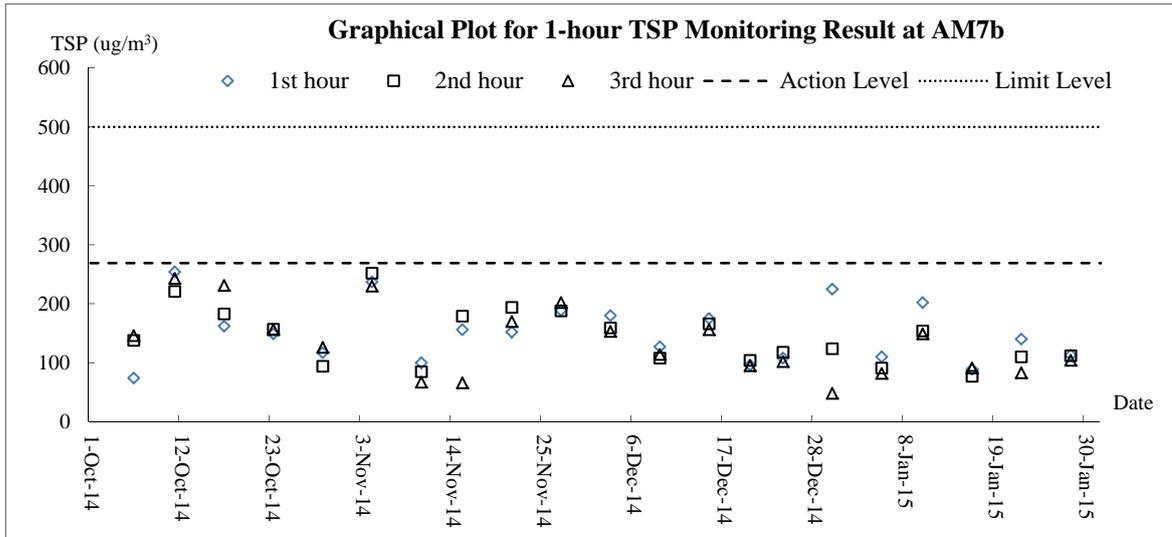
Date	31-Jan-15													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM4-CA	12:56	0.08	17.3	17.3	7.87	7.8	81.8	81.5	8.8	8.6	7.3	7.3	9	9.5
			17.3		7.8		81.2		8.4		7.3		10	
WM4-CB	13:13	0.19	18.1	18.1	5.91	5.9	61.5	60.9	13.4	13.1	7.2	7.2	11	11.0
			18.1		5.82		60.2		12.7		7.2		11	
WM4	12:40	0.25	17.2	17.2	6.82	6.9	70.9	71.4	20.0	20.3	7.2	7.2	20	20.5
			17.2		6.91		71.8		20.6		7.2		21	

Appendix J

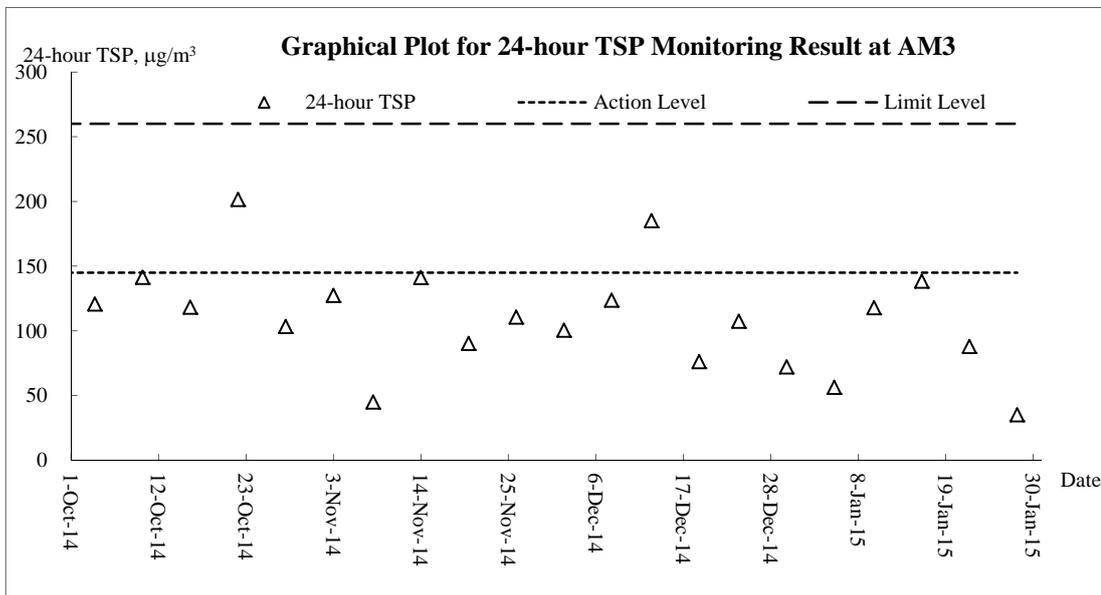
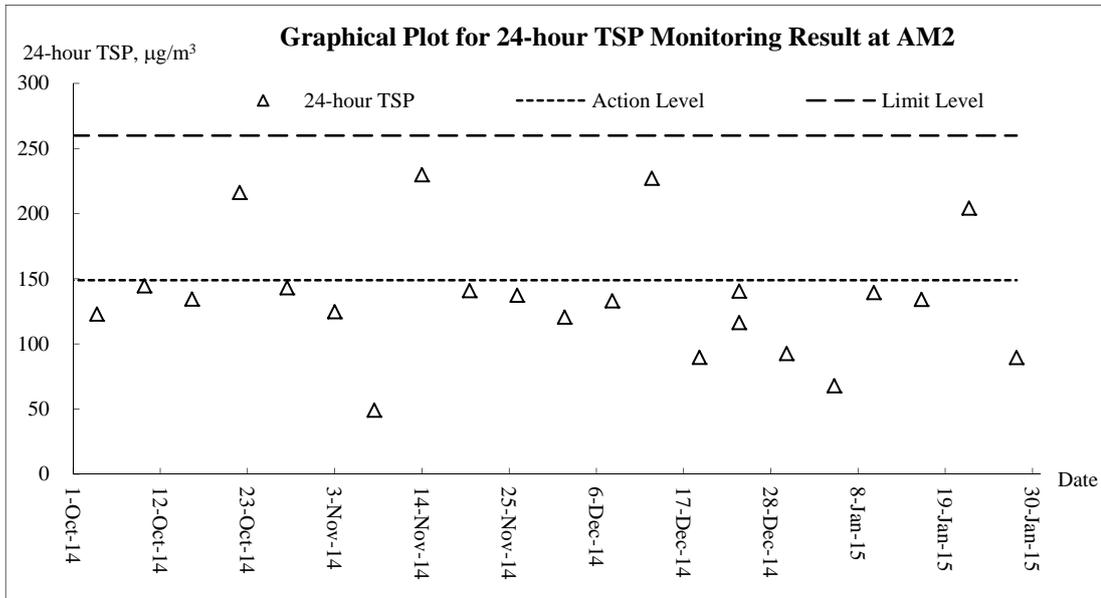
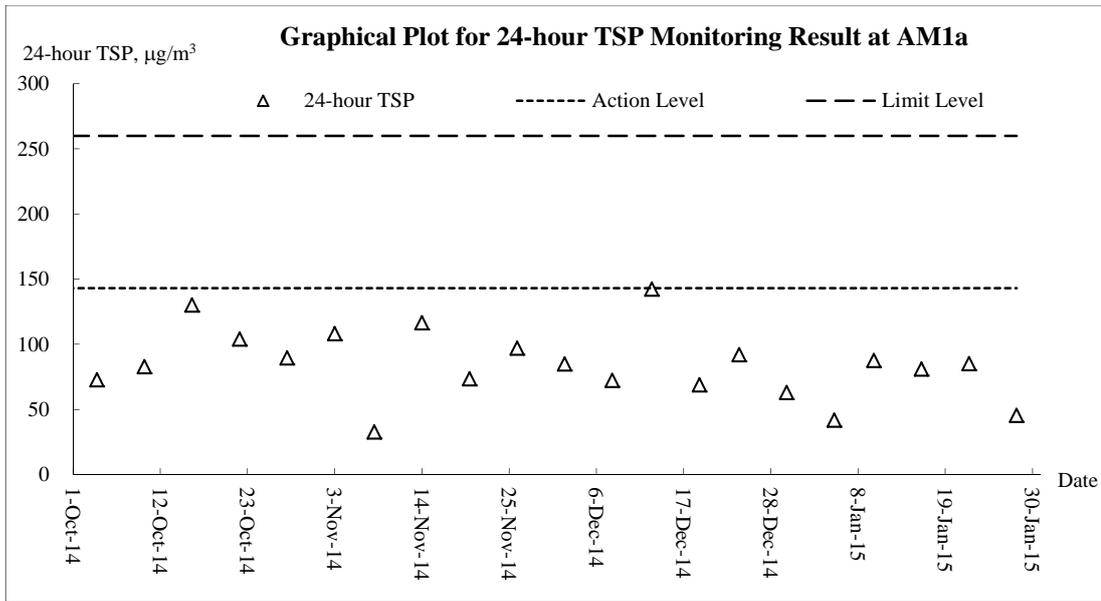
Graphical Plots for Monitoring Result

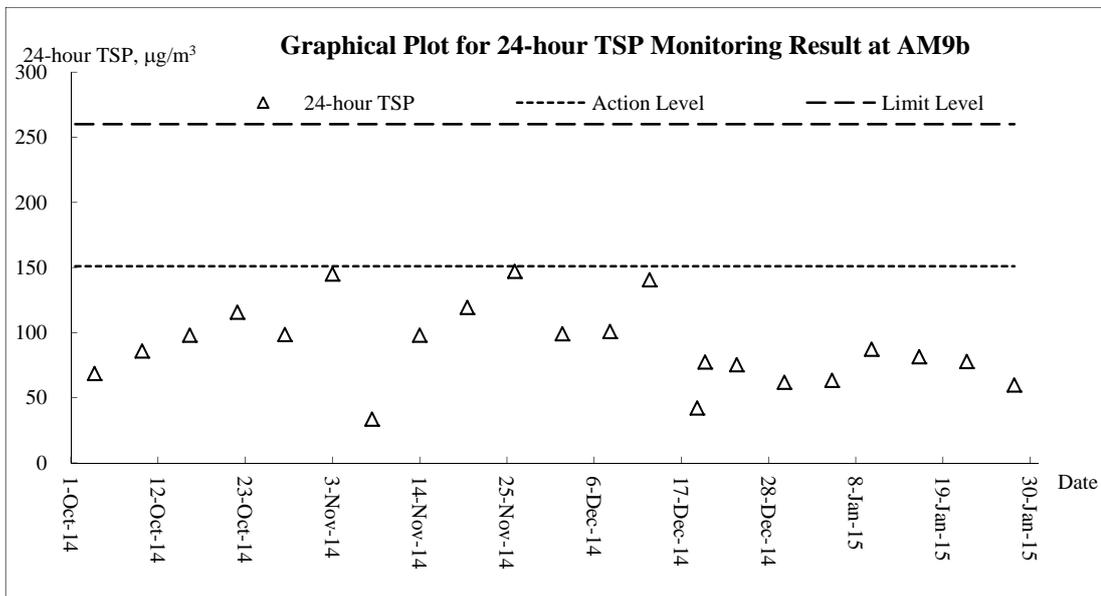
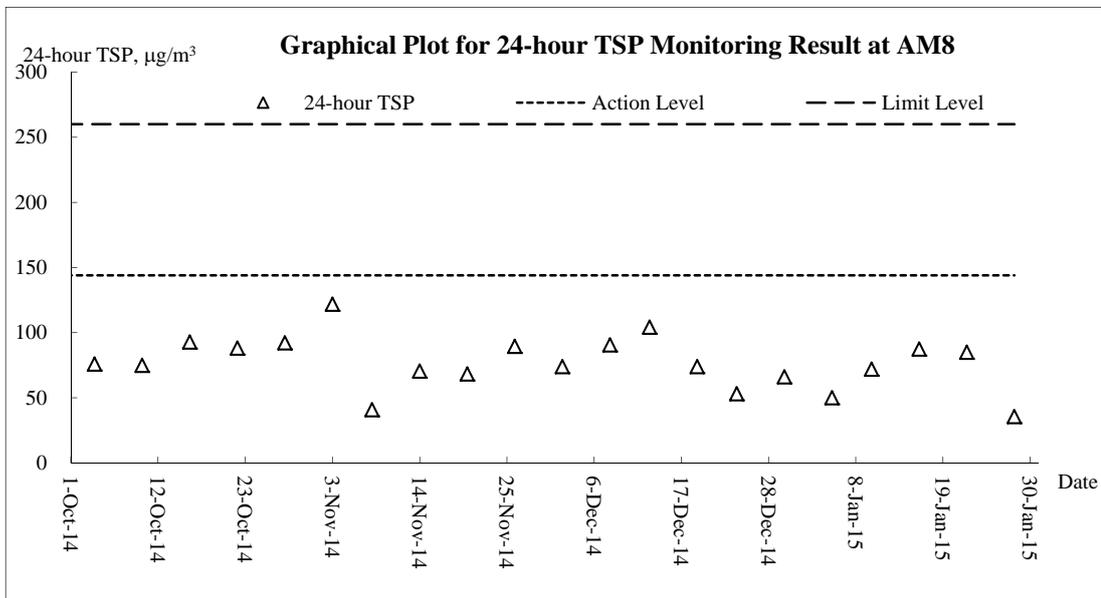
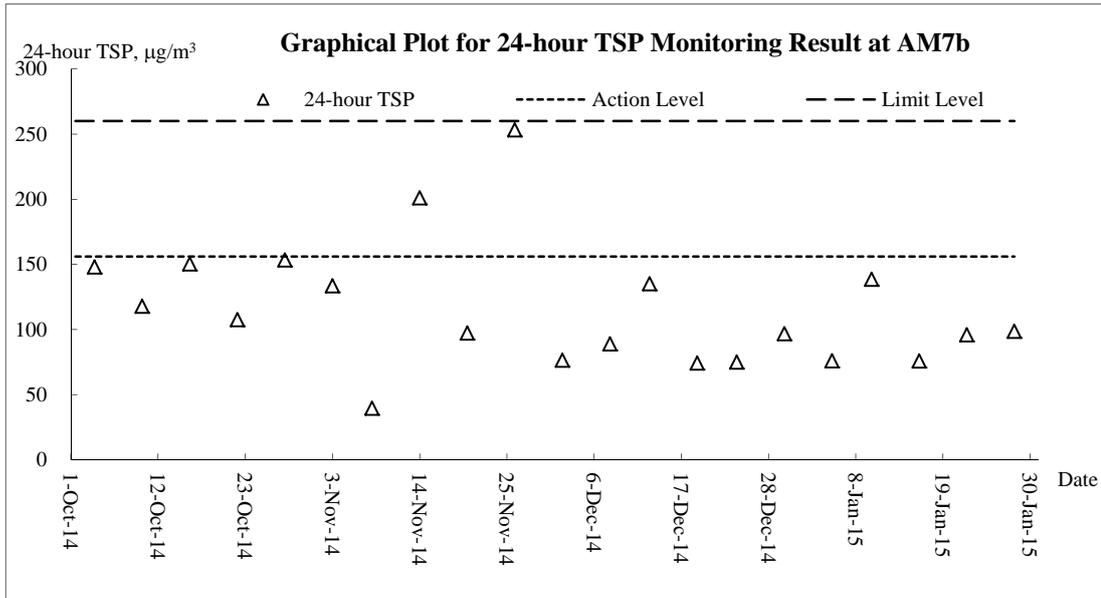
Air Quality – 1-hour TSP



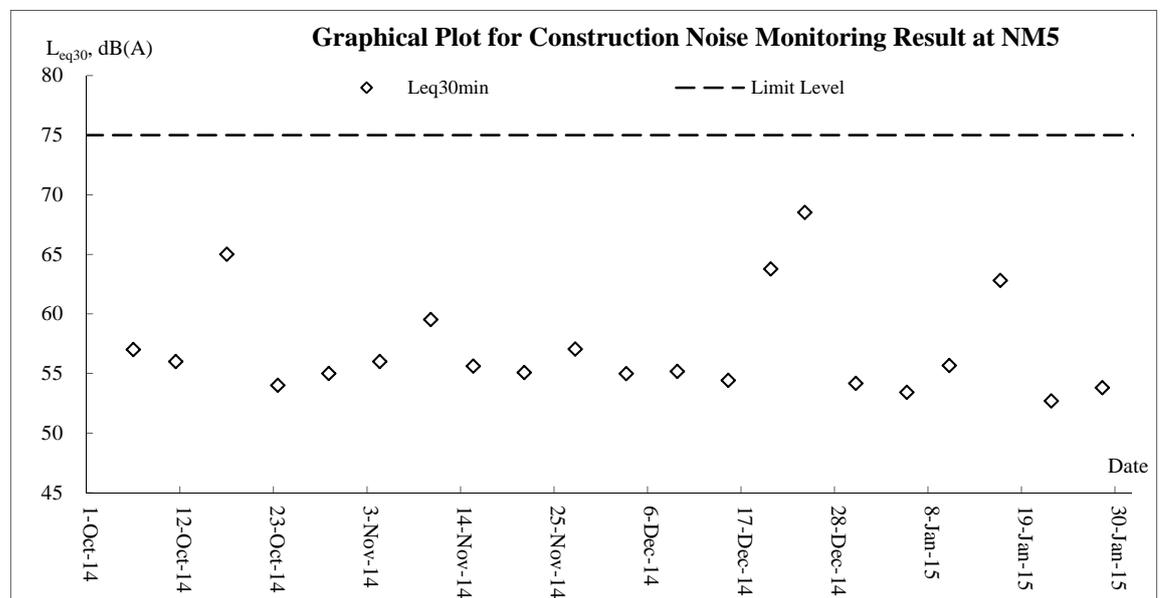
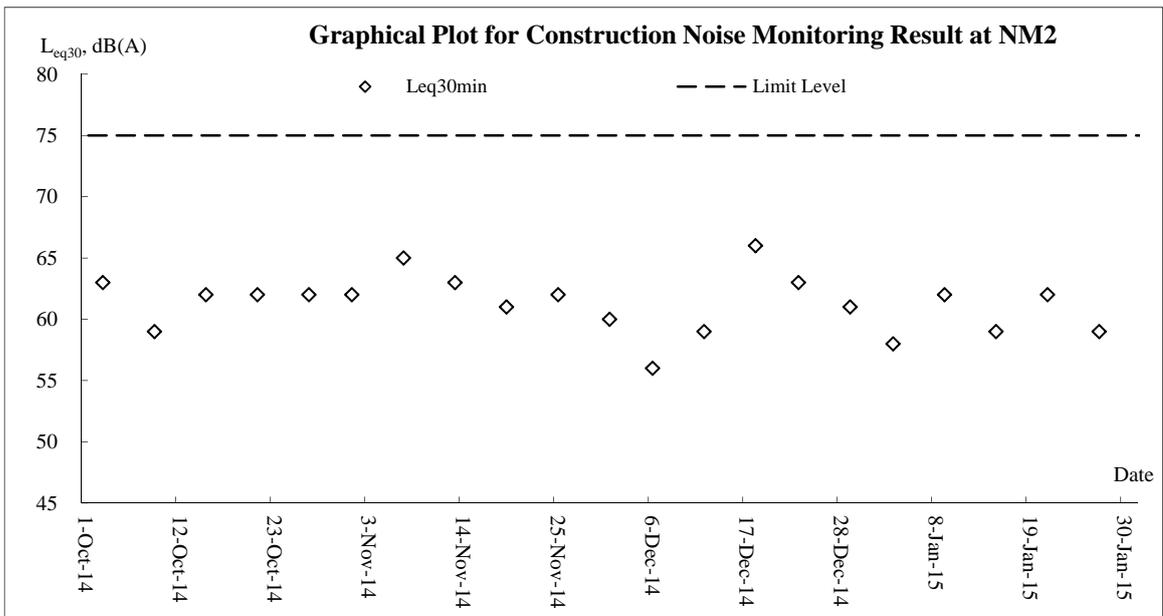
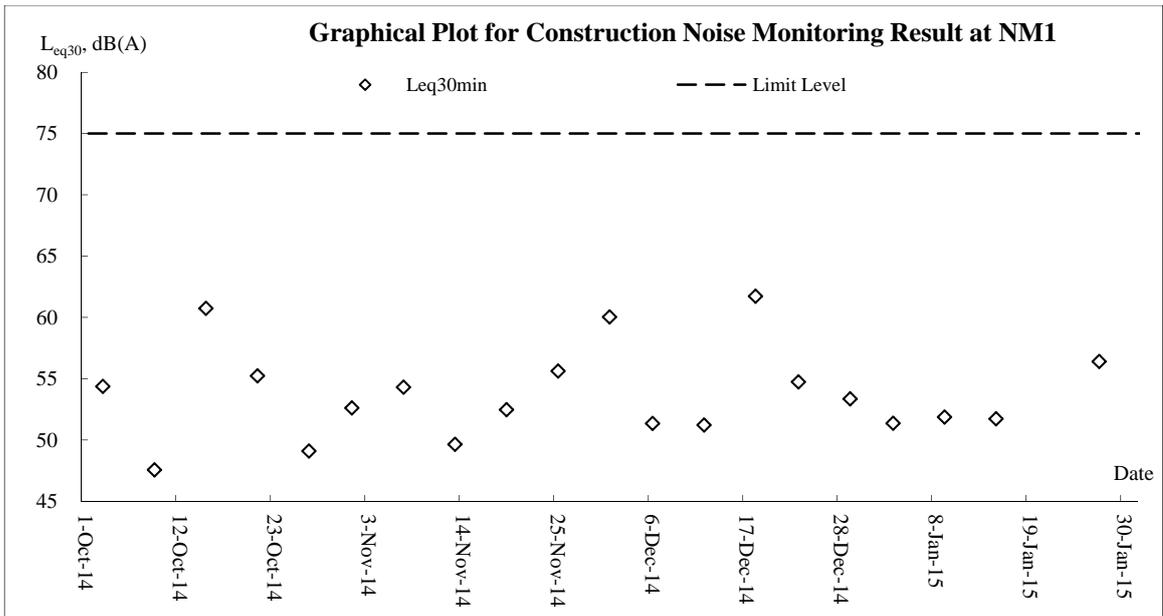


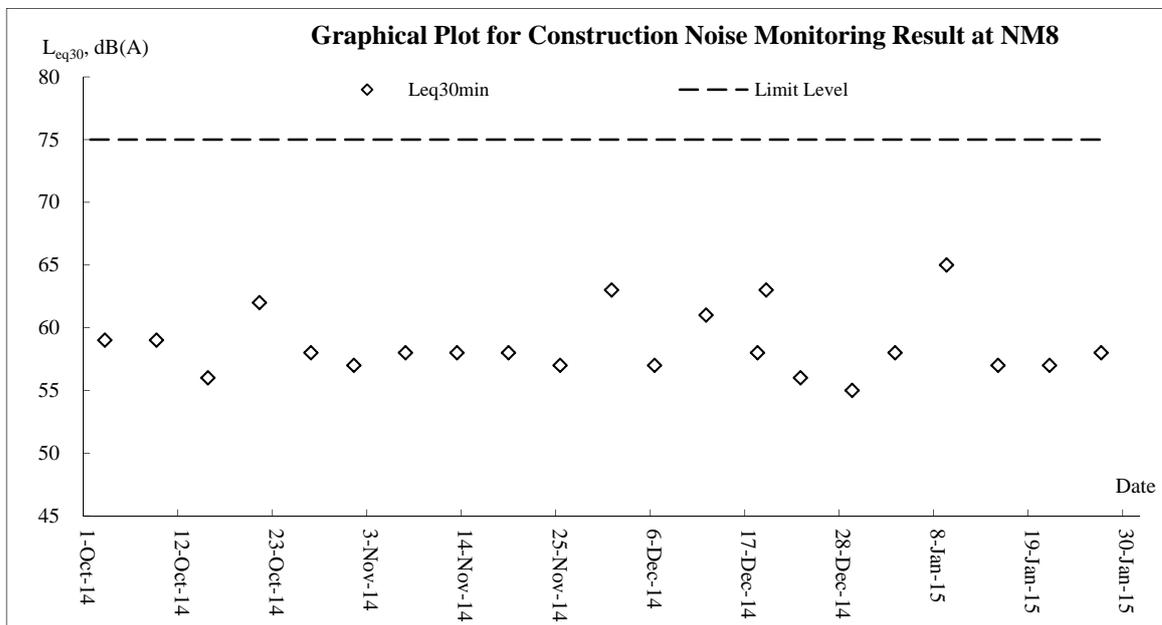
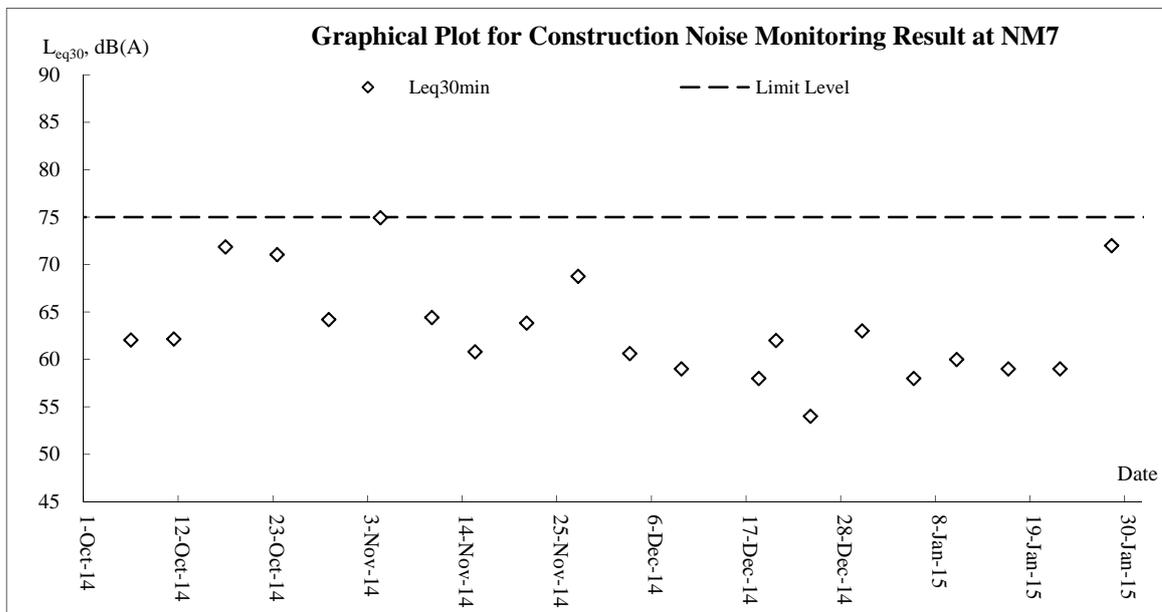
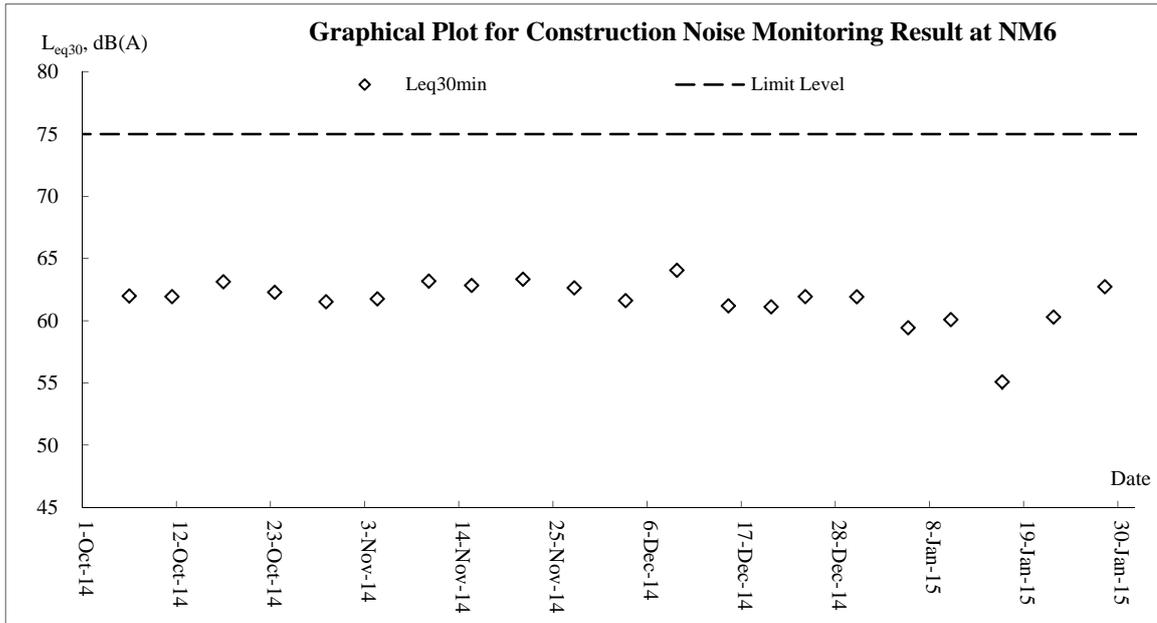
Air Quality – 24-hour TSP

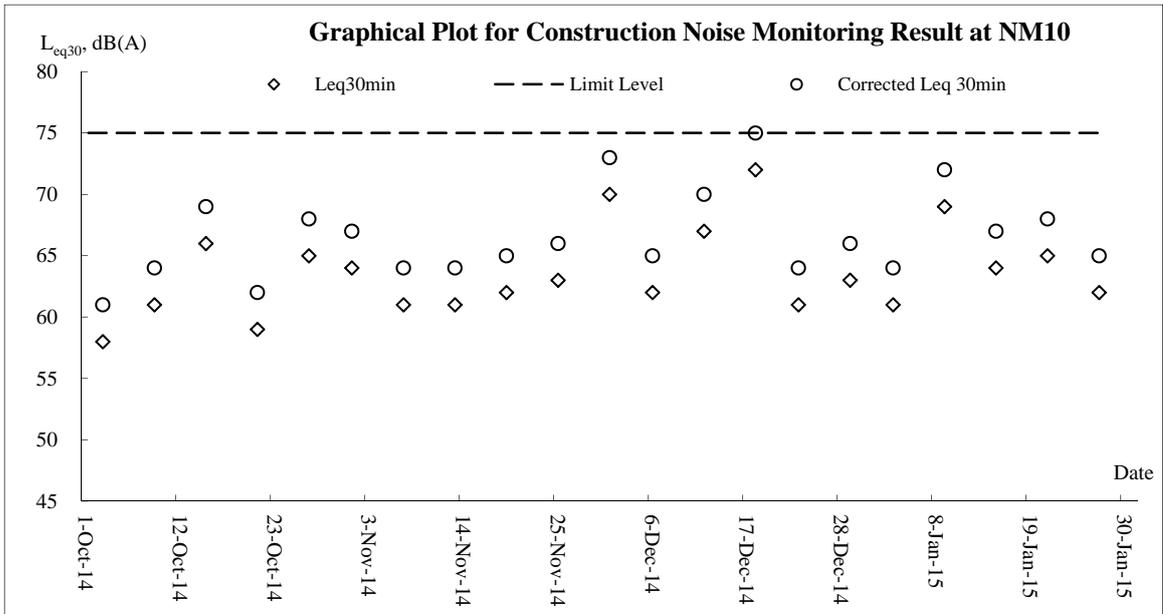
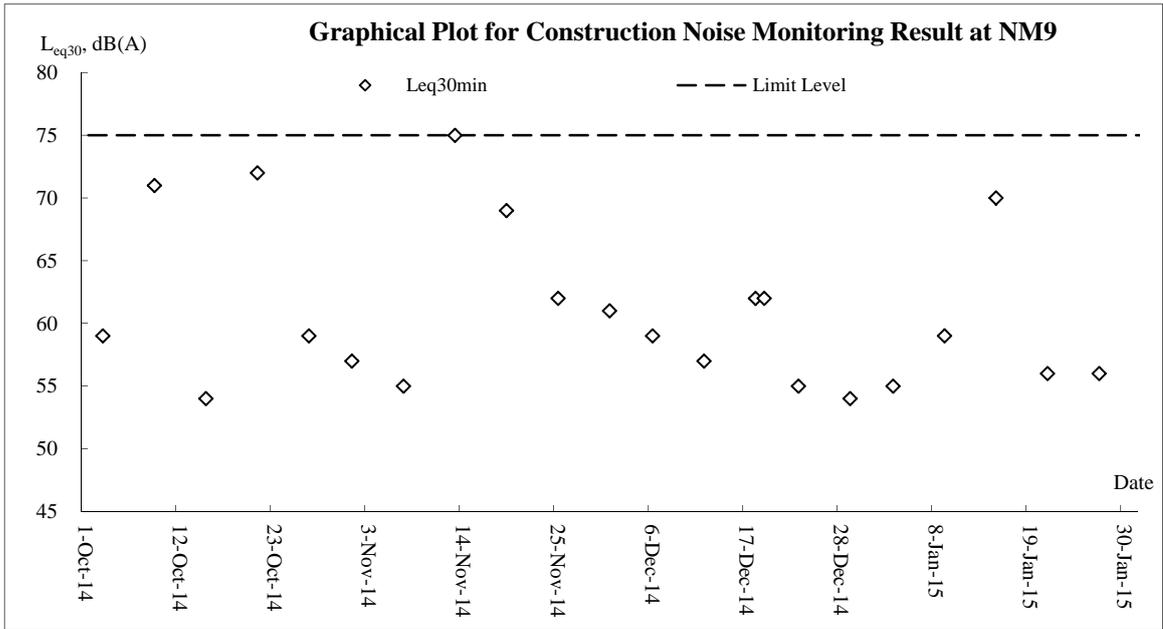




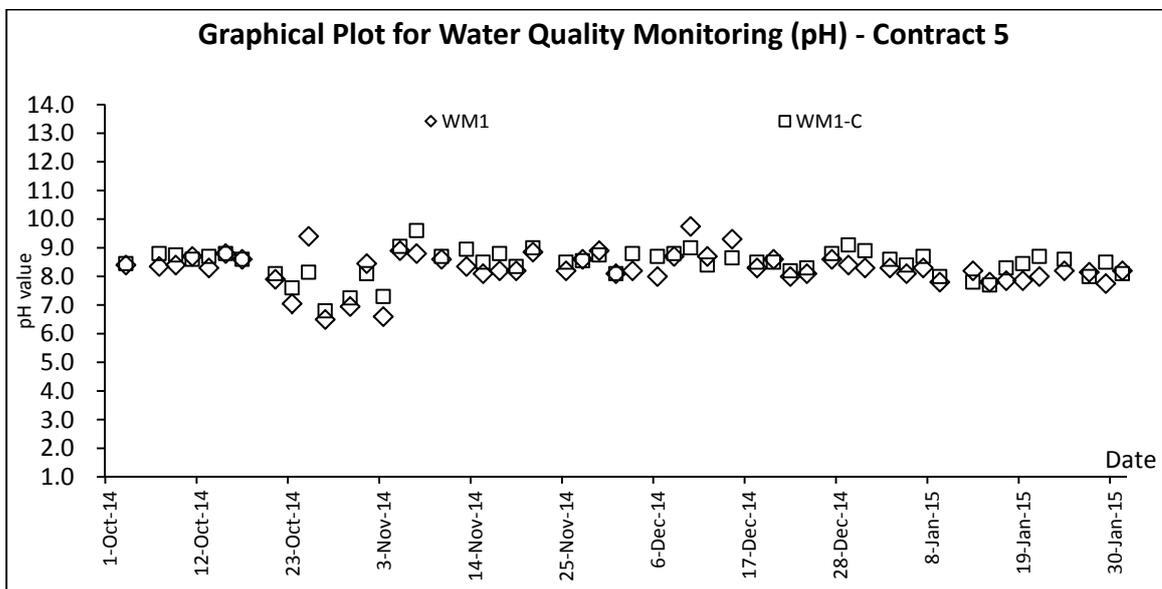
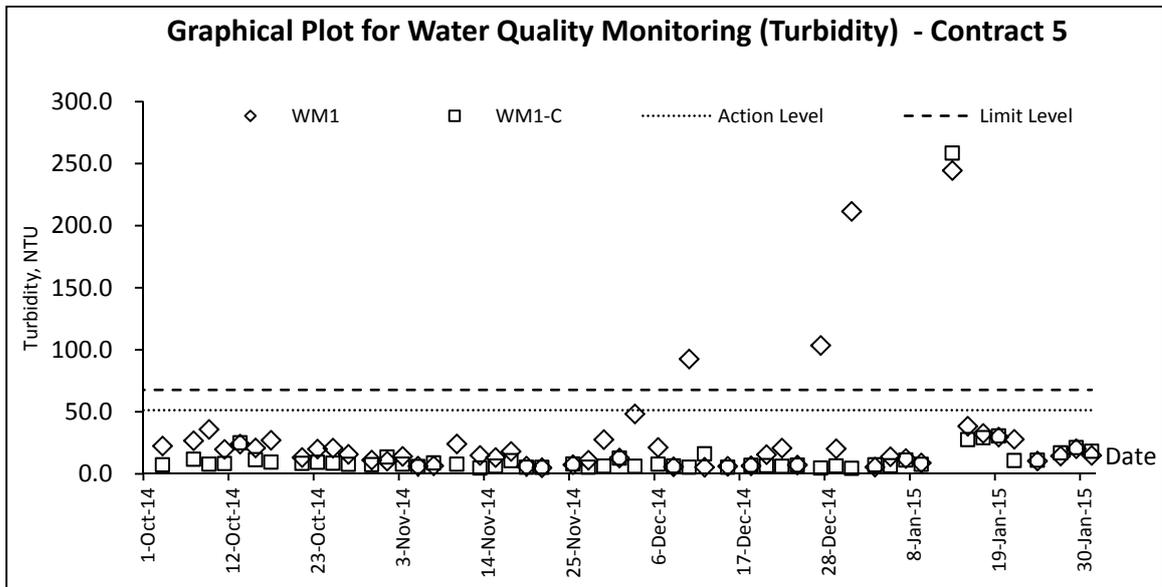
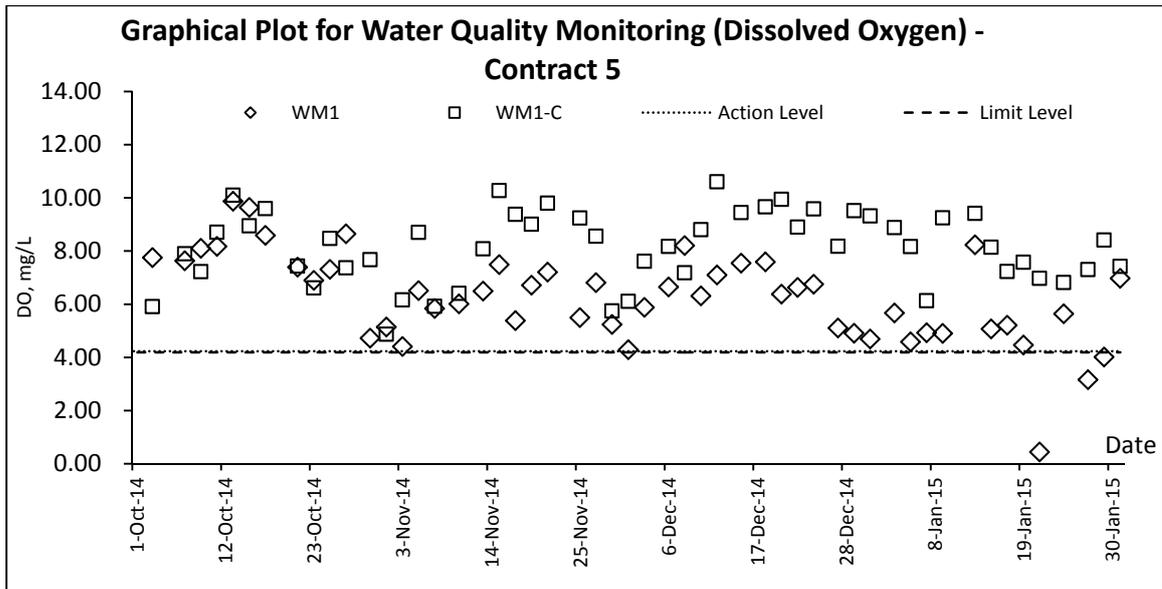
Noise

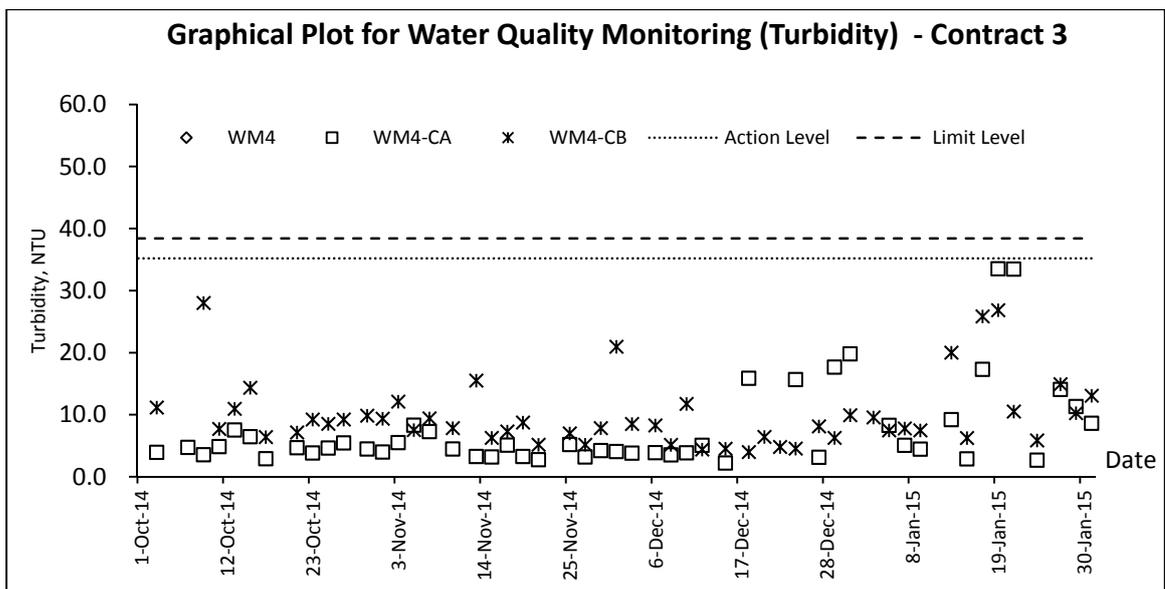
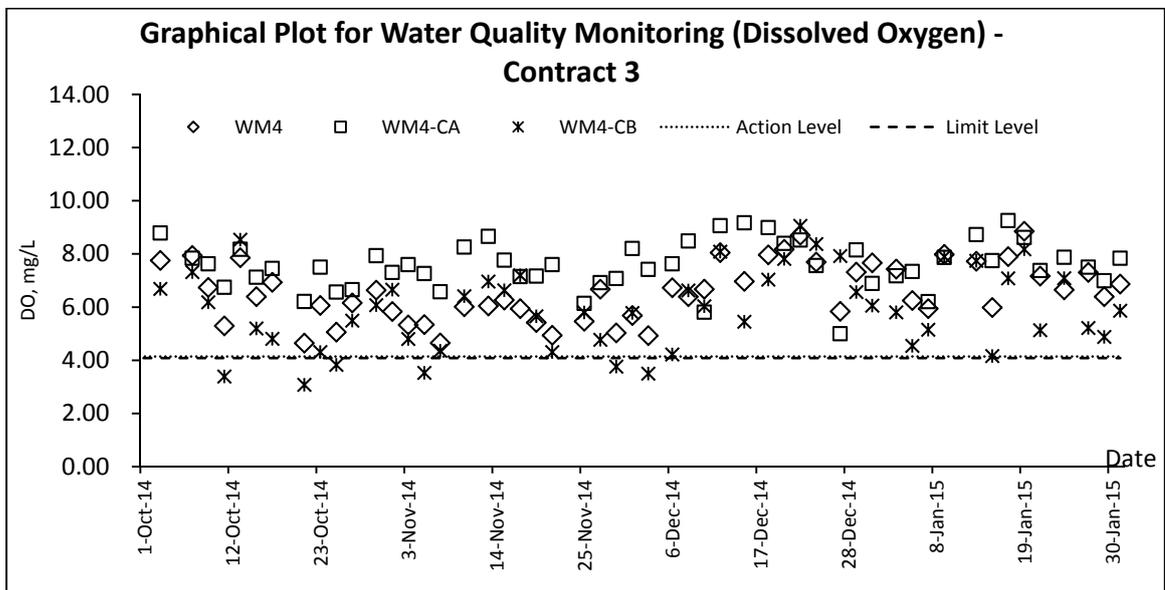
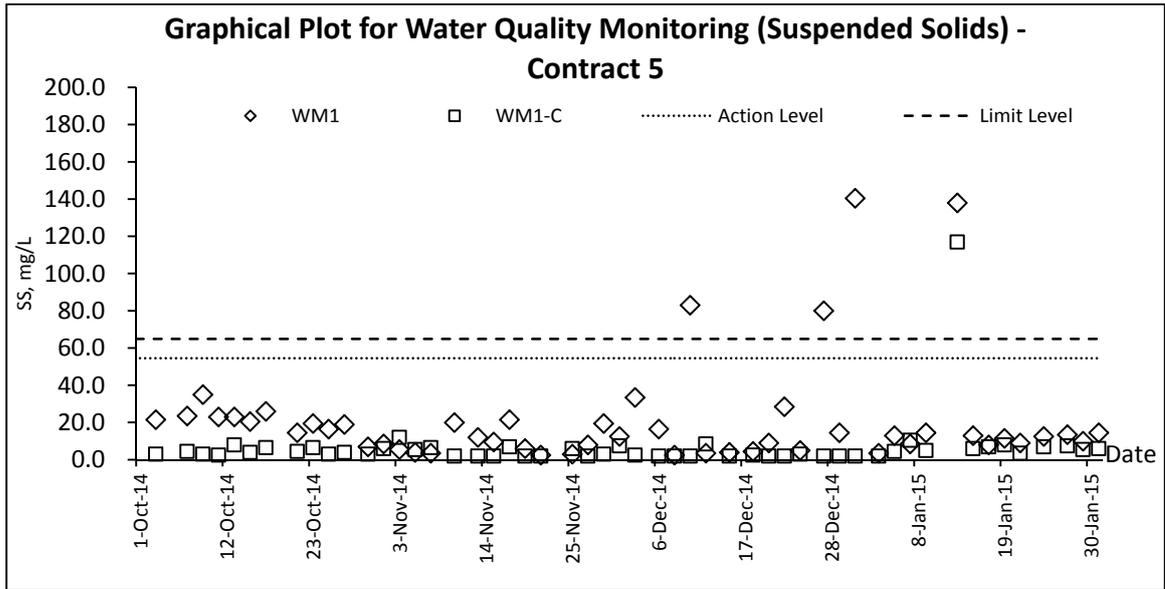


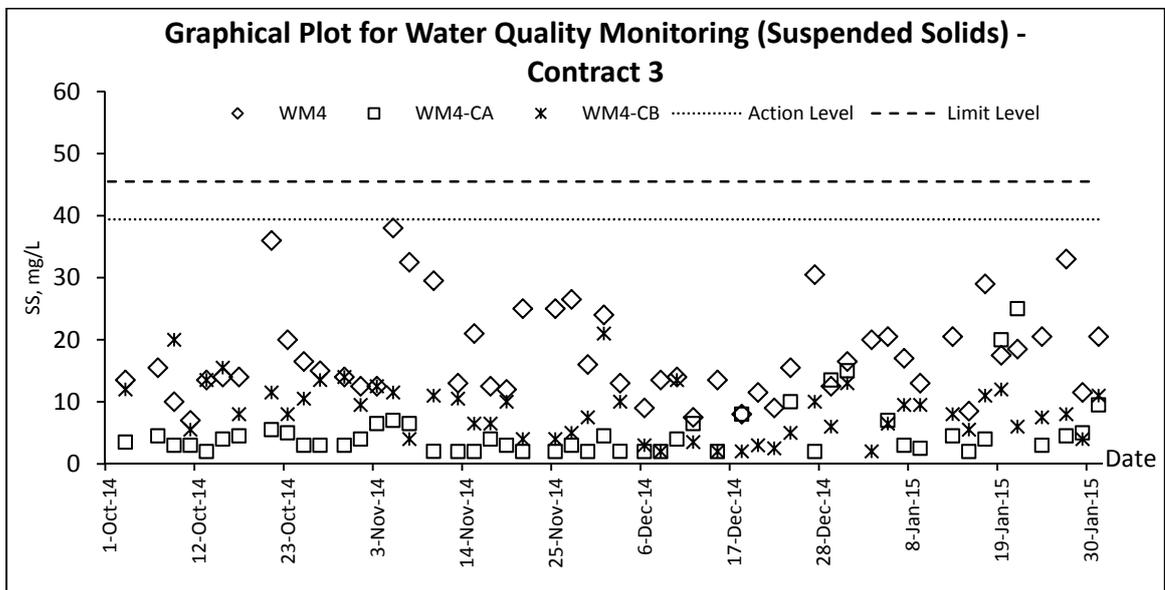
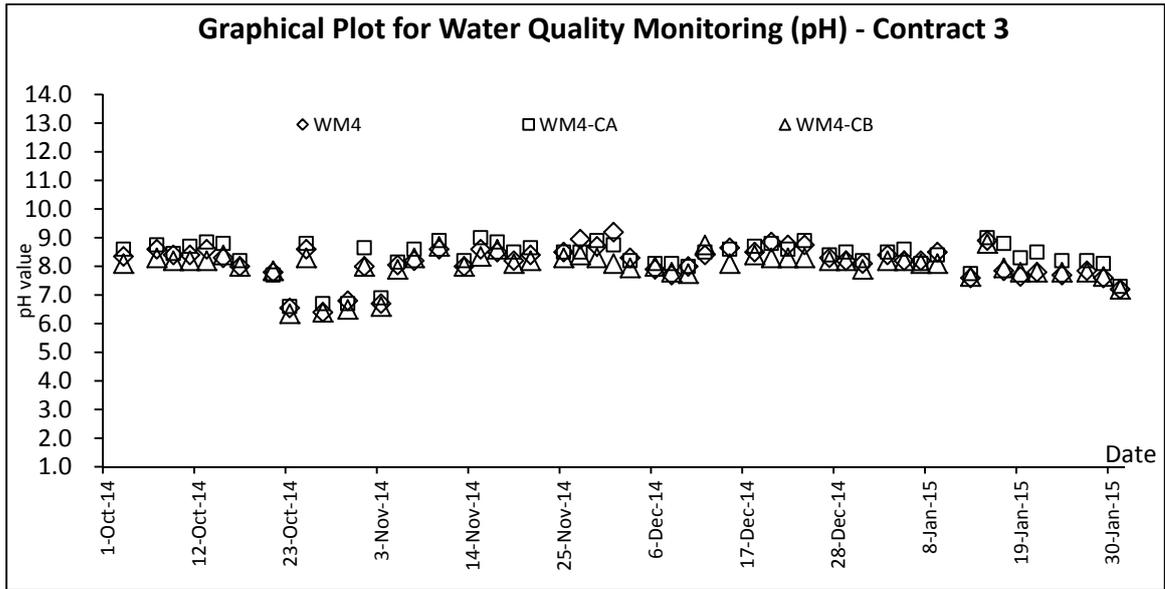




Water Quality







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-Jan-15	Thu	Some haze. Cloudy and significantly cooler overnight. Moderate to fresh north to northeasterly winds.	0	13.6	7.5	Maintenance	N
2-Jan-15	Fri	Some haze. Cloudy and significantly cooler overnight. Moderate to fresh north to northeasterly winds.	0	13.5	6.4	64	E/NE
3-Jan-15	Sat	Fine and dry. Moderate northeasterly winds, fresh at times.	0	15.3	7.6	57.5	E/SE
4-Jan-15	Sun	Mainly fine and dry. Moderate east to northeasterly winds, fresh offshore.	0	17	7.5	70	E
5-Jan-15	Mon	Some haze. Cloudy and significantly cooler overnight. Moderate to fresh north to northeasterly winds.	0	19.9	10.6	77	E
6-Jan-15	Tue	Some haze. Cloudy and significantly cooler overnight. Moderate to fresh north to northeasterly winds.	0	22.7	6.5	68.2	E/SE
7-Jan-15	Wed	Some haze. Cloudy and significantly cooler overnight. Moderate to fresh north to northeasterly winds.	0.1	17	8.2	74.5	N
8-Jan-15	Thu	Fine and dry. Moderate northeasterly winds, fresh at times.	0	14.7	8.7	59	N
9-Jan-15	Fri	Mainly fine and dry. Moderate east to northeasterly winds, fresh offshore.	0	13.9	6.4	64.7	E
10-Jan-15	Sat	Mainly fine and dry. Moderate east to northeasterly winds, fresh offshore.	0	14.4	6.8	64	E
11-Jan-15	Sun	Overcast with occasional rain. Fresh north to northeasterly winds.	Trace	16.2	6.6	64.7	N
12-Jan-15	Mon	Overcast with occasional rain. Fresh north to northeasterly winds.	14.9	13.3	10.5	78.7	N
13-Jan-15	Tue	One or two light rain patches at first. It will be cold. Moderate north to northeasterly winds, fresh at first.	25.8	10.6	5	90.5	N/NW
14-Jan-15	Wed	Fine and dry. Moderate northeasterly winds.	0	13	14.7	65.5	N
15-Jan-15	Thu	Fine and dry. Moderate northeasterly winds.	0	11.7	5.4	67.7	N/NW
16-Jan-15	Fri	Fine and dry. Moderate northeasterly winds.	0	15.7	5.2	65.5	N/NW
17-Jan-15	Sat	Mainly fine. Moderate to fresh easterly winds.	0	13.9	7.5	64.7	E/SE
18-Jan-15	Sun	Mainly fine. Moderate to fresh easterly winds.	0	15.9	9.6	60	E/SE
19-Jan-15	Mon	Fine. Very dry in the afternoon. Moderate easterly to northeasterly winds, occasionally fresh later.	0	14.3	7.5	53.7	E/SE
20-Jan-15	Tue	Sunny periods in the afternoon. Cloudy tonight. Fresh easterly winds.	0	16.1	7.5	57.5	E/SE
21-Jan-15	Wed	Mainly fine. Moderate to fresh easterly winds.	Trace	15.8	6	64.7	N/NW
22-Jan-15	Thu	Fine and dry. Moderate northeasterly winds.	0	15.5	6.5	Maintenance	E
23-Jan-15	Fri	Mainly fine. Moderate to fresh easterly winds.	0	15	8.3	57.2	E
24-Jan-15	Sat	Mainly fine. Moderate to fresh easterly winds.	0.9	17.1	10	72	E/SE
25-Jan-15	Sun	Fine. Very dry in the afternoon. Moderate easterly to northeasterly winds, occasionally fresh later.	Trace	19.7	18	76	E/SE
26-Jan-15	Mon	Sunny periods in the afternoon. Cloudy tonight. Fresh easterly winds.	0	19.8	7	77	E
27-Jan-15	Tue	Mainly fine. Moderate to fresh easterly winds.	0	19.1	7.5	78.2	E
28-Jan-15	Wed	Sunny periods in the afternoon. Cloudy tonight. Fresh easterly winds.	Trace	17.1	15.3	70.7	E
29-Jan-15	Thu	Mainly fine. Moderate to fresh easterly winds.	Trace	17.6	8.2	70	E
30-Jan-15	Fri	Mainly fine. Moderate to fresh easterly winds.	0	16	5.5	71.1	N/NW
31-Jan-15	Sat	Mainly fine. Moderate to fresh easterly winds.	Trace	13.4	4.5	80	N/NW

Appendix L

Waste Flow Table

Name of Department : CEDD

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

Appendix I - Monthly Summary Waste Flow Table for 2015

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

Month	Actual Quantities of Inert C&D Materials Generated / Imported (in '000 m3)						Actual Quantities of Other C&D Materials / Wastes Generated				
	Total Quantities Generated [a+b+c+d]	Broken Concrete (including rock for recycling into aggregates) (a)	Reused in the Contract (b)	Reused in Other Projects (c)	Disposed as Public Fill (d)	Imported C&D Material	Metal (in '000kg)	Paper/ Cardboard Packaging (in '000kg)	Plastic (bottles/containers, plastic sheets/ foams from package material) (in '000kg)	Chemical Waste (in '000kg)	Others (e.g. General Refuse etc.) (in '000m3)
January	66.2666	0.0000	0.0670	65.6529	0.5467	0.1150	0.0000	0.2500	0.0000	0.0000	0.0617
February	0.0000										
March	0.0000										
April	0.0000										
May	0.0000										
June	0.0000										
Half-year total	66.2666	0.0000	0.0670	65.6529	0.5467	0.1150	0.0000	0.2500	0.0000	0.0000	0.0617
July	0.0000										
August	0.0000										
September	0.0000										
October	0.0000										
November	0.0000										
December	0.0000										
Yearly Total	66.2666	0.0000	0.0670	65.6529	0.5467	0.1150	0.0000	0.2500	0.0000	0.0000	0.0617

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

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

Remark:

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

Monthly Summary Waste Flow Table for 2015 (year)

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper/ cardboard packaging	Plastics (see Note 3)	Chemical Waste	Others, e.g. general refuse
	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)
Jan	3.864	0.105	0.648	0.000	3.216	0.118	0.000	0.000	0.000	0.040	0.080
Feb											
Mar											
Apr											
May											
Jun											
Sub-total	3.864	0.105	0.648	0.000	3.216	0.118	0.000	0.000	0.000	0.040	0.080
Jul											
Aug											
Sep											
Oct											
Nov											
Dec											
Total	3.864	0.105	0.648	0.000	3.216	0.118	0.000	0.000	0.000	0.040	0.080

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

Name of Department: CEDD

Monthly Summary Waste Flow Table for 2015

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper/ cardboard packaging	Plastics	Chemical Waste	Others, e.g. general refuse
	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m ³)
JAN	0	0	0	0	0	33.3285	4.16	0	0	0	0.42
FEB											
MAR											
APRIL											
MAY											
JUN											
Sub Total	0	0	0	0	0	33.3285	4.16	0	0	0	0.42
JUL											
AUG											
SEP											
OCT											
NOV											
DEC											
Total	0	0	0	0	0	33.33	4.16	0	0	0	0.42

Notes:

Name of Department: CEDD

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

Notes:

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

Appendix M

**Implementation Schedule for
Environmental Mitigation Measures**

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to implement the measure?	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve?
Air Quality Impact (Construction)							
3.6.1.1	2.1	<p>General Dust Control Measures</p> <p>The following dust suppression measures should be implemented:</p> <ul style="list-style-type: none"> ■ Frequent water spraying for active construction areas (4 times per day for active areas in Po Kak Tsai and 8 times per day for all other active areas), including areas with heavy construction and slope cutting activities ■ 80% of stockpile areas should be covered by impervious sheets ■ Speed of trucks within the site should be controlled to about 10 km/hr ■ All haul roads within the site should be paved to avoid dust emission due to vehicular movement 	To minimize adverse dust emission generated from various construction activities of the works sites	Contractor	Construction Works Sites	During Construction	EIA Recommendation and Air Pollution Control (Construction Dust) Regulation
3.6.1.2	2.1	<p>Best Practice for Dust Control</p> <p>The relevant best practices for dust control as stipulated in the Air Pollution Control (Construction Dust) Regulation should be adopted to further reduce the construction dust impacts of the Project. These best practices include:</p> <p><i>Good site management</i></p> <ul style="list-style-type: none"> ■ The Contractor should maintain high standard of housekeeping to prevent emission of fugitive dust. ■ Loading, unloading, handling and storage of raw materials, wastes or by-products should be carried out in a manner so as to minimize the release of visible dust emission. ■ Any piles of materials accumulated on or around the work areas should be cleaned up regularly. ■ Cleaning, repair and maintenance of all plant facilities within the work areas should be carried out in a manner minimizing generation of fugitive dust emissions. ■ The material should be handled properly to prevent fugitive dust emission before cleaning. <p><i>Disturbed Parts of the Roads</i></p> <ul style="list-style-type: none"> ■ Each and every main temporary access should be paved with 	To minimize adverse dust emission generated from various construction activities of the works sites	Contractor	Construction Works Sites	During Construction	EIA Recommendation and Air Pollution Control (Construction Dust) Regulation

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

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

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

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

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

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

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

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

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

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

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

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