



JOB NO.: TCS00694/13

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

MONTHLY ENVIRONMENTAL MONITORING AND AUDIT
REPORT (NO.32) – MARCH 2016

PREPARED FOR
CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT
(CEDD)

Date	Reference No.	Prepared By	Certified By
14 April 2016	TCS00694/13/600/R0227v2	 Nicola Hon (Environmental Consultant)	 Tam Tak Wing (Environmental Team Leader)

Version	Date	Remarks
1	11 April 2016	First Submission
2	14 April 2016	Amended against the IEC's comments on 13 April 2016



Local People. Global Experience.

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

14 April 2016

Our ref: 7076192/ L20308/AB/AW/MC/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. 32) – March 2016

With reference to the Monthly EM&A Report No. 32 for March 2016 (Version 2) certified by the ET Leader, please be noted that we have no adverse comments on the captioned submission. We herewith verify the captioned submission in accordance with Condition 5.4 of the Environmental Permit No. EP-404/2011/C.

Thank you for your attention and please do not hesitate to contact the undersigned on tel. 3995-8120 or by email to antony.wong@smec.com; or our Mr Man CHEUNG on tel. 3995 8132 or by email to man.cheung@smec.com.

Yours faithfully
for and on behalf of
SMEC Asia Limited

Antony WONG
Independent Environmental Checker

cc	CEDD/BCP	-	Mr Desmond LAM	by fax: 3547 1659
	ArchSD	-	Mr William WL CHENG	by fax: 2804 6805
	AECOM	-	Mr Pat LAM / Mr Perry YAM	by email
	Ronald Lu	-	Mr Peter YAM / Mr Justin CHEUNG	by email
	SRJV	-	Mr Edwin AU	by email
	CW	-	Mr Daniel HO	by email
	DHK	-	Mr Edmond WONG	by email
	CCKJV	-	Mr Vincent CHAN	by email
	KRSJV	-	Mr TY LEUNG	by email
	Leighton	-	Mr Jon KITCHING	by email
	AUES	-	Mr TW TAM	by email

EXECUTIVE SUMMARY

ES01 This is the 32nd monthly EM&A report presenting the monitoring results and inspection findings for the reporting period from **1 to 31 March 2016** (hereinafter ‘the Reporting Period’).

ENVIRONMENTAL MONITORING AND AUDIT ACTIVITIES

ES02 To facilitate the project management and implementation, Liantang/Heung Yuen Wai Boundary Control Point and Associated Works of the Project is divided to six CEDD contracts including Contract 2 (CV/2012/08), Contract 3 (CV/2012/09), Contract 4 (TCSS), Contract 5 (CV/2013/03), Contract 6 (CV/2013/08) and Contract 7 (NE/2014/03) and an ArshSD contract (Contract SS C505).

ES03 In the Reporting Period, the construction works under Liantang/Heung Yuen Wai Boundary Control Point and Associated Works of the Project currently included Contract 2, Contract 3, Contract 5, Contract 6, Contract 7 and Contract SS C505. 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	9	156
	24-hour TSP	9	50
Construction Noise	L _{eq(30min)} Daytime	10	55
Water Quality	Water in-situ measurement and/or sampling	WM1 & WM1-C,	15 ^(*)
		WM2A & WM2A-C	13 ^(*)
		WM2B & WM2B-C	21 ^(*)
		WM3 & WM3-C	13 ^(*)
		WM4, WM4-CA & WM4-CB	13 ^(*)
Joint Site Inspection / Audit	IEC, ET, the Contractor and RE joint site Environmental Inspection and Auditing	Contract 2	4
		Contract 3	4
		Contract 5	5
		Contract 6	5
		Contract 7	5
		Contract SS C505	5

() Monitoring day (included additional monitoring day due to exceedance)*

BREACH OF ACTION AND LIMIT (A/L) LEVELS

ES04 In the Reporting Period, no air quality and construction noise exceedance was registered for the Project. For water quality monitoring, a total of forty-two (42) Action/ Limit Levels (AL/LL) exceedances, namely twenty (26) LL exceedances of turbidity and nineteen (19) AL/LL exceedances of Suspended Solids. The summary of exceedance in the Reporting Period is shown below.

Environmental Aspect	Monitoring Parameters	Action Level	Limit Level	Event & Action		
				NOE Issued	Investigation Result	Corrective Actions
Air Quality	1-hour TSP	0	0	0	--	--
	24-hour TSP	0	0	0	--	--
Construction Noise	L _{eq(30min)} Daytime	0	0	0	--	--
Water Quality	DO	0	0	0	--	--

Environmental Aspect	Monitoring Parameters	Action Level	Limit Level	Event & Action		
				NOE Issued	Investigation Result	Corrective Actions
	Turbidity	0	23	23	- Channel clearing was carried out on 5, 8, 9 and 10 March 2016 to remove the silt cumulated at the channel bed. The exceedances were due to insufficient mitigation measures during channel clearing.	- CCKJV should ensure the turbid water at the adjacent open channel was entirely blocked by the sand bag barrier or other means to prevent it flowing further downstream before carry out the channel cleaning.
	SS	1	18	19		

ENVIRONMENTAL COMPLAINT

- ES05 In this Reporting Period, one (1) documented environmental complaint was received for Contract 2 regarding generation of fugitive dust when heavy dump truck travelling along in Sha Tau Kok Road on 8 March 2016. Investigation report for complaint had conducted by ET and submitted to relevant parties.

NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTIONS

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

REPORTING CHANGE

- ES07 In the Reporting Period, the revised EM&A Programme was approved by EPD on 29 March 2016.

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 **4, 11, 18 and 24 March 2016**. 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 **7, 16, 21 and 30 March 2016**. 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 **1, 8, 15, 22 and 29 March 2016**. No non-compliance was noted.
- ES11 In the Reporting Period, joint site inspection to evaluate the site environmental performance at **Contract 6** has been carried out by the RE, IEC, ET and the Contractor on **3, 10, 17, 24 and 31 March 2016**. No non-compliance was noted.
- ES12 In the Reporting Period, joint site inspection to evaluate the site environmental performance at **Contract SS C505** has been carried out by the RE, IEC, ET and the Contractor on **2, 9, 16, 23 and 30 March 2016**. No non-compliance was noted.
- ES13 In the Reporting Period, joint site inspection to evaluate the site environmental performance at **Contract 7** has been carried out by the RE, IEC, ET and the Contractor on **1, 8, 15, 22 and 29 March 2016**. No non-compliance was noted.

FUTURE KEY ISSUES

- ES14 In upcoming wet season, preventive measures for muddy water or other water pollutants from site surface flow to local stream such as Kong Yiu Channel, Ma Wat Channel, Ping Yuen River or

public area would be the key issue. The Contractors should paid special attention on water quality mitigation measures and fully implement according ISEMM of the EM&A Manual, in particular for Contract 6.

- ES15 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.
- ES16 Since most of construction sites under the Project are located adjacent to villages, the Contractors should fully implement air quality mitigation measures to reduce construction dust emission.

Table of Contents

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	5
2.3	CONCURRENT PROJECTS	7
2.4	CONSTRUCTION PROGRESS	7
2.5	SUMMARY OF ENVIRONMENTAL SUBMISSIONS	9
3	SUMMARY OF IMPACT MONITORING REQUIREMENTS	13
3.1	GENERAL	13
3.2	MONITORING PARAMETERS	13
3.3	MONITORING LOCATIONS	13
3.4	MONITORING FREQUENCY AND PERIOD	15
3.5	MONITORING EQUIPMENT	16
3.6	MONITORING METHODOLOGY	18
3.7	EQUIPMENT CALIBRATION	20
3.8	DERIVATION OF ACTION/LIMIT (A/L) LEVELS	20
3.9	DATA MANAGEMENT AND DATA QA/QC CONTROL	21
4	AIR QUALITY MONITORING	22
4.1	GENERAL	22
4.2	AIR QUALITY MONITORING RESULTS IN REPORTING MONTH	22
5	CONSTRUCTION NOISE MONITORING	25
5.1	GENERAL	25
5.2	NOISE MONITORING RESULTS IN REPORTING MONTH	25
6	WATER QUALITY MONITORING	25
6.1	GENERAL	26
6.2	RESULTS OF WATER QUALITY MONITORING	26
7	WASTE MANAGEMENT	30
7.1	GENERAL WASTE MANAGEMENT	30
7.2	RECORDS OF WASTE QUANTITIES	30
8	SITE INSPECTION	31
8.1	REQUIREMENTS	31
8.2	FINDINGS / DEFICIENCIES DURING THE REPORTING MONTH	31
9	ENVIRONMENTAL COMPLAINT AND NON-COMPLIANCE	36
9.1	ENVIRONMENTAL COMPLAINT, SUMMONS AND PROSECUTION	36
10	IMPLEMENTATION STATUS OF MITIGATION MEASURES	39
10.1	GENERAL REQUIREMENTS	39
10.2	TENTATIVE CONSTRUCTION ACTIVITIES IN THE COMING MONTH	39
10.3	KEY ISSUES FOR THE COMING MONTH	41
11	CONCLUSIONS AND RECOMMENDATIONS	42
11.1	CONCLUSIONS	42
11.2	RECOMMENDATIONS	42

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 – AM4B
TABLE 4-5	SUMMARY OF 24-HOUR AND 1-HOUR TSP MONITORING RESULTS – AM5A
TABLE 4-6	SUMMARY OF 24-HOUR AND 1-HOUR TSP MONITORING RESULTS – AM6
TABLE 4-7	SUMMARY OF 24-HOUR AND 1-HOUR TSP MONITORING RESULTS – AM7A
TABLE 4-8	SUMMARY OF 24-HOUR AND 1-HOUR TSP MONITORING RESULTS – AM8
TABLE 4-9	SUMMARY OF 24-HOUR AND 1-HOUR TSP MONITORING RESULTS – AM9B
TABLE 5-1	SUMMARY OF CONSTRUCTION NOISE MONITORING RESULTS (CONTRACT 3 AND 5)
TABLE 5-2	SUMMARY OF CONSTRUCTION NOISE MONITORING RESULTS (CONTRACT 2 AND 6)
TABLE 6-1	SUMMARY OF WATER QUALITY MONITORING RESULTS FOR CONTRACT 2 AND 3
TABLE 6-2	SUMMARY OF WATER QUALITY MONITORING RESULTS FOR CONTRACT 5 AND SS C505
TABLE 6-3	SUMMARY OF WATER QUALITY MONITORING RESULTS FOR CONTRACT 6
TABLE 6-4	SUMMARY OF WATER QUALITY MONITORING RESULTS FOR CONTRACT 2 AND 6
TABLE 6-5	BREACHES OF WATER QUALITY MONITORING CRITERIA IN REPORTING PERIOD
TABLE 6-6	SUMMARY OF WATER QUALITY EXCEEDANCE IN THE 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 8-4	SITE OBSERVATIONS FOR CONTRACT 6
TABLE 8-5	SITE OBSERVATIONS FOR CONTRACT SS C505
TABLE 8-6	SITE OBSERVATIONS FOR CONTRACT 7
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
APPENDIX N	INVESTIGATION REPORT FOR EXCEEDANCE

1 INTRODUCTION

1.1 PROJECT BACKGROUND

- 1.1.1 Civil Engineering and Development Department is the Project Proponent and the Permit Holder of *Agreement No. CE 45/2008 (CE) Liantang / Heung Yuen Wai Boundary Control Point and Associated Works*, which is a Designated Project to be implemented under Environmental Permit number EP-404/2011/C granted on 12 March 2015.
- 1.1.2 The Project consists of two main components: Construction of a Boundary Control Point (hereinafter referred as “BCP”); and Construction of a connecting road alignment. Layout plan of the Project is shown in *Appendix A*.
- 1.1.3 The proposed BCP is located at the boundary with Shenzhen near the existing Chuk Yuen Village, comprising a main passenger building with passenger and cargo processing facilities and the associated customs, transport and ancillary facilities. The connecting road alignment consists of six main sections:
- 1) Lin Ma Hang to Frontier Closed Area (FCA) Boundary – this section comprises at-grade and viaducts and includes the improvement works at Lin Ma Hang Road;
 - 2) Ping Yeung to Wo Keng Shan – this section stretches from the Frontier Closed Area Boundary to the tunnel portal at Cheung Shan and comprises at-grade and viaducts including an interchange at Ping Yeung;
 - 3) North Tunnel – this section comprises the tunnel segment at Cheung Shan and includes a ventilation building at the portals on either end of the tunnel;
 - 4) Sha Tau Kok Road – this section stretches from the tunnel portal at Wo Keng Shan to the tunnel portal south of Loi Tung and comprises at-grade and viaducts including an interchange at Sha Tau Kok and an administration building;
 - 5) South Tunnel – this section comprises a tunnel segment that stretches from Loi Tung to Fanling and includes a ventilation building at the portals on either end of the tunnel as well as a ventilation building in the middle of the tunnel near Lau Shui Heung;
 - 6) Fanling – this section comprises the at-grade, viaducts and interchange connection to the existing Fanling Highway.
- 1.1.4 Action-United Environmental Services & Consulting has been commissioned as an Independent ET to implement the relevant EM&A program in accordance with the approved EM&A Manual, as well as the associated duties. As part of the EM&A program, the baseline monitoring has carried out between **13 June 2013** and **12 July 2013** for all parameters including air quality, noise and water quality before construction work commencement. The Baseline Monitoring Report summarized the key findings and the rationale behind determining a set of Action and Limit Levels (A/L Levels) from the baseline data. Also, the Project baseline monitoring report which verified by the IEC has been submitted to EPD on **16 July 2013** for endorsement. The major construction works of the Project was commenced on **16 August 2013** in accordance with the EP Section 5.3 stipulation.
- 1.1.5 This is **32nd** monthly EM&A report presenting the monitoring results and inspection findings for reporting period from **1** to **31 March 2016**.

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 (NE/2014/02)
- Contract 5 (CV/2013/03)
- Contract 6 (CV/2013/08)
- Contract 7 (NE/2014/03)
- ArchSD Contract No. SS C505

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

Contract 2 (CV/2012/08)

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

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

Contract 3 (CV/2012/09)

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

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

Contract 4 (NE/2014/02)

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

Contract 5 (CV/2013/03)

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

- site formation of about 23 hectares of land for the development of the BCP;

- construction of an approximately 1.6 km long perimeter road at the BCP including a 175m long depressed road;
- associated diversion/modification works at existing local roads and junctions including Lin Ma Hang Road;
- construction of pedestrian subway linking the BCP to Lin Ma Hang Road;
- provision of resite area with supporting infrastructure for reprovisioning of the affected village houses; and
- construction of associated footpath, slopes, retaining structures, drainage, sewerage, waterworks, landscaping works and other ancillary works.

Contract 6 (CV/2013/08)

2.1.7 Contract 6 has awarded in June 2015 and construction work was commenced on 23 October 2015. Major Scope of Work of the Contract 6 would be included below:

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

Contract 7 (NE/2014/03)

2.1.8 Contract 7 has awarded in December 2015 and the construction works of Contract 7 was commenced on 15 February 2016. Major Scope of Work of the Contract 7 would be included below:

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

ArchSD Contract No. SS C505

2.1.9 SS C505 has awarded in July 2015 and construction work was commenced on 1 September 2015. Major Scope of Work of the SS C505 would be included below:

- passenger-related facilities including processing kiosks and examination facilities for private cars and coaches, passenger clearance building and halls, the interior fitting works for the pedestrian bridge crossing Shenzhen River, etc.;
- cargo processing facilities including kiosks for clearance of goods vehicles, customs inspection platforms, X-ray building, etc.;
- accommodation for the facilities inside of the Government departments providing services in connection with the BCP;
- transport-related facilities inside the BCP including road networks, public transport interchange, transport drop-off and pick-up areas, vehicle holding areas and associated road furniture etc;
- a public carpark; and
- other ancillary facilities such as sewerage and drainage, building services provisions and electronic systems, associated environmental mitigation measure and landscape 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.

Architectural Services Department (ArchSD)

2.2.3 ArchSD acts as the works agent for Development Bureau (DEVB), for Contract SS C505 Liantang/ Heung Yuen Wai Boundary Control Point (BCP) – BCP Buildings and Associated Facilities.

Environmental Protection Department (EPD)

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

Ronald Lu & Partners (Hong Kong) Ltd (The Architect)

2.2.5 Ronald Lu & Partners (Hong Kong) Ltd is appointed by ArchSD as an Architect for Contract SS C505 Liantang/ Heung Yuen Wai Boundary Control Point (BCP) – BCP Buildings and Associated Facilities. It responsible for overseeing the construction works of Contract SS C505 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 Architect 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' and ET'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.

Engineer or Engineers Representative (ER)

2.2.6 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)

- 2.2.7 There will be one contractor for each individual works contract. Once the contractors are appointed, EPD, ET and IEC will be notified the details of the contractor.
- 2.2.8 The Contractor for Contracts under CEDD should report to the ER. For ArchSD Contract, the Contractor should report to the Architect or Architect's Representative (AR). 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)

- 2.2.9 Once the ET is appointed, the EPD, CEDD, ER, Architect and IEC will be notified the details of the ET.
- 2.2.10 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 Architect, the IEC and Contractor 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)

- 2.2.11 One IEC will be employed for this Project. Once the IEC is appointed, EPD, ER, the Architect and ET will be notified the details of the IEC.
- 2.2.12 The Independent Environmental Checker (IEC) should not be in any way an associated body of the Contractor 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 appointment of IEC should be subject to the approval of EPD. The IEC should:
- 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
 - Verify the log-book(s) mentioned in Condition 2.2 of the EP, notify the Director by fax, within one working day of receipt of notification from the ET Leader of each and every occurrence, change of circumstances or non-compliance with the EIA Report and/or the EP, which might affect the monitoring or control of adverse environmental impacts from the Project
 - 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, the Architect, ET, IEC and the Contractor of the concurrent projects as listed under Section 2.3 below regarding the cumulative impact issues.

2.3 CONCURRENT PROJECTS

- 2.3.1 The concurrent construction works that may be carried out include, but not limited to, the following:
- (a) Regulation of Shenzhen River Stage IV;
 - (b) Widening of Fanling Highway – Tai Hang to Wo Hop Shek Interchange – Contract No. HY/2012/06;
 - (c) 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, 5, 6, 7 and SS C505 and they are summarized in below. Moreover, the 3-month rolling construction program of the Contracts 2, 3, 5, 6 and SS C505 and initial construction program for Contract 7 are enclosed in **Appendix C**.

Contract 2 (CV/2012/08)

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

Mid-Vent Portal	•	Tube excavation (NB + SB)
	•	Adit invert slab
	•	Ventilation building superstructure
North Portal	•	Slope stabilization and retaining wall
	•	Northbound top heading excavation and tunnel enlargement
	•	Tunnel Boring Machine (TBM) excavation
South Portal	•	Southbound and Northbound Drill and Blast (D&B) excavation
	•	Building works foundation and substructure
Admin Building	•	Building works foundation

Contract 3 (CV/2012/09)

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

- Cable detection and trial trenches
- FRP Lining on existing water main
- Filling works at Tong Hang East
- Storm drain laying
- Noise barrier construction
- Pier / pier table construction
- Pile cap works
- Portal beam construction
- Pre-drilling
- Retaining Wall construction
- Road works at Fanling Highway
- Sewer works
- Tree felling works
- Utilities duct laying
- Viaduct segment erection
- Slope works
- Waterworks

Contract 4 (Contract number to be assigned)

2.4.4 The contract has not yet been awarded.

Contract 5 (CV/2013/03)

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

- Construction of rising main (VO61) at existing Lin Ma Hang (LMH) Road
- Drainage works of Depressed Road at BCP3
- Additional works (Access Works) for Village House at RS4
- Drainage works at existing LMH Road
- Brick laying at footpath of proposed LMH road
- Preparation works for planting at proposed LMH road
- Installation of Underground Utility (UU) at proposed and existing LMH road
- Irrigation at proposed LMH Road
- Water works at existing LMH Road
- Bituminous laying at L15 road existing & proposed LMH road

Contract 6 (CV/2013/08)

2.4.6 Contract 6 has awarded in June 2015 and construction work was commenced on 23 October 2015. In this Reporting Period, construction activities conducted are listed below:

- Site Clearance

- Slope Works
- Site Accesses Construction
- Ground Investigation (GI) Works
- Soil nail
- Bored piling
- H-piling
- Pile cap construction
- Road surfacing

Contract 7 (NE/2014/03)

- 2.4.7 Contract 7 has awarded in December 2015 and construction work was commenced on 15 February 2015. In this Reporting Period, construction activities conducted are listed below:
- Erection of Engineer's Site Office
 - Ground Investigation Works for Bridge A-E
 - Piling Works for Bridge B-D

Contract SS C505

- 2.4.8 Contract SS C505 has awarded in July 2015 and construction work was commenced on 1 September 2015. In this Reporting Period, construction activities conducted are listed below:
- General Site Setup
 - Building no. 5 and 9 construction
 - Assembly of Crawler Crane
 - H-pile works
 - Tower crane construction
 - Erection of Welfare Shelter
 - Underground drainage works
 - Column and conduit works
 - Weighbridge works
 - Prototype "A" Construction works
 - Mock Up Curtain Wall works
 - Pile Cap construction
 - Bored Pile works and pre-drill works
 - Bridge construction works

2.5 SUMMARY OF ENVIRONMENTAL SUBMISSIONS

- 2.5.1 In according to the EP, the required documents have submitted to EPD which listed in below:
- Project Layout Plans of Contracts 2, 3, 5, 6, 7 and SS C505
 - Landscape Plan
 - Topsoil Management Plan
 - Environmental Monitoring and Audit Programme
 - Baseline Monitoring Report (TCS00690/13/600/R0030v3) for the Project
 - Waste Management Plan of the Contracts 2, 3, 5, 6 and SS C505
 - Contamination Assessment Plan (CAP) for Po Kat Tsai, Loi Tung and the workshops in Fanling
 - Contamination Assessment Report (CAR) for Po Kat Tsai, Loi Tung and the workshops in Fanling
 - Vegetation Survey Report
 - Woodland Compensation Plan
 - Habitat Creation Management Plan
 - Wetland Compensation Plan
- 2.5.2 Summary of the relevant permits, licenses, and/or notifications on environmental protection for the Project of each contracts are presented in **Table 2-1**.

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

Item	Description	License/Permit Status		
		Ref. no.	Effective Date	Expiry Date
Contract 2				
1	Air pollution Control (Construction Dust) Regulation	Ref No.: 368864	31 Dec 2013	Till Contract ends
2	Chemical Waste Producer Registration	<i>North Portal</i> Waste Producers Number: No.5213-652-D2523-01	25 Mar 2014	Till Contract ends
		<i>Mid-Vent Portal</i> Waste Producers Number: No.5213-634-D2524-01	25 Mar 2014	Till Contract ends
		<i>South Portal</i> Waste Producers Number: No.5213-634-D2526-01	9 Apr 2014	Till Contract ends
3	Water Pollution Control Ordinance - Discharge License	No. WT00018374-2014	3 Mar 2014	28 Feb 2019
		No.: W5/11389	28 Mar 2014	31 Mar 2019
		No.: W5/11390	19 June 2014	31 Mar 2019
		No. WT00023063-2015	18 Dec 2015	31 Mar 2019.
4	Waste Disposal Regulation - Billing Account for Disposal of Construction Waste	No.: W5/11392	28 Mar 2014	31 Mar 2019
		Account No. 7019105	8 Jan 2014	Till Contract ends
5	Construction Noise Permit	GW-RN0738-15	18 Nov 2015	8 May 2016
		GW-RN0795-15	7 Dec 2015	6 Jun 2016
		GW-RN0893-15	01-Jan-2016	27-Jun-2016
		GW-RN0057-16	28-Feb-2016	27-May-2016
		GW-RN0059-16	24-Feb-2016	23-Apr-2016
		GW-RN0067-16	28-Feb-2016	27-May-2016
		GW-RN0068-16	23-Feb-2016	22-Apr-2016
		GW-RN0071-16	02-Feb-16	31-Jul-2016
		GW-RN0077-16	07-Feb-2016	06-Aug-2016
		GW-RN0167-16	18-Mar-2016	17-May-2016
GW-RN0199-16	24-Mar-2016	17-Sep-2016		
Contract 3				
1	Air pollution Control (Construction Dust) Regulation	Ref. No: 362101	17 Jul 2013	Till Contract ends
2	Chemical Waste Producer Registration	Waste Producers Number: No.:5113-634-C3817-01	7 Oct 2013	Till Contract ends
3	Water Pollution Control Ordinance - Discharge License	No.:WT00016832 – 2013	28 Aug 13	31 Aug 2018
4	Waste Disposal Regulation - Billing Account for Disposal	Account No. 7017914	2 Aug 13	Till Contract ends

Item	Description	License/Permit Status		
		Ref. no.	Effective Date	Expiry Date
	of Construction Waste			
5	Construction Noise Permit	GW-RN0892-15	9 Jan 2016	8 July 2016
		GW-RN0064-16	16 Feb 2016	13 Aug 2016
		GW-RN0086-16	16 Feb 2016	7 May 2016
		GW-RN0094-16	6 Mar 2016	22 May 2016
		GW-RN0096-16	6 Mar 2016	12 Jun 2016
		GW-RN0097-16	1 Mar 2016	17 Jun 2016
		GW-RN0098-16	1 Mar 2016	4 Sep 2016
		GW-RN0111-16	1 Mar 2016	30 Apr 2016
		GW-RN0113-16	25 Feb 2016	24 Aug 2016
		GW-RN0115-16	1 Mar 2016	7 May 2016
		GW-RN0139-16	2 Mar 2016	24 Aug 2016
		GW-RN0140-16	2 Mar 2016	24 Aug 2016
		GW-RN0157-16	8 Mar 2016	7 Jun 2016
		GW-RN0158-16	8 Mar 2016	31 Aug 2016
		GW-RN0164-16	16 Mar 2016	31 Mar 2016
		GW-RN0168-16	15 Mar 2016	14 Sep 2016
		GW-RN0169-16	15 Mar 2016	14 Jun 2016
		GW-RN0170-16	11 Mar 2016	10 Sep 2016
GW-RN0172-16	29 Mar 2016	8 Apr 2016		
GW-RN0218-16	6 April 2016	30 Sep 2016		
Contract 5				
1	Air pollution Control (Construction Dust) Regulation	Ref. No: 359338	13 May 2013	Till the end of Contract
2	Chemical Waste Producer Registration	Waste Producers Number No.: 5213-642-S3735-01	8 Jun 2013	Till the end of Contract
3	Water Pollution Control Ordinance - Discharge License	No.: W5/1G44/1	8 Jun 13	30 Jun 2018
4	Waste Disposal Regulation - Billing Account for Disposal of Construction Waste	Account No. 7017351	29 Apr 13	Till the end of Contract
Contract 6				
1	Air pollution Control (Construction Dust) Regulation	Ref. No: 390614	29 Jun 2015	Till the end of Contract
2	Chemical Waste Producer Registration	Waste Producers Number No.: 5213-652-C3969-01	31 Aug 2015	Till the end of Contract
3	Waste Disposal Regulation - Billing Account for Disposal of Construction Waste	Account No. 7022707	9 Jul 2015	Till the end of Contract

Item	Description	License/Permit Status		
		Ref. no.	Effective Date	Expiry Date
4	Water Pollution Control Ordinance - Discharge License	Application is processing by EPD		
5	Construction Noise Permit	GW-RN0681-15	26 Oct 2015	25 Apr 2016
6	Construction Noise Permit	GW-RN0683-15	26 Oct 2015	25 Apr 2016
Contract SS C505				
1	Air pollution Control (Construction Dust) Regulation	Ref. No: 390974	13 Jul 2015	Till the end of Contract
2	Chemical Waste Producer Registration	Waste Producer No.: 5213-642-L1048-07	16 Sep 2015	Till the end of Contract
3	Water Pollution Control Ordinance - Discharge License	No.: WT00022774-2015	17 Nov 2015	30 Nov 2020
4	Waste Disposal Regulation - Billing Account for Disposal of Construction Waste	Account No. 7022831	23 Jul 2015	Till the end of Contract
5	Construction Noise Permit	PP-RN0027-15	5 Oct 2015	2 Apr 2016
		PP-RN0002-16	23 Jan 2016	22 Mar 2016
		PP-RN0007-16	10 Mar 2016	9 May 2016
		GW-RN0023-16	23 Jan 2016	22 Mar 2016
		GW-RN0197-16	23 Jan 2016	22 May 216
		GW-RN0209-16	23 Jan 2016	22 May 216
Contract 7				
1	Air pollution Control (Construction Dust) Regulation	Ref. No: 397015	21 Dec 2015	Till the end of Contract
2	Chemical Waste Producer Registration	Application is processing by EPD		
3	Water Pollution Control Ordinance - Discharge License	Application is processing by EPD		
4	Waste Disposal Regulation - Billing Account for Disposal of Construction Waste	Account No. 7024129	21 Jan 2016	Till the end of Contract
5	Construction Noise Permit	GW-RN0162-16	23 Mar 2016	22 May 2016

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
AM1b^	Open area at Tsung Yuen Ha Village	BCP	SS C505 Contract 5 Contract 7
AM2	Village House near Lin Ma Hang Road	LMH to Frontier Closed Area	Contract 5 Contract 6

Station ID	Description	Works Area	Related to the Work Contract
AM3	Ta Kwu Ling Fire Service Station of Ta Kwu Ling Village.	LMH to Frontier Closed Area	Contract 5 Contract 6
AM4b [^]	House no. 10B1 Nga Yiu Ha Village	LMH to Frontier Closed Area	Contract 6
AM5a [^]	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 Contract 6
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).

[^] Proposal for change of air quality monitoring locations was enclosed in the updated EM&A Programme which approval by EPD on 29 Mar 2016.

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	SS C505 Contract 5 Contract 7
NM2	Village House near Lin Ma Hang Road	Lin Ma Hang to Frontier Closed Area	Contract 5, Contract 6
NM3	Ping Yeung Village House (facade facing northeast)	Ping Yeung to Wo Keng Shan	Contract 6
NM4	Wo Keng Shan Village House	Ping Yeung to Wo Keng Shan	Contract 6
NM5	Village House, Loi Tung	Sha Tau Kok Road	Contract 2, Contract 6
NM6	Tai Tong Wu Village House 2	Sha Tau Kok Road	Contract 2, Contract 6
NM7	Po Kat Tsai Village	Po Kat Tsai	Contract 2
NM8	Village House, Tong Hang	Fanling	Contract 2 Contract 3
NM9	Village House, Kiu Tau Village	Fanling	Contract 3
NM10	Nam Wa Po Village House No. 80	Fanling	Contract 3

Table 3-4 Impact Monitoring Stations - Water Quality

Station ID	Description	Coordinates of Designated / Alternative Location		Nature of the location	Related to the Work Contract
WM1	Downstream of Kong Yiu Channel	833 679	845 421	Alternative location located at upstream 51m of the designated location	SS C505 Contract 5 Contract 6
WM1-	Upstream of	834 185	845 917	NA	SS C505

Station ID	Description	Coordinates of Designated / Alternative Location		Nature of the location	Related to the Work Contract
Control	Kong Yiu Channel				Contract 5 Contract 6
WM2A	Downstream of River Ganges	834 204	844 471	Alternative location located at downstream 81m of the designated location	Contract 6
WM2A-Controlx #	Upstream of River Ganges	835 377	844 188	Alternative location located at upstream 160m 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
WM3x #	Downstream of River Indus	836 206	842 270	Alternative location located at downstream 180m of the designated location	Contract 2 Contract 6
WM3-Control	Upstream of River Indus	836 763	842 400	Alternative location located at downstream 26m of the designated location	Contract 2 Contract 6
WM4	Downstream of Ma Wat Channel	833 850	838 338	Alternative location located at upstream 11m of the designated location	Contract 2 Contract 3
WM4-Control A	Kau Lung Hang Stream	834 028	837 695	Alternative location located at downstream 28m of the designated location	Contract 2 Contract 3
WM4-Control B	Upstream of Ma Wat Channel	833760	837395	Alternative location located at upstream 15m of the designated location	Contract 2 Contract 3

Proposal for change of water quality monitoring location from are enclosed in the updated EM&A Programme which approval by EPD on 29 Mar 2016.

3.4 MONITORING FREQUENCY AND PERIOD

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

Air Quality Monitoring

3.4.1 Frequency of impact air quality monitoring is as follows:

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

Noise Monitoring

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

Water Quality Monitoring

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

3.5 MONITORING EQUIPMENT

Air Quality Monitoring

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

Table 3-5 Air Quality Monitoring Equipment

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

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

Wind Data Monitoring Equipment

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

Noise Monitoring

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

speed shall be checked with a portable wind speed meter capable of measuring the wind speed in m/s.

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

Table 3-6 Construction Noise Monitoring Equipment

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

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

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

Water Quality Monitoring

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

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

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

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

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

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

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

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

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

Table 3-7 Water Quality Monitoring Equipment

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

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

3.6 MONITORING METHODOLOGY

1-hour TSP Monitoring

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

- (a.) A pump to draw sample aerosol through the optic chamber where TSP is measured;
- (b.) A sheath air system to isolate the aerosol in the chamber to keep the optics clean for maximum reliability; and
- (c.) A built-in data logger compatible with Windows based program to facilitate data collection, analysis and reporting.

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

24-hour TSP Monitoring

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

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

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

3.6.5 24-hour TSP is collected by the ET on filters of HVS and quantified by a local HOKLAS accredited laboratory, ALS Technichem (HK) Pty Ltd (ALS), upon receipt of the samples. The ET keep all the sampled 24-hour TSP filters in normal air conditioned room conditions, i.e. 70% RH (Relative Humidity) and 25°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}). $L_{eq(30min)}$ in six consecutive $L_{eq(5min)}$ measurements will use as the monitoring parameter for the time period between 0700-1900 hours on weekdays; and also $L_{eq(15min)}$ in three consecutive $L_{eq(5min)}$ measurements would be used as monitoring parameter for other time periods (e.g. during restricted hours), if necessary.
- 3.6.8 Prior of noise measurement, the accuracy of the sound level meter is checked using an acoustic calibrator generating a known sound pressure level at a known frequency. The checking is performed before and after the noise measurement.

Water Quality

- 3.6.9 Water quality monitoring is conducted at the designated locations. The sampling procedures 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 or tape measurement is used for the determination of water depth at each station. At each station, water sample would be collected from 0.1m below water surface or the water surface to prevent the river bed sediment for stirring.
- 3.6.11 The sample container will be rinsed with a portion of the water sample. The water sample then will be transferred to the high-density polythene bottles as provided by the laboratory, labeled with a unique sample number and sealed with a screw cap.
- 3.6.12 Before sampling, general information such as the date and time of sampling, weather condition as well as the personnel responsible for the monitoring would be recorded on the field data sheet.
- 3.6.13 A 'Willow' 33-liter plastic cool box packed with ice will be used to preserve the water samples prior to arrival at the laboratory for chemical determination. The water temperature of the cool box is maintained at a temperature as close to 4°C as possible without being frozen. Samples collected are delivered to the laboratory upon collection.

In-situ Measurement

- 3.6.14 YSI PRO20 Handheld Dissolved Oxygen Instrument or YSI Professional DSS 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 or YSI Professional DSS 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 or YSI Professional DSS 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
AM1b	265	143	500	260
AM2	268	149		
AM3	269	145		
AM4b	267	148		
AM5a	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	Monitoring Location
-----------	-------------	---------------------

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

Remarks:

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

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

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

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

3.9 DATA MANAGEMENT AND DATA QA/QC CONTROL

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

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

4 AIR QUALITY MONITORING**4.1 GENERAL**

4.1.1 In the Reporting Period, construction works under the project have been commenced in Contracts 2, 3, 5, 6, 7 and Contract SS C505 and air quality monitoring was performed at all designated locations.

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 **156** events of 1-hour TSP and **50** events 24-hours TSP monitoring were carried out and the monitoring results are summarized in *Tables 4-1 to 4-9*. 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 – AM1b

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-Mar-16	105	1-Mar-16	11:42	207	168	156
11-Mar-16	32	7-Mar-16	12:05	180	113	88
17-Mar-16	17	12-Mar-16	10:01	24	22	26
23-Mar-16	27	18-Mar-16	9:30	76	69	67
29-Mar-16	61	24-Mar-16	13:01	49	43	40
		30-Mar-16	13:40	71	65	62
Average (Range)	48 (17 – 105)	Average (Range)		85 (22 – 207)		

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-Mar-16	87	1-Mar-16	11:22	220	179	169
11-Mar-16	90	7-Mar-16	12:21	175	91	67
17-Mar-16	38	12-Mar-16	10:11	28	27	32
23-Mar-16	51	18-Mar-16	9:39	71	65	62
29-Mar-16	94	24-Mar-16	13:05	62	65	60
		30-Mar-16	13:27	79	82	78
Average (Range)	72 (38 – 94)	Average (Range)		90 (27 – 220)		

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-Mar-16	74	1-Mar-16	11:03	236	222	192
11-Mar-16	99	7-Mar-16	11:40	155	113	85
17-Mar-16	28	12-Mar-16	10:15	64	43	43
23-Mar-16	31	18-Mar-16	9:45	67	60	58
29-Mar-16	112	24-Mar-16	13:11	44	41	38
		30-Mar-16	13:13	60	56	53
Average (Range)	69 (31 – 112)	Average (Range)		91 (38 – 236)		

Table 4-4 Summary of 24-hour and 1-hour TSP Monitoring Results – AM4b

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
3-Mar-16	69	4-Mar-16	10:01	84	74	62
9-Mar-16	34	10-Mar-16	13:00	15	14	17
15-Mar-16	71	16-Mar-16	9:31	95	88	67
19-Mar-16	59	21-Mar-16	9:58	47	41	38
24-Mar-16	27	23-Mar-16	9:31	56	49	47
30-Mar-16	115	29-Mar-16	9:41	60	54	51
Average (Range)	63 (27 – 115)	Average (Range)		53 (14 – 95)		

Table 4-5 Summary of 24-hour and 1-hour TSP Monitoring Results – AM5a

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
3-Mar-16	64	4-Mar-16	10:11	79	69	62
9-Mar-16	35	10-Mar-16	13:05	10	7	22
15-Mar-16	59	16-Mar-16	9:44	69	53	57
19-Mar-16	46	21-Mar-16	10:04	60	54	51
24-Mar-16	30	23-Mar-16	9:37	73	76	71
30-Mar-16	82	29-Mar-16	9:37	68	71	67
Average (Range)	52 (30 – 82)	Average (Range)		57 (7 – 79)		

Table 4-6 Summary of 24-hour and 1-hour TSP Monitoring Results – AM6

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
3-Mar-16	117	4-Mar-16	11:01	71	61	53
9-Mar-16	51	10-Mar-16	13:14	14	9	13
15-Mar-16	123	16-Mar-16	9:22	66	59	48
19-Mar-16	86	21-Mar-16	10:14	43	36	34
24-Mar-16	29	23-Mar-16	9:49	53	49	47
30-Mar-16	127	29-Mar-16	9:33	53	49	47
Average (Range)	88 (29 – 127)	Average (Range)		45 (9 – 71)		

Table 4-7 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
4-Mar-16	41	5-Mar-16	9:26	95	57	52
10-Mar-16	22	11-Mar-16	9:09	89	67	79
16-Mar-16	57	17-Mar-16	10:04	38	32	29
22-Mar-16	30	23-Mar-16	14:09	60	54	51
24-Mar-16	28	29-Mar-16	13:01	65	58	56
30-Mar-16	130					
Average (Range)	51 (22 – 130)	Average (Range)		59 (29 – 95)		

Table 4-8 Summary of 24-hour and 1-hour TSP Monitoring Results – AM8

Date	24-hour TSP (µg/m ³)	1-hour TSP (µg/m ³)				
		Date	Start Time	1 st reading	2 nd reading	3 rd reading
4-Mar-16	28	5-Mar-16	10:14	75	66	60
10-Mar-16	34	11-Mar-16	13:01	81	60	77
16-Mar-16	19	17-Mar-16	10:05	43	36	34
22-Mar-16	22	23-Mar-16	14:21	68	71	67
24-Mar-16	19	29-Mar-16	13:17	73	76	71
30-Mar-16	70					
Average (Range)	32 (19 – 70)	Average (Range)		64 (34 – 81)		

Table 4-9 Summary of 24-hour and 1-hour TSP Monitoring Results – AM9b

Date	24-hour TSP (µg/m ³)	1-hour TSP (µg/m ³)				
		Date	Start Time	1 st reading	2 nd reading	3 rd reading
5-Mar-16	35	1-Mar-16	11:03	125	115	116
11-Mar-16	25	7-Mar-16	9:14	115	114	122
17-Mar-16	23	12-Mar-16	9:11	64	54	44
23-Mar-16	38	18-Mar-16	9:23	181	141	145
29-Mar-16	65	24-Mar-16	13:09	74	64	69
		30-Mar-16	9:31	69	63	60
Average (Range)	37 (23 – 65)	Average (Range)		96 (44 – 181)		

4.2.2 As shown in *Tables 4-1 to 4-9*, all the 1-hour TSP and 24-hour TSP monitoring results were below the Action/Limit Levels. No Notification of Exceedance (NOE) was issued in this Reporting Period.

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

5 CONSTRUCTION NOISE MONITORING

5.1 GENERAL

5.1.1 In the Reporting Period, construction works under the project have been commenced in Contracts 2, 3, 5, 6, 7 and Contract SS C505 and noise monitoring was performed at all designated locations.

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 **55** 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, NM3, NM4, 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 and façade correction (+3 dB(A)) has added according to the requirement in this month. The noise monitoring results at the designated locations are summarized in *Tables 5-1 and 5-2*. The detailed noise monitoring data are presented in *Appendix I* and the relevant graphical plots are shown in *Appendix J*.

Table 5-1 Summary of Construction Noise Monitoring Results

Construction Noise Level ($L_{eq30min}$), dB(A)					
Date	NM1	NM2	NM8	NM9	NM10 ^(*)
1-Mar-16	55	61	63	61	60
7-Mar-16	55	68	54	60	61
12-Mar-16	64	62	56	60	63
18-Mar-16	66	64	56	61	67
24-Mar-16	54	56	60	56	62
30-Mar-16	64	60	63	63	61
Limit Level	75 dB(A)				

Remarks

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

i bold and underlined indicated Limit Level exceedance.

Table 5-2 Summary of Construction Noise Monitoring Results

Construction Noise Level ($L_{eq30min}$), dB(A)					
Date	NM3	NM4	NM5	NM6	NM7
5-Mar-16	58	64	52	53	60
10-Mar-16	61	64	62	59	65
16-Mar-16	63	57	51	60	59
21-Mar-16	62	63	53	61	59
29-Mar-16	61	61	51	61	63
Limit Level	75 dB(A)				

5.2.2 As shown in *Tables 5-1 and 5-2*, the noise level measured at all designated monitoring locations were below 75dB(A). Furthermore, there was no noise complaints (Action Level exceedance) received by the RE, CEDD, Architect/AR/ and the Contractors 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 2, 3, 5, 6, 7 and Contract SS C505 and water quality monitoring was performed at all designated locations. 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 twelve (12) sampling days was scheduled to carry out for all designated locations with their control stations, except for thirteen (13) sampling days for WM4 and its control station. Since water quality exceedances were recorded, one (1) additional day water quality monitoring were conducted at WM2A, WM3 and WM4 and three (3) and nine (9) additional day water quality monitoring were conducted at WM1 and WM2B respectively and their control stations in accordance with “*Event and Action Plan*”.

6.2.2 The key monitoring parameters including Dissolved Oxygen, Turbidity and Suspended Solids are summarized in *Tables 6-1 to 6-5*. Breaches of water quality monitoring criteria are shown in *Table 6-6*. 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 Water Quality Monitoring Results Associated of Contracts 2 and 3

Date	Dissolved Oxygen (mg/L)			Turbidity (NTU)			Suspended Solids (mg/L)		
	WM4	WM4-CA	WM4-CB	WM4	WM4-CA	WM4-CB	WM4	WM4-CA	WM4-CB
2-Mar-16	5.6	6.6	5.1	29.1	90.5	13.1	24.5	33.5	9.0
4-Mar-16	7.7	8.6	7.1	26.8	14.9	15.1	18.5	5.0	13.5
7-Mar-16	5.1	6.3	4.2	20.5	11.2	33.3	26.5	8.5	42.0
9-Mar-16	4.8	4.9	4.1	20.7	11.5	45.2	19.5	9.0	33.0
11-Mar-16	9.7	10.4	7.5	27.8	28.4	22.0	18.5	11.5	20.0
14-Mar-16	8.3	9.5	6.5	21.8	14.6	20.6	17.0	6.5	29.0
16-Mar-16	7.4	9.4	6.0	34.7	over range	37.6	29.0	50.5	51.0
18-Mar-16	7.1	7.8	5.8	23.2	29.0	29.9	21.5	14.5	25.5
21-Mar-16	7.6	8.6	7.3	<u>89.1</u>	25.7	49.1	<u>70.5</u>	20.5	35.5
22-Mar-16#	--	--	--	35.1	20.4	30.5	20.0	9.0	18.0
23-Mar-16	7.4	8.3	5.9	33.1	18.6	28.6	24.0	7.5	26.0
25-Mar-16	9.4	8.2	8.5	16.5	8.2	16.8	12.0	3.5	15.5
29-Mar-16	8.3	8.9	7.1	39.0	127.0	44.7	29.0	86.5	25.0
31-Mar-16	7.9	9.3	6.8	15.7	6.8	19.3	28.0	7.5	42.5

Remarks: (i) *bold with underline indicated Limit Level exceedance*
Additional water quality monitoring at the exceeded location(s) due to two consecutive monitoring days indicated Limit Level exceedance.

Table 6-2 Water Quality Monitoring Results Associated of Contracts 5, 6 and SS C505

Date	Dissolved Oxygen (mg/L)		Turbidity (NTU)		Suspended Solids (mg/L)	
	WM1	WM1-Control	WM1	WM1-Control	WM1	WM1-Control
2-Mar-16	8.6	10.2	31.1	11.6	37.5	4.5
4-Mar-16	8.0	9.4	<u>146.0</u>	9.1	<u>185.5</u>	2.5
5-Mar-16#	--	--	31.2	11.2	23.0	5.0
7-Mar-16	4.9	7.4	38.1	11.6	25.5	9.0
9-Mar-16	5.2	6.7	<u>82.7</u>	23.0	51.0	11.0
10-Mar-16#	--	--	<u>352.0</u>	47.2	<u>196.0</u>	35.0
11-Mar-16	8.6	9.2	28.0	8.1	6.5	42.5
12-Mar-16#	--	--	28.1	10.3	26.0	5.0
14-Mar-16	7.8	9.2	47.4	41.1	27.5	23.5

Date	Dissolved Oxygen (mg/L)		Turbidity (NTU)		Suspended Solids (mg/L)	
	WM1	WM1-Control	WM1	WM1-Control	WM1	WM1-Control
16-Mar-16	8.2	8.4	38.8	13.1	42.0	9.0
18-Mar-16	6.9	7.3	30.0	12.3	17.0	6.5
21-Mar-16	8.0	8.2	367.0	389.0	206.0	193.5
23-Mar-16	8.0	7.7	47.5	33.4	37.5	23.0
29-Mar-16	9.0	8.9	94.0	92.6	71.5	97.0
31-Mar-16	8.2	8.8	25.9	10.6	29.5	7.0

Remarks: (ii) *bold with underline indicated Limit Level exceedance*
 # *Additional water quality monitoring at the exceeded location(s) due to two consecutive monitoring days indicated Limit Level exceedance.*

Table 6-3 Water Quality Monitoring Results Associated only Contract 6

Date	Dissolved Oxygen (mg/L)				Turbidity (NTU)				Suspended Solids (mg/L)			
	WM2A	WM2A-C	WM2B	WM2B-C	WM2A	WM2A-C	WM2B	WM2B-C	WM2A	WM2A-C	WM2B	WM2B-C
2-Mar-16	9.7	8.6	7.8	6.4	9.8	9.4	<u>over range</u>	3.5	5.5	<2	<u>1355.0</u>	2.0
3-Mar-16#	--	--	--	--	--	--	<u>20.7</u>	3.9	--	--	<u>21.0</u>	3.0
4-Mar-16	9.0	8.0	8.1	7.5	4.9	21.8	<u>24.1</u>	9.5	2.0	12.0	10.5	<2
5-Mar-16#	--	--	--	--	--	--	<u>40.2</u>	2.6	--	--	10.0	<2
7-Mar-16	6.3	6.2	6.3	6.3	13.4	7.8	<u>7.7</u>	4.0	5.5	5.0	6.5	<2
8-Mar-16#	--	--	--	--	--	--	<u>221.5</u>	4.0	--	--	<u>138.0</u>	4.0
9-Mar-16	6.3	5.7	6.3	6.0	14.5	30.3	<u>14.9</u>	5.0	10.0	15.0	<u>12.0</u>	5.5
10-Mar-16#	--	--	--	--	--	--	<u>27.3</u>	5.2	--	--	<u>16.0</u>	6.0
11-Mar-16	9.4	8.8	10.0	8.4	<u>198.5</u>	16.1	<u>87.6</u>	5.1	<u>164.5</u>	7.0	<u>70.0</u>	2.0
12-Mar-16#	--	--	--	--	12.8	10.4	10.6	9.4	11.0	6.0	6.0	12.0
14-Mar-16	10.1	8.4	9.9	8.7	13.0	19.2	<u>45.1</u>	15.7	2.5	6.0	<u>69.0</u>	<2
15-Mar-16#	--	--	--	--	--	--	<u>19.0</u>	5.6	--	--	10.0	<2
16-Mar-16	8.4	8.4	9.6	7.6	14.9	8.6	<u>108.0</u>	5.9	12.5	<2	<u>48.5</u>	3.0
17-Mar-16#	--	--	--	--	--	--	9.1	7.8	--	--	9.0	9.0
18-Mar-16	8.6	7.8	8.3	7.3	23.6	19.7	9.4	6.3	11.5	9.5	4.0	3.5
21-Mar-16	8.6	8.3	9.4	8.1	23.6	41.6	<u>284.0</u>	6.7	9.5	18.0	<u>179.0</u>	5.0
22-Mar-16#	--	--	--	--	--	--	<u>50.0</u>	6.3	--	--	<u>52.0</u>	3.0
23-Mar-16	7.8	7.8	8.4	8.0	29.7	27.3	<u>452.0</u>	49.8	10.5	5.0	<u>301.5</u>	35.5
24-Mar-16#	--	--	--	--	--	--	<u>124.0</u>	20.8	--	--	<u>160.0</u>	9.0
29-Mar-16	9.5	8.8	9.1	7.6	11.8	8.4	11.2	6.0	4.5	2.0	5.0	<2
31-Mar-16	9.3	8.3	9.0	7.7	8.9	5.1	9.2	3.2	5.0	2.0	10.5	<2

Remarks: (iii) *bold with underline indicated Limit Level exceedance*
 # *Additional water quality monitoring at the exceeded location(s) due to two consecutive monitoring days indicated Limit Level exceedance.*

Table 6-4 Water Quality Monitoring Results Associated Contracts 2 and 6

Date	Dissolved Oxygen (mg/L)		Turbidity (NTU)		Suspended Solids (mg/L)	
	WM3	WM3-Control	WM3	WM3-Control	WM3	WM3-Control
2-Mar-16	7.2	6.9	12.0	8.3	12.5	6.5
4-Mar-16	9.3	10.0	16.8	19.0	11.0	11.5
7-Mar-16	6.6	5.6	7.4	12.8	11.5	21.0
9-Mar-16	5.2	4.7	13.1	11.8	15.5	16.5
11-Mar-16	8.7	10.3	16.8	16.2	25.5	26.5
14-Mar-16	8.8	8.3	19.5	40.1	13.5	51.5
16-Mar-16	8.2	8.8	13.2	36.1	15.5	13.0
18-Mar-16	7.6	8.1	13.2	6.5	12.0	8.0
21-Mar-16	7.6	8.8	32.0	28.9	21.0	41.5

Date	Dissolved Oxygen (mg/L)		Turbidity (NTU)		Suspended Solids (mg/L)	
	WM3	WM3-Control	WM3	WM3-Control	WM3	WM3-Control
23-Mar-16	8.0	7.9	38.5	34.7	25.5	47.0
29-Mar-16	8.0	8.3	72.1	4.9	109.0	7.0
30-Mar-16#	--	--	121.5	5.2	54.5	6.5
31-Mar-16	8.4	8.2	35.3	2.6	16.0	14.0

Remarks: (iv) *bold with underline indicated Limit Level exceedance*
Additional water quality monitoring at the exceeded location(s) due to two consecutive monitoring days indicated Limit Level exceedance.

Table 6-5 Breaches of Water Quality Monitoring Criteria in Reporting Period

Location	Dissolved Oxygen		Turbidity		Suspended Solids		Total Exceedance	
	Action	Limit	Action	Limit	Action	Limit	Action	Limit
WM1	0	0	0	3	0	2	0	5
WM2A	0	0	0	1	0	1	0	2
WM2B	0	0	0	15	1	11	1	26
WM3	0	0	0	3	0	3	0	6
WM4	0	0	0	1	0	1	0	2
No of Exceedance	0	0	0	23	1	18	1	41

6.2.3 In this Reporting Period, a total of forty-two (42) Action/ Limit Levels (AL/LL) exceedances, namely twenty-three (23) LL exceedances of turbidity and nineteen (19) AL/LL exceedances of Suspended Solids were recorded for the Project and they are summarized in *Table 6-5*.

6.2.4 NOE was issued to relevant parties upon confirmation of the monitoring result. The cause of exceedance is summarized in *Table 6-6* accordance to investigation findings and the detailed investigation reports for the exceedances are attached in *Appendix N*.

Table 6-6 Summary of Water Quality Exceedance in the Reporting Period

Date of Exceedance	Location	Exceeded Parameter	Cause of Water Quality Exceedance
2 & 3 Mar 2016	WM2B (C6)	NTU & SS	A pipe carrying wastewater from bored piling to the nearest AquaSed was burst on 2 March 2016 and the untreated wastewater were getting into the open channel accidentally. CCKJV has immediate halted the bored piling work until the damaged pipe was replaced. The exceedances were related to the pipe burst accident and unlikely related to the works under Contract 6.
4 Mar 2016	WM2B (C6)	NTU	The exceedances were due to the shallow water and the disturbance of sediment at river bed and unlikely related to the works under Contract 6.
5 Mar 2016	WM2B (C6)	NTU	Channel clearing was carried out on 5, 8, 9 and 10 March 2016 to remove the silt cumulated at the channel bed. The exceedances were due to insufficient mitigation measures during channel clearing. CCKJV should ensure the turbid water at the adjacent open channel was entirely blocked by the sand bag barrier or other means to prevent it flowing further downstream before carry out the channel cleaning.
8, 9 & 10 Mar 2016	WM2B (C6)	NTU & SS	
4, 9 & 10 Mar 2016	WM1 (C5, C6 and SS)	NTU & SS	<ul style="list-style-type: none"> C5 - There were no wastewater generation activities carried out on 4, 9 & 10 Mar 2016 and no discharge made into the river course. The exceedances were

	C505)		<p>unlikely due to the Contract 5.</p> <ul style="list-style-type: none"> • C6 - Turbid water was observed at upstream of the site area of Contract 6, the exceedances were unlikely due to the Contract 6. • SS C505 - The discharge point connecting public drainage under SS C505 would not flow to WM1 and its upstream, the exceedances were unlikely due to the SS C505.
11 Mar 2016	WM2A (C6)	NTU & SS	The condition of the water quality besides of Ping Yuen River of Bridge D under C6 on 1 Mar 2016 was normal and no turbid water was observed. There were no trails of turbid water discharge from the construction site, it is considered that exceedances were unlikely due to Contract 6.
11 Mar 2016	WM2B (C6)	NTU & SS	The water recirculation pump was detached from the water pipe accidentally and causing overflow of turbid water through the bar screen to downstream. The Contractor immediately fixed the detached recirculation pump and water pipe and the function of the recirculation pump was back to normal in the afternoon. It is concluded that the exceedances were a single incident.
14, 15 & 16 Mar 2016	WM2B (C6)	NTU & SS	The exceedances were due to the shallow water and the disturbance of sediment at river bed and unlikely related to the works under Contract 6.
21, 22, 23 & 24 Mar 2016	WM2B (C6)	NTU & SS	The effluent quality of C6 was visually acceptable. However, it was observed that muddy runoff from the public road surface into the existing channel due to rain. It is considered that the exceedances were related to cumulated silt at the river bed and muddy runoff from the public road surface and unlikely related to the works under Contract 6.
21 Mar 2016	WM4 (C2 & C3)	NTU & SS	<ul style="list-style-type: none"> • C2 & C3 - muddy water flowed from other upstream location which was not under monitored by the Contract was observed on 21 Mar 2016. It is considered that the exceedances were due to the stir up of sediment during rain and external muddy water from upstream and not related to the works under Contracts 2 & 3.
29, 30 & 31 Mar 2016	WM3 (C2 & C6)	NTU & SS	<ul style="list-style-type: none"> • C2 & C6 - discharge of turbid water and accumulated silt was observed from an unknown outfall which located at between the works area of C6 and WM3. It is considered that the turbid water detected at WM3 was related to the turbid discharge from the unknown outfall and unlikely due to the works under Contracts 2 and 6.

7 WASTE MANAGEMENT

7.1 GENERAL WASTE MANAGEMENT

7.1.1 Waste management was carried out in accordance with the Waste Management Plan (WMP) for each contract.

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		Contract 6		Contract 7		Contract SS C505		Total Quantity
	Qty.	Disposal location	Qty.	Disposal location	Qty.	Disposal location	Qty.	Disposal location	Qty.	Disposal location	Qty.	Disposal location	
C&D Materials (Inert) (in '000m ³)	34.1616	--	1.084	--	0	--	43.765	--	0.135	--	0.793	--	79.9386
Reused in this Contract (Inert) (in '000 m ³)	0.3100	--	0	--	0	--	6.438	--	0	--	0	--	6.748
Reused in other Contracts/ Projects (Inert) (in '000 m ³)	29.3514	C6/ NENT# & other projects approved by the ER	0	--	0	--	12.034	C5 & other projects approved by the ER	0	--	0	--	41.3854
Disposal as Public Fill (Inert) (in '000 m ³)	4.5003	Tuen Mun 38	1.084	Tuen Mun 38	0	--	25.292	Tuen Mun 38	0.135	Tuen Mun 38	0.793	TKO 137	31.5603

Remark #: The C&D materials were delivered to NENT for reuse by laying cover of the landfilling area.

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

Type of Waste	Contract 2		Contract 3		Contract 5		Contract 6		Contract 7		Contract SS C505		Total Quantity
	Qty.	Disposal location	Qty.	Disposal location	Qty.	Disposal location	Qty.	Disposal location	Qty.	Disposal location	Qty.	Disposal location	
Recycled Metal ('000kg) #	0	-	0	-	0	--	0	--	0	--	52.752	Licensed collector	52.752
Recycled Paper / Cardboard Packing ('000kg) #	0	-	0	-	0	--	0	Licensed collector	0	--	0.044	Licensed collector	0.044
Recycled Plastic ('000kg) #	0	--	0.001	-	0	--	0.007	--	0	--	0	--	0.001# 0.007
Chemical Wastes ('000kg) #	11.7920	Licensed collector	0	-	0	--	0	--	0	--	0	--	11.7920
General Refuses ('000m ³)	0.0682	NENT	0.090	NENT	0.055	NENT	0.042	NENT	0.005	--	0.059	NENT	0.3192

Remark #: Unit of recycled metal, recycled paper/ cardboard packing, recycled plastic and chemical waste for Contract 3 was in ('000m³).

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

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 **4, 11, 18 and 24 March 2016**. 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
4 March 2016	<ul style="list-style-type: none"> Oil drums without drip tray was observed. Drip tray should be provided for all chemical storage on site. (Admin-building) 	<ul style="list-style-type: none"> Oil drums removed from site.
11 March 2016	<ul style="list-style-type: none"> No adverse environmental were observed. 	NA
18 March 2016	<ul style="list-style-type: none"> No adverse environmental were observed. 	NA
24 March 2016	<ul style="list-style-type: none"> Proper control measures should be provided to prevent turbidity water discharged into the water body during maintenance of the de-silting system. (North Portal) 	<ul style="list-style-type: none"> The damaged water pipe in concern was replaced immediately and no direct discharge was allowed.

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 **7, 16, 21 and 30 March 2016**. 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
7 March 2016	<ul style="list-style-type: none"> Stopper for drip tray under the generator at Bridge J was missing. The Contractor should provide a stopper for drip tray to avoid leakage of chemical and cause land contamination. 	<ul style="list-style-type: none"> Plug for the drip tray at Bridge J was installed.
16 March 2016	<ul style="list-style-type: none"> No adverse environmental were observed. 	<ul style="list-style-type: none"> NA
21 March 2016	<ul style="list-style-type: none"> Muddy trail was observed at site exit SA2. The Contractor should ensure no muddy trail at the site exit and public access road, and ensure all the vehicles were washed to remove dusty materials from their wheels before leaving the site. 	<ul style="list-style-type: none"> No muddy trail was observed at site exit SA2
30 March 2016	<ul style="list-style-type: none"> No adverse environmental were observed. 	<ul style="list-style-type: none"> NA

Contract 5

8.2.5 In the Reporting Period, joint site inspection for Contract 5 to evaluate the site environmental performance has been carried out by the RE, IEC, ET and the Contractor on **1, 8, 15, 22 and 29 March 2016**. No non-compliance was noted.

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

Table 8-3 Site Observations for Contract 5

Date	Findings / Deficiencies	Follow-Up Status
1 March 2016	<ul style="list-style-type: none"> Stagnant water accumulated in precast concrete was found at LMH site area, the Contractor should remove the stagnant water. 	<ul style="list-style-type: none"> Precast concretes have been turned over to prevent stagnant water.
8 March 2016	<ul style="list-style-type: none"> No adverse environmental were observed. 	<ul style="list-style-type: none"> NA
15 March 2016	<ul style="list-style-type: none"> No adverse environmental were observed. 	<ul style="list-style-type: none"> NA
22 March 2016	<ul style="list-style-type: none"> No adverse environmental were observed. 	<ul style="list-style-type: none"> NA
29 March 2016	<ul style="list-style-type: none"> No adverse environmental were observed. 	<ul style="list-style-type: none"> NA

Contract 6

8.2.7 In the Reporting Period, joint site inspection for Contract 6 to evaluate the site environmental performance has been carried out by the RE, IEC, ET and the Contractor on **3, 10, 17, 24 and 31 March 2016**. No non-compliance was noted.

8.2.8 The findings / deficiencies of **Contract 6** that observed during the weekly site inspection are listed in **Table 8-4**.

Table 8-4 Site Observations for Contract 6

Date	Findings / Deficiencies	Follow-Up Status
3 March 2016	<ul style="list-style-type: none"> Mud bund and water accumulated along waterfill barrier at the STK road site entrance was observed, the Contractor should remove the mud and provide sand bags to prevent run-off. Insufficient surface water run-off control measures at temporary bridge Z and Bridge A wheel washing facility were observed, relevant mitigation measures should be provided. A sedimentation tank for vehicle washing water collection was found at the STK road site entrance, the Contractor was reminded that the discharge water should fulfil the requirement of the discharge licence. 	<ul style="list-style-type: none"> Mud bund has been removed and sand bag bund has been provided along the waterfill barrier to prevent water from entering the footpath. Mud bund has been removed and sand bag bund has been provided along the waterfill barrier to prevent water from entering the footpath. Not required for reminder.
10 March 2016	<ul style="list-style-type: none"> Water overflow from vehicle washing bay was observed at Ping Yeung Interchange, the Contractor should review and improve the vehicle washing procedure and system. 	<ul style="list-style-type: none"> The condition of the wheel washing bay was maintained and excess water in the wheel washing bay was pumped out to prevent overflow.
17 March	<ul style="list-style-type: none"> Diesel drum without drip tray was 	<ul style="list-style-type: none"> The chemical container has

Date	Findings / Deficiencies	Follow-Up Status
2016	observed on site, the Contractor should provide drip tray for it to prevent land contamination.(Location: Bridge D) <ul style="list-style-type: none"> • Water accumulated in several drip trays of generator were found, the Contractor should remove the water and treat it as chemical waste (Location: Bridge D) • To reduce smoke emission, it was reminded that construction plant maintenance should be carried out regularly. • Also, maintenance should be provided for construction plant and equipment to reduce the noise generation. 	been put back into chemical storage chamber. <ul style="list-style-type: none"> • The chemical container has been put back into chemical storage chamber. • Not required for reminder. • Not required for reminder.
24 March 2016	<ul style="list-style-type: none"> • Dark smoke emitted from the generator was observed. Proper maintenance should be provided. (Location: BCP) • Engine cover for the power pack was opened during operation was observed. The contractor should close the engine cover to reduce noise impact during the plant is operating. (Location: BCP) • Housekeeping at the grouting area should be improved. (Location: Bridge D) • Wheel washing water spillage into the public road was observed. The contractor should maintain the public road leading to the site is clean and tidy. (Location: Bridge D) 	<ul style="list-style-type: none"> • Exhaust filter of the generator has been replaced. • Engine cover of the air compressor has been closed. • Cement bags and empty chemical containers have been removed. • The road surface has been cleaned.
31 March 2016	<ul style="list-style-type: none"> • Noise emission label was found missing on an air compressor at BCP, the Contractor should provide and display the noise emission label for it. • Oil spillage was observed in a drip tray at BCP site area, the Contractor should treat the contaminated soil as chemical waste and provide measures to prevent oil leakage. 	<ul style="list-style-type: none"> • No muddy water accumulated at public access road at STK road was observed. • The condition of the public footpath at the site entrance has been improved.

Contract SS C505

8.2.9 In the Reporting Period, joint site inspection for Contract SS C505 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 March 2016**. No non-compliance was noted.

8.2.10 The findings / deficiencies of **Contract SS C505** that observed during the weekly site inspection are listed in **Table 8-5**.

Table 8-5 Site Observations for Contract SS C505

Date	Findings / Deficiencies	Follow-Up Status
2 March 2016	<ul style="list-style-type: none"> • Stagnant water was observed near emergency equipment station at training center and temporary drainage channel 	<ul style="list-style-type: none"> • Stagnant water was removed.

Date	Findings / Deficiencies	Follow-Up Status
	near training center. The Contractor should remove the stagnant water to prevent mosquito breeding. <ul style="list-style-type: none"> • Machinery without secondary containment was observed at training center. The Contractor should provide secondary containment such as drip tray to avoid leakage of oil and cause land contamination. • The Contractor should carry out dust mitigation measures at Portion 1 Zone 6 to reduce dust generation. • The Contractor was reminded to spray water for breaking works. 	<ul style="list-style-type: none"> • Drip tray was provided to machinery to avoid oil leakage. • Water spray as dust mitigation was implemented at Portion 1 Zone 6. • Not required for reminder.
9 March 2016	<ul style="list-style-type: none"> • No adverse environmental were observed. 	NA
16 March 2016	<ul style="list-style-type: none"> • Stagnant water was observed in waste container near Building 5 at Portion 1 (Photo 1) and at the channel between Portion 1 and 2 (Photo 2). The Contractor should remove the stagnant water to prevent mosquito breeding. • Muddy sediment was observed at drainage channel of Portion 1. The Contractor should remove the muddy sediment to ensure the channel function properly. 	<ul style="list-style-type: none"> • Muddy sediment was observed at drainage channel of Portion 1. The Contractor should remove the muddy sediment to ensure the channel function properly. • Muddy sediment was removed at the drainage channel of Portion 1.
23 March 2016	<ul style="list-style-type: none"> • The Contractor was reminded to remove stagnant water at drainage channel in Portion 1 regularly and after rainy days. 	<ul style="list-style-type: none"> • Not required for reminder.
30 March 2016	<ul style="list-style-type: none"> • NRMM label was missing for excavator (PUC 262) at Portion 1. The Contractor should provide the exemption/approval label for the excavator under the NRMM regulation. 	<ul style="list-style-type: none"> • NRMM label was posted at the excavator (PUC 262)

Contract 7

8.2.11 In the Reporting Period, joint site inspection for Contract 7 to evaluate the site environmental performance has been carried out by the RE, IEC, ET and the Contractor on **1, 8, 15, 22 and 29 March 2016**. No non-compliance was noted.

8.2.12 The findings / deficiencies of **Contract 7** that observed during the weekly site inspection are listed in **Table 8-6**.

Table 8-6 Site Observations for Contract 7

Date	Findings / Deficiencies	Follow-Up Status
1 March 2016	<ul style="list-style-type: none"> • No adverse environmental were observed. 	NA
8 March 2016	<ul style="list-style-type: none"> • As a reminder, to prevent mosquito breeding stagnant water should be removed from containers. 	<ul style="list-style-type: none"> • Not required for reminder.

Date	Findings / Deficiencies	Follow-Up Status
15 March 2016	<ul style="list-style-type: none">No adverse environmental were observed.	NA
22 March 2016	<ul style="list-style-type: none">No adverse environmental were observed.	NA
29 March 2016	<ul style="list-style-type: none">No adverse environmental were observed.	NA

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

Other Contracts

8.2.14 Since Contract 4 has not yet commenced, no site inspection were performed.

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, 5, 6, 7 and Contract SS C505. However, one (1) documented environmental complaint was received for Contract 2 regarding generation of fugitive dust when heavy dump truck travelling along in Sha Tau Kok Road on 8 March 2016.

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. Follow up actions have been undertaken by the Contractor to resolve the deficiencies. Investigation report for the complaint has conducted by the ET and submitted to the relevant parties and the detail of complaint investigation is presented below.

Investigation Result for the Documented Complaints received from 1823 on 8 March 2016

9.1.3 A complaint was received from 1823 regarding the generation of fugitive dust when heavy dump truck from construction site of Contract 6 (DHK) travelling on Sha Tau Kok Road. Previously, DHK did arrange water bowser for road cleaning on Sha Tau Kok Road every day. However, the complainant stated that no water bowser was provided recently and the route of road cleaning was ignoring the area near 安居花園.

9.1.4 As advised by DHK, water bowser for road cleaning is still providing on Sha Tau Kok Road and the route is between Wo Keng Shan Road (Admin Bldg Site) to Ping Che Roundabout which covered the area near 安居花園. In normal day, there were 4 round trips per day and water bowser is ready whenever necessary.

9.1.5 During weekly site inspection in late February 2016 and early March 2016, the condition of the concerned Sha Tau Kok Road – Ma Mei Ha were being inspected. According to the site inspection record, the observation during site inspection is summarized below.

- (a) wheel washing facilities were provided at the site exit of North Portal
- (b) no dusty materials were brought by the vehicles from the site
- (c) the cleanliness condition of the exit of North Portal and adjoined Sha Tau Kok Road were satisfactory.

9.1.6 Since there were many other heavy vehicles using the Sha Tau Kok Road, it is considered that the dust problem on Sha Tau Kok Road is not due to the Contract. Nevertheless, ET will continue to inspect the cleanliness of site exit and adjacent roads.

9.1.7 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 – 29 Feb 2016	Contract 2	0	13	• (6) Water Quality • (5) Dust • (2) Noise
06 Nov 2013 – 29 Feb 2016	Contract 3	0	4	• (1) Dust • (2) Water quality
16 Aug 2013 – 29 Feb 2016	Contract 5	0	2	• (2) Dust
16 Aug 2013 – 29 Feb 2016	Contract 6	0	7	• (2) Water Quality • (1) Dust
15 Feb 2016 – 29 Feb 2016	Contract 7	0	0	N/A

Reporting Period	Contract No	Environmental Complaint Statistics		
		Frequency	Cumulative	Complaint Nature
16 Aug 2013 – 29 Feb 2016	SS C505	0	0	N/A
1 – 31 Mar 2016	Contract 2	1	14	<ul style="list-style-type: none"> • (6) Water Quality • (6) Dust • (2) Noise
	Contract 3	0	4	<ul style="list-style-type: none"> • (1) Dust • (2) Water quality • (1) Noise
	Contract 5	0	2	<ul style="list-style-type: none"> • (2) Dust
	Contract 6	0	7	<ul style="list-style-type: none"> • (6) Water Quality • (1) Dust
	Contract 7	0	0	N/A
	SS C505	0	0	N/A

Table 9-2 Statistical Summary of Environmental Summons

Reporting Period	Contract No	Environmental Summons Statistics		
		Frequency	Cumulative	Complaint Nature
19 May 2014 – 29 Feb 2016	Contract 2	0	0	NA
06 Nov 2013 – 29 Feb 2016	Contract 3	0	0	NA
16 Aug 2013 – 29 Feb 2016	Contract 5	0	0	NA
16 Aug 2013 – 29 Feb 2016	Contract 6	0	0	NA
15 Feb 2016 – 29 Feb 2016	Contract 7	0	0	NA
16 Aug 2013 – 29 Feb 2016	SS C505	0	0	NA
1 – 31 Mar 2016	Contract 2	0	0	NA
	Contract 3	0	0	NA
	Contract 5	0	0	NA
	Contract 6	0	0	NA
	Contract 7	0	0	NA
	SS C505	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 – 29 Feb 2016	Contract 2	0	0	NA
06 Nov 2013 – 29 Feb 2016	Contract 3	0	0	NA
16 Aug 2013 – 29 Feb 2016	Contract 5	0	0	NA
16 Aug 2013 – 29 Feb 2016	Contract 6	0	0	NA
15 Feb 2016 – 29 Feb 2016	Contract 7	0	0	NA
16 Aug 2013 – 29 Feb 2016	SS C505	0	0	NA
1 – 31 Mar 2016	Contract 2	0	0	NA
	Contract 3	0	0	NA

	Contract 5	0	0	NA
	Contract 6	0	0	NA
	Contract 7	0	0	NA
	SS C505	0	0	NA

The Other Contracts

- 9.1.8 Since the construction works at the Contract 4 has 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, 5, 6, 7 and Contract SS C505 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 wastewater treatment facilities i.e. sedimentation tank or similar facility before discharge.
Air Quality	<ul style="list-style-type: none"> Maintain damp / wet surface on access road Low vehicular speed within the works areas. 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

- Mid-Vent Portal
- Tube excavation (NB+SB)
 - Adit invert slab
 - Ventilation building superstructure
- North Portal
- Retaining walls and slope stabilization
 - Northbound top heading excavation and tunnel enlargement
 - TBM excavation
- South Portal
- Southbound and Northbound D&B excavation
 - Building works superstructure
- Admin Building
- Building works foundation & superstructure

Contract 3

- Cable detection and trial trenches
- Decking construction for Bridge E
- Filling works at Tong Hang East
- Storm Drains Laying

- Noise barrier construction
- Pier / Pier Table construction
- Pile cap works
- Portal beam erection
- Pre-drilling works and piling works for viaduct
- Retaining Wall construction
- Road works at Fanling Highway
- Sewer works
- Slope works
- Socket H-pile installation
- Tree felling works
- Utilities duct laying
- Viaduct segment erection
- Water works
- Per-drilling works for noise barrier

Contract 5

- Laying of rising main (VO61) at LMH road
- Bituminous laying at L15 road and existing LMH road.
- Brick laying at footpath of proposed LMH road
- Road works (kerb and bituminous laying) at existing LMH road
- Construction drainage works at Depressed Road
- Irrigation system at existing LMH Road
- Installation of underground utilities at existing LMH road
- Planting works at proposed & existing LMH road

Contract 6

- Site Clearance
- Slope Works
- Site Accesses Construction
- Ground Investigation Works
- Soil Nail
- Bored Piling
- H-piling
- Pile cap construction

Contract 7

- Erection of Engineer's Site Office
- Ground Investigation Works for Bridge –E
- Piling Works for Bridge B-D
- Pile cap construction for Bridge C

Contract SS C505

- General Site Setup
- Building no. 5 and 9 construction
- Assembly of Crawler Crane
- H-pile works
- Tower crane construction
- Erection of Welfare Shelter
- Underground drainage works
- Column works
- Weighbridge works
- Prototype “A” Construction works
- Mock Up Curtain Wall works

- Pile Cap construction
- Bored Pile works and per-drill works
- Bridge construction works

10.3 KEY ISSUES FOR THE COMING MONTH

- 10.3.1 Key issues to be considered in the coming month for Contracts 2, 3, 5, 6, 7 and SS C505 include:
- Implementation of control measures for rainstorm;
 - Regular clearance of stagnant water during wet season;
 - Implementation of dust suppression measures at all times;
 - Potential wastewater quality impact due to surface runoff;
 - Potential fugitive dust quality impact due from the dry/loose/exposure soil surface/dusty material;
 - Disposal of empty engine oil containers within site area;
 - Ensure dust suppression measures are implemented properly;
 - Sediment catch-pits and silt removal facilities should be regularly maintained;
 - Management of chemical wastes;
 - Discharge of site effluent to the nearby wetland, stockpiling or disposal of materials, and any dredging or construction area at this area are prohibited;
 - Follow-up of improvement on general waste management issues; and
 - Implementation of construction noise preventative control measures
- 10.3.2 Contract 4 has not yet commenced and no environmental issue is presented.

11 CONCLUSIONS AND RECOMMENDATIONS

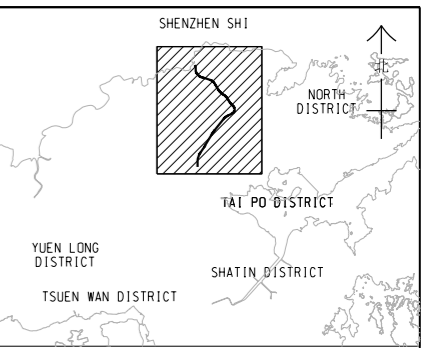
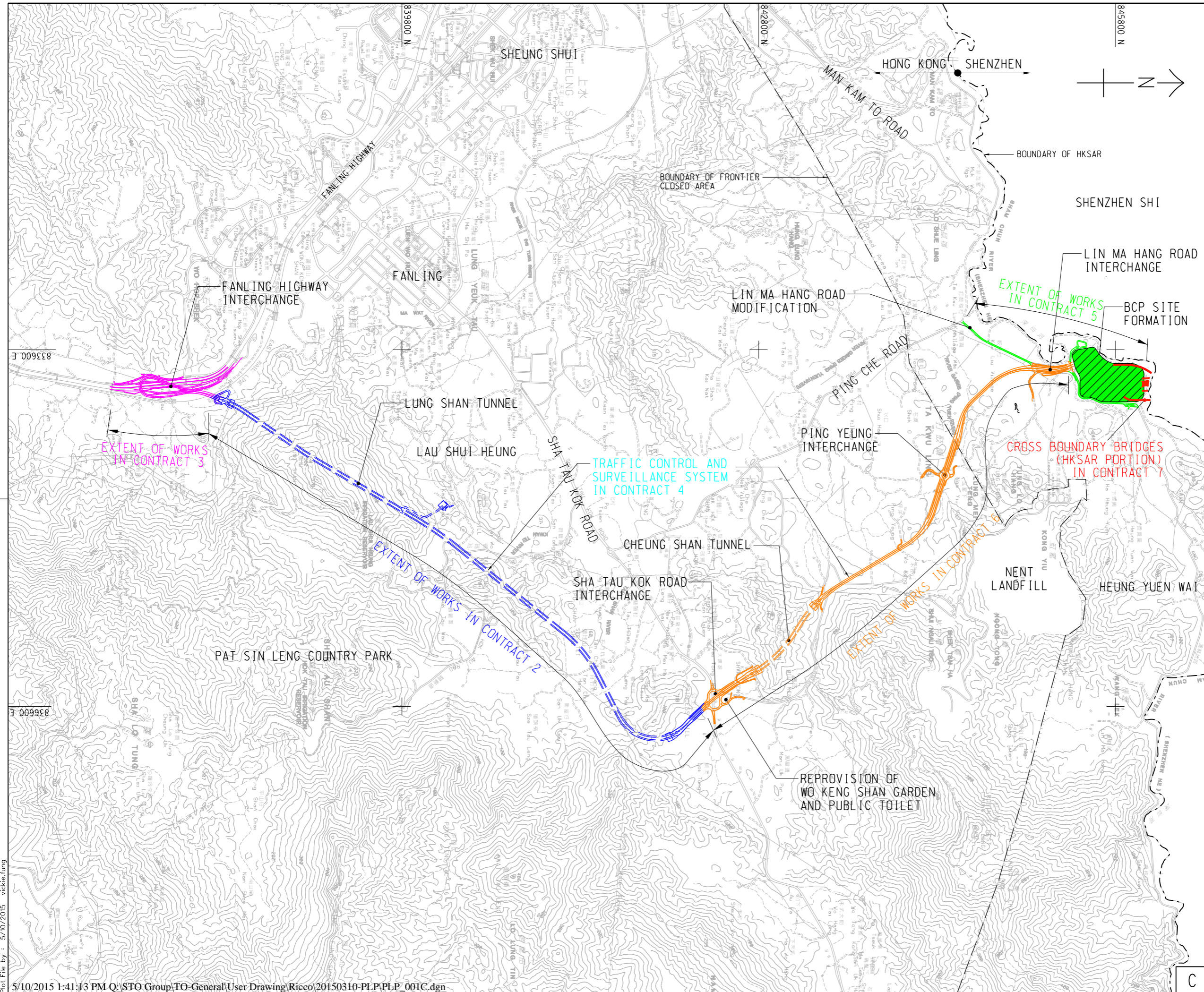
11.1 CONCLUSIONS

- 11.1.1 This is the **32nd** monthly EM&A report presenting the monitoring results and inspection findings for the Reporting Period from **1 to 31 March 2016**.
- 11.1.2 For air quality monitoring, no 1-hour and 24-hour TSP monitoring results triggered the Action or Limit Levels were recorded. No NOEs or the associated corrective actions were therefore issued.
- 11.1.3 No noise complaint (which is an Action Level exceedance) was received and no construction noise measurement results that exceeded the Limit Level were recorded in the Reporting Period. No NOEs or the associated corrective actions were therefore issued.
- 11.1.4 For water quality monitoring, a total of forty-two (42) Action/ Limit Levels (AL/LL) exceedances, namely twenty-three (23) LL exceedances of turbidity and nineteen (19) AL/LL exceedances of Suspended Solids. The investigations for the cause of exceedances have been conducted by the ET and the associated investigation reports were submitted to relevant parties
- 11.1.5 No environmental summons or successful prosecutions were recorded in the Reporting Period.
- 11.1.6 In this Reporting Period, one (1) documented environmental complaint was received for Contract 2 regarding generation of fugitive dust when heavy dump truck travelling along in Sha Tau Kok Road on 8 March 2016. Investigation report for complaint had conducted by ET and submitted to relevant parties.
- 11.1.7 During the Reporting Period, weekly joint site inspection by the RE, IEC, ET with the relevant Main-contractor were carried out for Contracts 2, 3, 5, 6, 7 and SS C505 in accordance with the EM&A Manual stipulation. No non-compliance observed during the site inspection.

11.2 RECOMMENDATIONS

- 11.2.1 In upcoming wet season, preventive measures for muddy water or other water pollutants from site surface flow to local stream such as Kong Yiu Channel, Ma Wat Channel, Ping Yuen River or public area would be the key issue. The Contractors should paid special attention on water quality mitigation measures and fully implement according ISEMM of the EM&A Manual, in particular for Contract 6.
- 11.2.2 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.
- 11.2.3 Since most of construction sites under the Project are located adjacent to villages, the Contractors should fully implement air quality mitigation measures to reduce construction dust emission.
- 11.2.4 Furthermore, daily cleaning and weekly tidiness shall be properly performed and maintained. In addition, mosquito control should be kept to prevent mosquito breeding on site.

Appendix A
Layout plan of the Project



LOCATION PLAN
SCALE 1 : 30000

LEGEND:
--- UNDERGROUND WORKS

REV.	DESCRIPTION	DRAWN	CHECKED	DATE

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

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

PROJECT LAYOUT PLAN

AECOM

DRG. NO. 60212563/PLP/001
圖紙編號

DESIGNED BY	CONTRACT NO.	P. Dir. APPROVED

SCALE A1 1 : 15000 比例 A3 1 : 30000	STATUS

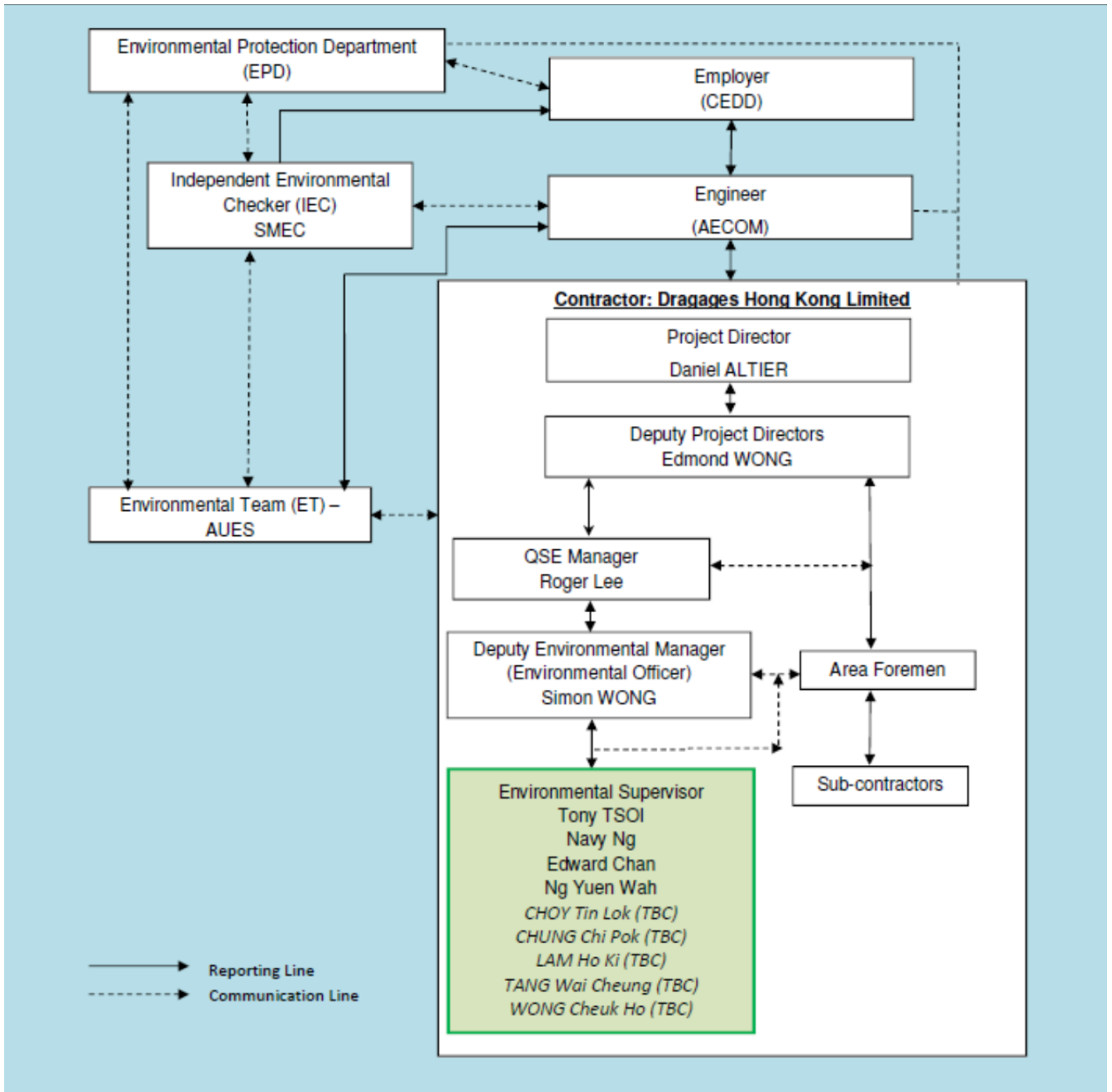
DIMENSIONS ARE IN METRES

© COPYRIGHT RESERVED
版權 所 有

Plot File by : 5/10/2015 vickie.fung

Appendix B

Organization Chart



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	Edmond Wong	2171 3004	2171 3299
DHK	QSE Manager	Roger Lee	6293 8726	2171 3299
DHK	Environmental Officer	Simon Wong	2171 3004	2171 3299
DHK	Environmental Supervisor	Sophie Baycheuer	6321 5001	2171 3299
DHK	Environmental Supervisor	Tony Tsoi	6028 5623	2171 3299
AUES	Environmental Team Leader	T. W. Tam	2959 6059	2959 6079
AUES	Environmental Consultant	Nicola Hon	2959 6059	2959 6079
AUES	Environmental Consultant	Ben Tam	2959 6059	2959 6079

Legend:

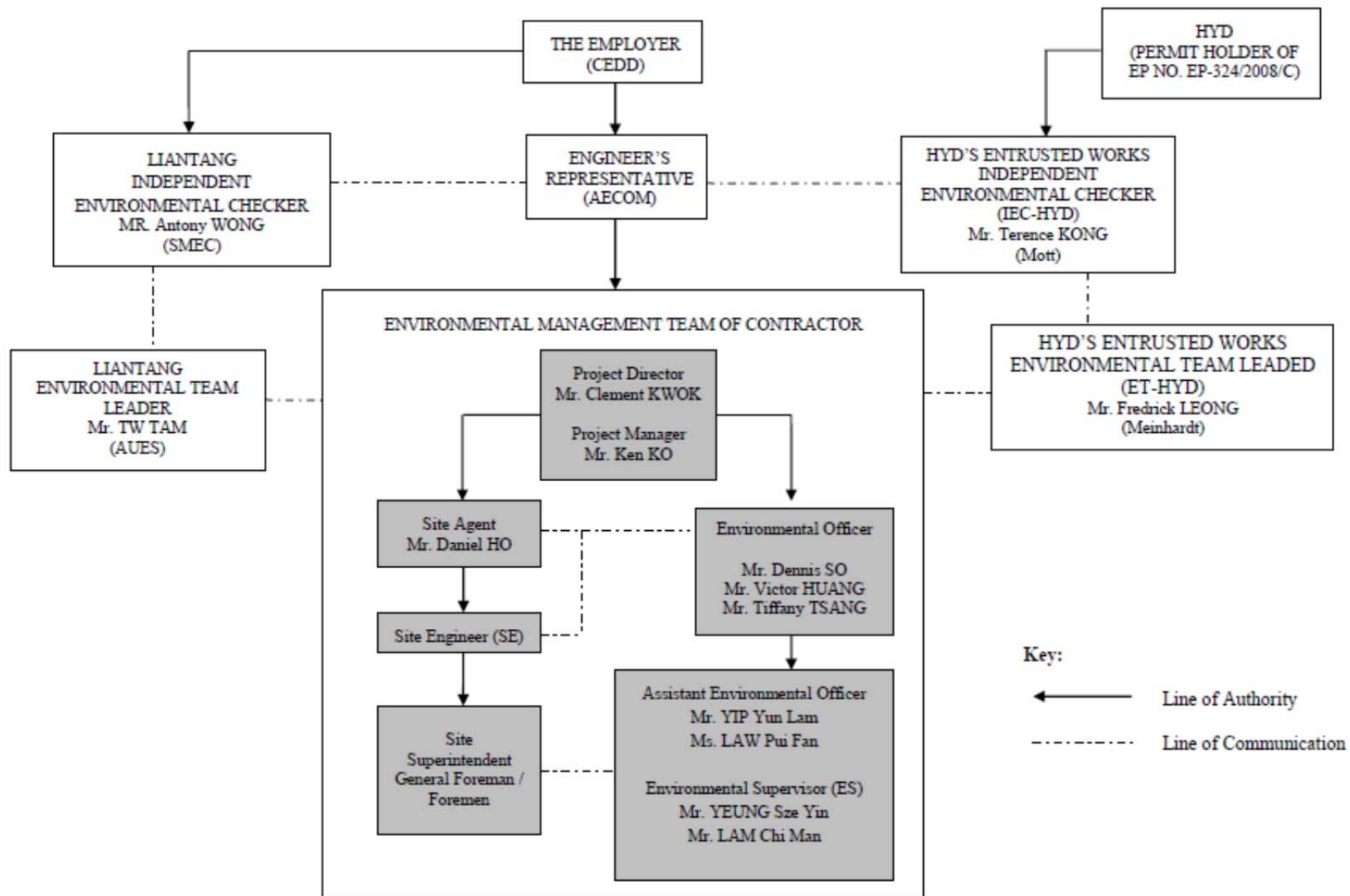
CEDD (Employer) – Civil Engineering and Development Department

AECOM (Engineer) – AECOM Asia Co. Ltd.

DHK(Main Contractor) –Dragages Hong Kong Ltd.

SMEC (IEC) – SMEC Asia Limited

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



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

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

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

Legend:

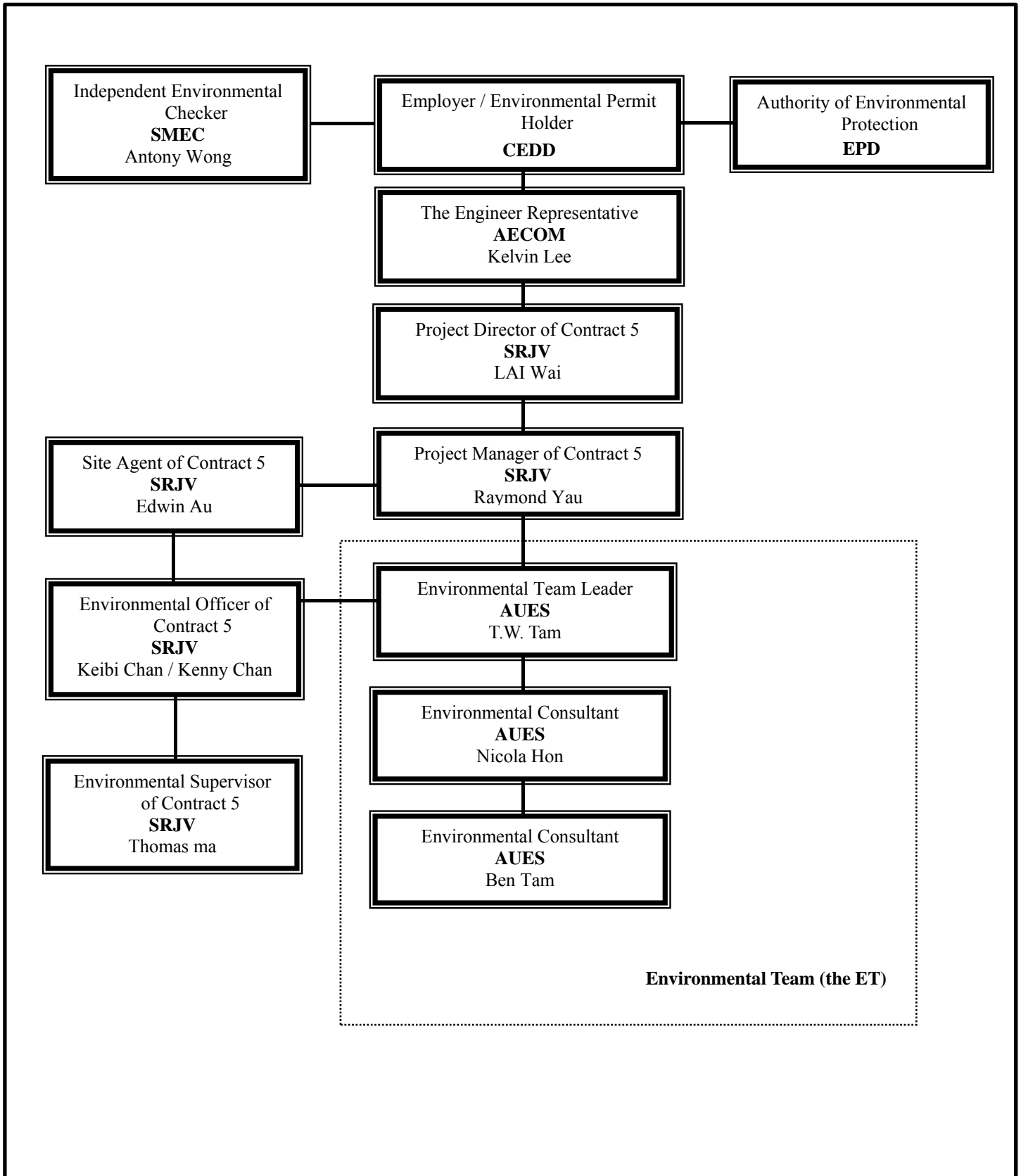
CEDD (Employer) – Civil Engineering and Development Department

AECOM (Engineer) – AECOM Asia Co. Ltd.

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

SMEC (IEC) – SMEC Asia Limited

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



Environmental Management Organization – CV/2013/03

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

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

Legend:

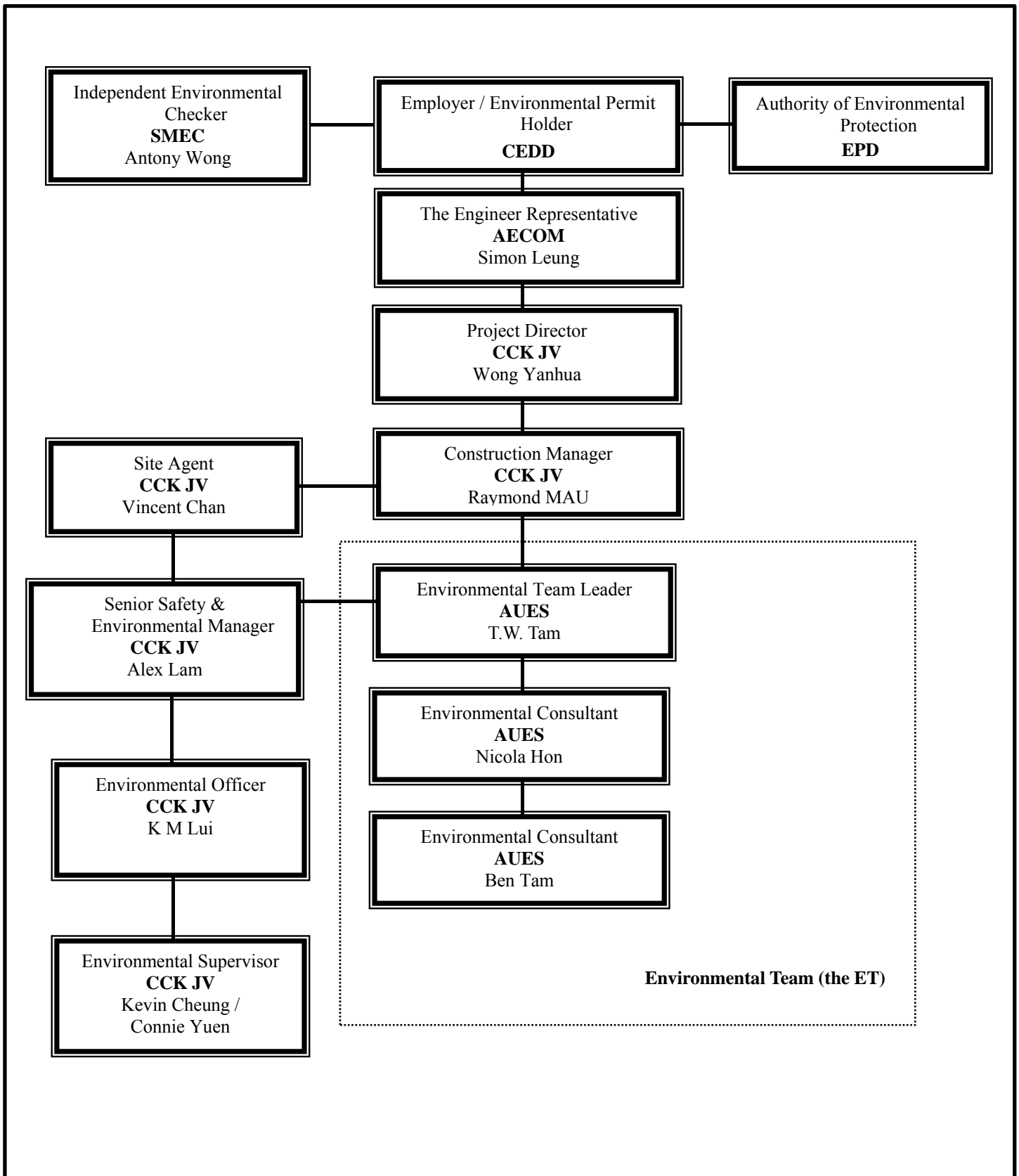
CEDD (Employer) – Civil Engineering and Development Department

AECOM (Engineer) – AECOM Asia Co. Ltd.

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

SMEC (IEC) – SMEC Asia Limited

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



Environmental Management Organization – CV/2013/08

Contact Details of Key Personnel for Contract 6 - 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
CCK JV	Project Director	Wang Yanhua	6190 4212	--
CCK JV	Construction Manager	Raymond Mau Sai-Wai	9011 5340	--
CCK JV	Site Agent	Vincent Chan	9655 9404	--
CCK JV	Senior Safety & Environmental Manager	Alex Lam	5547 0181	--
CCK JV	Environmental Officer	K M Lui	51138223	--
CCK JV	Environmental Supervisor	Kevin Cheung/ Connie Yeun	6316 6931 6117 1344	--
AUES	Environmental Team Leader	TW Tam	2959 6059	2959 6079
AUES	Environmental Consultant	Ben Tam	2959 6059	2959 6079
AUES	Environmental Consultant	Nicola Hon	2959 6059	2959 6079

Legend:

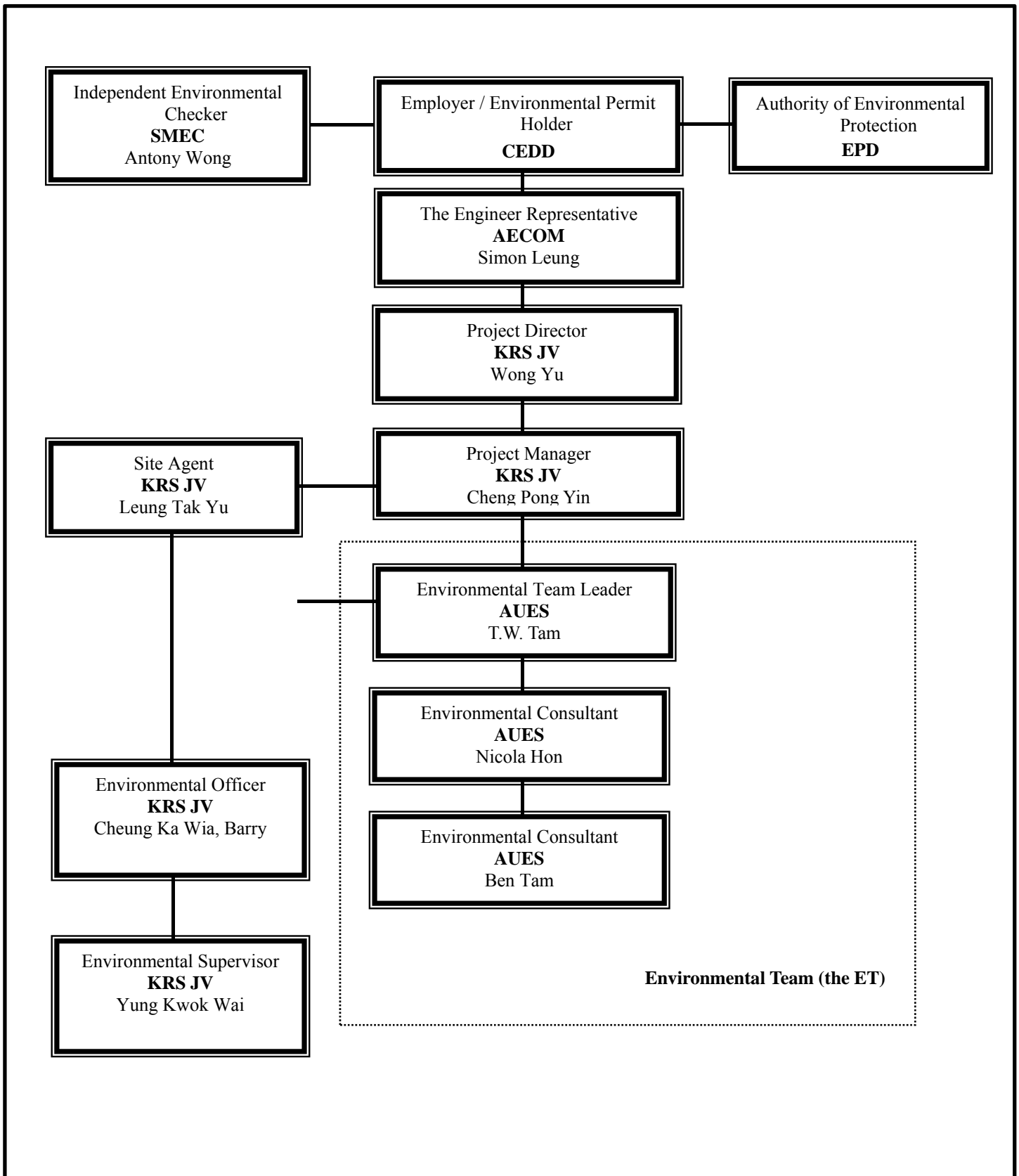
CEDD (Employer) – Civil Engineering and Development Department

AECOM (Engineer) – AECOM Asia Co. Ltd.

CCK JV (Main Contractor) – CRBE-CEC-Kaden Joint Venture

SMEC (IEC) – SMEC Asia Limited

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



Environmental Management Organization –NE/2014/03

Contact Details of Key Personnel for Contract 7 – NE/2014/03

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
CCK JV	Project Director	Wong Yu	2682 6691	2682 2783
CCK JV	Project Manager	Cheng Pong Yin	9023 4821	2682 2783
CCK JV	Site Agent	Leung Tak Yu	9705 7536	2682 2783
CCK JV	Environmental Officer	Cheung Ka Wia, Barry	6117 2339	2682 2783
CCK JV	Environmental Supervisor	Yung Kwok Wai	6592 3084	2682 2783
AUES	Environmental Team Leader	TW Tam	2959 6059	2959 6079
AUES	Environmental Consultant	Ben Tam	2959 6059	2959 6079
AUES	Environmental Consultant	Nicola Hon	2959 6059	2959 6079

Legend:

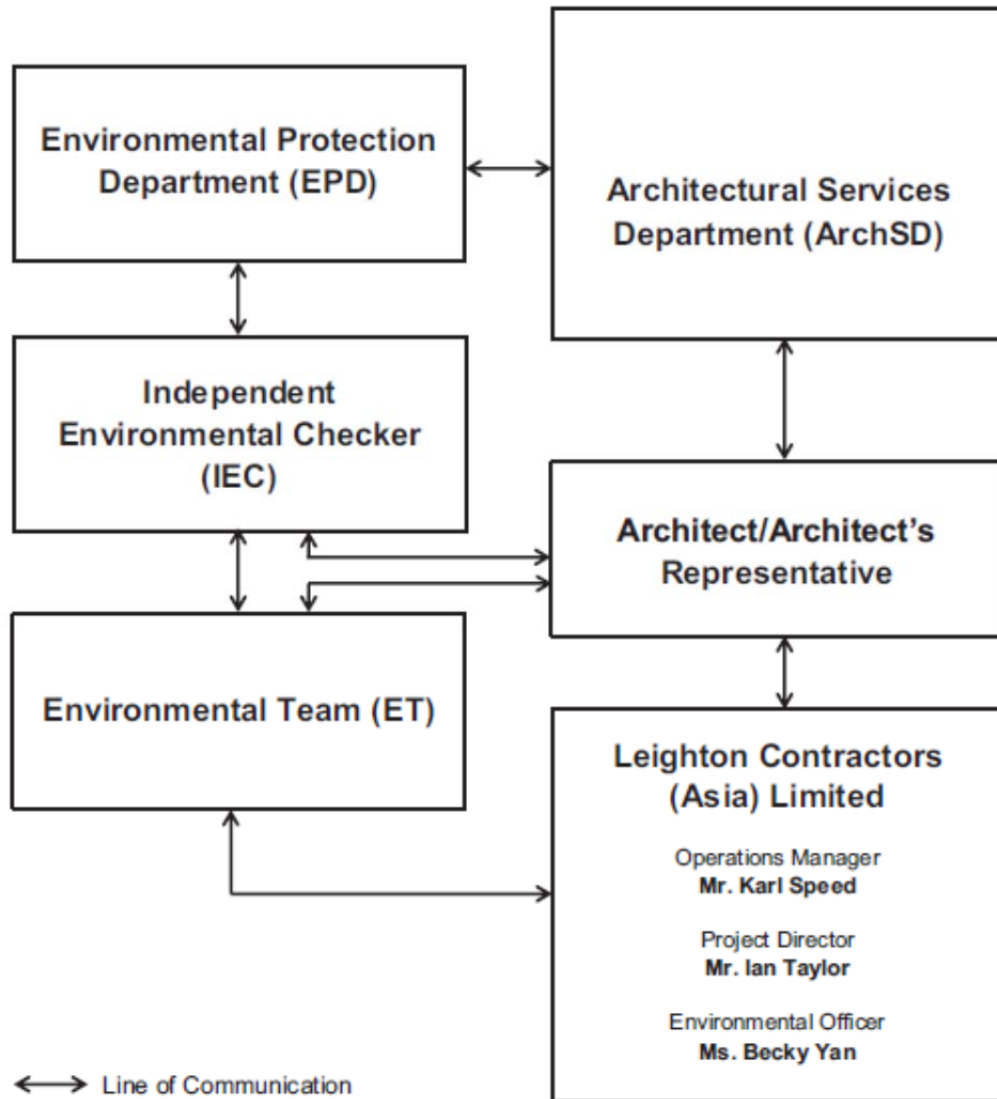
CEDD (Employer) – Civil Engineering and Development Department

AECOM (Engineer) – AECOM Asia Co. Ltd.

KRS JV (Main Contractor) –Kwan On-Richwell-SCG Joint Venture

SMEC (IEC) – SMEC Asia Limited

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



Environmental Management Organigram

Environmental Management Organization for Contract SS C505

Contact Details of Key Personnel for Contract SS C505

Organization	Project Role	Name of Key Staff	Tel No.	Fax No.
ArchSD	Works agent for the Development Bureau (DEVB)	Mr. William Cheng	2867 3904	2804 6805
Ronald Lu & Partners	Architect/ Architect's Representative	Mr. Justin Cheung	3189 9272	2834 5442
SMEC	Independent Environmental Checker	Mr. Antony Wong	3995 8120	3995 8101
Leighton	Operation Manager	Mr. Karl Speed	2823 1433	25298784
Leighton	Project Director	Mr. Ian Taylor	2858 1519	2858 1899
Leighton	Environmental Officer	Ms. Becky Yan	3973 1069	-
Leighton	Assistant Environmental Officer	Ms. Penny Yiu	3973 0818	-
AUES	Environmental Team Leader	Mr. T. W. Tam	2959 6059	2959 6079
AUES	Environmental Consultant	Ms. Nicola Hon	2959 6059	2959 6079
AUES	Environmental Consultant	Mr. Ben Tam	2959 6059	2959 6079

Legend:

ArchSD (Project Proponent) – Architectural Services Department

Ronald Lu & Partners (Architect/ Architect's Representative) – Ronald Lu & Partners (Hong Kong) Ltd

Leighton (Main Contractor) – Leighton Contractors (Asia) Limited

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	2016			
					Mar	Apr	May	Jun
Total		805.0d	27-Oct-14	04-Mar-17				
HKLTH Works Programme update (Rev D) 19-March-2016		805.0d	27-Oct-14	04-Mar-17				
2 General		805.0d	27-Oct-14	04-Mar-17				
Noise Barriers		122.0d	03-Jul-15	01-Dec-15				
DDA Submission		122.0d	03-Jul-15	01-Dec-15				
CONTDS1090	Preparation of DDA for formal submission to ER/ICE/IP	45.0d	03-Jul-15	28-Aug-15				
CONTDS1100	IPs/ ER's Review	28.0d	29-Aug-15	03-Oct-15				
CONTDS1110	Preparation of DDA with ICE Certification for resubmission to ER/ICE/IP	21.0d	05-Oct-15	29-Oct-15				
CONTDS1120	ER/IP's Approval	28.0d	30-Oct-15	01-Dec-15				
Project Wide E&M		805.0d	27-Oct-14	04-Mar-17				
E&M Design & Engineering Works		177.0d	22-Jan-15	29-Aug-15				
Shop Drawing & Builder's Drawing Submission		177.0d	22-Jan-15	29-Aug-15				
PD.DW.1010	Shop Drawings & Builder's Drawings Submission & Approval	177.0d	22-Jan-15	29-Aug-15				
Equipment Selection & Submission		338.0d	27-Oct-14	14-Dec-15				
PD.PQ.1080	Electrical Services System Submission and Approval by the Engineer	338.0d	27-Oct-14	14-Dec-15				
PD.PQ.1150	Tunnel Ventilation System Submission and Approval by the Engineer	228.0d	07-Nov-14	15-Aug-15				
PD.PQ.2010	FS System Submission and Approval by the Engineer	278.0d	01-Nov-14	09-Oct-15				
Manufacturing & Delivery of Major Equipment		390.0d	22-Jan-16	04-Mar-17				
PD.EC.MD	Manufacturing and Delivery of ECS System	390.0d	22-Jan-16	04-Mar-17				
3 South Portal Area		357.0d	06-May-15	14-Mar-16				
3.1 South Portal Subcontract & Procurement		309.4d	30-Jun-15	16-Jan-16				
SPS&P0080	Subcontract : Ventilation Building Structure Works	60.0d	30-Jun-15	08-Sep-15				
SPS&P0090	Subcontract : Tunnel Lining Works	60.0d	13-Jul-15	19-Sep-15				
SPS&P0100	Subcontract : Tunnel Lining Formworks (Design, Fabrication, Delivery, & On-Site Assembly)	150.0d	13-Jul-15	09-Jan-16				
SPS&P0110	Subcontract : Tunnel Concreting Works	60.0d	24-Aug-15	04-Nov-15				
SPS&P0120	Subcontract : Tunnel Finishing Works	60.0d	05-Nov-15	16-Jan-16				
3.2 South Portal Design Submission		289.0d	08-Jul-15	27-Dec-15				
South Tunnel Internal Structures		28.0d	26-Jul-15	22-Aug-15				
DDA Submission		28.0d	26-Jul-15	22-Aug-15				
STIS1L1023690	ER/IP's Approval	28.0d	26-Jul-15	22-Aug-15				
Cross Passages -Temp Works D&B Tunnel - Rock		55.0d	08-Jul-15	07-Oct-15				
DDA Submission		55.0d	08-Jul-15	07-Oct-15				
FL326980	IPs/ ER's Review	28.0d	08-Jul-15	08-Aug-15				
FL327000	Preparation for resubmission to ER/ICE/IP with ICE Certification	27.0d	10-Aug-15	09-Sep-15				
FL327100	ER/IP's Approval	28.0d	10-Sep-15	07-Oct-15				
As-Built Drawings [Contractor's Design/ Contractor's Alternative Design]		60.0d	29-Oct-15	27-Dec-15				
SC1650	As-Built Drawings Submission - South Portal Ventilation Bldg Foundation	60.0d	29-Oct-15	27-Dec-15				
3.3 South Portal Method Statement Submission		48.0d	05-Jan-16	03-Mar-16				
South Portal: Temporary Bridge Dismantling		48.0d	05-Jan-16	03-Mar-16				
FL2022077	Prepare Method Statement	48.0d	05-Jan-16	03-Mar-16				
3.5 South Portal Works		283.6d	06-May-15	14-Mar-16				
South Portal: Foundation & Substructure		109.0d	29-Jun-15	28-Oct-15				
SV2180	South Bound Foundation	54.0d	29-Jun-15	04-Sep-15				
SV2190	Handover to SB Tunneling	1.0d	04-Sep-15	04-Sep-15				
SV2210	N/B Bored Piles 4nos & Pile Test	48.0d	07-Jul-15	04-Sep-15				

					MAIN CONTRACTOR  A member of the Bouygues Construction group	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/00124/A
A	Monthly Report No.27	20/03/2016	KEC/RAN	RBS/SJO	DAL			DOC. STATUS FOR INFO. CREATION DATE 20-Mar-16 REVISION A	
REV	DESCRIPTION	DATE	PREPARED	CHECKED	APPROVED		TITLE Monthly Report No.27 3-Months Rolling Programme (Approved Works Programme Rev. D)	PAPER SIZE A3 SCALE N/A PAGE 1 of 5	

Activity ID	Activity Name	Working Duration	BL Project Start	BL Project Finish	2016			
					Mar	Apr	May	Jun
SV2740	N/B Pile Caps & Tie Beams	36.0d	05-Sep-15	20-Oct-15				
SV2745	N/B Backfilling	6.0d	22-Oct-15	28-Oct-15				
SV2750	Handover to NB Tunneling	1.0d	28-Oct-15	28-Oct-15				
South Portal: Superstructure		139.0d	22-Oct-15	02-Feb-16				
SV2325	Retaining Walls (LSTSP/ RW3 & LST SP/ RW4 & S1,S2 & S3)	74.0d	22-Oct-15	19-Jan-16				
SV2335	Backfilling to Permanent Slope	60.0d	21-Nov-15	02-Feb-16				
South Tunnels: Southbound Tunnel		273.6d	06-May-15	14-Mar-16				
DB6300	D&B Setup / Site Installation	101.0d	06-May-15	04-Sep-15				
DB6310	Top Heading Excavation (Canopies) (CRP: Ch1,751>Ch1,787) 36m	57.0d	05-Sep-15	11-Nov-15				
DB6320	Bottom Bench Excavation (CRP:Ch1,751>Ch1,787) 36m	34.0d	12-Nov-15	21-Dec-15				
DB6330cdwp	Full Face D&B Excavation: (CRP: Ch1,787 to Ch2,065) 278m	70.0d	22-Dec-15	14-Mar-16				
South Tunnels: Northbound Tunnel		159.2d	30-Oct-15	25-Feb-16				
DB6340dwp1	Top Heading Excavation (Canopies) (P20/NB Ch: 139 to 178); 39m; (CRP: Ch1,750>Ch1,789)	67.0d	30-Oct-15	18-Jan-16				
DB6340dwp2	Top Heading Excavation (Canopies) (P20/NB Ch: 178 to 200); 22m; (CRP: Ch1,789>Ch1,811)	28.0d	19-Jan-16	19-Feb-16				
DB6350	Bottom Bench Excavation (P20/NB - 139>200); 61m; (CRP: Ch1,750>Ch1,811)	62.0d	14-Dec-15	25-Feb-16				
4 Middle Portal Area		446.0d	05-Feb-15	02-Apr-16				
4.1 Middle Portal Subcontract & Procurement		416.2d	05-Feb-15	04-Dec-15				
MPS&P0050	Subcontract : Tunnel Lining Formworks (Design, Fabrication, Delivery, & On-Site Assembly)	150.0d	05-Feb-15	11-Aug-15				
MPS&P0080	Subcontract : Ventilation Building ABWF Works	60.0d	15-Jul-15	22-Sep-15				
MPS&P0090	Subcontract : Tunnel Concreting Works for Internal Structures	60.0d	31-Aug-15	11-Nov-15				
MPS&P0100	Subcontract : External Works and Landscaping Works	60.0d	23-Sep-15	04-Dec-15				
4.2 Middle Portal Design Submission		410.0d	20-Jul-15	26-Sep-15				
Mid Vent Adit Internal Structure		119.0d	20-Jul-15	25-Sep-15				
DDA Submission		119.0d	20-Jul-15	25-Sep-15				
DSN29084	Preparation for resubmission to ER/ICE/IP with ICE Certification	35.0d	20-Jul-15	28-Aug-15				
DSN29085	ER/IP's Approval	28.0d	29-Aug-15	25-Sep-15				
Mid Vent Junction Internal Structure		56.0d	24-Jul-15	26-Sep-15				
DDA Submission		56.0d	24-Jul-15	26-Sep-15				
DSN29104	Preparation for resubmission to ER/ICE/IP with ICE Certification	32.0d	24-Jul-15	29-Aug-15				
DSN29105	ER/IP's Approval	28.0d	30-Aug-15	26-Sep-15				
4.3 Middle Portal Method Statement Submission		115.7d	29-Jul-15	02-Feb-16				
Cavern Permanent Lining		80.0d	29-Jul-15	02-Nov-15				
A25522	Engineer's Comment	28.0d	29-Jul-15	29-Aug-15				
A25523	Re-submission Method Statement	24.0d	31-Aug-15	26-Sep-15				
A25524	Engineer's Approval	28.0d	29-Sep-15	02-Nov-15				
Middle Ventilation Adit Tunnel Concreting Works (Internal Structures)		115.7d	31-Aug-15	02-Feb-16				
A25517	Prepare Method Statement	48.0d	31-Aug-15	28-Oct-15				
A25518	Engineer's Comment	28.0d	29-Oct-15	30-Nov-15				
A25519	Re-submission Method Statement	24.0d	01-Dec-15	30-Dec-15				
A25520	Engineer's Approval	28.0d	31-Dec-15	02-Feb-16				
4.5 Middle Portal Works		343.0d	18-Jul-15	02-Apr-16				
Adit Construction - Mid Portal		343.0d	18-Jul-15	02-Apr-16				
MV2530	Cavern Excavation Ch302>Ch371; 69m	70.0d	18-Jul-15	10-Oct-15				
MV2710	D&B UT Tunneling Ch3,436 to Ch3,586 (NNB) - towards North 150m	70.0d	12-Oct-15	02-Jan-16				
MV2720	D&B DT Tunneling Ch3,433 to Ch3,561 (NSB) - towards North 128m	60.0d	23-Oct-15	02-Jan-16				
MV2730	D&B UT Tunneling Ch3,413 to Ch3,313 (SNB) - towards South 100m	23.0d	04-Jan-16	29-Jan-16				
MV2740	D&B DT Tunneling Ch3,410 to Ch3,313 (SSB) - towards South 97m	23.0d	04-Jan-16	29-Jan-16				
MV2749	Ground Treatment for TBm Breakthrough	77.0d	04-Jan-16	02-Apr-16				
MV2750	De-mobilization of Tunneling plants & equipment	24.0d	30-Jan-16	26-Feb-16				
MV2760a	Adit Lining (up to Ch151)	50.0d	30-Jan-16	29-Mar-16				

					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  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/00124/A		
A Monthly Report No.27 20/03/2016 KEC/RAN RBS/SJO DAL									DOC. STATUS FOR INFO.		CREATION DATE 20-Mar-16	REVISION A			
REV DESCRIPTION DATE PREPARED CHECKED APPROVED									TITLE Monthly Report No.27 3-Months Rolling Programme (Approved Works Programme Rev. D)		PAPER SIZE A3	SCALE N/A	PAGE 2 of 5		

Activity ID	Activity Name	Working Duration	BL Project Start	BL Project Finish	2016			
					Mar	Apr	May	Jun
5 North Portal Area								
5.0 North Portal Site Possession Contract Dates								
A1920	LS7 (near North Vent Slope)	0.0d	19-Aug-15	19-Aug-15				
5.1 North Portal Subcontract & Procurement								
NPS&P0070	Subcontract : Tunnel Lining Works	60.0d	05-Jun-15	15-Aug-15				
NPS&P0080	Subcontract : Tunnel Concreting Works	60.0d	05-Jun-15	15-Aug-15				
NPS&P0090	Subcontract : Tunnel Lining Formworks (Design, Fabrication, Delivery, & On-Site Assembly)	150.0d	05-Jun-15	02-Dec-15				
NPS&P0110	Subcontract : Ventilation Building Structure Works	60.0d	12-Aug-15	23-Oct-15				
NPS&P0120	Subcontract : Ventilation Building Pile Cap Works	60.0d	23-Sep-15	04-Dec-15				
NPS&P0130	Subcontract : Ventilation Building ABWF Works	60.0d	24-Oct-15	05-Jan-16				
NPS&P0140	Subcontract : External Works and Landscaping Works	60.0d	06-Jan-16	18-Mar-16				
5.2 North Portal Design Submission								
Bored Tunnel/ D&B Tunnel Transition - Headwall Structure (N/B & S/B)								
DDA Submission								
FL2022182	IPs/ ER's Review	28.0d	15-Jul-15	15-Aug-15				
FL2022183	Preparation for resubmission to ER/ICE/IP with ICE Certification	30.0d	17-Aug-15	19-Sep-15				
FL2022184	ER/IP's Approval	28.0d	20-Sep-15	17-Oct-15				
North Tunnel Curved Section Cross Passages - Temp Works								
DDA Submission								
FL2022190	IPs/ ER's Review	28.0d	20-Jul-15	20-Aug-15				
FL2022191	Preparation for resubmission to ER/ICE/IP with ICE Certification	32.0d	21-Aug-15	26-Sep-15				
FL2022192	ER/IP's Approval	28.0d	27-Sep-15	24-Oct-15				
Bored Tunnel Cross Passages Permanent Lining (Soft Ground)								
DDA Submission								
FL2022211	Preparation for resubmission to ER/ICE/IP with ICE Certification	43.0d	28-Jul-15	15-Sep-15				
FL2022212	ER/IP's Approval	28.0d	16-Sep-15	13-Oct-15				
Bored Tunnel Cross Passages Permanent Lining (Rock)								
DDA Submission								
FL2022218	IPs/ ER's Review	28.0d	18-Jul-15	19-Aug-15				
FL2022219	Preparation for resubmission to ER/ICE/IP with ICE Certification	23.0d	20-Aug-15	15-Sep-15				
FL2022220	ER/IP's Approval	28.0d	16-Sep-15	13-Oct-15				
Bored Tunnel Cross Passages Internal Structures								
DDA Submission								
FL2022225	Preparation for formal submission to ER/ICE/IP	75.0d	18-May-15	15-Aug-15				
FL2022226	IPs/ ER's Review	28.0d	17-Aug-15	17-Sep-15				
FL2022227	Preparation for resubmission to ER/ICE/IP with ICE Certification	25.0d	18-Sep-15	19-Oct-15				
FL2022228	ER/IP's Approval	28.0d	20-Oct-15	16-Nov-15				
5.3 North Portal Method Statement Submission								
North Tunnel (Cross Passages) Blasting Method Statement								
FL2022111	Preparation and Submission of Blasting Method Statement	70.0d	01-Jun-15	22-Aug-15				
FL2022112	Engineer's/IP's Review & Approval	60.0d	14-Jul-15	21-Sep-15				
MS for TBM Break-out								
FL2022544	Prepare & Submit Method Statement	24.0d	17-Sep-15	16-Oct-15				
FL2022554	ER's Comment for Method Statement	30.0d	17-Oct-15	15-Nov-15				
FL2022564	Prepare & Re-submit Method Statement	18.0d	16-Nov-15	05-Dec-15				
FL2022574	ER's Approval for Method Statement	30.0d	06-Dec-15	04-Jan-16				
MS for TBM Turn								
FL3875	Prepare & Submit Method Statement	24.0d	17-Oct-15	14-Nov-15				
FL3880	ER's Comment for Method Statement	30.0d	15-Nov-15	14-Dec-15				
FL3885	Prepare & Re-submit Method Statement	18.0d	15-Dec-15	07-Jan-16				

					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  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/00124/A		
REVISION A Monthly Report No.27 20/03/2016 KEC/RAN RBS/SJO DAL									DOC. STATUS FOR INFO.		CREATION DATE 20-Mar-16	REVISION A			
									TITLE Monthly Report No.27 3-Months Rolling Programme (Approved Works Programme Rev. D)		PAPER SIZE A3	SCALE N/A	PAGE 3 of 5		

Activity ID	Activity Name	Working Duration	BL Project Start	BL Project Finish	2016			
					Mar	Apr	May	Jun
FL3890	ER's Approval for Method Statement	30.0d	08-Jan-16	06-Feb-16				
MS for Removal of Left-in HDC Drill Rods within N/B TBM Excavation		46.8d	13-Nov-15	30-Jan-16				
FL2022584	Prepare & Submit Method Statement	40.0d	13-Nov-15	31-Dec-15				
FL2022594	ER's Comment for Method Statement	30.0d	01-Jan-16	30-Jan-16				
North Portal: MS for Cross Passage Ground Treatment		42.0d	20-Jul-15	07-Sep-15				
FL2022067	Prepare & Re-submit Method Statement	18.0d	20-Jul-15	08-Aug-15				
FL2022068	ER's Approval for Method Statement	30.0d	09-Aug-15	07-Sep-15				
North Portal: MS for Cross Passage Excavation in Rock		239.0d	12-Sep-15	20-Jan-16				
FL2022069	Prepare & Submit Method Statement	40.0d	12-Sep-15	31-Oct-15				
FL2022070	ER's Comment for Method Statement	30.0d	01-Nov-15	30-Nov-15				
FL2022071	Prepare & Re-submit Method Statement	18.0d	01-Dec-15	21-Dec-15				
FL2022072	ER's Approval for Method Statement	30.0d	22-Dec-15	20-Jan-16				
North Portal: MS for Cross Passage Excavation in Soft		239.0d	12-Sep-15	20-Jan-16				
FL2022073	Prepare & Submit Method Statement	40.0d	12-Sep-15	31-Oct-15				
FL2022074	ER's Comment for Method Statement	30.0d	01-Nov-15	30-Nov-15				
FL2022075	Prepare & Re-submit Method Statement	18.0d	01-Dec-15	21-Dec-15				
FL2022076	ER's Approval for Method Statement	30.0d	22-Dec-15	20-Jan-16				
5.5 North Portal Works		485.0d	21-Jan-15	06-May-16				
North Portal: Site Formation		262.9d	21-Jan-15	30-Oct-15				
N20655	NB: Stage 3 Permanent Slope from +75mPD to +30mPD	192.0d	21-Jan-15	30-Sep-15				
N20665	NB: Stage 4 Excavation from +18mPD to +9.5mPD w/4 rows Soil Nail	24.0d	02-Oct-15	30-Oct-15				
Southbound Tunnel (Mined Excavation) inc Enlargement		271.0d	23-Jul-15	06-May-16				
TD0910	SB - Invert Grouting	60.0d	23-Jul-15	03-Oct-15				
TD0920	SB - Gallery	60.0d	21-Aug-15	31-Oct-15				
TD0930	SB - Crown Grouting	60.0d	19-Sep-15	28-Nov-15				
TD0940a	Top Heading Enlargement (Ch6355>Ch6268); 87m; [P21: 4755 to 4668]	47.0d	09-Nov-15	04-Jan-16				
TD0940a1	Top Heading Enlargement (Ch6268>Ch6148); 120m; [P21: 4668 to 4548] - WSD Restriction Zone	104.0d	05-Jan-16	06-May-16				
Northbound Tunnel (Mined Excavation)		247.0d	09-Jun-15	31-Mar-16				
DB6400a2	Top Heading Canopies (Ch6410>Ch6350); 60m; [P20: 4788 to 4728]	70.0d	09-Jun-15	31-Aug-15				
DB6400a3	Top Heading Canopies (Ch6350>Ch6284); 66m; [P20: 4728 to 4662]	76.0d	01-Sep-15	30-Nov-15				
DB6400a5	Platform Lowering for Bench Excavation	26.0d	01-Dec-15	31-Dec-15				
DB6400a6	Bench Excavation (Ch6446>Ch6284); 162m; [P20: 4824 to 4662]	76.0d	02-Jan-16	31-Mar-16				
Southbound Tunnel (TBM Tunneling)		311.0d	10-Jun-15	12-Feb-16				
TD1000a	TBM DT (Ch6,355>Ch6,077) 278m	82.0d	10-Jun-15	16-Sep-15				
TD1000a20	TBM DT (Ch6,268>Ch6,148) 120m - WSD Restriction Zone	35.0d	11-Jul-15	21-Aug-15				
TD1000a30	TBM DT (Ch6,148>Ch6,077) 71m	21.0d	22-Aug-15	16-Sep-15				
TD1010a	TBM DT (Ch6,077>Ch5,950) 127m	17.0d	17-Sep-15	07-Oct-15				
TD1010b	TBM DT (Ch5,950>Ch5,713) 237m	31.0d	08-Oct-15	12-Nov-15				
TD1050	TBM DT (Ch5,713>Ch4,904) 809m	77.0d	13-Nov-15	12-Feb-16				
Bored Tunnel (S/B & N/B) Internal Works & Finishes		148.0d	28-Oct-15	20-Apr-16				
Southbound Tunnel Internal Works & Finishes		148.0d	28-Oct-15	20-Apr-16				
TD1470a	Tunnel Backfilling (Ch5,950 >Ch5,153) 797m- (Stage 1)	85.0d	28-Oct-15	05-Feb-16				
TD1480a	Bottom Drilling for Cross Passage (fr.Ch5953)	70.0d	14-Nov-15	05-Feb-16				
TD1490a	Tunnel Backfilling (Ch5,950 >Ch5,153) 797m- (Stage 2)	80.0d	19-Nov-15	22-Feb-16				
TD1500a	Drilling for Cross Passage (Remaining) (Ch5,950 >Ch5,153) 797m	80.0d	19-Nov-15	22-Feb-16				
TD1520a	Corbel (Ch5,950 >Ch5,153) 797m	80.0d	03-Dec-15	07-Mar-16				
TD1523a	OHVD Slab & 132kV Cable Trough (Ch5,950 >Ch5,153) 797m	81.0d	15-Dec-15	19-Mar-16				
TD1524a	Walkway Construction Ch5,950 >Ch5,153) 797m	81.0d	30-Dec-15	04-Apr-16				
TD1528a	Ground Treatment for Cross Passage Ch5,950 >Ch5,153) 797m	82.0d	19-Dec-15	25-Mar-16				
TD1725a	E&M Installation for S/B TBM Tunnel [CRP Ch5,950 to Ch5,650] 300m	77.0d	21-Jan-16	20-Apr-16				
North Portal: Retaining Wall & Site Formation		58.0d	03-Aug-15	05-Dec-15				

					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  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/00124/A		
A Monthly Report No.27 20/03/2016 KEC/RAN RBS/SJO DAL									DOC. STATUS FOR INFO.		CREATION DATE 20-Mar-16	REVISION A			
REV DESCRIPTION DATE PREPARED CHECKED APPROVED									TITLE Monthly Report No.27 3-Months Rolling Programme (Approved Works Programme Rev. D)		PAPER SIZE A3	SCALE N/A	PAGE 4 of 5		

Activity ID	Activity Name	Working Duration	BL Project Start	BL Project Finish	2016			
					Mar	Apr	May	Jun
N20930	*Retaining Wall & Site Formation (STK/RW1)	57.0d	03-Aug-15	13-Oct-15				
N20940	Retaining Wall & Site Formation (STK/RW3)	45.0d	14-Oct-15	05-Dec-15				
North Portal: Noise Barrier (NB5 to NB9)		51.0d	04-Jan-16	09-Mar-16				
N20990	Noise Barrier NB 6,8,9	51.0d	04-Jan-16	09-Mar-16				
5.6 Administration Building:		153.0d	24-Jul-15	05-Mar-16				
5.65 Administration Building: Works		153.0d	24-Jul-15	05-Mar-16				
Administration Building: Demolition		18.0d	24-Jul-15	15-Aug-15				
SV2945	Demolish Existing Building (AB3 - GLL 36508)	18.0d	24-Jul-15	15-Aug-15				
Administration Building: Site Formation		88.0d	17-Aug-15	05-Jan-16				
AD2070	Backfilling for Surcharge	66.0d	17-Aug-15	06-Nov-15				
AD2080	Surcharge (2 months Consolidation)	60.0d	07-Nov-15	05-Jan-16				
Administration Building: Foundation & Substructure		46.0d	06-Jan-16	05-Mar-16				
AD2030	Excavation for Footing	46.0d	06-Jan-16	05-Mar-16				

						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  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/00124/A	DOC. STATUS FOR INFO.	CREATION DATE 20-Mar-16	REVISION A
A	Monthly Report No.27	20/03/2016	KEC/RAN	RBS/SJO	DAL				TITLE Monthly Report No.27 3-Months Rolling Programme (Approved Works Programme Rev. D)	PAPER SIZE A3	SCALE N/A	PAGE 5 of 5	
REV	DESCRIPTION	DATE	PREPARED	CHECKED	APPROVED								

Contract 3

Activity ID	Activity Name	OD	RD	Start	Finish	TF	2016				
							Mar	Apr	May	Jun	Jul
3-Month Rolling Programme 2016-03-21											
Key Dates (Contractual)											
KD-1100	KD7: Stage 1A - Completion of the Realigned Tai Wo Service Road West for diversion of vehicular traffic	0	0		21-Mar-16*	-61	◆ KD7: Stage 1A - Completion of the Realigned Tai Wo Service Road West for diversion of vehicular traffic				
KD-1600	KD14: Stage N4B - Commissioning of Roundabout A by connecting to Slip Rd Y, Access Rd A & the realigned TWSRE	0	0		01-Jun-16*	0	◆ KD14: Stage N4B - Commissioning of Roundabout A by connecting to Slip Rd Y, Access Rd A & the realigned TWSRE				
Key Dates (Forecast)											
KD-1105	KD7: Stage 1A - Completion of the Realigned Tai Wo Service Road West for diversion of vehicular traffic	0	0		21-Mar-16	-61	◆ KD7: Stage 1A - Completion of the Realigned Tai Wo Service Road West for diversion of vehicular traffic				
KD-1605	KD14: Stage N4B - Commissioning of Roundabout A by connecting to Slip Rd Y, Access Rd A & the realigned TWSRE	0	0		01-Jun-16	0	◆ KD14: Stage N4B - Commissioning of Roundabout A by connecting to Slip Rd Y, Access Rd A & the realigned TWSRE				
Major Milestones and Events											
MS-2000C1	T3a: TTA to shift FLHS SB eastward for subsequent stage T3 (between CH7130 and CH7470)	1	0	07-Mar-16 A	07-Mar-16 A		T3a: TTA to shift FLHS SB eastward for subsequent stage T3 (between CH7130 and CH7470);				
MS-2000C	T3: TTA to split FLHS NB & SB with 3 lanes in the middle unoccupied (between CH7130 and CH7470)	1	0	20-Mar-16 A	20-Mar-16 A		T3: TTA to split FLHS NB & SB with 3 lanes in the middle unoccupied (between CH7130 and CH7470)				
MS-2000D	T4: TTA to divert TWSRW traffic to the completed re-aligned TWSRW	1	1	02-Apr-16	02-Apr-16	3	T4: TTA to divert TWSRW traffic to the completed re-aligned TWSRW				
MS-0200	Completion of 4 nos. of piers crash with the existing FLH (by 2 sets)	0	0		13-Apr-16	216	◆ Completion of 4 nos. of piers crash with the existing FLH (by 2 sets)				
Major Procurement & Delivery											
Footbridge Steel Truss											
MM-3050	Fabrication of footbridge steel truss (Kiu Tau Footbridge)	100	100	28-Mar-16	05-Jul-16	-9	Fabrication of footbridge steel truss (Kiu Tau Footbridge)				
Design and Submissions											
Statutory Approval											
PRE-1050	Submission & approval of CDIA report for construction of temporary platform for segment erection works	185	4	27-Nov-14 A	24-Mar-16	125	Submission & approval of CDIA report for construction of temporary platform for segment erection works, Submission & approval of CDIA report for construction of temporary platform for segment erection works				
Method Statement and Design (Major) Approved by AECOM											
PRE-2050	Submission of Shop Drawing for fabrication of Kiu Tau Footbridge Steelworks	30	7	02-Nov-15 A	27-Mar-16	-9	Submission of Shop Drawing for fabrication of Kiu Tau Footbridge Steelworks, Submission of Shop Drawing for fabrication of Kiu Tau Footbridge Steelworks				
PRE-2030	Submission of E&M design for lighting of Kiu Tau Footbridge	60	60	21-Mar-16	04-Jun-16	59	Submission of E&M design for lighting of Kiu Tau Footbridge				
PRE-2040	Submission of E&M design for lighting inside viaduct structures of Bridge A, B, C & D	60	60	26-Apr-16	08-Jul-16	69	Submission of E&M design for lighting inside viaduct structures of Bridge A, B, C & D				
Section IA & IB - Fanling Highway Widening (KD-1 & KD-2)											
Fanling Highway South Portion between CH6935 and CH7470											
Fanling Highway Zone 1 between CH6935 and CH7130 (within SBZ2)											
At-Grade Roadworks (195m)											
FHW-1130*	Pipe Laying - DN1200 Watermains (CHC) along Fanling Highway (80m long, 4m depth)	182	20	20-Feb-14 A	16-Apr-16	24	Pipe Laying - DN1200 Watermains (CHC) along Fanling Highway (80m long, 4m depth)				
FHW-1300	Noise Barrier NB68 - Mini-Piling at central median (CSD: 24 nos)	80	80	21-Mar-16	29-Jun-16	0	Noise Barrier NB68 - Mini-Piling at central median (CSD: 24 nos)				
FHW-1140	Noise Barrier NB70 - Footing adjacent to SB lane (15m)	115	115	29-Apr-16	14-Sep-16	14	Noise Barrier NB70 - Footing adjacent to SB lane (15m)				

3-Month Rolling Programme updated to 2016-03-20			
Date	Revision	Checked	Approved
20-Mar-16	Rev.0	SL	

Activity ID	Activity Name	OD	RD	Start	Finish	TF	2016				
							Mar	Apr	May	Jun	Jul
FHW-1310	Noise Barrier NB68 - Footing at central median (72m)	73	73	17-Jun-16	10-Sep-16	0					
Fanling Highway Zone 2 between CH7130 and CH7290											
At-Grade Roadworks (160m)											
FHW-2130*	Pipe Laying - DN1200 & DN600 Watermains (CHB & CHC) along Fanling Highway (183m long, 4m depth)	144	316	12-Oct-15 A	20-Apr-17	198					
FHW-2140	Road Formation, Kerb and Pavement (Eastern Side: FLH SB Slow lane and hard should)	61	0	14-Oct-15 A	04-Mar-16 A						
FHW-2300	Noise Barrier NB68 - Mini-Piling at central median (CSD: 22 nos)	80	79	19-Mar-16 A	28-Jun-16	-39					
FHW-2190	Footpath & DSD Access Track adjacent to SB lane	108	108	29-Apr-16	06-Sep-16	109					
FHW-2310	Noise Barrier NB68A - Footing at central median (157m)	130	130	18-May-16	21-Oct-16	-39					
Fanling Highway Zone 3 between CH7290 and CH7380											
At-Grade Roadworks (130m)											
FHW-3150*	Pipe Laying - DN600, DN1200 Watermains (CHB & CHC) along Fanling Highway (90m long, 3m depth)	150	316	07-Jun-14 A	20-Apr-17	39					
FHW-3160	Road Formation, Kerb and Pavement (Eastern Side: FLH SB Slow lane and hard should)	63	0	05-Oct-15 A	04-Mar-16 A						
FHW-3300	Noise Barrier NB68A - Mini-Piling at central median (CSD: 20 nos)	70	69	19-Mar-16 A	16-Jun-16	-34					
FHW-3310	Noise Barrier NB68A - Footing at central median (98m)	90	90	05-May-16	20-Aug-16	-34					
Fanling Highway North Portion between CH7470 and CH7925											
Fanling Highway Zone 4 between CH7380 and CH7470											
At-Grade Roadworks (90m)											
FHW-4210	Noise Barrier NB68A - Footing at central median (40m)	90	90	05-May-16	20-Aug-16	-34					
FHW-4100	Noise Barrier NB71 & NB72 - Footing adjacent to SB lane (90m)	115	115	30-May-16	15-Oct-16	41					
Fanling Highway Zone 5 between CH7470 and CH7600 (Provision of Kiu Tau Footbridge)											
Kiu Tau Footbridge Re-provision (East)											
FHW-5110	Inspection & Remedial Works for the 3nos. suspected defected piles (AB1-7, AB2-4, P3-9)	35	5	20-Nov-15 A	29-Mar-16	-3					
FHW-5000C2	KT-P2 - Piling Works (3 out of 6 nos of Pile) - Phase 2, conflict with existing TWSRE	15	15	21-Mar-16	11-Apr-16	-8					
FHW-5010E	KT-P4 - Ple Cap & Pter	75	75	21-Mar-16	23-Jun-16	2					
FHW-5010A	KT-AB1 - Ple Cap & Abutment	75	75	30-Mar-16	29-Jun-16	-3					
FHW-5090	Additional BFA Facilities - Pile Cap & Sump Pit, to be covered by VO	45	45	12-Apr-16	04-Jun-16	17					
FHW-5010D	KT-P3 - Ple Cap & Pter	60	60	12-Apr-16	23-Jun-16	-8					
FHW-5010C	KT-P2 - Ple Cap & Pter	60	60	12-Apr-16	23-Jun-16	-8					
FHW-5010B	KT-AB2 - Ple Cap & Abutment	60	60	23-Apr-16	06-Jul-16	-8					



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
- ▬ Actual Level of Effort
- ▬ Project Baseline Bar

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

3-Month Rolling Programme
Programme ID: 3MPR032 (Data Date: 21-Mar-16)

Page 2 of 9

3-Month Rolling Programme updated to 2016-03-20

Date	Revision	Checked	Approved
20-Mar-16	Rev.0	SL	

Activity ID	Activity Name	OD	RD	Start	Finish	TF	2016				
							Mar	Apr	May	Jun	Jul
At-Grade Road Works (130m)											
FHW-5120C	Preparation Works for Implementation of TTA Scheme E3A	30	0	07-Nov-15 A	02-Mar-16 A		Preparation Works for Implementation of TTA Scheme E3A				
FHW-5120D	Implementation of TTA - Scheme E3A (shifting TWSR East westward, at the existing ramp of Kiu Tau Footbridge)	0	0	03-Mar-16 A			◆ Implementation of TTA - Scheme E3A (shifting TWSR East westward, at the existing ramp of Kiu Tau Footbridge)				
Remaining Works for Noise Barrier along widened Fanling Highway											
FHW-NB-120	Noise Barrier Steelworks & Panel for NB6 (123m), adjacent to Fanling Highway SB lanes at Zone 1	20	10	03-Mar-16 A	05-Apr-16	485	[Bar]				
FHW-NB-130	Noise Barrier Steelworks & Panel for NB7 (60m), adjacent to Fanling Highway SB lanes at Zone 1	10	10	06-Apr-16	16-Apr-16	485	[Bar]				
FHW-NB-140	Noise Barrier Steelworks & Panel for NB71 (254m), adjacent to Fanling Highway SB lanes at Zones 2,3 & 4	45	45	18-Apr-16	11-Jun-16	485	[Bar]				
Section II - Remainder of the Works (KD-3)											
At Grade Link Road at Fanling Highway Interchange											
Link Road 1 (near Abutment AB1)											
FHI-LR1-1005	Noise Barrier NB66 - Footing adjacent NB lane (75m)	95	95	05-Apr-16	28-Jul-16	8	[Bar]				
FHI-LR1-1010	Noise Barrier NB67 - Mini-Piling (42nos) (Assume 2 sets of plant)	160	160	05-Apr-16	15-Oct-16	1	[Bar]				
Link Road 3 (near Abutment AD1)											
FHI-LR3-3000	Completion of WSD works incl. DN600, DN1200 & DN1400	0	0		16-Apr-16	395	◆ Completion of WSD works incl. DN600, DN1200 & DN1400				
Link Road 4 (near Abutment AC1)											
FHI-LR4-4030	Construction of Retaining Wall beside Abutment AC1 (4 bays)	35	35	21-Mar-16	05-May-16	380	[Bar] Construction of Retaining Wall beside Abutment AC1 (4 bays)				
FHI-LR4-4000	Diversion of Traffic from Existing TWSR West to Realigned TWSR West	0	0	02-Apr-16		407	◆ Diversion of Traffic from Existing TWSR West to Realigned TWSR West				
WSD Works											
DN450 Fire Mains (CHA)											
WA-1090	Pipe Laying - CHA 800 - 960 (DN450) near Ext. TWSR West (No Roadworks), 160m long & 3m depth	148	148	21-Mar-16*	19-Sep-16	18	[Bar]				
WA-1060	Pipe Laying - CHA 450 - 575 (DN450) near Realigned TWSR West (Re-TWSRW: CH640 - 695), 125m long & 2m depth	95	95	30-Mar-16	23-Jul-16	171	[Bar]				
DN600 Water Mains (CHB)											
WB-1060	Pipe Laying - CHB 538 - 635 (DN600) near Realigned TWSR East (TWSRE: CH270-380), 97m long & GL	40	15	17-Jul-15 A	11-Apr-16	499	[Bar]				
WB-1030C	Pipe Laying - CHB 350 - 450 (DN600) from Portal AB7/AD9/AC12 to Portal AB8	85	85	08-Apr-16	20-Jul-16	417	[Bar]				
DN1200 Water Mains (CHC)											
WC-1050A	Pipe Laying - CHC 155 - 200 (DN1200) near Fanling Highway S/B (FHW: CH6935-7130), 45m long, 4m depth	120	20	15-Oct-14 A	16-Apr-16	24	[Bar] Pipe Laying - CHC 155 - 200 (DN1200) near Fanling Highway S/B (FHW: CH6935-7130), 45m				
WC-1060	Pipe Laying - CHC 235 - 420 (DN1200) near Fanling Highway S/B (FHW: CH7130-7290), 185m long (common trench with NB)	95	30	12-Oct-15 A	28-Apr-16	14	[Bar] Pipe Laying - CHC 235 - 420 (DN1200) near Fanling Highway S/B (FHW: CH7130-7290), 185m long (common trench with NB)				
WC-1090C	Pipe Laying - CHC 615 - 720 (DN1200) from Portal AB7/AD9/AC12 to Portal AB8	85	85	08-Apr-16	20-Jul-16	102	[Bar]				
Twin DN1400 Water Mains (CHE & CHG)											



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
- Actual Level of Effort
- Project Baseline Bar

CEDD Contract No. CV/2012/09
Liantang / Heung Yuen Wai BCP - Site Formation & Infrastructure Works,
Contract 3
3-Month Rolling Programme
Programme ID: 3MPR032 (Data Date: 21-Mar-16)
Page 3 of 9

3-Month Rolling Programme updated to 2016-03-20			
Date	Revision	Checked	Approved
20-Mar-16	Rev.0	SL	

Activity ID	Activity Name	OD	RD	Start	Finish	TF	2016						
							Mar	Apr	May	Jun	Jul		
WE-1060	Pipe Laying - CHE & CHG (Twins DN1400) from Portal AB8 to new connection point	110	110	04-Jun-16	15-Oct-16	-28							
WE-1050	Pipe Laying - CHE & CHG (Twins DN1400) from Portal AB7/AD9/AC12 to Portal AB8	85	85	04-Jun-16	13-Sep-16	4							
DN2200 Water Mains (CHF)													
WF-1000A	Pipe Laying - CHF 80 - 112 (DN2200) near ext. TWSR West underneath Box Culvert BC01	210	210	05-Apr-16	13-Dec-16	87							
DN2300 Water Mains and Leakage Collection System (CHJ & CHKA/CHK)													
WJ-1020A	Pipe Laying - CHK 0 - 80 (DN1400) near Realigned TWSR East, 80m long & 4m depth	55	23	05-Oct-15 A	20-Apr-16	86							
WJ-1100	DN300 Washout at around CHJ 268	65	65	21-Mar-16	11-Jun-16*	144							
WJ-1110	DN300 Washout at CHJ 155	65	65	21-Mar-16	11-Jun-16*	144							
WJ-1020B	Pipe Laying - CHKA 0 - 73 (DN1400) near Realigned TWSR East, 73m long & 4m depth	90	90	21-Apr-16	08-Aug-16	86							
Kau Lung Hang Valve Control & Telemetry House Reprovision													
VCTH-1020c	Testing and Commissioning (Valve operation for DN1400 watermains)	30	12	10-Oct-15 A	07-Apr-16	116							
VCTH-1030	Demolition of Existing KLH Valve Control & Telemetry House	90	90	08-Apr-16*	26-Jul-16	116							
Existing Nam Wa Po Trunk Sewage Pumping Station (PST3)													
PS-1000	Demolition of Existing Boundary Wall of Pumping Station (PST3)	50	50	21-Mar-16*	24-May-16	410							
PS-1010	Construction of New Boundary Wall for Pumping Station (PST3)	90	90	25-May-16	08-Sep-16	410							
Stage 1A - Realignment of Tai Wo Service Road West (KD-7)													
TWSRW Zone 1 between CH100 and CH155													
At-Grade Roadworks													
TWSRW-1160	Road Formation, Road Drainage, DN150 watermain, Kerb, Planter & Pavement	286	2	15-Nov-14 A	22-Mar-16	7							
TWSRW Zone 2 between CH155 and CH280													
At-Grade Roadworks													
TWSRW-2120	Road Formation, Road Drainage, DN150 watermain, Kerb, Planter & Pavement	165	13	16-Oct-14 A	28-Apr-16	24							
TWSRW-2130	Noise Barrier NB1a - Footing adjacent Realigned TWSR West (Covered by VO 103) (Approx. 60.2m)	85	3	14-Sep-15 A	23-Mar-16	45							
TWSRW-2140	Rectification Works for Southern Trunk Sewer	48	20	30-Oct-15 A	16-Apr-16	24							
TWSRW-2120A	Temporary Road Formation for connecting Existing TWSRW to Realigned TWSR West	18	0	22-Jan-16 A	22-Feb-16 A								
TWSRW Zone 3 between CH280 and CH315													
At-Grade Roadworks													
TWSRW-3120	Road Formation, Road Drainage, Kerb, Planter and Pavement	181	0	22-Jun-15 A	26-Feb-16 A								
TWSRW Zone 4 between CH315 and CH376													



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
- Actual Level of Effort
- Project Baseline Bar

CEDD Contract No. CV/2012/09
Liantang / Heung Yuen Wai BCP - Site Formation & Infrastructure Works,
Contract 3
3-Month Rolling Programme
Programme ID: 3MPR032 (Data Date: 21-Mar-16)
Page 4 of 9

3-Month Rolling Programme updated to 2016-03-20			
Date	Revision	Checked	Approved
20-Mar-16	Rev.0	SL	

Activity ID	Activity Name	OD	RD	Start	Finish	TF	2016					
							Mar	Apr	May	Jun	Jul	
Construction of Bridge E												
TWSRW-4100	Remove Scaffold System and Temporary Work together with Slope Reinstatement	75	0	21-Dec-15 A	12-Mar-16 A		Remove Scaffold System and Temporary Work together with Slope Reinstatement					
At-Grade Roadworks												
TWSRW-4200	Cast Parapet, Lay Surfacing and Road Furniture for Footpath and Carriageway	35	0	12-Dec-15 A	27-Feb-16 A		Cast Parapet, Lay Surfacing and Road Furniture for Footpath and Carriageway					
TWSRW Zone 5 between CH376 and CH520												
At-Grade Roadworks												
TWSRW-5100	Retaining Wall RW7- adjacent to Realigned TWSR West (66m) (covered by VO No.100)	70	10	29-Oct-15 A	05-Apr-16	24	Retaining Wall RW7- adjacent to Realigned TWSR West (66m) (covered by VO No.100), Retaining Wall RW8 (to be covered by VO), Retaining Wall RW9 (to be covered by VO)					
TWSRW-5110	Retaining Wall RW9 (to be covered by VO)	45	12	05-Jan-16 A	07-Apr-16	2	Retaining Wall RW9 (to be covered by VO), Retaining Wall RW9 (to be covered by VO)					
TWSRW-5110A	Road Formation, DN150 watermain, Kerb, Planter and Pavement	19	0	21-Jan-16 A	23-Feb-16 A		Road Formation, DN150 watermain, Kerb, Planter and Pavement					
TWSRW-5100A	Retaining Wall RW8 - adjacent to Realigned TWSR West (66m) (covered by VO No.100)	50	0	29-Jan-16 A	17-Mar-16 A		Retaining Wall RW8 - adjacent to Realigned TWSR West (66m) (covered by VO No.100)					
TWSRW-5130	Installation of Stone Facing Finish	45	45	19-Mar-16 A	18-May-16	274	Installation of Stone Facing Finish, Installation of Stone Facing Finish					
TWSRW-5140	Remaining Road Formation, DN150 watermain, Kerb, Planter and Pavement (incl. Zone 5)	8	8	21-Mar-16	01-Apr-16	1	Remaining Road Formation, DN150 watermain, Kerb, Planter and Pavement (incl. Zone 5)					
TWSRW-5120	Permanent Vehicular Access to Lot 81	125	125	06-Apr-16	02-Sep-16	115	Permanent Vehicular Access to Lot 81					
TWSRW Zone 6 between CH520 and CH530												
At-Grade Roadworks												
TWSRW-6110	Slope Upgrading Works for unregistered feature beside Slope 3SW-D/C80 (Covered by VO. 68)	65	8	22-May-15 A	01-Apr-16	1	Slope Upgrading Works for unregistered feature beside Slope 3SW-D/C80 (Covered by VO. 68), Slope Upgrading Works for unregistered feature beside Slope 3SW-D/C80 (Covered by VO. 68)					
TWSRW-6100	Preparation Works for Implementation of TTA (shifting TWSRW traffic towards the edge of extended box culvert)	21	5	24-Dec-15 A	29-Mar-16	19	Preparation Works for Implementation of TTA (shifting TWSRW traffic towards the edge of extended box culvert, Preparation Works for Implementation of TTA (shifting TWSRW traffic towards the edge of extended box culvert)					
TWSRW Zone 7 between CH530 and CH640												
At-Grade Roadworks												
TWSRW-7150A	Road Drainage, Road Formation, DN150 watermain, Kerb, Planter and Pavement (incl. Zone 6 & Zone 7)	49	0	21-Dec-15 A	26-Feb-16 A		Road Drainage, Road Formation, DN150 watermain, Kerb, Planter and Pavement (incl. Zone 6 & Zone 7)					
TWSRW-7100	Preparation Works for Implementation of TTA (shifting TWSRW traffic towards FLH SB)	21	5	22-Dec-15 A	29-Mar-16	19	Preparation Works for Implementation of TTA (shifting TWSRW traffic towards FLH SB), Preparation Works for Implementation of TTA (shifting TWSRW traffic towards FLH SB)					
TWSRW-7110	Implementation of TTA - Scheme W3A(shifting TWSRW traffic towards FLH SB)	0	0	30-Mar-16		19	Implementation of TTA - Scheme W3A(shifting TWSRW traffic towards FLH SB)					
TWSRW-7150B	Remaining Road Formation, DN150 watermain, Kerb, Planter and Pavement (incl. Zone 6 & Zone 7)	30	30	30-Mar-16	05-May-16	19	Remaining Road Formation, DN150 watermain, Kerb, Planter and Pavement (incl. Zone 6 & Zone 7)					
TWSRW Zone 8 between CH640 and CH695												
Kiu Tau Footbridge Reprvision (West)												
TWSRW-8020	Construction of Pile Cap and Abutment	50	22	17-Nov-15 A	19-Apr-16	55	Construction of Pile Cap and Abutment, Construction of Pile Cap and Abutment					
At-Grade Roadworks												
TWSRW-8120	Road Formation, Road Drainage, Kerb and Pavement	22	0	21-Dec-15 A	26-Feb-16 A		Road Formation, Road Drainage, Kerb and Pavement					
TWSRW-8110*	Pipe Laying - DN450 Watermains (CHA)	95	95	30-Mar-16	23-Jul-16	171	Pipe Laying - DN450 Watermains (CHA)					



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
- ▬ Actual Level of Effort
- ▬ Project Baseline Bar

CEDD Contract No. CV/2012/09
Liantang / Heung Yuen Wai BCP - Site Formation & Infrastructure Works,
Contract 3
3-Month Rolling Programme
Programme ID: 3MPR032 (Data Date: 21-Mar-16)
Page 5 of 9

3-Month Rolling Programme updated to 2016-03-20			
Date	Revision	Checked	Approved
20-Mar-16	Rev.0	SL	

Activity ID	Activity Name	OD	RD	Start	Finish	TF	2016				
							Mar	Apr	May	Jun	Jul
Remainder of the Works											
TWSRW-9030	Utilities Diversion in Area 3 (along existing TWSRW, Approx. 150m) (by utilities undertakers)	106	106	03-Apr-16	17-Jul-16	178					
Remaining Works for Noise Barrier along realigned TWSR West											
TWSRW-NB-110	Noise Barrier Steelworks & Panel for NB4 at Zones 1 & 2	20	20	21-Mar-16*	16-Apr-16	4					
TWSRW-NB-130	Noise Barrier Steelworks & Panel for NB1b at Zone 4	10	10	18-Apr-16	28-Apr-16	4					
TWSRW-NB-140	Noise Barrier Steelworks & Panel for NB2 at Zone 5	20	20	29-Apr-16	24-May-16	4					
Stage N4A & N4B - Realignment of Tai Wo Service Road East (KD-13 & KD-14)											
TWSRE Zone 1 between CH100 and CH270											
At-Grade Roadworks											
TWSRE-1140*	Pipe laying - DN1400 Watermains (CHKA) along Realigned TWSR East	90	90	21-Apr-16	08-Aug-16	86					
TWSRE-1170	Remaining Noise Barrier NB3 Stem Wall (a total of 24m long)	30	30	20-May-16	24-Jun-16	218					
TWSRE Zone 2 between CH270 and CH380											
At-Grade Roadworks											
TWSRE-2030A*	Pipe laying - DN600 & DN1200 Watermains (CHB & CHC) along Realigned TWSR East	30	256	17-Jul-15 A	04-Feb-17	280					
TWSRE-2030B*	Pipe laying - DN1400 Watermains (CHK) along Realigned TWSR East	55	23	05-Oct-15 A	20-Apr-16	86					
TWSRE-2040	Road Formation, Kerb, Footpath, Cycle Track, Planter and Pavement	71	71	21-Apr-16	16-Jul-16	200					
TWSRE-2060	Erection of Scaffolding for Demolition Works	60	60	16-Jun-16	25-Aug-16	0					
TWSRE Zone 3 between CH380 and CH456											
At-Grade Roadworks											
TWSRE-3040	Road Formation, Kerb, Footpath, Cycle Track, Planter and Pavement (Incl. FL/F10)	165	165	21-Mar-16	11-Oct-16	129					
Roundabout A, Slip Road and Access Road											
TWSRE-4070	Roundabout A - Road Formation, Kerb, Planter and Pavement	90	17	26-Oct-15 A	13-Apr-16	40					
TWSRE-4110	Preparation Works for Implementation of TTA Scheme E1A (to shift TWSRE to Roundabout A)	30	0	26-Oct-15 A	19-Mar-16 A						
TWSRE-4020	Slip Road Y (CH260-CH404) - Road Formation, Road Drainage, Kerb, Planter and Pavement	108	57	28-Dec-15 A	01-Jun-16	0					
TWSRE-4120	Implementation of TTA - Scheme E1A (to shift TWSRE to Roundabout A)	0	0	21-Mar-16 A							
TWSRE-4030B	Slip Road Y (CH100-CH230) - Road Formation, Remaining Road Drainage, Kerb, Planter and Pavement	120	120	21-Mar-16	16-Aug-16	54					
Stage 1C - Viaduct Structure & TCSS Civil Provisions (KD-9)											
Preliminaries											
B-3050	Relocation of Plant including Pre-drilling Works	21	10	08-Mar-16 A	05-Apr-16	11					

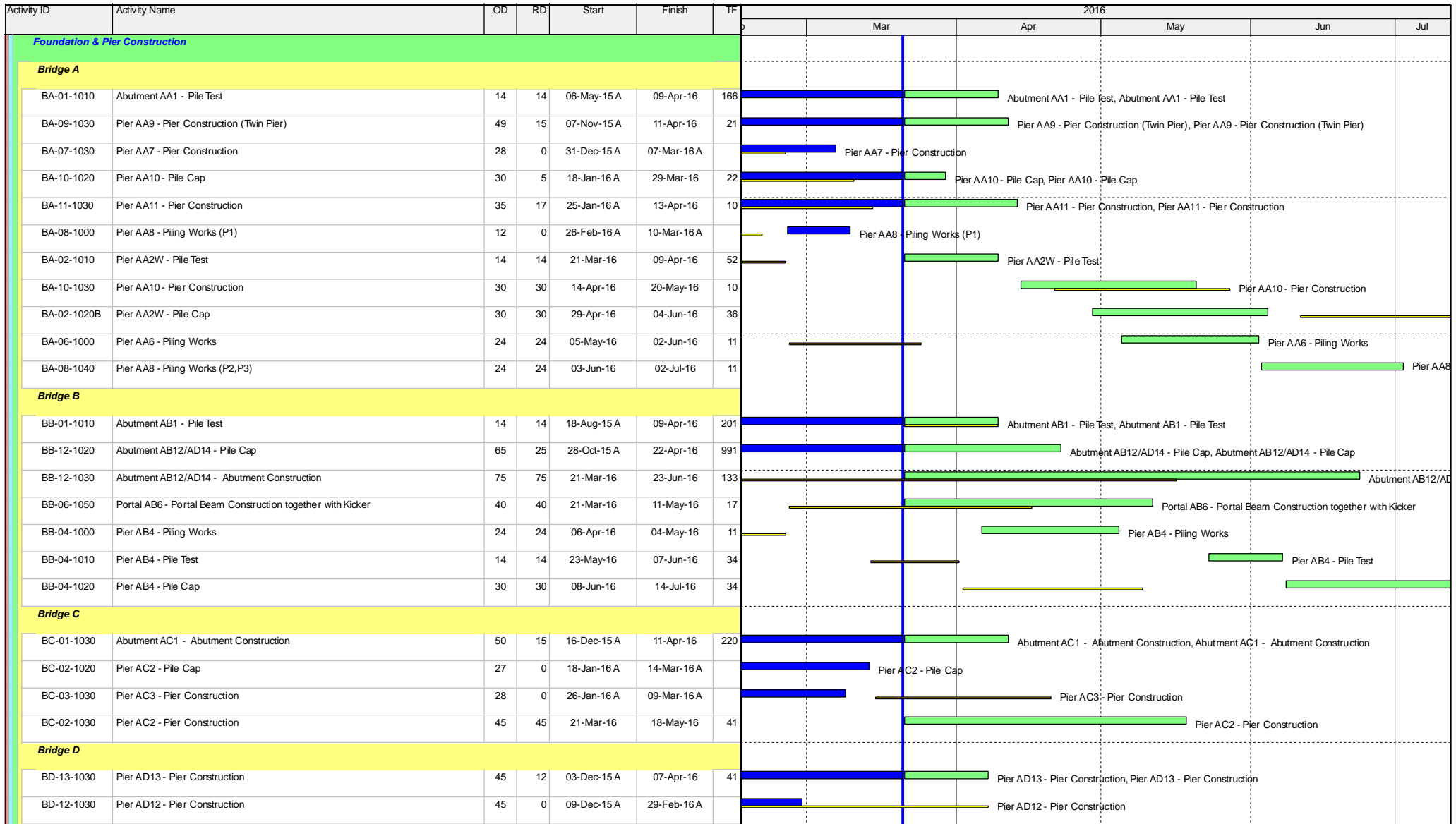


俊和建築工程有限公司
CHUN WO CONSTRUCTION & ENGINEERING CO., LTD.

- Actual Work
- Remaining Work
- Summary Bar
- Critical Remaining Work
- Milestone
- Actual Level of Effort
- Project Baseline Bar

CEDD Contract No. CV/2012/09
Liantang / Heung Yuen Wai BCP - Site Formation & Infrastructure Works,
Contract 3
3-Month Rolling Programme
Programme ID: 3MPR032 (Data Date: 21-Mar-16)
Page 6 of 9

3-Month Rolling Programme updated to 2016-03-20			
Date	Revision	Checked	Approved
20-Mar-16	Rev.0	SL	



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
- Actual Level of Effort
- Project Baseline Bar

CEDD Contract No. CV/2012/09
Liantang / Heung Yuen Wai BCP - Site Formation & Infrastructure Works,
Contract 3
3-Month Rolling Programme
Programme ID: 3MPR032 (Data Date: 21-Mar-16)

3-Month Rolling Programme updated to 2016-03-20

Date	Revision	Checked	Approved
20-Mar-16	Rev.0	SL	



- Actual Work
- Remaining Work
- Summary Bar
- Critical Remaining Work
- ◆ Milestone
- ▬ Actual Level of Effort
- ▬ Project Baseline Bar

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

3-Month Rolling Programme
Programme ID: 3MPR032 (Data Date: 21-Mar-16)
Page 8 of 9

3-Month Rolling Programme updated to 2016-03-20			
Date	Revision	Checked	Approved
20-Mar-16	Rev.0	SL	

Activity ID	Activity Name	OD	RD	Start	Finish	TF	2016				
							Mar	Apr	May	Jun	Jul
PD-1080	Pier Table Construction at Portal AC11/AD8 (4 nos.)	20	20	04-May-16	27-May-16	9					
Vaduct Bridge Segment Erection											
Bridge A											
EA-1030	Bridge Deck Construction at Pier AA3 by Typical Lifting Frame (16 nos + 1 no. key segment)	10	0	04-Mar-16 A	18-Mar-16 A						
EA-1040	Bridge Deck Construction at Pier AA4 by Typical Lifting Frame (16 nos + 1 no. key segment)	10	10	21-Mar-16	05-Apr-16	5					
EA-1050	Bridge Deck Construction at Pier AA5 by Typical Lifting Frame (12 nos + 1 no. key segment)	10	10	09-May-16	20-May-16	0					
EA-1180	Bridge Deck Construction at Pier AA18 by Typical Lifting Frame (24 nos + 2 no. key segment)	15	15	21-May-16	07-Jun-16	0					
Bridge B											
EB-1070	Bridge Deck Construction at Pier AB7 by Crane (26 nos + 2 no. key segment)	20	12	29-Feb-16 A	07-Apr-16	19					
EB-1100	Bridge Deck Construction at Pier AB10 by Special Lifting Frame (54 nos in which 12 nos above MTRCL Railway)	72	72	23-Mar-16	22-Jun-16	-88					
EB-1050	Bridge Deck Construction at Pier AB5 by Typical Lifting Frame (16 nos + 1 no. key segment)	10	10	20-Apr-16	30-Apr-16	5					
EB-1090	Bridge Deck Construction at Pier AB9 by Crane (36 nos + 2 no. key segment)	16	16	29-Apr-16	19-May-16	218					
Bridge C											
EC-1050	Bridge Deck Construction at Pier AC5 by Typical Lifting Frame (20 nos + 2 no. key segment + 3 no. of AC6)	12	12	06-Apr-16	19-Apr-16	5					
Bridge D											
ED-1070	Bridge Deck Construction at Pier AD7 by Typical Lifting Frame (26 nos + 1 no. key segment)	15	0	29-Jan-16 A	25-Feb-16 A						
ED-1100	Bridge Deck Construction at Portal AD10 by Crane (52 nos)	32	32	06-Apr-16	13-May-16	-11					
ED-1090	Bridge Deck Construction at Portal AD9 by Crane (14 nos + 4 no. key segment)	15	15	03-Jun-16	21-Jun-16	-28					
ED-1130	Bridge Deck Construction at Pier AD13 by Crane (6 nos)	44	44	04-Jun-16	27-Jul-16	41					
ED-1080	Bridge Deck Construction at Portal (AC11 & AD8) by Typical Lifting Frame (12 nos + 2 no. key segment)	13	13	08-Jun-16	23-Jun-16	0					
Section VI - Works in Portion FH9 (KD-6A)											
Major Works											
S6-2000*	Construction of Abutment AB12/AD14 (including Piling, Pile Cap & Abutment construction)	276	75	06-Feb-15 A	23-Jun-16	133					
Landscaping & Establishment Works (KD-4, 4A, 5, 5A, 6)											
Section III - Remainder of Landscaping Softworks Not Included in Section IIIA											
S3-1000	Transplanting along Realigned TWSR West	120	120	05-Apr-16	26-Aug-16	305					
S3-1020	Transplanting near MTR East Rail Line	240	240	21-May-16	13-Mar-17	147					



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
- Actual Level of Effort
- Project Baseline Bar

CEDD Contract No. CV/2012/09
Liantang / Heung Yuen Wai BCP - Site Formation & Infrastructure Works,
Contract 3
3-Month Rolling Programme
Programme ID: 3MPR032 (Data Date: 21-Mar-16)
Page 9 of 9

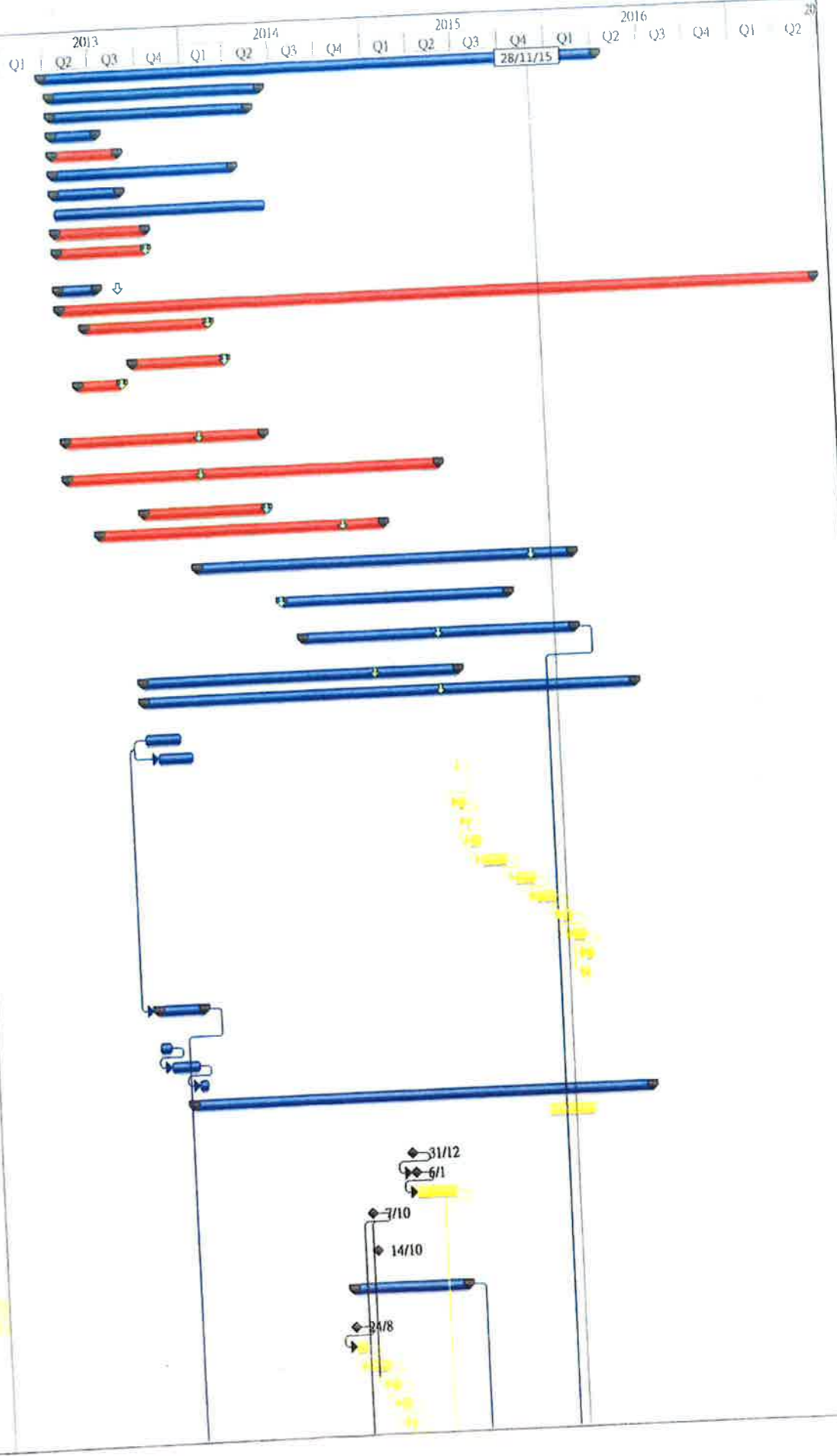
3-Month Rolling Programme updated to 2016-03-20			
Date	Revision	Checked	Approved
20-Mar-16	Rev.0	SL	

Contract 5

Site Formation and Infrastructure Works - Contract 5

Contract No. CV/2013/03 - Liantang/Heung Yuen Wai Boundary Control Point -

ID	WBS	Task Name	Duration	Start	Finish	Predecessors
1	1	Key Dates	1110 days	Thu 28/3/13	Sun 10/4/16	
47	2	Preliminaries and Statuary / Contractual Submissions	424 days	Thu 11/4/13	Mon 9/6/14	4
48	2.1	Site Establishment	399 days	Thu 11/4/13	Thu 15/5/14	
53	2.2	Applications to Government Department	89 days	Fri 12/4/13	Tue 9/7/13	
58	2.3	Temporary Traffic Arrangement (TTA) Scheme for temp. LMH Rd	131 days	Fri 12/4/13	Tue 20/8/13	
63	2.4	Liaison with Utility Undertakers	363 days	Fri 12/4/13	Wed 9/4/14	
66	2.5	Environmental Baseline & Impact Monitoring	132 days	Thu 11/4/13	Wed 21/8/13	
77	2.6	General Site Clearance	424 days	Fri 12/4/13	Mon 9/6/14	5SS
78	3	Stage of the Works	180 days	Thu 11/4/13	Mon 7/10/13	4
79	3.1	Stage I of the Works - Temporary vehicular bridge B and temporary Lin Ma Hang Road	179 days	Fri 12/4/13	Mon 7/10/13	4
90	3.2	Stage II of the Works - Temporary ArchSD Depot (I MH2)	78 days	Thu 11/4/13	Thu 27/6/13	
94	4	Section of the Works	1511 days	Fri 12/4/13	Wed 31/5/17	74SS+13 days
95	4.1	Section I of the Works - Ground Investigation field works (Drg. 7101A-7111A)	251 days	Thu 30/5/13	Tue 4/2/14	
100	4.2	Section II of the Works - All laboratory tests for Section I	188 days	Sat 31/8/13	Thu 6/3/14	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. SR.IV/W47/SO/J5/1308/00416 dated 23/8/2013)	89 days	Sun 12/5/13	Thu 8/8/13	24,25,26
111	4.4	Section IV of the Works - Village house within portion RS4 - EOT3 completion 15/5/2014	399 days	Fri 12/4/13	Thu 15/5/14	4
123	4.5	Section V of the Works - All works within portion RS4 exclude Section IV - EOT8 completion 28/4/2015	747 days	Fri 12/4/13	Tue 28/4/15	4
140	4.6	Section VII of the Works - All works within Area CRD	249 days	Mon 9/9/13	Thu 15/5/14	8
177	4.7	Section VIII of the Works - All works within Area BCPA - EOT6 completion 2/1/2015	571 days	Tue 11/6/13	Fri 2/1/15	6,7,18
211	4.8	Section IX of the Works - All works within Area BCPB - EOTO12 completion 9 January 2016	751 days	Fri 20/12/13	Sat 9/1/16	7
223	4.9	Section X of the Works - All works within Area BCPC	454 days	Thu 5/6/14	Tue 1/9/15	8
239	4.10	Section XI of the Works - All works within Area BCPD - EOTO12 completion 6 January 2016	542 days	Mon 14/7/14	Wed 6/3/16	
322	4.11	Section XII of the Works - All works within Area LMH	635 days	Thu 22/8/13	Mon 18/5/15	74
491	4.12	Section XIII of the Works - Works not covered in any other Sections	983 days	Thu 22/8/13	Sat 30/4/16	74
492	4.12.1	Submissions	70 days	Thu 22/8/13	Wed 30/10/13	
493	4.12.2	Approval of Submissions	68 days	Mon 16/9/13	Fri 22/11/13	492SS+25 days
494	4.12.3	VO.080 Additional Footpath adjacent to the Eastern Side of Chuk Yuen Village Re-site Area	1 day	Tue 5/5/15	Tue 5/5/15	
495	4.12.4	Submissions	14 days	Wed 6/5/15	Tue 19/5/15	494
496	4.12.5	Approval of Submissions	7 days	Wed 20/5/15	Tue 26/5/15	495
497	4.12.6	Temporary works and excavation	20 days	Wed 27/5/15	Mon 15/6/15	496
498	4.12.7	Base slab	50 days	Tue 16/6/15	Tue 4/8/15	496FS+20 days
499	4.12.8	Wall Stem	40 days	Thu 20/8/15	Mon 28/9/15	498FS+15 days
500	4.12.9	Backfilling	40 days	Tue 29/9/15	Sat 7/11/15	499
501	4.12.10	DN150 watermain & Utilities Laying	20 days	Wed 18/11/15	Mon 7/12/15	500FS+10 days
502	4.12.11	Surfacing & U-Channel	25 days	Tue 8/12/15	Fri 1/1/16	501
503	4.12.12	Reinstatement of Gabion	14 days	Sat 2/1/16	Tue 5/1/16	502
504	4.12.13	Type 2 Railing	4 days	Sat 2/1/16	Tue 5/1/16	502
505	4.12.14	Temporary Traffic Arrangement (TTA) Scheme for Works at existing LMH Rd	92 days	Fri 23/8/13	Fri 22/11/13	492SS+1 day
506	4.12.14.1	Preparation of TTA scheme	21 days	Fri 23/8/13	Thu 12/9/13	
507	4.12.14.2	Comment & approval of TTA scheme by TD & RMO	55 days	Fri 13/9/13	Wed 6/11/13	506
508	4.12.14.3	Obtain roadwork advice from RMO	16 days	Thu 7/11/13	Fri 22/11/13	507
509	4.12.15	Lin Ma Hang Road Widening Section	920 days	Thu 24/10/13	Sat 30/4/16	
510	4.12.15.1	PYO - Additional U-Channel along both Side of existing LMH Road 600m x 2) (Advanced works commenced)	91 days	Wed 7/10/15	Tue 5/1/16	
511	4.12.15.2	VO.061 Addition at Rising Main at LMH Road	0 days	Wed 31/12/14	Wed 31/12/14	511FS+2 days
512	4.12.15.3	place order for HDPE pipes	0 days	Tue 6/1/15	Tue 6/1/15	512
513	4.12.15.4	arrival of HDPE pipes	80 days	Tue 6/1/15	Thu 26/3/15	
514	4.12.15.5	RECEIVE VO 053 ADDITIONAL CROSS ROAD DUCTS FOR EXISTING IRRIGATION PIPES	0 days	Tue 7/10/14	Tue 7/10/14	
515	4.12.15.6	RECEIVE VO 062 CABLE DUCTS LAYING FOR PUBLIC LIGHTING SYSTEM AT LIN MA HANG ROAD	0 days	Tue 14/10/14	Tue 14/10/14	
516	4.12.15.7	1 Works from chainage 190 to chainage 380 (west side carriageway & footpath)	231 days	Sun 24/8/14	Sat 11/4/15	
517	4.12.15.7.1	TTA for ch 310-380(west)	0 days	Sun 24/8/14	Sun 24/8/14	517
518	4.12.15.7.2	earthwork to lay drainage & waterwork	21 days	Sun 24/8/14	Sat 13/9/14	518
519	4.12.15.7.3	drainage & waterwork + backfill for CLP	45 days	Sun 14/9/14	Tue 28/10/14	519,514
520	4.12.15.7.4	VO053 - crossing no. 1(whole), 2 (west)	18 days	Wed 29/10/14	Sat 15/11/14	520
521	4.12.15.7.5	UU for ch 190-380 (132kV,11kV,LV)	19 days	Sun 16/11/14	Thu 4/12/14	521
522	4.12.15.7.6	filling works to formation of road (include SRT98%)	7 days	Fri 5/12/14	Thu 11/12/14	521



Revision 1 Tue 26/1/16

Task Milestone Project Summary Critical Split

Split Summary Critical Progress Deadline

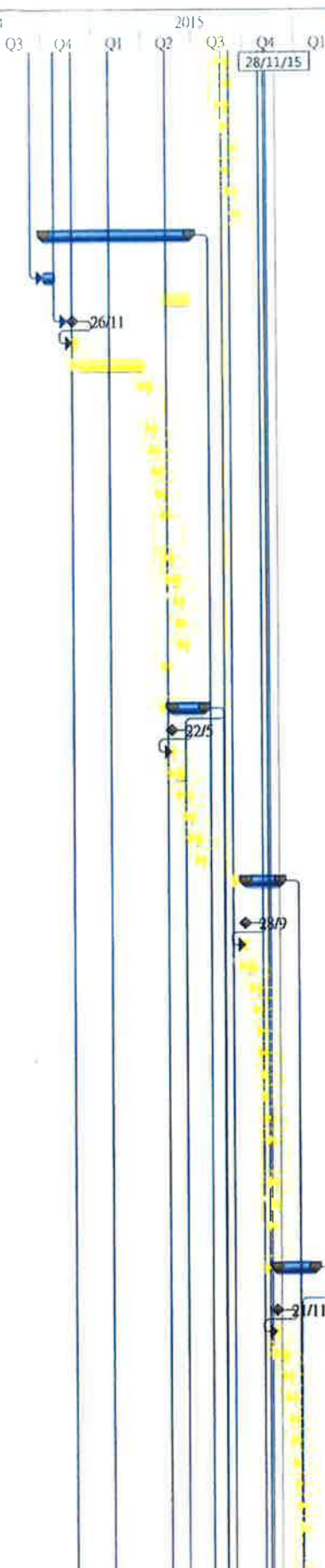
ID	WBS	Task Name	Duration	Start	Finish	Predecessors	Gantt Chart (2013-2016)																			
523	4.12.15.7.7	street lighting drawpits & crossroads	7 days	Fri 12/12/14	Thu 18/12/14	522	[Gantt Chart]																			
524	4.12.15.7.8	kerb bedding, laying & backing before bituminous material	9 days	Fri 19/12/14	Sat 27/12/14	523	[Gantt Chart]																			
525	4.12.15.7.9	filling works to formation of footpath	4 days	Sun 28/12/14	Wed 31/12/14	524	[Gantt Chart]																			
526	4.12.15.7.10	UU for CLP (lighting)	5 days	Thu 1/1/15	Mon 5/1/15	525	[Gantt Chart]																			
527	4.12.15.7.11	UU for ch 190-380 (PCCW)	7 days	Tue 6/1/15	Mon 12/1/15	526	[Gantt Chart]																			
528	4.12.15.7.12	irrigation system	7 days	Tue 13/1/15	Mon 19/1/15	527	[Gantt Chart]																			
529	4.12.15.7.13	preparation works to formation of footpath	3 days	Mon 19/1/15	Wed 21/1/15	528FS-1 day	[Gantt Chart]																			
530	4.12.15.7.14	footpath paving	9 days	Thu 22/1/15	Fri 30/1/15	529	[Gantt Chart]																			
531	4.12.15.7.15	VO.061 for renewal of rising main	6 days	Fri 27/3/15	Wed 1/4/15	513	[Gantt Chart]																			
532	4.12.15.7.16	sub-base laying for road	5 days	Thu 2/4/15	Mon 6/4/15	531	[Gantt Chart]																			
533	4.12.15.7.17	AC - lay DBM & base course	5 days	Tue 7/4/15	Sat 11/4/15	524,532	[Gantt Chart]																			
534	4.12.15.8	1 Works from chainage 380 to chainage 580 (west side carriageway & footpath)	402 days	Fri 22/11/13	Mon 29/12/14	505	[Gantt Chart]																			
535	4.12.15.8.1	TTA for ch 380-580(west)	0 days	Fri 22/11/13	Fri 22/11/13		[Gantt Chart]																			
536	4.12.15.8.2	watermain (include issue of alignment and laying)	120 days	Sat 23/11/13	Sat 22/3/14	535	[Gantt Chart]																			
537	4.12.15.8.3	drainage (pipe, manholes & gullies)	155 days	Sun 23/3/14	Sun 24/8/14	536	[Gantt Chart]																			
538	4.12.15.8.4	Received Variation Order Nos. 040 & 042	0 days	Mon 28/4/14	Mon 28/4/14		[Gantt Chart]																			
539	4.12.15.8.5	construct DN450mm pipe with concrete surround	28 days	Mon 12/5/14	Sun 8/6/14	537SS+50 days,538FS+14 days	[Gantt Chart]																			
540	4.12.15.8.5.1	low stream pipe & catchpit at western side	28 days	Mon 12/5/14	Sun 8/6/14		[Gantt Chart]																			
541	4.12.15.8.6	construct 1900x950 box culvert with manholes SMH8052A & B	49 days	Mon 9/6/14	Sun 27/7/14	538,540	[Gantt Chart]																			
542	4.12.15.8.6.1	support existing DN150mm sewer pipe & watermain	7 days	Mon 9/6/14	Sun 15/6/14		[Gantt Chart]																			
543	4.12.15.8.6.2	construct box culvert	14 days	Mon 16/6/14	Sun 29/6/14	542	[Gantt Chart]																			
544	4.12.15.8.6.3	construct manholes	28 days	Mon 30/6/14	Sun 27/7/14	543	[Gantt Chart]																			
545	4.12.15.8.7	found existing cables affected construction of gullies & discuss with CLP	18 days	Sat 26/7/14	Tue 12/8/14	537FF-12 days,544FS-2 days	[Gantt Chart]																			
546	4.12.15.8.8	complete preparation work & fill footpath for 132kV, 11kV & LV	8 days	Wed 13/8/14	Wed 20/8/14	545	[Gantt Chart]																			
547	4.12.15.8.9	UU - 132kV+11kV & LV	35 days	Thu 21/8/14	Wed 24/9/14	546	[Gantt Chart]																			
548	4.12.15.8.10	temporary connection of cables	3 days	Thu 25/9/14	Sat 27/9/14	547	[Gantt Chart]																			
549	4.12.15.8.11	960x650 box culvert (low stream & west catchpit)	7 days	Sun 28/9/14	Sat 4/10/14	548	[Gantt Chart]																			
551	4.12.15.8.12	construct outstanding drainage & gullies	7 days	Wed 1/10/14	Tue 7/10/14	550FS-4 days	[Gantt Chart]																			
552	4.12.15.8.13	filling work to formation of road (include SRT98%)	5 days	Wed 8/10/14	Sun 12/10/14	551	[Gantt Chart]																			
553	4.12.15.8.14	VO053 - crossing no. 3, 4 (west)	10 days	Mon 13/10/14	Wed 22/10/14	514FS+6 days	[Gantt Chart]																			
554	4.12.15.8.15	complete filling work to formation of road (include SRT98%)	5 days	Thu 23/10/14	Mon 27/10/14	553	[Gantt Chart]																			
555	4.12.15.8.16	street lighting drawpits & crossing at ch 523	4 days	Mon 27/10/14	Thu 30/10/14	554FS-1 day	[Gantt Chart]																			
556	4.12.15.8.17	UU for CLP (lighting)	5 days	Fri 31/10/14	Tue 4/11/14	555	[Gantt Chart]																			
557	4.12.15.8.18	sub-base laying for road	4 days	Wed 5/11/14	Sat 8/11/14	556	[Gantt Chart]																			
558	4.12.15.8.19	kerb bedding, laying & backing before bituminous material	12 days	Sat 8/11/14	Wed 19/11/14	557FS-1 day	[Gantt Chart]																			
559	4.12.15.8.20	filling works to formation of footpath	5 days	Thu 20/11/14	Mon 24/11/14	558	[Gantt Chart]																			
560	4.12.15.8.21	UU for ch 380-580 (PCCW)	14 days	Tue 25/11/14	Mon 8/12/14	559	[Gantt Chart]																			
561	4.12.15.8.22	irrigation system	4 days	Tue 9/12/14	Fri 12/12/14	560	[Gantt Chart]																			
562	4.12.15.8.23	preparation works to formation of footpath	3 days	Sat 13/12/14	Mon 15/12/14	561	[Gantt Chart]																			
563	4.12.15.8.24	footpath paving	14 days	Tue 16/12/14	Mon 29/12/14	562	[Gantt Chart]																			
564	4.12.15.8.25	AC - lay DBM & base course	5 days	Thu 20/11/14	Mon 24/11/14	558	[Gantt Chart]																			
565	4.12.15.9	2 Works from ch 380-580 (east side carriageway)	318 days	Wed 26/11/14	Sat 10/10/15	564FS+2 days	[Gantt Chart]																			
566	4.12.15.9.1	TTA for ch 380-580 (east)	0 days	Wed 26/11/14	Wed 26/11/14		[Gantt Chart]																			
567	4.12.15.9.2	remove existing pavement	4 days	Thu 27/11/14	Sun 30/11/14	566	[Gantt Chart]																			
568	4.12.15.9.3	PVO: 2 nos. U-Channel Drainage Crossing	14 days	Mon 1/12/14	Sun 14/12/14	567	[Gantt Chart]																			
569	4.12.15.9.4	VO.061 for rising main	40 days	Fri 27/3/15	Tue 3/5/15	513,568	[Gantt Chart]																			
570	4.12.15.9.5	Waterworks - 150T FH, 150T Irrigation & 150T	14 days	Wed 6/5/15	Tue 19/5/15	569	[Gantt Chart]																			
571	4.12.15.9.6	VO053 - crossing no. 2, 3, 4, 5 (east)	20 days	Wed 13/5/15	Mon 1/6/15	570FS-7 days	[Gantt Chart]																			
572	4.12.15.9.7	PVO - Revised Design of VO.061 for Rising Mains	40 days	Fri 19/6/15	Tue 28/7/15		[Gantt Chart]																			
573	4.12.15.9.8	**Re-construction: VO.061 for Rising Mains	30 days	Wed 29/7/15	Thu 27/8/15	572	[Gantt Chart]																			
574	4.12.15.9.9	**Re-construction: Waterworks - 150T FH, 150T Irrigation & 150T	10 days	Fri 28/8/15	Sun 6/9/15	573	[Gantt Chart]																			
575	4.12.15.9.10	**Re-construction: RVO053 - crossing no. 2, 3, 4, 5 (east)	10 days	Mon 31/8/15	Wed 9/9/15	574FS-7 days	[Gantt Chart]																			
576	4.12.15.9.11	**Re-construction: PVO: 2 nos. U-Channel Drainage Crossing	10 days	Fri 28/8/15	Sun 6/9/15	573	[Gantt Chart]																			
577	4.12.15.9.12	middle stream box culvert 960x650	14 days	Mon 31/8/15	Sun 13/9/15	576FS-7 days	[Gantt Chart]																			
578	4.12.15.9.13	middle stream DN450mm pipe	12 days	Mon 7/9/15	Fri 18/9/15	577FS-7 days	[Gantt Chart]																			
579	4.12.15.9.14	street light crossing at ch 523	4 days	Sat 19/9/15	Tue 22/9/15	575,578	[Gantt Chart]																			
580	4.12.15.9.15	SRT Formation level	5 days	Wed 23/9/15	Sun 27/9/15	579	[Gantt Chart]																			
581	4.12.15.9.16	sub-base & east kerbing	8 days	Mon 28/9/15	Mon 5/10/15	575,580	[Gantt Chart]																			
582	4.12.15.9.17	AC - lay DBM & base course	5 days	Tue 6/10/15	Sat 10/10/15	581	[Gantt Chart]																			
583	4.12.15.10	3 Works from ch 190-380 (east side carriageway)	60 days	Wed 29/7/15	Sat 26/9/15	516FS+2 days	[Gantt Chart]																			
584	4.12.15.10.1	TTA for ch 190-380 (east)	0 days	Wed 29/7/15	Wed 29/7/15		[Gantt Chart]																			
585	4.12.15.10.2	remove existing pavement	4 days	Wed 29/7/15	Sat 1/8/15	584	[Gantt Chart]																			
586	4.12.15.10.3	VO.061 for rising main	25 days	Sun 2/8/15	Wed 26/8/15	585	[Gantt Chart]																			

Revision 1 Tue 26/1/16

Task Milestone Project Summary Critical Split Deadline

Split Summary Critical Progress

ID	WBS	Task Name	Duration	Start	Finish	Predecessors	2013 2014 2015 2016													
							Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
587	4.12.15.10.4	Waterworks - 150T FH, 150T x 2	14 days	Thu 27/8/15	Wed 9/9/15	586														
588	4.12.15.10.5	RVO053 - crossing no. 1 (east)	6 days	Mon 7/9/15	Sat 12/9/15	587FS-3 days														
589	4.12.15.10.6	PVO: 2 nos. U-Channel Drainage Crossing	10 days	Thu 27/8/15	Sat 5/9/15	586														
590	4.12.15.10.7	street light crossings at ch 287, 350	4 days	Thu 3/9/15	Sun 6/9/15	589FS-3 days														
591	4.12.15.10.8	PCCW crossings at ch 350	2 days	Sat 5/9/15	Sun 6/9/15	590FF														
592	4.12.15.10.9	SRT Formation level	5 days	Mon 7/9/15	Fri 11/9/15	591														
593	4.12.15.10.10	sub-base & east kerbing	10 days	Sat 12/9/15	Mon 21/9/15	590,592														
594	4.12.15.10.11	AC - lay DBM & base course	5 days	Tue 22/9/15	Sat 26/9/15	593														
595	4.12.15.11	2,3,7 Works from chainage 580 to chainage 785 (west side carriageway & footpath)	265 days	Sun 5/10/14	Fri 26/6/15															
596	4.12.15.11.1	UU for ch 580-785 (132kV,11kV,LV)	21 days	Sun 5/10/14	Sat 25/10/14	549														
597	4.12.15.11.2	VO.091 Water Mains Diversion	50 days	Fri 8/5/15	Fri 26/6/15															
598	4.12.15.11.3	TTA for ch 580-785(west)	0 days	Wed 26/11/14	Wed 26/11/14	565SS														
599	4.12.15.11.4	earthwork to lay drainage & waterwork	10 days	Thu 27/11/14	Sat 6/12/14	598														
600	4.12.15.11.5	drainage & waterwork	120 days	Sun 7/12/14	Sun 5/4/15	599														
601	4.12.15.11.6	VO053 - crossing no. 5, 6, 7&8 & Ducts along ch613-700 (west)	14 days	Mon 6/4/15	Sun 19/4/15	600														
602	4.12.15.11.7	filling works to formation of road (include SRT98%)	7 days	Mon 20/4/15	Sun 26/4/15	601														
603	4.12.15.11.8	street lighting drawpits & crossings ch760,785	5 days	Mon 27/4/15	Fri 1/5/15	602														
604	4.12.15.11.9	sub-base laying for road	5 days	Sat 2/5/15	Wed 6/5/15	603														
605	4.12.15.11.10	kerb bedding, laying & backing before bituminous material	9 days	Thu 7/5/15	Fri 15/5/15	604														
606	4.12.15.11.11	filling works to formation of footpath	4 days	Sat 16/5/15	Tue 19/5/15	605														
607	4.12.15.11.12	UU for CLP (lighting)	5 days	Wed 20/5/15	Sun 24/5/15	606														
608	4.12.15.11.13	UU for ch 580-785 (PCCW)	14 days	Mon 25/5/15	Sun 7/6/15	606,607														
609	4.12.15.11.14	irrigation system	5 days	Mon 8/6/15	Fri 12/6/15	608														
610	4.12.15.11.15	preparation works to formation of footpath	3 days	Sat 13/6/15	Mon 15/6/15	609														
611	4.12.15.11.16	footpath paving	7 days	Tue 16/6/15	Mon 22/6/15	610														
612	4.12.15.11.17	AC - lay DBM & base course	5 days	Sat 16/5/15	Wed 20/5/15	605														
613	4.12.15.12	4,5,6 Works from ch 580-785 (east side carriageway)	58 days	Fri 22/5/15	Sun 19/7/15	612FS+2 days														
614	4.12.15.12.1	TTA for ch 580-785 (east)	0 days	Fri 22/5/15	Fri 22/5/15															
615	4.12.15.12.2	remove existing pavement	5 days	Sat 23/5/15	Wed 27/5/15	614														
616	4.12.15.12.3	VO.061 for rising main	20 days	Thu 28/5/15	Tue 16/6/15	615														
617	4.12.15.12.4	VO053 - crossing no. 5, 6, 7&8 (east)	14 days	Fri 12/6/15	Thu 25/6/15	616FS-5 days														
618	4.12.15.12.5	street lighting crossings at ch 760, 785	7 days	Wed 24/6/15	Tue 30/6/15	617FS-2 days														
619	4.12.15.12.6	sub-base & east kerbing	14 days	Wed 1/7/15	Tue 14/7/15	618														
620	4.12.15.12.7	AC - lay DBM & base course	5 days	Wed 15/7/15	Sun 19/7/15	619														
621	4.12.15.13	5 Works from chainage 125 to chainage 190 (west side carriageway & footpath)	62 days	Mon 28/9/15	Sun 29/11/15	594FS+2 days														
622	4.12.15.13.1	TTA for ch 125-190 (west)	0 days	Mon 28/9/15	Mon 28/9/15															
623	4.12.15.13.2	earthwork to lay drainage & waterwork	3 days	Tue 29/9/15	Thu 1/10/15	622														
624	4.12.15.13.3	drainage & waterwork + backfill for CLP	18 days	Thu 1/10/15	Sun 18/10/15	623FS-1 day														
625	4.12.15.13.4	UU for ch 125-190 (132kV,11kV,LV)	8 days	Mon 19/10/15	Mon 26/10/15	624														
626	4.12.15.13.5	filling works to formation of road (include SRT98%)	7 days	Sun 25/10/15	Sat 31/10/15	625FS-2 days														
627	4.12.15.13.6	street lighting drawpits & crossing at ch 154	3 days	Sun 1/11/15	Tue 3/11/15	626														
628	4.12.15.13.7	irrigation system	4 days	Mon 2/11/15	Thu 5/11/15	627FS-2 days														
629	4.12.15.13.8	UU for CLP (lighting)	3 days	Fri 6/11/15	Sun 8/11/15	628														
630	4.12.15.13.9	sub-base laying	3 days	Mon 9/11/15	Wed 11/11/15	629														
631	4.12.15.13.10	kerb bedding, laying & backing before bituminous material	5 days	Thu 12/11/15	Mon 16/11/15	630														
632	4.12.15.13.11	filling works to formation of footpath	3 days	Mon 16/11/15	Wed 18/11/15	631FS-1 day														
633	4.12.15.13.12	UU for ch 125-190 (PCCW)	5 days	Thu 19/11/15	Mon 23/11/15	632														
634	4.12.15.13.13	footpath paving	7 days	Mon 23/11/15	Sun 29/11/15	633FS-1 day														
635	4.12.15.13.14	AC - lay DBM & base course	4 days	Tue 17/11/15	Fri 20/11/15	631														
636	4.12.15.14	7 Works from chainage 80 to chainage 125 (west side carriageway & footpath)	67 days	Sat 21/11/15	Wed 27/1/16	635FS+1 day														
637	4.12.15.14.1	TTA for ch 80-125(west)	0 days	Sat 21/11/15	Sat 21/11/15															
638	4.12.15.14.2	earthwork to lay drainage & waterwork	3 days	Sun 22/11/15	Tue 24/11/15	637														
639	4.12.15.14.3	drainage & waterwork + backfill for CLP	18 days	Wed 25/11/15	Sat 12/12/15	638														
640	4.12.15.14.4	UU for ch 80-190 (132kV,11kV,LV)	6 days	Sun 13/12/15	Fri 18/12/15	639														
641	4.12.15.14.5	filling works to formation of road (include SRT98%)	7 days	Sat 19/12/15	Fri 25/12/15	640														
642	4.12.15.14.6	street lighting drawpits & crossing at ch 98	3 days	Sat 26/12/15	Mon 28/12/15	641														
643	4.12.15.14.7	irrigation system	3 days	Tue 29/12/15	Thu 31/12/15	642														
644	4.12.15.14.8	UU for CLP (lighting)	3 days	Fri 1/1/16	Sun 3/1/16	643														
645	4.12.15.14.9	sub-base laying	3 days	Mon 4/1/16	Wed 6/1/16	644														
646	4.12.15.14.10	kerb bedding, laying & backing before bituminous material	5 days	Thu 7/1/16	Mon 11/1/16	645														
647	4.12.15.14.11	filling works to formation of footpath	4 days	Tue 12/1/16	Fri 15/1/16	646														
648	4.12.15.14.12	UU for ch 80-190 (PCCW)	4 days	Sat 16/1/16	Tue 19/1/16	647														



Revision 1 Tue 26/1/16	Task Split	Milestone Summary	Project Summary Critical	Critical Split Progress	Deadline
---------------------------	---------------	----------------------	-----------------------------	----------------------------	----------

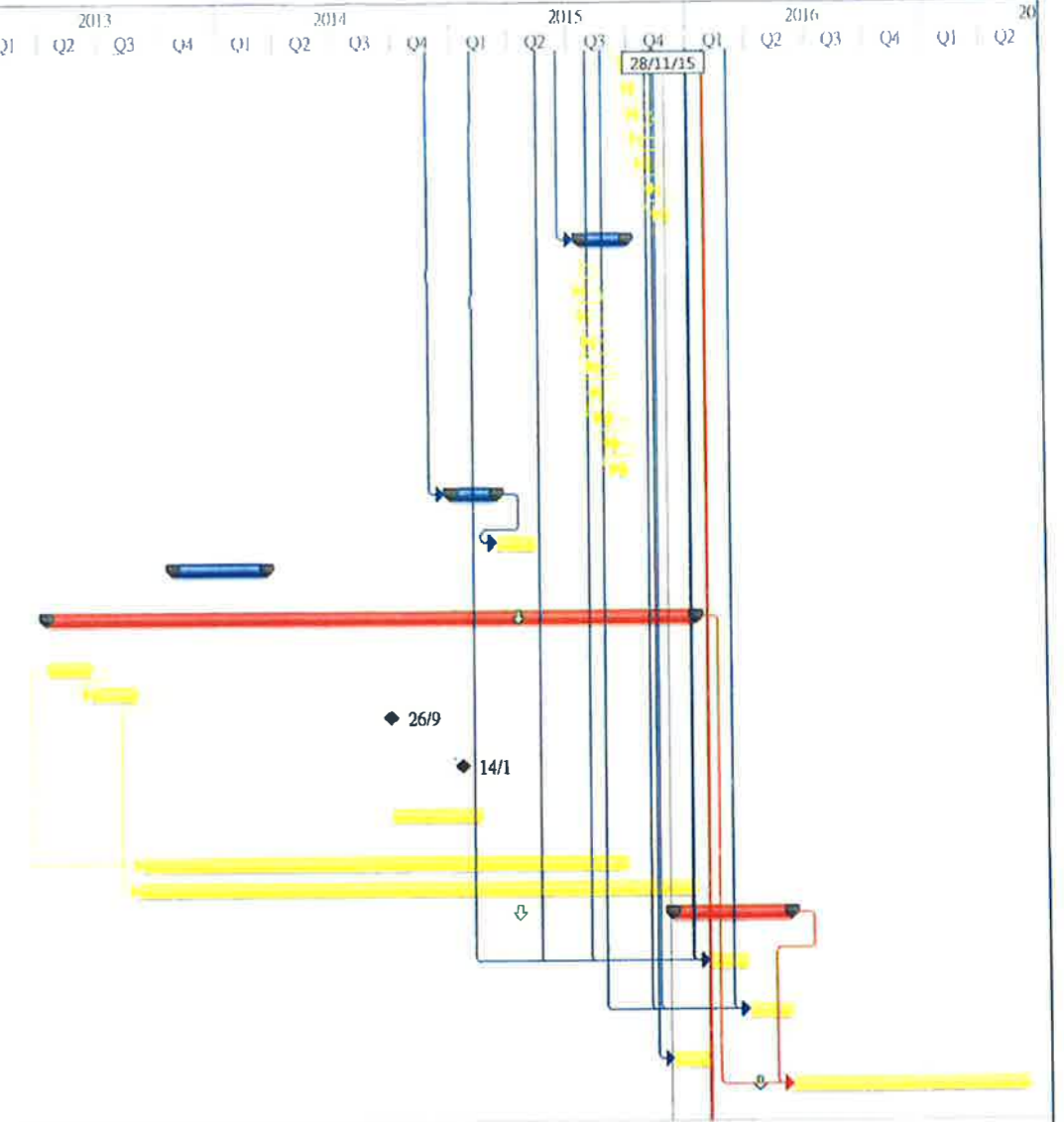
ID	WBS	Task Name	Duration	Start	Finish	Predecessors	Gantt Chart (2013-2016)																			
649	4.12.15.14.13	footpath paving	8 days	Wed 20/1/16	Wed 27/1/16	648	[Gantt Chart]																			
650	4.12.15.14.14	AC - lay DBM & base course	4 days	Tue 12/1/16	Fri 15/1/16	646	[Gantt Chart]																			
651	4.12.15.15	4 Works from chainage 125 to chainage 190 (east side carriageway & footpath)	42 days	Sat 16/1/16	Sat 27/2/16	650FS+1 day	[Gantt Chart]																			
652	4.12.15.15.1	TTA for ch 125-190 (east)	0 days	Sat 16/1/16	Sat 16/1/16		[Gantt Chart]																			
653	4.12.15.15.2	VO.061 for rising main	7 days	Sun 17/1/16	Sat 23/1/16	652	[Gantt Chart]																			
654	4.12.15.15.3	filling works to formation of road (include SRT98%)	4 days	Sat 23/1/16	Tue 26/1/16	653FS-1 day	[Gantt Chart]																			
655	4.12.15.15.4	street lighting drawpits & crossing at ch 154	3 days	Wed 27/1/16	Fri 29/1/16	654	[Gantt Chart]																			
656	4.12.15.15.5	irrigation system	3 days	Sat 30/1/16	Mon 1/2/16	655	[Gantt Chart]																			
657	4.12.15.15.6	UU for CLP (lighting)	3 days	Tue 2/2/16	Thu 4/2/16	656	[Gantt Chart]																			
658	4.12.15.15.7	sub-base laying	2 days	Fri 5/2/16	Sat 6/2/16	657,656	[Gantt Chart]																			
659	4.12.15.15.8	kerb bedding, laying & backing before bituminous material	5 days	Sun 7/2/16	Thu 11/2/16	658	[Gantt Chart]																			
660	4.12.15.15.9	filling works to formation of footpath	3 days	Fri 12/2/16	Sun 14/2/16	659	[Gantt Chart]																			
661	4.12.15.15.10	UU for ch 125-200 (PCCW/HGC)	5 days	Mon 15/2/16	Fri 19/2/16	660	[Gantt Chart]																			
662	4.12.15.15.11	footpath paving	8 days	Sat 20/2/16	Sat 27/2/16	661	[Gantt Chart]																			
663	4.12.15.15.12	AC - lay DBM & base course	4 days	Fri 12/2/16	Mon 15/2/16	659	[Gantt Chart]																			
664	4.12.15.16	6 Works from chainage 80 to chainage 125 (east side carriageway & footpath)	40 days	Tue 16/2/16	Sun 27/3/16	663FS+1 day	[Gantt Chart]																			
665	4.12.15.16.1	TTA for ch 80-125 (east)	0 days	Tue 16/2/16	Tue 16/2/16		[Gantt Chart]																			
666	4.12.15.16.2	VO.061 for rising main	7 days	Wed 17/2/16	Tue 23/2/16	665	[Gantt Chart]																			
667	4.12.15.16.3	filling works to formation of road (include SRT98%)	5 days	Mon 22/2/16	Fri 26/2/16	666FS-2 days	[Gantt Chart]																			
668	4.12.15.16.4	street lighting drawpits & crossing at ch 98	3 days	Fri 26/2/16	Sun 28/2/16	667FS-1 day	[Gantt Chart]																			
669	4.12.15.16.5	irrigation system	3 days	Mon 29/2/16	Wed 2/3/16	668	[Gantt Chart]																			
670	4.12.15.16.6	UU for CLP (lighting)	3 days	Thu 3/3/16	Sat 5/3/16	669	[Gantt Chart]																			
671	4.12.15.16.7	sub-base laying	3 days	Sun 6/3/16	Tue 8/3/16	670	[Gantt Chart]																			
672	4.12.15.16.8	kerb bedding, laying & backing before bituminous material	5 days	Wed 9/3/16	Sun 13/3/16	671	[Gantt Chart]																			
673	4.12.15.16.9	filling works to formation of footpath	3 days	Mon 14/3/16	Wed 16/3/16	672	[Gantt Chart]																			
674	4.12.15.16.10	UU for ch 80-125 (PCCW/HGC)	4 days	Thu 17/3/16	Sun 20/3/16	673	[Gantt Chart]																			
675	4.12.15.16.11	footpath paving	7 days	Mon 21/3/16	Sun 27/3/16	674	[Gantt Chart]																			
676	4.12.15.16.12	AC - lay DBM & base course	3 days	Mon 14/3/16	Wed 16/3/16	672	[Gantt Chart]																			
677	4.12.15.17	Rising manholes & drawpit covers & Lay wearing course (with TTA)	44 days	Fri 18/3/16	Sat 30/4/16	676FS+1 day	[Gantt Chart]																			
678	4.12.15.17.1	Chainage 80 to Chainage 180 (west side)	4 days	Fri 18/3/16	Mon 21/3/16		[Gantt Chart]																			
679	4.12.15.17.2	Chainage 80 to Chainage 180 (east side)	2 days	Tue 22/3/16	Wed 23/3/16	678	[Gantt Chart]																			
680	4.12.15.17.3	Chainage 180 to Chainage 280 (west side)	4 days	Thu 24/3/16	Sun 27/3/16	679	[Gantt Chart]																			
681	4.12.15.17.4	Chainage 180 to Chainage 280 (east side)	4 days	Mon 28/3/16	Thu 31/3/16	680	[Gantt Chart]																			
682	4.12.15.17.5	Chainage 280 to Chainage 380 (west side)	4 days	Fri 1/4/16	Mon 4/4/16	681	[Gantt Chart]																			
683	4.12.15.17.6	Chainage 280 to Chainage 380 (east side)	2 days	Tue 5/4/16	Wed 6/4/16	682	[Gantt Chart]																			
684	4.12.15.17.7	Chainage 380 to Chainage 480 (west side)	4 days	Thu 7/4/16	Sun 10/4/16	683	[Gantt Chart]																			
685	4.12.15.17.8	Chainage 380 to Chainage 480 (east side)	2 days	Mon 11/4/16	Tue 12/4/16	684	[Gantt Chart]																			
686	4.12.15.17.9	Chainage 480 to Chainage 580 (west side)	4 days	Wed 13/4/16	Sat 16/4/16	685	[Gantt Chart]																			
687	4.12.15.17.10	Chainage 480 to Chainage 580 (east side)	2 days	Sun 17/4/16	Mon 18/4/16	686	[Gantt Chart]																			
688	4.12.15.17.11	Chainage 580 to Chainage 680 (west side)	4 days	Tue 19/4/16	Fri 22/4/16	687	[Gantt Chart]																			
689	4.12.15.17.12	Chainage 580 to Chainage 680 (east side)	2 days	Sat 23/4/16	Sun 24/4/16	688	[Gantt Chart]																			
690	4.12.15.17.13	Chainage 680 to Chainage 785 (west side)	4 days	Mon 25/4/16	Thu 28/4/16	689	[Gantt Chart]																			
691	4.12.15.17.14	Chainage 680 to Chainage 785 (east side)	2 days	Fri 29/4/16	Sat 30/4/16	690	[Gantt Chart]																			
692	4.12.15.18	Eastern Footpath from ch 380-580	98 days	Sun 11/10/15	Sat 16/1/16	565	[Gantt Chart]																			
693	4.12.15.18.1	remove existing pavement	3 days	Sun 11/10/15	Tue 13/10/15		[Gantt Chart]																			
694	4.12.15.18.2	upper stream box culvert 960x650	14 days	Wed 14/10/15	Tue 27/10/15	693	[Gantt Chart]																			
695	4.12.15.18.3	upper stream DN450mm pipe	12 days	Wed 28/10/15	Sun 8/11/15	694	[Gantt Chart]																			
696	4.12.15.18.4	VO053 - crossing no. 2, 3, 4, 5 (east footpath)	5 days	Mon 9/11/15	Fri 13/11/15	695	[Gantt Chart]																			
697	4.12.15.18.5	filling works to formation of footpath	5 days	Sat 14/11/15	Wed 18/11/15	696	[Gantt Chart]																			
698	4.12.15.18.6	street light crossing at ch523	5 days	Thu 19/11/15	Mon 23/11/15	697	[Gantt Chart]																			
699	4.12.15.18.7	UU for CLP (lighting)	5 days	Sun 29/11/15	Thu 3/12/15	698FS+5 days	[Gantt Chart]																			
700	4.12.15.18.8	sub-base & edging	6 days	Fri 4/12/15	Wed 9/12/15	699	[Gantt Chart]																			
701	4.12.15.18.9	UU for ch 380-580 (PCCW/HGC)	14 days	Thu 10/12/15	Wed 23/12/15	700	[Gantt Chart]																			
702	4.12.15.18.10	construct edging	10 days	Thu 24/12/15	Sat 2/1/16	701	[Gantt Chart]																			
703	4.12.15.18.11	footpath paving	14 days	Sun 3/1/16	Sat 16/1/16	702	[Gantt Chart]																			
704	4.12.15.19	Eastern Footpath from ch 190-380	71 days	Sun 27/9/15	Sun 6/12/15	583	[Gantt Chart]																			
705	4.12.15.19.1	remove existing pavement	3 days	Sun 27/9/15	Tue 29/9/15		[Gantt Chart]																			
706	4.12.15.19.2	VO053 - crossing no. 2 (east footpath)	3 days	Wed 30/9/15	Fri 2/10/15	705	[Gantt Chart]																			

Revision 1 Tue 26/1/16

Task: [Blue Bar] Milestone: [Diamond] Project Summary: [Arrow] Critical Split: [Dotted Line] Deadline: [Star]

Split: [Dotted Line] Summary: [Blue Bar] Critical: [Yellow Bar] Progress: [Red Bar]

ID	WBS	Task Name	Duration	Start	Finish	Predecessors	2013 2014 2015 2016 2017															
							Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	
707	4.12.15.19.3	filling works to formation of footpath	5 days	Sat 3/10/15	Wed 7/10/15	706																
708	4.12.15.19.4	street light crossings at ch287,350	7 days	Thu 8/10/15	Wed 14/10/15	707																
709	4.12.15.19.5	UU for CLP (lighting)	5 days	Thu 15/10/15	Mon 19/10/15	708																
710	4.12.15.19.6	sub-base & edging	6 days	Tue 20/10/15	Sun 25/10/15	709																
711	4.12.15.19.7	UU for ch 190-380 (PCCW/HGC)	20 days	Mon 26/10/15	Sat 14/11/15	710																
712	4.12.15.19.8	construct edging	9 days	Sun 15/11/15	Mon 23/11/15	711																
713	4.12.15.19.9	footpath paving	13 days	Tue 24/11/15	Sun 6/12/15	712																
714	4.12.15.20	Eastern Footpath from ch 580-785	71 days	Mon 20/7/15	Mon 28/9/15	613																
715	4.12.15.20.1	remove existing pavement	3 days	Mon 20/7/15	Wed 22/7/15																	
716	4.12.15.20.2	VO053 - crossing no. 5, 6, 7&8 (east footpath)	7 days	Thu 23/7/15	Wed 29/7/15	715																
717	4.12.15.20.3	filling works to formation of footpath	5 days	Thu 30/7/15	Mon 3/8/15	716																
718	4.12.15.20.4	street light crossings at ch760,785	7 days	Tue 4/8/15	Mon 10/8/15	717																
719	4.12.15.20.5	UU for CLP (lighting)	5 days	Tue 11/8/15	Sat 15/8/15	718																
720	4.12.15.20.6	sub-base & edging	6 days	Sun 16/8/15	Fri 21/8/15	719																
721	4.12.15.20.7	UU for ch 580-785 (PCCW/HGC)	14 days	Sat 22/8/15	Fri 4/9/15	720																
722	4.12.15.20.8	construct edging	10 days	Sat 5/9/15	Mon 14/9/15	721																
723	4.12.15.20.9	footpath paving	14 days	Tue 15/9/15	Mon 28/9/15	722																
724	4.12.15.21	Construction of retaining wall RW8 - CH0 to 22 (3 bays)	70 days	Tue 30/12/14	Mon 9/3/15	534																
726	4.12.15.22	Site Formation works for ArchSD Depot (Drg. 1001B)	60 days	Tue 10/3/15	Fri 8/5/15	724																
727	4.12.15.23	Archaeological survey (Sections T1 to T3)(Drg. 6403A)	147 days	Thu 24/10/13	Wed 19/3/14																	
733	4.13	Section XIV of the Works - Trees preservation and protection (EOTO12 completion 9 January 2016)	1003 days	Fri 12/4/13	Sat 9/1/16	4																
734	4.13.1	Submissions	69 days	Fri 12/4/13	Wed 19/6/13																	
735	4.13.2	Approval of Submissions	70 days	Thu 20/6/13	Wed 28/8/13	734																
736	4.13.3	Claim No. 009 - Delays due to Delayed Possession of Portion BCP4 of the Site	0 days	Fri 26/9/14	Fri 26/9/14	181																
737	4.13.4	Claim No. 007 - Delay due to Non-Possession of Parts of Portion BCP3 due to Resistant by Local Resident	0 days	Wed 14/1/15	Wed 14/1/15	217																
738	4.13.5	Section XIV of the Works - Tree felling/removal works and tree transplanting works at BCP4	139 days	Fri 26/9/14	Wed 11/2/15	181																
739	4.13.6	Tree felling/removal works and tree transplanting works for other areas	750 days	Fri 6/9/13	Fri 25/9/15	74,734SS+147 days																
740	4.13.7	Preservation and Protection of Existing Trees in all Portion of the Site	864 days	Thu 29/8/13	Sat 9/1/16	74,735																
741	4.14	Section XV of the Works - Landscape soft works (including transplant trees to permanent locations)	181 days	Thu 3/12/15	Tue 31/5/16																	
742	4.14.1	tree & shrub planting at re-aligned Lin Ma Hang Road (west) for Section XIII of the Works	58 days	Thu 28/1/16	Fri 25/3/16	516,534,595,636,621FS-20 days																
743	4.14.2	tree & shrub planting at re-aligned Lin Ma Hang Road (east) for Section XIII of the Works	65 days	Mon 28/3/16	Tue 31/5/16	565,583,613,651,664																
744	4.14.3	tree & shrub planting at BCPD Section XI of the Works	55 days	Thu 3/12/15	Tue 26/1/16	239FS-35 days																
745	4.15	Section XVI of the Works - Establishment works for landscape soft works	365 days	Wed 1/6/16	Wed 31/5/17	733,741																



Revision 1 Tue 26/1/16	Task	Milestone	Project Summary	Critical Split	Deadline
	Split	Summary	Critical	Progress	

Contract 6



Liantang / Heung Yuen Wai Boundary Control Point Site Formation and Infrastructure Works - CONTRACT 6



Activity ID	Activity Name	Orig Dur	Start	Finish	Late Start	Late Finish	Total Float	2015							2016							2017							2018							2019																		
								J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A

LT/HYW BCP Contract 6 - Detail Works Programme Rev. B1

1.0 - Contract Key Dates								
1.1 - Commencement of the Works								
CKD-1000	Commencement of the Works - Project Start (PS)	0	24-Jun-15		24-Jun-15		0	◆ Commencement of the Works - Project Start (PS)
CKD-1100	Section IA Commencement of the Works Notification (PS+365d)	0	23-Jun-16		23-Jun-16		0	◆ Section IA Commencement of the Works Notification (PS+365d)
CKD-1200	Section IB Commencement of the Works Notification (PS+365d)	0	23-Jun-16		23-Jun-16		0	◆ Section IB Commencement of the Works Notification (PS+365d)
CKD-1300	Section IC Commencement of the Works Notification (PS+365d)	0	23-Jun-16		23-Jun-16		0	◆ Section IC Commencement of the Works Notification (PS+365d)
CKD-1400	Section ID Commencement of the Works Notification (PS+365d)	0	23-Jun-16		23-Jun-16		0	◆ Section ID Commencement of the Works Notification (PS+365d)
CKD-1500	Section IE Commencement of the Works Notification (PS+365d)	0	23-Jun-16		23-Jun-16		0	◆ Section IE Commencement of the Works Notification (PS+365d)
CKD-1600	Section IIA Commencement of the Works Notification (PS+215d)	0	25-Jan-16		25-Jan-16		0	◆ Section IIA Commencement of the Works Notification (PS+215d)
1.2 - Completion Section of the Works								
CKD-2000	KD-2 - Completion of Section II of the Works (PS+690d)	0		13-May-17*		13-May-17	0	◆ KD-2 - Completion of Section II of the Works (PS+690d)
CKD-2010	KD-3 - Completion of Section III of the Works (PS+690d)	0		13-May-17*		13-May-17	0	◆ KD-3 - Completion of Section III of the Works (PS+690d)
CKD-2020	KD-4 - Completion of Section IV of the Works (PS+1000d)	0		19-Mar-18*		19-Mar-18	0	◆ KD-4 - Completion of Section IV of the Works (PS+1000d)
CKD-2030	KD-5 - Completion of Section V of the Works (PS+1090d)	0		17-Jun-18*		17-Jun-18	0	◆ KD-5 - Completion of Section V of the Works (PS+1090d)
CKD-2040	KD-6 - Completion of Section VI of the Works (PS+1217d)	0		22-Oct-18*		22-Oct-18	0	◆ KD-6 - Completion of Section VI of the Works (PS+1217d)
CKD-2050	KD-7A - Completion of Section VIIA of the Works (PS+365d)	0		22-Jun-16*		22-Jun-16	0	◆ KD-7A - Completion of Section VIIA of the Works (PS+365d)
CKD-2060	KD-7B - Completion of Section VIIB of the Works (PS+1400d)	0		23-Apr-19*		23-Apr-19	0	◆ KD-7B - Completion of Section VIIB of the Works (PS+1400d)
CKD-2070	KD-8 - Completion of Section VIII of the Works (PS+1400d)	0		23-Apr-19*		23-Apr-19	0	◆ KD-8 - Completion of Section VIII of the Works (PS+1400d)
CKD-2080	KD-9A - Completion of Section IXA of the Works (PS+670d)	0		23-Apr-17*		23-Apr-17	0	◆ KD-9A - Completion of Section IXA of the Works (PS+670d)
CKD-2090	KD-9B - Completion of Section IXB of the Works (PS+2500d)	0		27-Apr-22*		27-Apr-22	0	◆ KD-9B - Completion of Section IXB of the Works (PS+2500d)
CKD-2100	KD-10 - Completion of Section X of the Works (PS+1765d)	0		22-Apr-20*		22-Apr-20	0	◆ KD-10 - Completion of Section X of the Works (PS+1765d)
CKD-2110	KD-11 - Completion of Section XI of the Works (PS+1217d)	0		23-Oct-18*		23-Oct-18	0	◆ KD-11 - Completion of Section XI of the Works (PS+1217d)
CKD-2120	KD-12 - Completion of Section XII of the Works (PS+1400d)	0		23-Apr-19*		23-Apr-19	0	◆ KD-12 - Completion of Section XII of the Works (PS+1400d)
1.3 - Completion Section of the Works Subject to Excision								
CKD-3000	KD-1A - Completion of Section IA of the Works (PS+850d)	0		20-Oct-17*		20-Oct-17	0	◆ KD-1A - Completion of Section IA of the Works (PS+850d)
CKD-3100	KD-1B - Completion of Section IB of the Works (PS+850d)	0		20-Oct-17*		20-Oct-17	0	◆ KD-1B - Completion of Section IB of the Works (PS+850d)
CKD-3200	KD-1C - Completion of Section IC of the Works (PS+850d)	0		20-Oct-17*		20-Oct-17	0	◆ KD-1C - Completion of Section IC of the Works (PS+850d)
CKD-3300	KD-1D - Completion of Section ID of the Works (PS+850d)	0		20-Oct-17*		20-Oct-17	0	◆ KD-1D - Completion of Section ID of the Works (PS+850d)
CKD-3400	KD-1E - Completion of Section IE of the Works (PS+850d)	0		20-Oct-17*		20-Oct-17	0	◆ KD-1E - Completion of Section IE of the Works (PS+850d)
CKD-3500	KD-2A - Completion of Section IIA of the Works (PS+690d)	0		13-May-17*		13-May-17	0	◆ KD-2A - Completion of Section IIA of the Works (PS+690d)
1.4 - Completion Stage of the Works								
CKD-4000	KD-S1 - Achievement of Stage I of the Works (PS+917d)	0		28-Dec-17*		28-Dec-17	0	◆ KD-S1 - Achievement of Stage I of the Works (PS+917d)
CKD-4100	KD-S2 - Achievement of Stage II of the Works (PS+917d)	0		27-Dec-17*		27-Dec-17	0	◆ KD-S2 - Achievement of Stage II of the Works (PS+917d)
CKD-4200	KD-S3 - Achievement of Stage III of the Works (PS+917d)	0		27-Dec-17*		27-Dec-17	0	◆ KD-S3 - Achievement of Stage III of the Works (PS+917d)
1.5 - Works Areas Possession Date								
CKD-5000	Possession of Portion RD of the Site (PS)	0	24-Jun-15*		24-Jun-15		0	◆ Possession of Portion RD of the Site (PS)
CKD-5010	Possession of Portion CS of the Site (PS)	0	24-Jun-15*		24-Jun-15		0	◆ Possession of Portion CS of the Site (PS)
CKD-5020	Possession of Portion CR1 of the Site (PS)	0	24-Jun-15*		24-Jun-15		0	◆ Possession of Portion CR1 of the Site (PS)
CKD-5030	Possession of Portion CR5A of the Site (PS)	0	24-Jun-15*		24-Jun-15		0	◆ Possession of Portion CR5A of the Site (PS)
CKD-5040	Possession of Works Area WA1 Access Road (PS)	0	24-Jun-15*		24-Jun-15		0	◆ Possession of Works Area WA1 Access Road (PS)
CKD-5050	Possession of Works Area WA1-2 (PS+add)	0	24-Jun-15*		24-Jun-15		0	◆ Possession of Works Area WA1-2 (PS+add)
CKD-5060	Possession of Works Area WA1-4 (PS)	0	24-Jun-15*		24-Jun-15		0	◆ Possession of Works Area WA1-4 (PS)
CKD-5070	Possession of Works Area WA1-5 (PS)	0	24-Jun-15*		24-Jun-15		0	◆ Possession of Works Area WA1-5 (PS)
CKD-5080	Possession of Portion CR2 of the Site (PS+30)	0	23-Jul-15*		23-Jul-15		0	◆ Possession of Portion CR2 of the Site (PS+30)
CKD-5090	Possession of Portion CR2A of the Site (PS+30)	0	23-Jul-15*		23-Jul-15		0	◆ Possession of Portion CR2A of the Site (PS+30)
CKD-5100	Possession of Portion CR2B of the Site (PS+30)	0	23-Jul-15*		23-Jul-15		0	◆ Possession of Portion CR2B of the Site (PS+30)
CKD-5110	Possession of Portion CR2C of the Site (PS+30)	0	23-Jul-15*		23-Jul-15		0	◆ Possession of Portion CR2C of the Site (PS+30)

CRBC-CEC-KADEN Joint Venture

- ◆ Milestone
- █ Critical Activity
- █ Non-Critical Activity
- █ Remaining Level of Effort
- █ Actual Work

Detail Works Programme Rev. B1

Data Date: 24-Jun-15 Run Date: 14-Apr-16

Project ID :LT6-DWPB1
 Layout : LT6DWPB1
 Page 1 of 37

Detail Works Programme			
Date	Revision	Checked	Approved
13-Apr-16	Revision B1		



Liantang / Heung Yuen Wai Boundary Control Point Site Formation and Infrastructure Works - CONTRACT 6



Activity ID	Activity Name	Orig Dur	Start	Finish	Late Start	Late Finish	Total Float	2015							2016							2017							2018							2019																			
								J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	F	M	A	M	J	J	F	M	A	M	J											
								-1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47
TUN-1688	N/B Tunnel through NP - D&B Excav CH386-291 (95m) + CP-03 (4.5m)	18	19-May-17	09-Jun-17	19-May-17	09-Jun-17	0																																																
TUN-1689	N/B Tunnel through NP - D&B Excav CH291-204 (87m) + CP-02 (4.5m)	18	10-Jun-17	30-Jun-17	10-Jun-17	30-Jun-17	0																																																
- Tunnel Breakthrough																																																							
TUN-1690	S/B Tunnel Breakthrough Mech Excav CH554-559 (5m)	14	06-Jul-17	21-Jul-17	06-Jul-17	21-Jul-17	0																																																
TUN-1695	N/B Tunnel Breakthrough Mech Excav CH450-455 (5m)	14	06-Jul-17	21-Jul-17	18-Jul-17	02-Aug-17	10																																																
TUN-1700	Cross Passage CP-07 Breakthrough Mech Excav	14	26-Jan-17	18-Feb-17	03-Mar-17	18-Mar-17	24																																																
TUN-1702	Cross Passage CP-06 Breakthrough Mech Excav	14	01-Apr-17	21-Apr-17	04-May-17	19-May-17	22																																																
TUN-1704	Cross Passage CP-05 Breakthrough Mech Excav	14	06-May-17	22-May-17	08-Jun-17	23-Jun-17	27																																																
TUN-1706	Cross Passage CP-04 Breakthrough Mech Excav	14	27-May-17	13-Jun-17	04-Jul-17	19-Jul-17	30																																																
TUN-1708	Cross Passage CP-03 Breakthrough Mech Excav	14	19-Jun-17	05-Jul-17	28-Jul-17	12-Aug-17	33																																																
TUN-1710	Cross Passage CP-02 Breakthrough Mech Excav	14	06-Jul-17	21-Jul-17	22-Aug-17	06-Sep-17	40																																																
9.3 - Lining Works																																																							
- South Bound Tunnel (S/B)																																																							
-- Kicker & Invert Slab																																																							
TUN-1721	S/B Tunnel CH813-749 (64m) - Kicker / Invert Slab	30	01-Apr-17	12-May-17	05-Apr-17	15-May-17	2																																																
TUN-1722	S/B Tunnel CH749-654 (95m) - Kicker	18	13-May-17	03-Jun-17	16-May-17	06-Jun-17	2																																																
TUN-1723	S/B Tunnel CH654-559 (95m) - Kicker	18	05-Jun-17	24-Jun-17	07-Jun-17	27-Jun-17	2																																																
TUN-1724	S/B Tunnel CH559-469 (90m) - Kicker	18	26-Jun-17	17-Jul-17	28-Jun-17	19-Jul-17	2																																																
TUN-1725	S/B Tunnel CH469-378 (93m) - Kicker	18	18-Jul-17	07-Aug-17	20-Jul-17	09-Aug-17	2																																																
TUN-1726	S/B Tunnel CH378-285 (93m) - Kicker	18	08-Aug-17	28-Aug-17	10-Aug-17	30-Aug-17	2																																																
TUN-1772	S/B Tunnel CH285-193 (92m) - Kicker	18	29-Aug-17	18-Sep-17	31-Aug-17	20-Sep-17	2																																																
TUN-1775	S/B Tunnel CH193-138 (55m) - Kicker / Invert Slab	30	22-Feb-17	28-Mar-17	13-May-17	17-Jun-17	63																																																
-- Waterproofing & Rebar																																																							
TUN-1730	S/B Tunnel Assemble Waterproofing & Rebar Platform	18	20-Apr-17	12-May-17	22-Apr-17	15-May-17	2																																																
TUN-1731	S/B Tunnel CH813-749 (64m) - Waterproofing & Rebar	18	13-May-17	03-Jun-17	16-May-17	06-Jun-17	2																																																
TUN-1732	S/B Tunnel CH749-654 (95m) - Waterproofing & Rebar	18	05-Jun-17	24-Jun-17	07-Jun-17	27-Jun-17	2																																																
TUN-1733	S/B Tunnel CH654-559 (95m) - Waterproofing & Rebar	18	26-Jun-17	17-Jul-17	28-Jun-17	19-Jul-17	2																																																
TUN-1734	S/B Tunnel CH559-469 (90m) - Waterproofing & Rebar	18	18-Jul-17	07-Aug-17	20-Jul-17	09-Aug-17	2																																																
TUN-1735	S/B Tunnel CH469-378 (93m) - Waterproofing & Rebar	18	08-Aug-17	28-Aug-17	10-Aug-17	30-Aug-17	2																																																
TUN-1736	S/B Tunnel CH378-285 (93m) - Waterproofing & Rebar	18	29-Aug-17	18-Sep-17	31-Aug-17	20-Sep-17	2																																																
TUN-1737	S/B Tunnel CH285-193 (92m) - Waterproofing & Rebar	18	19-Sep-17	10-Oct-17	21-Sep-17	12-Oct-17	2																																																
TUN-1738	S/B Tunnel CH193-138 (55m) - Waterproofing & Rebar	15	11-Oct-17	27-Oct-17	13-Oct-17	31-Oct-17	2																																																
-- Crown Lining																																																							
TUN-1727	Temp Work Design - Tunnel Lining Shutter	120	08-Jun-16	29-Oct-16	26-Aug-16	14-Jan-17	66																																																
TUN-1728	Temp Work Fabrication - Tunnel Lining Shutter	120	03-Oct-16	27-Feb-17	29-Dec-16	02-Jun-17	75																																																
TUN-1740	S/B Tunnel Assemble Crown Lining Shutter	24	07-Jun-17	05-Jul-17	07-Jun-17	05-Jul-17	0																																																
TUN-1741	S/B Tunnel CH813-749 (64m) - Tunnel Lining + Connection Structure	21	06-Jul-17	29-Jul-17	06-Jul-17	29-Jul-17	0																																																
TUN-1742	S/B Tunnel CH749-654 (95m) - Tunnel Lining	18	31-Jul-17	19-Aug-17	31-Jul-17	19-Aug-17	0																																																
TUN-1743	S/B Tunnel CH654-559 (95m) - Tunnel Lining	12	21-Aug-17	02-Sep-17	21-Aug-17	02-Sep-17	0																																																
TUN-1744	S/B Tunnel CH559-469 (90m) - Tunnel Lining	12	04-Sep-17	16-Sep-17	04-Sep-17	16-Sep-17	0																																																
TUN-1745	S/B Tunnel CH469-378 (93m) - Tunnel Lining	12	18-Sep-17	30-Sep-17	18-Sep-17	30-Sep-17	0																																																
TUN-1746	S/B Tunnel CH378-285 (93m) - Tunnel Lining	12	02-Oct-17	16-Oct-17	02-Oct-17	16-Oct-17	0																																																
TUN-1747	S/B Tunnel CH285-193 (92m) - Tunnel Lining	12	17-Oct-17	31-Oct-17	17-Oct-17	31-Oct-17	0																																																
TUN-1748	S/B Tunnel CH193-138 (55m) - Tunnel Lining + Connection Structure	18	01-Nov-17	21-Nov-17	01-Nov-17	21-Nov-17	0																																																
-- OHVD																																																							
TUN-1978	Temp Work Design - OHVD Shutter	120	15-Jul-16	03-Dec-16	03-Oct-16	27-Feb-17	66																																																
TUN-1979	Temp Work Fabrication - OHVD Shutter	120	07-Nov-16	03-Apr-17	23-Jan-17	27-Jun-17	66																																																
TUN-1981	S/B Tunnel Assemble OHVD Platform/Shutter	24	06-Jul-17	02-Aug-17	06-Jul-17	02-Aug-17	0																																																
TUN-1982	S/B Tunnel CH813-749 (64m) - OHVD	15	03-Aug-17	19-Aug-17	03-Aug-17	19-Aug-17	0																																																

- ◆ Milestone
- Critical Activity
- Non-Critical Activity
- Remaining Level of Effort
- Actual Work

Detail Works Programme Rev. B1

Data Date: 24-Jun-15

Run Date: 14-Apr-16

Project ID :LT6-DWPB1
 Layout :LT6DWPB1
 Page 18 of 37









Detail Works Programme			
Date	Revision	Checked	Approved
13-Apr-16	Revision B1		

Contract 7

NE/2014/03 - Liantang/ Heung Yuen Wai Boundary Control Point Site Formation and Infrastructure Works - Contract 7

ID	Task Name	Duration	Start	Finish	Predecessors	2016				2017				2018				2019					
						Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
1																							
2	Commencement of the Works	0 days	11/12/2015	11/12/2015			◆																
3	Commencement of Works - (Project Start - PS)	0 days	11/12/2015	11/12/2015			◆																
4	Section I Commencement of the Works Notification	0 days	11/12/2015	11/12/2015			◆																
5	Section II - Commencement of the Works Notification	0 days	11/12/2015	11/12/2015			◆																
6	Section III - Commencement of the Works Notification	0 days	11/12/2015	11/12/2015			◆																
7	Section IV - Commencement of the Works Notification	0 days	11/12/2015	11/12/2015			◆																
8	Section V - Commencement of the Works Notification	0 days	11/12/2015	11/12/2015			◆																
9																							
10	Completion of Section of the Works	550 days	9/3/2018	10/9/2019																			
11	(KD-2) Completion of Section II of the Works (PS+820d)	0 days	9/3/2018	9/3/2018																			
12	(KD-3) Completion of Section III of the Works (PS+1005d)	0 days	10/9/2018	10/9/2018																			
13	(KD-4) Completion of Section IV of the Works (PS+1005d)	0 days	10/9/2018	10/9/2018																			
14	(KD-5) Completion of Section V of the Works (PS+1370d)	0 days	10/9/2019	10/9/2019																			
15																							
16	Completion of Section of the Works Subject to Excision	0 days	10/9/2018	10/9/2018																			
17	(KD-1) Completion of Section I of the Works (PS+1005d)	0 days	10/9/2018	10/9/2018																			
18																							
19	Acheivement of Stage of the Works	550 days	8/4/2016	10/10/2017																			
20	(KD-S1) Acheivement of Stage I of the Works (PS+640d)	0 days	10/9/2017	10/9/2017																			
21	(KD-S2) Acheivement of Stage II of the Works (PS+365d)	0 days	9/12/2016	9/12/2016																			
22	(KD-S3) Acheivement of Stage III of the Works (PS+490d)	0 days	13/4/2017	13/4/2017																			
23	(KD-S4) Acheivement of Stage IV of the Works (PS+670d)	0 days	10/10/2017	10/10/2017																			
24	(KD-S5) Acheivement of Stage V of the Works (PS+120d)	0 days	8/4/2016	8/4/2016																			
25																							
26	Works Areas Possession Date	30 days	11/12/2015	9/1/2016																			
27	Possession of Portion A (PS+30d)	0 days	9/1/2016	9/1/2016																			
28	Possession of Portion B (PS)	0 days	11/12/2015	11/12/2015																			
29	Possession of Portion C (PS)	0 days	11/12/2015	11/12/2015																			
30	Possession of Portion D (PS)	0 days	11/12/2015	11/12/2015																			









Revision: 1

Task  Progress  Summary  Project Summary 
 Critical Task  Milestone  Split  Deadline 

NE/2014/03 - Liantang/ Heung Yuen Wai Boundary Control Point Site Formation and Infrastructure Works - Contract 7

ID	Task Name	Duration	Start	Finish	Predecessors	2016				2017				2018				2019				
						Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3
31	Possession of Portion E (PS)	0 days	11/12/2015	11/12/2015			◆															
32	Possession of Portion F (PS)	0 days	11/12/2015	11/12/2015			◆															
33	Possession of Portion G (PS)	0 days	11/12/2015	11/12/2015			◆															
34	Possession of Portion H (PS)	0 days	11/12/2015	11/12/2015			◆															
35	Possession of Portion Y (above +20.5mPD) (PS+30d)	0 days	9/1/2016	9/1/2016				◆														
36	Possession of Portion Z (PS+30d)	0 days	9/1/2016	9/1/2016				◆														
37																						
38	Possession of Works Areas to be Relinquished by Contractor	425 days	11/8/2016	10/10/2017																		
39	Possession of Portion A to be relinquished by Contractor (below +16.0mPD) (PS+490d)	0 days	13/4/2017	13/4/2017									◆									
40	Possession of Portion B to be relinquished by Contractor (PS+460d)	0 days	14/3/2017	14/3/2017									◆									
41	Possession of Portion C to be relinquished by Contractor (PS+365d)	0 days	9/12/2016	9/12/2016																		
42	Possession of Portion D to be relinquished by Contractor (PS+245d)	0 days	11/8/2016	11/8/2016																		
43	Possession of Portion E to be relinquished by Contractor (PS+245d)	0 days	11/8/2016	11/8/2016																		
44	Possession of Portion F to be relinquished by Contractor (PS+550d)	0 days	12/6/2017	12/6/2017																		
45	Possession of Portion G to be relinquished by Contractor (below +19.5mPD) (PS+670d)	0 days	10/10/2017	10/10/2017																		
46																						
47	Submission and Approval	463 days	11/12/2015	17/3/2017																		
48	General Submission	463 days	11/12/2015	17/3/2017																		
49	Submit Temporary Drainage Management Plan (Include Requirement in PS1.24A and PS1.112)	51 days	11/12/2015	30/1/2016																		
50	Submit Initial Record Survey of area of Shenzhen River	120 days	11/12/2015	8/4/2016																		
51	Submit Draft Safety Plan	14 days	11/12/2015	24/12/2015																		
52	Submit Environmental Management Plan	21 days	11/12/2015	31/12/2015																		
53	Submit Sub-contractor Management Plan	42 days	11/12/2015	21/1/2016																		
54	Submit Risk Management Plan	42 days	11/12/2015	21/1/2016																		
55	Submit Method Statement and Risk Assessment for Ground Investigation Works	14 days	11/12/2015	24/12/2015																		

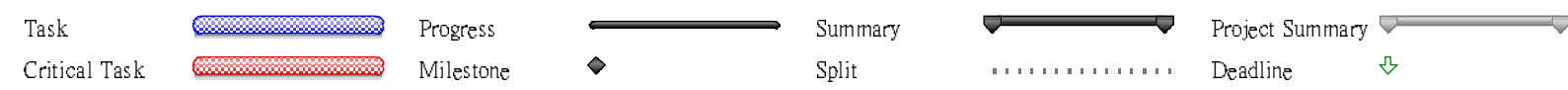
Revision: 1

Task  Progress  Summary  Project Summary 
 Critical Task  Milestone  Split  Deadline 

NE/2014/03 - Liantang/ Heung Yuen Wai Boundary Control Point Site Formation and Infrastructure Works - Contract 7

ID	Task Name	Duration	Start	Finish	Predecessors	2016				2017				2018				2019					
						Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
138	Decking	100 days	1/12/2016	10/3/2017																			
139	Pier B00 to Cantilever End	100 days	1/12/2016	10/3/2017	136,137																		
140	Stressing of Permanent Tendons	20 days	11/3/2017	30/3/2017																			
141	Pier B00 to Cantilever End	20 days	11/3/2017	30/3/2017	139																		
142	Removal of Temporary Works	14 days	31/3/2017	13/4/2017																			
143	Pier B00 to Cantilever End	14 days	31/3/2017	13/4/2017	141																		
144	Reinstate of Shenzhen River	14 days	31/3/2017	13/4/2017	141																		
145	Handover of Portion A	0 days	13/4/2017	13/4/2017	126SS+490 days, 144, 143																		
146																							
147	Construct Drop-in Span	90 days	11/3/2017	8/6/2017	139																		
148	Install parapet, lighting, drainage works, movement joint	90 days	9/6/2017	6/9/2017	141,147																		
149	Lay road surface and paint road marking	10 days	7/9/2017	16/9/2017	148																		
150	Handover of Bridge B	0 days	10/9/2018	10/9/2018	149, 126SS+1005 days																		
151																							
152	Bridge D	1005 days	11/12/2015	10/9/2018																			
153	Commencement	0 days	11/12/2015	11/12/2015																			
154	Preliminary Works	10 days	11/12/2015	20/12/2015																			
155	Initial survey and site clearance	10 days	11/12/2015	20/12/2015	153																		
156	GI Works	36 days	11/1/2016	15/2/2016																			
157	Pier D01 (Outside Boundary Fence)	24 days	11/1/2016	3/2/2016	155																		
158	Pier D00 (Inside Boundary Fence)	12 days	4/2/2016	15/2/2016	157																		
159	Piling - Bored Piles	72 days	4/2/2016	15/4/2016																			
160	Pier D01 (Outside Boundary Fence)	48 days	4/2/2016	22/3/2016	157																		
161	Pier D00 (Inside Boundary Fence)	24 days	23/3/2016	15/4/2016	158,160																		
162	Cap & Column	229 days	16/4/2016	30/11/2016																			
163	Pier D01 (Outside Boundary Fence)	30 days	1/11/2016	30/11/2016	160																		
164	Pier D00 (Inside Boundary Fence)	30 days	16/4/2016	15/5/2016	161																		
165	Decking	100 days	1/12/2016	10/3/2017																			

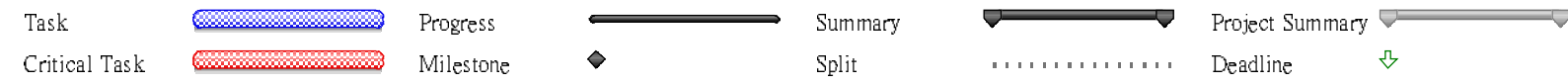
Revision: 1



NE/2014/03 - Liantang/ Heung Yuen Wai Boundary Control Point Site Formation and Infrastructure Works - Contract 7

ID	Task Name	Duration	Start	Finish	Predecessors	2016		2017				2018				2019							
						Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4				
166	Pier D00 to Cantilever End	100 days	1/12/2016	10/3/2017	163,164																		
167	Stressing of Permanent Tendons	20 days	11/3/2017	30/3/2017																			
168	Pier D00 to Cantilever End	20 days	11/3/2017	30/3/2017	166																		
169	Removal of Temporary Works	14 days	31/3/2017	13/4/2017																			
170	Pier D00 to Cantilever End	14 days	31/3/2017	13/4/2017	168																		
171	Reinstate Shenzhen River	14 days	31/3/2017	13/4/2017	168																		
172	Handover of Portion A	0 days	13/4/2017	13/4/2017	171, 153SS+490 days, 170																		
173																							
174	Construct Drop-in Span	90 days	11/3/2017	8/6/2017	166																		
175	Install parapet, lighting, drainage works and movement joint	60 days	9/6/2017	7/8/2017	168,174																		
176	Construct Semi-Enclosure (Subject to Excision)	90 days	8/8/2017	5/11/2017	175																		
177	Lay road surface and paint road marking	10 days	6/11/2017	15/11/2017	176																		
178	Handover of Bridge D	0 days	10/9/2018	10/9/2018	153SS+1005 days, 177																		
179																							
180	Bridge E	1005 days	11/12/2015	10/9/2018																			
181	Commencement	0 days	11/12/2015	11/12/2015																			
182	Preliminary Works	21 days	11/12/2015	31/12/2015																			
183	Initial survey and site clearance	21 days	11/12/2015	31/12/2015	181																		
184	Portion from Pier E01 to Pier E08 (Alternative Design - Prebored Socket H-Pile)	644 days	1/3/2016	4/12/2017																			
185	GI Works	54 days	1/3/2016	23/4/2016																			
186	Pier E06, E07 and E08 (Outside Boundary Fence)	18 days	1/3/2016	18/3/2016	183																		
187	Pier E03, E04 and E05 (Inside Boundary Fence)	24 days	19/3/2016	11/4/2016	186																		
188	Pier E01, E02	12 days	12/4/2016	23/4/2016	187																		
189	Piling - Pre-bore Socketed H-Piles	153 days	31/5/2016	30/10/2016																			
190	Pier E06, E07 and E08 (Outside Boundary Fence)	54 days	31/5/2016	23/7/2016	186,75																		
191	Pier E03, E04 and E05 (Inside Boundary Fence)	54 days	24/7/2016	15/9/2016	187,190																		
192	Pier E01, E02	24 days	16/9/2016	9/10/2016	188,191																		

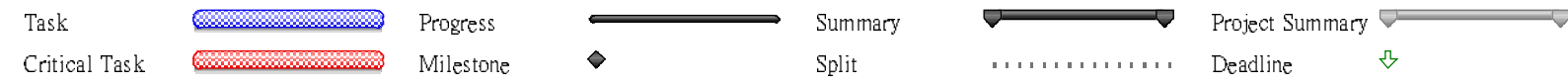
Revision: 1



NE/2014/03 - Liantang/ Heung Yuen Wai Boundary Control Point Site Formation and Infrastructure Works - Contract 7

ID	Task Name	Duration	Start	Finish	Predecessors	2016				2017				2018				2019					
						Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
193	Loading Testing of Pre-bored Socket H-Piles	21 days	10/10/2016	30/10/2016	190,191,192																		
194	Cap & Column	60 days	31/10/2016	29/12/2016																			
195	Pier E06, E07 and E08 (Outside Boundary Fence)	30 days	1/11/2016	30/11/2016	193																		
196	Pier E03, E04 and E05 (Inside Boundary Fence)	30 days	31/10/2016	29/11/2016	193																		
197	Pier E01, E02	30 days	30/11/2016	29/12/2016	196																		
198	Decking	335 days	1/12/2016	31/10/2017																			
199	Pier E07 to Cantilever End	100 days	1/12/2016	10/3/2017	195																		
200	Pier E03 to Pier E07	100 days	1/12/2016	10/3/2017	196,195																		
201	Abutment to Pier E03	235 days	11/3/2017	31/10/2017	197,200,220																		
202	Stressing of Permanent Tendons	255 days	11/3/2017	20/11/2017																			
203	Pier E07 to Cantilever End	20 days	11/3/2017	30/3/2017	199																		
204	Pier E03 to Pier E07	20 days	11/3/2017	30/3/2017	200																		
205	Abutment to Pier E03	20 days	1/11/2017	20/11/2017	201																		
206	Removal of Temporary Works	249 days	31/3/2017	4/12/2017																			
207	Pier E07 to Cantilever End	14 days	31/3/2017	13/4/2017	203																		
208	Pier E03 to Pier E07	14 days	31/3/2017	13/4/2017	204																		
209	Abutment to Pier E03	14 days	21/11/2017	4/12/2017	205																		
210	Reinstate of Shenzhen River	14 days	31/3/2017	13/4/2017	203,204																		
211	Handover of Portion A	0 days	13/4/2017	13/4/2017	181SS+490 days,210,207,208																		
212																							
213	Portion of Abutment and U-trough (Conforming Design)	461 days	2/5/2016	5/8/2017																			
214	GI Works	111 days	2/5/2016	20/8/2016																			
215	Abutment	36 days	2/5/2016	6/6/2016																			
216	U-trough	75 days	7/6/2016	20/8/2016	215																		
217	Piling - Bored Piles	215 days	7/6/2016	7/1/2017																			
218	Abutment	72 days	7/6/2016	17/8/2016	215																		
219	U-trough	140 days	21/8/2016	7/1/2017	216,218																		
220	Abutment Structure	90 days	18/8/2016	15/11/2016	218																		

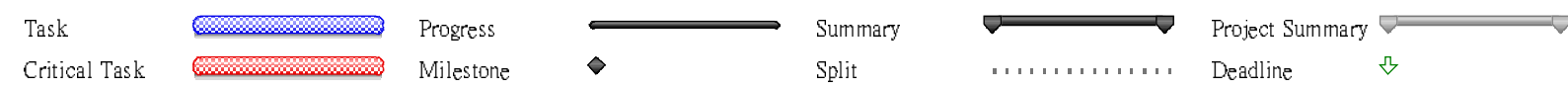
Revision: 1



NE/2014/03 - Liantang/ Heung Yuen Wai Boundary Control Point Site Formation and Infrastructure Works - Contract 7

ID	Task Name	Duration	Start	Finish	Predecessors	2016				2017				2018				2019					
						Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
221	U-trough Structure	120 days	8/1/2017	7/5/2017	219																		
222	Backfilling of U-trough	90 days	8/5/2017	5/8/2017	221																		
223																							
224	Construct Drop-in Span	90 days	21/11/2017	18/2/2018	199,200,201,205,222																		
225	Install parapet, lighting, drainage works, movement joint	90 days	19/2/2018	19/5/2018	224																		
226	Construct noise barrier and semi-enclosure (Subject to Excision)	100 days	20/5/2018	27/8/2018	225																		
227	Lay road surface and paint road marking	14 days	28/8/2018	10/9/2018	226																		
228	Handover of Bridge E	0 days	10/9/2018	10/9/2018	227, 181SS+1005 days, 209																		
229																							
230	Bridge C	820 days	11/12/2015	9/3/2018																			
231	Commencement	0 days	11/12/2015	11/12/2015																			
232	Preliminary Works	21 days	11/12/2015	31/12/2015																			
233	Initial survey and site clearance	21 days	11/12/2015	31/12/2015	231																		
234	GI Works	78 days	1/1/2016	18/3/2016																			
235	Type C1, Type C2 and Type C3 (Outside Boundary Fence)	30 days	1/1/2016	30/1/2016	233																		
236	Type A, Type B1, Type B2, Type B3, Type B4, Type B5, Type B6, Type D (Inside Boundary Fence)	48 days	31/1/2016	18/3/2016	235																		
237	Piling - Bored Piles	132 days	31/1/2016	10/6/2016																			
238	Type C1, Type C2 and Type C3 (Outside Boundary Fence)	120 days	31/1/2016	29/5/2016	235																		
239	Type A, Type B1, Type B2, Type B3, Type B4, Type B5, Type B6, Type D (Inside Boundary Fence)	84 days	19/3/2016	10/6/2016	236																		
240	Cap & Column	72 days	30/5/2016	9/8/2016																			
241	Type C1, Type C2 and Type C3 (Outside Boundary Fence)	60 days	30/5/2016	28/7/2016	238																		
242	Type A, Type B1, Type B2, Type B3, Type B4, Type B5, Type B6, Type D (Inside Boundary Fence)	60 days	11/6/2016	9/8/2016	239																		
243	Erection of falsework to 2nd floor slab	45 days	10/8/2016	23/9/2016	241,242																		
244	Construct 2nd Floor Slab and Column	60 days	24/9/2016	22/11/2016	243																		
245	Construction of 3rd Floor Slab and Column	60 days	23/11/2016	21/1/2017	244																		

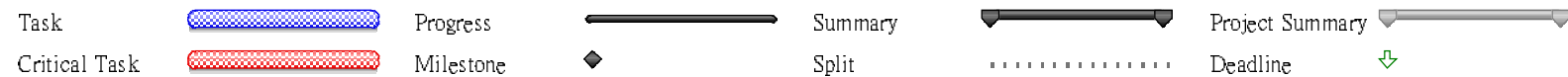
Revision: 1



NE/2014/03 - Liantang/ Heung Yuen Wai Boundary Control Point Site Formation and Infrastructure Works - Contract 7

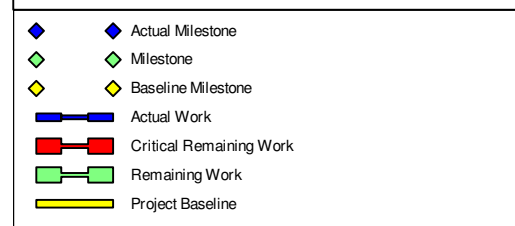
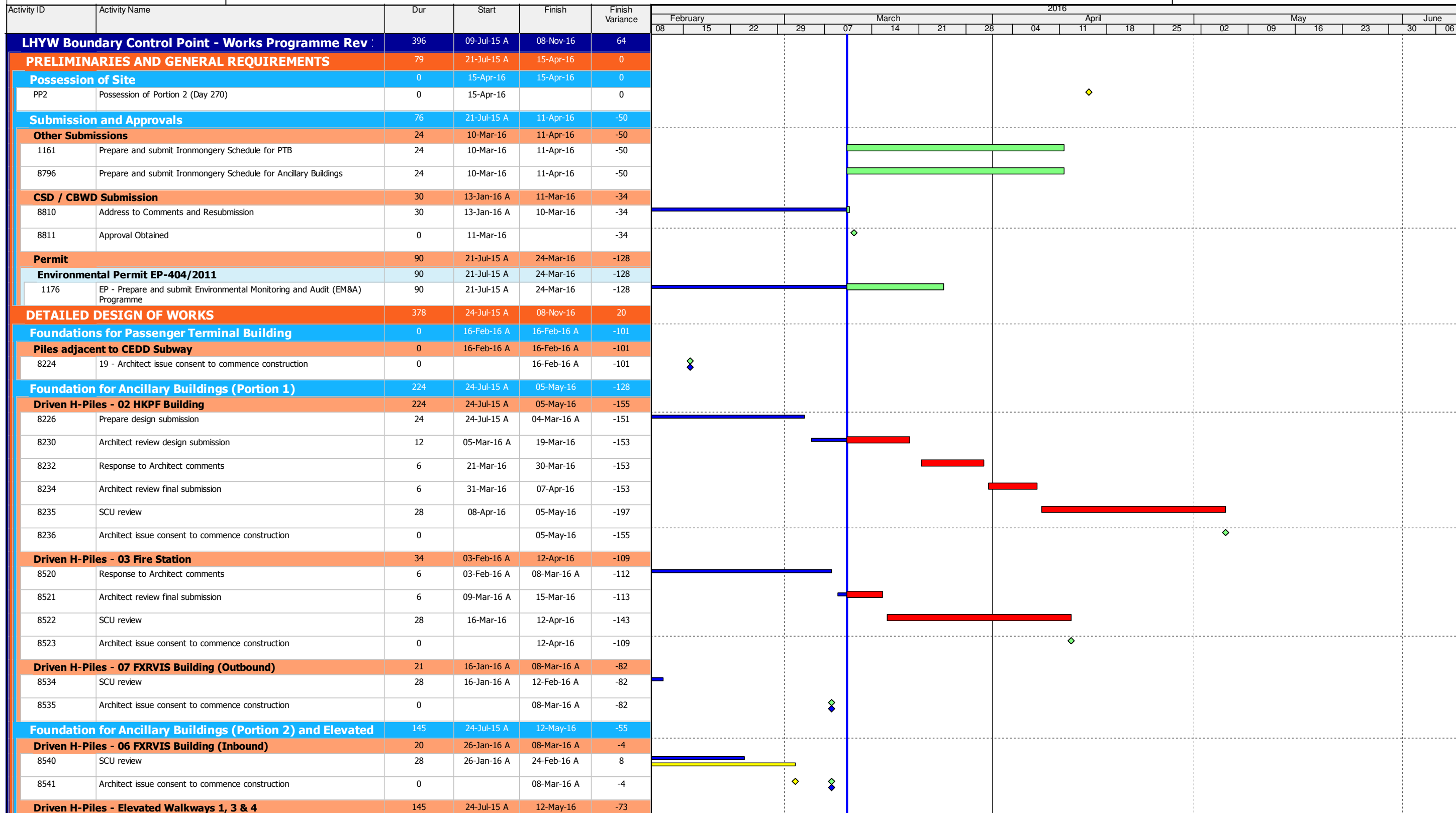
ID	Task Name	Duration	Start	Finish	Predecessors	2016		2017				2018				2019								
						Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4					
246	Construction of Roof Slab	55 days	22/1/2017	17/3/2017	245																			
247	Removal of Temporary Works	12 days	18/3/2017	29/3/2017	246																			
248	Reinstate Shen Zhen River	15 days	30/3/2017	13/4/2017	247																			
249	Handover of Portion A	0 days	13/4/2017	13/4/2017	231SS+490 days,248																			
250	Construction of Roof Upstand and Parapet	40 days	18/3/2017	26/4/2017	246																			
251	Install Façade Wall	180 days	18/3/2017	13/9/2017	246,61																			
252	Achievement of Stage I	0 days	13/9/2017	13/9/2017	231SS+640 days,251																			
253	Install Building Maintenance Unit	110 days	14/9/2017	1/1/2018	251,250																			
254	Install green roof and irrigation system at Roof Floor	67 days	2/1/2018	9/3/2018	253																			
255	Handover of Bridge C	0 days	9/3/2018	9/3/2018	231SS+820 days,254																			
256																								
257	Establishment works at Portion Z	528 days	1/4/2018	10/9/2019																				
258	Landscape softworks	163 days	1/4/2018	10/9/2018																				
259	Commencement of establishment works	0 days	10/9/2018	10/9/2018	258																			
260	Establishment works	365 days	11/9/2018	10/9/2019	259																			
261																								
262	Provision and delivery of stainless steel reinforcement bars to the contractor at Shenzhen	120 days	11/12/2015	8/4/2016																				
263	Contractor at Shenzhen to provide bar bending schedule	45 days	11/12/2015	24/1/2016																				
264	Provision and delivery the stainless steel reinforcement bars to the contractor at Shenzhen	75 days	25/1/2016	8/4/2016	263																			

Revision: 1



Contract SS C505

Liantang/Heung Yuen Wai Boundary Control Point BCP Buildings and Associated Facilities



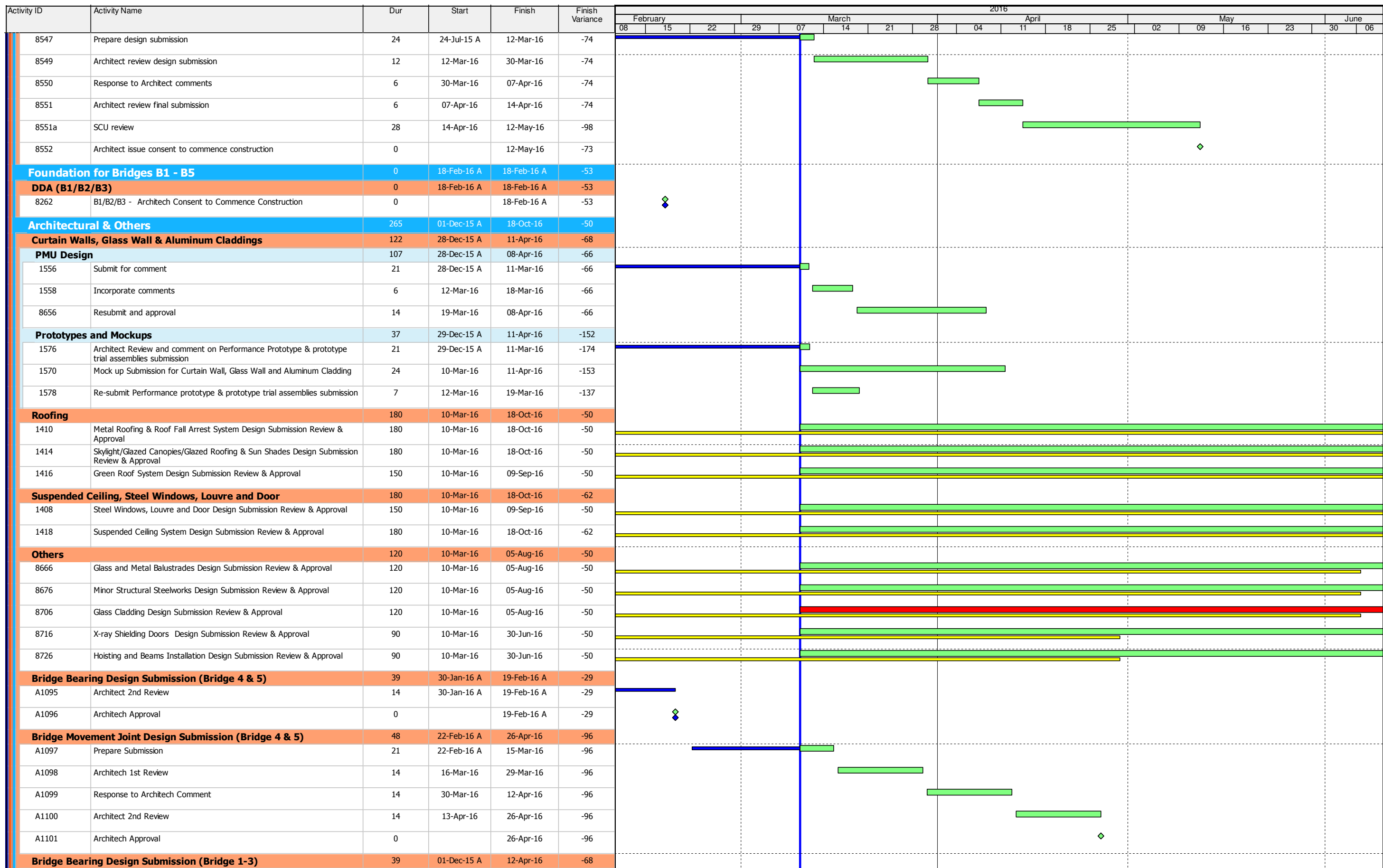
Page 1 of 11

3 Months Lookahead Works Programme

Progress to 10-Mar-16

Project ID: H2634-P9
Baseline: Works Programme Rev 1A
Layout: 3 Month Lookahead Works Programme
Filter: TASK filter: Date range DD-1M to DD+3M.
Page 1 of 11

Progress Update			
Date	Revision	Checked	A
10-Mar-16	Progress update		



3 Months Lookahead Works Programme

Progress to 10-Mar-16

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

Project ID: H2634-P9

Baseline: Works Programme Rev 1A

Layout: 3 Month Lookahead Works Programme
Filter: TASK filter: Date range DD-1M to DD+3M.

Progress Update			
Date	Revision	Checked	A
10-Mar-16	Progress update		

Activity ID	Activity Name	Dur	Start	Finish	Finish Variance	2016																											
						February							March							April							May						
						08	15	22	29	07	14	21	28	04	11	18	25	02	09	16	23	30	06										
A1083	Architech 1st Review	14	01-Dec-15 A	15-Mar-16	-68																												
A1084	Response to Architech Comment	14	16-Mar-16	29-Mar-16	-68																												
A1085	Architect 2nd Review	14	30-Mar-16	12-Apr-16	-68																												
A1086	Architech Approval	0		12-Apr-16	-68																												
Bridge Movement Joint Design Submission (Bridge 1-3)		47	15-Feb-16 A	26-Apr-16	-81																												
A1087	Prepare Submission	21	15-Feb-16 A	15-Mar-16	-81																												
A1088	Architech 1st Review	14	15-Mar-16	29-Mar-16	-81																												
A1089	Response to Architech Comment	14	29-Mar-16	12-Apr-16	-81																												
A1090	Architect 2nd Review	14	12-Apr-16	26-Apr-16	-81																												
A1091	Architech Approval	0		26-Apr-16	-81																												
MEP Systems		250	15-Sep-15 A	08-Nov-16	20																												
Shop Drawings		156	15-Oct-15 A	24-Mar-16	20																												
3100	Combined BWIC & Concealed Conduit / Services Drawings	120	15-Oct-15 A	14-Mar-16	-7																												
3102	Combined Services Drawings & Shop Drawings	120	27-Oct-15 A	24-Mar-16	20																												
Fuel Tank		100	27-Oct-15 A	10-Mar-16	117																												
DD.BS82	Fuel Tank Submission/Review & Approval	100	27-Oct-15 A	10-Mar-16	117																												
Air Conditioning		110	15-Sep-15 A	05-Aug-16	98																												
DD.BS0010	Chiller Design Submission/Review & Approval	100	15-Sep-15 A	06-Apr-16	98																												
DD.BS0012	Chiller Package Pumps Design Submission/Review & Approval	100	30-Mar-16*	29-Jul-16	4																												
DD.BS0016	VRV/VAV Design Submission Review & Approval	100	30-Mar-16*	29-Jul-16	4																												
DD.BS0020	AHU/PAU Design Submission/Review & Approval	100	07-Apr-16	05-Aug-16	98																												
DD.BS0014	Cooling Tower Design Submission/Review & Approval	100	07-Apr-16	05-Aug-16	98																												
Electrical		100	05-Apr-16	03-Aug-16	0																												
DD.BS0030	MCC Design Submission/Review & Approval	100	05-Apr-16	03-Aug-16	0																												
DD.BS0032	Armoured Cable Design Submission/Review & Approval	100	05-Apr-16	03-Aug-16	0																												
DD.BS0034	MCB/ MCCB Design Submission/Review & Approval	100	05-Apr-16	03-Aug-16	0																												
Fire Services		100	30-Apr-16	29-Aug-16	-22																												
DD.BS0040	FS Pumps Design Submission/Review & Approval	100	30-Apr-16*	29-Aug-16	-22																												
DD.BS0058	Fire Shutters, Folding Gates & Smoke Curtain Design Submission Review & Approval	100	30-Apr-16	29-Aug-16	-22																												
Diesel Generators		100	05-Apr-16	03-Aug-16	0																												
DD.BS0050	Diesel Generators Design Submission/Review & Approval	100	05-Apr-16	03-Aug-16	0																												
Broadcast Reception & Burglar Alarm System		100	05-Apr-16	03-Aug-16	0																												
DD.BS0070	Broadcast Reception Design Submission/Review & Approval	100	05-Apr-16	03-Aug-16	0																												
DD.BS0072	Burglar Alarm & Security System Design Submission/Review & Approval	100	05-Apr-16	03-Aug-16	0																												
Catering Equipment		180	05-Apr-16	08-Nov-16	0																												
DD.BS0080	Catering Equipment Design Submission/Review & Approval	180	05-Apr-16	08-Nov-16	0																												
LPG		100	05-Apr-16	03-Aug-16	0																												
DD.BS80	Liquified Petroleum Gas Design Submission/Review & Approval	100	05-Apr-16	03-Aug-16	0																												
Drainage		100	27-Oct-15 A	16-Mar-16	112																												
DD.BS81	Drainage and plumbing Design Submission/Review & Approval	100	27-Oct-15 A	16-Mar-16	112																												
Temporary Works Design & Engineering		126	29-Oct-15 A	18-Jul-16	0																												
ELS for u/g Water / Fuel Tanks		40	29-Oct-15 A	02-Apr-16	-120																												
1492	TW2 - ICE review and issue check certificate	6	29-Oct-15 A	16-Mar-16	-120																												

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

Page 3 of 11

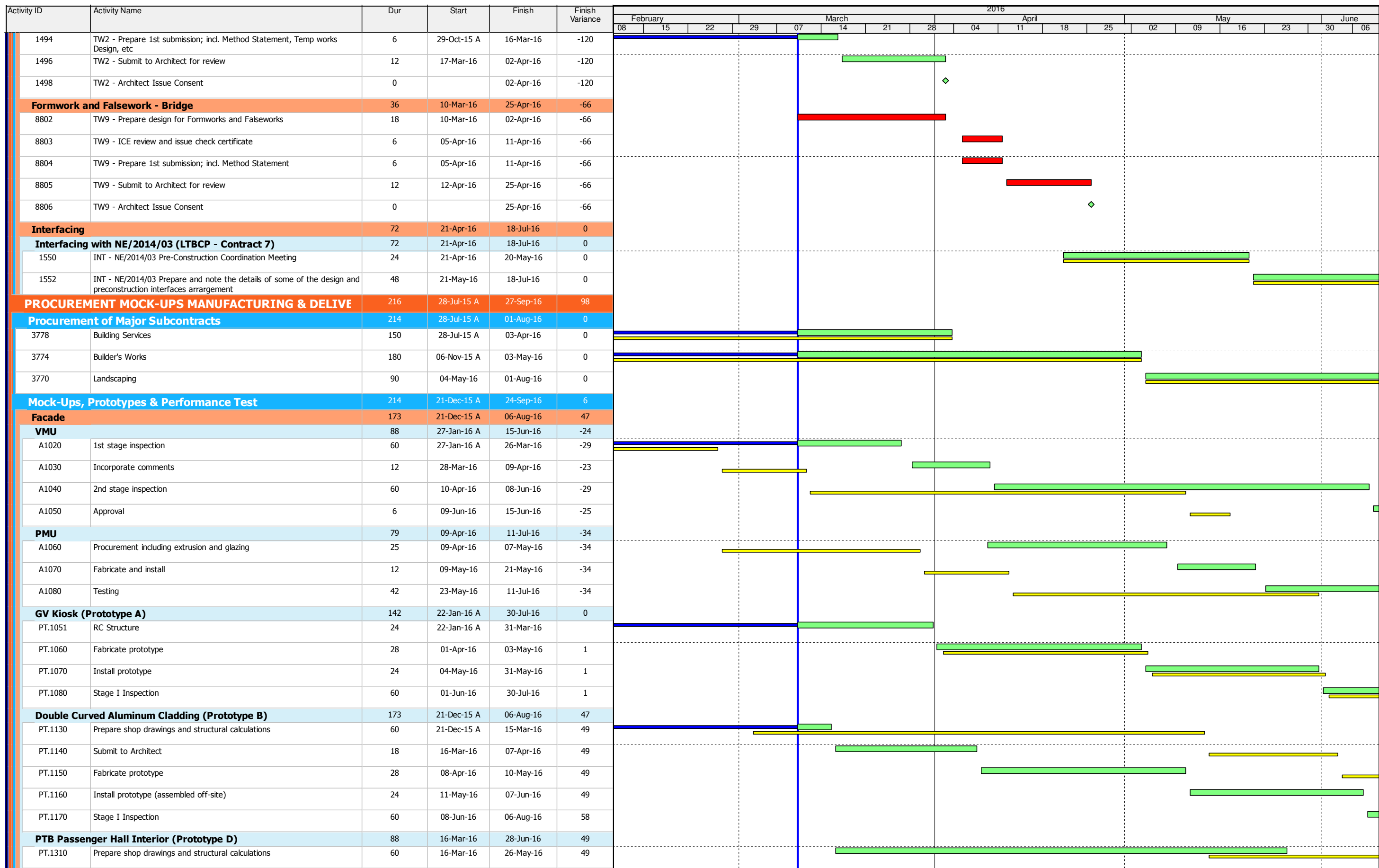
3 Months Lookahead Works Programme

Progress to 10-Mar-16

Project ID: H2634-P9
 Baseline: Works Programme Rev 1A
 Layout: 3 Month Lookahead Works Programme
 Filter: TASK filter: Date range DD-1M to DD+3M.

Page 3 of 11

Progress Update			
Date	Revision	Checked	A
10-Mar-16	Progress update		



3 Months Lookahead Works Programme

Progress to 10-Mar-16

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

Project ID: H2634-P9
Baseline: Works Programme Rev 1A

Layout: 3 Month Lookahead Works Programme
Filter: TASK filter: Date range DD-1M to DD+3M.

Progress Update			
Date	Revision	Checked	A
10-Mar-16	Progress update		

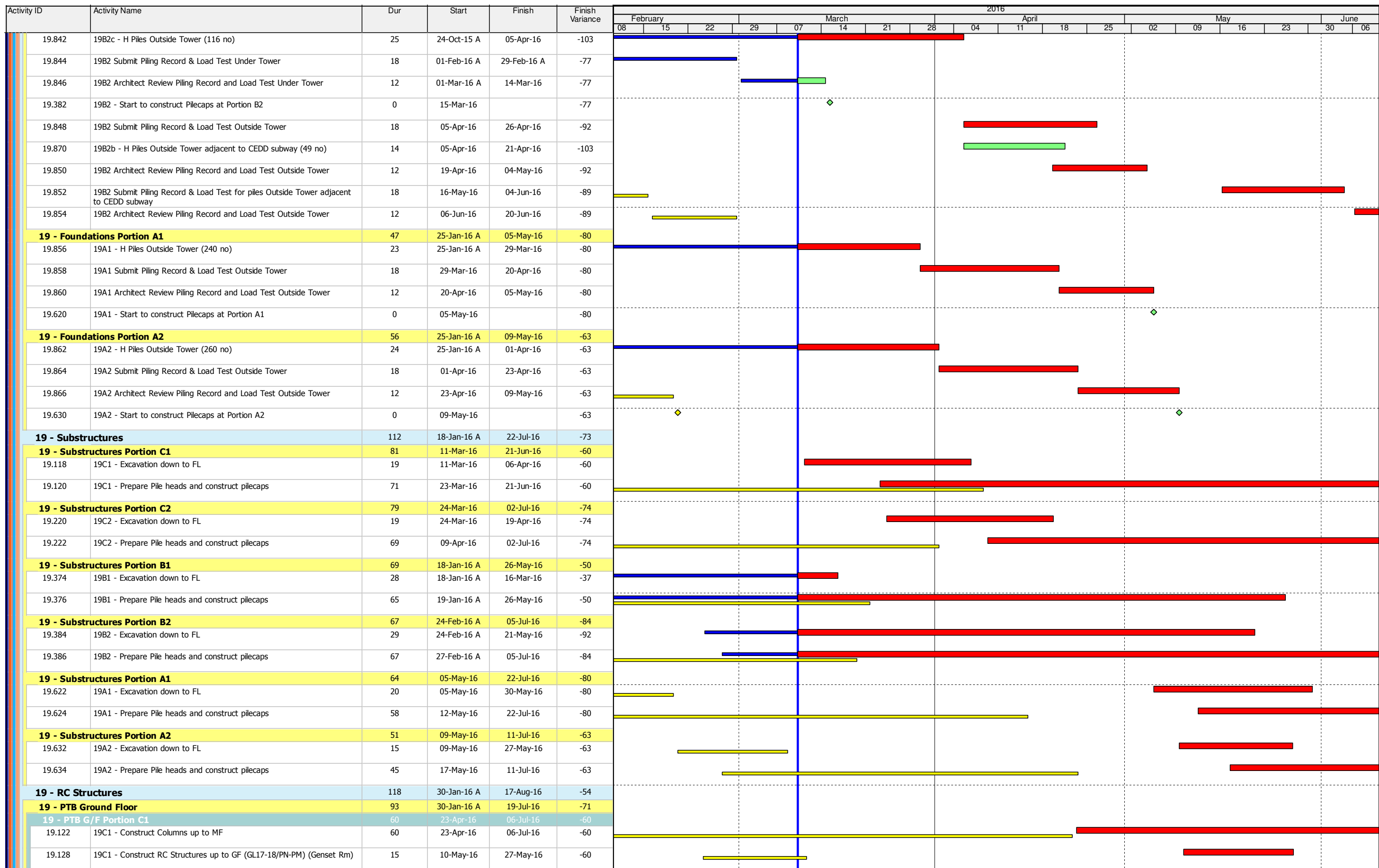
Activity ID	Activity Name	Dur	Start	Finish	Finish Variance	2016																							
						February				March				April				May				June							
						08	15	22	29	07	14	21	28	04	11	18	25	02	09	16	23	30	06						
PT.1320	Submit to Architect	18	27-May-16	16-Jun-16	49																								
PT.1330	Fabricate prototype	28	27-May-16	28-Jun-16	49																								
Mock-ups		162	10-Mar-16	24-Sep-16	0																								
Other Specified Mockups (PS.A01)		162	10-Mar-16	24-Sep-16	0																								
MU.1110	Acoustic Panel System	60	10-Mar-16*	25-May-16	-50																								
MU.1170	Dog Kennel Partitions and Doors	120	10-Mar-16*	05-Aug-16	-50																								
MU.1210	Fairface Concrete Works	120	10-Mar-16*	05-Aug-16	-98																								
MU.1240	Floor Self Smoothing System	60	10-Mar-16*	25-May-16	-50																								
MU.1250	Flooring System	60	10-Mar-16*	25-May-16	-50																								
MU.1360	Toilet Cubicle and Changing Cubicle (incl fittings etc)	120	10-Mar-16*	05-Aug-16	-50																								
MU.1370	Structural Steel works	120	10-Mar-16*	05-Aug-16	-98																								
MU.1120	Aluminium Windows Louvres and Doors	120	12-Apr-16	02-Sep-16	-152																								
MU.1130	Aluminium Standing Seam Metal Roofing	120	12-Apr-16	02-Sep-16	-74																								
MU.1180	Electrically Operated Chain Actuator System	120	04-May-16	24-Sep-16	0																								
MU.1190	Electrically Operated Security Gates and Barriers	120	04-May-16	24-Sep-16	0																								
MU.1200	External Paving Works	120	04-May-16	24-Sep-16	0																								
MU.1230	Finish Carpentry	120	04-May-16	24-Sep-16	0																								
MU.1270	Ironmongery	120	04-May-16	24-Sep-16	0																								
MU.1280	Painting works	60	04-May-16	15-Jul-16	0																								
MU.1290	Raised access flooring	100	04-May-16	31-Aug-16	0																								
MU.1300	Recycled Timber Systems	120	04-May-16	24-Sep-16	0																								
MU.1310	Signage Works	120	04-May-16	24-Sep-16	0																								
MU.1350	Tiling and Plastering Works	120	04-May-16	24-Sep-16	0																								
MU.1380	Smoke Vent & Curtain System	120	04-May-16	24-Sep-16	0																								
Procurement Architectural & Others		100	01-Dec-15 A	21-Jul-16	54																								
Walls, Windows & Claddings		96	23-Mar-16	21-Jul-16	54																								
1574	Bulk material procurement	96	23-Mar-16	21-Jul-16	54																								
Interior and Others		96	01-Dec-15 A	29-Apr-16	78																								
8756	Steel Maintenance and Support Platforms order manufacture and delivery	96	01-Dec-15 A	29-Apr-16	78																								
Elavated Walkway Type A & B Steel Trusses		60	27-Apr-16	11-Jul-16	-73																								
Elavated Walkway 1		60	27-Apr-16	11-Jul-16	-73																								
8901	Subcontracting / Prepare Shop Drawings / Matierial Submission	60	27-Apr-16	11-Jul-16	-73																								
Procurement MEP Systems		158	17-Mar-16	27-Sep-16	98																								
Air Conditioning		144	07-Apr-16	27-Sep-16	98																								
PR.BS1000	Chiller Order, Manufacturing & Delivery	144	07-Apr-16	27-Sep-16	98																								
Plumbing and Drainage		96	17-Mar-16	20-Jun-16	140																								
8566	Plumbing and Drainage materials & equipment Order Manufacturing & Delivery	96	17-Mar-16	20-Jun-16	140																								
CONSTRUCTION		348	09-Jul-15 A	09-Sep-16	99																								
Establishment Mobilisation & Advance Works		290	09-Jul-15 A	04-Jul-16	91																								
Site Establishment Works		33	15-Apr-16	25-May-16	0																								
Portion 2		33	15-Apr-16	25-May-16	0																								
Initial Surveys		33	15-Apr-16	25-May-16	0																								
1262	Initial site survey (P2)	6	15-Apr-16	21-Apr-16	0																								

3 Months Lookahead Works Programme

Progress to 10-Mar-16

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

Progress Update			
Date	Revision	Checked	A
10-Mar-16	Progress update		



3 Months Lookahead Works Programme

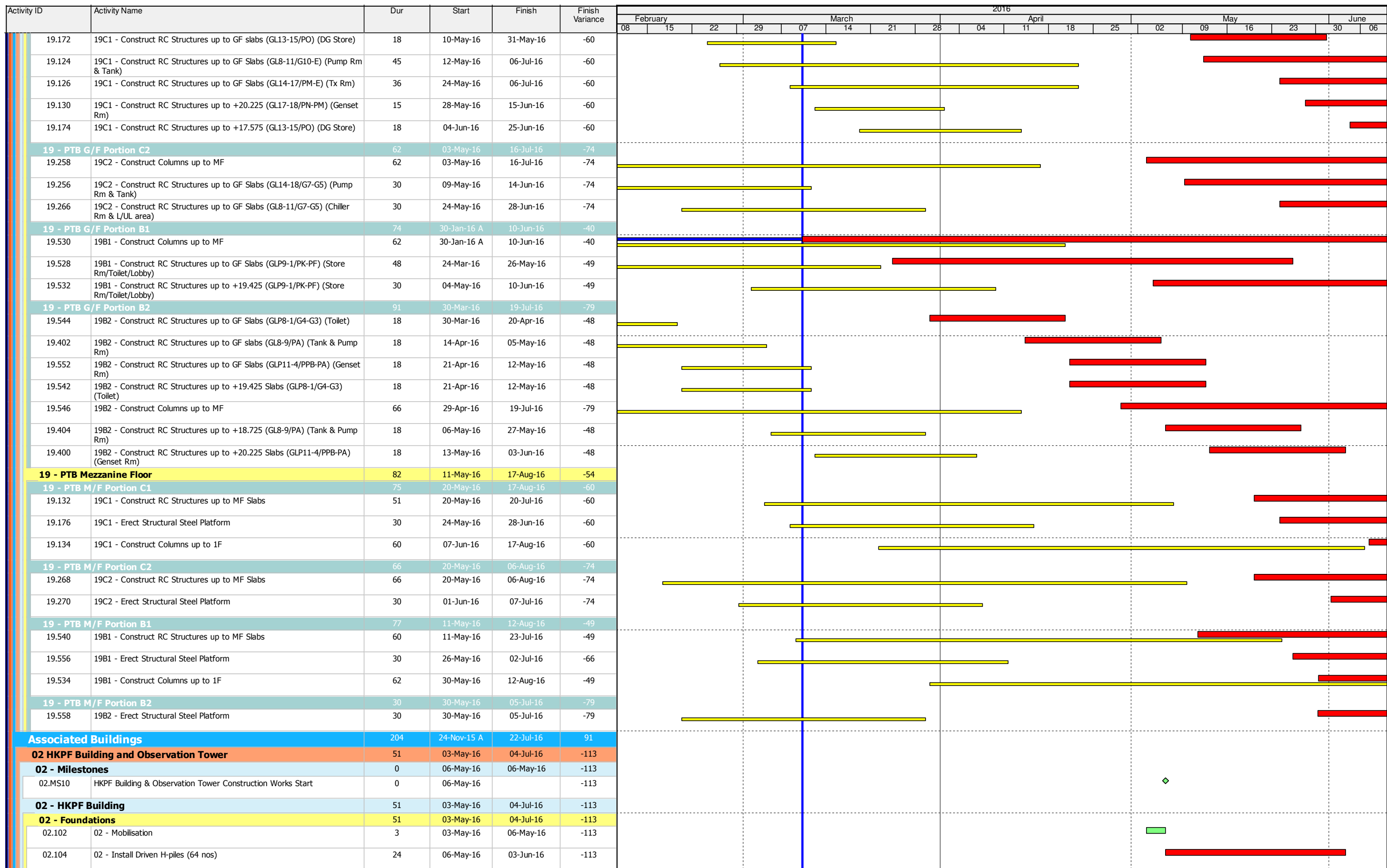
Progress to 10-Mar-16

Project ID: H2634-P9
 Baseline: Works Programme Rev 1A

Layout: 3 Month Lookahead Works Programme
 Filter: TASK filter: Date range DD-1M to DD+3M.

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

Progress Update			
Date	Revision	Checked	A
10-Mar-16	Progress update		



3 Months Lookahead Works Programme

Progress to 10-Mar-16

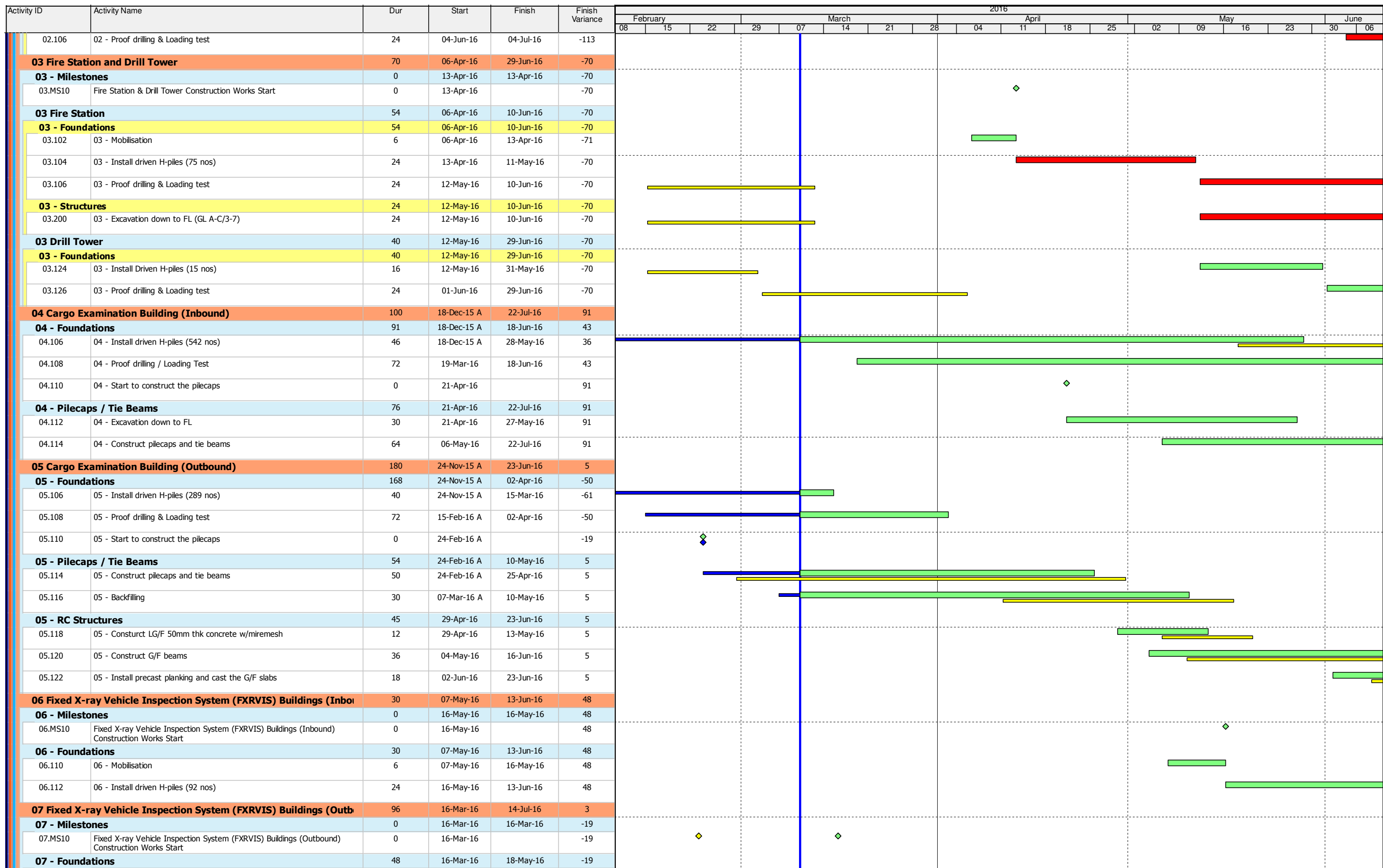
- Actual Milestone
- Milestone
- Baseline Milestone
- Actual Work
- Critical Remaining Work
- Remaining Work
- Project Baseline

Project ID: H2634-P9

Baseline: Works Programme Rev 1A

Layout: 3 Month Lookahead Works Programme
Filter: TASK filter: Date range DD-1M to DD+3M.

Progress Update			
Date	Revision	Checked	A
10-Mar-16	Progress update		



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

Page 9 of 11

3 Months Lookahead Works Programme

Progress to 10-Mar-16

Project ID: H2634-P9
 Baseline: Works Programme Rev 1A
 Layout: 3 Month Lookahead Works Programme
 Filter: TASK filter: Date range DD-1M to DD+3M.

Page 9 of 11

Progress Update			
Date	Revision	Checked	A
10-Mar-16	Progress update		

Activity ID	Activity Name	Dur	Start	Finish	Finish Variance	2016																											
						February							March							April							May						
						08	15	22	29	07	14	21	28	04	11	18	25	02	09	16	23	30	06										
07.112	07 - Install driven H-piles (84 nos)	24	16-Mar-16	16-Apr-16	-19																												
07.114	07 - Proof drilling / Loading Test	24	18-Apr-16	17-May-16	-19																												
07.116	07 - Start to construct pilecaps	0	18-May-16		-19																												
07 - Structures		48	18-May-16	14-Jul-16	3																												
07.200	07 - Excavation down to FL (Main bldg)	12	18-May-16	31-May-16	3																												
07.202	07 - Construct pilecaps and tie beams	36	01-Jun-16	14-Jul-16	3																												
10 GV Kiosk (Inbound)		18	26-May-16	16-Jun-16	0																												
10 - Milestones		0	26-May-16	26-May-16	0																												
10.MS10	GV Kiosk (Inbound) Construction Works Start	0	26-May-16		0																												
10 - Foundations		18	26-May-16	16-Jun-16	0																												
10.168	10 - Open cut excavation down to formation level -2.4	18	26-May-16	16-Jun-16	0																												
11 GV Kiosk (Outbound)		24	11-May-16	08-Jun-16	0																												
11 - Milestones		0	11-May-16	11-May-16	0																												
11.MS10	GV Kiosk (Outbound) Construction Works Start	0	11-May-16		0																												
11 - Foundations		24	11-May-16	08-Jun-16	0																												
11.168	11 - Open cut excavation down to formation level -2.4	18	11-May-16	01-Jun-16	0																												
11.170	11 - Plate load test	6	02-Jun-16	08-Jun-16	0																												
Other Associated Buildings for C&ED		130	19-Oct-15 A	11-Jun-16	-46																												
09 MXRVSS (Outbound)		130	19-Oct-15 A	11-Jun-16	-46																												
09 - Structures		130	19-Oct-15 A	11-Jun-16	-46																												
09.200	09 - Construct RC footing (x10)	30	19-Oct-15 A	06-Apr-16	-46																												
09.202	09 - Backfilling and construct G/F Slab	18	07-Apr-16	27-Apr-16	-46																												
09.212	09 - Construct Roof RC Structures	36	28-Apr-16	11-Jun-16	-46																												
External Civil Works		202	16-Dec-15 A	09-Sep-16	99																												
37-40 Elevated Walkways		115	02-Jan-16 A	29-Jun-16	15																												
37 Elevated Walkway E1		115	02-Jan-16 A	29-Jun-16	15																												
37 - Milestones		0	12-May-16	12-May-16	-19																												
37.MS10	Elevated Walkway E1 Construction Works Start	0	12-May-16		-19																												
37 - SI Works		28	02-Jan-16 A	25-Feb-16 A	70																												
37.100	37 - Site Investigation (11 nos)	28	02-Jan-16 A	25-Feb-16 A	70																												
37 - Foundations		45	05-May-16	29-Jun-16	15																												
37.104	37 - Mobilisation	6	05-May-16	12-May-16	15																												
37.106	37 - Install driven of H-piles (39 nos)	39	12-May-16	29-Jun-16	15																												
39 Elevated Walkway E3		13	26-Feb-16 A	10-Mar-16	61																												
39 - Milestones		0	10-Mar-16	10-Mar-16	58																												
39.MS10	Elevated Walkway E3 Construction Works Start	0	10-Mar-16		58																												
39 - SI Works		3	26-Feb-16 A	29-Feb-16 A	70																												
39.100	39 - Site investigation (1 nos)	3	26-Feb-16 A	29-Feb-16 A	70																												
40 Elevated Walkway E4		23	13-Jan-16 A	10-Mar-16	71																												
40 - Milestones		0	10-Mar-16	10-Mar-16	61																												
40.MS10	Elevated Walkway E4 Construction Works Start	0	10-Mar-16		61																												
40 - SI Works		10	13-Jan-16 A	04-Mar-16 A	76																												
40.100	40 - Site investigation (4 nos)	10	13-Jan-16 A	04-Mar-16 A	76																												
Vehicular Bridges		202	16-Dec-15 A	09-Sep-16	99																												
Bridge 1		111	30-Jan-16 A	09-Sep-16	67																												
B1 - Foundations		72	30-Jan-16 A	03-Jun-16	67																												
B1.106	B1 - Construction of Bored Piles	72	30-Jan-16 A	05-May-16	67																												

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

Page 10 of 11

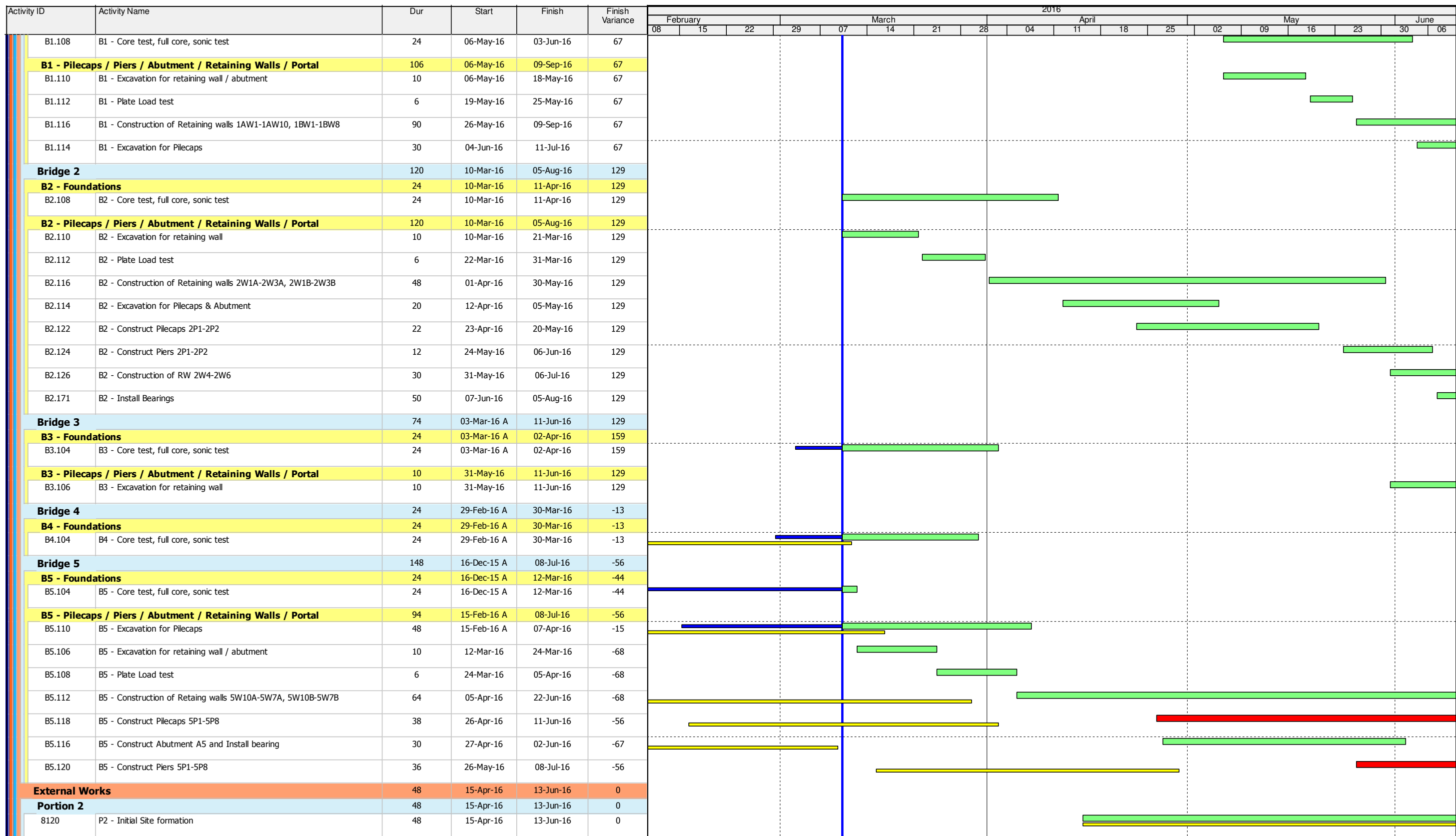
3 Months Lookahead Works Programme

Progress to 10-Mar-16

Project ID: H2634-P9
 Baseline: Works Programme Rev 1A
 Layout: 3 Month Lookahead Works Programme
 Filter: TASK filter: Date range DD-1M to DD+3M.

Page 10 of 11

Progress Update			
Date	Revision	Checked	A
10-Mar-16	Progress update		



- ◆ Actual Milestone
- ◇ Milestone
- ◆ Baseline Milestone
- Actual Work
- Critical Remaining Work
- Remaining Work
- Project Baseline

Page 11 of 11

3 Months Lookahead Works Programme

Progress to 10-Mar-16

Project ID: H2634-P9
 Baseline: Works Programme Rev 1A
 Layout: 3 Month Lookahead Works Programme
 Filter: TASK filter: Date range DD-1M to DD+3M.
 Page 11 of 11

Progress Update			
Date	Revision	Checked	A
10-Mar-16	Progress update		

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
Rev	Date	Drawn	Description	DC	WT

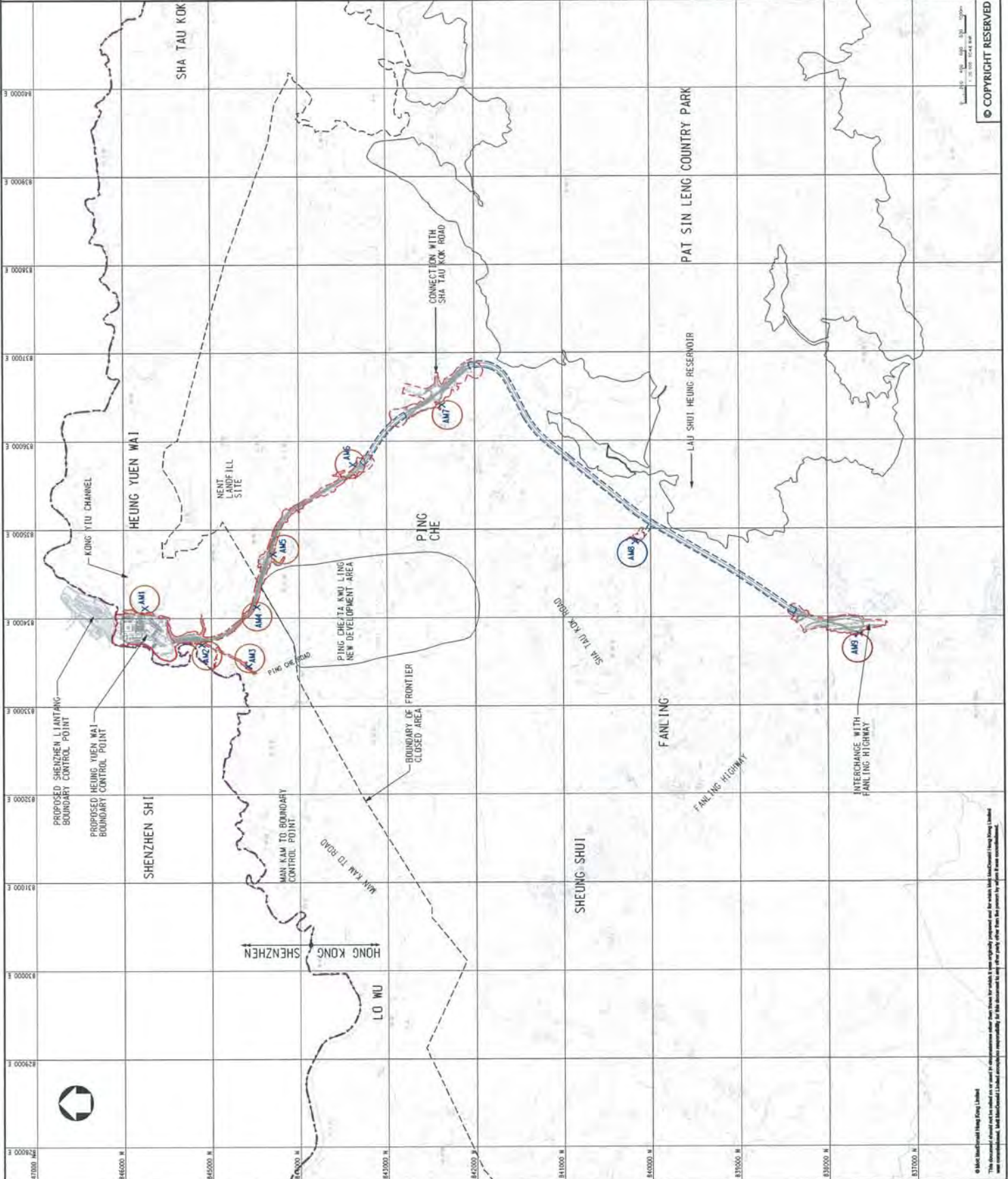


CIVIL ENGINEERING
AND DEVELOPMENT
DEPARTMENT

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

Title
PROPOSED LOCATION OF CONSTRUCTION
AIR QUALITY MONITORING STATIONS

Designed	DC	Eng. Check	EC	
Checked	H/EC	Coordination	EC	
Drawn	DC	Approval	WT	
Scale at A1	1:20000	Project	253228	
Drawing No.	CE45/2008(CE)001/002/003/004/005/006/007/008/009/010/011/012/013/014/015/016/017/018/019/020/021/022/023/024/025/026/027/028/029/030/031/032/033/034/035/036/037/038/039/040/041/042/043/044/045/046/047/048/049/050/051/052/053/054/055/056/057/058/059/060/061/062/063/064/065/066/067/068/069/070/071/072/073/074/075/076/077/078/079/080/081/082/083/084/085/086/087/088/089/090/091/092/093/094/095/096/097/098/099/100/101/102/103/104/105/106/107/108/109/110/111/112/113/114/115/116/117/118/119/120/121/122/123/124/125/126/127/128/129/130/131/132/133/134/135/136/137/138/139/140/141/142/143/144/145/146/147/148/149/150/151/152/153/154/155/156/157/158/159/160/161/162/163/164/165/166/167/168/169/170/171/172/173/174/175/176/177/178/179/180/181/182/183/184/185/186/187/188/189/190/191/192/193/194/195/196/197/198/199/200/201/202/203/204/205/206/207/208/209/210/211/212/213/214/215/216/217/218/219/220/221/222/223/224/225/226/227/228/229/230/231/232/233/234/235/236/237/238/239/240/241/242/243/244/245/246/247/248/249/250/251/252/253/254/255/256/257/258/259/260/261/262/263/264/265/266/267/268/269/270/271/272/273/274/275/276/277/278/279/280/281/282/283/284/285/286/287/288/289/290/291/292/293/294/295/296/297/298/299/300/301/302/303/304/305/306/307/308/309/310/311/312/313/314/315/316/317/318/319/320/321/322/323/324/325/326/327/328/329/330/331/332/333/334/335/336/337/338/339/340/341/342/343/344/345/346/347/348/349/350/351/352/353/354/355/356/357/358/359/360/361/362/363/364/365/366/367/368/369/370/371/372/373/374/375/376/377/378/379/380/381/382/383/384/385/386/387/388/389/390/391/392/393/394/395/396/397/398/399/400/401/402/403/404/405/406/407/408/409/410/411/412/413/414/415/416/417/418/419/420/421/422/423/424/425/426/427/428/429/430/431/432/433/434/435/436/437/438/439/440/441/442/443/444/445/446/447/448/449/450/451/452/453/454/455/456/457/458/459/460/461/462/463/464/465/466/467/468/469/470/471/472/473/474/475/476/477/478/479/480/481/482/483/484/485/486/487/488/489/490/491/492/493/494/495/496/497/498/499/500/501/502/503/504/505/506/507/508/509/510/511/512/513/514/515/516/517/518/519/520/521/522/523/524/525/526/527/528/529/530/531/532/533/534/535/536/537/538/539/540/541/542/543/544/545/546/547/548/549/550/551/552/553/554/555/556/557/558/559/560/561/562/563/564/565/566/567/568/569/570/571/572/573/574/575/576/577/578/579/580/581/582/583/584/585/586/587/588/589/590/591/592/593/594/595/596/597/598/599/600/601/602/603/604/605/606/607/608/609/610/611/612/613/614/615/616/617/618/619/620/621/622/623/624/625/626/627/628/629/630/631/632/633/634/635/636/637/638/639/640/641/642/643/644/645/646/647/648/649/650/651/652/653/654/655/656/657/658/659/660/661/662/663/664/665/666/667/668/669/670/671/672/673/674/675/676/677/678/679/680/681/682/683/684/685/686/687/688/689/690/691/692/693/694/695/696/697/698/699/700/701/702/703/704/705/706/707/708/709/710/711/712/713/714/715/716/717/718/719/720/721/722/723/724/725/726/727/728/729/730/731/732/733/734/735/736/737/738/739/740/741/742/743/744/745/746/747/748/749/750/751/752/753/754/755/756/757/758/759/760/761/762/763/764/765/766/767/768/769/770/771/772/773/774/775/776/777/778/779/780/781/782/783/784/785/786/787/788/789/790/791/792/793/794/795/796/797/798/799/800/801/802/803/804/805/806/807/808/809/810/811/812/813/814/815/816/817/818/819/820/821/822/823/824/825/826/827/828/829/830/831/832/833/834/835/836/837/838/839/840/841/842/843/844/845/846/847/848/849/850/851/852/853/854/855/856/857/858/859/860/861/862/863/864/865/866/867/868/869/870/871/872/873/874/875/876/877/878/879/880/881/882/883/884/885/886/887/888/889/890/891/892/893/894/895/896/897/898/899/900/901/902/903/904/905/906/907/908/909/910/911/912/913/914/915/916/917/918/919/920/921/922/923/924/925/926/927/928/929/930/931/932/933/934/935/936/937/938/939/940/941/942/943/944/945/946/947/948/949/950/951/952/953/954/955/956/957/958/959/960/961/962/963/964/965/966/967/968/969/970/971/972/973/974/975/976/977/978/979/980/981/982/983/984/985/986/987/988/989/990/991/992/993/994/995/996/997/998/999/1000	Scale	PRE	
Drawing No.	FIGURE 2-1		Sheet	P1



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

PI	ADD TO	DATE	NO	DESCRIPTION	DC	BY

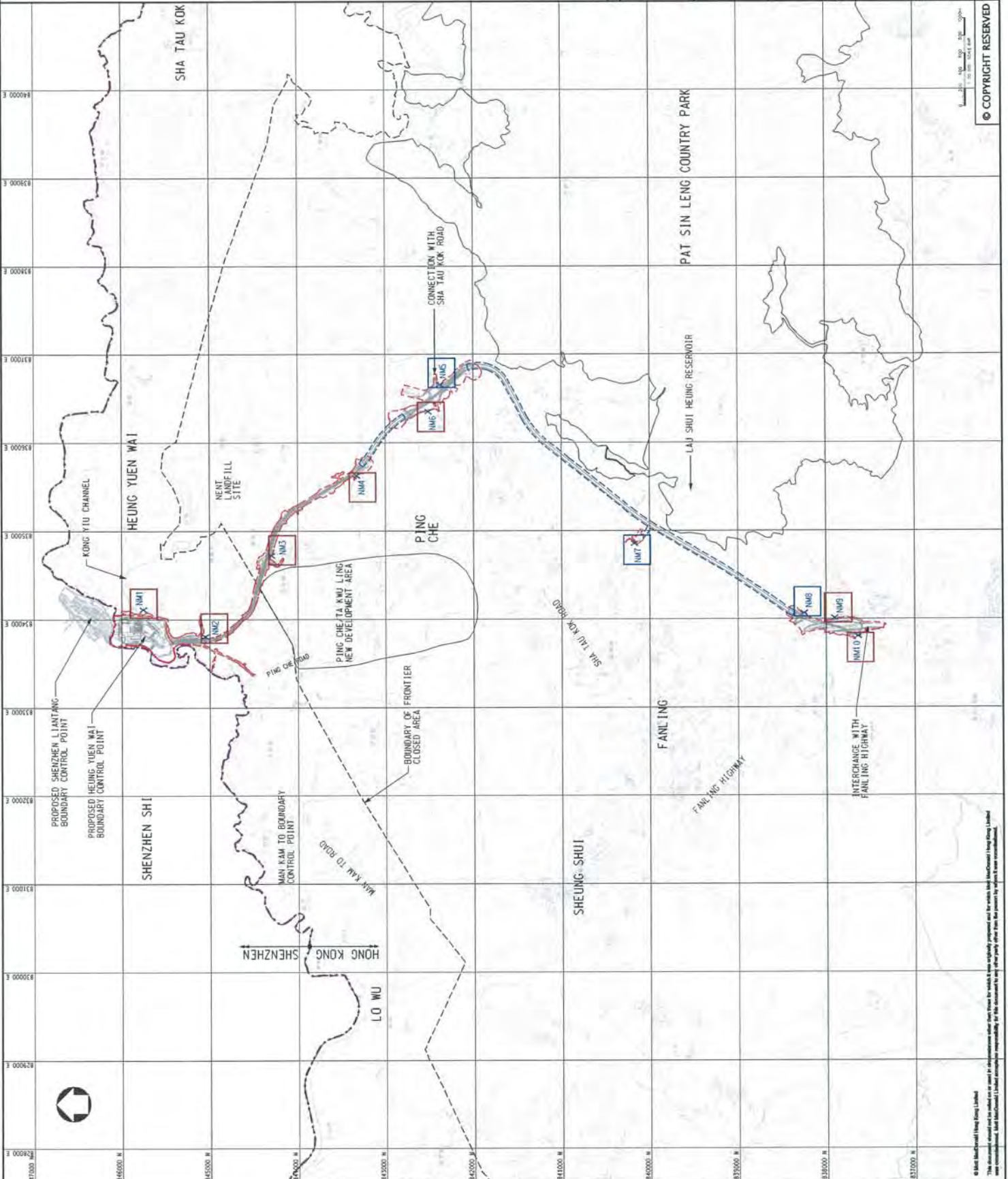


CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT

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

PROPOSED LOCATION OF CONSTRUCTION NOISE MONITORING STATIONS

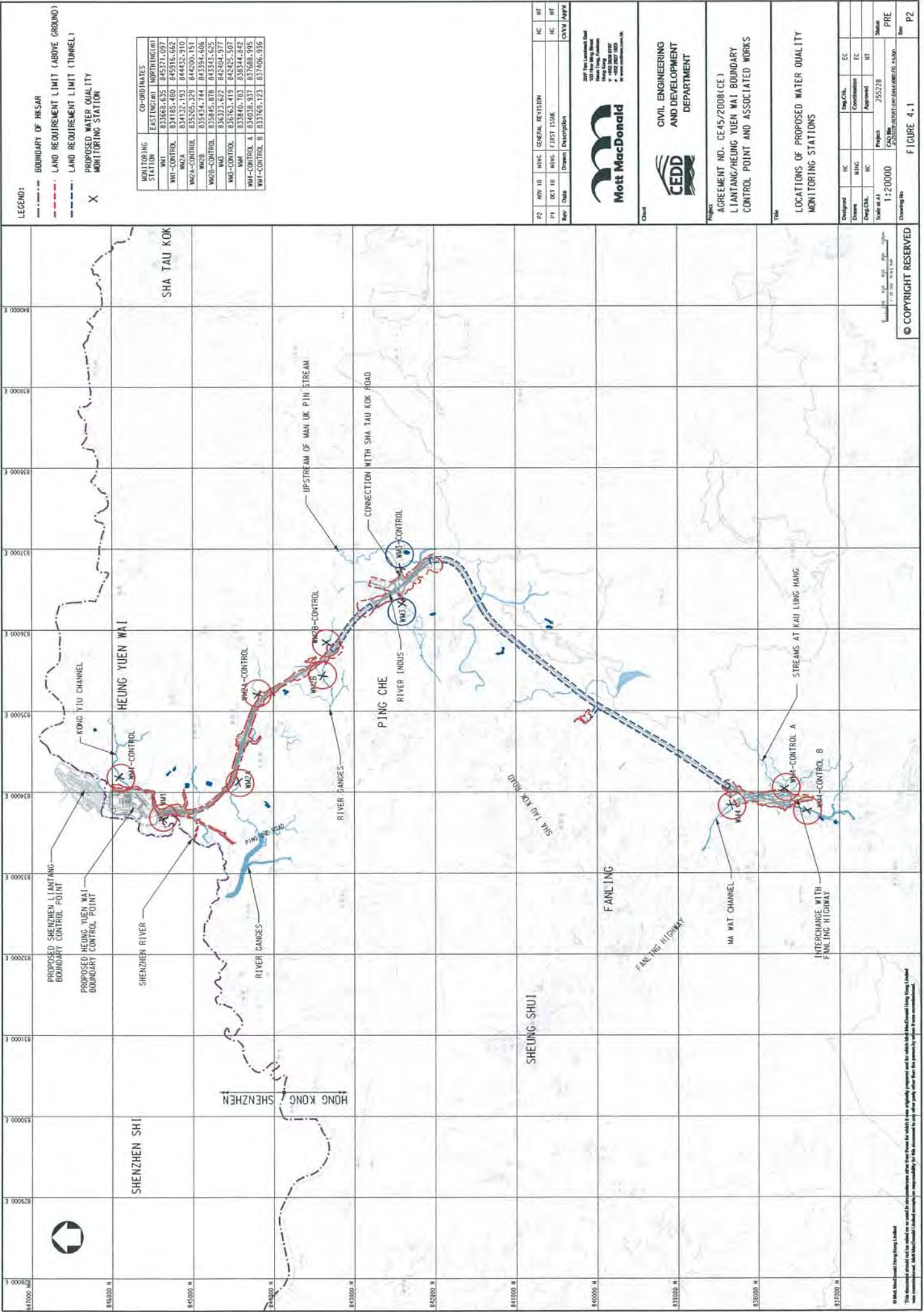
Designated	DC	DC	DC	DC	DC	DC



Scale: 1:20000
Drawing No. CE-45/2008(CE)-1509
PRE
PI

© 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 for any other purpose 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	836333.622	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

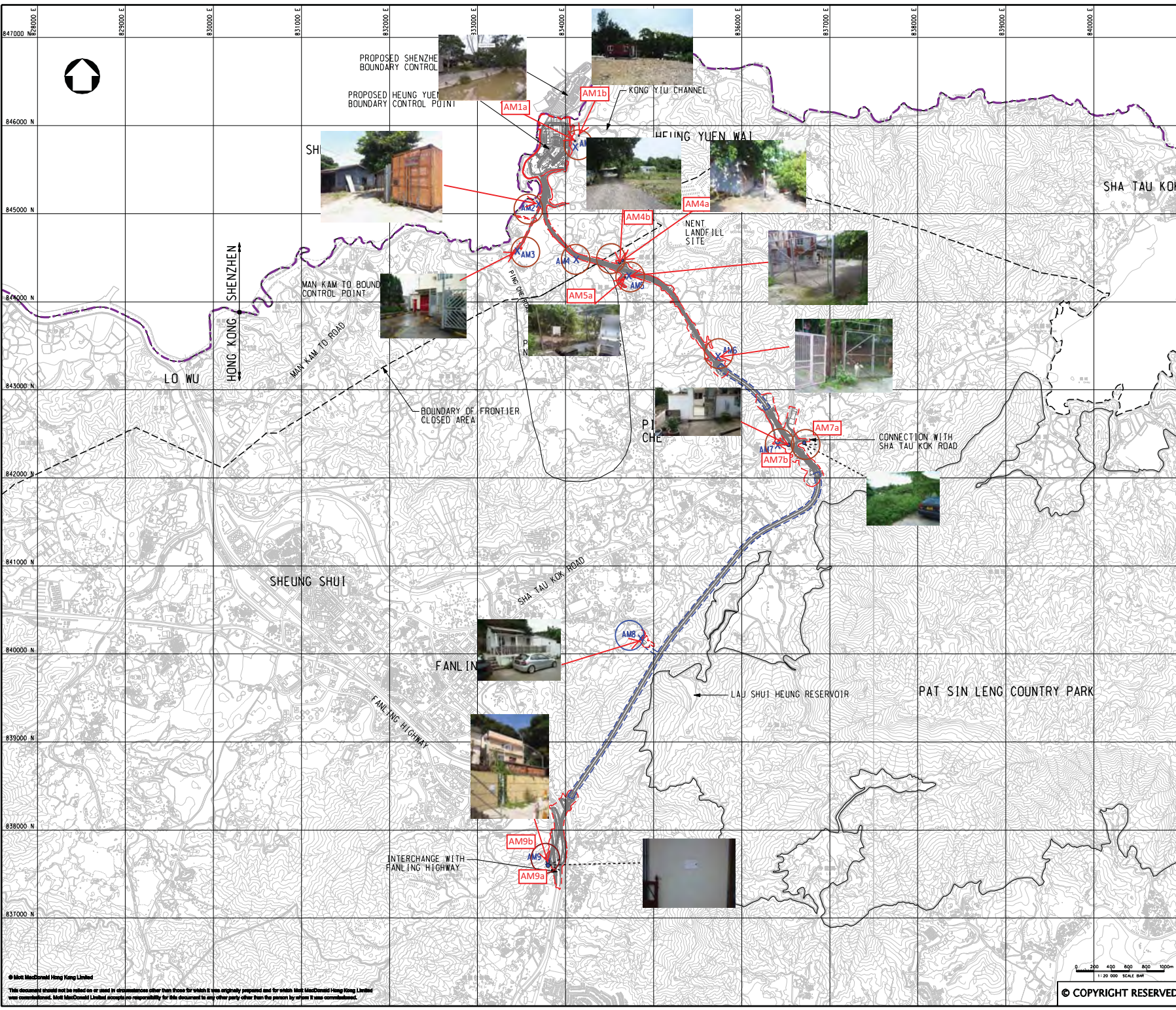
Developed	HC	Eng. Chk.	EC
Drawn	WHG	Coordination	EC
Eng. Chk.	HC	Approved	HT
Scale at A1	1:20000	Project	255228
Scale at A3		Station	PRE
Drawing No.		Rev	P2

© 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 in the EM&A Manual
 - Proposed Air Monitoring Stations

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



20/F Two Landmark East
100 Hoo Ming 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	
Draw.Chk.	DC	Approved	HT	
Scale at A1	1:20000	Project	255228	Status
		CAD file	255228\report\env\em&a\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.

LEGEND:

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

PA	REV TO	REV	FIRST ISSUE	DC	WT
Rev	Date	Drawn	Description	DC	WT

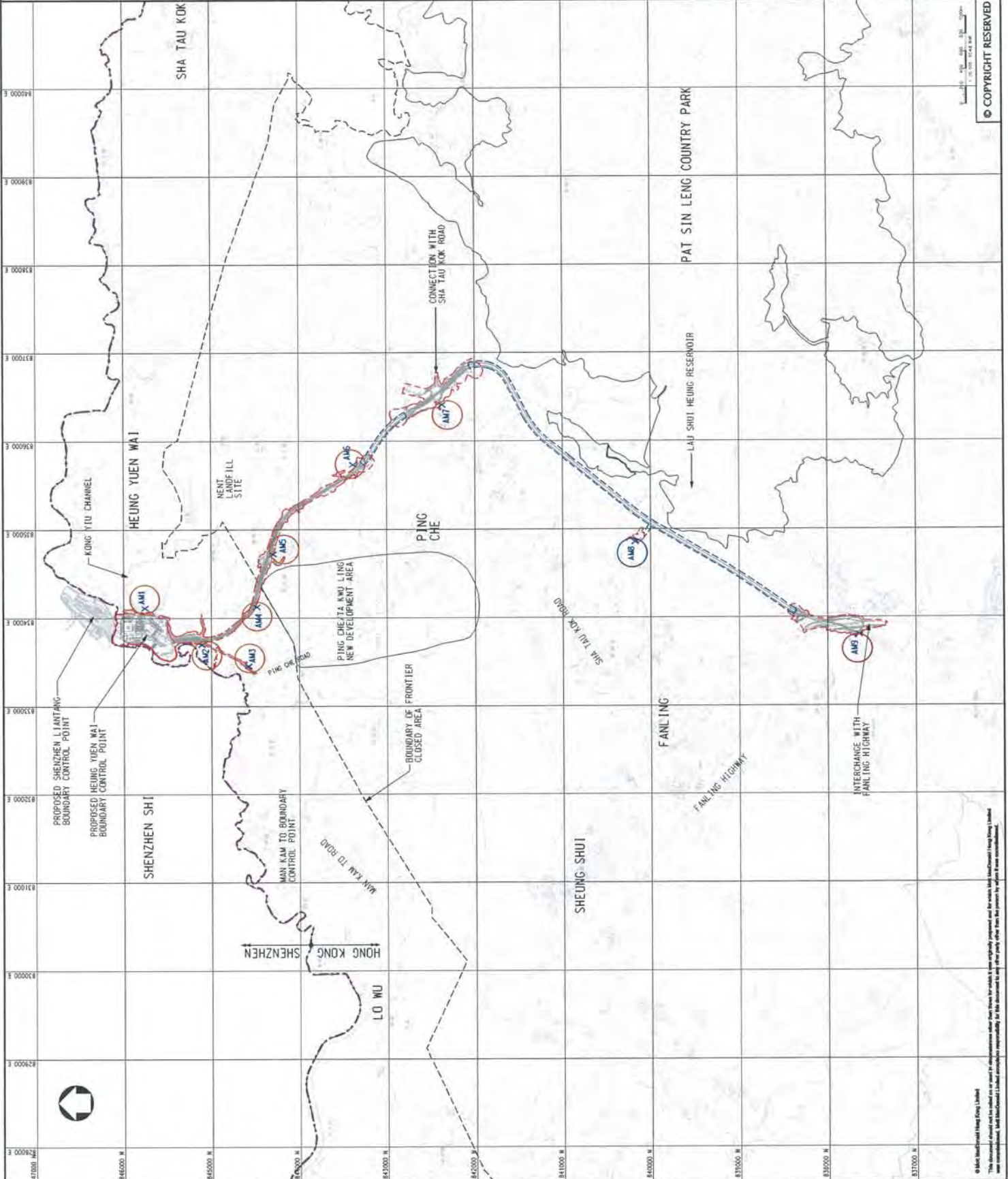


CIVIL ENGINEERING
AND DEVELOPMENT
DEPARTMENT

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

Title
PROPOSED LOCATION OF CONSTRUCTION
AIR QUALITY MONITORING STATIONS

Designed	DC	Eng. Check	EC
Drawn	H/HC	Coordination	EC
Check/Rev.	DC	Approval	WT
Scale of A1	1:20000	Project	253228
Drawing No.	CE45/2008(CE)001/002/003/004/005/006/007/008/009/010/011/012/013/014/015/016/017/018/019/020/021/022/023/024/025/026/027/028/029/030/031/032/033/034/035/036/037/038/039/040/041/042/043/044/045/046/047/048/049/050/051/052/053/054/055/056/057/058/059/060/061/062/063/064/065/066/067/068/069/070/071/072/073/074/075/076/077/078/079/080/081/082/083/084/085/086/087/088/089/090/091/092/093/094/095/096/097/098/099/100	Status	PRE
Drawing No.	FIGURE 2-1		Shee



© COPYRIGHT RESERVED

Mott MacDonald Hong Kong Limited
This document is confidential and its use is restricted to the project for which it was prepared. It is not to be distributed, copied, or otherwise used without the prior written consent of Mott MacDonald Hong Kong Limited.

LEGEND:

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

PI	ADD TO	NO	DATE	DESCRIPTION	DC	RT



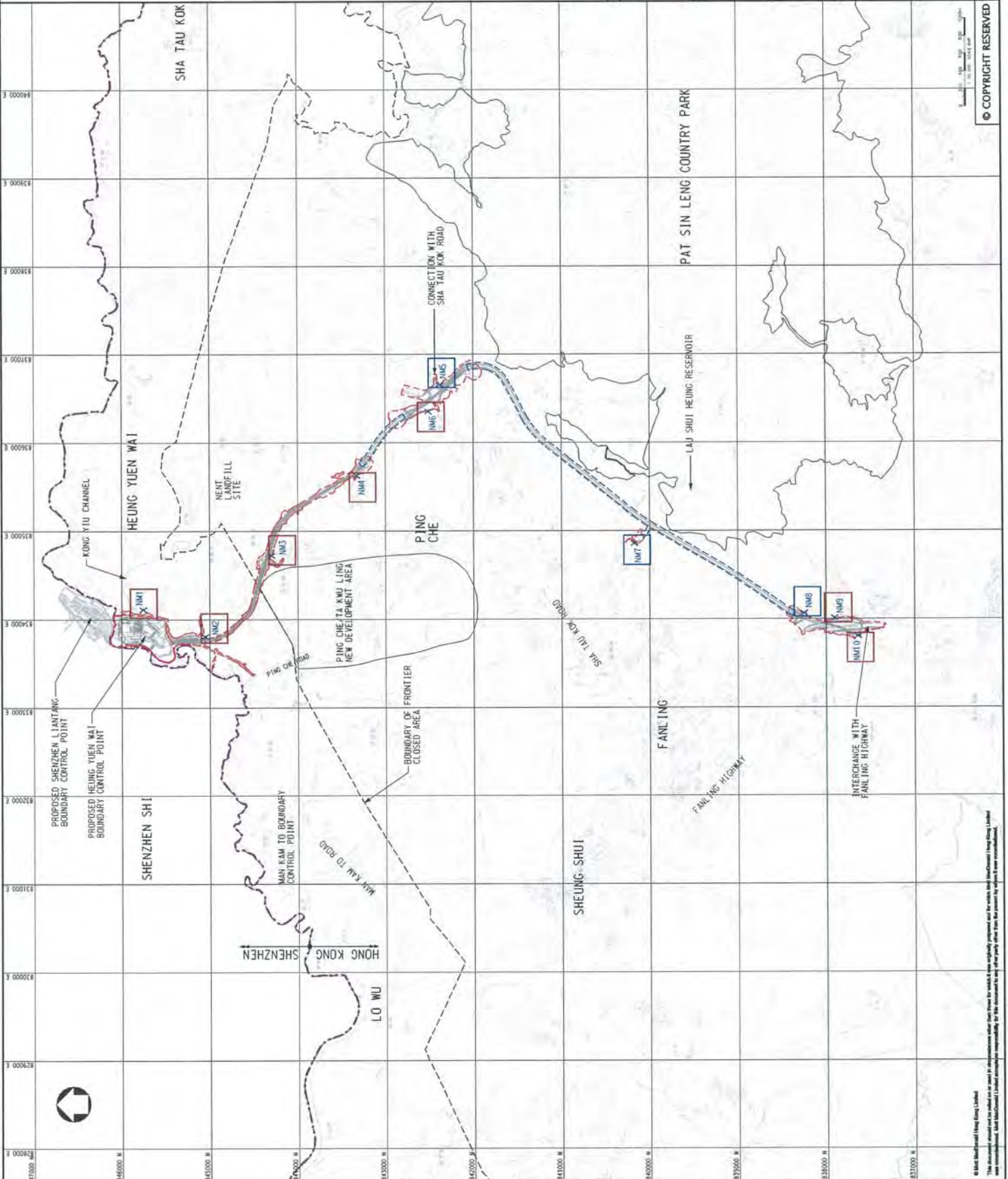
100 Yee Hong Street
 100 Yee Hong Street
 100 Yee Hong Street
 100 Yee Hong Street
 100 Yee Hong Street

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

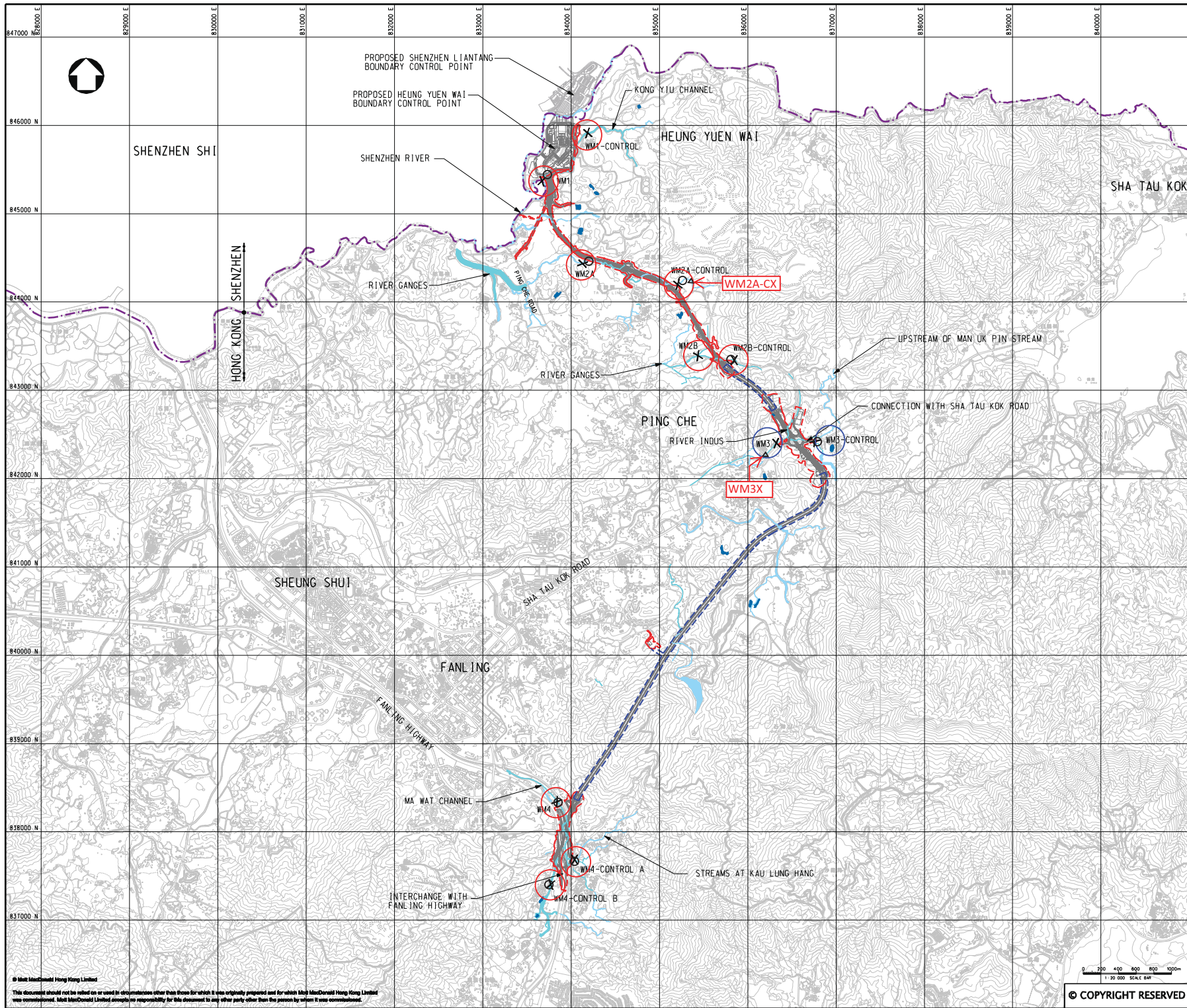
Designated	DC	DC	DC	DC	DC	DC



© COPYRIGHT RESERVED

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 for any other purpose without the prior written consent of Mott MacDonald (Hong Kong) Limited.



- LEGEND:**
- BOUNDARY OF HKSAR
 - LAND REQUIREMENT LIMIT (ABOVE GROUND)
 - LAND REQUIREMENT LIMIT (TUNNEL)
 - X Water Quality Monitoring Location Recommended in EM&A Manual
 - O Alternative Water Quality Monitoring Location for EM&A Programme
 - △ New Proposed Water Quality Monitoring Location in November 2015

Station ID ¹	Location recommended in EM&A Manual ²		Location found during site visit ³	
	Coordinates ⁴		Coordinates ⁵	
	Easting ⁶	Northing ⁷	Easting ⁸	Northing ⁹
WM1	833668.633	845371.097	833670	845421
WM1-Control	834185.480	845391.662	834185	845391
WM2A	834132.193	844432.910	834204	844473
WM2A-Control	835205.529	844200.151	835270	844245
WM2B	835434.744	843394.606	835433	843397
WM2B-Control	835845.878	843343.625	835835	843351
WM3	836323.622	842408.977	836324	842407
WM3-Control	836763.419	842423.507	836763	842400
WM4	833840.783	838344.842	833850	838338
WM4-Control A	834018.937	837668.995	834028	837685
WM4-Control B	833769.123	837406.936	833760	837395

New Proposed Water Quality Monitoring Location in November 2015

Location ID	Easting	Northing
WM2A-C (Original)	0835270	0844243
WM2A-Cx (Proposed)	0835377	0844188
WM3 (Original)	0836324	0842407
WM3x (Proposed)	0836206	0842270

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

200th Two Landmark East
100 New King Street
Kowloon, Kowloon
Hong Kong
T +852 2528 8787
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: LOCATIONS OF PROPOSED WATER QUALITY MONITORING STATIONS

Designed	HC	Eng.Chk.	EC
Drawn	MING	Coordination	EC
Dwg.Chk.	HC	Approved	HT
Scale at A1	Project	255228	Status
1:20000	CAD file	1:\255228\REPORTS\ENV\EM&A\WQMS\LOC_A1.dwg	PRE
Drawing No	Appendix C		Rev
			P2

© 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 to whom it was commissioned.

Photographic Records for Water Quality Monitoring Location



Alternative Location of WM1



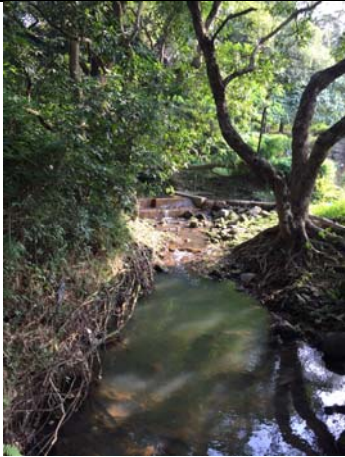
Alternative Location of WM1 – Control (WM1-C)



Alternative Location of WM2A



Alternative Location of WM2-Control (WM2-C)



Alternative Location of WM2- Control X (WM2-CX)



Location of WM2B-Control (WM2B-C)



Location of WM2B



Location of WM3-Control (WM3-C)



Location of WM3



Alternative Location of WM3X



Location of WM4-Control A (WM4-CA)



Location of WM4-Control B (WM4-CB)



Location of WM4



Appendix F

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

TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : Garden Farm, Tsung Yuen Ha Village	Date of Calibration:	23/2/2016
Location ID : AM1b	Next Calibration Date:	23/4/2016
	Technician:	Fai So

CONDITIONS

Sea Level Pressure (hPa)	1022.3	Corrected Pressure (mm Hg)	766.725
Temperature (°C)	15.5	Temperature (K)	289

CALIBRATION ORIFICE

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

CALIBRATION

Plate No.	H2O (L) (in)	H2O (R) (in)	H2O (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION		
							Slope =	Intercept =	Corr. coeff. =
18	6.7	6.7	13.4	1.779	53	54.10	Slope =	33.9477	
13	5.2	5.2	10.4	1.567	47	47.98	Intercept =	-5.5459	
10	4	4	8.0	1.375	41	41.85	Corr. coeff. =	0.9987	
7	2.5	2.5	5.0	1.087	31	31.65			
5	1.5	1.5	3.0	0.842	22	22.46			

Calculations :

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

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

Qstd = standard flow rate

IC = corrected chart responses

I = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

Ta = actual temperature during calibration (deg K)

Pstd = actual pressure during calibration (mm Hg)

For subsequent calculation of sampler flow:

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

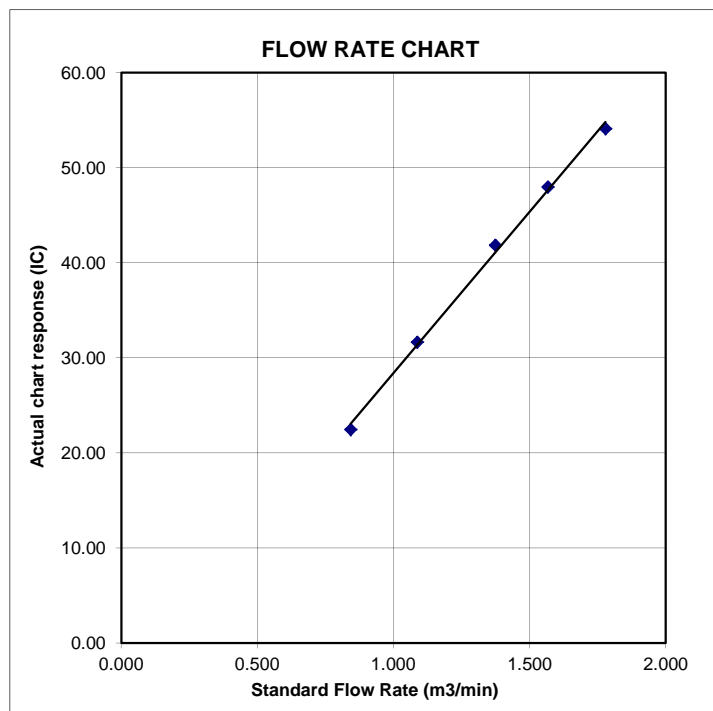
m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure



TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : Village House near Lin Ma Hang Road	Date of Calibration:	23/2/2016
Location ID : AM2	Next Calibration Date:	23/4/2016
	Technician:	Fai So

CONDITIONS

Sea Level Pressure (hPa)	1022.3	Corrected Pressure (mm Hg)	766.725
Temperature (°C)	15.5	Temperature (K)	289

CALIBRATION ORIFICE

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

CALIBRATION

Plate No.	H2O (L) (in)	H2O (R) (in)	H2O (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	6.4	6.4	12.8	1.739	56	57.17	Slope = 34.8659 Intercept = -2.8852 Corr. coeff. = 0.9961
13	4.8	4.8	9.6	1.506	48	49.00	
10	3.7	3.7	7.4	1.322	44	44.92	
7	2.4	2.4	4.8	1.065	34	34.71	
5	1.5	1.5	3.0	0.842	25	25.52	

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:

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

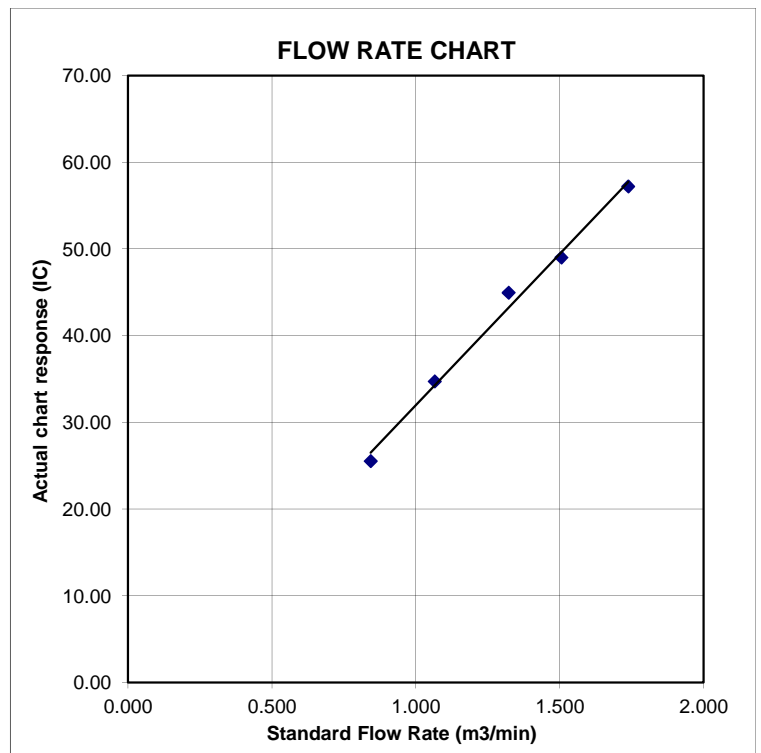
m = sampler slope

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	Date of Calibration:	23/2/2016
Location ID : AM3	Next Calibration Date:	23/4/2016
	Technician:	Fai So

CONDITIONS

Sea Level Pressure (hPa)	1022.3	Corrected Pressure (mm Hg)	766.725
Temperature (°C)	15.5	Temperature (K)	289

CALIBRATION ORIFICE

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

CALIBRATION

Plate No.	H2O (L) (in)	H2O (R) (in)	H2O (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	6	6	12.0	1.683	56	57.17	Slope = 30.9841 Intercept = 5.5195 Corr. coeff. = 0.9902
13	4.6	4.6	9.2	1.474	50	51.04	
10	3.5	3.5	7.0	1.286	45	45.94	
7	2	2	4.0	0.973	37	37.77	
5	1.5	1.5	3.0	0.842	29	29.60	

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:

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

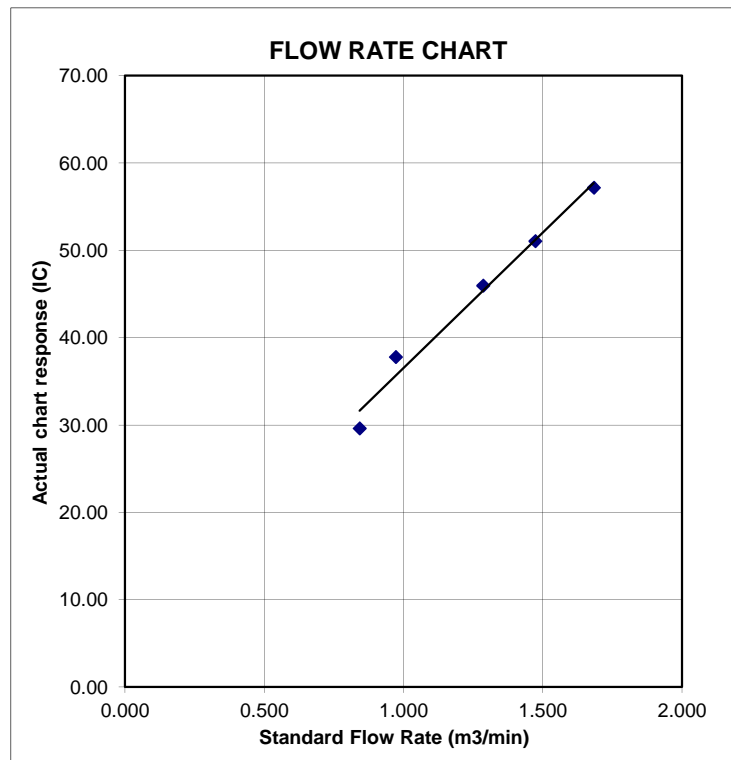
m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure



TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : Ping Yeung Village House	Date of Calibration:	23/2/2016
Location ID : AM4a	Next Calibration Date:	23/4/2016
	Technician:	Fai So

CONDITIONS

Sea Level Pressure (hPa)	1022.3	Corrected Pressure (mm Hg)	766.725
Temperature (°C)	15.5	Temperature (K)	289

CALIBRATION ORIFICE

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

CALIBRATION

Plate No.	H2O (L) (in)	H2O (R) (in)	H2O (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	6.4	6.4	12.8	1.739	57	58.19	Slope = 32.1143 Intercept = 1.5084 Corr. coeff. = 0.9979
13	5	5	10.0	1.537	49	50.02	
10	3.8	3.8	7.6	1.340	43	43.90	
7	2.3	2.3	4.6	1.043	35	35.73	
5	1.4	1.4	2.8	0.814	27	27.56	

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:

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

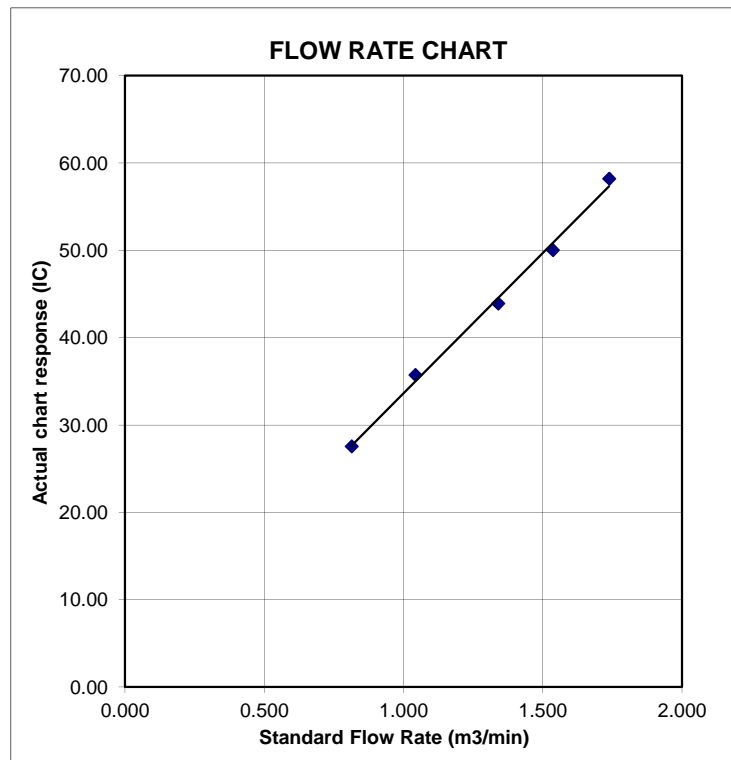
m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure



TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : Ping Yeung Village House	Date of Calibration:	23/2/2016
Location ID : AM5	Next Calibration Date:	23/4/2016
	Technician:	Fai So

CONDITIONS

Sea Level Pressure (hPa)	1022.3	Corrected Pressure (mm Hg)	766.725
Temperature (°C)	15.5	Temperature (K)	289

CALIBRATION ORIFICE

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

CALIBRATION

Plate No.	H2O (L) (in)	H2O (R) (in)	H2O (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	6.8	6.8	13.6	1.792	57	58.19	Slope = 33.3494 Intercept = -1.3144 Corr. coeff. = 0.9960
13	5.4	5.4	10.8	1.597	51	52.06	
10	3.8	3.8	7.6	1.340	42	42.87	
7	2.5	2.5	5.0	1.087	36	36.75	
5	1.6	1.6	3.2	0.870	26	26.54	

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:

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

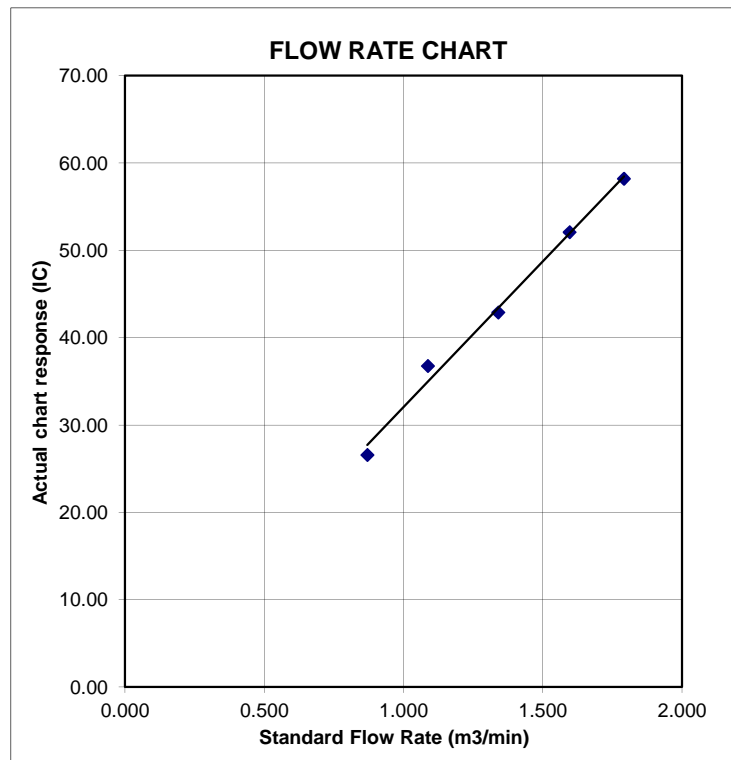
m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure



TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : Wo Keng Shan Village House	Date of Calibration:	23/2/2016
Location ID : AM6	Next Calibration Date:	23/4/2016
	Technician:	Fai So

CONDITIONS

Sea Level Pressure (hPa)	1022.3	Corrected Pressure (mm Hg)	766.725
Temperature (°C)	15.5	Temperature (K)	289

CALIBRATION ORIFICE

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

CALIBRATION

Plate No.	H2O (L) (in)	H2O (R) (in)	H2O (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	6.6	6.6	13.2	1.765	58	59.21	Slope = 28.4255 Intercept = 7.9294 Corr. coeff. = 0.9966
13	5.3	5.3	10.6	1.582	51	52.06	
10	3.7	3.7	7.4	1.322	44	44.92	
7	2.4	2.4	4.8	1.065	37	37.77	
5	1.5	1.5	3.0	0.842	32	32.67	

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:

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

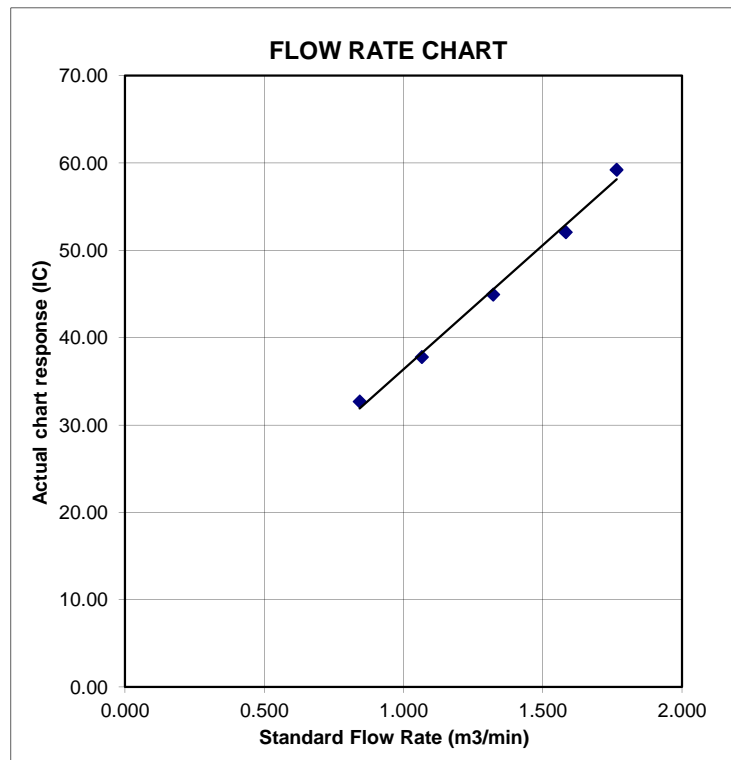
m = sampler slope

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: 23/2/2016

Location ID : AM7b

Next Calibration Date: 23/4/2016

Technician: Fai So

CONDITIONS

Sea Level Pressure (hPa) 1022.3
 Temperature (°C) 15.5

Corrected Pressure (mm Hg) 766.725
 Temperature (K) 289

CALIBRATION ORIFICE

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

Qstd Slope -> 2.10265
 Qstd Intercept -> -0.00335

CALIBRATION

Plate No.	H2O (L) (in)	H2O (R) (in)	H2O (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	4.9	4.9	9.8	1.521	55	56.14	Slope = 36.9465 Intercept = 0.0791 Corr. coeff. = 0.9991
13	4	4	8.0	1.375	50	51.04	
10	3.3	3.3	6.6	1.249	45	45.94	
7	2	2	4.0	0.973	36	36.75	
5	1.3	1.3	2.6	0.784	28	28.58	

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:

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

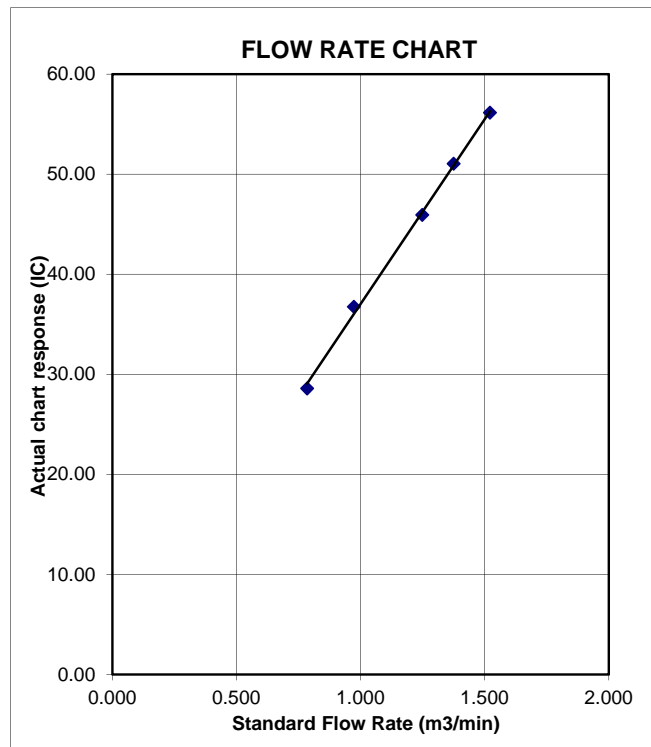
m = sampler slope

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: 23/2/2016
 Next Calibration Date: 23/4/2016
 Technician: Fai So

CONDITIONS

Sea Level Pressure (hPa)	1022.3	Corrected Pressure (mm Hg)	766.725
Temperature (°C)	15.5	Temperature (K)	289

CALIBRATION ORIFICE

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

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	6.5	6.5	13.0	1.752	66	67.37	Slope =	33.4105	
13	5.2	5.2	10.4	1.567	58	59.21	Intercept =	7.6575	
10	4	4	8.0	1.375	52	53.08	Corr. coeff. =	0.9967	
7	2.6	2.6	5.2	1.109	43	43.90			
5	1.5	1.5	3.0	0.842	36	36.75			

Calculations :

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

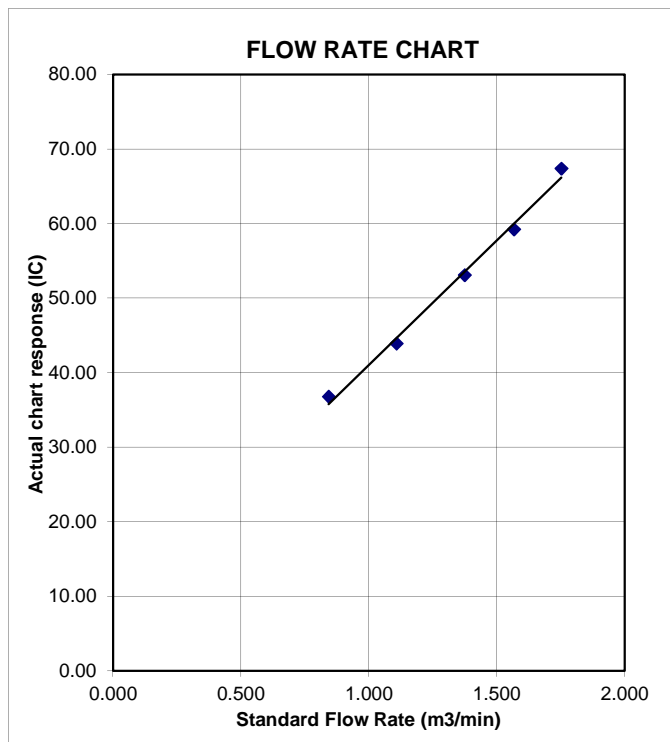
$$IC = I[\sqrt{P_a/P_{std}}(T_{std}/T_a)]$$

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

For subsequent calculation of sampler flow:

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

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



TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : Nam Wa Po Village House No. 80	Date of Calibration: 23/2/2016
Location ID : AM9b	Next Calibration Date: 23/4/2016
	Technician: Fai So

CONDITIONS

Sea Level Pressure (hPa) 1022.3	Corrected Pressure (mm Hg) 766.725
Temperature (°C) 15.5	Temperature (K) 289

CALIBRATION ORIFICE

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

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	1.752	54	55.12	Slope = 29.3935 Intercept = 4.3436 Corr. coeff. = 0.9985
13	5.2	5.2	10.4	1.567	50	51.04	
10	4.0	4	8.0	1.375	44	44.92	
7	2.5	2.5	5.0	1.087	36	36.75	
5	1.5	1.5	3.0	0.842	28	28.58	

Calculations :

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

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

Qstd = standard flow rate

IC = corrected chart responses

I = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

Ta = actual temperature during calibration (deg K)

Pstd = actual pressure during calibration (mm Hg)

For subsequent calculation of sampler flow:

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

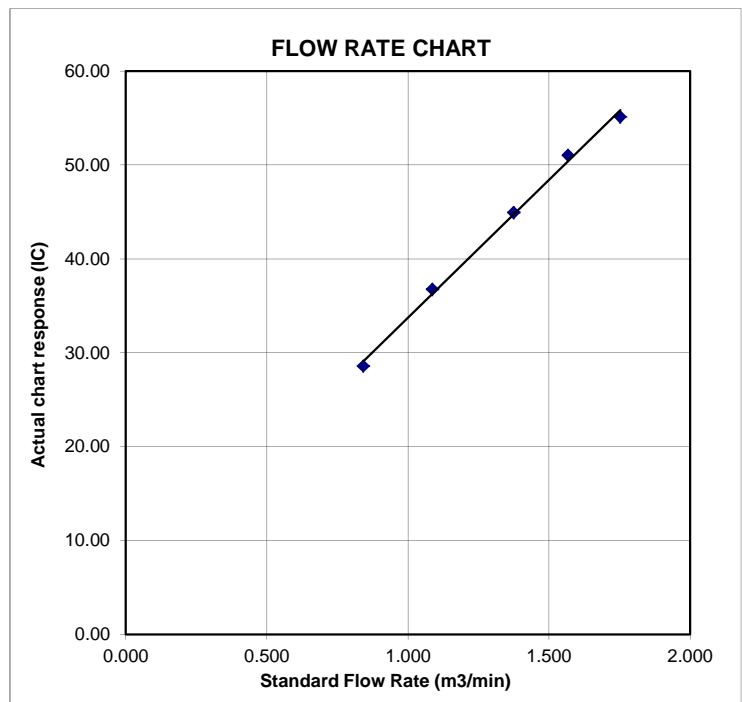
m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure





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

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

DATA TABULATION

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

CALCULATIONS

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

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

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

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

For subsequent flow rate calculations:

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

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

Equipment Verification Report (TSP)

Equipment Calibrated:

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

Standard Equipment:

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

Equipment Verification Results:

Testing Date: 5 April 2015

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

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

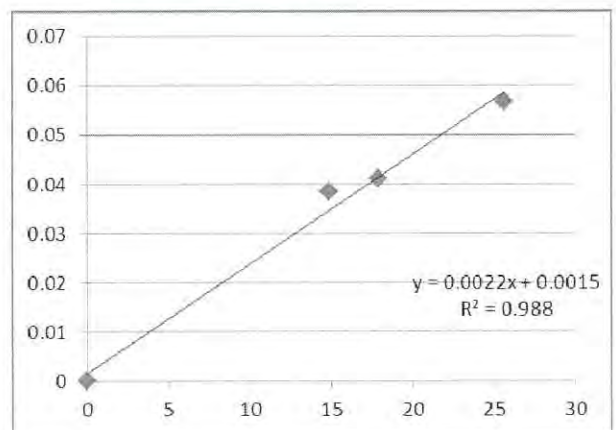
Sensitivity Adjustment Scale Setting (After Calibration) 602 (CPM)

Linear Regression of Y or X

Slope (K-factor): 0.0022

Correlation Coefficient 0.9940

Date of Issue 20 April 2015



Remarks:

- Strong** Correlation ($R > 0.8$)
 - Factor 0.0022 should be apply for TSP monitoring
- *If $R < 0.5$, repair or re-verification is required for the equipment

Operator : Donald Kwok Signature : [Signature] Date : 20 April 2015

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

TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

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

Date of Calibration: 6-Feb-15
 Next Calibration Date: 6-May-15

CONDITIONS

Sea Level Pressure (hPa) 1024.5
 Temperature (°C) 13.4

Corrected Pressure (mm Hg) 768.375
 Temperature (K) 286

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
18	3.8	3.8	7.6	1.417	56	57.44	Slope = 30.5075 Intercept = 14.6821 Corr. coeff. = 0.9974
13	3	3	6.0	1.260	52	53.33	
10	2.3	2.3	4.6	1.104	48	49.23	
8	1.7	1.7	3.4	0.950	42	43.08	
5	1.0	1.0	2.0	0.731	36	36.92	

Calculations :

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

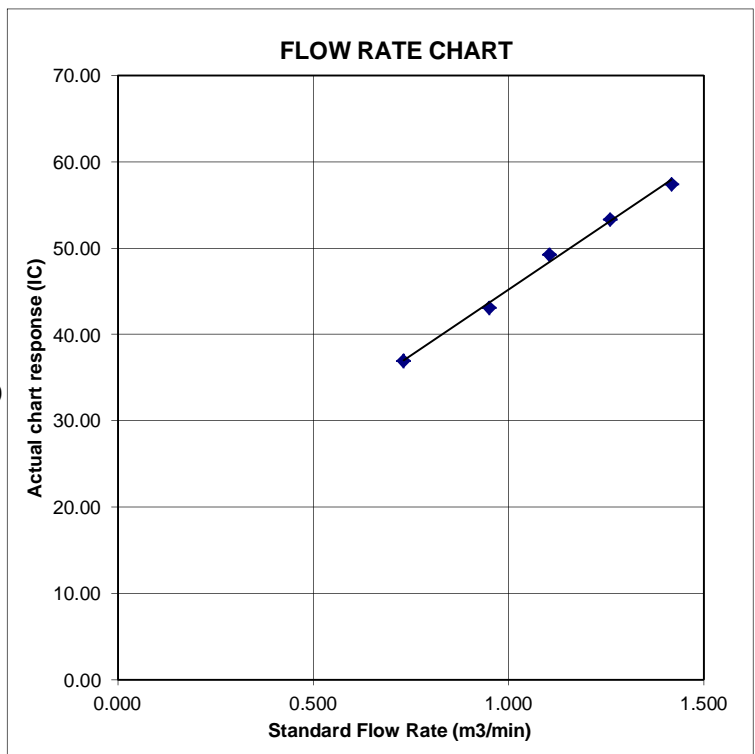
$$IC = I[\sqrt{P_a/P_{std}}(T_{std}/T_a)]$$

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

For subsequent calculation of sampler flow:

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

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



Equipment Verification Report (TSP)

Equipment Calibrated:

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

Standard Equipment:

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

Equipment Verification Results:

Testing Date: 5 April 2015

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

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

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

Linear Regression of Y or X

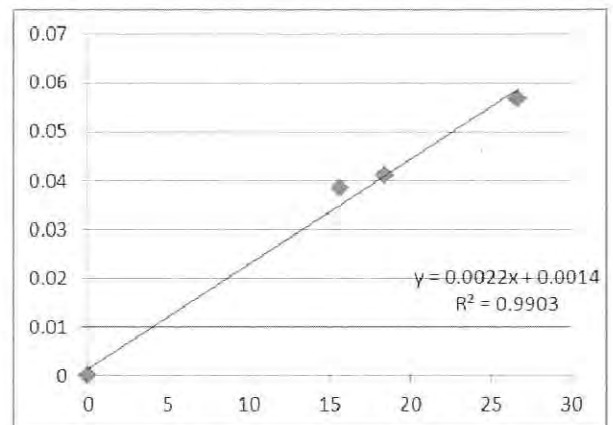
Slope (K-factor): 0.0022

Correlation Coefficient 0.9951

Date of Issue 20 April 2015

Remarks:

- Strong** Correlation ($R > 0.8$)
 - Factor 0.0022 should be apply for TSP monitoring
- *If $R < 0.5$, repair or re-verification is required for the equipment



Operator: Donald Kwok Signature: _____ Date: 20 April 2015

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

TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

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

Date of Calibration: 6-Feb-15
 Next Calibration Date: 6-May-15

CONDITIONS

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

CALIBRATION ORIFICE

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

CALIBRATION

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

Calculations :

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

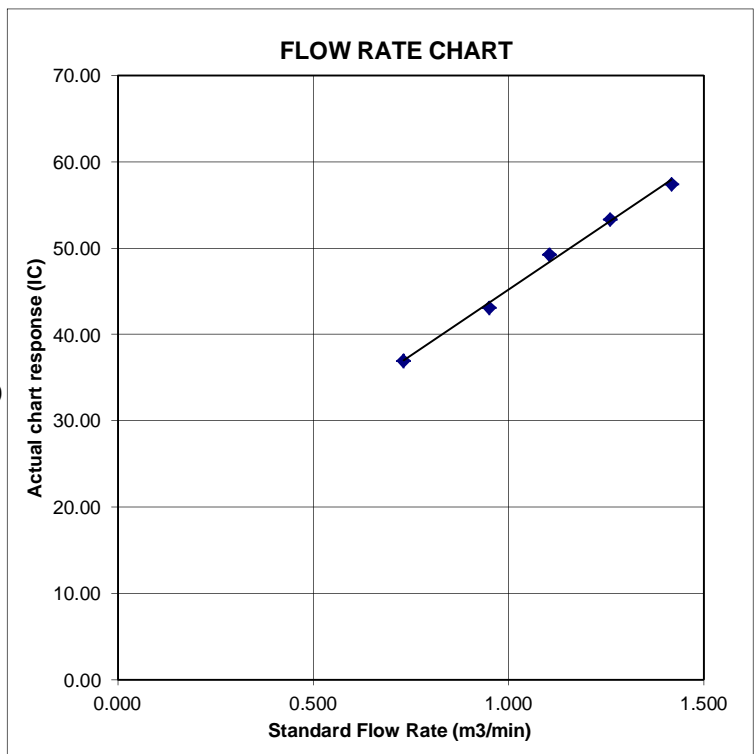
$$IC = I[\sqrt{P_a/P_{std}}(T_{std}/T_a)]$$

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

For subsequent calculation of sampler flow:

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

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



Equipment Verification Report (TSP)

Equipment Calibrated:

Type: Laser Dust monitor
 Manufacturer: Sibata LD-3B
 Serial No. 2X6145
 Equipment Ref: EQ105
 Job Order HK1603558

Standard Equipment:

Standard Equipment: Higher Volume Sampler
 Location & Location ID: AUES office (calibration room)
 Equipment Ref: HVS 018
 Last Calibration Date: 2 January 2016

Equipment Verification Results:

Testing Date: 4 to 6 January 2016

Hour	Time	Mean Temp °C	Mean Pressure (hPa)	Concentration in mg/m ³ (Standard Equipment)	Total Count (Calibrated Equipment)	Count/Minute (Total Count/60min)
2hr17min	17:30 ~ 19:47	20.6	1018.9	0.027	1602	11.7
2hr42min	17:00 ~ 19:42	20.7	1015.9	0.021	1522	9.3
2hr21min	18:00 ~ 20:21	20.9	1018.8	0.051	3347	23.6

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

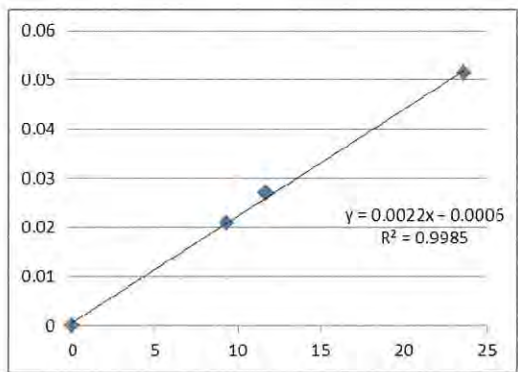
Sensitivity Adjustment Scale Setting (After Calibration) 596 (CPM)

Linear Regression of Y or X

Slope (K-factor): 0.0022

Correlation Coefficient 0.9985

Date of Issue 11 January 2016




Remarks:

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

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

Operator : Donald Kwok Signature :  Date : 12 January 2016

QC Reviewer : Ben Tam Signature :  Date : 12 January 2016

TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location :	Gold King Industrial Building, Kwai Chung	Date of Calibration: 2-Jan-16
Location ID :	Calibration Room	Next Calibration Date: 2-Apr-16

CONDITIONS

Sea Level Pressure (hPa)	1022	Corrected Pressure (mm Hg)	766.5
Temperature (°C)	18.9	Temperature (K)	292

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.10265
Model->	5025A	Qstd Intercept ->	-0.00335
Calibration Date->	24-Mar-15	Expiry Date->	24-Mar-16

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	1.384	56	56.82	Slope = 30.1332 Intercept = 15.8637 Corr. coeff. = 0.9950
13	3.2	3.2	6.4	1.222	52	52.76	
10	2.4	2.4	4.8	1.059	48	48.71	
8	1.6	1.6	3.2	0.865	42	42.62	
5	1.0	1.0	2.0	0.684	35	35.51	

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:

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

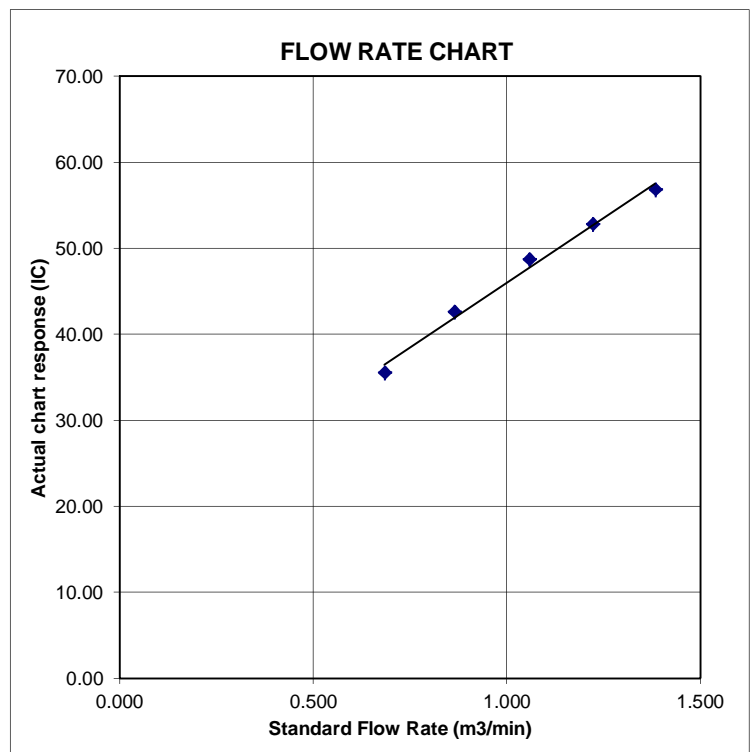
m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure



Equipment Verification Report (TSP)

Equipment Calibrated:

Type: Laser Dust monitor
 Manufacturer: Sibata LD-3B
 Serial No. 366409
 Equipment Ref: EQ109
 Job Order HK1603560

Standard Equipment:

Standard Equipment: Higher Volume Sampler
 Location & Location ID: AUES office (calibration room)
 Equipment Ref: HVS 018
 Last Calibration Date: 2 January 2016

Equipment Verification Results:

Testing Date: 4 to 6 January 2016

Hour	Time	Mean Temp °C	Mean Pressure (hPa)	Concentration in mg/m ³ (Standard Equipment)	Total Count (Calibrated Equipment)	Count/Minute (Total Count/60min)
2hr17min	17:30 ~ 19:47	20.6	1018.9	0.027	1577	11.5
2hr42min	17:00 ~ 19:42	20.7	1015.9	0.021	1433	8.8
2hr21min	18:00 ~ 20:21	20.9	1018.8	0.051	3328	23.5

Sensitivity Adjustment Scale Setting (Before Calibration) 540 (CPM)

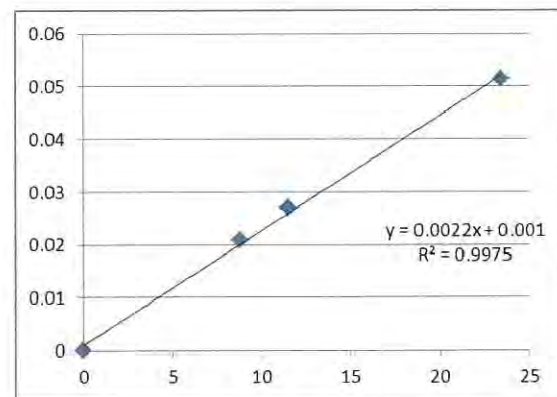
Sensitivity Adjustment Scale Setting (After Calibration) 540 (CPM)

Linear Regression of Y or X

Slope (K-factor): 0.0022

Correlation Coefficient 0.9975

Date of Issue 11 January 2016



Remarks:

- Strong** Correlation ($R > 0.8$)
 - Factor 0.0022 should be apply for TSP monitoring
- *If $R < 0.5$, repair or re-verification is required for the equipment

Operator : Donald Kwok Signature : [Signature] Date : 12 January 2016

QC Reviewer : Ben Tam Signature : [Signature] Date : 12 January 2016

TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location :	Gold King Industrial Building, Kwai Chung	Date of Calibration: 2-Jan-16
Location ID :	Calibration Room	Next Calibration Date: 2-Apr-16

CONDITIONS

Sea Level Pressure (hPa)	1022	Corrected Pressure (mm Hg)	766.5
Temperature (°C)	18.9	Temperature (K)	292

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.10265
Model->	5025A	Qstd Intercept ->	-0.00335
Calibration Date->	24-Mar-15	Expiry Date->	24-Mar-16

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	1.384	56	56.82	Slope = 30.1332 Intercept = 15.8637 Corr. coeff. = 0.9950
13	3.2	3.2	6.4	1.222	52	52.76	
10	2.4	2.4	4.8	1.059	48	48.71	
8	1.6	1.6	3.2	0.865	42	42.62	
5	1.0	1.0	2.0	0.684	35	35.51	

Calculations :

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

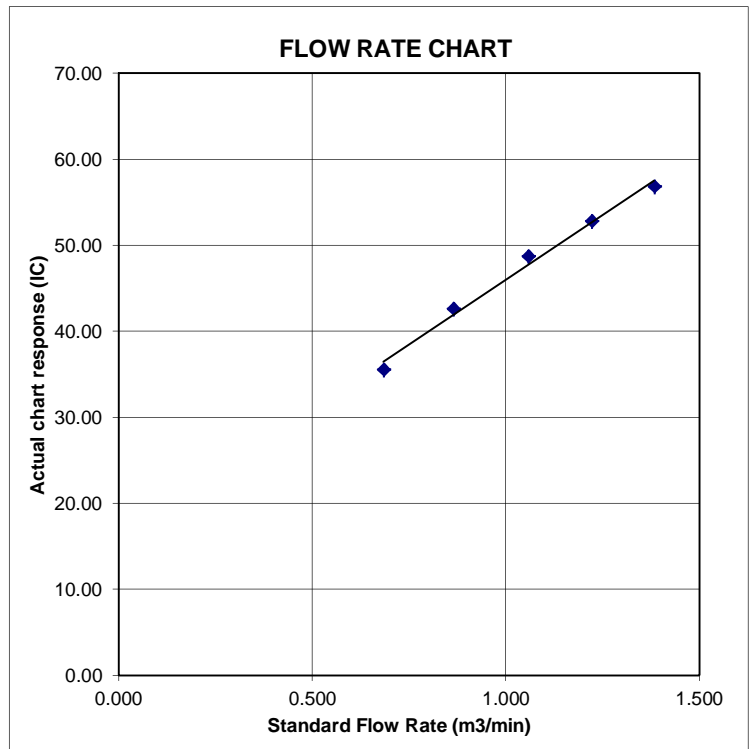
$$IC = I[\text{Sqrt}(Pa/Pstd)(Tstd/Ta)]$$

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 Verification Report (TSP)

Equipment Calibrated:

Type: Laser Dust monitor
 Manufacturer: Sibata LD-3B
 Serial No. 366410
 Equipment Ref: EQ110
 Job Order HK1603561

Standard Equipment:

Standard Equipment: Higher Volume Sampler
 Location & Location ID: AUES office (calibration room)
 Equipment Ref: HVS 018
 Last Calibration Date: 2 January 2016

Equipment Verification Results:

Testing Date: 4 to 6 January 2016

Hour	Time	Mean Temp °C	Mean Pressure (hPa)	Concentration in mg/m ³ (Standard Equipment)	Total Count (Calibrated Equipment)	Count/Minute (Total Count/60min)
2hr17min	17:30 ~ 19:47	20.6	1018.9	0.027	1566	11.4
2hr42min	17:00 ~ 19:42	20.7	1015.9	0.021	1422	8.7
2hr21min	18:00 ~ 20:21	20.9	1018.8	0.051	3318	23.4

Sensitivity Adjustment Scale Setting (Before Calibration) 660 (CPM)

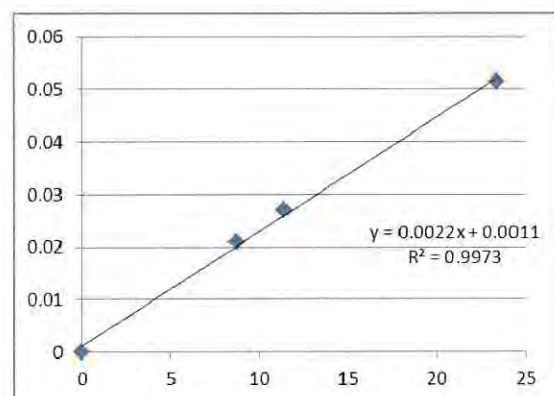
Sensitivity Adjustment Scale Setting (After Calibration) 661 (CPM)

Linear Regression of Y or X

Slope (K-factor): 0.0022

Correlation Coefficient 0.9973

Date of Issue 11 January 2016



Remarks:

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

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

Operator: Donald Kwok Signature: [Signature] Date: 12 January 2016

QC Reviewer: Ben Tam Signature: [Signature] Date: 12 January 2016

TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location :	Gold King Industrial Building, Kwai Chung	Date of Calibration: 2-Jan-16
Location ID :	Calibration Room	Next Calibration Date: 2-Apr-16

CONDITIONS

Sea Level Pressure (hPa)	1022	Corrected Pressure (mm Hg)	766.5
Temperature (°C)	18.9	Temperature (K)	292

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.10265
Model->	5025A	Qstd Intercept ->	-0.00335
Calibration Date->	24-Mar-15	Expiry Date->	24-Mar-16

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	1.384	56	56.82	Slope = 30.1332 Intercept = 15.8637 Corr. coeff. = 0.9950
13	3.2	3.2	6.4	1.222	52	52.76	
10	2.4	2.4	4.8	1.059	48	48.71	
8	1.6	1.6	3.2	0.865	42	42.62	
5	1.0	1.0	2.0	0.684	35	35.51	

Calculations :

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

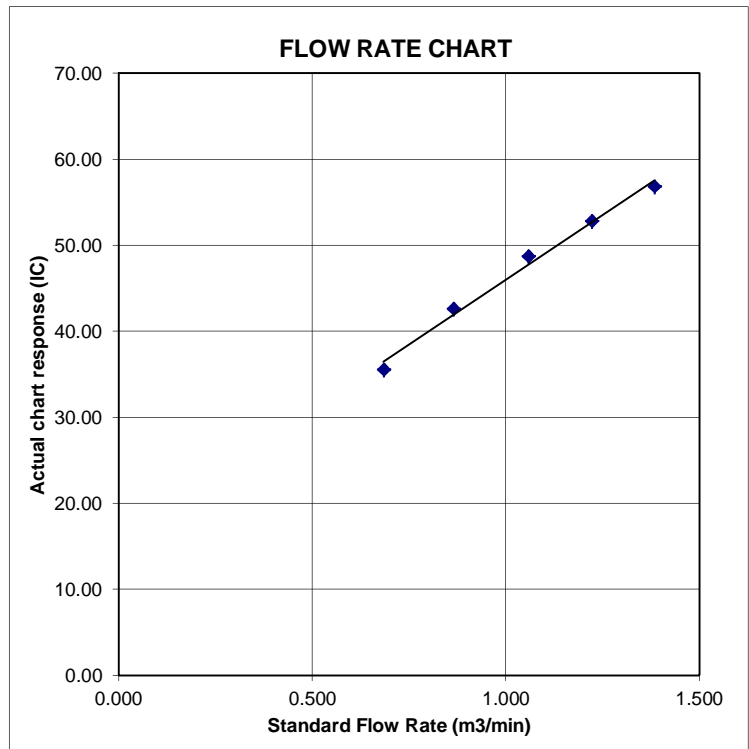
$$IC = I[\text{Sqrt}(Pa/Pstd)(Tstd/Ta)]$$

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 Verification Report (TSP)

Equipment Calibrated:

Type: Laser Dust monitor
Manufacturer: Sibata LD-3B
Serial No. 3Y6503
Equipment Ref: EQ112
Job Order HK1603553

Standard Equipment:

Standard Equipment: Higher Volume Sampler
Location & Location ID: AUES office (calibration room)
Equipment Ref: HVS 018
Last Calibration Date: 2 January 2016

Equipment Verification Results:

Testing Date: 4 to 6 January 2016

Hour	Time	Mean Temp °C	Mean Pressure (hPa)	Concentration in mg/m ³ (Standard Equipment)	Total Count (Calibrated Equipment)	Count/Minute (Total Count/60min)
2hr17min	17:30 ~ 19:47	20.6	1018.9	0.027	1633	11.9
2hr42min	17:00 ~ 19:42	20.7	1015.9	0.021	1502	9.2
2hr21min	18:00 ~ 20:21	20.9	1018.8	0.051	3365	23.8

Sensitivity Adjustment Scale Setting (Before Calibration) 642 (CPM)

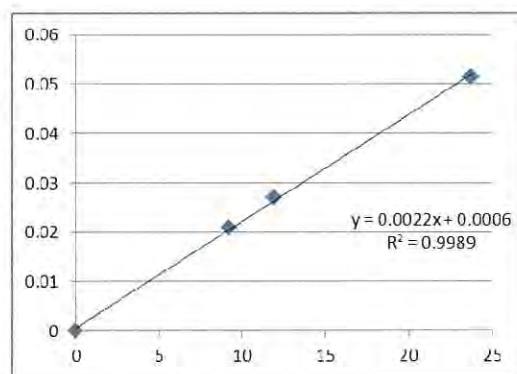
Sensitivity Adjustment Scale Setting (After Calibration) 648 (CPM)

Linear Regression of Y or X

Slope (K-factor): 0.0022

Correlation Coefficient 0.9989

Date of Issue 11 January 2016



Remarks:

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

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

Operator: Donald Kwok Signature:  Date: 12 January 2016

QC Reviewer: Ben Tam Signature:  Date: 12 January 2016

TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location :	Gold King Industrial Building, Kwai Chung	Date of Calibration: 2-Jan-16
Location ID :	Calibration Room	Next Calibration Date: 2-Apr-16

CONDITIONS

Sea Level Pressure (hPa)	1022	Corrected Pressure (mm Hg)	766.5
Temperature (°C)	18.9	Temperature (K)	292

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.10265
Model->	5025A	Qstd Intercept ->	-0.00335
Calibration Date->	24-Mar-15	Expiry Date->	24-Mar-16

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	1.384	56	56.82	Slope = 30.1332 Intercept = 15.8637 Corr. coeff. = 0.9950
13	3.2	3.2	6.4	1.222	52	52.76	
10	2.4	2.4	4.8	1.059	48	48.71	
8	1.6	1.6	3.2	0.865	42	42.62	
5	1.0	1.0	2.0	0.684	35	35.51	

Calculations :

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

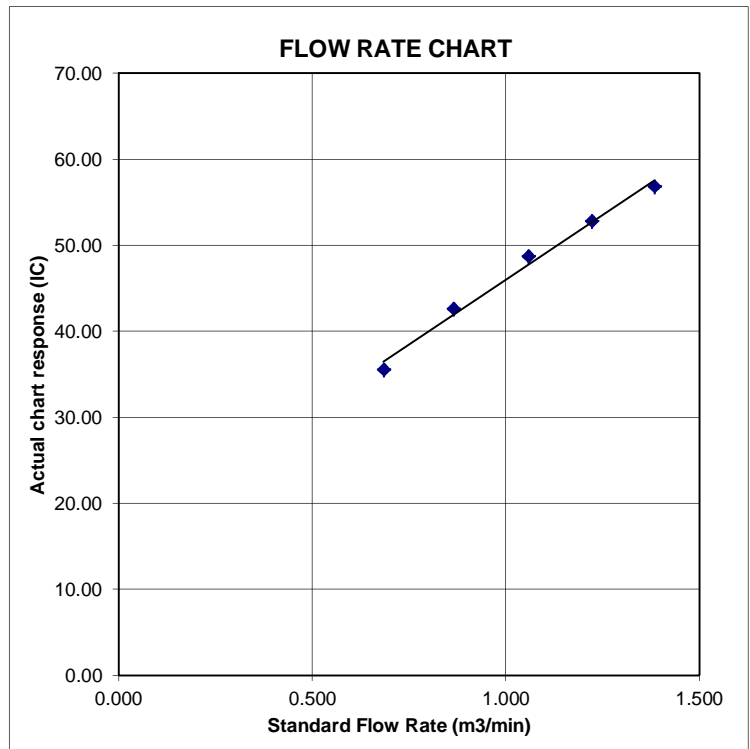
$$IC = I[\text{Sqrt}(Pa/Pstd)(Tstd/Ta)]$$

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 Verification Report (TSP)

Equipment Calibrated:

Type: Laser Dust monitor
 Manufacturer: Sibata LD-3B
 Serial No. 3Y6505
 Equipment Ref: EQ114
 Job Order HK1603562

Standard Equipment:

Standard Equipment: Higher Volume Sampler
 Location & Location ID: AUES office (calibration room)
 Equipment Ref: HVS 018
 Last Calibration Date: 2 January 2016

Equipment Verification Results:

Testing Date: 4 to 6 January 2016

Hour	Time	Mean Temp °C	Mean Pressure (hPa)	Concentration in mg/m ³ (Standard Equipment)	Total Count (Calibrated Equipment)	Count/Minute (Total Count/60min)
2hr17min	17:30 ~ 19:47	20.6	1018.9	0.027	1589	11.6
2hr42min	17:00 ~ 19:42	20.7	1015.9	0.021	1473	9.0
2hr21min	18:00 ~ 20:21	20.9	1018.8	0.051	3314	23.4

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

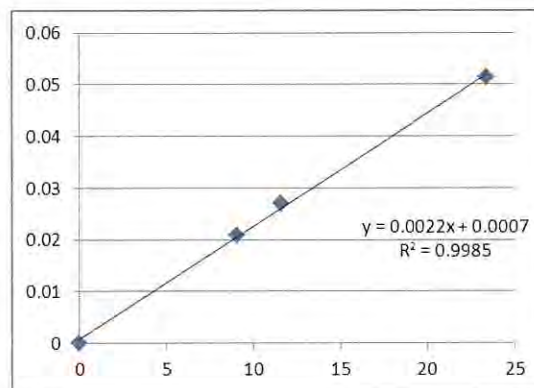
Sensitivity Adjustment Scale Setting (After Calibration) 585 (CPM)

Linear Regression of Y or X

Slope (K-factor): 0.0022

Correlation Coefficient 0.9985

Date of Issue 11 January 2016




Remarks:

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

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

Operator : Donald Kwok Signature :  Date : 12 January 2016

QC Reviewer : Ben Tam Signature :  Date : 12 January 2016

TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location :	Gold King Industrial Building, Kwai Chung	Date of Calibration: 2-Jan-16
Location ID :	Calibration Room	Next Calibration Date: 2-Apr-16

CONDITIONS

Sea Level Pressure (hPa)	1022	Corrected Pressure (mm Hg)	766.5
Temperature (°C)	18.9	Temperature (K)	292

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.10265
Model->	5025A	Qstd Intercept ->	-0.00335
Calibration Date->	24-Mar-15	Expiry Date->	24-Mar-16

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	1.384	56	56.82	Slope = 30.1332 Intercept = 15.8637 Corr. coeff. = 0.9950
13	3.2	3.2	6.4	1.222	52	52.76	
10	2.4	2.4	4.8	1.059	48	48.71	
8	1.6	1.6	3.2	0.865	42	42.62	
5	1.0	1.0	2.0	0.684	35	35.51	

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:

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

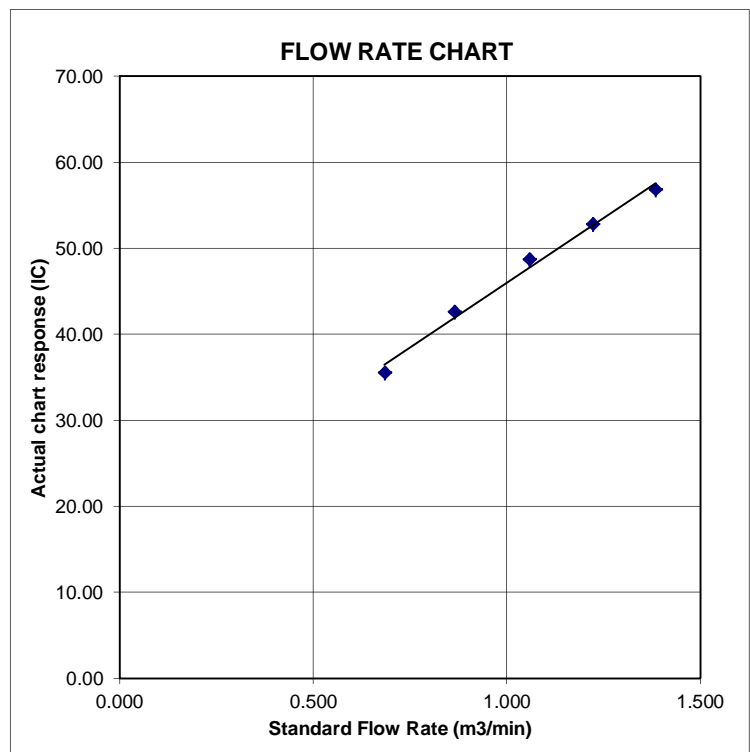
m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure



SIBATA SCIENTIFIC TECHNOLOGY LTD.

1-1-62, Nakane, Soka, Saitama, 340-0005 Japan

TEL : 048-933-1582 FAX : 048-933-1591

CALIBRATION CERTIFICATE

Date: May 11, 2015

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

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

Sincerely

SIBATA SCIENTIFIC TECHNOLOGY LTD.

Hong

For Kentaro Togo
Overseas Sales Division



Certificate of Calibration 校正證書

Certificate No. : C151969
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC15-0720) Date of Receipt / 收件日期 : 24 March 2015
Description / 儀器名稱 : Integrating Sound Level Meter (EQ006)
Manufacturer / 製造商 : Brüel & Kjær
Model No. / 型號 : 2238
Serial No. / 編號 : 2285762
Supplied By / 委託者 : Action-United Environmental Services and Consulting
Unit A, 20/F., Gold King Industrial Building,
35-41 Tai Lin Pai Road, Kwai Chung, N.T.

TEST CONDITIONS / 測試條件

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

TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 11 April 2015

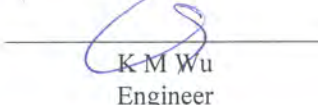
TEST RESULTS / 測試結果

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

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

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

Tested By : 
測試 : K C Lee
Project Engineer

Certified By : 
核證 : K M Wu
Engineer

Date of Issue : 14 April 2015
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. : C151969

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	C150014
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 _{AFP}	A	F	94.00	1	94.3

6.1.1.2 After Self-calibration

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

6.1.2 Linearity

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

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

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. : C151969
證書編號

6.2 Time Weighting

6.2.1 Continuous Signal

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

6.2.2 Tone Burst Signal (2 kHz)

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

6.3 Frequency Weighting

6.3.1 A-Weighting

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

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. : C151969
證書編號

6.3.2 C-Weighting

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

6.4 Time Averaging

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

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

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

- Uncertainties of Applied Value :

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

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

Note :

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

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。



輝創工程有限公司

Sun Creation Engineering Limited

Calibration and Testing Laboratory

Certificate of Calibration

校正證書

Certificate No. : C153055
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC15-0720)

Date of Receipt / 收件日期 : 15 May 2015

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

TEST CONDITIONS / 測試條件

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

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 : 4 June 2015


TEST RESULTS / 測試結果

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

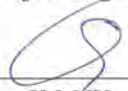
The test equipment used for calibration are traceable to National Standards via :

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

Tested By
測試


K C Lee
Project Engineer

Certified By
核證


K M Wu
Engineer

Date of Issue
簽發日期

5 June 2015

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

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. : C153055
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.
- The results presented are the mean of 3 measurements at each calibration point.
- Test equipment :

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

- Test procedure : MA101N.

- Results :

5.1 Sound Pressure Level

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

5.1.2 Linearity

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

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

- Time Weighting

5.2.1 Continuous Signal

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

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. : C153055
證書編號

5.2.2 Tone Burst Signal (2 kHz)

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

5.3 Frequency Weighting

5.3.1 A-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
50 - 130	L _{AFP}	A	F	94.00	31.5 Hz	54.8	-39.4 ± 1.5
					63 Hz	67.9	-26.2 ± 1.5
					125 Hz	77.8	-16.1 ± 1.0
					250 Hz	85.3	-8.6 ± 1.0
					500 Hz	90.8	-3.2 ± 1.0
					1 kHz	94.0	Ref.
					2 kHz	95.2	+1.2 ± 1.0
					4 kHz	95.0	+1.0 ± 1.0
					8 kHz	92.9	-1.1 (+1.5 ; -3.0)
					12.5 kHz	89.8	-4.3 (+3.0 ; -6.0)

5.3.2 C-Weighting

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

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. : C152552
證書編號

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

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

TEST CONDITIONS / 測試條件

Temperature / 溫度 : $(23 \pm 2)^{\circ}\text{C}$ 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 May 2015

TEST RESULTS / 測試結果

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

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

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

Tested By : 
測試 : K C Lee
Project Engineer

Certified By : 
核證 : K M Wu
Engineer

Date of Issue : 12 May 2015
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. : C152552
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 :

<u>Equipment ID</u>	<u>Description</u>	<u>Certificate No.</u>
CL280	40 MHz Arbitrary Waveform Generator	C150014
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)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
30 - 130	L _A	A	Fast	94.00	1	93.6	± 1.1

6.1.2 Linearity

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

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

6.2 Time Weighting

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

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. : C152552
證書編號

6.3 Frequency Weighting

6.3.1 A-Weighting

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

6.3.2 C-Weighting

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

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

- Mfr's Spec. : IEC 61672 Class 1

- Uncertainties of Applied Value :

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

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

Note :

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

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. : C151967
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC15-0720) Date of Receipt / 收件日期 : 24 March 2015
Description / 儀器名稱 : Sound Level Calibrator (EQ084)
Manufacturer / 製造商 : Cesva
Model No. / 型號 : CB-5
Serial No. / 編號 : 030023
Supplied By / 委託者 : Action-United Environmental Services and Consulting
Unit A, 20/F., Gold King Industrial Building,
35-41 Tai Lin Pai Road, Kwai Chung, N.T.

TEST CONDITIONS / 測試條件

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

TEST SPECIFICATIONS / 測試規範

Calibration

DATE OF TEST / 測試日期 : 11 April 2015

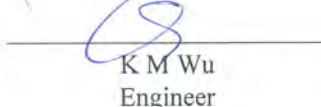
TEST RESULTS / 測試結果

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

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

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

Tested By : 
測試 K C Lee
Project Engineer

Certified By : 
核證 K M Wu
Engineer

Date of Issue : 14 April 2015
簽發日期

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

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

Certificate of Calibration

校正證書

Certificate No. : C151967

證書編號

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

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

4. Test procedure : MA100N.

5. Results :

5.1 Sound Level Accuracy

5.1.1 Before Adjustment

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

Out of Mfr's Spec.

5.1.2 After Adjustment

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

5.2 Frequency Accuracy

5.2.1 Before Adjustment

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

5.2.2 After Adjustment

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

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. : C151967
證書編號

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

Note :

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

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

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. : C152550
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC15-0720) Date of Receipt / 收件日期 : 16 April 2015
Description / 儀器名稱 : Acoustical Calibrator (EQ081)
Manufacturer / 製造商 : Brüel & Kjær
Model No. / 型號 : 4231
Serial No. / 編號 : 2326408
Supplied By / 委託者 : Action-United Environmental Services and Consulting
Unit A, 20/F., Gold King Industrial Building,
35-41 Tai Lin Pai Road, Kwai Chung, N.T.

TEST CONDITIONS / 測試條件

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

TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 7 May 2015


TEST RESULTS / 測試結果

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

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

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

Tested By : 
測試 : K C Lee
Project Engineer

Certified By : 
核證 : K M Wu
Engineer

Date of Issue : 12 May 2015
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而批准。

Certificate of Calibration

校正證書

Certificate No. : C152550
證書編號

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

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

- Test procedure : MA100N.

- Results :

5.1 Sound Level Accuracy

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

5.2 Frequency Accuracy

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

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

Note :

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

Certificate of Calibration

校正證書

Certificate No. : C151968
證書編號

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

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

TEST CONDITIONS / 測試條件

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

TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 11 April 2015


TEST RESULTS / 測試結果

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

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

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

Tested By : 
測試 : K C Lee
Project Engineer

Certified By : 
核證 : K M Wu
Engineer

Date of Issue : 14 April 2015
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. : C151968
證書編號

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

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

- Test procedure : MA100N.
- Results :

5.1 Sound Level Accuracy

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

5.2 Frequency Accuracy

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

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

Note :

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



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

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

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

WORK ORDER: HK1548853
SUB-BATCH: 0
LABORATORY: HONG KONG
DATE RECEIVED: 16/12/2015
DATE OF ISSUE: 24/12/2015

COMMENTS

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

Scope of Test: Dissolved Oxygen and Temperature
Equipment Type: Dissolved Oxygen Meter
Brand Name: YSI
Model No.: YSI Pro 20
Serial No.: 12C100570
Equipment No.: --
Date of Calibration: 23 December, 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: HK1548853
Sub-Batch: 0
Date of Issue: 24/12/2015
Client: ACTION UNITED ENVIRO SERVICES



Equipment Type: Dissolved Oxygen Meter
Brand Name: YSI
Model No.: YSI Pro 20
Serial No.: 12C100570
Equipment No.: --
Date of Calibration: 23 December, 2015 **Date of next Calibration:** 23 March, 2016

Parameters:

Dissolved Oxygen

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

Expected Reading (mg/L)	Displayed Reading (mg/L)	Tolerance (mg/L)
1.80	1.75	-0.05
4.86	4.73	-0.13
8.59	8.69	+0.10
Tolerance Limit (mg/L)		±0.20

Temperature

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

Expected Reading (°C)	Displayed Reading (°C)	Tolerance (°C)
10	10.4	+0.4
20	20.6	+0.6
40	39.2	-0.8
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., GOLD KING IND BLDG,
NO. 35-41 TAI LIN PAI ROAD,
KWAI CHUNG,
N.T., HONG KONG.

WORK ORDER: HK1610840
SUB-BATCH: 0
LABORATORY: HONG KONG
DATE RECEIVED: 16/03/2016
DATE OF ISSUE: 23/03/2016

COMMENTS

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

Scope of Test: Dissolved Oxygen and Temperature
Equipment Type: Dissolved Oxygen Meter
Brand Name: YSI
Model No.: 550A
Serial No.: 16A104433
Equipment No.: --
Date of Calibration: 23 March, 2016

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: HK1610840
Sub-Batch: 0
Date of Issue: 23/03/2016
Client: ACTION UNITED ENVIRO SERVICES



Equipment Type: Dissolved Oxygen Meter
Brand Name: YSI
Model No.: 550A
Serial No.: 16A104433
Equipment No.: --

Date of Calibration: 23 March, 2016 Date of next Calibration: 23 June, 2016

Parameters:

Dissolved Oxygen

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

Expected Reading (mg/L)	Displayed Reading (mg/L)	Tolerance (mg/L)
2.43	2.37	-0.06
5.50	5.40	-0.10
8.89	8.75	-0.14
Tolerance Limit (mg/L)		±0.20

Temperature

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

Expected Reading (°C)	Displayed Reading (°C)	Tolerance (°C)
12	11.3	-0.7
22	21.7	-0.3
43	42.5	-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.

A handwritten signature in blue ink, appearing to read 'R. 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., GOLD KING IND BLDG,
NO. 35-41 TAI LIN PAI ROAD,
KWAI CHUNG,
N.T., HONG KONG

WORK ORDER: HK1600633
SUB-BATCH: 0
LABORATORY: HONG KONG
DATE RECEIVED: 06/01/2016
DATE OF ISSUE: 08/01/2016

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.

Scope of Test: Turbidity
Equipment Type: Turbidimeter
Brand Name: HACH
Model No.: 2100Q
Serial No.: 12060C018266
Equipment No.: --
Date of Calibration: 07 January, 2016

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: HK1600633
Sub-batch: 0
Date of Issue: 08/01/2016
Client: ACTION UNITED ENVIRO SERVICES

Equipment Type: Turbidimeter
Brand Name: HACH
Model No.: 2100Q
Serial No.: 12060C018266
Equipment No.: --
Date of Calibration: 07 January, 2016

Parameters:

Turbidity

Method Ref: APHA 21st Ed. 2130B

Expected Reading (NTU)	Displayed Reading (NTU)	Tolerance (%)
0	0.00	--
40	43.7	+9.3
400	404	+1.0
Tolerance Limit (%)		±10.0

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


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



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

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

CONTACT: MR BEN TAM
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: HK1549776
SUB-BATCH: 0
LABORATORY: HONG KONG
DATE RECEIVED: 24/12/2015
DATE OF ISSUE: 04/01/2016

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 and Temperature
Description: pH Meter
Brand Name: AZ
Model No.: 8685
Serial No.: 1118396
Equipment No.: --
Date of Calibration: 04 January, 2016

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: HK1549776
Sub-batch: 0
Date of Issue: 04/01/2016
Client: ACTION UNITED ENVIRO SERVICES

Description: pH Meter
Brand Name: AZ
Model No.: 8685
Serial No.: 1118396
Equipment No.: --

Date of Calibration: 04 January, 2016

Date of next Calibration:

04 April, 2016

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	7.0	0.00
10.0	9.8	-0.20
	Tolerance Limit (pH Unit)	±0.20

Temperature

Method Ref: Section 6 of International Accreditation New Zealand Technical

Guide No. 3 Second edition March 2008: Working Thermometer Calibration Procedure.

Expected Reading (°C)	Displayed Reading (°C)	Tolerance (°C)
11	10.3	-0.7
23	22.0	-1.0
42	40.9	-1.1
	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



Hong Kong Accreditation Service
香港認可處

Certificate of Accreditation
認可證書

This is to certify that
特此證明

ALS TECHNICHEM (HK) PTY LIMITED

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

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

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

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

Environmental Testing
環境測試

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

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

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

CHAN Sing Sing, Terence, Executive Administrator
執行幹事 陳成城
Issue Date : 5 May 2009
簽發日期：二零零九年五月五日

Registration Number : **HOKLAS 066**
註冊號碼：

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



Appendix G

Event and Action Plan

Event and Action Plan for Air Quality

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

Event and Action Plan for Water Quality

EVENT	ACTION CONTRACTOR			
	ET	IEC	ER	
Action level being exceeded by one sampling day	<ol style="list-style-type: none"> 1. Repeat in-situ measurement to confirm findings; 2. Identify reasons for non-compliance and sources of impact; 3. Inform IEC and Contractor; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with IEC and Contractor; 6. Repeat measurement on next day of exceedance. 	<ol style="list-style-type: none"> 1. Discuss with ET and Contractor on the mitigation measures; 2. Review proposals on mitigation measures submitted by Contractor and advise the ER accordingly; 3. Assess the effectiveness of the implemented mitigation measures 	<ol style="list-style-type: none"> 1. Discuss with IEC on the proposed mitigation measures; 2. Make agreement on the mitigation measures to be implemented; 3. Assess the effectiveness of the implemented mitigation measures 	<ol style="list-style-type: none"> 1. Inform the ER and confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Check all plant and equipment; 4. Consider changes of working methods; 5. Discuss with ET and IEC and propose mitigation measures to IEC and ER; 6. Implement the agreed mitigation measures.
Action Level being exceeded by more than two consecutive sampling days	<ol style="list-style-type: none"> 1. Repeat in-situ measurement to confirm findings; 2. Identify reasons for non-compliance and sources of impact; 3. Inform IEC and Contractor; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with IEC and Contractor; 6. Ensure mitigation measures are implemented; 7. Prepare to increase the monitoring frequency to daily; 8. Repeat measurement on next day of exceedance. 	<ol style="list-style-type: none"> 1. Discuss with ET and Contractor on the mitigation measures; 2. Review proposals on mitigation measures submitted by Contractor and advise the ER accordingly; 3. Assess the effectiveness of the implemented mitigation measures 	<ol style="list-style-type: none"> 1. Discuss with IEC on the proposed mitigation measures; 2. Make agreement on the mitigation measures to be implemented; 3. Assess the effectiveness of the implemented mitigation measures 	<ol style="list-style-type: none"> 1. Inform the ER and confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Check all plant and equipment; 4. Consider changes of working methods; 5. Discuss with ET and IEC and propose mitigation measures to IEC and ER within 3 working days; 6. Implement the agreed mitigation measures.
Limit Level being exceeded by one sampling day	<ol style="list-style-type: none"> 1. Repeat in-situ measurement to confirm findings; 2. Identify reasons for non-compliance and sources of impact; 3. Inform IEC, Contractor and EPD; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with IEC, ER and Contractor; 6. Ensure mitigation measures are implemented; 7. Increase the monitoring frequency to daily until no exceedance of Limit Level. 	<ol style="list-style-type: none"> 1. Discuss with ET and Contractor on the mitigation measures; 2. Review proposals on mitigation measures submitted by Contractor and advise the ER accordingly; 3. Assess the effectiveness of the implemented mitigation measures 	<ol style="list-style-type: none"> 1. Discuss with IEC, ET and Contractor on the proposed mitigation measures; 2. Request Contractor to critically review the working methods; 3. Make agreement on the mitigation measures to be implemented; 4. Assess the effectiveness of the implemented mitigation measures 	<ol style="list-style-type: none"> 1. Inform the ER and confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Check all plant and equipment; 4. Consider changes of working methods; 5. Discuss with ET, IEC and ER and propose mitigation measures to IEC and ER within 3 working days; 6. Implement the agreed mitigation measures.
Limit level being exceeded by more than one consecutive sampling days	<ol style="list-style-type: none"> 1. Repeat in-situ measurement to confirm findings; 2. Identify reasons for non-compliance and sources of impact; 3. Inform IEC, Contractor and EPD; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with IEC, ER and Contractor; 6. Ensure mitigation measures are implemented; 7. Increase the monitoring frequency to daily until no exceedance of Limit Level for two consecutive days. 	<ol style="list-style-type: none"> 1. Discuss with ET and Contractor on the mitigation measures; 2. Review proposals on mitigation measures submitted by Contractor and advise the ER accordingly; 3. Assess the effectiveness of the implemented mitigation measures. 	<ol style="list-style-type: none"> 1. Discuss with IEC, ET and Contractor on the proposed mitigation measures; 2. Request Contractor to critically review the working methods; 3. Make agreement on the mitigation measures to be implemented; 4. Assess the effectiveness of the implemented mitigation measures; 5. Consider and instruct, if necessary, the Contractor to slow down or to stop all or part of the construction activities until no exceedance of Limit Level. 	<ol style="list-style-type: none"> 1. Inform the ER and confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Check all plant and equipment; 4. Consider changes of working methods; 5. Discuss with ET, IEC and ER and propose mitigation measures to IEC and ER within 3 working days; 6. Implement the agreed mitigation measures; 7. As directed by the ER, to slow down or to stop all or part of the construction activities.

Appendix H

Impact Monitoring Schedule

Impact Monitoring Schedule for the Reporting Period – March 2016

Date		Dust Monitoring		Noise Monitoring	Water Quality
		1-hour TSP	24-hour TSP		
Tue	1-Mar-16	C3&C5 & SSC505		C3&C5 & SSC505	
Wed	2-Mar-16				C2 & C3&C5& SSC505& C6
Thu	3-Mar-16		C6		
Fri	4-Mar-16	C6	C2	C6	C2 & C3&C5& SSC505& C6
Sat	5-Mar-16	C2	C3&C5 & SSC505	C2	
Sun	6-Mar-16				
Mon	7-Mar-16	C3&C5 & SSC505		C3&C5 & SSC505	C2 & C3&C5& SSC505& C6
Tue	8-Mar-16				
Wed	9-Mar-16		C6		C2 & C3&C5& SSC505& C6
Thu	10-Mar-16	C6	C2	C6	
Fri	11-Mar-16	C2	C3&C5 & SSC505	C2	C2 & C3&C5& SSC505& C6
Sat	12-Mar-16	C3&C5 & SSC505		C3&C5 & SSC505	
Sun	13-Mar-16				
Mon	14-Mar-16				C2 & C3&C5& SSC505& C6
Tue	15-Mar-16		C6		
Wed	16-Mar-16	C6	C2	C6	C2 & C3&C5& SSC505& C6
Thu	17-Mar-16	C2	C3&C5 & SSC505	C2	
Fri	18-Mar-16	C3&C5 & SSC505		C3&C5 & SSC505	C2 & C3&C5& SSC505& C6
Sat	19-Mar-16		C6		
Sun	20-Mar-16				
Mon	21-Mar-16	C6		C6	C2 & C3&C5& SSC505& C6
Tue	22-Mar-16		C2		
Wed	23-Mar-16	C2&C6	C3&C5 & SSC505	C2	C2 & C3&C5& SSC505& C6
Thu	24-Mar-16	C3&C5 & SSC505	C2&C6	C3&C5 & SSC505	
Fri	25-Mar-16				C2 & C3 (*)
Sat	26-Mar-16				
Sun	27-Mar-16				
Mon	28-Mar-16				
Tue	29-Mar-16	C2&C6	C3&C5 & SSC505	C2&C6	C2 & C3&C5& SSC505& C6
Wed	30-Mar-16	C3&C5 & SSC505	C2&C6	C3&C5 & SSC505	
Thu	31-Mar-16				C2 & C3&C5& SSC505& C6

(*) Water monitoring will be conducted at WM4, WM4-CA and WM4-CB only.

	Monitoring Day
	Sunday or Public Holiday

Monitoring Location

Contract 2 (C2)	Air Quality	AM7b & AM8
	Construction Noise	NM5, NM6, NM7
	Water Quality#	WM3, WM3-Control, WM4, WM4-Control A & WM4-Control B
Contract 3 (C3)	Air Quality	AM9b
	Construction Noise	NM8, NM9 & NM10
	Water Quality	WM4, WM4-Control A & WM4-Control B
Contract 5 (C5)	Air Quality	AM1b, AM2 & AM3
	Construction Noise	NM1, NM2
	Water Quality	WM1 & WM1-Control
Contract SS C505	Air Quality	AM1b
	Construction Noise	NM1
	Water Quality	WM1 & WM1-Control
Contract 6 (C6)	Air Quality	AM2, AM3, AM4b, AM5 & AM6
	Construction Noise	NM2, NM3, NM4, NM5 & NM6
	Water Quality	WM1, WM1C, WM2a, WM2A-C, WM2B, WM2B-C, WM3, WM3-C
Contract 7 (C7)	Air Quality	AM1b
	Construction Noise	NM1

Impact Monitoring Schedule for next Reporting Period – April 2016

Date		Dust Monitoring		Noise Monitoring	Water Quality
		1-hour TSP	24-hour TSP		
Fri	1-Apr-16				
Sat	2-Apr-16	C2&C6	C3&C5&C7&SSC505		C2 & C3&C5& SSC505& C6
Sun	3-Apr-16				
Mon	4-Apr-16				
Tue	5-Apr-16	C3&C5&C7&SSC505	C2&C6	C3&C5&C7&SSC505	C2 & C3&C5& SSC505& C6
Wed	6-Apr-16				
Thu	7-Apr-16				C2 & C3&C5& SSC505& C6
Fri	8-Apr-16	C2&C6	C3&C5&C7&SSC505	C2&C6	
Sat	9-Apr-16				C2 & C3&C5& SSC505& C6
Sun	10-Apr-16				
Mon	11-Apr-16	C3&C5&C7&SSC505	C2&C6	C3&C5&C7&SSC505	C2 & C3&C5& SSC505& C6
Tue	12-Apr-16				
Wed	13-Apr-16				
Thu	14-Apr-16	C2&C6	C3&C5&C7&SSC505	C2&C6	C2 & C3&C5& SSC505& C6
Fri	15-Apr-16				
Sat	16-Apr-16	C3&C5&C7&SSC505	C2&C6		C2 & C3&C5& SSC505& C6
Sun	17-Apr-16				
Mon	18-Apr-16				C2 & C3&C5& SSC505& C6
Tue	19-Apr-16				
Wed	20-Apr-16	C2&C6	C3&C5&C7&SSC505	C2&C6	C2 & C3&C5& SSC505& C6
Thu	21-Apr-16				
Fri	22-Apr-16	C3&C5&C7&SSC505	C2&C6	C3&C5&C7&SSC505	C2 & C3&C5& SSC505& C6
Sat	23-Apr-16				
Sun	24-Apr-16				
Mon	25-Apr-16				
Tue	26-Apr-16	C2&C6	C3&C5&C7&SSC505	C2&C6	C2 & C3&C5& SSC505& C6
Wed	27-Apr-16				
Thu	28-Apr-16	C3&C5&C7&SSC505	C2&C6	C3&C5&C7&SSC505	C2 & C3&C5& SSC505& C6
Fri	29-Apr-16				
Sat	30-Apr-16				C2 & C3&C5& SSC505& C6

	Monitoring Day
	Sunday or Public Holiday

Monitoring Location

Contract 2 (C2)	Air Quality	AM7b & AM8
	Construction Noise	NM5, NM6, NM7
	Water Quality#	WM3, WM3-Control, WM4, WM4-Control A & WM4-Control B
Contract 3 (C3)	Air Quality	AM9b
	Construction Noise	NM8, NM9 & NM10
	Water Quality	WM4, WM4-Control A & WM4-Control B
Contract 5 (C5)	Air Quality	AM1b, AM2 & AM3
	Construction Noise	NM1, NM2
	Water Quality	WM1 & WM1-Control
Contract SS C505	Air Quality	AM1b
	Construction Noise	NM1
	Water Quality	WM1 & WM1-Control
Contract 6 (C6)	Air Quality	AM2, AM3, AM4b, AM5 & AM6
	Construction Noise	NM2, NM3, NM4, NM5 & NM6
	Water Quality	WM1, WM1C, WM2a, WM2A-C, WM2B, WM2B-C, WM3, WM3-C
Contract 7 (C7)	Air Quality	AM1b
	Construction Noise	NM1

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		
AM1b – Open Area, Tsung Yuen Ha Village															
5-Mar-16	29179	11214.97	11239.10	1447.80	44	44	44.0	20.8	1016.7	1.47	2130	2.8658	3.0896	0.2238	105
11-Mar-16	29188	11239.10	11263.24	1448.40	38	39	38.5	11.9	1022.6	1.33	1924	2.8756	2.9365	0.0609	32
17-Mar-16	29216	11263.24	11287.32	1444.80	28	30	29.0	15.3	1014.3	1.03	1491	2.9243	2.9494	0.0251	17
23-Mar-16	29226	11287.32	11311.44	1447.20	32	32	32.0	18.4	1012.8	1.12	1616	2.9009	2.9449	0.0440	27
29-Mar-16	29255	11311.44	11335.60	1449.60	47	47	47.0	17.7	1021.4	1.57	2277	2.8720	3.0108	0.1388	61
AM2 - Village House near Lin Ma Hang Road															
5-Mar-16	29177	6762.62	6786.45	1429.80	36	36	36.0	20.8	1016.7	1.12	1608	2.8797	3.0200	0.1403	87
11-Mar-16	29187	6786.45	6810.29	1430.40	32	33	32.5	11.9	1022.6	1.04	1488	2.8785	3.0129	0.1344	90
17-Mar-16	29217	6810.29	6834.19	1434.00	30	30	30.0	15.3	1014.3	0.96	1374	2.9245	2.9771	0.0526	38
23-Mar-16	29227	6834.19	6857.86	1420.20	36	38	37.0	18.4	1012.8	1.16	1641	2.8859	2.9696	0.0837	51
29-Mar-16	29257	6857.86	6881.61	1425.00	45	45	45.0	17.7	1021.4	1.39	1987	2.8734	3.0593	0.1859	94
AM3 - Ta Kwu Ling Fire Service Station of Ta Kwu Ling Village															
5-Mar-16	29718	7875.00	7899.00	1440.00	49	49	49.0	20.8	1016.7	1.42	2041	2.8792	3.0297	0.1505	74
11-Mar-16	29189	7899.00	7923.01	1440.60	38	39	38.5	11.9	1022.6	1.10	1582	2.8533	3.0099	0.1566	99
17-Mar-16	29215	7923.01	7946.99	1438.80	48	48	48.0	15.3	1014.3	1.40	2011	2.8986	2.9545	0.0559	28
23-Mar-16	29225	7946.99	7970.99	1440.00	48	48	48.0	18.4	1012.8	1.39	1999	2.8904	2.9514	0.0610	31
29-Mar-16	29258	7970.99	7994.99	1440.00	46	46	46.0	17.7	1021.4	1.33	1917	2.8385	3.0527	0.2142	112
AM4 - House no. 10B1 Nga Yiu Ha Village															
3-Mar-16	29123	9858.75	9882.75	1440.00	32	32	32.0	22.4	1023.2	0.96	1381	2.8450	2.9398	0.0948	69
9-Mar-16	29128	9882.75	9906.75	1440.00	38	39	38.5	20.8	1012.5	1.16	1670	2.8460	2.9028	0.0568	34
15-Mar-16	29193	9906.75	9930.76	1440.60	32	32	32.0	14.8	1017.1	0.97	1396	2.8892	2.9876	0.0984	71
19-Mar-16	29219	9930.76	9954.75	1439.40	36	36	36.0	22.4	1013	1.08	1553	2.8964	2.9875	0.0911	59
24-Mar-16	29230	9954.75	9978.75	1440.00	39	39	39.0	15.3	1020.3	1.19	1716	2.9079	2.9548	0.0469	27
30-Mar-16	29259	9978.75	10002.75	1440.00	40	40	40.0	20	1018.3	1.21	1746	2.8635	3.0637	0.2002	115
AM5a - Ping Yeung Village House															
3-Mar-16	29124	7697.05	7721.05	1440.00	31	31	31.0	22.4	1023.2	0.98	1408	2.8646	2.9552	0.0906	64
9-Mar-16	29186	7721.05	7745.05	1440.00	28	29	28.5	20.8	1012.5	0.90	1296	2.8719	2.9175	0.0456	35
15-Mar-16	29194	7745.05	7769.07	1441.20	30	30	30.0	14.8	1017.1	0.96	1378	2.8642	2.9459	0.0817	59
19-Mar-16	29220	7769.07	7793.06	1439.40	32	32	32.0	22.4	1013.0	1.00	1444	2.8908	2.9577	0.0669	46
24-Mar-16	29231	7793.06	7817.06	1440.00	26	26	26.0	15.3	1020.3	0.83	1202	2.8875	2.9233	0.0358	30
30-Mar-16	29260	7817.06	7841.06	1440.00	28	28	28.0	20	1818.3	1.17	1690	2.8640	3.0027	0.1387	82
AM6 - Wo Keng Shan Village House															
3-Mar-16	29125	6268.47	6292.47	1440.00	30	30	30.0	18.7	1021.9	0.79	1141	2.8335	2.9674	0.1339	117

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		
9-Mar-16	29127	6292.47	6316.47	1440.00	33	34	33.5	20.8	1012.5	0.91	1307	2.8560	2.9227	0.0667	51
15-Mar-16	29192	6316.47	6340.48	1440.60	34	34	34.0	14.8	1017.1	0.94	1355	2.8902	3.0567	0.1665	123
19-Mar-16	29221	6340.48	6364.47	1439.40	34	34	34.0	22.4	1013.0	0.92	1327	2.9160	3.0300	0.1140	86
24-Mar-16	29232	6364.47	6388.47	1440.00	34	34	34.0	15.3	1020.3	0.94	1355	2.9030	2.9420	0.0390	29
30-Mar-16	29261	6388.47	6412.04	1414.20	28	28	28.0	20.0	1018.3	0.72	1014	2.8754	3.0038	0.1284	127
AM7b - Loi Tung Village House															
4-Mar-16	29126	15301.10	15325.10	1440.00	30	32	31.0	20.2	1018.1	0.85	1218	2.8498	2.8993	0.0495	41
10-Mar-16	29195	15325.10	15349.10	1440.00	24	24	24.0	13.4	1019.5	0.66	954	2.8720	2.8933	0.0213	22
16-Mar-16	29213	15349.10	15373.10	1440.00	28	28	28.0	15.3	1015	0.77	1107	2.8999	2.9626	0.0627	57
22-Mar-16	29224	15373.10	15397.10	1440.00	30	30	30.0	16.6	1013.4	0.82	1183	2.8909	2.9264	0.0355	30
24-Mar-16	29253	15397.10	15421.10	1440.00	20	20	20.0	15.3	1020.3	0.55	792	2.8871	2.9095	0.0224	28
30-Mar-16	29262	15421.10	15445.10	1440.00	27	28	27.5	20	1018.3	0.75	1080	2.8595	2.9999	0.1404	130
AM8 - Po Kat Tsai Village No. 4															
4-Mar-16	29176	9171.50	9195.52	1441.20	38	38	38.0	20.2	1018.1	0.92	1326	2.8885	2.9251	0.0366	28
10-Mar-16	29191	9195.52	9219.52	1440.00	30	30	30.0	13.4	1019.5	0.69	993	2.8919	2.9252	0.0333	34
16-Mar-16	29214	9219.52	9243.51	1439.40	36	36	36.0	15.3	1015	0.87	1248	2.9166	2.9407	0.0241	19
22-Mar-16	29228	9243.51	9267.51	1440.00	36	36	36.0	16.6	1013.4	0.86	1244	2.8871	2.9148	0.0277	22
24-Mar-16	29254	9267.51	9291.50	1439.40	42	42	42.0	15.3	1020.2	1.05	1516	2.8769	2.9058	0.0289	19
30-Mar-16	29263	9291.50	9315.51	1440.60	37	37	37.0	20	1018.3	0.89	1283	2.8624	2.9527	0.0903	70
AM9b - Nam Wa Po Village House No. 80															
5-Mar-16	29057	16648.32	16672.34	1441.20	38	38	38.0	20.8	1016.7	1.16	1667	2.7994	2.8573	0.0579	35
11-Mar-16	29190	16672.34	16696.34	1440.00	46	46	46.0	11.9	1022.6	1.46	2103	2.8755	2.9275	0.0520	25
17-Mar-16	29218	16696.34	16720.34	1440.00	24	24	24.0	15.3	1014.3	0.68	983	2.8877	2.9104	0.0227	23
23-Mar-16	29229	16720.34	16744.33	1439.40	29	29	29.0	18.4	1012.8	0.85	1223	2.8904	2.9363	0.0459	38
29-Mar-16	29256	16744.33	16768.33	1440.00	28	29	28.5	17.7	1021.4	0.84	1206	2.8705	2.9493	0.0788	65

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	Leq ₃₀	façade correction
NM1 - Tsung Yuen Ha Village House No. 63																					
1-Mar-16	11:27	57.0	59.5	46.5	55.8	59.5	48.0	51.7	54.5	47.0	50.2	52.5	47.0	57.3	61.0	47.0	54.7	54.5	47.0	55	NA
7-Mar-16	13:10	58.5	56.5	45.0	54.5	54.5	46.0	51.3	50.5	46.5	55.9	55.0	47.0	55.3	54.0	48.0	53.0	55.5	48.0	55	NA
12-Mar-16	10:04	62.9	67.9	55.0	61.9	66.3	55.0	64.3	67.7	56.3	62.1	66.4	54.5	66.0	67.3	53.8	63.5	67.1	54.2	64	NA
18-Mar-16	9:52	68.3	70.7	59.2	65.1	67.5	55.5	61.3	64.6	55.1	61.7	65.0	53.7	65.3	69.5	56.2	68.3	70.7	59.2	66	NA
24-Mar-16	13:41	54.0	56.6	50.2	53.7	55.6	50.7	53.4	56.0	50.5	56.5	57.0	50.2	53.7	55.8	50.6	53.0	55.1	50.4	54	NA
30-Mar-16	14:00	66.3	71.6	54.5	64.1	69.8	52.9	62.6	68.3	51.7	62.1	67.4	52.2	63.0	64.0	54.9	62.4	68.0	52.0	64	NA
NM2 - Village House near Lin Ma Hang Road																					
1-Mar-16	11:22	60.3	61.3	52.7	67.2	63.5	50.1	57.1	61.4	49.1	55.6	59.0	47.7	56.2	58.5	46.6	58.3	62.8	46.5	61	NA
7-Mar-16	14:07	63.2	65.5	54.5	71.3	74.5	57.5	69.3	73.5	57.0	70.1	71.5	58.0	62.6	66.0	51.5	60.5	63.5	50.5	68	NA
12-Mar-16	11:07	61.3	65.2	52.1	62.6	66.3	53.9	62.8	66.8	55.2	62.7	66.6	54.0	62.6	66.3	52.8	62.6	66.1	54.9	62	NA
18-Mar-16	10:27	64.3	67.5	55.2	66.4	68.1	55.0	67.7	69.7	55.7	60.2	63.1	53.7	60.2	59.8	52.4	56.8	60.2	53.3	64	NA
24-Mar-16	13:01	54.4	56.7	50.4	56.3	59.0	50.7	55.1	57.8	51.1	53.8	56.7	50.5	57.7	59.9	50.4	54.5	57.9	50.3	56	NA
30-Mar-16	13:19	63.0	64.2	54.9	60.2	63.2	54.3	56.6	58.5	53.7	58.5	61.1	53.8	57.6	59.5	54.7	59.5	62.0	54.9	60	NA
NM3 - Ping Yeung Village House																					
5-Mar-16	11:20	59.2	62.0	52.5	61.0	64.5	51.5	56.0	58.5	50.5	55.2	55.0	49.5	55.7	54.5	50.5	54.0	54.0	50.0	58	NA
10-Mar-16	14:45	63.9	66.4	56.9	61.7	63.2	55.1	58.1	60.0	54.8	60.1	62.1	53.9	61.6	62.5	54.5	60.4	63.4	57.3	61	NA
16-Mar-16	10:36	62.7	63.5	52.5	58.5	63.0	52.5	54.1	54.5	52.5	57.0	55.5	52.5	54.5	55.5	52.5	68.8	65.5	53.5	63	NA
21-Mar-16	11:04	64.3	66.7	55.4	59.3	60.4	55.1	62.0	63.7	55.7	60.3	62.5	54.1	62.0	63.1	54.7	60.5	63.1	57.0	62	NA
29-Mar-16	9:45	61.0	62.9	56.6	61.5	63.4	56.5	61.9	63.7	56.2	60.8	62.4	56.0	61.1	62.8	56.6	61.0	62.8	56.1	61	NA
NM4 - Wo Keng Shan Village House																					
5-Mar-16	10:14	65.2	67.6	59.7	63.9	61.9	57.0	61.2	60.5	55.9	63.4	66.6	57.8	62.6	62.8	57.8	63.9	65.4	58.4	64	NA
10-Mar-16	14:00	61.5	61.8	58.8	64.7	64.1	59.3	62.4	62.1	59.1	66.3	66.1	59.1	65.0	68.5	59.2	62.1	62.9	58.5	64	NA
16-Mar-16	9:19	56.7	56.5	48.5	57.9	61.5	49.0	50.2	52.0	47.5	57.7	60.5	48.0	60.3	58.0	47.5	56.6	58.0	48.0	57	NA
21-Mar-16	13:11	61.7	62.3	58.9	65.1	65.9	59.7	63.1	64.3	59.8	65.4	68.7	59.3	62.1	63.0	58.9	62.0	63.1	58.8	63	NA
29-Mar-16	10:25	61.9	60.3	55.1	61.0	63.4	56.0	61.5	62.8	55.8	60.8	63.7	56.0	61.1	62.8	55.1	61.0	62.4	56.1	61	NA
NM5 - Ping Yeung Village House (façade facing northeast)																					
5-Mar-16	10:25	51.4	53.5	48.5	53.0	53.5	49.0	52.8	56.5	48.5	49.7	51.0	47.5	51.4	53.5	48.0	51.6	53.5	48.5	52	NA
11-Mar-16	9:18	62.5	64.0	59.5	62.0	63.0	59.5	62.0	63.0	60.0	61.3	63.0	59.0	62.8	66.0	59.5	63.8	65.0	60.0	62	NA
17-Mar-16	15:17	51.6	53.8	48.4	51.4	53.6	48.6	50.0	52.7	46.0	50.5	52.6	46.4	50.9	53.5	46.9	51.0	53.2	47.0	51	NA
23-Mar-16	13:03	52.3	54.7	49.1	53.6	55.8	49.4	53.0	55.4	49.2	50.6	52.7	48.6	53.9	56.3	49.4	54.3	56.8	49.3	53	NA
29-Mar-16	11:15	51.5	55.0	44.8	50.6	53.7	45.0	51.1	54.5	44.9	52.5	56.0	44.8	50.6	53.8	45.6	51.9	55.8	45.4	51	NA
NM6 - Tai Tong Wu Village House 2																					

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
5-Mar-16	9:42	52.0	54.0	47.5	52.4	55.5	47.0	53.0	56.0	47.0	51.6	54.0	46.0	56.8	59.0	51.0	51.2	53.0	47.0	53	NA
11-Mar-16	9:59	56.6	58.0	54.5	55.8	57.5	53.5	55.5	56.5	54.0	64.7	58.5	54.5	57.2	59.0	54.5	56.7	58.5	54.0	59	NA
17-Mar-16	14:38	59.3	62.4	50.3	59.5	61.8	52.1	63.0	66.9	53.2	57.2	60.4	50.1	58.4	61.2	52.8	59.1	61.4	51.9	60	NA
23-Mar-16	13:44	59.4	62.7	50.6	63.7	67.5	53.6	62.1	66.3	52.9	61.3	65.7	52.6	58.4	61.4	52.8	59.5	61.7	52.1	61	NA
29-Mar-16	14:47	59.4	62.6	53.9	60.1	62.9	45.7	63.7	65.4	50.3	62.1	63.6	47.6	59.7	62.7	52.1	59.9	63.1	53.0	61	NA
NM7 – Po Kat Tsai Village																					
5-Mar-16	13:09	57.7	59.5	53.0	65.3	62.0	52.0	58.0	58.5	52.0	55.9	58.0	52.0	56.5	57.0	51.5	54.2	55.5	52.5	60	NA
11-Mar-16	13:05	65.8	69.0	57.5	64.1	67.5	56.5	62.2	63.0	57.0	63.8	65.0	56.0	64.5	67.0	55.5	67.7	70.5	55.5	65	NA
17-Mar-16	13:53	60.6	59.8	52.8	61.2	61.6	52.5	58.5	58.1	51.4	57.5	57.0	52.0	59.7	60.1	51.9	53.4	55.1	51.7	59	NA
23-Mar-16	14:35	59.1	58.7	51.6	59.7	61.1	51.6	53.6	55.7	51.7	55.6	57.8	52.0	59.7	60.1	51.8	61.1	63.4	53.0	59	NA
29-Mar-16	14:01	61.0	62.9	56.6	62.1	63.3	56.7	62.9	63.8	56.8	64.7	65.9	57.0	62.5	64.1	56.8	63.3	64.1	56.9	63	NA
NM8 - Village House, Tong Hang																					
1-Mar-16	13:46	59.8	62.4	53.5	60	62.7	54	66.7	69	56.5	63.7	64.6	55.9	60.6	62.4	55.8	61.3	65.2	55.9	63	NA
7-Mar-16	13:42	56.2	58.5	47.5	53.5	55.5	47.5	54.6	54.5	46.5	53.8	55.5	48	52.4	54.5	47	51.9	54	47	54	NA
12-Mar-16	10:37	58.8	63	50.5	53.2	56	49	54.5	57	48.5	53.2	56	49	56.9	60	50.5	55.8	58.5	50	56	NA
18-Mar-16	13:43	55.3	57	50.5	58.2	60.5	50.5	55.3	56.5	51.5	54.5	56.5	51	54.7	57	51	57.4	60	51.5	56	NA
24-Mar-16	10:36	58.4	61	51.8	61.6	64.1	53.3	57.7	61.1	50.3	56.4	59.3	50.3	58.9	60.7	51.3	61.8	63.8	50.9	60	NA
30-Mar-16	10:21	62.1	66.4	51.9	63.3	67	52.2	63	66.8	52.3	62.5	66.7	52.3	62.8	67.1	52.5	64.4	68.5	53.1	63	NA
NM9 - Village House, Kiu Tau Village																					
1-Mar-16	13:00	60.2	63.7	55.9	64.3	68.0	55.6	59.5	63.3	54.7	58.9	61.0	55.6	60.4	65.0	55.2	61.7	66.6	55.8	61	NA
7-Mar-16	13:00	61.9	62.0	52.0	60.2	60.5	53.5	58.6	59.5	53.0	62.6	64.5	53.4	59.0	60.0	52.5	55.3	57.0	51.0	60	NA
12-Mar-16	9:55	58.5	59.5	57.0	60.0	61.5	57.5	59.0	60.5	57.0	59.9	61.5	57.5	60.2	62.0	57.5	60.6	63.0	57.5	60	NA
18-Mar-16	13:00	62.7	61.0	51.5	53.5	54.5	51.0	63.2	62.0	53.0	55.4	56.0	52.0	53.4	55.0	50.5	65.3	67.0	51.0	61	NA
24-Mar-16	11:30	56.0	58.5	52.2	56.8	58.5	52.5	55.4	57.8	51.6	55.4	57.6	52.4	54.9	57.7	50.1	55.6	59.7	50.2	56	NA
30-Mar-16	10:40	61.8	62.5	58.5	63.0	64.7	58.6	63.1	65.7	58.5	63.7	65.9	58.1	62.6	64.7	58.5	63.1	64.5	58.5	63	NA
NM10 - Nam Wa Po Village House No. 80																					
1-Mar-16	11:06	56.9	59.1	53.6	56.9	59.2	54.2	56.9	59.7	53.9	55.0	56.9	51.9	57.8	59.9	53.7	59.1	61.3	55.6	57	60
7-Mar-16	9:17	61.7	62.5	48.0	52.4	52.0	47.5	60.8	59.5	48.5	58.5	55.5	48.5	55.7	56.5	47.0	48.8	50.0	46.0	58	61
12-Mar-16	9:14	60.2	61.0	58.5	59.7	60.5	58.0	59.7	61.0	58.0	60.4	62.0	58.5	60.4	62.0	58.5	60.7	62.0	58.5	60	63
18-Mar-16	9:21	67.3	70.0	59.5	62.7	65.0	59.0	63.0	65.0	59.0	62.9	65.0	59.0	63.1	65.5	58.0	61.9	63.5	57.0	64	67
24-Mar-16	13:18	57.9	60.1	54.5	60.4	62.7	54.1	58.8	61.3	55.0	57.9	58.6	54.1	58.4	60.5	53.8	58.5	61.0	55.3	59	62
30-Mar-16	11:24	57.7	59.8	55.2	56.6	58.8	54.6	57.8	60.1	55.3	58.1	60.5	55.7	57.3	59.5	55.3	58.5	60.3	55.8	58	61

Water Quality Monitoring Data for Contract 5, 6 and SS C505

Date	2-Mar-16													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM1-C	12:13	0.37	20.1	20.1	10.22	10.2	112.6	112.7	11.1	11.6	6.7	6.7	4	4.5
			20.1		10.25		112.8		12.0		6.7		5	
WM1	12:30	0.41	20.3	20.3	8.56	8.6	95.9	529.5	30.6	31.1	6.5	6.5	38	37.5
			20.3		8.63		963.0		31.5		6.5		37	

Date	4-Mar-16													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM1-C	11:20	0.17	19.6	19.6	9.42	9.4	103.1	103.2	9.1	9.1	6.4	6.4	3	2.5
			19.6		9.43		103.3		9.2		6.4		2	
WM1	11:35	0.25	20.5	20.5	7.97	8.0	88.5	88.6	145.0	146.0	6.4	6.4	185	185.5
			20.5		7.98		88.7		147.0		6.4		186	

Date	5-Mar-16													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM1-C	11:38	0.20							11.4	11.2			5	5.0
							10.9		5					
WM1	11:30	0.23							30.9	31.2			23	23.0
							31.4		23					

Date	7-Mar-16													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM1-C	12:17	0.21	20.4	20.4	7.36	7.4	82.4	82.5	11.4	11.6	6	6.0	9	9.0
			20.4		7.37		82.6		11.7		6		9	
WM1	12:01	0.22	20.8	20.8	4.92	4.9	55.6	55.7	37.8	38.1	5.5	5.5	26	25.5
			20.8		4.93		55.8		38.4		5.5		25	

Date	9-Mar-16													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM1-C	10:45	0.31	22.7	22.9	6.68	6.7	78.8	78.5	22.5	23.0	5.6	5.8	11	11.0
			23.1		6.72		78.1		23.5		5.9		11	
WM1	11:00	0.29	23.4	23.4	5.14	5.2	50.6	50.7	82.6	82.7	5.6	5.7	51	51.0
			23.4		5.16		50.8		82.8		5.7		51	

Date	10-Mar-16													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM1-C	13:14	0.31							47.4	47.2		#DIV/0!	35	35.0
							47.0		35					
WM1	13:03	0.27							350.0	352.0		#DIV/0!	196	196.0
							354.0		196					

Date	11-Mar-16													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM1-C	9:50	0.24	12.9	12.9	9.23	9.2	87.6	87.6	8.1	8.1	7.4	7.3	6	6.5
			12.9		9.24		87.5		8.1		7.2		7	
WM1	10:08	0.31	12.6	12.6	8.56	8.6	80.5	80.6	27.6	28.0	6.4	6.4	44	42.5
			12.6		8.56		80.6		28.4		6.4		41	

Date	12-Mar-16													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM1-C	11:37	0.37							10.3	10.3			5	5.0
							10.2		5					
WM1	11:27	0.37							27.8	28.1			26	26.0
							28.4		26					

Date	14-Mar-16													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM1-C	10:20	0.37	15.4	15.4	9.25	9.2	92.5	92.2	40.8	41.1	7.3	7.3	24	23.5
			15.4		9.2		91.9		41.4		7.3		23	
WM1	10:37	0.39	16	16.0	7.81	7.8	79.1	79.2	47.0	47.4	6.6	6.6	27	27.5
			16		7.84		79.3		47.7		6.6		28	

Date	16-Mar-16													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM1-C	12:15	0.29	16.5	16.6	8.38	8.4	86.5	87.0	13.3	13.1	5.8	5.9	9	9.0
			16.7		8.47		87.4		12.8		5.9		9	
WM1	12:30	0.27	16.5	16.5	8.25	8.2	84.5	84.4	38.7	38.8	5.7	5.7	41	42.0
			16.5		8.24		84.3		38.9		5.7		43	

Date	18-Mar-16													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM1-C	10:00	0.37	21.2	21.2	7.3	7.3	83.0	83.3	12.1	12.3	6.9	6.9	7	6.5
			21.2		7.32		83.5		12.4		6.9		6	
WM1	10:40	0.39	21.5	21.5	6.95	6.9	79.1	79.0	29.7	30.0	6.4	6.4	17	17.0
			21.5		6.92		78.8		30.2		6.4		17	

Date	21-Mar-16													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM1-C	9:39	0.47	18.5	18.5	8.21	8.2	87.6	87.5	385.0	389.0	5.9	5.9	191	193.5
			18.5		8.2		87.4		393.0		5.9		196	
WM1	9:55	0.39	18.3	18.3	8.04	8.0	85.6	85.7	364.0	367.0	6	6.0	210	206.0
			18.3		8.05		85.8		370.0		6		202	

Date	23-Mar-16													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM1-C	9:48	0.39	20.1	20.1	7.66	7.7	83.8	84.1	33.3	33.4	6.5	6.5	22	23.0
			20.1		7.68		84.3		33.4		6.5		24	
WM1	9:57	0.39	20.5	20.5	7.95	8.0	88.4	88.5	47.8	47.5	6.1	6.1	37	37.5
			20.5		7.97		88.6		47.2		6.1		38	

Date	29-Mar-16													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM1-C	10:09	0.36	17.7	17.7	8.9	8.9	93.4	93.2	92.5	92.6	9.6	9.6	95	97.0
			17.7		8.87		93.0		92.7		9.6		99	
WM1	10:47	0.39	17.8	17.8	9.02	9.0	95.0	95.2	93.8	94.0	9.4	9.4	69	71.5
			17.8		9.04		95.3		94.1		9.4		74	

Date	31-Mar-16													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM1-C	13:27	0.29	23.5	23.5	8.77	8.8	103.1	103.5	10.5	10.6	9	9.0	7	7.0
			23.5		8.79		103.8		10.7		9		7	
WM1	13:46	0.37	22.8	22.8	8.14	8.2	94.7	94.8	25.0	25.9	8.8	8.8	30	29.5
			22.8		8.17		94.9		26.8		8.8		29	

Water Quality Monitoring Data for Contract 2 and 3

Date	2-Mar-16													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM4-CA	14:40	0.13	21.4	21.6	6.66	6.6	75.3	75.2	90.0	90.5	6.7	6.7	34	33.5
			21.7		6.63		75.0		90.9		6.7		33	
WM4-CB	14:55	0.25	22.9	22.9	5.02	5.1	60.9	60.9	12.9	13.1	6.6	6.6	9	9.0
			22.9		5.11		60.8		13.3		6.6		9	
WM4	14:25	0.36	22.7	22.7	5.68	5.6	65.8	65.1	28.9	29.1	6.6	6.6	25	24.5
			22.7		5.56		64.3		29.2		6.6		24	

Date	4-Mar-16													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM4-CA	15:15	0.24	22.3	22.3	8.59	8.6	98.7	98.8	14.9	14.9	6.5	6.5	4	5.0
			22.3		8.61		98.9		14.8		6.5		6	
WM4-CB	15:35	0.26	23.2	23.2	7.04	7.1	82.1	82.2	14.9	15.1	6.1	6.1	13	13.5
			23.2		7.06		82.3		15.3		6.1		14	
WM4	15:05	0.31	24	24.0	7.67	7.7	91.3	91.5	26.2	26.8	6.1	6.1	18	18.5
			24		7.69		91.7		27.3		6.1		19	

Date	7-Mar-16													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM4-CA	13:52	0.19	20.3	20.3	6.31	6.3	70.5	70.6	11.0	11.2	6.4	6.4	9	8.5
			20.3		6.34		70.7		11.4		6.4		8	
WM4-CB	14:05	0.22	20.9	20.9	4.14	4.2	47.1	47.2	33.2	33.3	6.0	6.0	43	42.0
			20.9		4.16		47.3		33.4		6.0		41	
WM4	13:40	0.27	21.6	21.6	5.09	5.1	58.7	58.8	20.1	20.5	6.0	6.0	26	26.5
			21.6		5.11		58.8		20.9		6.0		27	

Date	9-Mar-16													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM4-CA	14:05	0.15	22.9	22.9	4.98	4.9	56.3	56.1	11.4	11.5	6.2	6.2	8	9.0
			22.9		4.88		55.8		11.5		6.2		10	
WM4-CB	14:21	0.27	22.1	22.1	4.09	4.1	46.8	46.4	45.1	45.2	6	6.0	33	33.0
			22.1		4.03		46.0		45.3		6		33	
WM4	13:53	0.23	22.2	22.2	4.75	4.8	55.3	55.4	20.7	20.7	6	6.0	20	19.5
			22.2		4.77		55.5		20.6		6		19	

Date	11-Mar-16													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM4-CA	13:59	0.26	14.9	14.9	10.38	10.4	102.5	102.6	28.2	28.4	6.4	6.4	12	11.5
			14.9		10.41		102.7		28.5		6.4		11	
WM4-CB	14:15	0.31	16.2	16.2	7.54	7.5	77.3	77.1	21.8	22.0	6	6.0	20	20.0
			16.2		7.47		76.8		22.1		6		20	
WM4	13:46	0.29	14.9	14.9	9.63	9.7	96.0	96.4	27.7	27.8	6.5	6.5	18	18.5
			14.9		9.7		96.7		27.8		6.5		19	

Date	14-Mar-16													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM4-CA	13:35	0.19	16.7	16.7	9.5	9.5	97.1	97.2	14.4	14.6	6.1	6.1	6	6.5
			16.7		9.52		97.3		14.8		6.1		7	
WM4-CB	13:54	0.24	17.3	17.3	6.52	6.5	68.2	68.3	20.3	20.6	5.9	5.9	29	29.0
			17.3		6.53		68.4		20.8		5.9		29	
WM4	13:25	0.28	17.3	17.3	8.29	8.3	86.2	86.0	22.3	21.8	6	6.0	17	17.0
			17.3		8.25		85.7		21.2		6		17	

Date	16-Mar-16													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM4-CA	14:35	0.28	17.4	17.4	8.92	9.4	93.0	93.2	OVERRANGE	OVERRANGE	6.1	6.1	52	50.5
			17.4		9.94		93.3		OVERRANGE		6.1		49	
WM4-CB	14:55	0.29	17.4	17.4	6.03	6.0	62.9	62.9	37.1	37.6	5.8	5.8	51	51.0
			17.4		6.01		62.8		38.0		5.8		51	
WM4	14:23	0.27	17.4	17.4	7.45	7.4	77.8	77.8	34.6	34.7	5.9	5.9	29	29.0
			17.4		7.44		77.7		34.8		5.9		29	

Date	18-Mar-16													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM4-CA	14:11	0.19	22	22.0	7.78	7.8	89.1	89.3	28.6	29.0	6.7	6.7	14	14.5
			22		7.8		89.5		29.3		6.7		15	
WM4-CB	14:28	0.27	22.3	22.3	5.74	5.8	66.0	66.2	29.6	29.9	6.4	6.4	25	25.5
			22.3		5.76		66.3		30.1		6.4		26	
WM4	14:03	0.30	22.4	22.4	7.05	7.1	81.5	81.7	23.1	23.2	6.6	6.6	21	21.5
			22.4		7.07		81.8		23.3		6.6		22	

Date	21-Mar-16													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM4-CA	13:31	0.24	18.9	18.9	8.59	8.6	92.7	92.6	25.5	25.7	6	6.0	20	20.5
			18.9		8.61		92.5		25.9		6		21	
WM4-CB	13:50	0.37	19.2	19.2	7.3	7.3	78.9	79.2	48.9	49.1	5.8	5.8	36	35.5
			19.2		7.34		79.4		49.2		5.8		35	
WM4	13:00	0.41	18.6	18.6	7.57	7.6	80.9	81.1	88.8	89.1	5.9	5.9	72	70.5
			18.6		7.6		81.3		89.4		5.9		69	

Date	22-Mar-16													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM4-CA	11:03	0.27							20.4	20.4			9	9.0
											20.3		9	
WM4-CB	11:20	0.37							30.4	30.5			18	18.0
											30.6		18	
WM4	10:49	0.39							34.9	35.1			20	20.0
											35.2		20	

Date	23-Mar-16													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM4-CA	11:35	0.21	19	19.0	8.24	8.3	88.8	89.0	18.4	18.6	5.6	5.6	8	7.5
			19		8.27		89.1		18.7		5.6		7	
WM4-CB	11:56	0.37	19.6	19.6	5.85	5.9	63.7	63.8	28.0	28.6	5.5	5.5	25	26.0
			19.6		5.87		63.9		29.1		5.5		27	
WM4	11:25	0.36	19.7	19.7	7.42	7.4	80.7	80.9	32.7	33.1	5.5	5.5	24	24.0
			19.7		7.46		81.1		33.4		5.5		24	

Date	25-Mar-16													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM4-CA	9:50	0.21	15.4	15.4	9.63	8.2	97.0	97.4	8.4	8.2	7.3	7.3	4	3.5
			15.4		6.72		97.7		7.9		7.3		3	
WM4-CB	10:10	0.37	16.8	16.8	8.66	8.5	88.5	87.4	17.6	16.8	6.5	6.5	16	15.5
			16.8		8.37		86.3		15.9		6.5		15	
WM4	9:30	0.36	15.2	15.2	9.66	9.4	95.5	93.4	16.2	16.5	7.2	7.2	11	12.0
			15.2		9.07		91.3		16.7		7.2		13	

Date	29-Mar-16													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM4-CA	14:15	0.27	20.8	20.8	8.86	8.9	99.0	99.2	125.0	127.0	9.3	9.3	89	86.5
			20.8		8.87		99.3		129.0		9.3		84	
WM4-CB	14:43	0.31	21.5	21.5	7.14	7.1	80.9	81.1	44.3	44.7	8.7	8.7	26	25.0
			21.5		7.15		81.2		45.1		8.7		24	
WM4	14:05	0.37	21.8	21.8	8.26	8.3	94.1	94.4	39.2	39.0	8.9	8.9	28	29.0
			21.8		8.3		94.7		38.8		8.9		30	

Date	31-Mar-16													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM4-CA	9:51	0.19	19.8	19.8	9.23	9.3	101.0	101.4	6.8	6.8	9.5	9.5	7	7.5
			19.8		9.27		101.7		6.8		9.5		8	
WM4-CB	10:17	0.29	21.4	21.4	6.8	6.8	76.9	77.1	19.0	19.3	8.7	8.7	42	42.5
			21.4		6.84		77.3		19.6		8.7		43	
WM4	9:35	0.23	20.6	20.6	7.87	7.9	87.5	87.7	15.1	15.7	8.9	8.9	28	28.0
			20.6		7.9		87.9		16.3		8.9		28	

Water Quality Monitoring Data for Contract 6

Date	2-Mar-16													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM2A-C	11:20	0.23	17.5	17.5	8.6	8.6	90.1	90.2	9.6	9.4	9.50	9.5	<2	<2
			17.5		8.61		90.3		9.2		9.50			
WM2A	11:50	0.11	19.2	19.2	9.71	9.7	104.0	104.0	9.5	9.8	6.90	6.9	6	5.5
			19.2		9.63		103.9		10.1		6.90		5	

Date	4-Mar-16													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM2A-C	12:00	0.25	19.5	19.5	8.01	8.0	88.7	88.8	21.5	21.8	6.30	6.3	11	12.0
			19.5		8.04		88.8		22.0		6.30		13	
WM2A	10:59	0.13	20.6	20.6	9.03	9.0	102.2	102.4	4.9	4.9	6.30	6.3	<2	2.0
			20.6		9.02		102.6		4.9		6.30		2	

Date	7-Mar-16													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM2A-C	11:15	0.21	19.9	19.9	6.17	6.2	68.2	68.3	7.8	7.8	5.70	5.7	6	5.0
			19.9		6.19		68.3		7.8		5.70		4	
WM2A	11:35	0.13	21	21.0	6.31	6.3	71.8	71.8	13.2	13.4	5.60	5.6	6	5.5
			21		6.32		71.8		13.6		5.60		5	

Date	9-Mar-16													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM2A-C	11:40	0.23	21.2	21.2	5.7	5.7	65.1	65.3	30.1	30.3	5.60	5.6	14	15.0
			21.2		5.73		65.4		30.4		5.60		16	
WM2A	11:24	0.19	22.2	22.2	6.32	6.3	73.3	73.6	14.3	14.5	5.70	5.7	10	10.0
			22.2		6.37		73.8		14.7		5.70		10	

Date 11-Mar-16														
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM2A-C	10:50	0.24	14.4	14.4	8.78	8.8	86.3	86.3	15.9	16.1	6.00	6.0	8	7.0
			14.4		8.74		86.3		16.3		6.00		6	
WM2A	10:30	0.27	14.5	14.5	9.32	9.4	91.5	91.8	194.0	198.5	6.40	6.4	165	164.5
			14.5		9.41		92.1		203.0		6.40		164	

Date 12-Mar-16														
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM2A-C	11:00	0.37							10.1	10.4			6	6.0
							10.6		6					
WM2A	11:13	0.17							12.5	12.8			11	11.0
							13.1		11					

Date 14-Mar-16														
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM2A-C	11:35	0.33	16.9	16.9	8.44	8.4	87.2	87.1	18.9	19.2	6.10	6.1	6	6.0
			16.9		8.43		86.9		19.5		6.10		6	
WM2A	11:18	0.16	16.1	16.1	10.07	10.1	102.1	102.4	12.8	13.0	6.40	6.4	2	2.5
			16.1		10.09		102.6		13.2		6.40		3	

Date 16-Mar-16														
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM2A-C	10:30	0.23	16.8	16.8	8.39	8.4	86.5	86.8	8.6	8.6	5.60	5.6	<2	<2
			16.8		8.43		87.1		8.6		5.60		<2	
WM2A	10:48	0.21	16.2	16.2	8.39	8.4	92.5	92.4	14.7	14.9	5.60	5.6	12	12.5
			16.2		8.43		92.3		15.0		5.60		13	

Date 18-Mar-16														
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM2A-C	11:25	0.26	20.9	20.9	7.8	7.8	87.3	87.4	19.3	19.7	6.00	6.0	10	9.5
			20.9		7.82		87.5		20.1		6.00		9	
WM2A	11:02	0.23	22.1	22.1	8.65	8.6	98.8	98.7	23.2	23.6	6.20	6.2	11	11.5
			22.1		8.63		98.6		23.9		6.20		12	

Date															21-Mar-16	
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)			
WM2A-C	11:10	0.34	18.3	18.3	8.31	8.3	99.5	99.4	41.2	41.6	5.80	5.8	17	18.0		
			18.3		8.34		99.3		41.9		5.80		19			
WM2A	10:32	0.19	19.1	19.1	8.59	8.6	93.1	93.3	23.9	23.6	6.00	6.0	10	9.5		
			19.1		8.63		93.4		23.3		6.00		9			

Date															23-Mar-16	
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)			
WM2A-C	10:50	0.31	20.1	20.1	7.77	7.8	85.7	85.8	26.6	27.3	5.80	5.8	5	5.0		
			20.1		7.79		85.9		27.9		5.80		5			
WM2A	10:30	0.19	20.1	20.1	7.81	7.8	86.3	86.5	29.6	29.7	5.90	5.9	10	10.5		
			20.1		7.84		86.6		29.8		5.90		11			

Date															29-Mar-16	
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)			
WM2A-C	11:36	0.21	18.5	18.5	8.74	8.8	93.5	93.6	8.2	8.4	8.20	8.4	<2	2.0		
			18.5		8.77		93.7		8.5		8.50		<2			
WM2A	11:07	0.18	19.3	19.3	9.47	9.5	102.5	102.7	11.6	11.8	11.60	11.8	5	4.5		
			19.3		9.48		102.9		12.0		12.00		4			

Date															31-Mar-16	
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)			
WM2A-C	12:41	0.27	21.2	21.2	8.27	8.3	93.2	93.6	5.0	5.1	9.20	9.2	2	2.0		
			21.2		8.31		93.9		5.2		9.20		<2			
WM2A	13:05	0.17	23.3	23.3	9.3	9.3	109.3	109.4	8.7	8.9	8.90	8.9	4	5.0		
			23.3		9.32		109.5		9.0		8.90		6			

—

Date		1-Mar-16												
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM2B-C	9:15	0.03							2.8	2.6			8	8.0
											2.5		8	
WM2B	9:30	0.06							10.8	10.6			11	11.0
											10.4		11	

Date		2-Mar-16												
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM2B-C	10:57	0.02	19.4	19.4	6.37	6.4	69.6	69.5	3.5	3.5	6.40	6.4	<2	2.0
			19.4		6.34		69.3		3.6		6.40		2	
WM2B	11:10	0.02	19.8	19.8	6.34	7.8	104.1	104.3	overrange	overrange	6.00	6.0	1380	1355.0
			19.8		9.35		104.5		overrange		6.00		1330	

Date		3-Mar-16												
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM2B-C	9:20	0.02							4.0	3.9			3	3.0
											3.8			
WM2B	9:30	0.04							20.8	20.7			21	21.0
											20.5			

Date		4-Mar-16												
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM2B-C	12:10	0.01	21.6	21.6	7.52	7.5	85.1	85.2	9.8	9.5	6.30	6.3	<2	<2
			21.6		7.54		85.3		9.3		6.30		<2	
WM2B	10:21	0.01	22.6	22.6	8.02	8.1	101.4	101.5	24.0	24.1	6.40	6.4	10	10.5
			22.6		8.11		101.6		24.1		6.40		11	

Date		5-Mar-16												
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM2B-C	11:04	0.01							2.6	2.6			<2	<2
											2.6		<2	
WM2B	10:55	0.01							40.4	40.2			10	10.0
											40.0		10	

Date														
7-Mar-16														
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM2B-C	10:47	0.01	20.9	20.9	6.31	6.3	70.9	70.8	3.9	4.0	6.50	6.5	<2	<2
			20.9		6.3		70.7		4.0		6.50		<2	
WM2B	11:03	0.01	21.4	21.4	6.28	6.3	71.7	71.8	7.7	7.7	6.00	6.0	7	6.5
			21.4		6.3		71.9		7.7		6.00		6	

Date														
8-Mar-16														
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM2B-C	11:00	0.01							3.9	4.0			4	4.0
							4.0							
WM2B	11:10	0.02							220.0	221.5			138	138.0
							223.0							

Date														
9-Mar-16														
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM2B-C	12:03	0.01	23.2	23.2	5.92	6.0	69.4	69.5	5.0	5.0	6.00	6.0	6	5.5
			23.2		6		69.5		5.0		6.00		5	
WM2B	11:52	0.02	22.7	22.7	6.29	6.3	73.9	74.0	14.9	14.9	5.80	5.8	11	12.0
			22.7		6.3		74.0		14.9		5.80		13	

Date														
10-Mar-16														
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM2B-C	14:00	0.02							5.2	5.2			6	6.0
							5.2							
WM2B	14:19	0.02							27.5	27.3			16	16.0
							27.1							

Date														
11-Mar-16														
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM2B-C	11:16	0.01	19.7	19.7	8.4	8.4	91.9	92.1	5.1	5.1	6.10	6.1	2	2.0
			19.7		8.41		92.3		5.1		6.10		<2	
WM2B	11:04	0.02	14.7	14.7	9.96	10.0	98.4	98.9	87.3	87.6	5.70	5.7	71	70.0
			14.7		10.01		99.4		87.8		5.70		69	

Date		12-Mar-16												
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM2B-C	10:49	0.01							9.5	9.4			12	12.0
									9.3					
WM2B	10:38	0.01							10.4	10.6			6	6.0
									10.8					

Date		14-Mar-16												
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM2B-C	11:55	0.01	19.8	19.8	8.7	8.7	94.7	94.8	15.6	15.7	6.20	6.2	<2	<2
			19.8		8.71		94.9		15.7		6.20		<2	
WM2B	11:45	0.02	17.2	17.2	9.84	9.9	101.9	102.1	44.6	45.1	5.70	5.7	68	69.0
			17.2		9.88		102.3		45.5		5.70		70	

Date		15-Mar-16												
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM2B-C	11:37	0.01							5.6	5.6			<2	<2
									5.6		<2			
WM2B	11:25	0.01							18.7	19.0			10	10.0
									19.2		10			

Date		16-Mar-16												
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM2B-C	10:10	0.01	20.9	20.9	7.62	7.6	85.2	85.1	5.7	5.9	6.50	6.5	3	3.0
			20.9		7.6		85.0		6.2		6.50		3	
WM2B	10:20	0.02	17.2	17.2	9.57	9.6	99.6	99.7	106.0	108.0	5.60	5.6	47	48.5
			17.2		9.58		99.7		110.0		5.60		50	

Date		17-Mar-16												
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM2B-C	11:14	0.01							7.8	7.8			9	9.0
								7.8	9					
WM2B	11:03	0.01							9.1	9.1			9	9.0
								9.2	9					

Date		18-Mar-16												
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM2B-C	11:48	0.01	22.1	22.1	7.26	7.3	83.4	83.6	6.2	6.3	7.10	7.1	3	3.5
			22.1		7.29		83.7		6.3		7.10		4	
WM2B	11:35	0.01	22.3	22.3	8.33	8.3	96.0	95.9	9.4	9.4	7.20	7.2	4	4.0
			22.3		8.29		95.7		9.3		7.20		4	

Date		21-Mar-16												
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM2B-C	11:45	0.01	20.1	20.1	8.04	8.1	96.1	96.4	6.7	6.7	6.20	6.2	5	5.0
			20.1		8.07		96.7		6.7		6.20		5	
WM2B	11:35	0.02	18.4	18.4	9.36	9.4	88.8	88.9	281.0	284.0	5.80	5.8	92	179.0
			18.4		9.35		89.0		287.0		5.80		266	

Date		22-Mar-16												
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM2B-C	10:24	0.02							6.3	6.3			3	3.0
								6.3						
WM2B	10:11	0.02							50.3	50.0			52	52.0
								49.7	52					

Date		23-Mar-16												
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM2B-C	13:16	0.02	20.5	20.5	8.01	8.0	89.4	89.6	49.5	49.8	6.60	6.6	36	35.5
			20.4		8.05		89.7		50.1		6.60		35	
WM2B	13:05	0.02	20.3	20.3	8.36	8.4	92.6	92.8	448.0	452.0	6.30	6.3	290	301.5
			20.3		8.38		92.9		456.0		6.30		313	

Date														24-Mar-16	
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)		
WM2B-C	11:11	0.02							21.3	20.8			9	9.0	
							20.2		9						
WM2B	11:24	0.02							123.0	124.0			160	160.0	
							125.0		160						

Date														29-Mar-16	
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)		
WM2B-C	12:05	0.01	21.6	21.6	7.6	7.6	86.2	86.6	6.0	6.0	9.50	9.5	<2	<2	
			21.6		7.63		86.9		6.0		9.50		<2		
WM2B	11:57	0.02	19.7	19.7	9.06	9.1	102.2	102.4	11.1	11.2	9.30	9.3	5	5.0	
			19.7		9.09		102.5		11.2		9.30		5		

Date														31-Mar-16	
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)		
WM2B-C	12:29	0.01	22.3	22.3	7.68	7.7	88.4	88.6	3.3	3.2	9.40	9.4	<2	<2	
			22.3		7.71		88.7		3.2		9.40		<2		
WM2B	12:15	0.01	24.8	24.8	8.97	9.0	108.1	108.0	9.2	9.2	9.10	9.1	10	10.5	
			24.8		8.94		107.8		9.2		9.10		11		

Water Quality Monitoring Data for Contract 2 and 6

Date: 2-Mar-16														
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM3-C	10:30	0.03	20.7	20.7	6.92	6.9	76.8	76.4	8.1	8.3	6.20	6.3	7	6.5
			20.7		6.9		76.0		8.5		6.30		6	
WM3	10:16	0.23	17.9	17.9	7.28	7.2	77.2	77.1	11.7	12.0	6.20	6.2	12	12.5
			17.9		7.2		77.0		12.2		6.10		13	

Date: 4-Mar-16														
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM3-C	12:55	0.01	22.6	22.6	9.98	10.0	115.2	115.3	19.3	19.0	6.40	6.4	12	11.5
			22.6		10		115.3		18.7		6.40		11	
WM3	12:30	0.10	20.6	20.6	9.27	9.3	102.7	102.8	16.5	16.8	5.90	5.9	10	11.0
			20.6		9.31		102.9		17.1		5.90		12	

Date: 7-Mar-16														
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM3-C	10:25	0.06	22.1	22.1	5.66	5.6	64.8	64.5	12.9	12.8	6.00	6.0	21	21.0
			22.1		5.62		64.2		12.7		6.00		21	
WM3	10:12	0.21	20.9	20.9	6.64	6.6	74.2	74.1	7.3	7.4	6.10	6.2	11	11.5
			20.9		6.6		74.0		7.6		6.20		12	

Date: 9-Mar-16														
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM3-C	12:23	0.02	21.9	21.9	4.71	4.7	54.5	54.6	11.6	11.8	5.70	5.7	16	16.5
			21.9		4.74		54.7		12.0		5.70		17	
WM3	12:33	0.16	20.9	20.9	5.19	5.2	59.2	59.3	13.0	13.1	5.80	5.8	15	15.5
			20.9		5.21		59.3		13.1		5.80		16	

Date: 11-Mar-16														
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM3-C	11:32	0.06	15.8	15.8	10.31	10.3	103.9	104.0	15.7	16.2	6.00	6.0	27	26.5
			15.8		10.34		104.0		16.7		6.00		26	
WM3	12:00	0.17	16.3	16.3	8.73	8.7	89.1	89.3	16.7	16.8	6.30	6.3	25	25.5
			16.3		8.75		89.4		16.9		6.30		26	

Date		14-Mar-16													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)		
WM3-C	12:10	0.23	17.3	17.3	8.33	8.3	86.7	86.7	39.8	40.1	5.80	5.8	52	51.5	
			17.3		8.3		86.6		40.3		5.80		51		
WM3	12:25	0.16	19.2	19.2	8.79	8.8	95.1	95.0	19.3	19.5	5.70	5.7	13	13.5	
			19.2		8.77		94.9		19.6		5.70		14		

Date		16-Mar-16													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)		
WM3-C	10:00	0.21	18.6	18.6	8.81	8.8	84.1	84.1	35.7	36.1	6.40	6.4	12	13.0	
			18.6		8.8		84.0		36.4		6.40		14		
WM3	9:44	0.19	16.5	16.5	8.21	8.2	94.3	94.1	12.8	13.2	6.20	6.2	15	15.5	
			16.5		8.2		93.9		13.6		6.20		16		

Date		18-Mar-16													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)		
WM3-C	13:32	0.09	22.6	22.6	8.07	8.1	93.3	93.3	6.4	6.5	6.50	6.5	8	8.0	
			22.6		8.06		93.2		6.6		6.50		8		
WM3	13:13	0.21	20.7	20.7	7.59	7.6	84.4	84.3	13.1	13.2	6.60	6.6	12	12.0	
			20.7		7.56		84.1		13.3		6.60		12		

Date		21-Mar-16													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)		
WM3-C	11:58	0.24	19.8	19.8	8.81	8.8	80.7	80.9	28.2	28.9	5.60	5.6	40	41.5	
			19.8		8.83		81.0		29.5		5.60		43		
WM3	12:10	0.19	18.4	18.4	7.56	7.6	80.7	80.9	31.9	32.0	5.70	5.7	21	21.0	
			18.4		7.58		81.1		32.0		5.70		21		

Date	23-Mar-16													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM3-C	13:32	0.09	20.2	20.2	7.81	7.9	86.4	86.9	36.1	34.7	6.00	6.0	45	47.0
			20.2		7.91		87.3		33.2		6.00		49	
WM3	14:00	0.20	19.7	19.7	7.94	8.0	86.7	87.0	38.1	38.5	6.10	6.1	25	25.5
			19.7		7.98		87.3		38.9		6.10		26	

Date	29-Mar-16													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM3-C	12:25	0.02	21.2	21.2	8.32	8.3	90.8	91.0	5.3	4.9	9.10	9.1	7	7.0
			21.2		8.35		91.1		4.6		9.10		7	
WM3	12:41	0.07	19.7	19.7	7.99	8.0	89.7	89.8	71.9	72.1	8.90	8.9	109	109.0
			19.7		7.98		89.8		72.3		8.90		109	

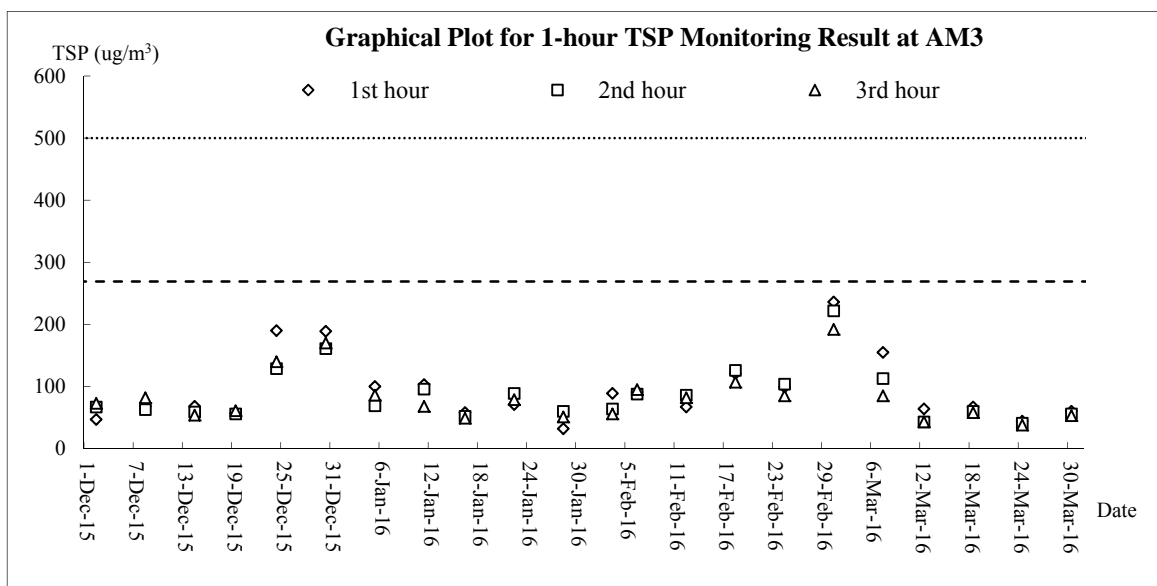
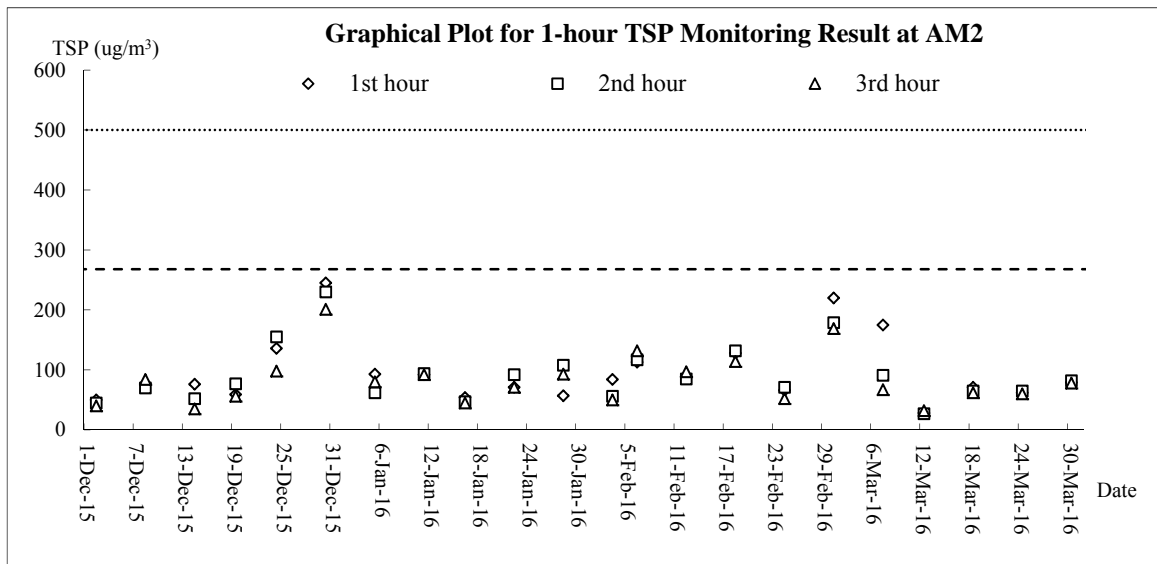
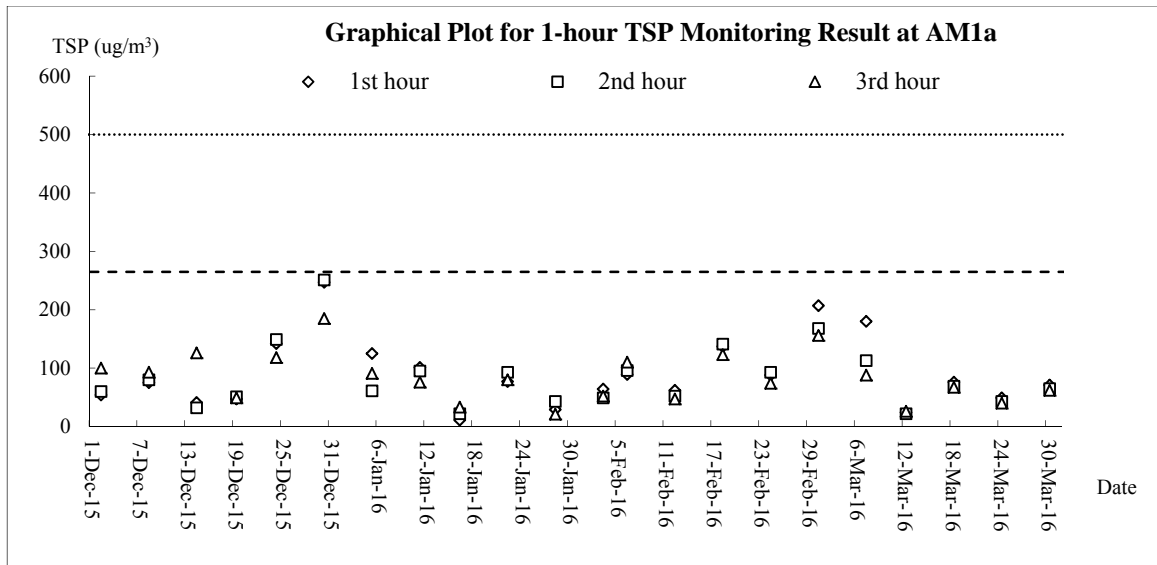
Date	30-Mar-16													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM3-C	12:43	0.09							5.5	5.2			6	6.5
							4.9		7					
WM3	12:35	0.20							125.0	121.5			56	54.5
							118.0		53					

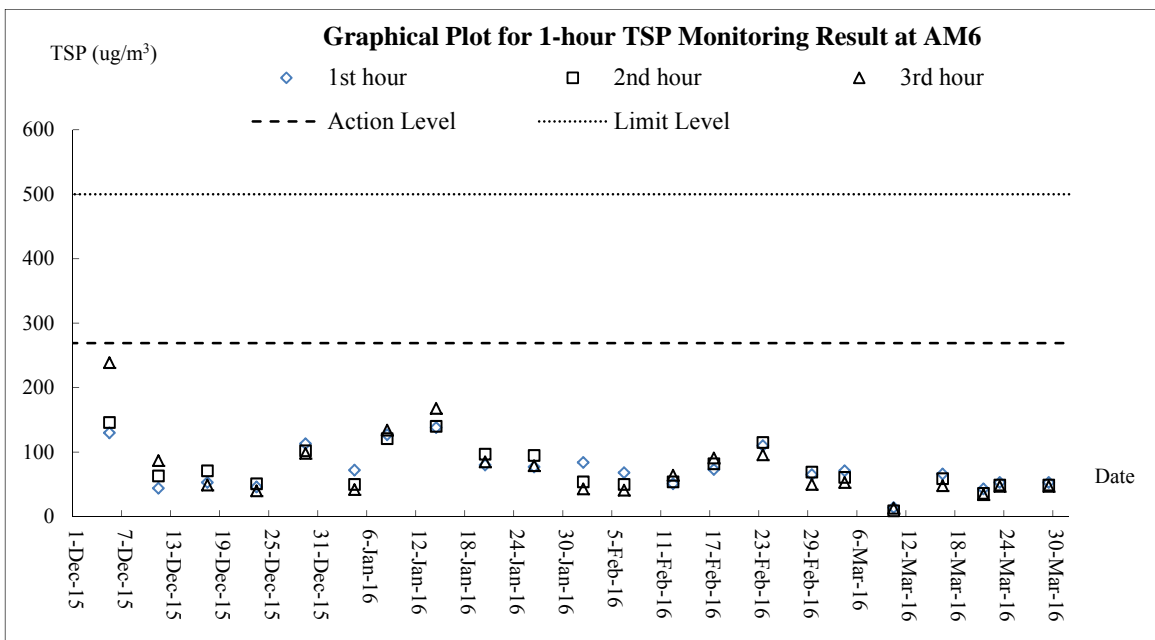
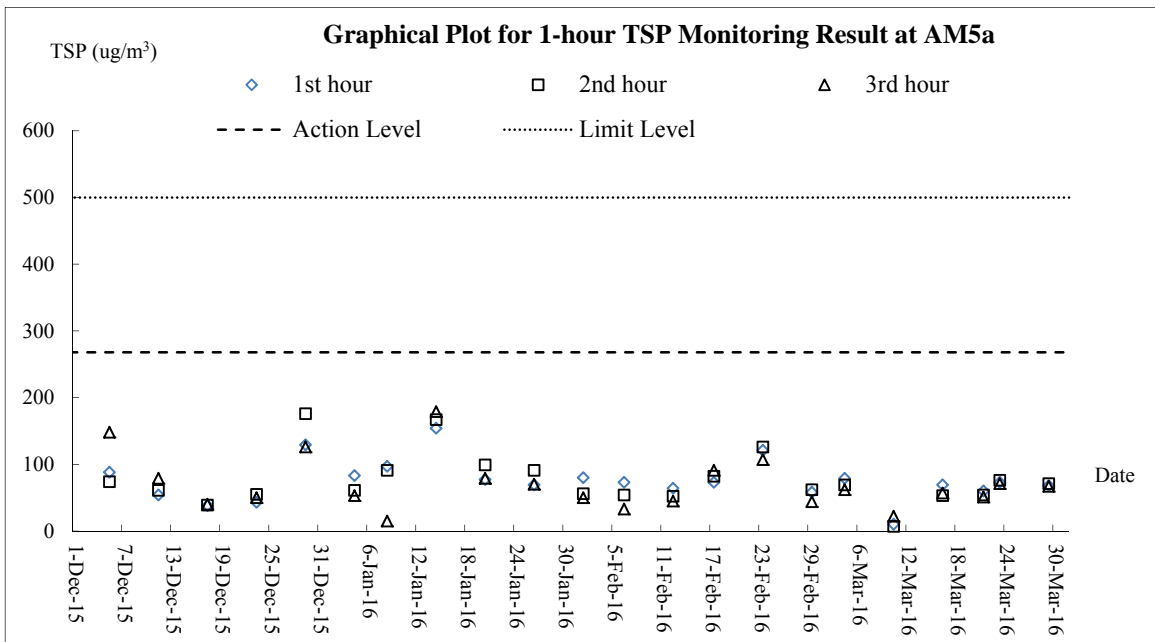
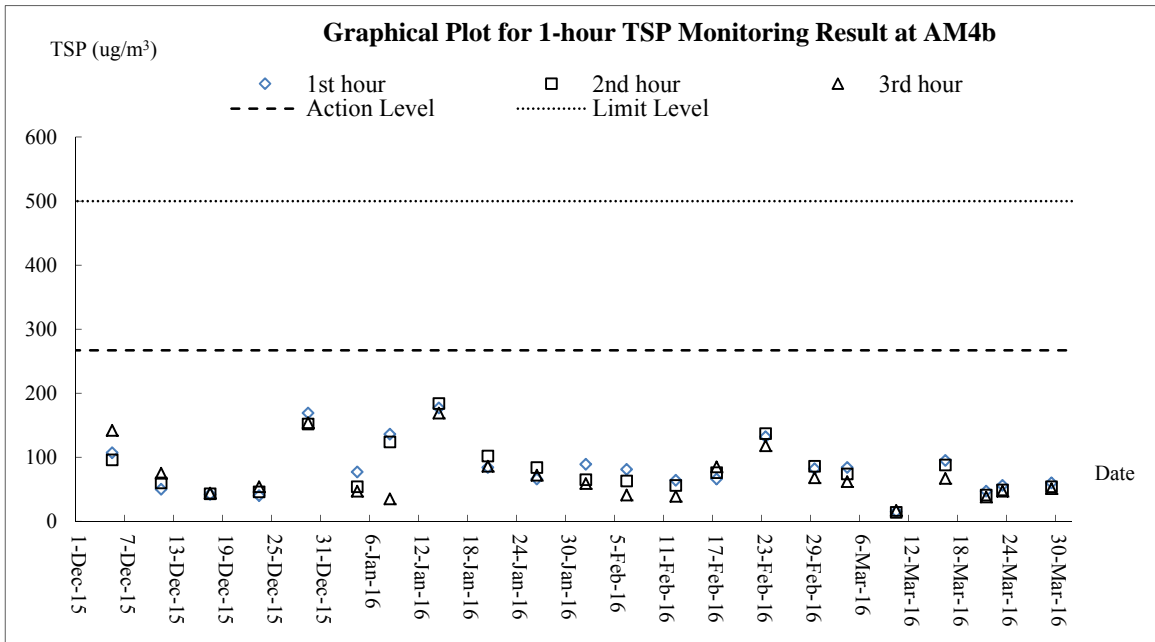
Date	31-Mar-16													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM3-C	10:58	0.01	23.7	23.7	8.2	8.2	97.0	97.0	2.8	2.6	8.50	8.5	14	14.0
			23.7		8.22		96.9		2.4		8.50		14	
WM3	10:43	0.21	21.1	21.1	8.41	8.4	94.5	94.8	34.3	35.3	8.90	8.9	16	16.0
			21.1		8.47		95.0		36.2		8.90		16	

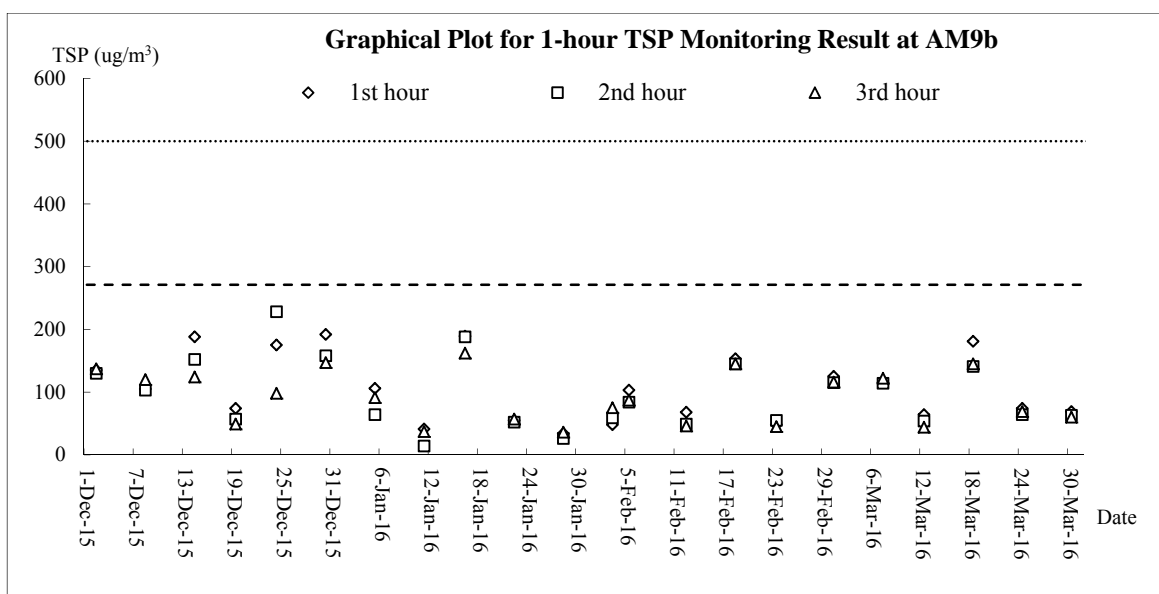
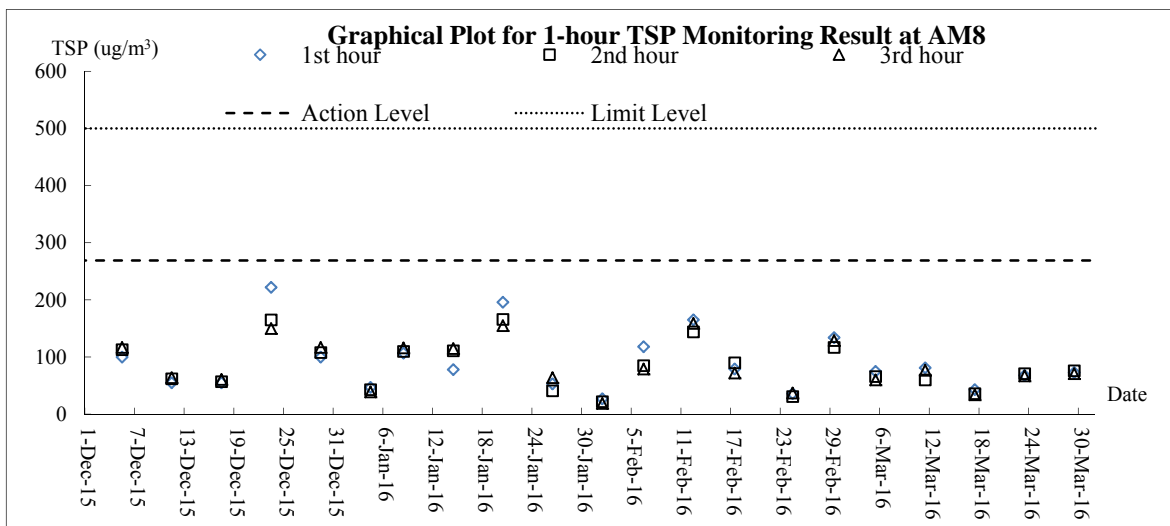
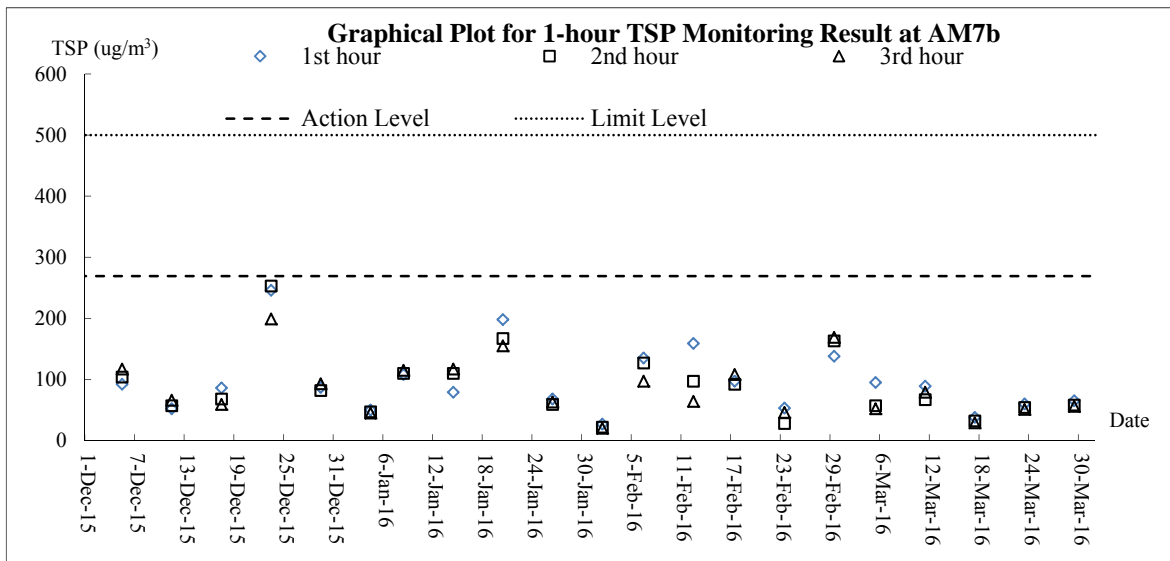
Appendix J

Graphical Plots for Monitoring Result

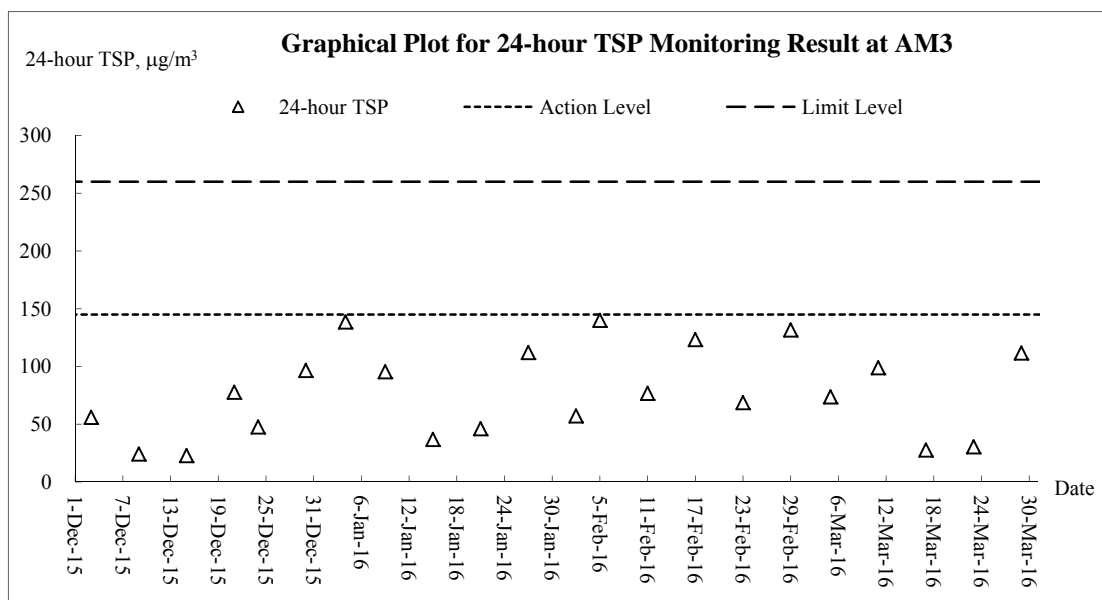
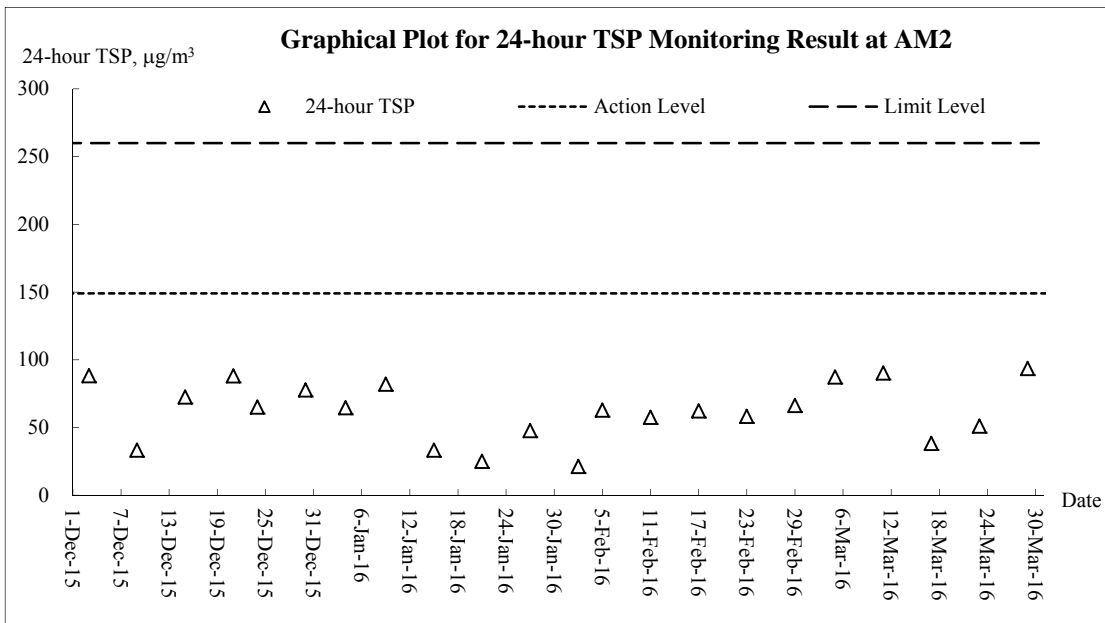
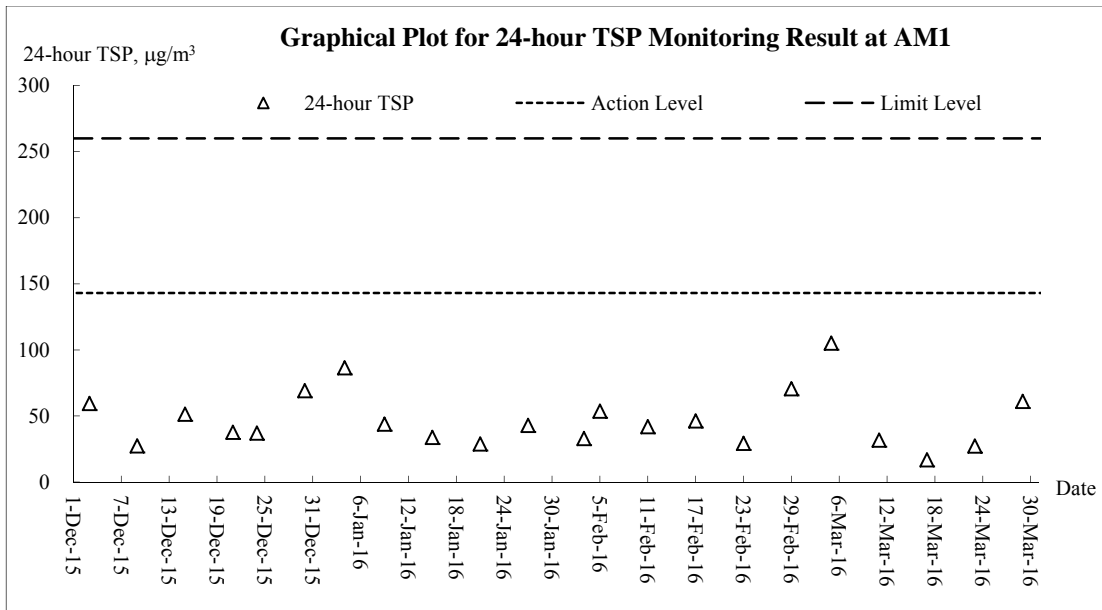
Air Quality – 1-hour TSP

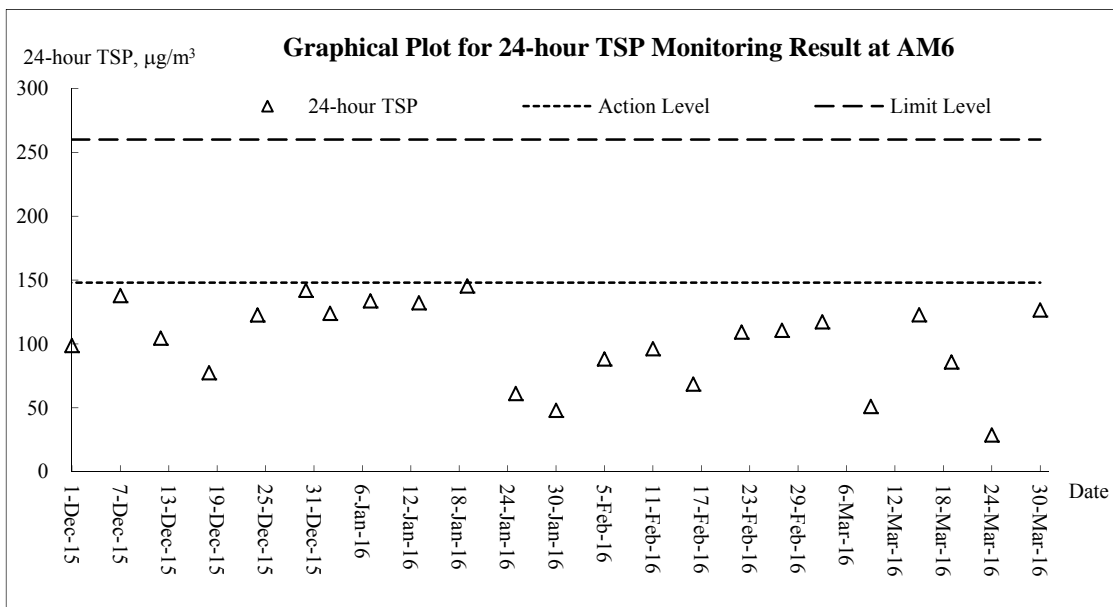
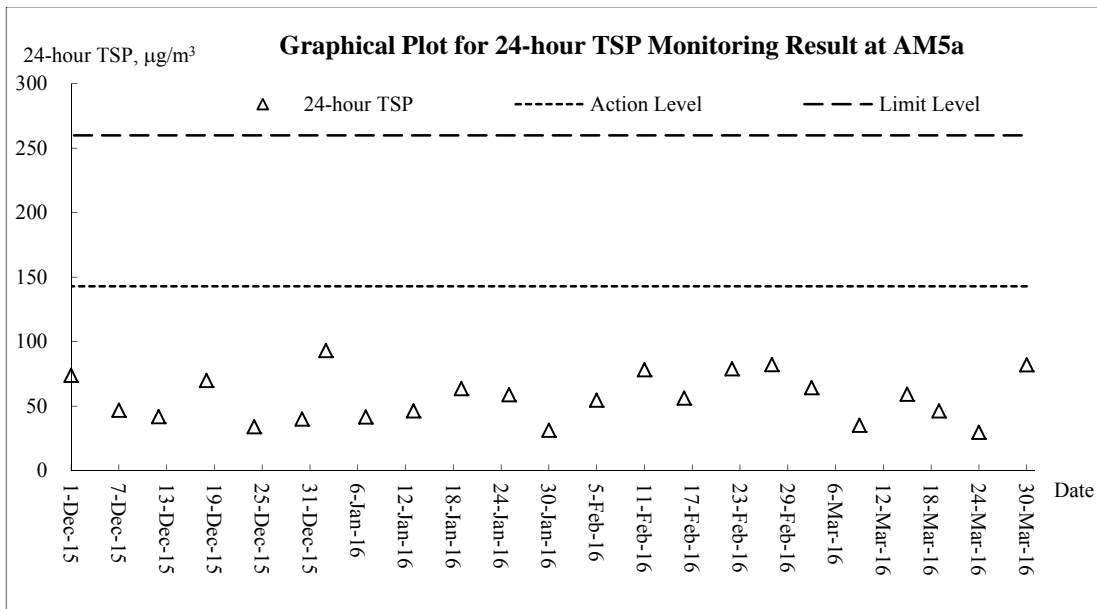
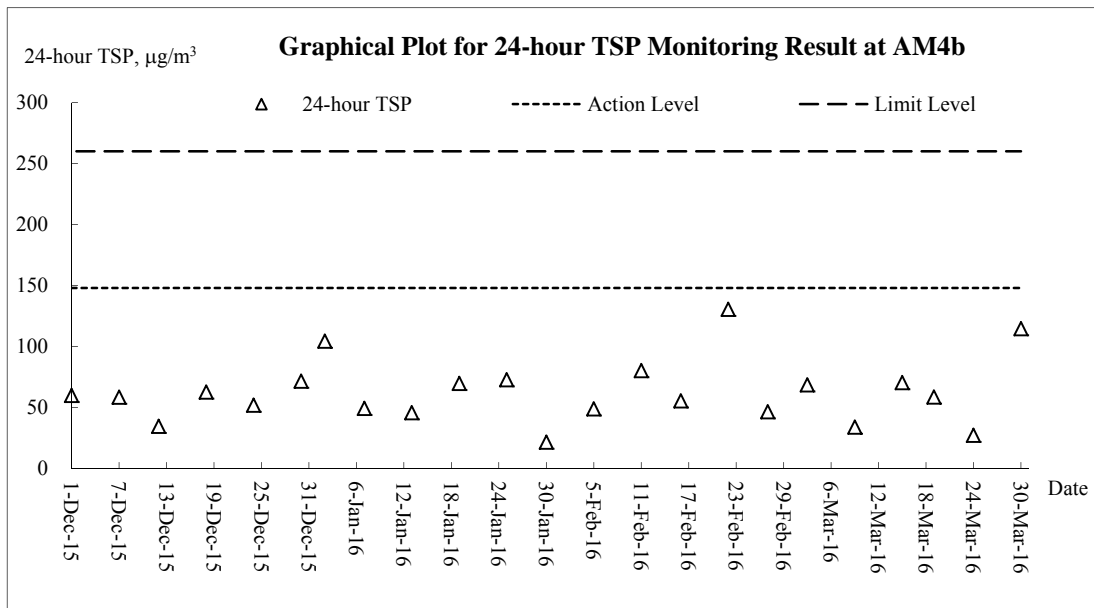


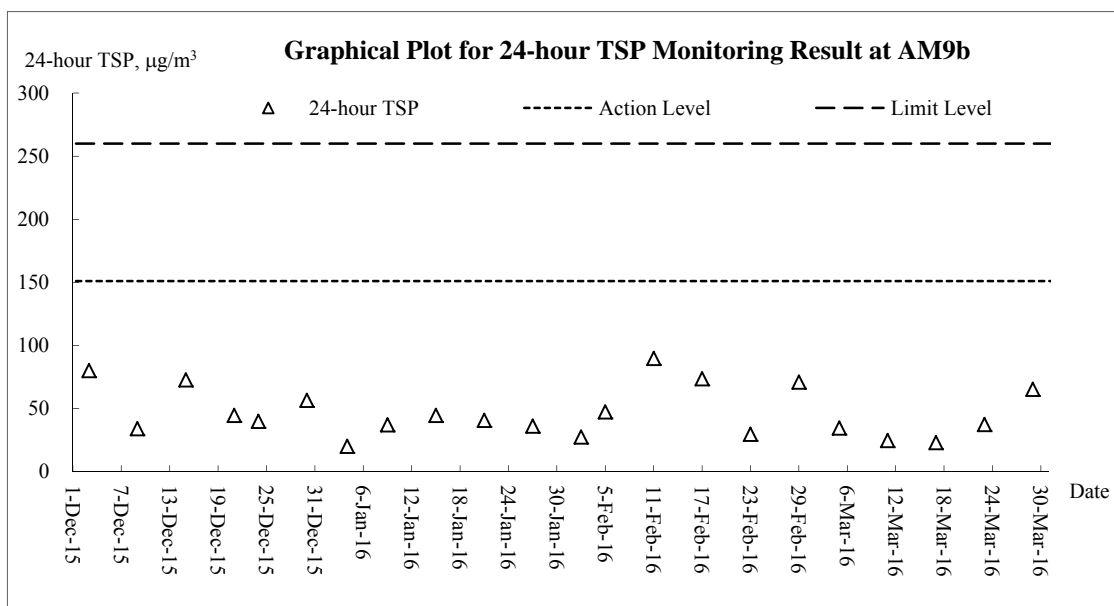
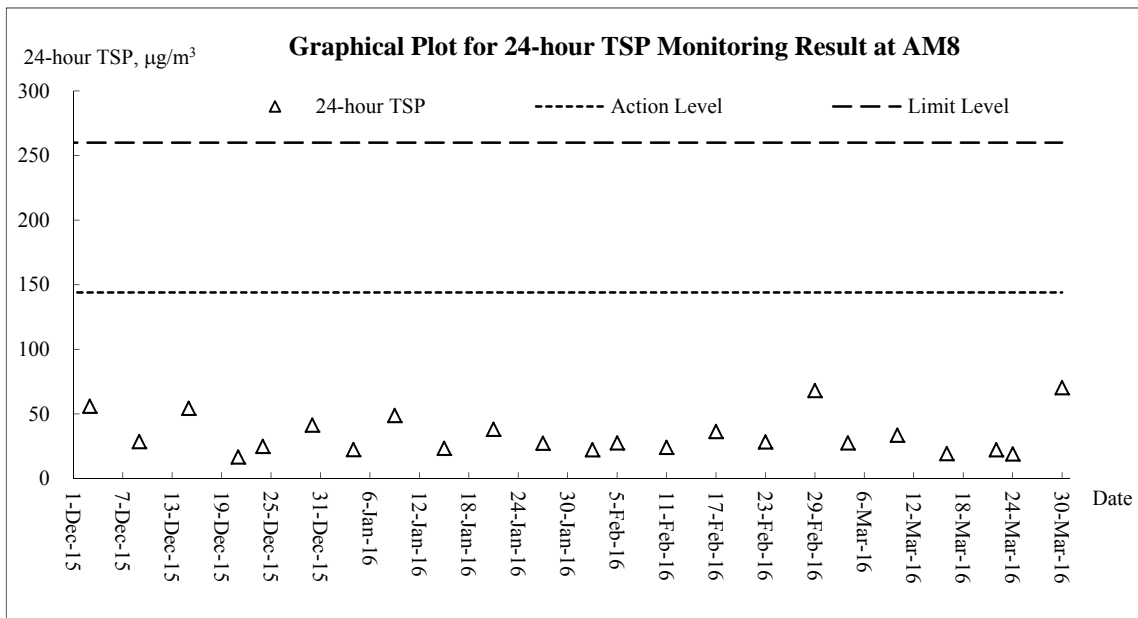
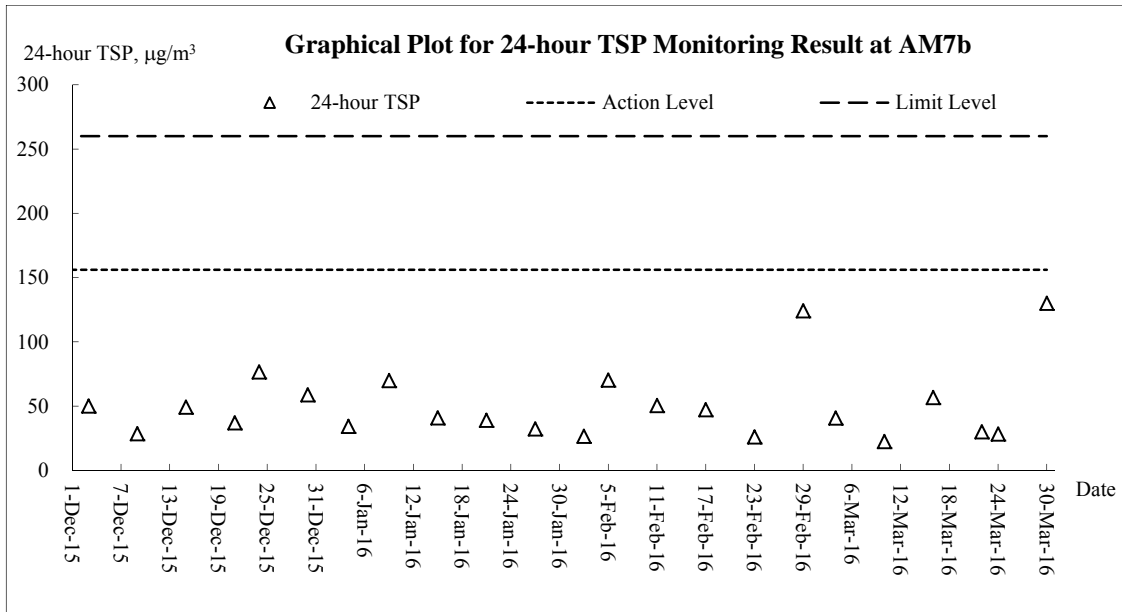




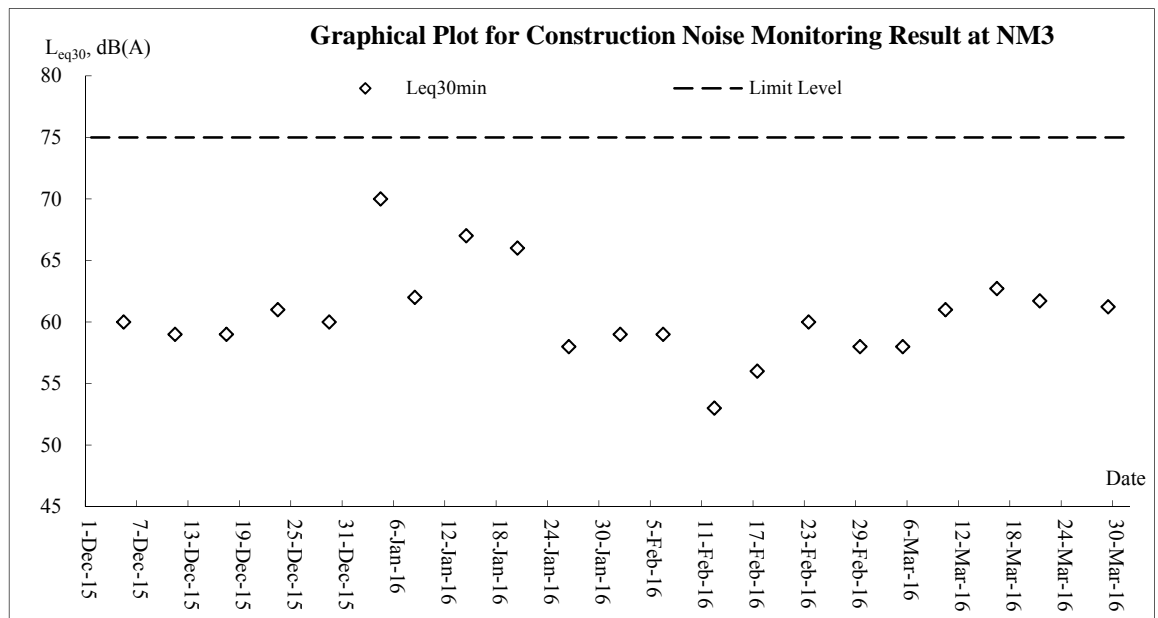
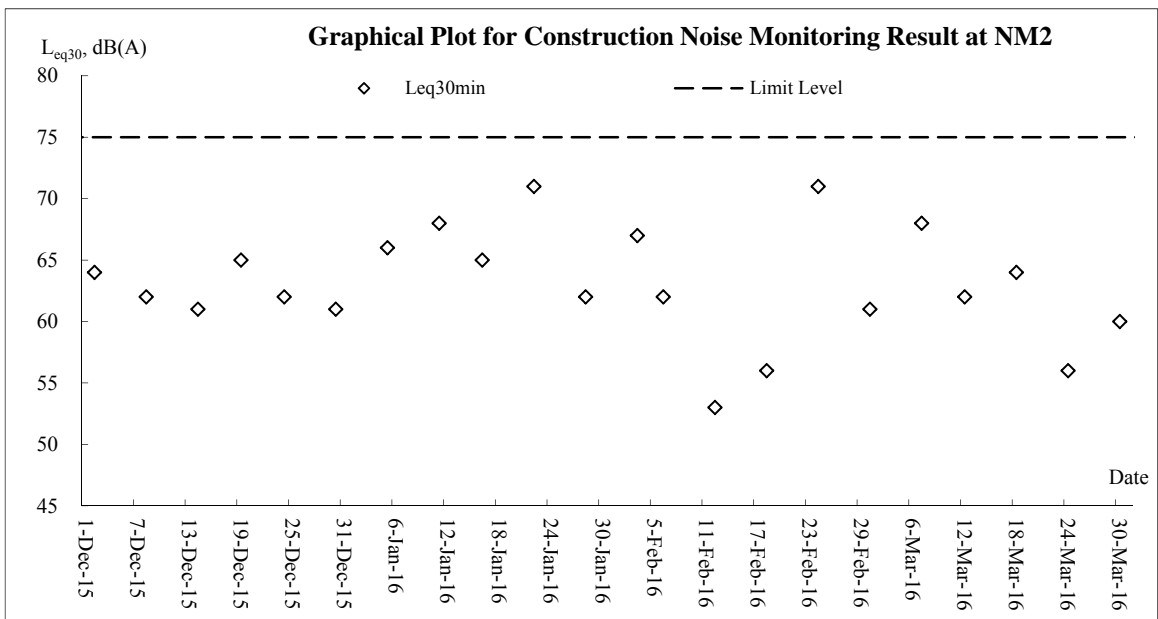
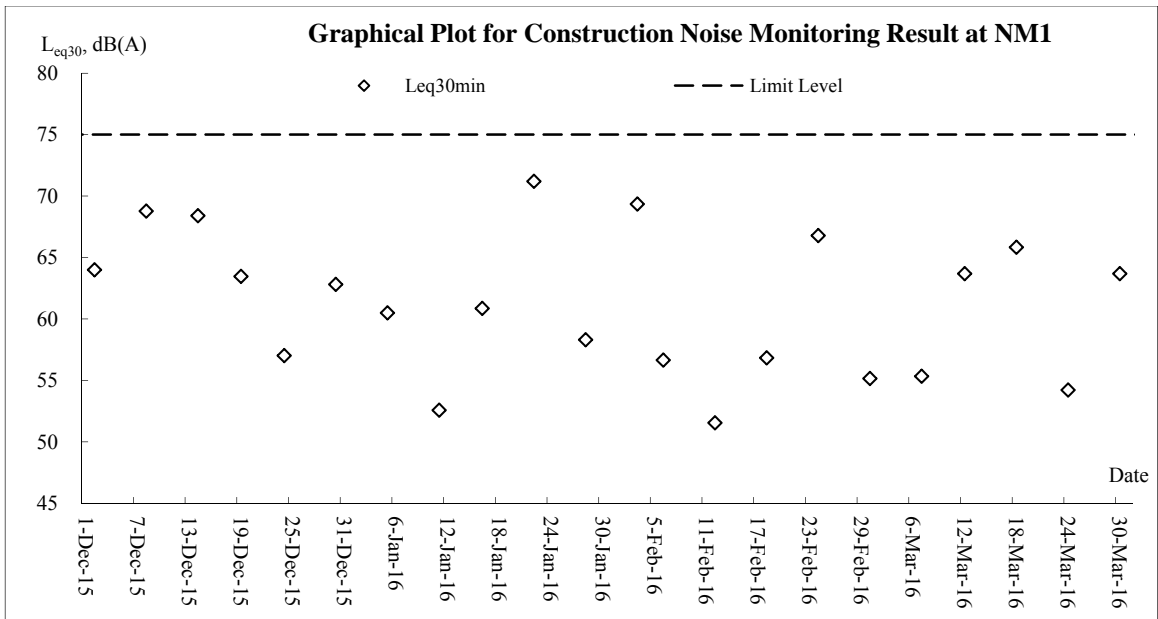
Air Quality – 24-hour TSP

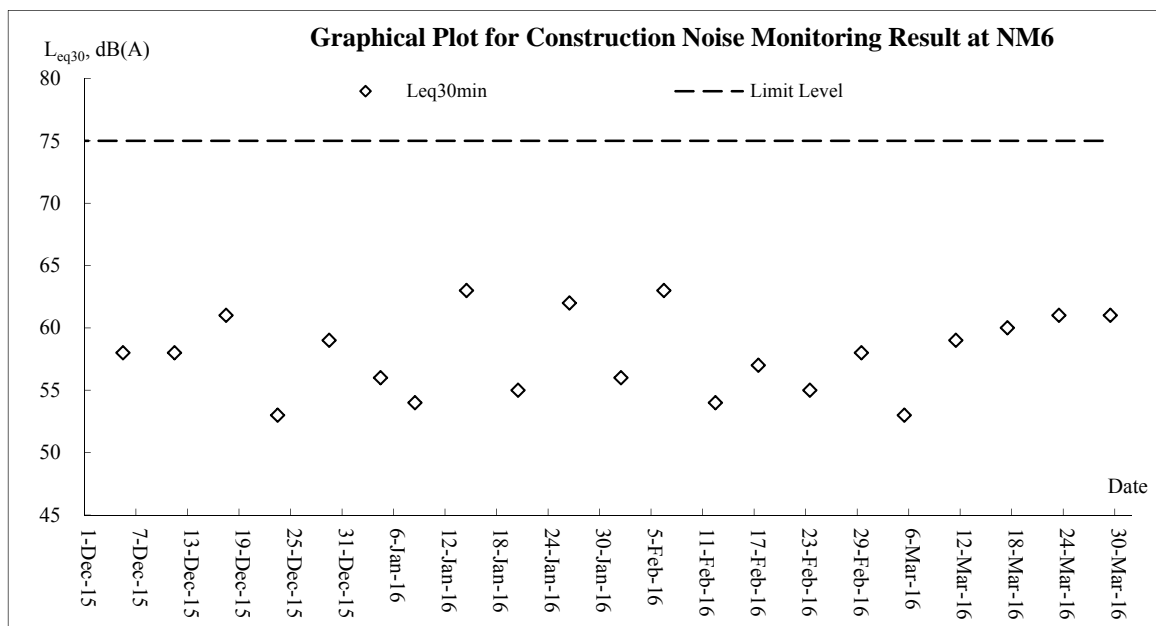
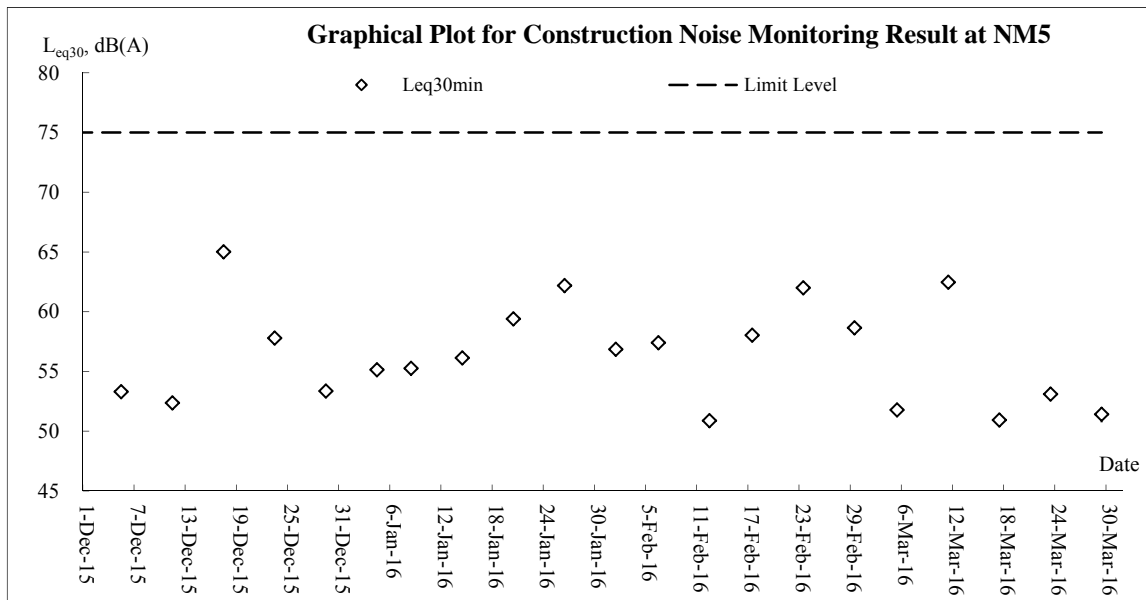
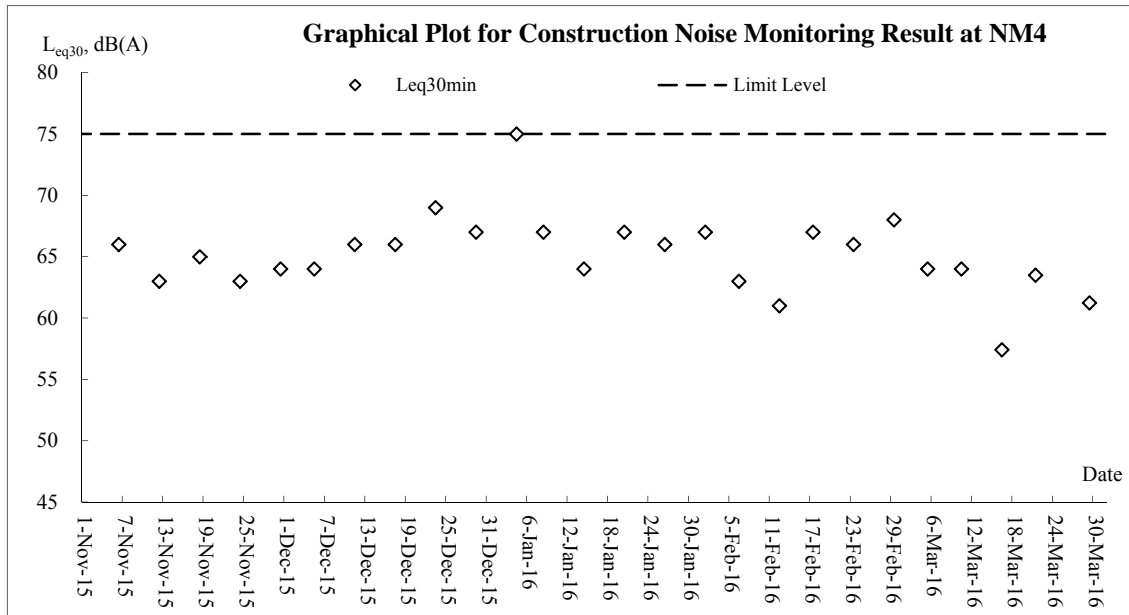


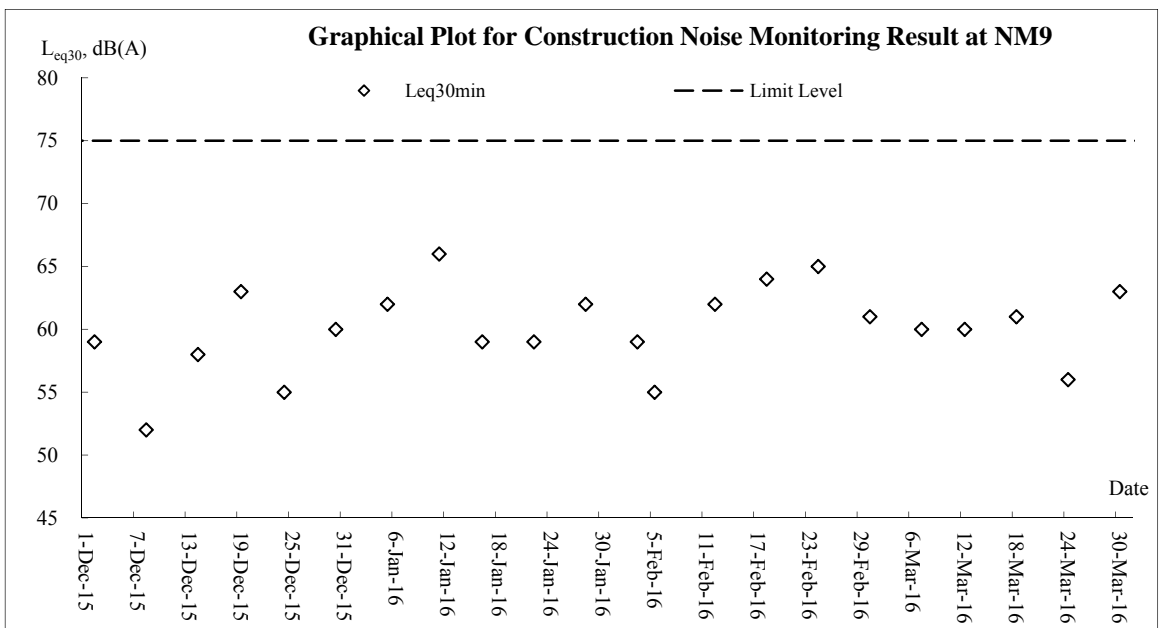
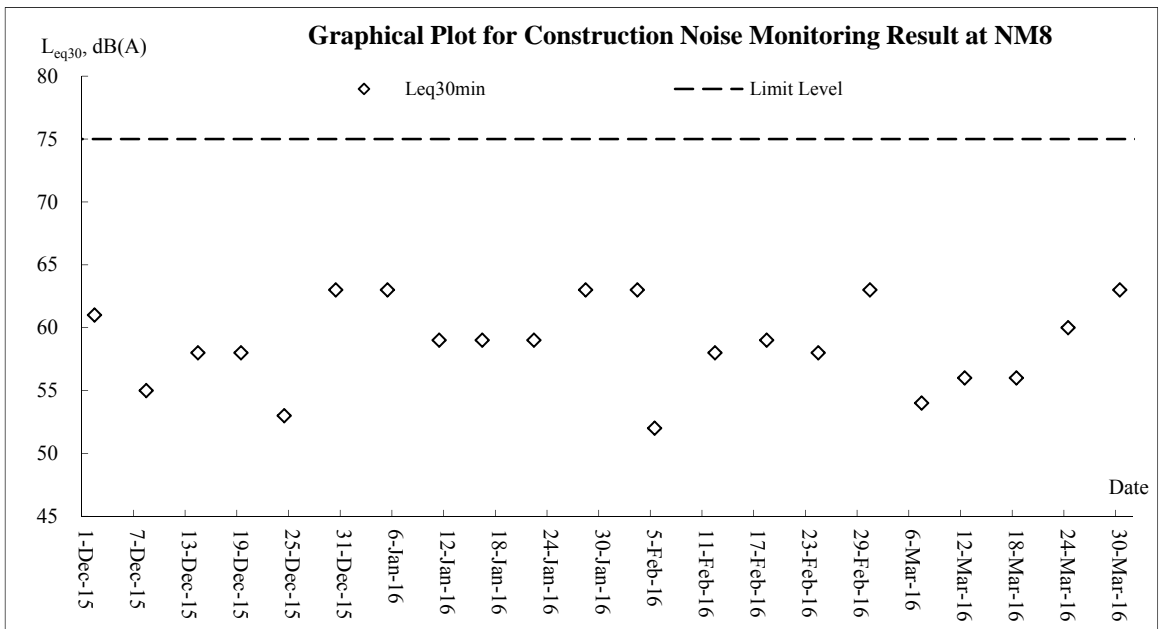
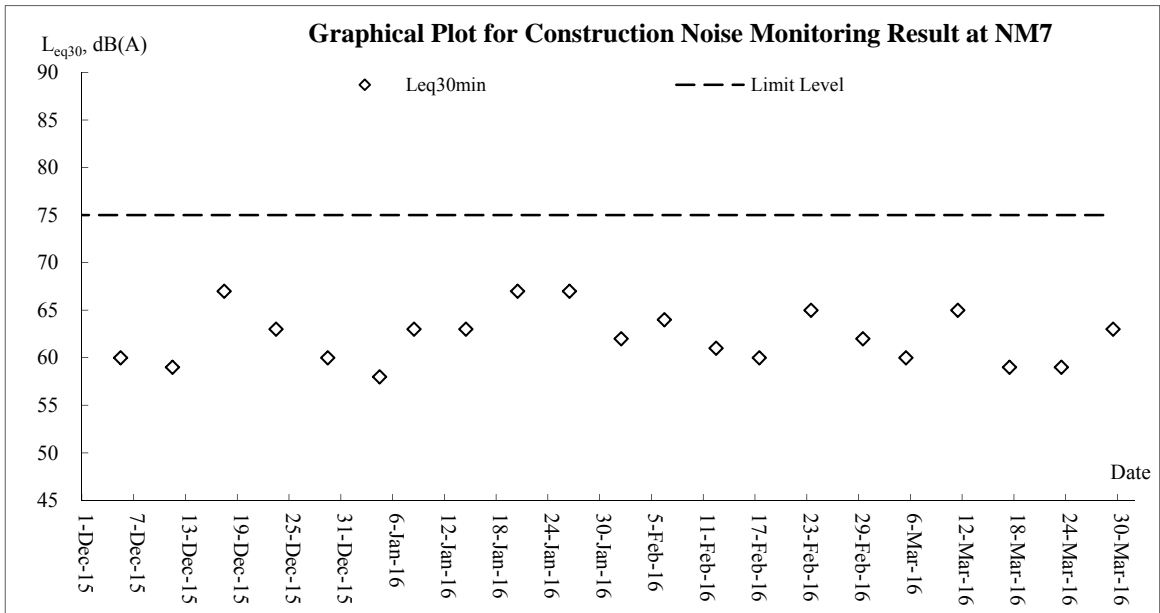


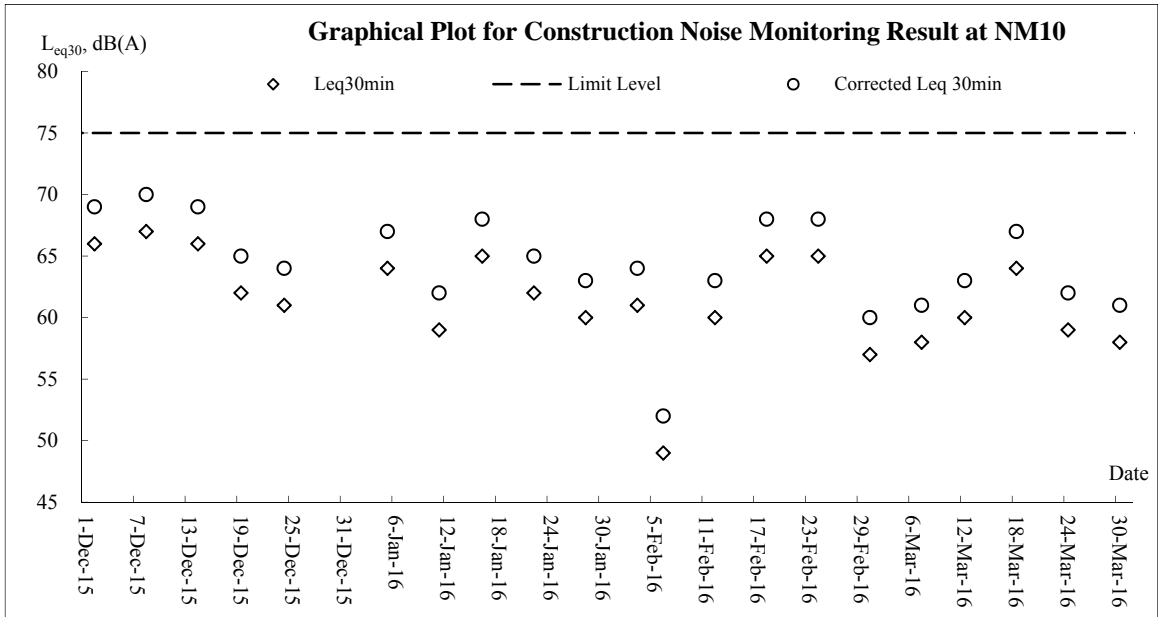


Noise

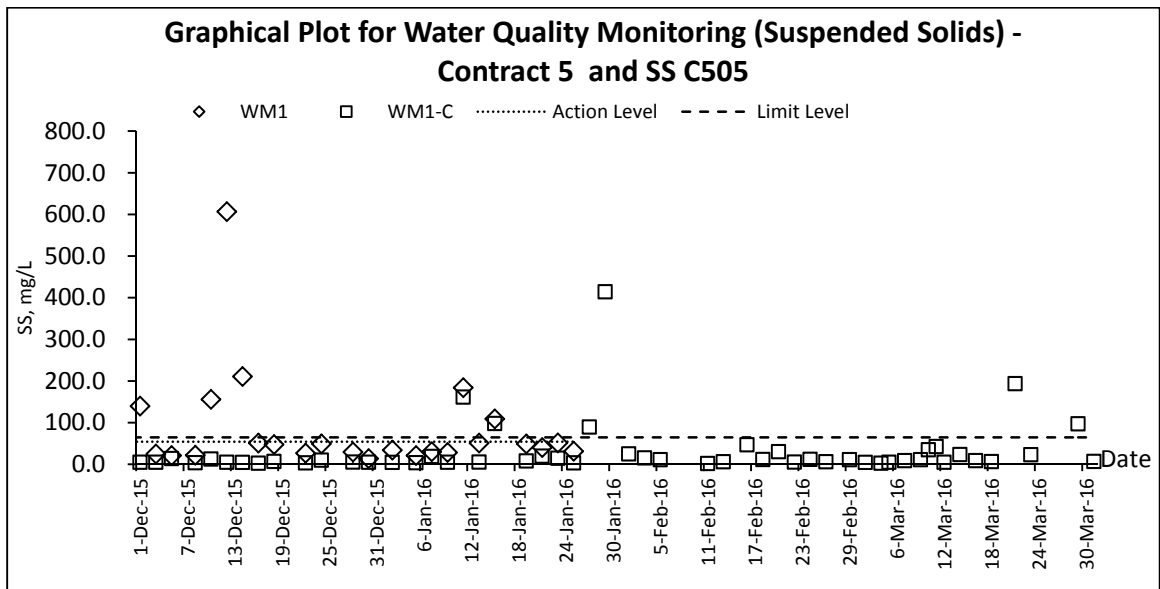
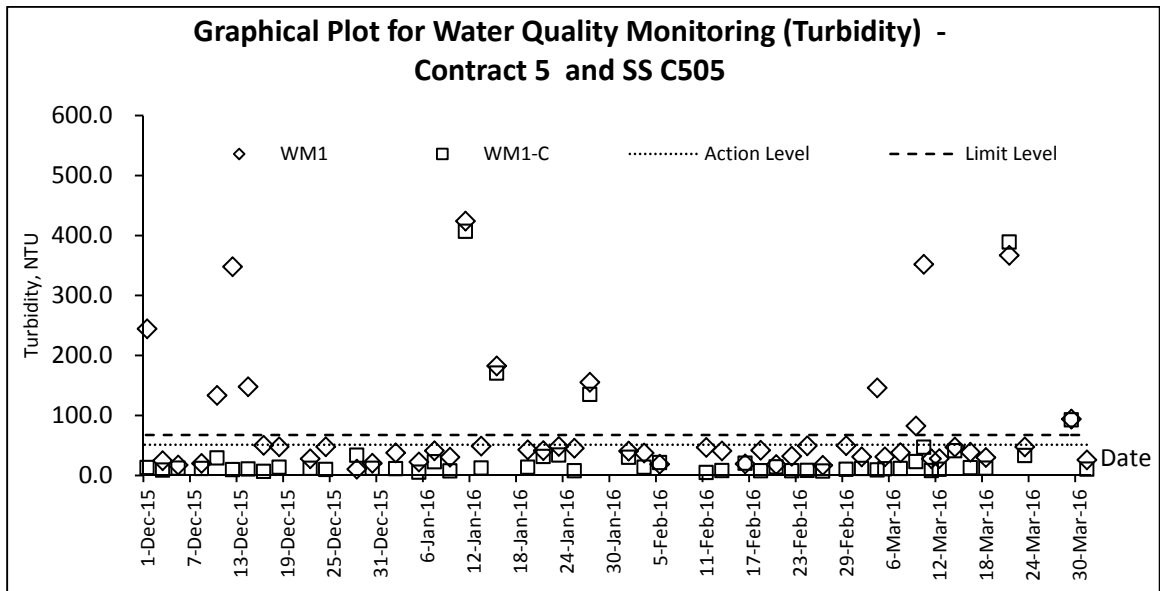
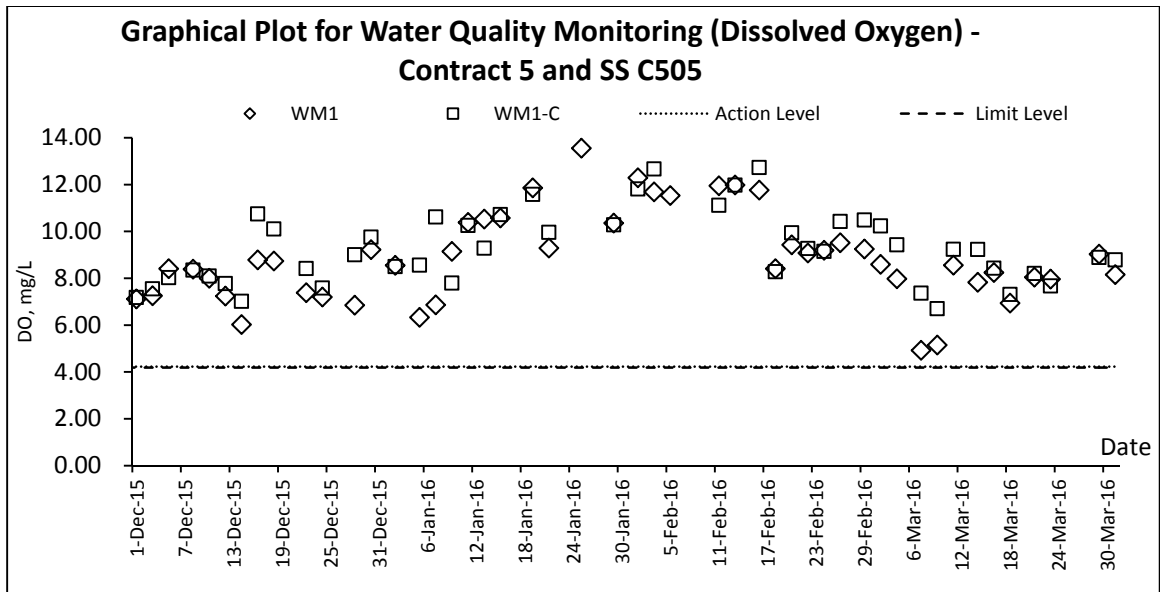


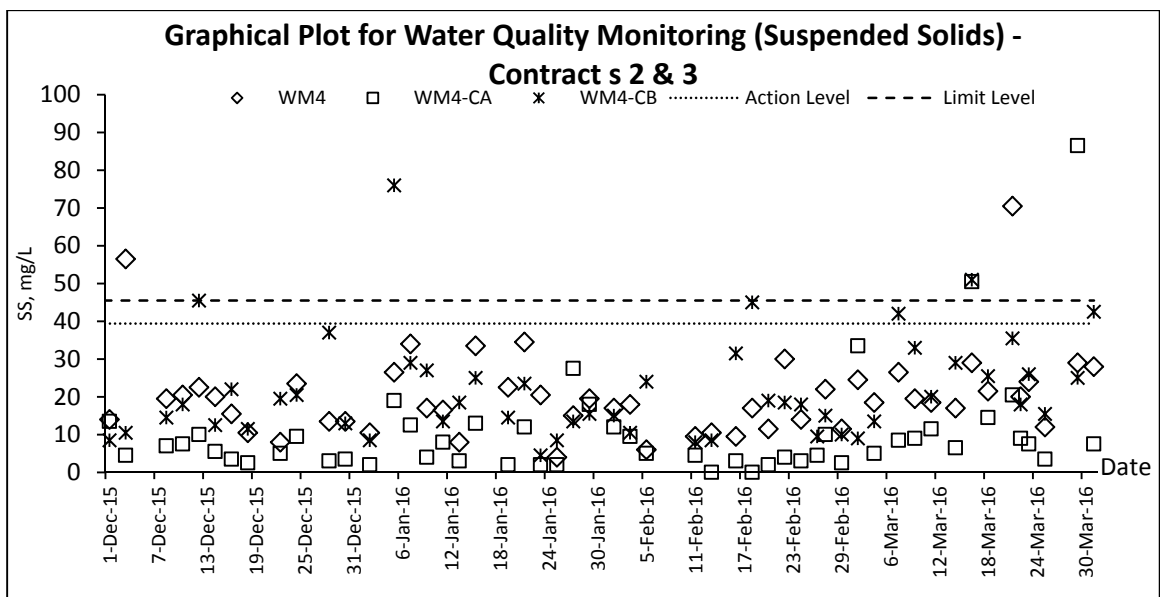
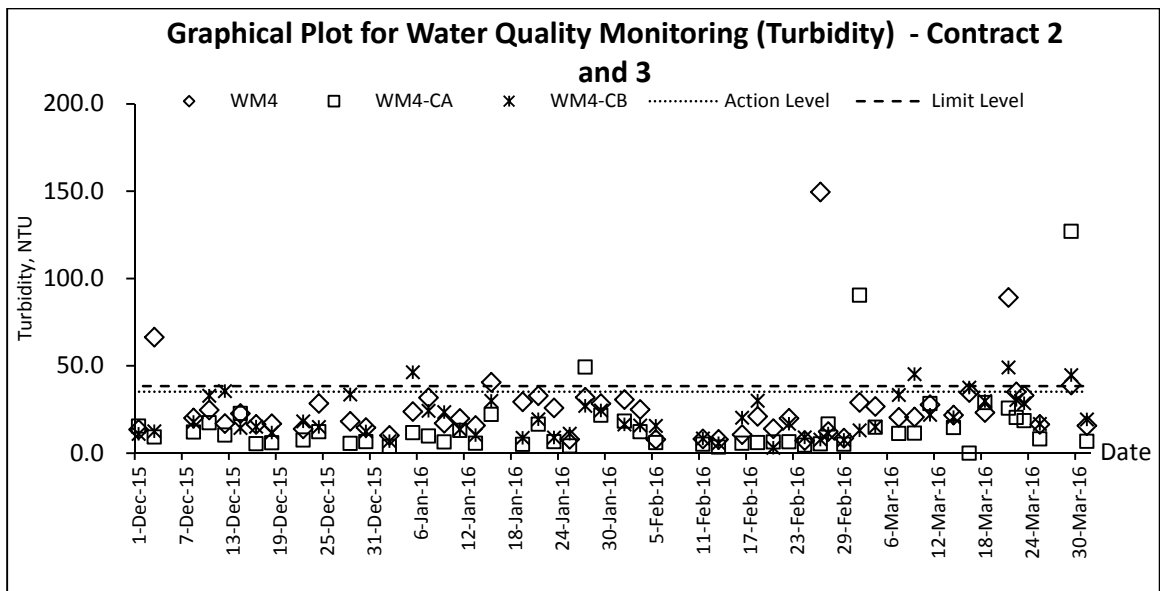
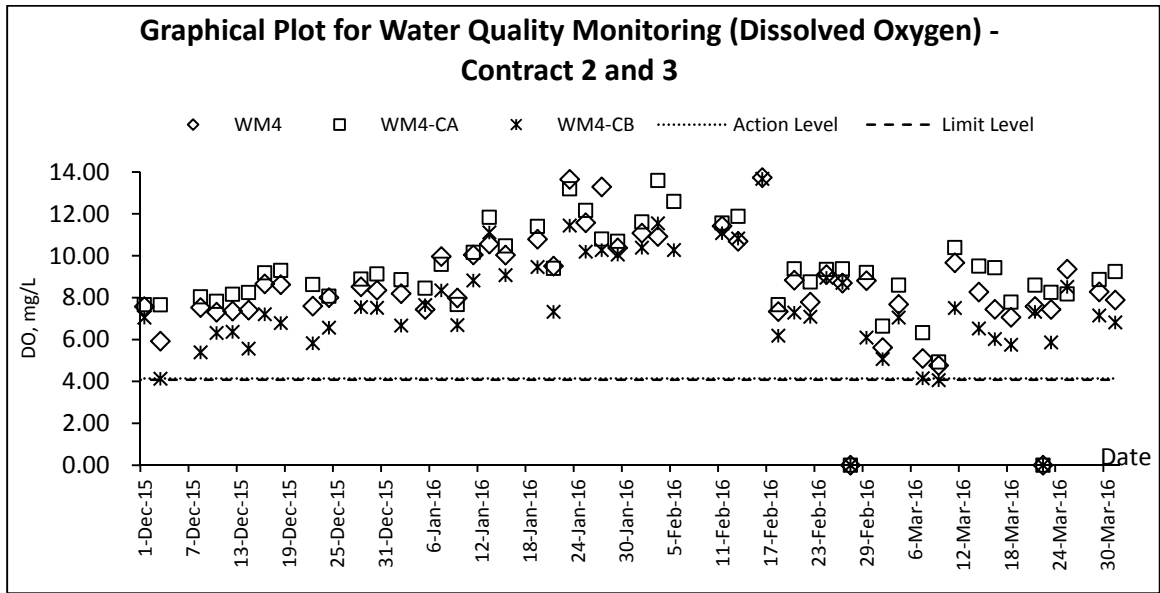


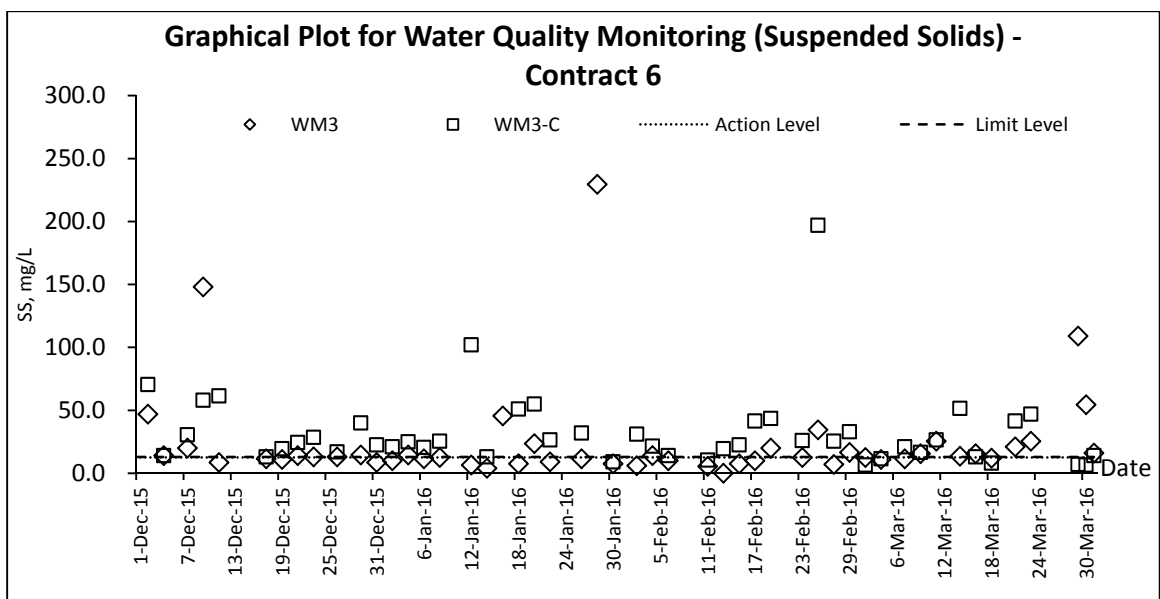
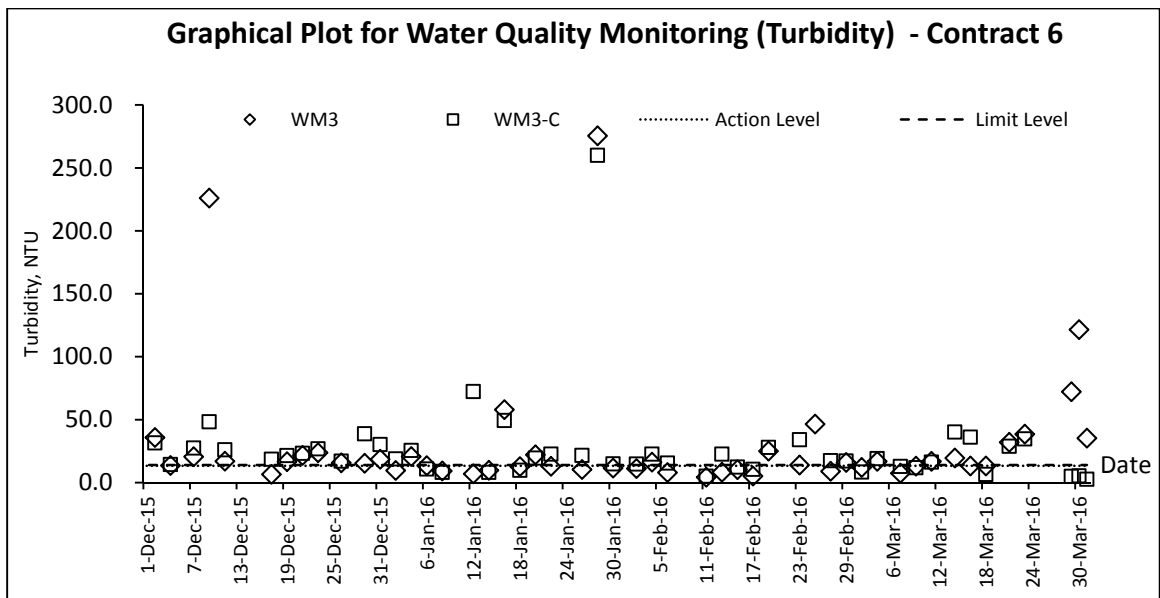
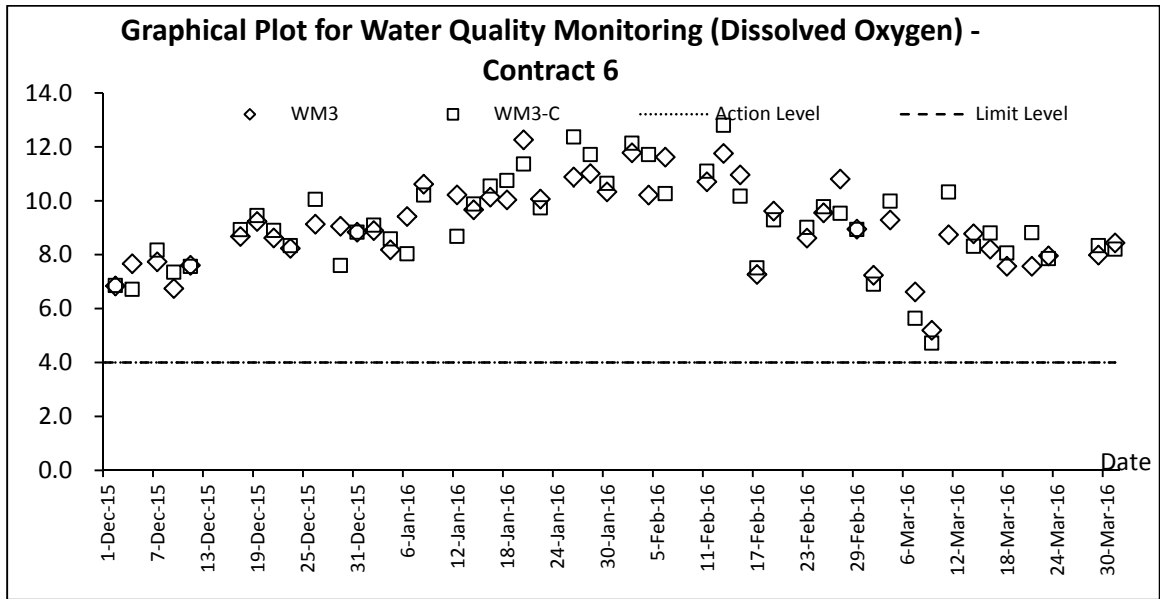


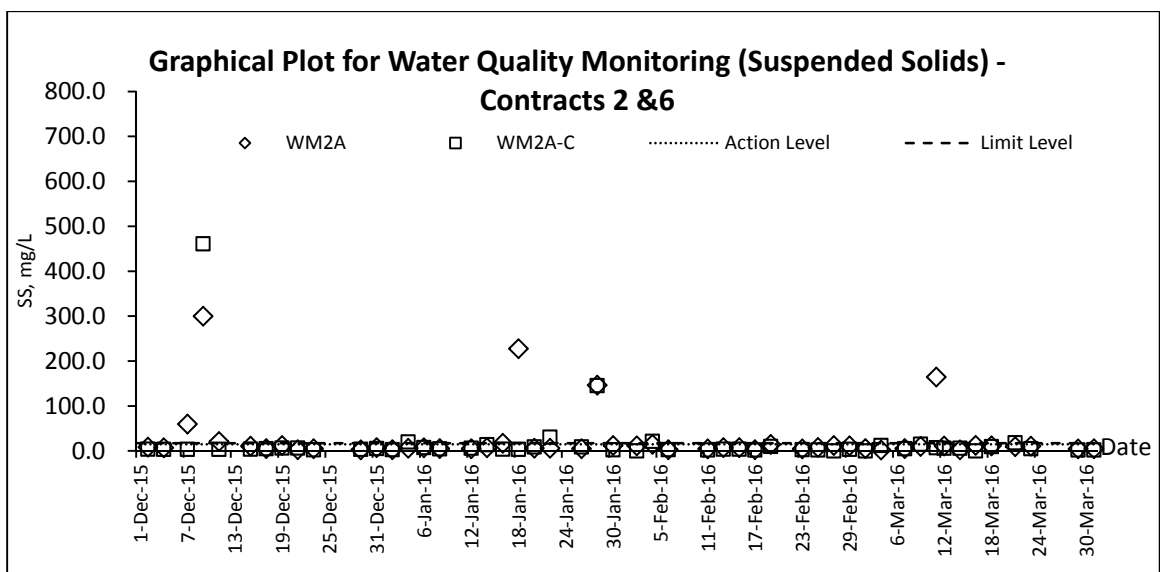
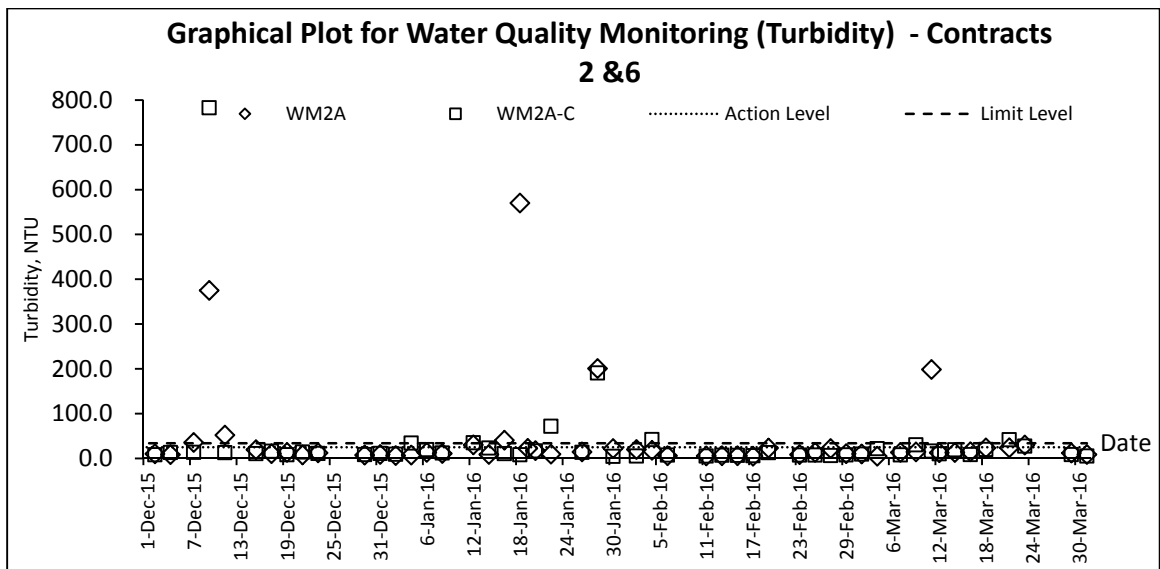
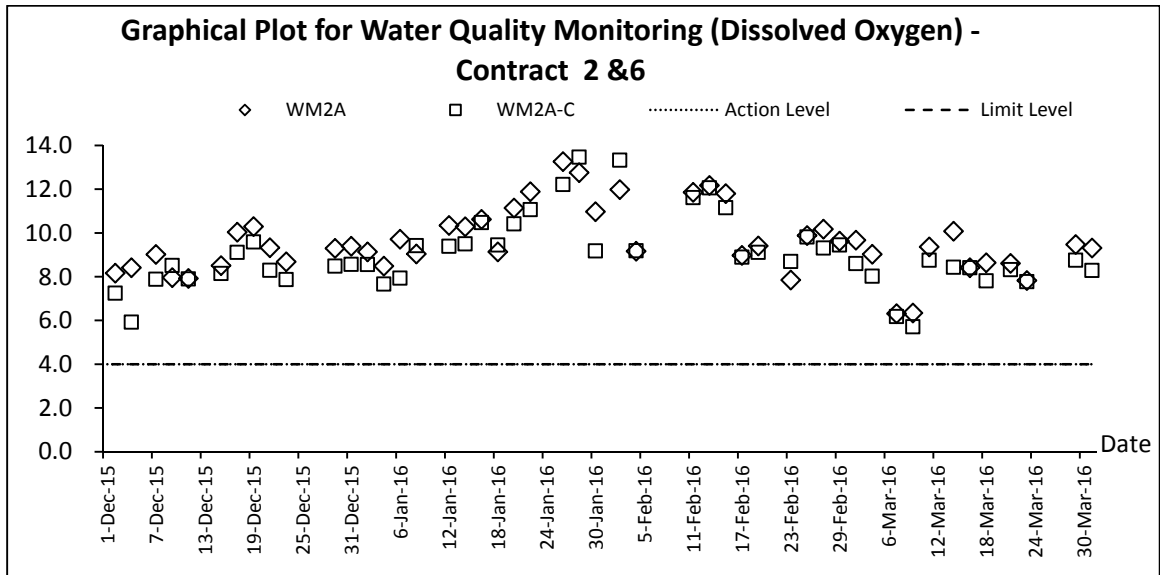


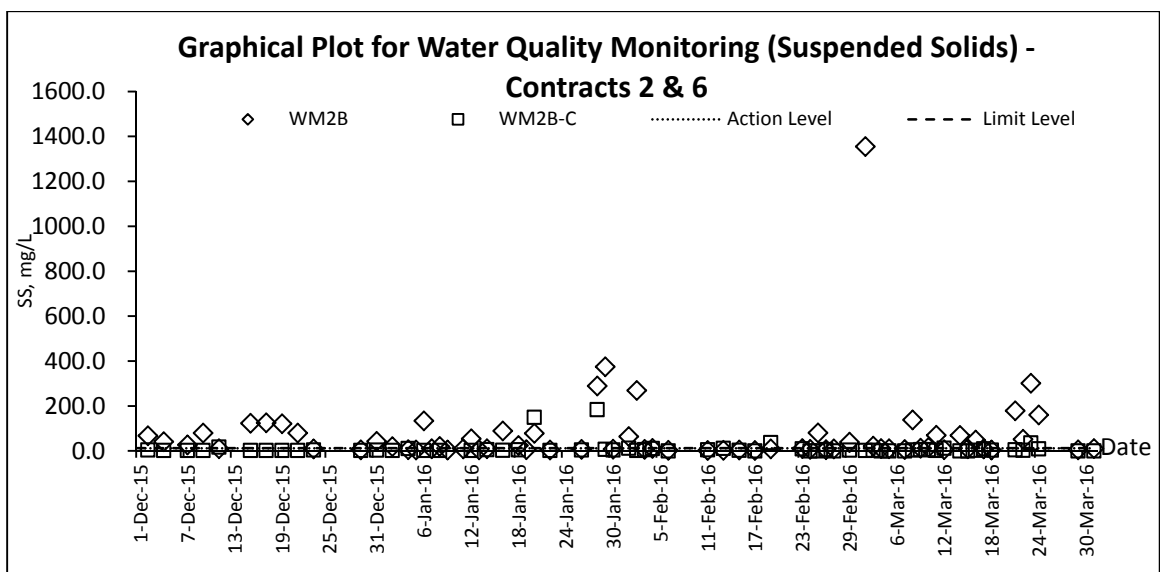
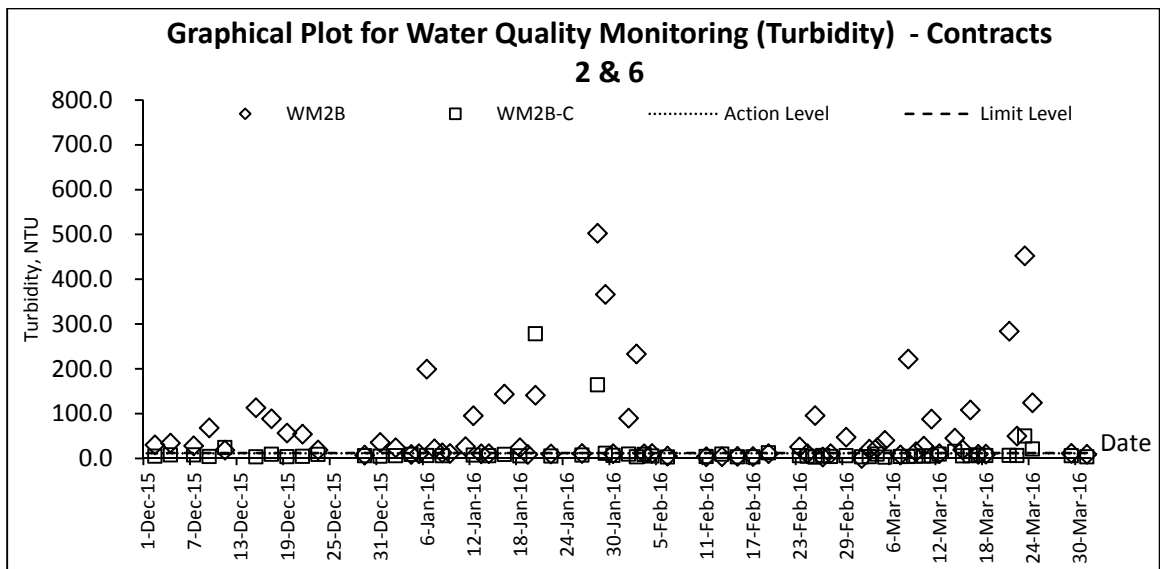
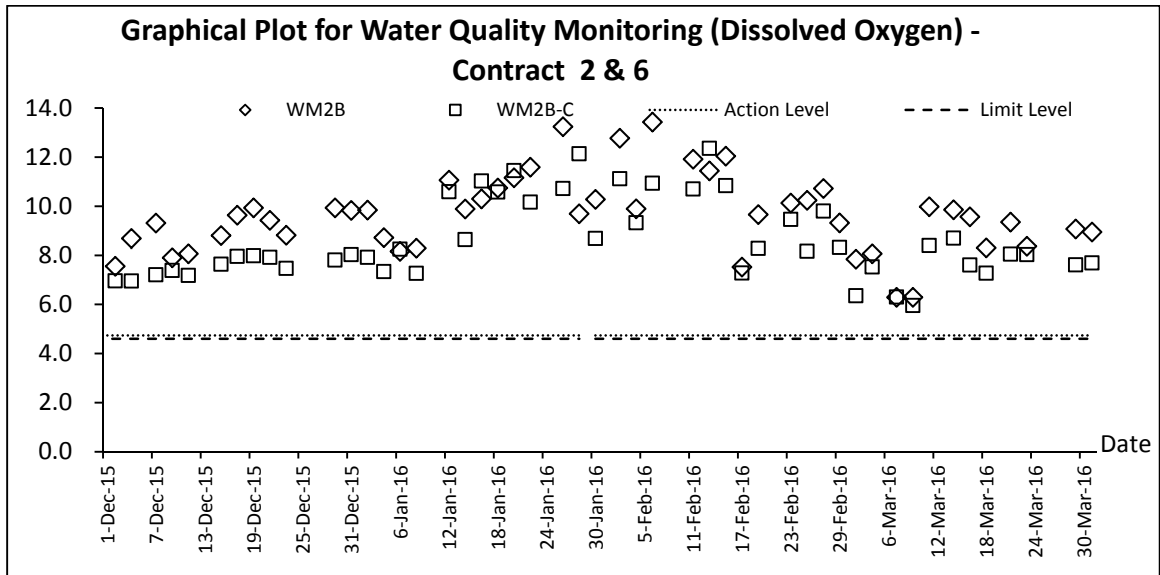
Water Quality











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-Mar-16	Tue	Mainly fine.Moderate easterly winds.	0	17.6	10.5	63.5	E/SE
2-Mar-16	Wed	Mainly fine.Moderate easterly winds.	0	17.1	9.1	55.5	E/SE
3-Mar-16	Thu	Fine. Dry in the afternoon. Light to moderate easterly winds.	0	18.2	7.2	71	E
4-Mar-16	Fri	Mainly cloudy. Sunny intervals during the day. Light to moderate easterly winds.	0	19.6	6	77	E
5-Mar-16	Sat	Mainly cloudy with a few fog and light rain patches.	Trace	21.4	13.3	79	E
6-Mar-16	Sun	Mainly cloudy with a few fog and light rain patches.	0	21.8	4.5	75	S/SW
7-Mar-16	Mon	Mainly cloudy with a few fog and light rain patches.	0.2	18.3	8	88.2	E
8-Mar-16	Tue	Fresh northerly winds, occasionally strong offshore and on high ground at first.	0	20.7	8.7	85.7	E/SE
9-Mar-16	Wed	Mainly cloudy with a few fog and light rain patches.	15.5	20.4	6.4	89.7	E/SE
10-Mar-16	Thu	Mainly cloudy with a few fog and light rain patches.	16.8	12.9	12	81.2	N
11-Mar-16	Fri	Moderate to fresh easterly winds	0.1	10.1	25	77	NE
12-Mar-16	Sat	Cloudy to overcast with occasional rain	0.1	12.2	36	87	E
13-Mar-16	Sun	Mainly fine. Moderate easterly winds.	6.8	16.2	6	90.5	N/NW
14-Mar-16	Mon	Fine. Dry in the afternoon. Light to moderate easterly winds.	0.8	14.3	6.2	75.5	N
15-Mar-16	Tue	Mainly cloudy. Sunny intervals during the day. Light to moderate easterly winds.	Trace	14.4	3.2	75	E
16-Mar-16	Wed	Moderate to fresh easterly winds	1.1	15.2	10.6	83.3	E/SE
17-Mar-16	Thu	Cloudy to overcast with occasional rain	2.2	17.3	14	90.5	E
18-Mar-16	Fri	Fine. Dry in the afternoon. Light to moderate easterly winds.	Trace	21.3	9	85.5	E/SE
19-Mar-16	Sat	Mainly cloudy with a few fog and light rain patches.	Trace	23.5	12.5	94	E
20-Mar-16	Sun	Moderate to fresh easterly winds	0.3	20.4	15.5	76	E/SE
21-Mar-16	Mon	Moderate to fresh easterly winds	59.6	18	15	85.7	E/SE
22-Mar-16	Tue	Cloudy to overcast with occasional rain	1.7	17.3	16.3	90	E/SE
23-Mar-16	Wed	Cloudy to overcast with occasional rain	8.7	19.9	8.9	90	E/SE
24-Mar-16	Thu	Cloudy to overcast with occasional rain	33.4	15	6.5	90	E/NE
25-Mar-16	Fri	Moderate to fresh easterly winds	1.4	13	19.4	75	NE
26-Mar-16	Sat	Moderate to fresh easterly winds	0	13.9	13.4	68	E
27-Mar-16	Sun	Moderate to fresh easterly winds	0	16.1	14.6	58	NE
28-Mar-16	Mon	Mainly cloudy with coastal fog.	0	15.7	7.4	58	E/SE
29-Mar-16	Tue	Light to moderate southeasterly winds.	Trace	17.5	6.5	59.5	SE
30-Mar-16	Wed	Light to moderate southeasterly winds.	Trace	21.1	6.5	70	E
31-Mar-16	Thu	Mainly cloudy with coastal fog.	0	22.5	6	74.5	SW

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 2016

(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	72.2029	0.0000	0.6482	31.8061	39.7486	0.7684	26.2000	0.0000	0.0000	1.2320	0.1247
February	55.6715	0.0000	1.0145	38.3484	16.3085	0.9343	8.3800	0.9800	0.0000	1.4080	0.1089
March	34.1616	0.0000	0.3100	29.3514	4.5003	0.9272	0.0000	0.0000	0.0000	11.7920	0.0682
April	0.0000										
May	0.0000										
June	0.0000										
Half-year total	162.0360	0.0000	1.9727	99.5059	60.5574	2.6299	34.5800	0.9800	0.0000	14.4320	0.3018
July	0.0000										
August	0.0000										
September	0.0000										
October	0.0000										
November	0.0000										
December	0.0000										
Yearly Total	162.0360	0.0000	1.9727	99.5059	60.5574	2.6299	34.5800	0.9800	0.0000	14.4320	0.3018

(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	570.9459	0.0000	20.8159	543.2162	6.9138	4.5492	14.1300	3.9220	1.5000	16.1920	1.1696
2016	162.0360	0.0000	1.9727	99.5059	60.5574	2.6299	34.5800	0.9800	0.0000	14.4320	0.3018
2017											
2018											
Total	1158.4225	0.0000	25.5248	1019.1167	113.7810	12.8036	51.9200	5.3410	1.5070	41.5040	3.7323

Remark:

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

3) Density of Spent Oil to be 0.88 metric ton/m3

Monthly Summary Waste Flow Table for 2016 (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	Chemical Waste	Others, e.g. general refuse
	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in m ³)	(in '000m ³)
Jan	2.430	0.253	0.030	0.000	2.400	0.799	0.001	0.000	0.000	0.000	0.115
Feb	1.225	0.651	0.020	0.000	1.205	1.141	0.000	0.000	0.000	0.000	0.110
Mar	1.084	0.417	0.000	0.000	1.084	0.831	0.000	0.000	0.001	0.000	0.090
Apr											
May											
Jun											
Sub-total	4.739	1.321	0.050	0.000	4.689	2.772	0.001	0.000	0.001	0.000	0.315
Jul											
Aug											
Sep											
Oct											
Nov											
Dec											
Total	4.739	1.321	0.050	0.000	4.689	2.772	0.001	0.000	0.001	0.000	0.315

- 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 2016

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	0.235	0	0	0	0	0.06
FEB	0	0	0	0	0	0.141	0	0	0	0	0.045
MAR	0	0	0	0	0	0.1785	0	0	0	0	0.055
APRIL											
MAY											
JUN											
Sub Total	0	0	0	0	0	0.5545	0	0	0	0	0.16
JUL											
AUG											
SEP											
OCT											
NOV											
DEC											
Total	0	0	0	0	0	0.55	0	0	0	0	0.16

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

Monthly Summary Waste Flow Table for 2016 (year)

Name of Person completing the record: KM LUI (EO)

Project : Liangtang / Heung Yuen Wai Boundary Control Point Site Formation and Infrastructure Works – Contract 6

Contract No.: CV/2013/08

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 '000 kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000 m ³)
Jan	58.943	0	3.811	12.131	43.001	31.248	0	0	0	0	0.695
Feb	74.418	0	8.785	39.85	25.783	6.552	0	0.097	0	0	0.339
Mar	43.764	0	6.438	12.034	25.292	3.288	0	0	0.007	0	0.042
Apr											
May											
Jun											
Sub-total	177.125	0	19.034	64.015	94.076	41.088	0	0.097	0.007	0	1.076
Jul											
Aug											
Sep											
Oct											
Nov											
Dec											
Total	346.348	0	37.568	80.799	227.981	48.337	0	0.391	0.007	32.28	4.152

- Notes:
- (1) The waste flow table shall also include C&D materials that are specified in the Contract to be imported for use at the Site.
 - (2) Plastics refer to plastic bottles/containers, plastic sheets/ foam from packaging materials.
 - (3) Broken concrete for recycling into aggregates.

MONTHLY SUMMARY WASTE FLOW TABLE

Name of Department: CEDD

Contract Title: Liantang/ Heung Yuen Wai Boundary Control Point
Site Formation and Infrastructure Works – Contract 7

Contract No.: NE/2014/03

Monthly Summary Waste Flow Table for 2016 (year)

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of Inert 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	Plastic (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)
Jan	0	0	0	0	0	0	0	0	0	0	0
Feb	0	0	0	0	0.16	0	0	0	0	0	0
Mar	0	0	0	0	0.135	0	0	0	0	0	0.005
Apr											
May											
June											
Sub-total	0	0	0	0	0.295	0	0	0	0	0	0.005
July											
Aug											
Sept											
Oct											
Nov											
Dec											
Total	0	0	0	0	0.295	0	0	0	0	0	0.005

Notes: (1) The waste flow table shall also include C&D materials that are specified in the Contract to be imported for use at the Site.
(2) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material.

Contract No. / Works Order No.: - SSC505**Monthly Summary Waste Flow Table for 2016** [year] [to be submitted not later than the 15th day of each month following reporting month]

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

Month	Actual Quantities of Inert Construction Waste Generated Monthly				
	(a)=(b)+(c)+(d)+(e) Total Quantity Generated	(b) Broken Concrete (see Note 4)	(c) Reused in the Contract	(d) Reused in other Projects	(e) Disposed of as Public Fill
	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)
Jan	0.800	0	0	0	0.800
Feb	0.858	0	0	0	0.858
Mar	0.793	0	0	0	0.793
Apr					
May					
Jun					
Sub-total	2.451	0	0	0	2.451
Jul					
Aug					
Sep					
Oct					
Nov					
Dec					
Total	2.451	0	0	0	2.451

Month	Actual Quantities of Non-inert Construction Waste Generated Monthly												
	Timber		Metals		Paper/ cardboard packaging		Plastics (see Note 3)		Chemical Waste		Other Recyclable Materials (see Page 3)		General Refuse disposed of at Landfill
	(in '000kg)		(in '000kg)		(in '000kg)		(in '000kg)		(in '000kg)		(in '000kg)		(in '000m ³)
	generated	recycled	generated	recycled	generated	recycled	generated	recycled	generated	recycled	generated	recycled	generated
Jan	0.000	0.000	4.73	4.73	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.072
Feb	0.000	0.000	0.0004	0.0004	0.0186	0.0186	0.000	0.000	0.000	0.000	0.021	0.021	0.065
Mar	0	0	52.752	52.752	0.044	0.044	0	0	0	0	0.05	0.05	0.059
Apr													
May													
Jun													
Sub-total	0	0	57.4824	57.4824	0.0626	0.0626	0	0	0	0	0.071	0.071	0.195
Jul													
Aug													
Sep													
Oct													
Nov													
Dec													
Total	0	0	57.4824	57.4824	0.0626	0.0626	0	0	0	0	0.071	0.071	0.195

Description of mode and details of recycling if any for the month e.g. XX kg of used timber was sent to YY site for transformation into fertilizers					
50kg of glass bottles were sent to <i>Action Health</i> for recycling	2kg of cans and 44kg of papers were sent to <i>Wong Kei</i> for recycling	0	0	0	0

- Notes:
- (1) The performance targets are given in the Particular Specification on Environmental Management Plan.
 - (2) The waste flow table shall also include construction waste that are specified in the Contract to be imported for use at the site.
 - (3) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material.
 - (4) Broken concrete for recycling into aggregates.
 - (5) If necessary, use the conversion factor: 1 full load of dumping truck being equivalent to 6.5 m³ by volume.

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

Appendix N


Investigation Report for Exceedance

Agreement No. CE 45/2008
Liantang/ Heung Yuen Wai Boundary Control Point and Associated Works
Investigation Report on Action or Limit Level Non-compliance

Project		CE 45/2008	
Date		2 March 2016	
Location		WM2B	
Time		11:10	
Parameter		Turbidity (NTU)	Suspended Solids (mg/L)
Action Level		11.4 AND 120% of upstream control station of the same day	11.8 AND 120% of upstream control station of the same day
Limit Level		12.3 AND 130% of upstream control station of the same day	12.4 AND 130% of upstream control station of the same day
Measured Levels	WM2B-C	3.5	2
	WM2B	Over ranged	1335.0
Exceedance		Limit Level	Limit Level
Investigation Results, Recommendations & Mitigation Measures		<ol style="list-style-type: none"> 1. According to the site record from the monitoring team during monitoring on 2 March 2016, muddy water was observed at WM2B and throughout the open channel. It is suspected that the muddy water was came from the construction site of North Portal. 2. As advised by CCKJV, construction activities carried out on 2 March 2016 at North Portal (upstream of WM2B) were bored piling and slope work. In normal practice, the wastewater generated from bored piling was recirculated to the nearest AquaSed for treatment and no discharge would be made as far as practicable. However, a pipe carrying wastewater from bored piling to the nearest AquaSed was burst on 2 March 2016 morning and the untreated wastewater were getting into the open channel accidentally. 3. CCKJV has immediate halted the bored piling work until the damaged pipe was replaced. Channel clearing was immediately carried out and muddy water in the open channel was pumped back to the AquaSed for treatment and recirculated for bored piling. However, the silt cumulated at the river bed was difficult to remove completely. During channel clearing, part of the muddy water was flowing out of the site and detected at WM2B. 4. It is considered that the exceedances were related to the pipe burst accident. CCKJV was advised to check the condition of connected pipe more frequently and ensure the wastewater treatment a facility is in proper function. 5. According to the Event and Action, the monitoring frequency at WM2B has been increase to daily due to the limit level exceedance recorded until no exceedances were triggered in consecutive days. Additional monitoring was conducted on 3 March 2016 and turbidity and SS exceedances were triggered too. Although the exceedances were concluded as not project related, CCKJV should continue fully implement the water mitigation measures as recommended in the implementation schedule for environmental mitigation measures in the EM&A Manual. 	

Prepared By : Nicola Hon

Designation : Environmental Consultant

Signature : 

Date : 16 March 2016

Photo Record



Photo 1
Muddy water was observed at WM2B and throughout the open channel on 2 March 2016.



Photo 2
The water samples collected at WM2B on 2 March 2016 was turbid.

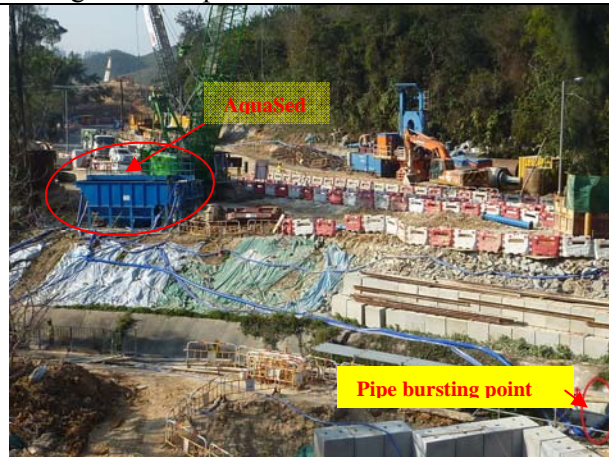


Photo 3
A pipe carrying wastewater from bored piling to the nearest AquaSed was burst on 2 March 2016 morning and the untreated wastewater water were getting into the open channel accidentally.



Photo 4
The muddy water in the open channel was pumped back to the AquaSed for treatment and recirculated for bored piling.

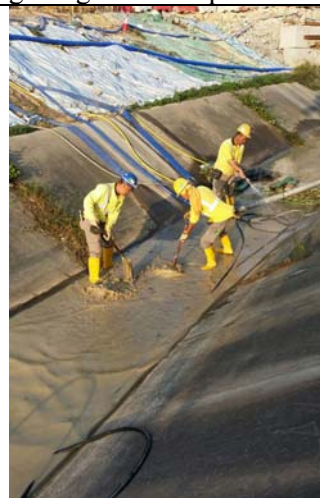


Photo 5
Channel clearing was immediately carried out and muddy water in the open channel was pumped back to the AquaSed for treatment and recirculated for bored piling.

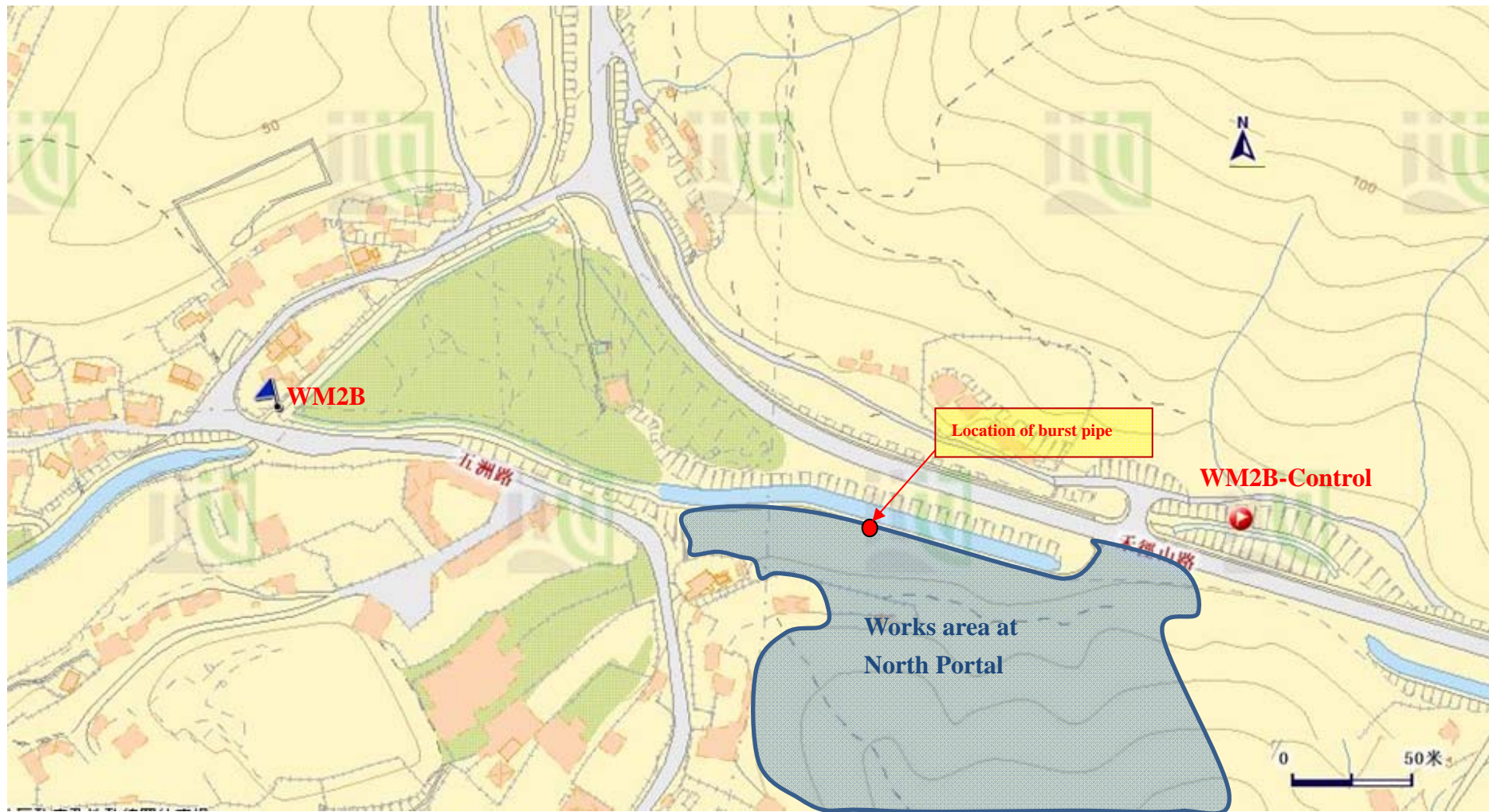


Figure 1 Location Map for Water Quality Monitoring Locations WM2B and WM2B-Control


Agreement No. CE 45/2008
Liantang/ Heung Yuen Wai Boundary Control Point and Associated Works
Investigation Report on Action or Limit Level Non-compliance

Project		CE 45/2008	
Date		3 March 2016	
Location		WM2B	
Time		9:30	
Parameter		Turbidity (NTU)	Suspended Solids (mg/L)
Action Level		11.4 AND 120% of upstream control station of the same day	11.8 AND 120% of upstream control station of the same day
Limit Level		12.3 AND 130% of upstream control station of the same day	12.4 AND 130% of upstream control station of the same day
Measured Levels	WM2B-C	3.9	3.0
	WM2B	20.7	21.0
Exceedance		Limit Level	Limit Level
Investigation Results, Recommendations & Mitigation Measures		<ol style="list-style-type: none"> 1. According to the site information provided from the CCKJV, construction activities carried out on 3 March 2016 at North Portal (upstream of WM2B) were bored piling and slope work. The monitoring locations and works area are shown in Figure 1. 2. According to the site record from the monitoring team during monitoring on 3 March 2016, very shallow water was measured at WM2B and the water depth was around 0.04m. (Photo 1) Although cumulated silt was observed at the channel bed, the water flowing in the channel and the samples collected at WM2B was visually clear. (Photo 2) Since the water sampling was carried out at the bridge over the drainage channel at shallow water, the sampled water could not avoid inclusion of the loose sediment and debris. 3. As advised by the CCKJV, the wastewater generated from the bored piling was recirculated and no discharge was made. As water mitigation measures, sump pits were constructed under the slopes to divert the site runoff for temporary storage and primarily desilting before divert to the AquaSed. Moreover, the slopes adjacent to channel were covered with tarpaulin sheet and hydro-seeding was carried out on the stabilized slope to minimize muddy runoff. 4. There were no rains recorded on 3 March 2016, therefore, generation of muddy runoff from the site was not likely to occur. In our investigation, it is considered that the exceedances were due to the shallow water and the disturbance of sediment at river bed. 5. According to the Event and Action, the monitoring frequency at WM2B has been increase to daily due to the limit level exceedance recorded until no exceedances were triggered in consecutive days. Additional monitoring was carried out on 4 March 2016 and turbidity exceedance was triggered too. Although the exceedance was concluded as not project related, CCKJV should continue fully implement the water 	

	mitigation measures as recommended in the implementation schedule for environmental mitigation measures in the EM&A Manual.
--	---

Prepared By : Nicola Hon

Designation : Environmental Consultant

Signature : 

Date : 16 March 2016

Photo Record

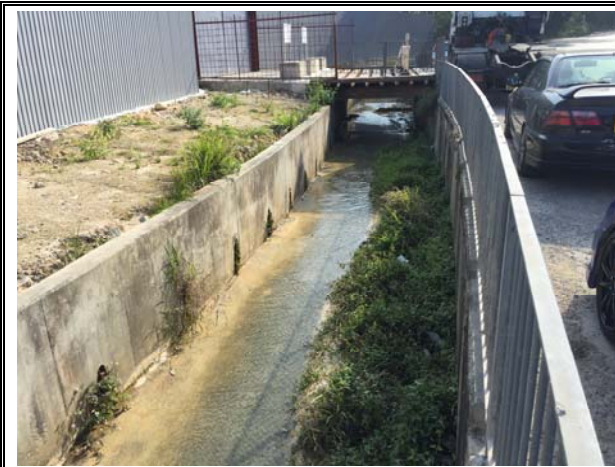


Photo 1

During water sampling on 3 March 2016, shallow water was observed at WM2B and the water quality at WM2B was visually clear.



Photo 2

The water samples collected at WM2B on 3 March 2016 was visually clear.

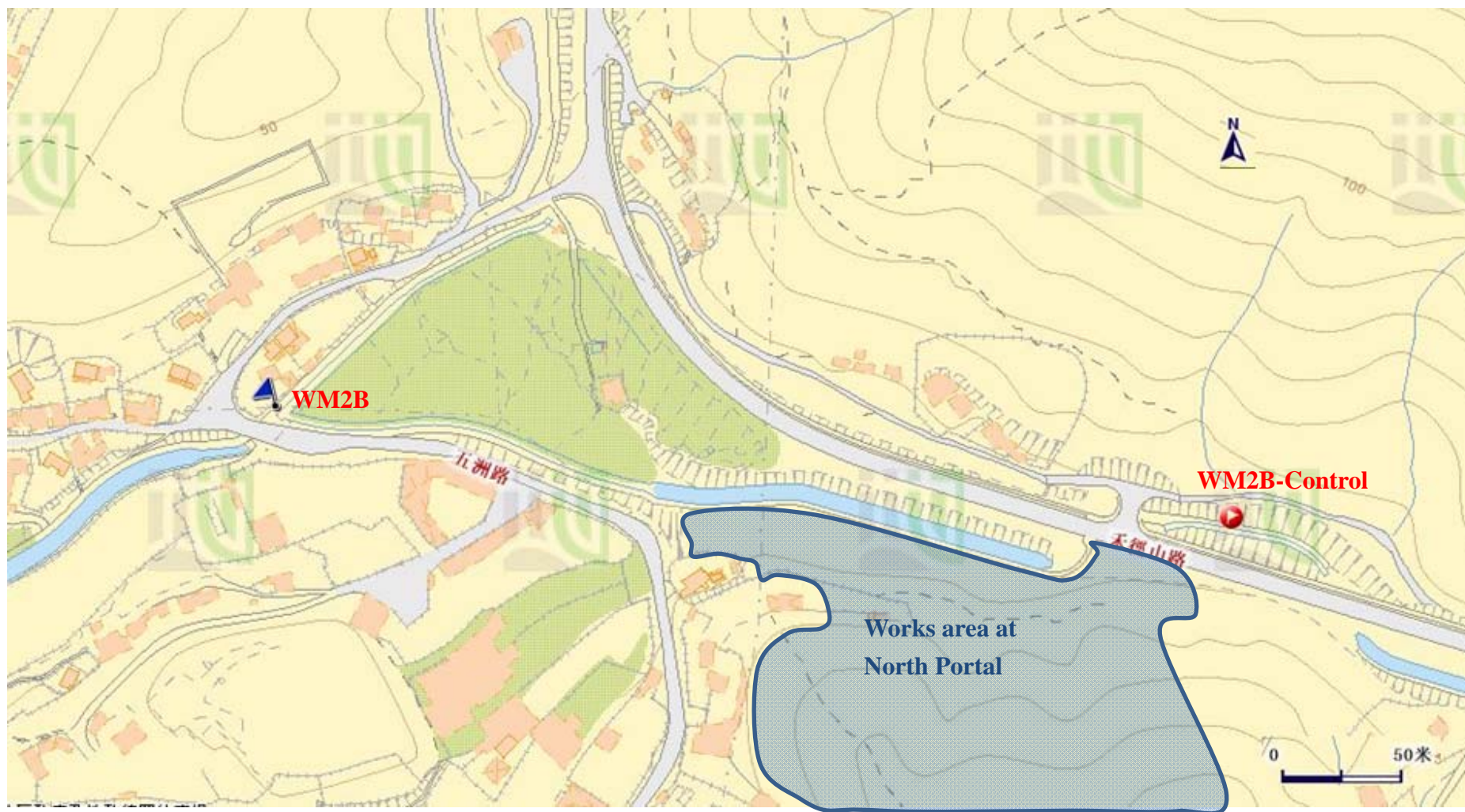


Figure 1 Location Map for Water Quality Monitoring Locations WM2B and WM2B-Control

Agreement No. CE 45/2008
Liantang/ Heung Yuen Wai Boundary Control Point and Associated Works
Investigation Report on Action or Limit Level Non-compliance

Project		CE 45/2008
Date		4 March 2016
Location		WM2B
Time		10:21
Parameter		Turbidity (NTU)
Action Level		11.4 AND 120% of upstream control station of the same day
Limit Level		12.3 AND 130% of upstream control station of the same day
Measured Levels	WM2B-C	9.5
	WM2B	24.1
Exceedance		Limit Level
Investigation Results, Recommendations & Mitigation Measures		<ol style="list-style-type: none"> 1. According to the site information provided from the CCKJV, construction activities carried out on 4 March 2016 at North Portal (upstream of WM2B) were bored piling and slope work. The monitoring locations and works area are shown in Figure 1. 2. According to the site record from the monitoring team during monitoring on 4 March 2016, very shallow water was measured at WM2B and the water depth was around 0.01m. (Photo 1) Although cumulated silt was observed at the channel bed, the water flowing in the channel and the samples collected at WM2B was visually clear. (Photo 2) Since the water sampling was carried out at the bridge over the drainage channel at shallow water, the sampled water could not avoid inclusion of the loose sediment and debris. 3. As advised by the Contractor, the wastewater generated from the bored pile works was recirculated to the AquaSed for treatment and discharge would be made when the effluent is overflow from the AquaSed. Since discharge license was not yet granted for the Contract, self-monitoring for the effluent quality would be conducted by the Contractor if discharge is required to ensure the discharge effluent complied with the relevant requirements. According to the self-monitoring record by the Contractor on 4 March 2016 the treated water in the AquaSed was visually acceptable. (Photo 3) 4. There were no rains recorded on 4 March 2016, therefore, generation of muddy runoff from the site was not likely to occur. In our investigation, it is considered that the exceedances were due to the shallow water and the disturbance of sediment at river bed. 5. According to the Event and Action, the monitoring frequency at WM2B has been increase to daily due to the limit level exceedance recorded until no exceedances were triggered in consecutive days. Additional monitoring was carried out on 5 March 2016 and turbidity exceedances were triggered. CCKJV should continue fully implement the water mitigation measures as recommended in the implementation schedule for environmental mitigation measures in the EM&A Manual.

Prepared By : _____ Nicola Hon _____

Designation : _____ Environmental Consultant _____

Signature : _____  _____

Date : _____ 16 March 2016 _____

Photo Record



Photo 1
During water sampling on 4 March 2016, shallow water was observed at WM2B and the water quality at WM2B was visually clear.



Photo 2
The water samples collected at WM2B on 4 March 2016 was visually clear.

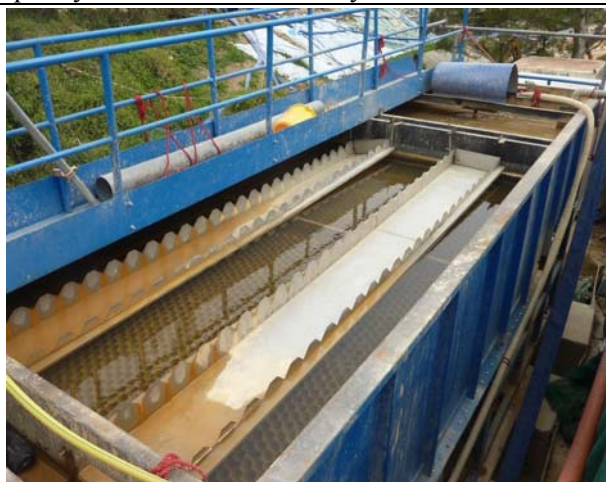


Photo 3
The treated water in the AquaSed was visually clear on 4 March 2016.

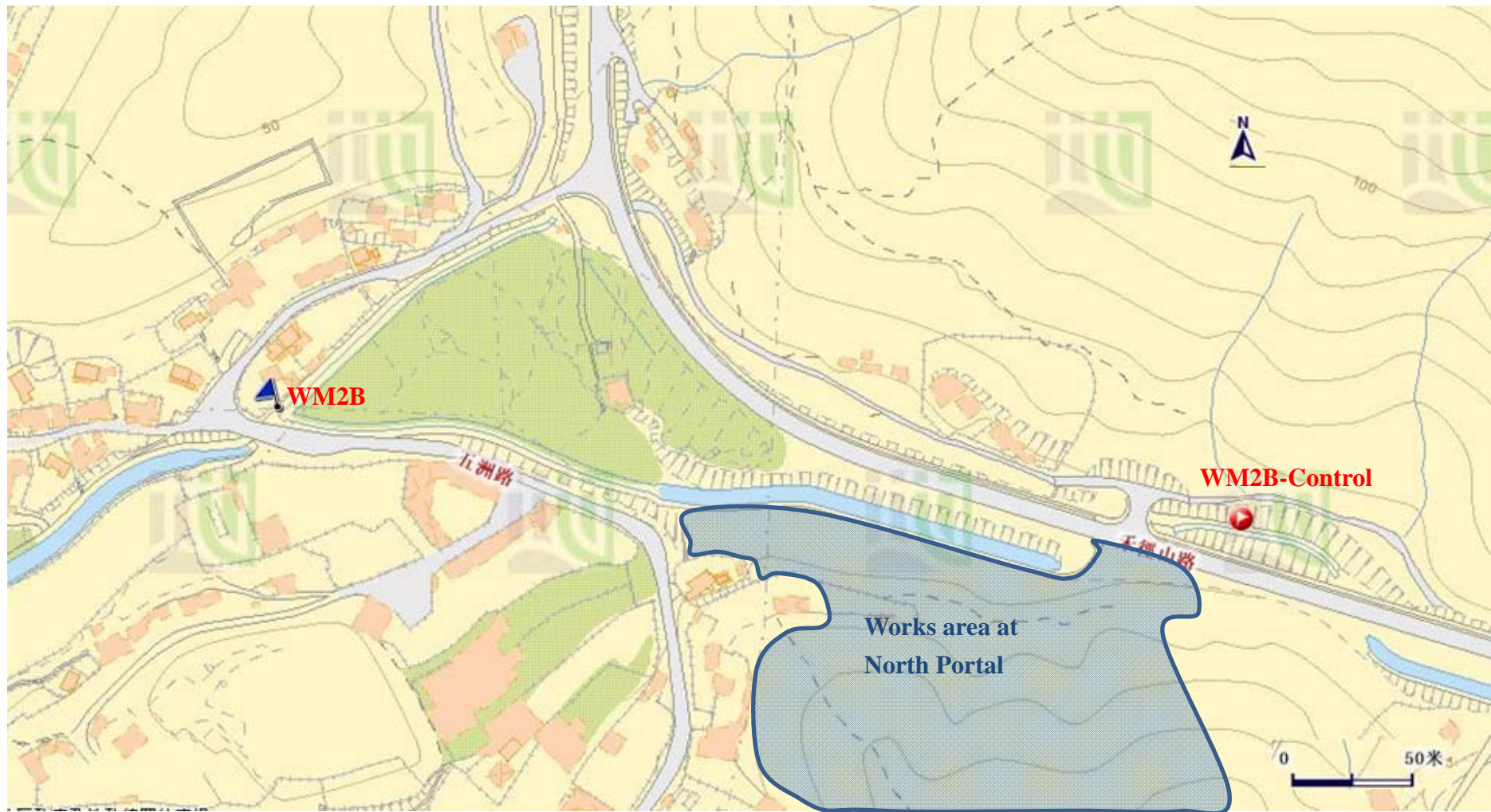


Figure 1 Location Map for Water Quality Monitoring Locations WM2B and WM2B-Control

Agreement No. CE 45/2008
Liantang/ Heung Yuen Wai Boundary Control Point and Associated Works
Investigation Report on Action or Limit Level Non-compliance

Project		CE 45/2008
Date		5 March 2016
Location		WM2B
Time		10:55
Parameter		Turbidity (NTU)
Action Level		11.4 AND 120% of upstream control station of the same day
Limit Level		12.3 AND 130% of upstream control station of the same day
Measured Levels	WM2B-C	2.6
	WM2B	40.2
Exceedance		Limit Level
Investigation Results, Recommendations & Mitigation Measures		<ol style="list-style-type: none"> 1. According to the site information provided from the CCKJV, construction activities carried out on 5 March 2016 at North Portal (upstream of WM2B) were bored piling and slope work. The monitoring locations and works area are shown in Figure 1. 2. According to the site record from the monitoring team during monitoring on 5 March 2016, very shallow water was measured at WM2B and the water depth was around 0.01m. (Photo 1) The water flowing in the channel and the samples collected at WM2B was slightly turbid. (Photo 2) Since the water sampling was carried out at the bridge over the drainage channel at shallow water, the sampled water could not avoid inclusion of the loose sediment and debris. 3. As advised by the CCKJV, channel clearing was carried out on 5 March 2016 to remove the silt cumulated at the channel bed. The turbid water in the open channel was pumped back to the AquaSed for treatment and recirculated for bored piling. However, the silt cumulated at the river bed was difficult to remove completely. During channel clearing, sand bag barrier was provided in the channel to prevent the turbid water flowing further downstream, however, part of the turbid water was flowing out of the site and detected at WM2B. (Photo 3) 4. In our investigation, it is considered that the exceedance was due to the channel cleaning. CCKJV should to ensure the turbid water at the adjacent open channel was entirely blocked by the sand bag barrier or other means to prevent it flowing further downstream before carry out the channel cleaning. 5. According to the Event and Action, the monitoring frequency at WM2B has been increase to daily due to the limit level exceedance recorded until no exceedances were triggered in consecutive days. Additional monitoring was carried out on 7 March 2016 no exceedances were triggered. However, CCKJV is reminded continue fully implement the water

	mitigation measures as recommended in the implementation schedule for environmental mitigation measures in the EM&A Manual.
--	---

Prepared By : Nicola Hon

Designation : Environmental Consultant

Signature : 

Date : 16 March 2016

Photo Record



Photo 1

During water sampling on 5 March 2016, shallow water was observed at WM2B and the water quality at WM2B was slightly turbid.



Photo 2

The water samples collected at WM2B on 5 March 2016 was slightly turbid.



Photo 3

Channel cleaning at the open channel was carried on 5 March 2016.

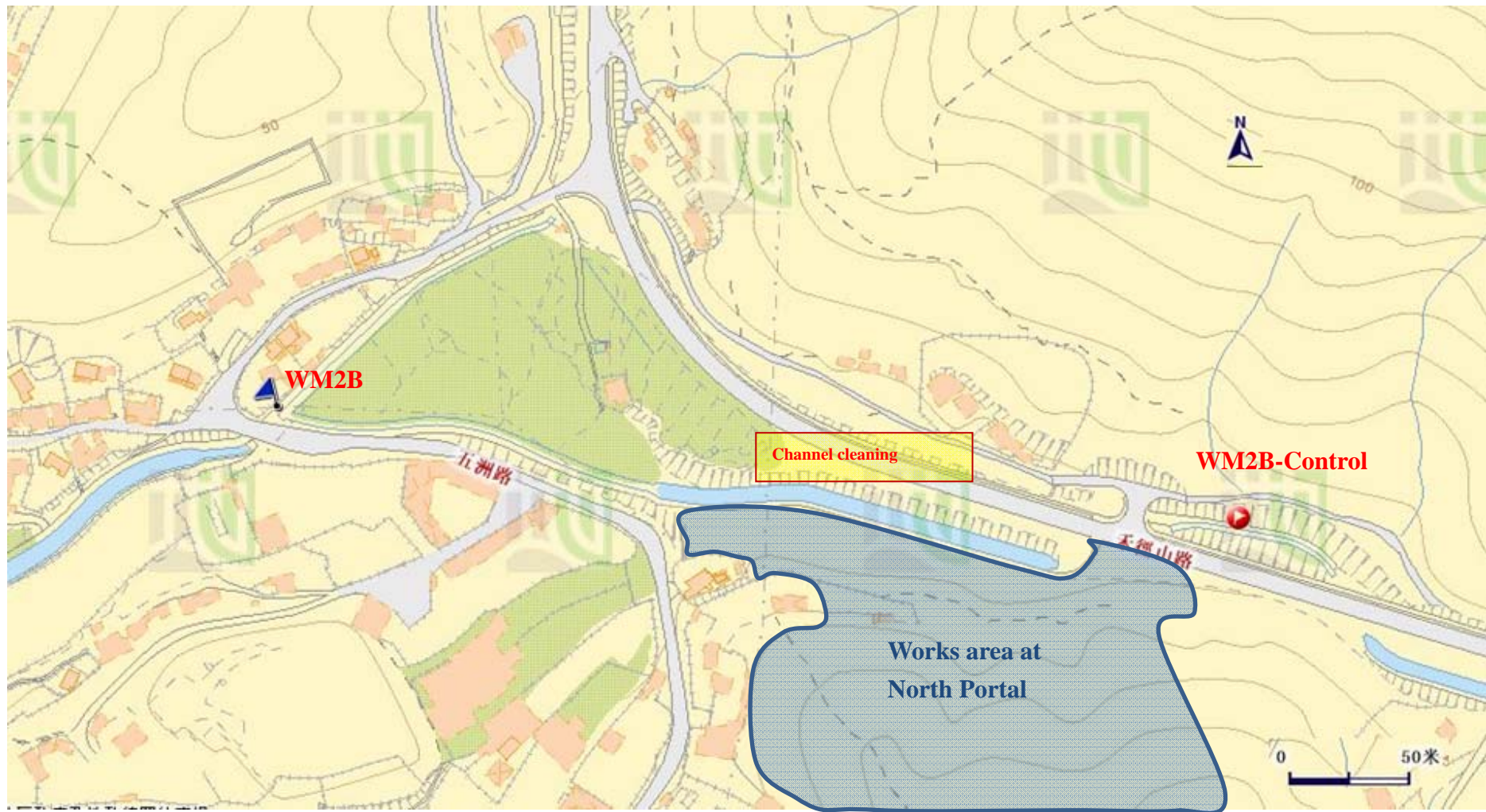


Figure 1 Location Map for Water Quality Monitoring Locations WM2B and WM2B-Control

To Mr. Edwin Au **Fax No** 2403 1162

Company Sang Hing Civil – Richwell Machinery JV

cc

From Nicola Hon **Date** 23 March 2016

Our Ref TCS00694/13/300/F0183a **No of Pages** 6 (Incl. cover sheet)

RE Agreement No. CE 45/2008
Liantang/ Heung Yuen Wai Boundary Control Point and Associated Works
Investigation Report of Exceedance of Water Quality at Location WM1 on 4 and 9
March 2016 (Contract 5)

If you do not receive all pages, or transmission is illegible, please contact the originator on (852) 2959-6059 to re-send. Should this facsimile be sent to the wrong fax number, would receiver please destroy this copy and notify Action-United Environmental Services & Consulting immediately. Thank you.

Dear Sir,

Further to the following Notification of Exceedance (NOE) ref.:

TCS00694/13/300/F0162 dated 7 March 2016
TCS00694/13/300/F0170 dated 9 March 2016
TCS00694/13/300/F0175 dated 11 March 2016.

Please find attached the “Investigation Report on Action or Limit Level Non-compliance” referenced above for your follow up action.

Should you have any queries or need further information, please do not hesitate to contact us or the undersigned at **Tel: 2959-6059 or Fax: 2959-6079**.

Yours Faithfully,
For and on Behalf of
Action-United Environmental Services & Consulting



Nicola Hon
Environmental Consultant

Encl.


c.c.	Mr. David Chan (EPD)	Fax:	2685 1155
	Mr. Kelvin Lee (ER, AECOM)	Fax:	2674 7732
	Mr. Antony Wong (IEC, SMEC)		By email

Agreement No. CE 45/2008
Liantang/ Heung Yuen Wai Boundary Control Point and Associated Works
Investigation Report on Action or Limit Level Non-compliance

Project		CE 45/2008			
Date		4 March 2016	9 March 2016	4 March 2016	9 March 2016
Location		WM1			
Time		11:35	11:00	11:35	11:00
Parameter		Turbidity (NTU)		Suspended Solids (mg/L)	
Action Level		51.3 AND 120% of upstream control station of the same day		54.5 AND 120% of upstream control station of the same day	
Limit Level		67.6 AND 130% of upstream control station of the same day		64.9 AND 130% of upstream control station of the same day	
Measured	WM1-C	9.1	23.0	2.5	11.0
Levels	WM1	146.0	82.7	185.5	51.0
Exceedance		Limit Level	Limit Level	Limit Level	NO exceedance
Investigation Results, Recommendations & Mitigation Measures		<ol style="list-style-type: none"> 1. According to the site information provided from the SRJV, construction activities carried out on 4 and 9 March 2016 were construction of u-channel and bituminous laying at Lin Ma Hang Road. (Figure 1) No wastewater was generated from the abovementioned work and no construction activities were conducted at Boundary Control Point (BCP) which near Kong Yiu Kong. 2. According to the site record from the monitoring team during monitoring on 4 March 2016, turbid water was observed at WM1 whereas the water quality at WM1-C was visually clear. (Photo 1 to 3) On 9 March 2016, slightly turbid water was observed at both WM1-C and WM1. (Photo 4 to 6) 3. During site inspection by the RE, IEC, SRJV and ET on 1 and 8 March 2016, no adverse water quality impact was observed. (Photo 7 & 8) Moreover, there were no wastewater generation activities carried out and no discharge made into the river course. In our investigation, it is considered that the exceedances were unlikely due to the Contract. 4. According to the Event and Action, the monitoring frequency at WM1 has been increase to daily due to the limit level exceedance recorded until no exceedances were triggered in consecutive days. Additional monitoring was carried out on 5 and 10 March 2016 in which turbidity and SS exceedances were triggered on 10 March 2016. SRJV should continue fully implement the water mitigation measures as recommended in the implementation schedule for environmental mitigation measures in the EM&A Manual. 			

Prepared By : Nicola Hon

Designation : Environmental Consultant

Signature : 

Date : 23 March 2016

Photo Record



Photo 1

During water sampling on 4 March 2016, turbid water was observed at WM1.



Photo 2

During water sampling on 4 March 2016, the water quality at WM1-C was visually clear



Photo 3

The water samples collected at WM1 on 4 March 2016 were slightly turbid.



Photo 4

During water sampling on 9 March 2016, slightly turbid water was observed at WM1.

AUES



Photo 5
During water sampling on 9 March 2016, the water quality at WM1-C was slightly turbid.



Photo 6
The water samples collected at both WM1-C and WM1 on 9 March 2016 were slightly turbid.



Photo 7
During site inspection on 1 March 2016, construction of u-channel was observed. No adverse water quality impact was noted.



Photo 8
During site inspection on 8 March 2016, construction of u-channel was observed. No adverse water quality impact was noted.

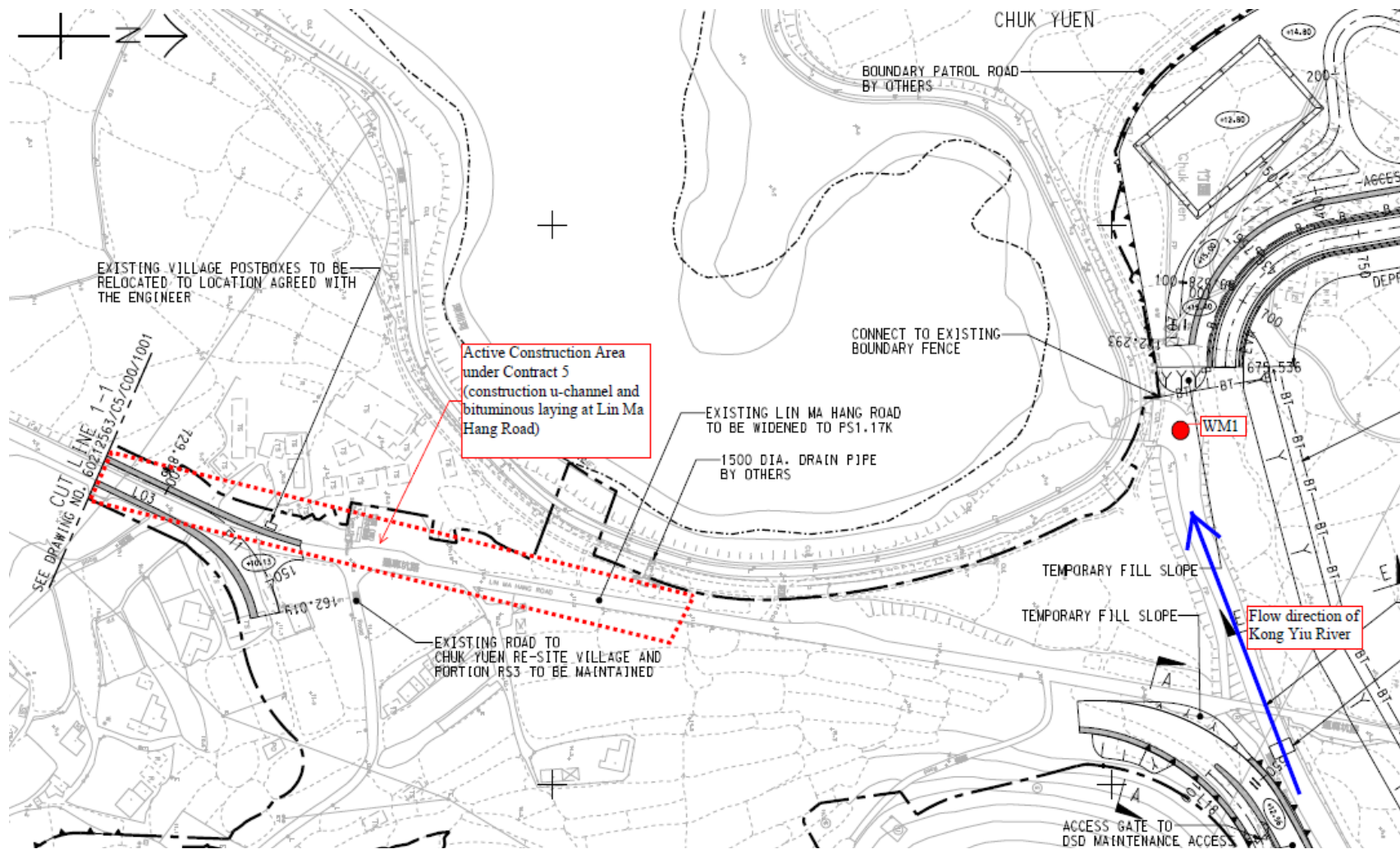


Figure 1 Location Map

Agreement No. CE 45/2008
Liantang/ Heung Yuen Wai Boundary Control Point and Associated Works
Investigation Report on Action or Limit Level Non-compliance

Project		CE 45/2008			
Date		4 March 2016	9 March 2016	4 March 2016	9 March 2016
Location		WM1			
Time		11:35	11:00	11:35	11:00
Parameter		Turbidity (NTU)		Suspended Solids (mg/L)	
Action Level		51.3 AND 120% of upstream control station of the same day		54.5 AND 120% of upstream control station of the same day	
Limit Level		67.6 AND 130% of upstream control station of the same day		64.9 AND 130% of upstream control station of the same day	
Measured Levels	WM1-C	9.1	23.0	2.5	11.0
	WM1	146.0	82.7	185.5	51.0
Exceedance		Limit Level	Limit Level	Limit Level	NO exceedance
Investigation Results, Recommendations & Mitigation Measures		<ol style="list-style-type: none"> 1. According to the site information provided from the CCKJV, construction activities carried out on 4 and 9 March 2016 at Boundary Control Point (BCP) which upstream of WM1 was bored piling. The monitoring locations and works area are shown in Figure 1. 2. According to the site record from the monitoring team during monitoring on 4 March 2016, turbid water was observed at WM1 whereas the water quality at WM1-C was visually clear. (Photo 1 to 3) On 9 March 2016, slightly turbid water was observed at both WM1-C and WM1. (Photo 4 to 6) Moreover, during the course of sampling on 4 and 9 March 2016, turbid water was observed at upstream of the works area of Contract 6. (Photo 7 & 8) 3. As advised by the Contractor, the wastewater generated from the bored pile works was recirculated to the AquaSed for treatment and discharge would be made when the effluent is overflow from the AquaSed. (Photo 9) Since discharge license was not yet granted for the Contract, self-monitoring for the effluent quality would be conducted by the Contractor if discharge is required to ensure the discharge effluent complied with the relevant requirements. 4. Since turbid water was observed at upstream of the site area of Contract 6, it is considered that the exceedances were unlikely due to the Contract. 5. According to the Event and Action, the monitoring frequency at WM1 has been increase to daily due to the limit level exceedance recorded until no exceedances were triggered in consecutive days. Additional monitoring was carried out on 5 and 10 March 2016 in which turbidity and SS exceedances were triggered on 10 March 2016. CCKJV should continue fully implement the water mitigation measures as recommended in the implementation schedule for environmental mitigation measures in the EM&A Manual. 			


Prepared By : _____ Nicola Hon _____
Designation : _____ Environmental Consultant _____
Signature : _____  _____
Date : _____ 23 March 2016 _____

Photo Record



Photo 1
During water sampling on 4 March 2016, turbid water was observed at WM1.



Photo 2
During water sampling on 4 March 2016, the water quality at WM1-C was visually clear



Photo 3
The water samples collected at WM1 on 4 March 2016 were slightly turbid.



Photo 4
During water sampling on 9 March 2016, slightly turbid water was observed at WM1.



Photo 5
During water sampling on 9 March 2016, the water quality at WM1-C was slightly turbid.



Photo 6
The water samples collected at both WM1-C and WM1 on 9 March 2016 were slightly turbid.



Photo 7

During water sampling on 4 March 2016, turbid water was observed at upstream of the works area of Contract 6. (works area of Contract 6 is after the Bridge)



Photo 8

During water sampling on 9 March 2016, turbid water was observed at upstream of the works area of Contract 6. (works area of Contract 6 is after the Bridge)



Photo 9

The wastewater generated from the bored pile works was recirculated to the AquaSed for treatment and discharge would be made when the effluent is overflow from the AquaSed.

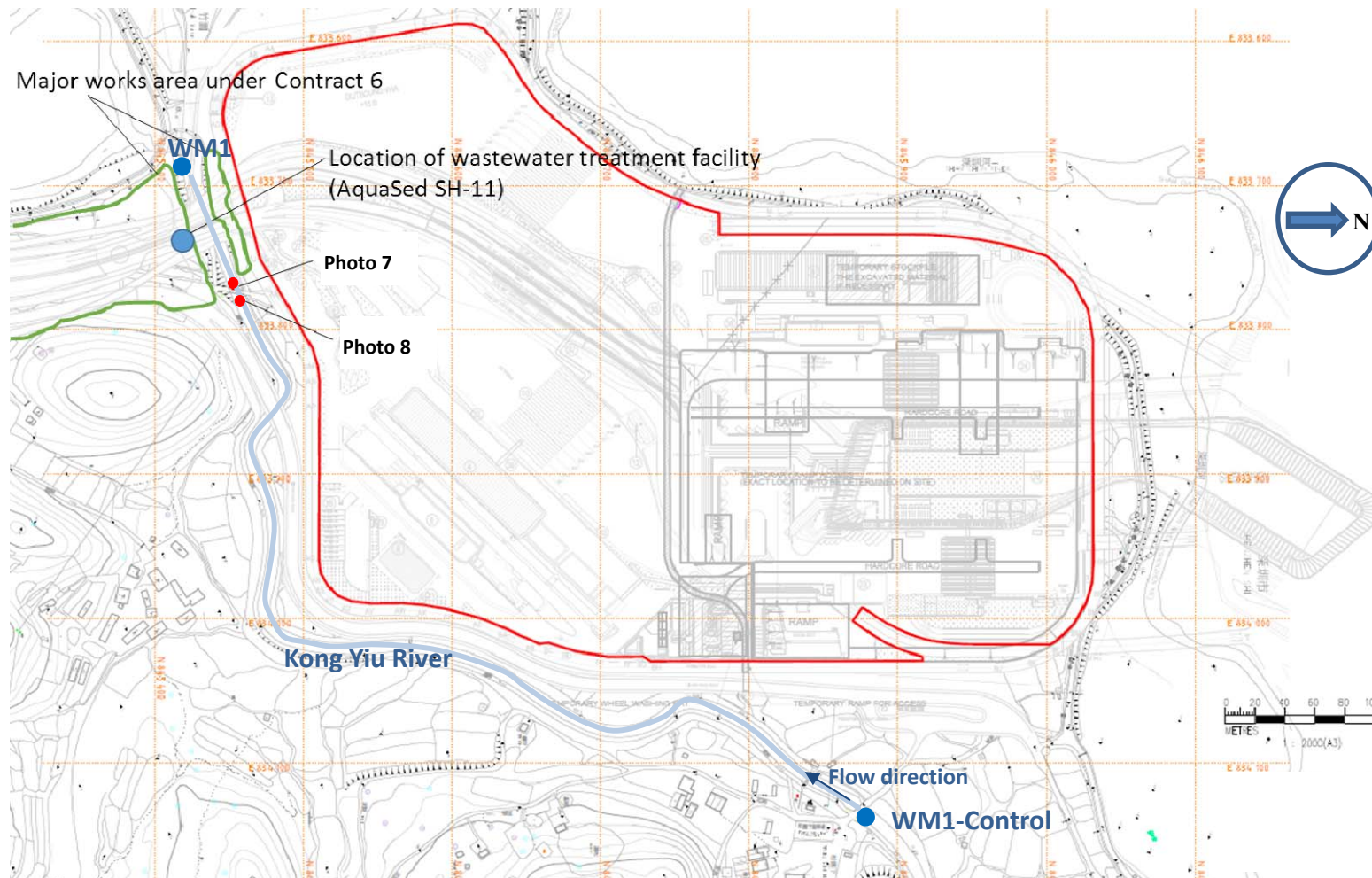


Figure 1 Location Map for Water Quality Monitoring Locations WM1 and WM1-C

To Mr. Jon Kitching **Fax No** 2743 1600
Company Leighton Contractors (Asia) Limited
cc
From Nicola Hon **Date** 15 March 2016
Our Ref TCS00769/15/300/F0066 **No of Pages** 8 (Incl. cover sheet)

RE Architectural Services Department (ArchSD) Contract No: SS C505
Construction of Liantang/Heung Yuen Wai Boundary Control Point (BCP) – BCP
Buildings and Associated Facilities
Investigation Report for Exceedance of Water Quality Monitoring at Location WM1
on 4 and 9 March 2016

If you do not receive all pages, or transmission is illegible, please contact the originator on (852) 2959-6059 to re-send. Should this facsimile be sent to the wrong fax number, would receiver please destroy this copy and notify Action-United Environmental Services & Consulting immediately. Thank you.

Dear Sir,

Further to the Notification of Exceedance (NOE) ref. of following:-

TCS00769/15/300/F0056 dated 7 March 2016
TCS00769/15/300/F0062 dated 9 March 2016
TCS00769/15/300/F0064 dated 11 March 2016

Please find attached the “Investigation Report on Action or Limit Level Non-compliance” referenced above for your follow up action.

Should you have any queries or need further information, please do not hesitate to contact us or the undersigned at **Tel: 2959-6059 or Fax: 2959-6079**.

Yours Faithfully,
For and on Behalf of
Action-United Environmental Services & Consulting



Nicola Hon
Environmental Consultant
Encl.

c.c.	Mr. David Chan (EPD)	Fax:	2685 1155
	Mr. William WL Cheng (ASD)		By e-mail
	Mr. Justin Cheung (Ronald Lu)		By e-mail
	Mr. Antony Wong (IEC, SMEC)		By e-mail
	Mr. Simon Leung (ER, AECOM)	Fax:	2674 7732

Agreement No. CE 45/2008
Liantang/ Heung Yuen Wai Boundary Control Point and Associated Works

Investigation Report on Action or Limit Level Non-compliance

Project		CE 45/2008			
Contract		SS C505			
Monitoring Location		WM1			
Date		4 March 2016	9 March 2016	4 March 2016	9 March 2016
Time		11:35	11:00	11:35	11:00
Parameter		Turbidity (NTU)		Suspended Solids (mg/L)	
Action Level		51.3 AND 120% of upstream control station of the same day		54.5 AND 120% of upstream control station of the same day	
Limit Level		67.6 AND 130% of upstream control station of the same day		64.9 AND 130% of upstream control station of the same day	
Measured levels	WM1-C	9.1	23.0	2.5	11.0
	WM1	146.0	82.7	185.5	51.0
Exceedance		Limit Level	Limit Level	Limit Level	NO exceedance
Investigation Results, Recommendations & Mitigation Measures		<ol style="list-style-type: none"> 1. According to the site information provided by the Contractor, the major construction activities carried out on 4 and 9 March 2016 included excavation, formwork erection, soil compaction, driven pile and bored piling which are illustrated in Figure 1. It is noted that the majority active construction area were not closed to Kong Yiu River. (Figure 2) 2. According to the field data record by ET on 4 and 9 March 2016, cloudy water was observed at WM1 whereas the water quality at WM1-C was visually clear. (Photo 1 to 6) 3. In view of the construction activities on 4 and 9 March 2016 and confirmed by the Contractor, wastewater was generated during the bored piling work only and the wastewater was recirculated for the piling work used. If water discharge is required, they will follow the temporary site drainage plan in which wastewater would be diverted to the perimeter channel and then collected to the wastewater treatment plant for treatment before discharge. (Figure 3) It is noted that the discharge point connecting public drainage was located at the west of the site and the discharge water would not flow to WM1 and its upstream. (Figure 3) 4. During site inspection on 2 and 9 March 2016, it was observed that the perimeter channel and the wastewater treatment facilities were in proper function. (Photo 7 & 9) The effluent from the AquaSed on 2 March 2016 was visually clear whereas no discharge was made on 9 March 2016. (Photo 8 & 10) Moreover, no major water impact was observed during site inspection on 2 and 9 March 2016. 5. In view of the topography of the construction site, the formation level of the site is lower than the roads bounding the site (around 2m height difference), it is considered that the wastewater generated on-site is not likely flowing out of the site boundary. (Photo 11) As advised by the Contractor, around 90% of treated water is reused on-site (water spread for dust suppression) whereas the rest of the treatment wastewater would be discharge off site at the approval discharge point. 			

	<p>6. There were no exceedances triggered in the subsequent monitoring result after 5 and 7 March 2016 and 11 and 12 March 2016. According to the above investigation, it is considered that the exceedances were not likely related to the works under the Contract.</p>
<p>Action to be taken</p>	<p>The Contractor is reminded to fully implement the water mitigation measures as recommended in the implementation schedule for environmental mitigation measures in the EM&A Manual.</p>

Prepared By : Nicola Hon

Designation : Environmental Consultant

Signature : 

Date : 15 March 2016



Photo 1
Cloudy water was observed at WM1 on 4 March 2016.



Photo 2
Clear water was observed at WM1-C on 4 March 2016.



Photo 3
The water collected at WM1 on 4 March 2016 was slightly cloudy.



Photo 4
Cloudy water was observed at WM1 on 9 March 2016.



Photo 5
Clear water was observed at WM1-C on 9 March 2016.



Photo 6
The water collected at WM1 on 9 March 2016 was slightly cloudy.



Photo 7
During site inspection on 2 March 2016, the perimeter channel was in proper function.



Photo 8
During site inspection on 2 March 2016, it was observed that the effluent from the AquaSed was visually clear.



Photo 9
During site inspection on 9 March 2016, the perimeter channel was in proper function.



Photo 10
During site inspection on 9 March 2016, there was no discharge observed from the wastewater treatment system.



Photo 11
Temporary drainage channel has been constructing at the periphery of the site and the formation level of the site is lower than the roads bounding the site

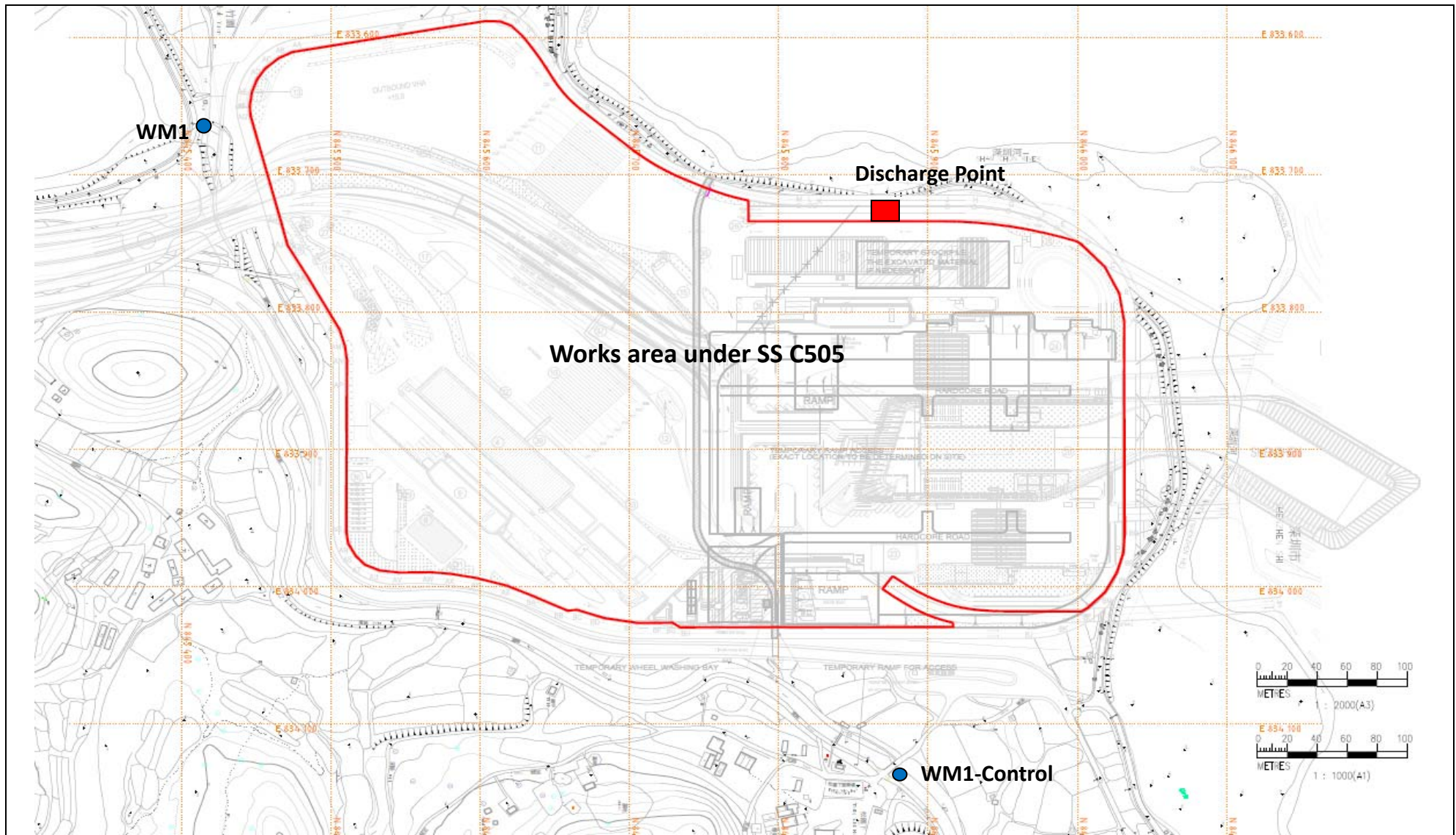


Figure 2 Location Map of Water Monitoring Location

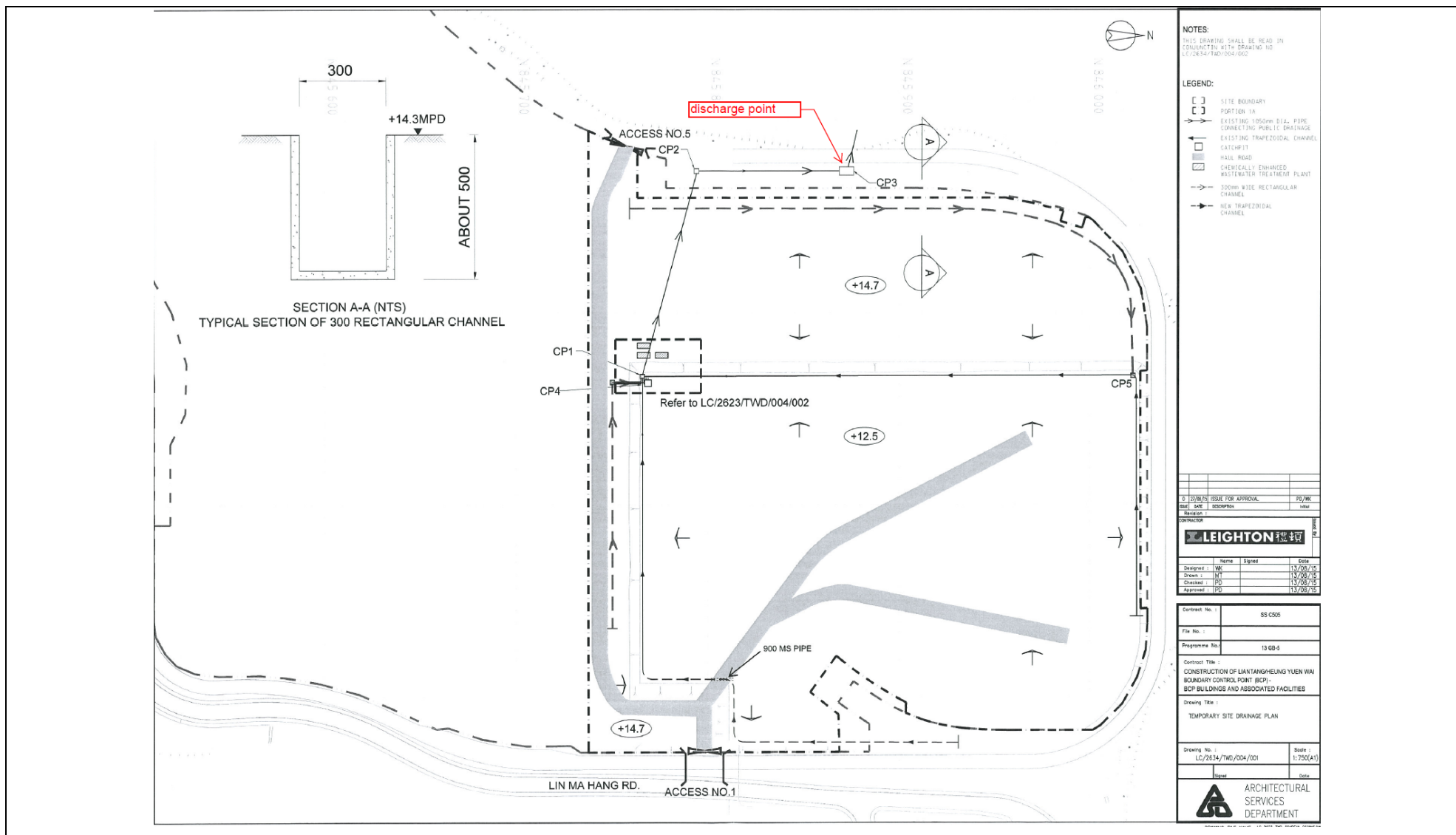


Figure 3 Temporary Site Drainage Plan

Agreement No. CE 45/2008
Liantang/ Heung Yuen Wai Boundary Control Point and Associated Works
Investigation Report on Action or Limit Level Non-compliance

Project		CE 45/2008					
Date		8 March 2016	9 March 2016	10 March 2016	8 March 2016	9 March 2016	10 March 2016
Location		WM2B					
Time		11:10	11:52	14:19	11:10	11:52	14:19
Parameter		Turbidity (NTU)			Suspended Solids (mg/L)		
Action Level		11.4 AND 120% of upstream control station of the same day			11.8 AND 120% of upstream control station of the same day		
Limit Level		12.3 AND 130% of upstream control station of the same day			12.4 AND 130% of upstream control station of the same day		
Measured Levels	WM2B-C	4.0	5.0	5.2	4.0	5.5	6.0
	WM2B	221.5	14.9	27.3	138.0	12.0	16.0
Exceedance		Limit Level	Limit Level	Limit Level	Limit Level	Action Level	Limit Level
Investigation Results, Recommendations & Mitigation Measures		<ol style="list-style-type: none"> 1. According to the site information provided from the CCKJV, construction activities carried out on 8 to 10 March 2016 at North Portal (upstream of WM2B) were bored piling and slope work. The monitoring locations and works area are shown in Figure 1. 2. According to the site record from the monitoring team during monitoring on 8 March 2016, very shallow water was measured at WM2B and the water depth was around 0.02m. (Photo 1) The water flowing in the channel and the samples collected at WM2B was slightly turbid. (Photo 2) On 9 and 10 March 2016, very shallow water was measured at WM2B and the water depth was around 0.02m and the water flowing in the open channel was visually clear. (Photo 3 to 5) Since the water sampling was carried out at the bridge over the drainage channel at shallow water, the sampled water could not avoid inclusion of the loose sediment and debris. 3. As advised by the CCKJV, desilting of the open channel adjacent to the site was carried out during 8 to 10 March 2016 to remove the silt cumulated at the channel bed. (Photo 6) During the process of desilting, the turbid water inside in channel was blocked by the bar screen and sand bag barriers to prevent it flowing further downstream. Then, the turbid water in the open channel was pumped to the AquaSed for treatment and recirculated to the desilting works. The performance AquaSed was regularly checked by CCKJV to ensure it functioned properly. (Photo 7) 4. During site inspection on 10 March 2016, it was observed that desilting of open channel still carrying out. (Photo 8 & 9) Although stacks of sand bag barrier were provided in the channel to block the turbid water, it only retarded the flow rate and some of the turbid water was flowing out of the site and detected at WM2B. In our investigation, it is considered that the exceedance was due to the channel desilting. To enhance the mitigation measures, the Contractor was advised to provide more power pumps to facilitate the desilting work and minimize the amount of turbid water flowing out 					

	<p>of the site.</p> <p>5. According to the Event and Action, the monitoring frequency at WM2B has been increase to daily due to the limit level exceedance recorded until no exceedances were triggered in consecutive days. Additional monitoring was carried out on 11 March 2016 and turbidity and SS exceedances were triggered. CCKJV should continue fully implement the water mitigation measures as recommended in the implementation schedule for environmental mitigation measures in the EM&A Manual.</p>
--	--

Prepared By : Nicola Hon

Designation : Environmental Consultant

Signature : 

Date : 17 March 2016

Photo Record



Photo 1
During water sampling on 8 March 2016, shallow water was observed at WM2B and the water quality at WM2B was slightly turbid.

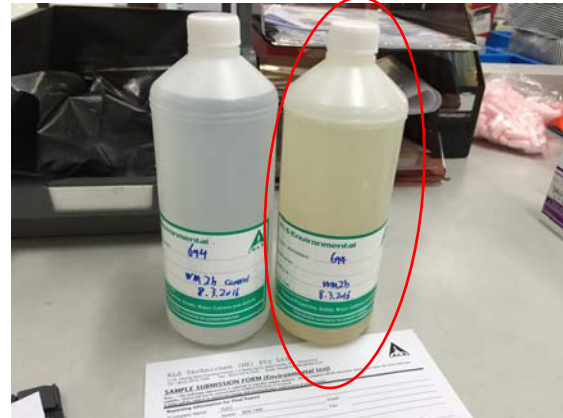


Photo 2
The water samples collected at WM2B on 8 March 2016 was slightly turbid.

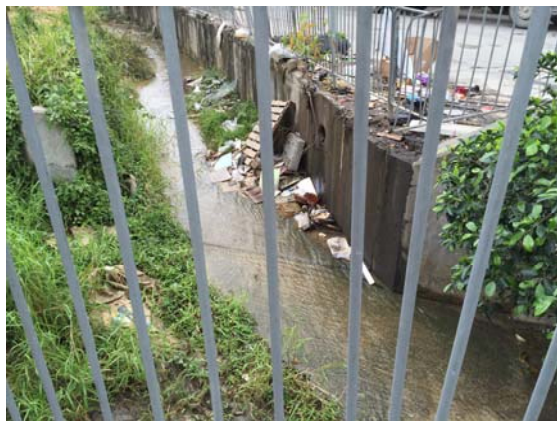


Photo 3
During water sampling on 9 March 2016, shallow water was observed at WM2B and the water quality at WM2B was visually clear.



Photo 4
The water samples collected at WM2B on 9 March 2016 was visually clear.



Photo 5
During water sampling on 10 March 2016, shallow water was observed at WM2B and the water quality at WM2B was visually clear.



Photo 6
Desilting of open channel was carried on 8 March 2016. The turbid water was blocked by the bar screen to prevent it flowing further downstream.

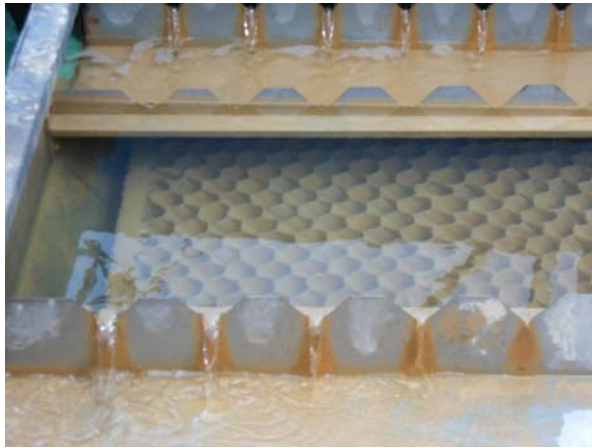


Photo 7
CCKJV was regularly checked the performance AquaSed to ensure it functioned properly. (8 March 2016)



Photo 8
During site inspection on 10 March 2016, it was observed that desilting of open channel was carried out.



Photo 9
During site inspection on 10 March 2016, it was observed desilting work at upstream portion was completed

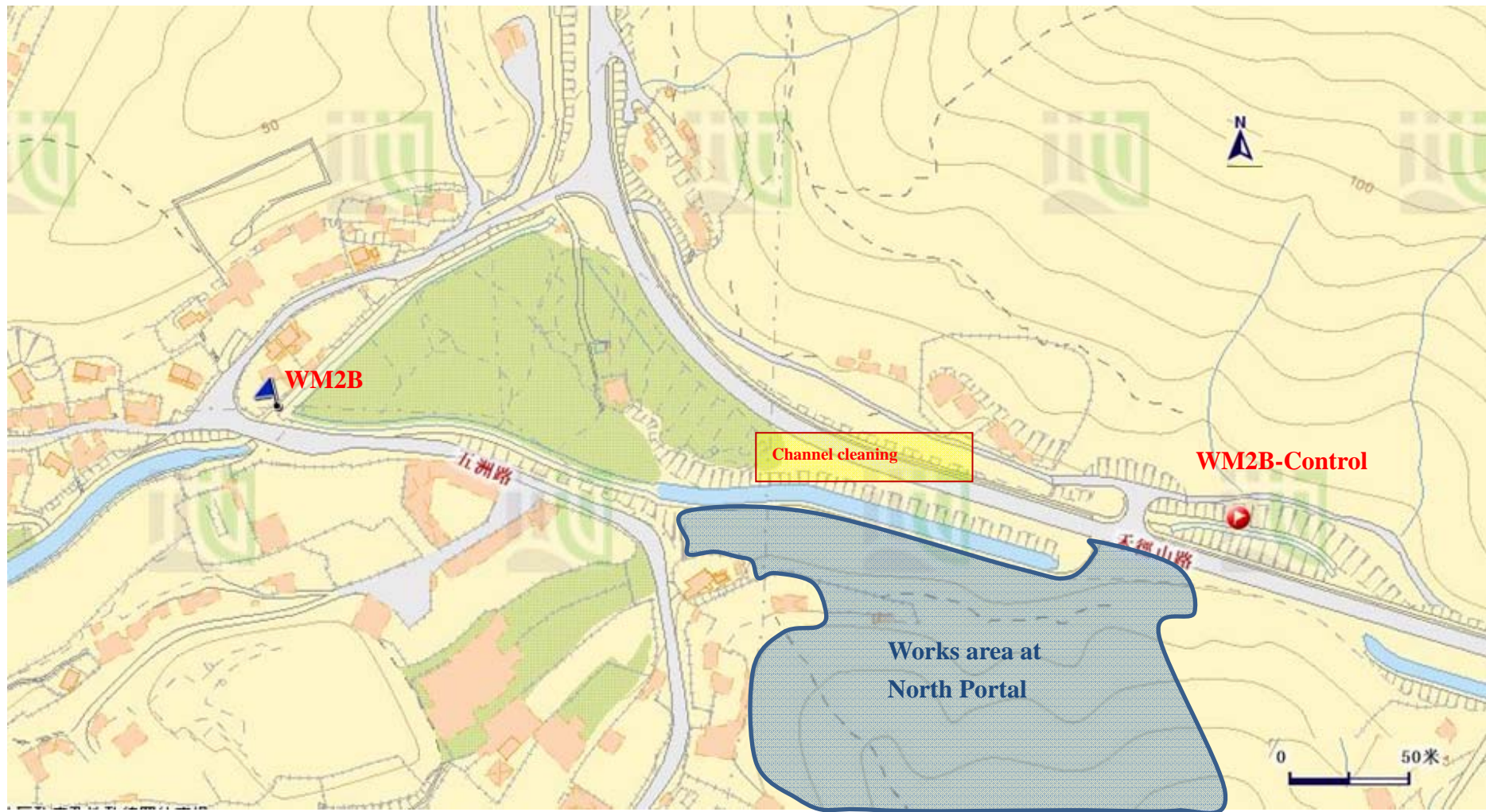


Figure 1 Location Map for Water Quality Monitoring Locations WM2B and WM2B-Control

Agreement No. CE 45/2008
Liantang/ Heung Yuen Wai Boundary Control Point and Associated Works
Investigation Report on Action or Limit Level Non-compliance

Project		CE 45/2008	
Date		11 March 2016	
Location		WM2B	
Time		11:04	
Parameter		Turbidity (NTU)	Suspended Solids (SS)
Action Level		11.4 AND 120% of upstream control station of the same day	11.8 AND 120% of upstream control station of the same day
Limit Level		12.3 AND 130% of upstream control station of the same day	12.4 AND 130% of upstream control station of the same day
Measured Levels	WM2B-C	5.1	2.0
	WM2B	87.6	70.0
Exceedance		Limit Level	Limit Level
Investigation Results, Recommendations & Mitigation Measures		<ol style="list-style-type: none"> 1. According to the site information provided from the CCKJV, construction activities carried out on 11 March 2016 at North Portal (upstream of WM2B) were bored piling and slope work. The monitoring locations and works area are shown in Figure 1. 2. According to the site record from the monitoring team during monitoring on 11 March 2016, very shallow water was measured at WM2B and the water depth was around 0.02m and the samples collected at WM2B was slightly turbid. (Photo 1 & 2) 3. As advised by the Contractor, desilting of the open channel adjacent to the site was carried out on 10 March 2016. On 11 March 2016, the remaining turbid water caused by to the desilting work in the open channel was blocked by the bar screen to prevent it flow to further downstream. The turbid water was then pumped to the AquaSed for treatment and recirculated to the bored piling work. However, the water recirculation pump was detached from the water pipe accidentally and causing overflow of turbid water through the bar screen to downstream. (Photo 3 and 4) Although stack of sand bag barrier was provided after the screen bar, some turbid water was flowing to further downstream and detected at WM2B. 4. The Contractor immediately fixed the detached recirculation pump and water pipe and the function of the recirculation pump was back to normal in the afternoon. It is concluded that the exceedances were a single incident. 5. According to the Event and Action, the monitoring frequency at WM2B has been increase to daily due to the limit level exceedance recorded until no exceedances were triggered in consecutive days. Additional monitoring was carried out on 12 March 2016 and no exceedance was triggered. Nevertheless, CCKJV should continue fully implement the water mitigation measures as recommended in the implementation schedule for environmental mitigation measures in the EM&A Manual. 	

Prepared By : Nicola Hon

Designation : Environmental Consultant

Signature : 

Date : 24 March 2016

Photo Record



Photo 1

During water sampling on 11 March 2016, shallow water was observed at WM2B and the water quality at WM2B was slightly turbid.



Photo 2

The water samples collected at WM2Bon 11 March 2016 was slightly turbid.



Photo 3

On 11 March 2016, the water recirculation pump was detached from the water pipe accidentally and causing overflow of turbid water through the bar screen to downstream.



Photo 4

On 11 March 2016, the water recirculation pump was detached from the water pipe accidentally and causing overflow of turbid water through the bar screen to downstream.

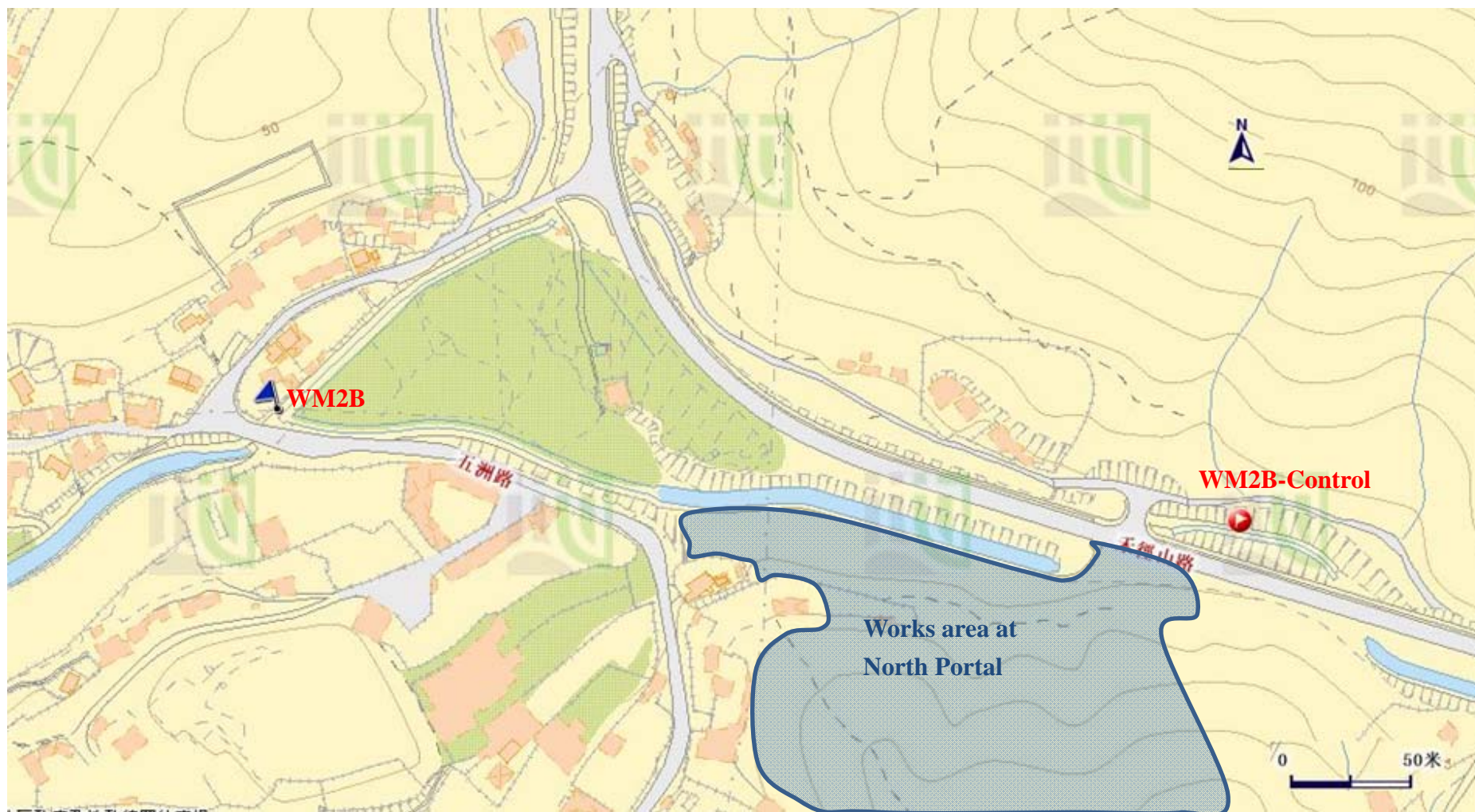


Figure 1 Location Map for Water Quality Monitoring Locations WM2B and WM2B-Control


Agreement No. CE 45/2008
Liantang/ Heung Yuen Wai Boundary Control Point and Associated Works
Investigation Report on Action or Limit Level Non-compliance

Project		CE 45/2008	
Date		11 March 2016	
Location		WM2A	
Time		10:30	
Parameter		Turbidity (NTU)	Suspended Solids (mg/L)
Action Level		11.4 AND 120% of upstream control station of the same day	11.6 AND 120% of upstream control station of the same day
Limit Level		12.3 AND 130% of upstream control station of the same day	17.3 AND 130% of upstream control station of the same day
Measured Levels	WM2A-C	16.1	7.0
	WM2A	198.5	164.5
Exceedance		Limit Level	Limit Level
Investigation Results, Recommendations & Mitigation Measures		<ol style="list-style-type: none"> 1. According to the site information provided from the CCKJV, construction activities carried out on 11 March 2016 at Bridge D (upstream of WM2A) were mainly piling works. The monitoring locations and works area are shown in Figure 1. 2. According to the site record from the monitoring team during monitoring on 11 March 2016, turbid water was observed at WM2A (Photo 1 & 2). 3. As water mitigation measures, wastewater treatment facilities including one AquaSed and three series of sedimentation tank have been installed for piling work. (Photo 3 and 4) As advised by the Contractor, the wastewater generated from piling was recirculated and discharge could be made when water overflow from the AquaSed. Since discharge license was not yet granted for the Contract, self-monitoring for the effluent quality would be conducted by the Contractor if discharge is required to ensure the discharge effluent complied with the relevant requirements. 4. According to the photo record from the monitoring team on 11 March 2016, the condition of the water quality besides of Ping Yuen River of Bridge D was normal and no turbid water was observed. (Photo 5) Moreover, concrete block and sand bag act as a bund was provided at the area of the piling works besides of Ping Yuen River of Bridge D. (Photo 6) CCKJV advised that the construction of concrete bund will be continuously constructed along the piling area. 5. Since there were no trails of turbid water discharge from the construction site, it is considered that exceedances were unlikely due to the Contract. 6. According to the Event and Action, the monitoring frequency at WM2A has been increase to daily due to the limit level exceedance recorded until no exceedances were triggered in consecutive days. There were no exceedance triggered at WM2A for monitoring on 12 and 14 March 2016. Nevertheless, the Contractor should continue to fully 	

	implement the water mitigation measures as recommended in the implementation schedule for environmental mitigation measures in the EM&A Manual.
--	---

Prepared By : Nicola Hon

Designation : Environmental Consultant

Signature : 

Date : 24 March 2016

Photo Record



Photo 1
During water sampling on 11 March 2016, turbid water was observed at WM2A.



Photo 2
The water samples collected at WM2A on 11 March 2016 was turbid.



Photo 3
Wastewater treatment facilities was installed for piling work at Bridge D.



Photo 4
Wastewater treatment facilities was installed for piling work at Bridge D. Moreover, concrete block and sand bag act as a bund was provided at the area of the piling works besides of Ping Yuen River of Bridge D.



Photo 5

According to the photo record from the monitoring team on 11 March 2016, the condition of the water quality besides of Ping Yuen River of Bridge D was normal and no turbid water was observed.



Photo 6

According to the photo record from the monitoring team on 11 March 2016, the condition of the water quality besides of Ping Yuen River of Bridge D was normal and no turbid water was observed. Moreover, concrete block and sand bag act as a bund was provided at the area of the piling works besides of Ping Yuen River of Bridge D.

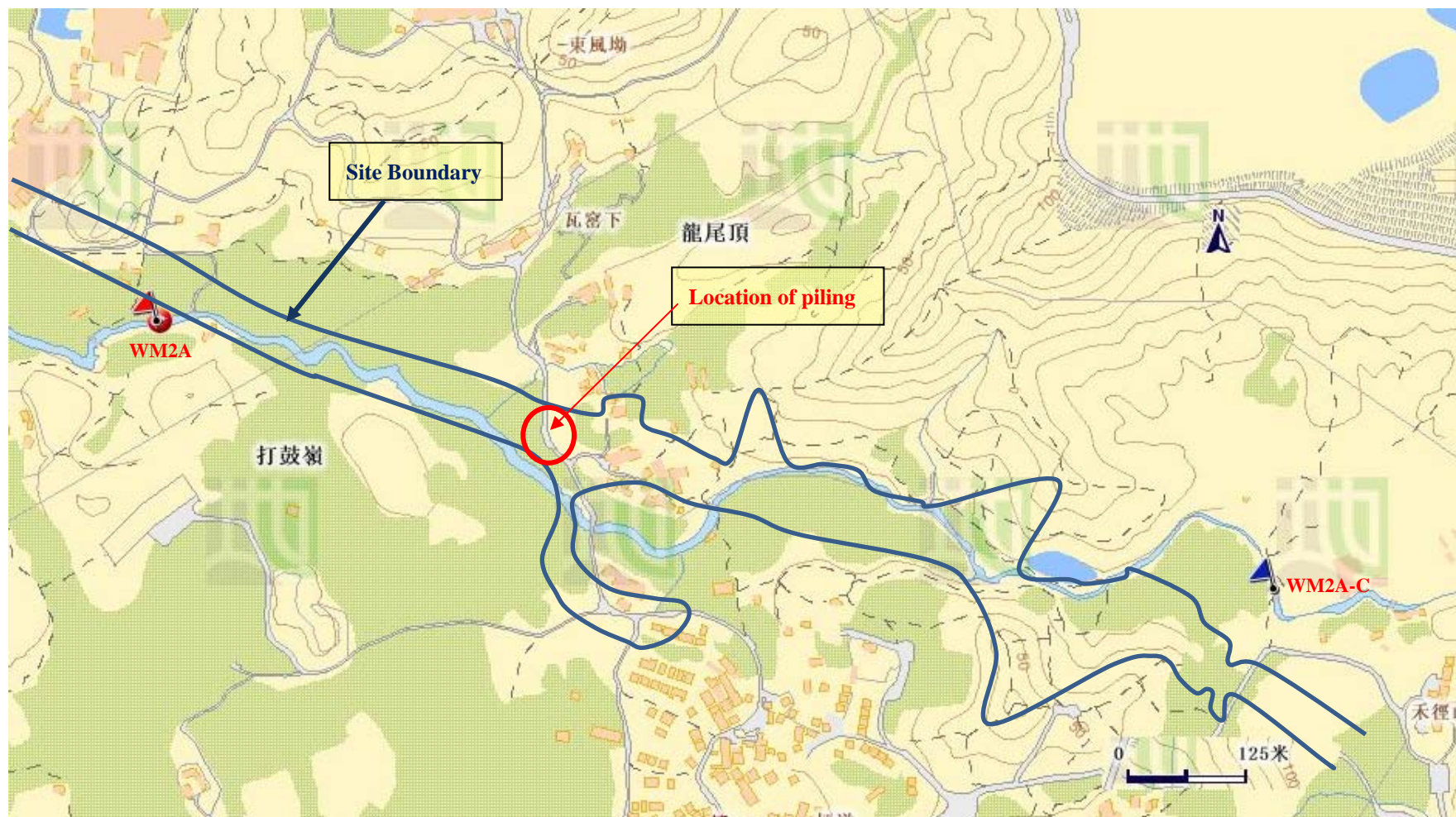


Figure 1 Location Map for Water Quality Monitoring Locations WM2A and WM2A-Control

To Mr. Edwin Au **Fax No** 2403 1162

Company Sang Hing Civil – Richwell Machinery JV

cc

From Nicola Hon **Date** 24 March 2016

Our Ref TCS00694/13/300/F0197 **No of Pages** 4 (Incl. cover sheet)

RE Agreement No. CE 45/2008
Liantang/ Heung Yuen Wai Boundary Control Point and Associated Works
Investigation Report of Exceedance of Water Quality at Location WM1 on 10 March
2016 (Contract 5)

If you do not receive all pages, or transmission is illegible, please contact the originator on (852) 2959-6059 to re-send. Should this facsimile be sent to the wrong fax number, would receiver please destroy this copy and notify Action-United Environmental Services & Consulting immediately. Thank you.

Dear Sir,

Further to the following Notification of Exceedance (NOE) ref.:

TCS00694/13/300/F0162 dated 7 March 2016
TCS00694/13/300/F0170 dated 9 March 2016
TCS00694/13/300/F0175 dated 11 March 2016.

Please find attached the “Investigation Report on Action or Limit Level Non-compliance” referenced above for your follow up action.

Should you have any queries or need further information, please do not hesitate to contact us or the undersigned at **Tel: 2959-6059 or Fax: 2959-6079**.

Yours Faithfully,
For and on Behalf of
Action-United Environmental Services & Consulting



Nicola Hon
Environmental Consultant

Encl.

c.c.	Mr. David Chan (EPD)	Fax:	2685 1155
	Mr. Kelvin Lee (ER, AECOM)	Fax:	2674 7732
	Mr. Antony Wong (IEC, SMEC)		By email

Agreement No. CE 45/2008
Liantang/ Heung Yuen Wai Boundary Control Point and Associated Works
Investigation Report on Action or Limit Level Non-compliance

Project		CE 45/2008	
Date		10 March 2016	
Location		WM1	
Time		13:03	
Parameter		Turbidity (NTU)	Suspended Solids (mg/L)
Action Level		51.3 AND 120% of upstream control station of the same day	54.5 AND 120% of upstream control station of the same day
Limit Level		67.6 AND 130% of upstream control station of the same day	64.9 AND 130% of upstream control station of the same day
Measured	WM1-C	47.2	35.0
Levels	WM1	352.0	196.0
Exceedance		Limit Level	Limit Level
Investigation Results, Recommendations & Mitigation Measures		<ol style="list-style-type: none"> 1. According to the site information provided from the SRJV, construction activities carried out on 10 March 2016 were construction of u-channel and bituminous laying at Lin Ma Hang Road. (Figure 1) No wastewater was generated from the abovementioned work and no construction activities were conducted at Boundary Control Point (BCP) which near Kong Yiu Kong. 2. According to the site record from the monitoring team during monitoring on 10 March 2016, turbid water was observed at WM1 and the water quality at WM1-C was slightly turbid. (Photo 1 & 2) 3. During site inspection by the RE, IEC, SRJV and ET on 8 and 15 March 2016, no adverse water quality impact was observed. (Photo 7 & 8) Moreover, there were no wastewater generation activities carried out and no discharge made into the river course. In our investigation, it is considered that the exceedances were unlikely due to the Contract. 4. According to the Event and Action, the monitoring frequency at WM1 has been increase to daily due to the limit level exceedance recorded until no exceedances were triggered in consecutive days. Additional monitoring was carried out on 11 and 12 March 2016 and no exceedance was recorded. However, SRJV should continue fully implement the water mitigation measures as recommended in the implementation schedule for environmental mitigation measures in the EM&A Manual. 	

Prepared By : _____ Nicola Hon

Designation : _____ Environmental Consultant

Signature : _____ 

Date : _____ 24 March 2016

Photo Record



Photo 1

During water sampling on 10 March 2016, turbid water was observed at WM1.

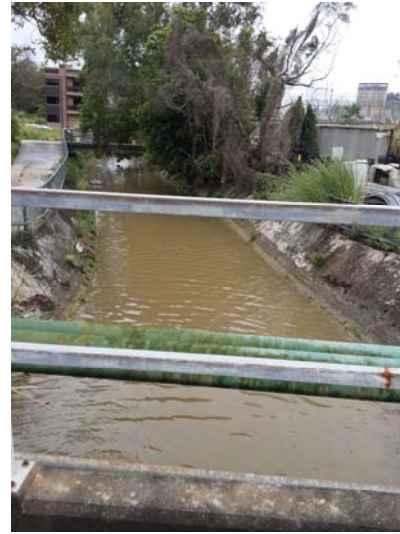


Photo 2

During water sampling on 10 March 2016, the water quality at WM1-C was slightly turbid.



Photo 3

During site inspection on 8 March 2016, construction of u-channel was observed. No adverse water quality impact was noted.



Photo 4

During site inspection on 15 March 2016, construction of u-channel was observed. No adverse water quality impact was noted.

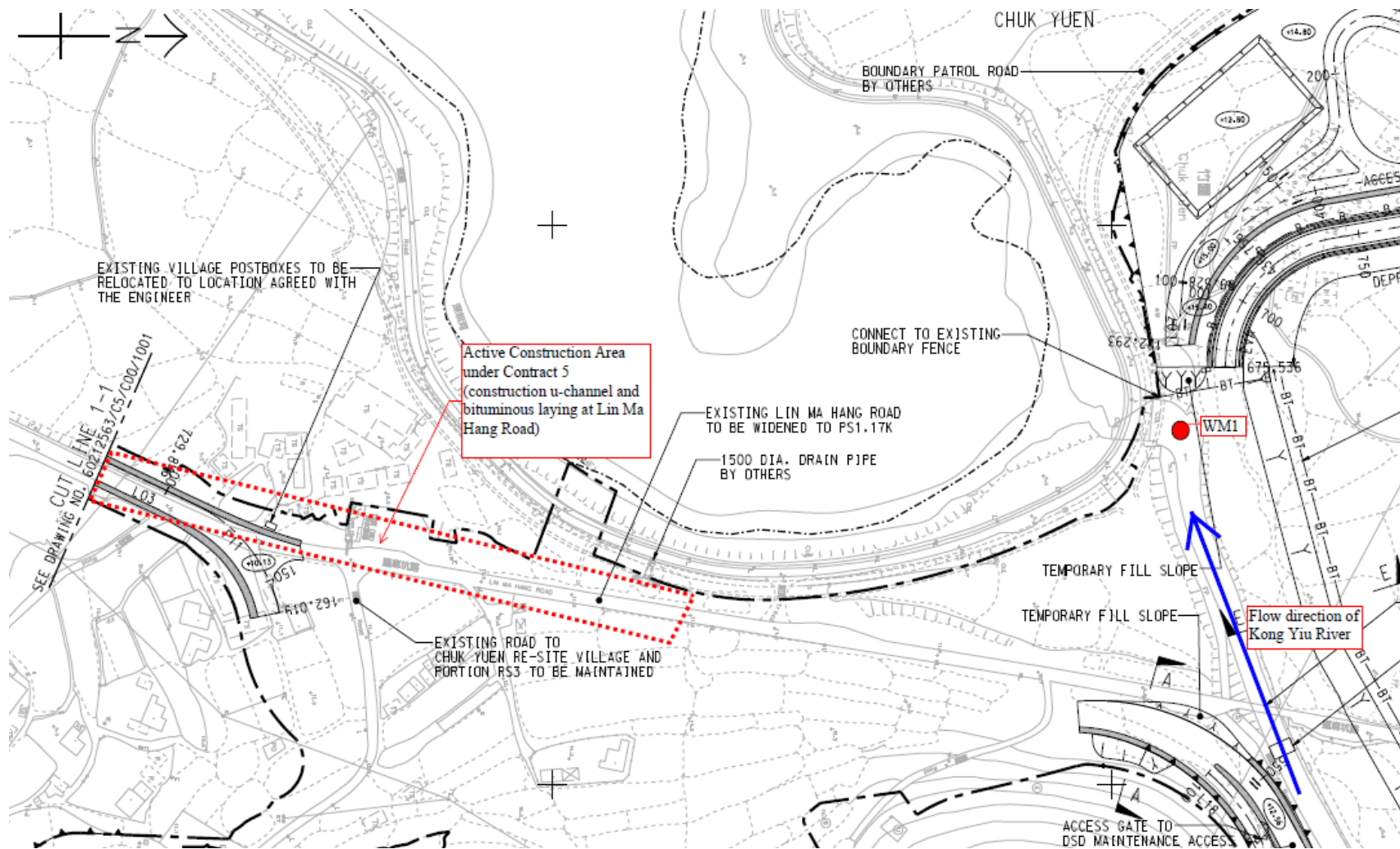


Figure 1 Location Map

Agreement No. CE 45/2008
Liantang/ Heung Yuen Wai Boundary Control Point and Associated Works
Investigation Report on Action or Limit Level Non-compliance

Project		CE 45/2008	
Date		10 March 2016	
Location		WM1	
Time		13:03	
Parameter		Turbidity (NTU)	Suspended Solids (mg/L)
Action Level		51.3 AND 120% of upstream control station of the same day	54.5 AND 120% of upstream control station of the same day
Limit Level		67.6 AND 130% of upstream control station of the same day	64.9 AND 130% of upstream control station of the same day
Measured Levels	WM1-C	47.2	35.0
	WM1	352.0	196.0
Exceedance		Limit Level	Limit Level
Investigation Results, Recommendations & Mitigation Measures		<ol style="list-style-type: none"> 1. According to the site information provided from the CCKJV, construction activities carried out on 10 March 2016 at Boundary Control Point (BCP) which upstream of WM1 was bored piling. The monitoring locations and works area are shown in Figure 1. 2. According to the site record from the monitoring team during monitoring on 10 March 2016, turbid water was observed at WM1 whereas the water quality at WM1-C was slightly turbid clear. (Photo 1 & 2) Moreover, during the course of sampling on 10 March 2016, turbid water was observed at upstream of the works area of Contract 6. (Photo 3) 3. As advised by the Contractor, the wastewater generated from the bored pile works was recirculated to the AquaSed for treatment and discharge would be made when the effluent is overflow from the AquaSed. Since discharge license was not yet granted for the Contract, self-monitoring for the effluent quality would be conducted by the Contractor if discharge is required to ensure the discharge effluent complied with the relevant requirements. 4. During site inspection by the RE, IEC, Contractor and ET on 10 March 2016, the effluent of the AquaSed was inspected and the effluent quality is visually clear. (Photo 4) Moreover, turbid water was observed at upstream of the works area of Contract 6 as well. In our investigation, it is considered that the exceedances were unlikely due to the Contract. 5. According to the Event and Action, the monitoring frequency at WM1 has been increase to daily due to the limit level exceedance recorded until no exceedances were triggered in consecutive days. Additional monitoring was carried out on 11 and 12 March 2016 and no exceedance was recorded. However, CCKJV should continue fully implement the water mitigation measures as recommended in the implementation schedule for environmental mitigation measures in the EM&A Manual. 	

Prepared By : _____ Nicola Hon

Designation : _____ Environmental Consultant

Signature : _____ 

Date : _____ 24 March 2016

Photo Record



Photo 1

During water sampling on 10 March 2016, turbid water was observed at WM1.



Photo 2

During water sampling on 10 March 2016, the water quality at WM1-C was slightly turbid.



Photo 3

During water sampling on 10 March 2016, turbid water was observed at upstream of the works area of Contract 6. (works area of Contract 6 is after the Bridge)



Photo 4

During site inspection by the RE, IEC, Contractor and ET on 10 March 2016, the effluent of the AquaSed was inspected and the effluent quality is visually clear.

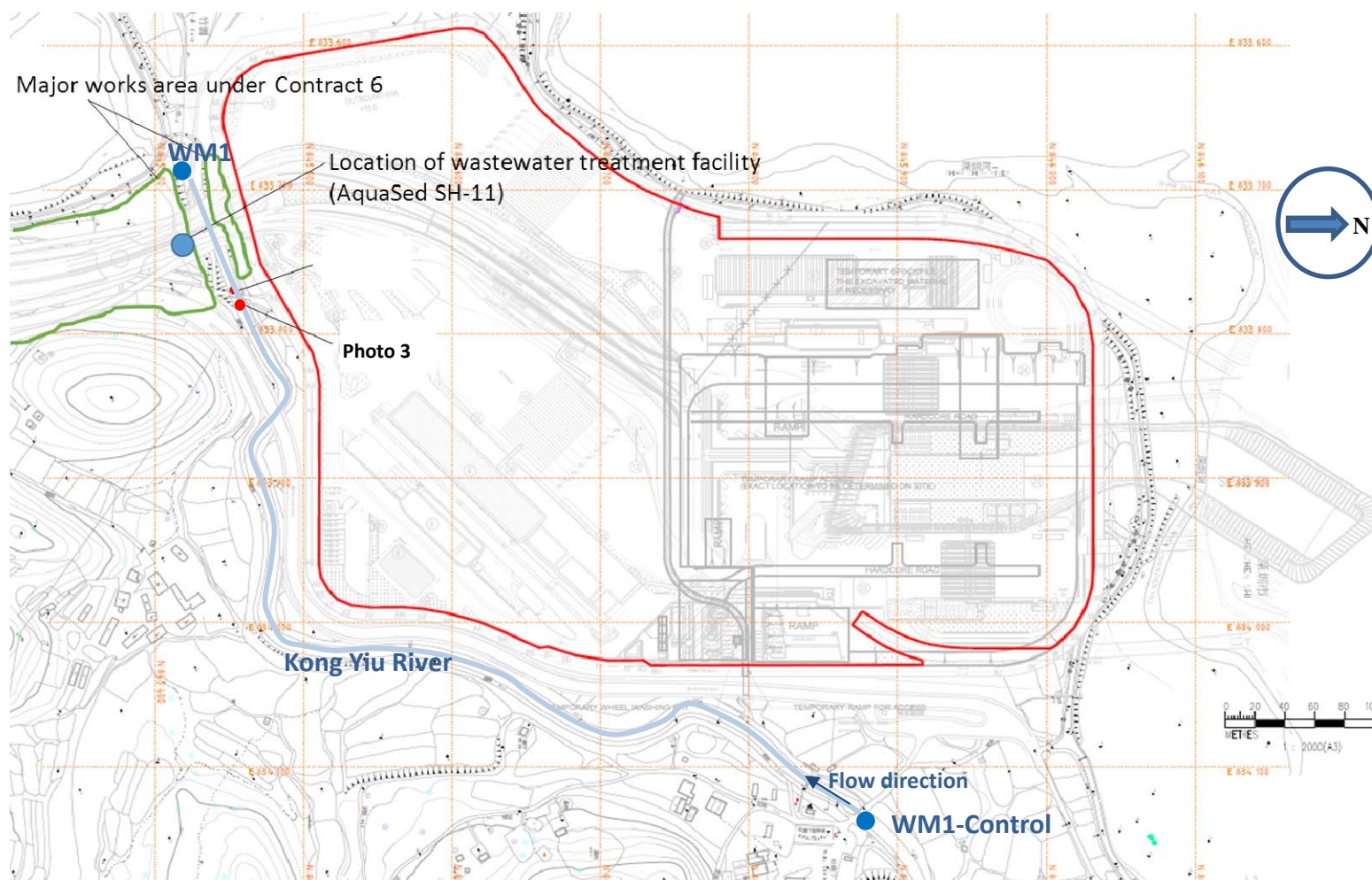


Figure 1 Location Map for Water Quality Monitoring Locations WM1 and WM1-C

To Mr. Jon Kitching **Fax No** 2743 1600
Company Leighton Contractors (Asia) Limited
cc
From Nicola Hon **Date** 29 March 2016
Our Ref TCS00769/15/300/F0073 **No of Pages** 7 (Incl. cover sheet)

RE **Architectural Services Department (ArchSD) Contract No: SS C505**
Construction of Liantang/Heung Yuen Wai Boundary Control Point (BCP) – BCP
Buildings and Associated Facilities
Investigation Report for Exceedance of Water Quality Monitoring at Location WM1
on 10 March 2016

If you do not receive all pages, or transmission is illegible, please contact the originator on (852) 2959-6059 to re-send. Should this facsimile be sent to the wrong fax number, would receiver please destroy this copy and notify Action-United Environmental Services & Consulting immediately. Thank you.

Dear Sir,

Further to the Notification of Exceedance (NOE) ref. of following:-

TCS00769/15/300/F0065 dated 11 March 2016

TCS00769/15/300/F0072 dated 29 March 2016

Please find attached the “Investigation Report on Action or Limit Level Non-compliance” referenced above for your follow up action.

Should you have any queries or need further information, please do not hesitate to contact us or the undersigned at **Tel: 2959-6059 or Fax: 2959-6079**.

Yours Faithfully,

For and on Behalf of

Action-United Environmental Services & Consulting



Nicola Hon
Environmental Consultant
Encl.

c.c.	Mr. David Chan (EPD)	Fax:	2685 1155
	Mr. William WL Cheng (ASD)		By e-mail
	Mr. Justin Cheung (Ronald Lu)		By e-mail
	Mr. Antony Wong (IEC, SMEC)		By e-mail
	Mr. Simon Leung (ER, AECOM)	Fax:	2674 7732

Agreement No. CE 45/2008
Liantang/ Heung Yuen Wai Boundary Control Point and Associated Works

Investigation Report on Action or Limit Level Non-compliance

Project		CE 45/2008	
Contract		SS C505	
Monitoring Location		WM1	
Date		10 March 2016	
Time		13:03	
Parameter		Turbidity (NTU)	Suspended Solids (mg/L)
Action Level		51.3 AND 120% of upstream control station of the same day	54.5 AND 120% of upstream control station of the same day
Limit Level		67.6 AND 130% of upstream control station of the same day	64.9 AND 130% of upstream control station of the same day
Measured levels	WM1-C	47.2	35.0
	WM1	325.0	196.0
Exceedance		Limit Level	Limit Level
Investigation Results, Recommendations & Mitigation Measures		<ol style="list-style-type: none"> 1. According to the site information provided by the Contractor, the major construction activities carried out on 10 March 2016 included excavation, formwork erection, soil compaction, driven pile and bored piling and site investigation which are illustrated in Figure 1. It is noted that the majority active construction area were not closed to Kong Yiu River. (Figure 2) 2. According to the field data record by ET on 10 March 2016, turbid water was observed at WM1 whereas the water quality at WM1-C was slightly turbid clear. (Photo 1 & 2) 3. In view of the construction activities on 10 March 2016 and confirmed by the Contractor, wastewater was generated during the bored piling work only and the wastewater was recirculated for the piling work used. If water discharge is required, they will follow the temporary site drainage plan in which wastewater would be diverted to the perimeter channel and then collected to the wastewater treatment plant for treatment before discharge. (Figure 3) It is noted that the discharge point connecting public drainage was located at the west of the site and the discharge water would not flow to WM1 and its upstream. (Figure 3) 4. During site inspection on 9 March 2016, it was observed that the perimeter channel and the wastewater treatment facilities were in proper function and there were no discharge was made on 9 March 2016. (Photo 3 & 4) Moreover, no major water impact was observed during site inspection on 9 March 2016. 5. In view of the topography of the construction site, the formation level of the site is lower than the roads bounding the site (around 2m height difference), it is considered that the wastewater generated on-site is not likely flowing out of the site boundary. (Photo 5) As advised by the Contractor, around 90% of treated water is reused on-site (water spread for dust suppression) whereas the rest of the treatment wastewater would be discharge off site at the approval discharge point. 6. According to the above investigation, it is considered that the exceedances were not likely related to the works under the Contract. 	

	<p>7. According to the Event and Action, the monitoring frequency at WM1 has been increase to daily due to the limit level exceedance recorded until no exceedances were triggered in consecutive days. Additional monitoring was carried out on 11 and 12 March 2016 and no exceedance was recorded. However, the Contractor should continue fully implement the water mitigation measures as recommended in the implementation schedule for environmental mitigation measures in the EM&A Manual.</p>
<p>Action to be taken</p>	<p>The Contractor is reminded to fully implement the water mitigation measures as recommended in the implementation schedule for environmental mitigation measures in the EM&A Manual.</p>

Prepared By : Nicola Hon

Designation : Environmental Consultant

Signature : 

Date : 29 March 2016



Photo 1
During water sampling on 10 March 2016, turbid water was observed at WM1.



Photo 2
During water sampling on 10 March 2016, the water quality at WM1-C was slightly turbid.



Photo 3
During site inspection on 9 March 2016, the perimeter channel was in proper function.



Photo 4
During site inspection on 9 March 2016, there was no discharge observed from the wastewater treatment system.



Photo 5
Temporary drainage channel has been constructing at the periphery of the site and the formation level of the site is lower than the roads bounding the site

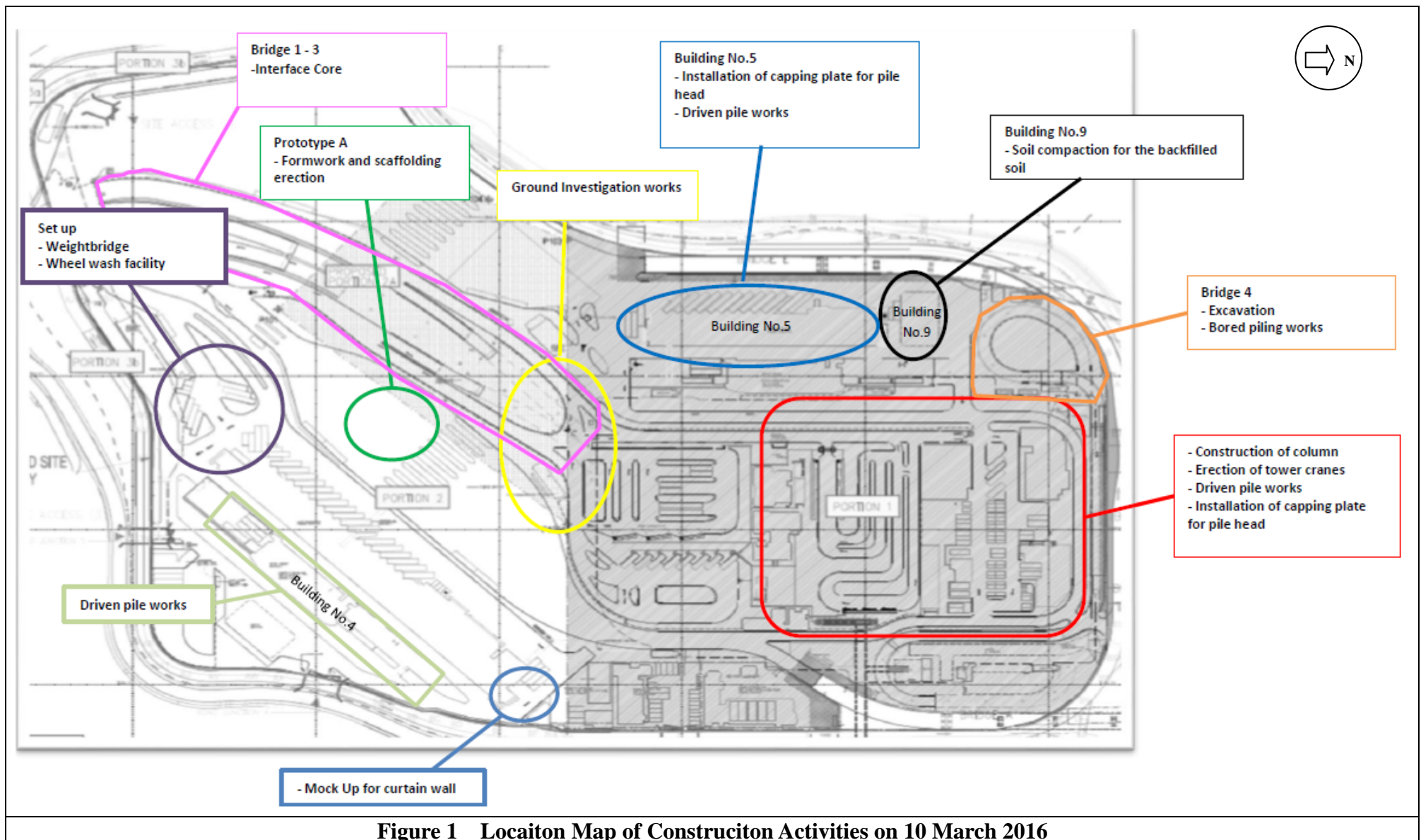


Figure 1 Location Map of Construction Activities on 10 March 2016

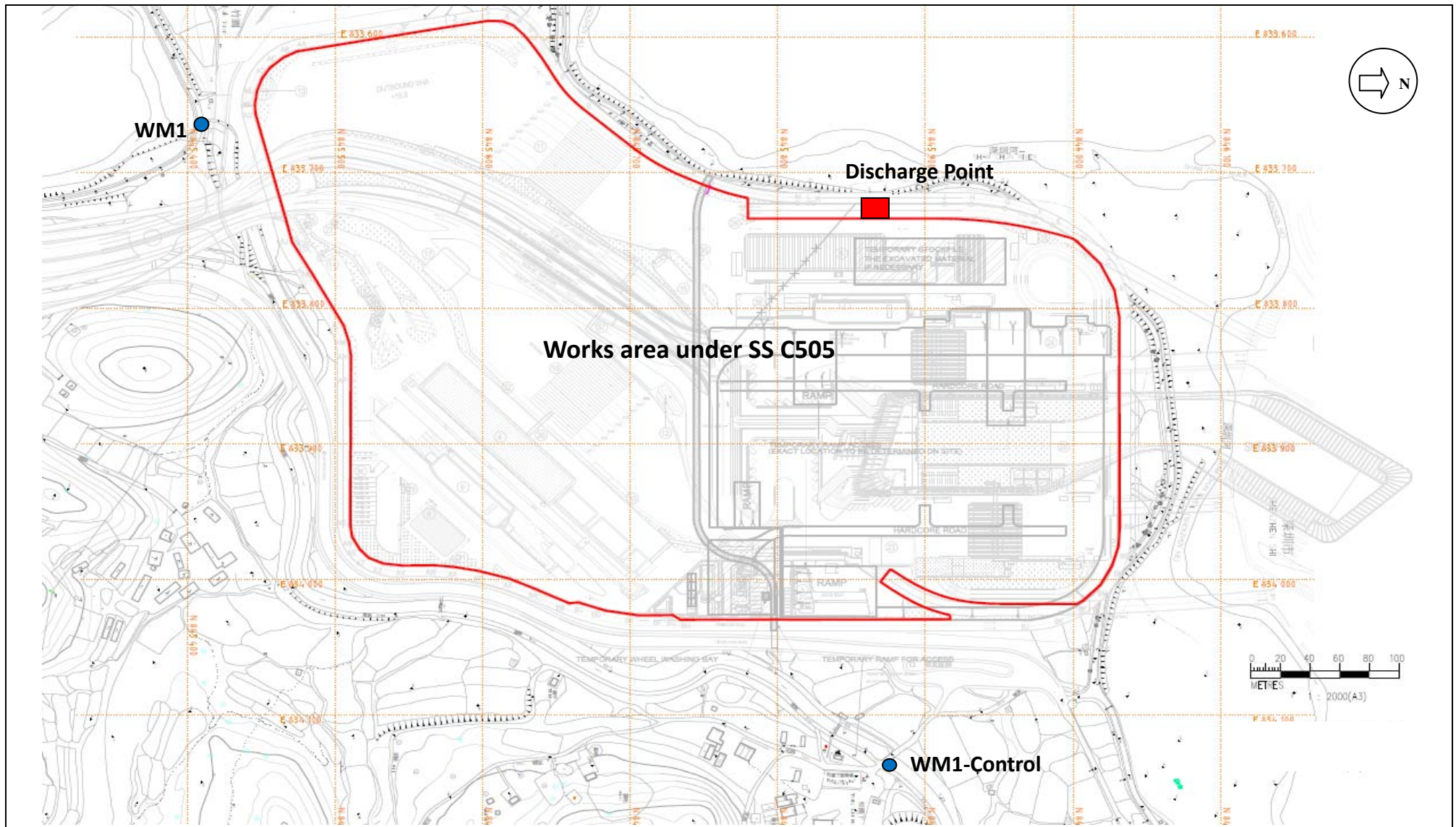


Figure 2 Location Map of Water Monitoring Location

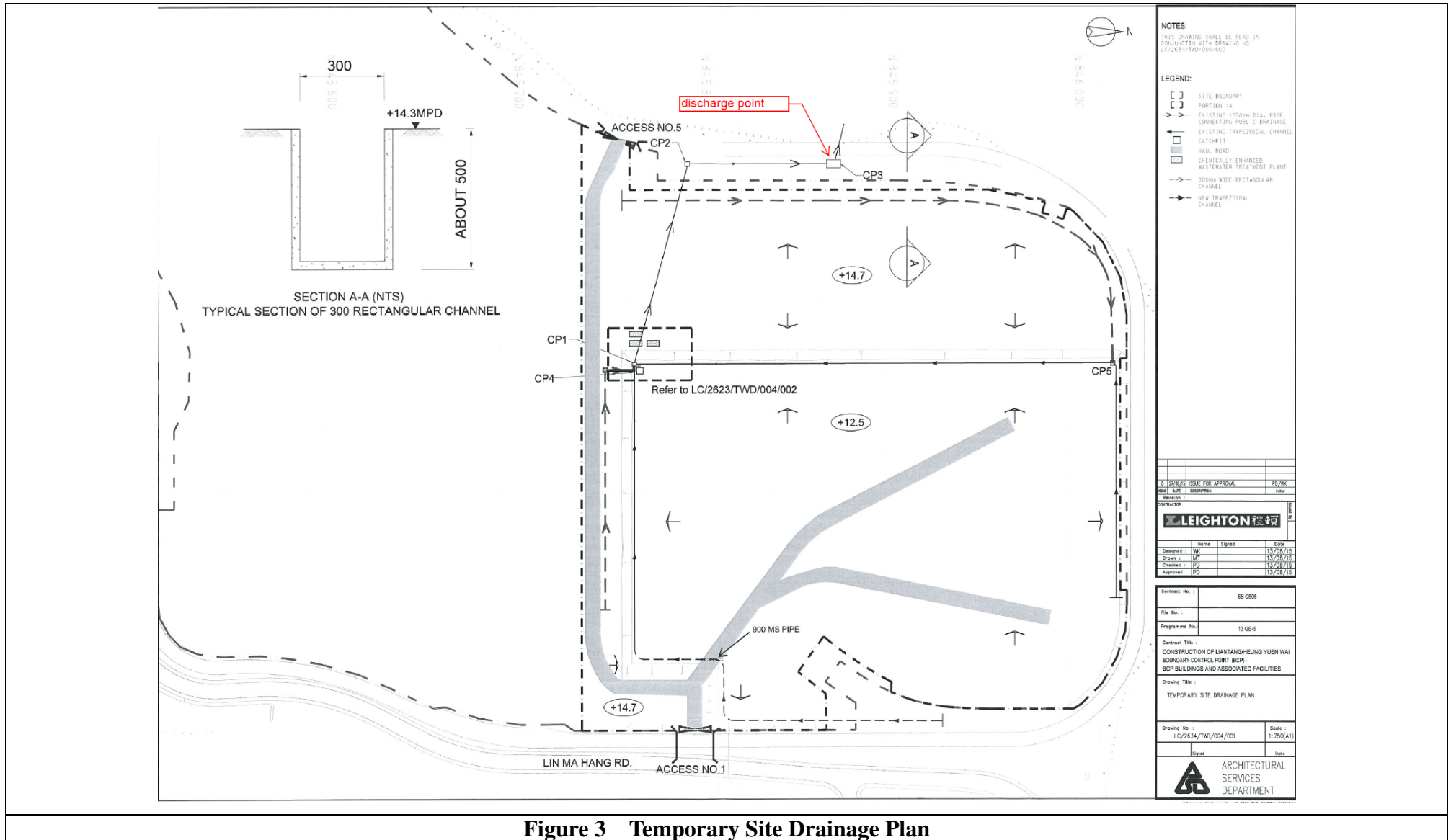


Figure 3 Temporary Site Drainage Plan

Agreement No. CE 45/2008


Liantang/ Heung Yuen Wai Boundary Control Point and Associated Works

Investigation Report on Action or Limit Level Non-compliance

Project		CE 45/2008					
Date		14 March 2016	15 March 2016	16 March 2016	14 March 2016	15 March 2016	16 March 2016
Location		WM2B					
Time		11:45	11:25	10:20	11:45	11:25	10:20
Parameter		Turbidity (NTU)			Suspended Solids (mg/L)		
Action Level		11.4 AND 120% of upstream control station of the same day			11.8 AND 120% of upstream control station of the same day		
Limit Level		12.3 AND 130% of upstream control station of the same day			12.4 AND 130% of upstream control station of the same day		
Measured Levels	WM2B-C	15.7	5.6	5.9	<2	<2	3.0
	WM2B	45.1	19.0	108.0	69.0	10.0	48.5
Exceedance		Limit Level	Limit Level	Limit Level	Limit Level	NO exceedance	Limit Level
Investigation Results, Recommendations & Mitigation Measures		<ol style="list-style-type: none"> 1. According to the site information provided from the CCKJV, construction activities carried out on 14 to 16 March 2016 at North Portal (upstream of WM2B) were bored piling and slope work. The monitoring locations and works area are shown in Figure 1. 2. According to the site record from the monitoring team on 14 and 15 March 2016, very shallow water was measured at WM2B and the water depth was around 0.01-0.02m. (Photo 1 & 3) It was observed that the water flowing in the channel and the water samples collected at WM2B was visually clear. (Photo 2 & 4) Since the water sampling was carried out at the bridge over the drainage channel at shallow water, the water sample could not avoid inclusion of the loose sediment and debris. On 16 March 2016, the water sampling was conducted after shower and it was observed that the water flowing in the open channel was slightly turbid due to stir up of sediment at the river bed during rain. (Photo 5 & 6) 3. As advised by the Contractor, self-monitoring for the treated water in the wastewater treatment facilities was conducted and effluent was visually clear. (Photo 7) As water mitigation measures, sump pits with temporary channel were constructed under the slopes to divert the site runoff for temporary storage and primarily desilting before divert to the AquaSed. Moreover, the slopes adjacent to channel were covered with tarpaulin sheet or hard paved to minimise muddy runoff during rain. 4. According to the Event and Action, the monitoring frequency at WM2B has been increase to daily due to the limit level exceedance recorded until no exceedances were triggered in consecutive days. Additional monitoring was carried out on 17 and 18 March 2016 and no exceedances were triggered. Nevertheless, CCKJV should continue fully implement the water mitigation measures as recommended in the implementation schedule for environmental mitigation measures in the EM&A Manual. 					

Prepared By : Nicola Hon

Designation : Environmental Consultant

Signature : 

Date : 31 March 2016

Photo Record



Photo 1
During water sampling on 14 March 2016, shallow water was observed at WM2B and the water quality at WM2B was visually clear.



Photo 2
The water samples collected at WM2B on 14 March 2016 was visually clear.



Photo 3
During water sampling on 15 March 2016, shallow water was observed at WM2B and the water quality at WM2B was visually clear.



Photo 4
The water samples collected at WM2B on 15 March 2016 was visually clear.



Photo 5
During water sampling on 16 March 2016, shallow water was observed at WM2B and the water quality at WM2B was slightly turbid.



Photo 6
The water samples collected at WM2B on 16 March 2016 was slightly turbid.



Photo 7
The effluent of the AquaSed was visually clear.

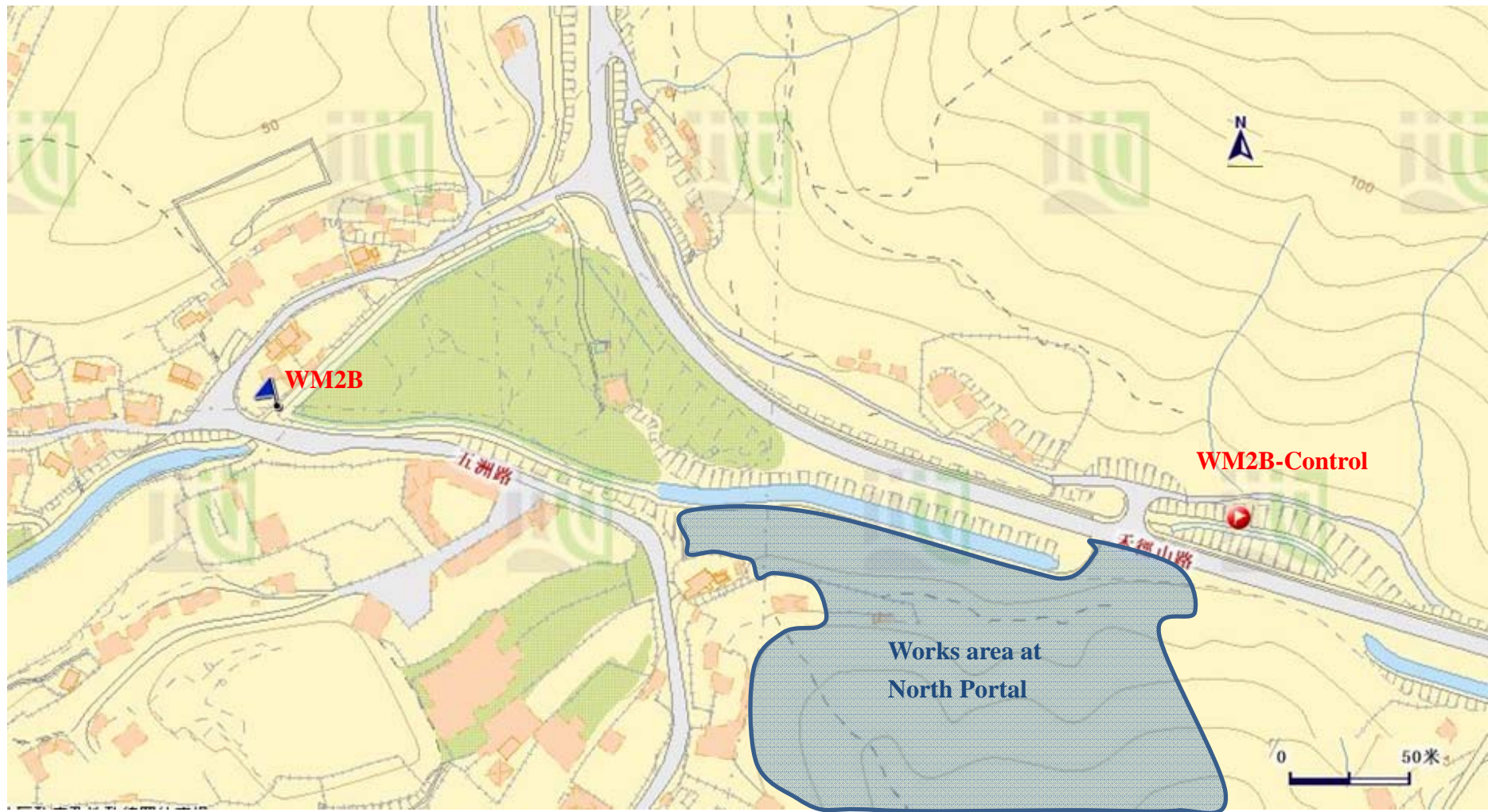


Figure 1 Location Map for Water Quality Monitoring Locations WM2B and WM2B-Control

To Mr. Daniel Ho **Fax No** 2638 7077

Company Chun Wo Construction Ltd

cc

From Nicola Hon **Date** 1 April 2016

Our Ref TCS00670/13/300/F0211 **No of Pages** 4 (Incl. cover sheet)

RE Agreement No. CE 45/2008
Liantang/ Heung Yuen Wai Boundary Control Point and Associated Works
Investigation Report of Exceedance of Water Quality at Location WM4 on 21 March
2016 (Contract 3)

If you do not receive all pages, or transmission is illegible, please contact the originator on (852) 2959-6059 to re-send. Should this facsimile be sent to the wrong fax number, would receiver please destroy this copy and notify Action-United Environmental Services & Consulting immediately. Thank you.

Dear Mr. Ho,

Further to the Notification of Exceedance (NOE) ref.: TCS00670/13/300/F0195 dated 22 March 2016 and TCS00670/13/300/F0205 dated 31 March 2016. Please find attached the "Investigation Report on Action or Limit Level Non-compliance" referenced above for your follow up action.

Should you have any queries or need further information, please do not hesitate to contact us or the undersigned at **Tel: 2959-6059 or Fax: 2959-6079**.

Yours Faithfully,
For and on Behalf of
Action-United Environmental Services & Consulting



Nicola Hon
Environmental Consultant

Encl.

c.c.	Mr. David Chan (EPD)	Fax:	2685 1155
	Mr. Alan Lee (ER of C3, AECOM)	Fax:	2171 3498
	Mr. Antony Wong (IEC, SMEC)		By e-mail

Photo Record



Photo 1

Turbid water was observed at WM4 on 21 March 2016.



Photo 2

Turbid water was observed at WM4-CA on 21 March 2016.



Photo 3

Turbid water was observed at WM4-CB on 21 March 2016.



Photo 4

The water samples collected at WM4, WM4-CA and WM4-C were turbid.



Photo 5

Turbid water flowed from upstream was observed on 21 March 2016.



Photo 6

Turbid water flowed from upstream affecting the water quality throughout the river course as observed on 21 March 2016.

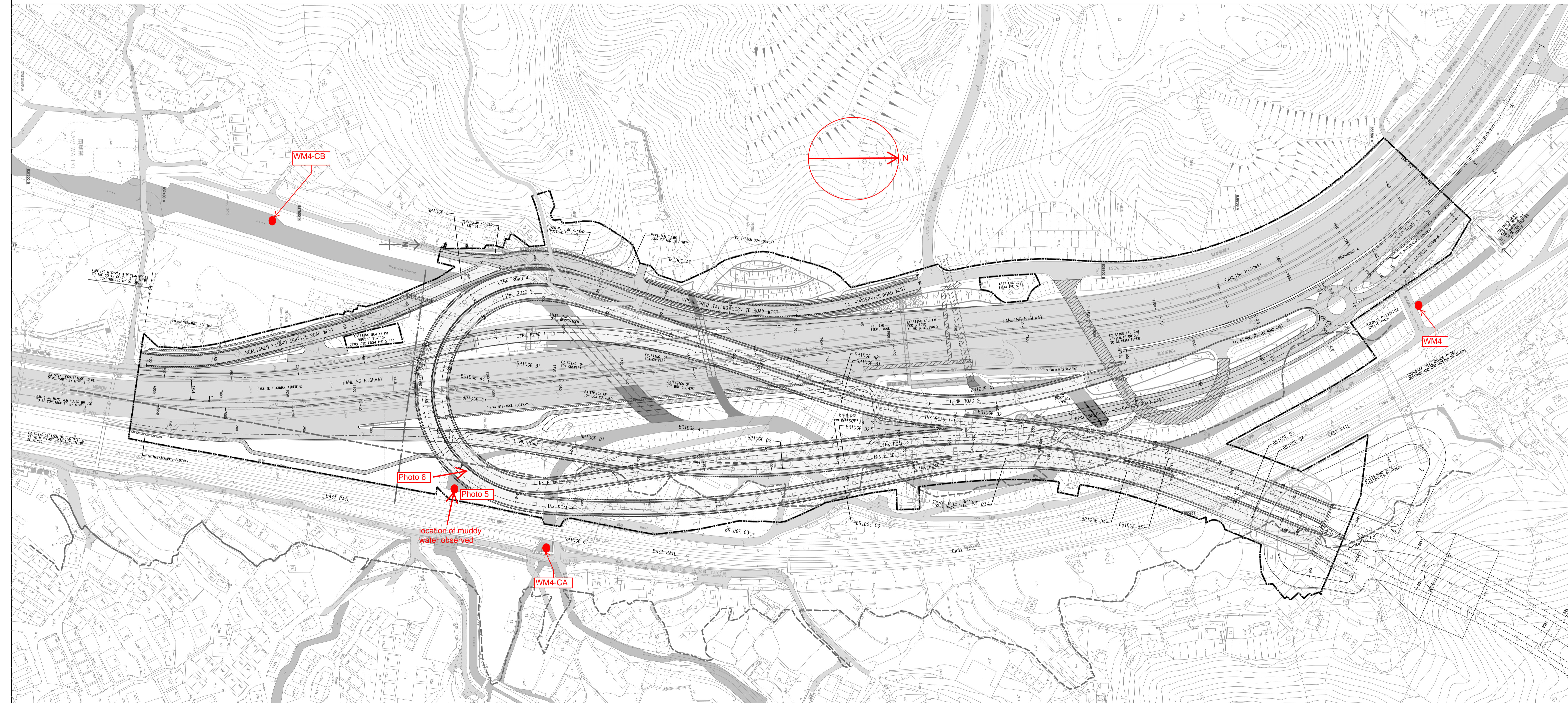



Figure 1. Location of Water Quality Monitoring Location

Agreement No. CE 45/2008
Liantang/ Heung Yuen Wai Boundary Control Point and Associated Works
Investigation Report on Action or Limit Level Non-compliance

Project		CE 45/2008	
Date		21 March 2016	
Location		WM4	
Time		13:00	
Parameter		Turbidity (NTU)	Suspended Solids (mg/L)
Action Level		35.2 AND 120% of upstream control station of the same day	39.4 AND 120% of upstream control station of the same day
Limit Level		38.4 AND 130% of upstream control station of the same day	45.5 AND 130% of upstream control station of the same day
Measured Level	WM4-CA	25.7	20.5
	WM4-CB	49.1	35.5
	WM4	89.1	70.5
Exceedance		Limit Level	Limit Level
Investigation Results, Recommendations & Mitigation Measures		<ol style="list-style-type: none"> 1. According to the site information provided by the Contractor of Contract 2 (DHK), construction activities carried out at South Portal on 21 March 2016 included tunnel excavation and ventilation building superstructure. The construction activities were carried out away from the river course and no discharge was made on 21 March 2016. 2. According to the site record from the monitoring team on 21 March 2016, turbid water was observed at both impact and control station WM4, WM4-CA and WM4-CB under the influence of rain (Photo 1 to 4 and Figure 1) 3. As advised by the Contractor of C3, muddy water flowed from other upstream location which was not under monitored by the Contract was observed on 21 March 2016. (Photo 5 &6) It is considered that the exceedances were due to the stir up of sediment during rain and external muddy water from upstream and not related to the works under the Contract. 4. According to the Event and Action, the monitoring frequency at exceed station shall be increased to daily due to the limit level exceedance recorded until no exceedances were triggered in consecutive days. In view of the subsequent monitoring result, no exceedances were triggered at WM4 on 22 and 23 March 2016. However, the Contractor should continue to implement the environmental mitigation measures recommended in implementation schedule in the EM&A Manual. 	

Prepared By : _____ Nicola Hon _____

Designation : _____ Environmental Consultant _____

Signature : _____  _____

Date : _____ 1 April 2016 _____

Photo Record



Photo 1

Turbid water was observed at WM4 on 21 March 2016.



Photo 2

Turbid water was observed at WM4-CA on 21 March 2016.



Photo 3

Turbid water was observed at WM4-CB on 21 March 2016.



Photo 4

The water samples collected at WM4, WM4-CA and WM4-C were turbid.



Photo 5

Turbid water flowed from upstream was observed on 21 March 2016.



Photo 6


Turbid water flowed from upstream affecting the water quality throughout the river course as observed on 21 March 2016.

Agreement No. CE 45/2008
Liantang/ Heung Yuen Wai Boundary Control Point and Associated Works
Investigation Report on Action or Limit Level Non-compliance

Project		CE 45/2008			
Date		21 March 2016	22 March 2016	21 March 2016	22 March 2016
Location		WM2B			
Time		11:35	10:11	11:35	10:11
Parameter		Turbidity (NTU)		Suspended Solids (mg/L)	
Action Level		11.4 AND 120% of upstream control station of the same day		11.8 AND 120% of upstream control station of the same day	
Limit Level		12.3 AND 130% of upstream control station of the same day		12.4 AND 130% of upstream control station of the same day	
Measured Levels	WM2B-C	6.7	6.3	5.0	3.0
	WM2B	284.0	179.0	50.0	232.0
Exceedance		Limit Level	Limit Level	Limit Level	Limit Level
Investigation Results, Recommendations & Mitigation Measures		<ol style="list-style-type: none"> 1. According to the site information provided from the CCKJV, construction activities carried out on 21 and 22 March 2016 at North Portal (upstream of WM2B) was pile cap installation work only. The monitoring locations and works area are shown in Figure 1. 2. According to the site record from the monitoring team on 21 and 22 March 2016, very shallow water was measured at WM2B and the water depth was around 0.02m. (Photo 1&3) The water sampling was conducted during rain and it was observed that the water flowing in the open channel was slightly turbid due to stir up of sediment and cumulated silt at the river bed during rain. (Photo 2 & 4) 3. As advised by the Contractor, self-monitoring for the treated water in the wastewater treatment facilities was conducted and effluent was visually clear. (Photo 5 & 6) As water mitigation measures, sump pit was constructed near the pile cap area to collect the possible runoff and wastewater generated from the works before divert to the AquaSed for proper treatment. Moreover, hydro-seeding and shotcreting were applied on the stabilized slopes which adjacent to existing open channel to minimise muddy runoff during rain. (Photo 7 & 8) 4. Apart from the disturbance of cumulated silt at the river bed during rain, it was observed trails of muddy runoff from the public road surface into the existing channel due to rain. (Photo 1 & 3 & Figure 1) It is considered that the exceedances were likely related to cumulated silt at the river bed and muddy runoff from the public road surface. 5. According to the Event and Action, the monitoring frequency at WM2B has been increase to daily due to the limit level exceedance recorded until no exceedances were triggered in consecutive days. Additional monitoring was carried out on 23 and 24 March 2016 and exceedances of turbidity and SS were triggered. CCKJV should continue fully implement the water mitigation measures as recommended in the implementation schedule for environmental mitigation measures in the EM&A Manual. 			

Prepared By : Nicola Hon

Designation : Environmental Consultant

Signature : 

Date : 7 April 2016

Photo Record



Photo 1
During water sampling on 21 March 2016, shallow water was observed at WM2B and the water quality at WM2B was turbid.



Photo 2
The water samples collected at WM2B on 21 March 2016 was turbid.



Photo 3
During water sampling on 22 March 2016, shallow water was observed at WM2B and the water quality at WM2B was slightly turbid.



Photo 4
The water samples collected at WM2B on 21 March 2016 was slightly turbid.



Photo 5
The effluent of the AquaSed was visually clear.



Photo 6
The effluent of the AquaSed was visually clear.



Photo 7

Sump pit was constructed near the pile cap area to collect the possible runoff and wastewater generated from the works before divert to the AquaSed for proper treatment.



Photo 8

Hydro-seeding and shotcreting were applied on the stabilized slopes which adjacent to existing open channel to minimise muddy runoff during rain.

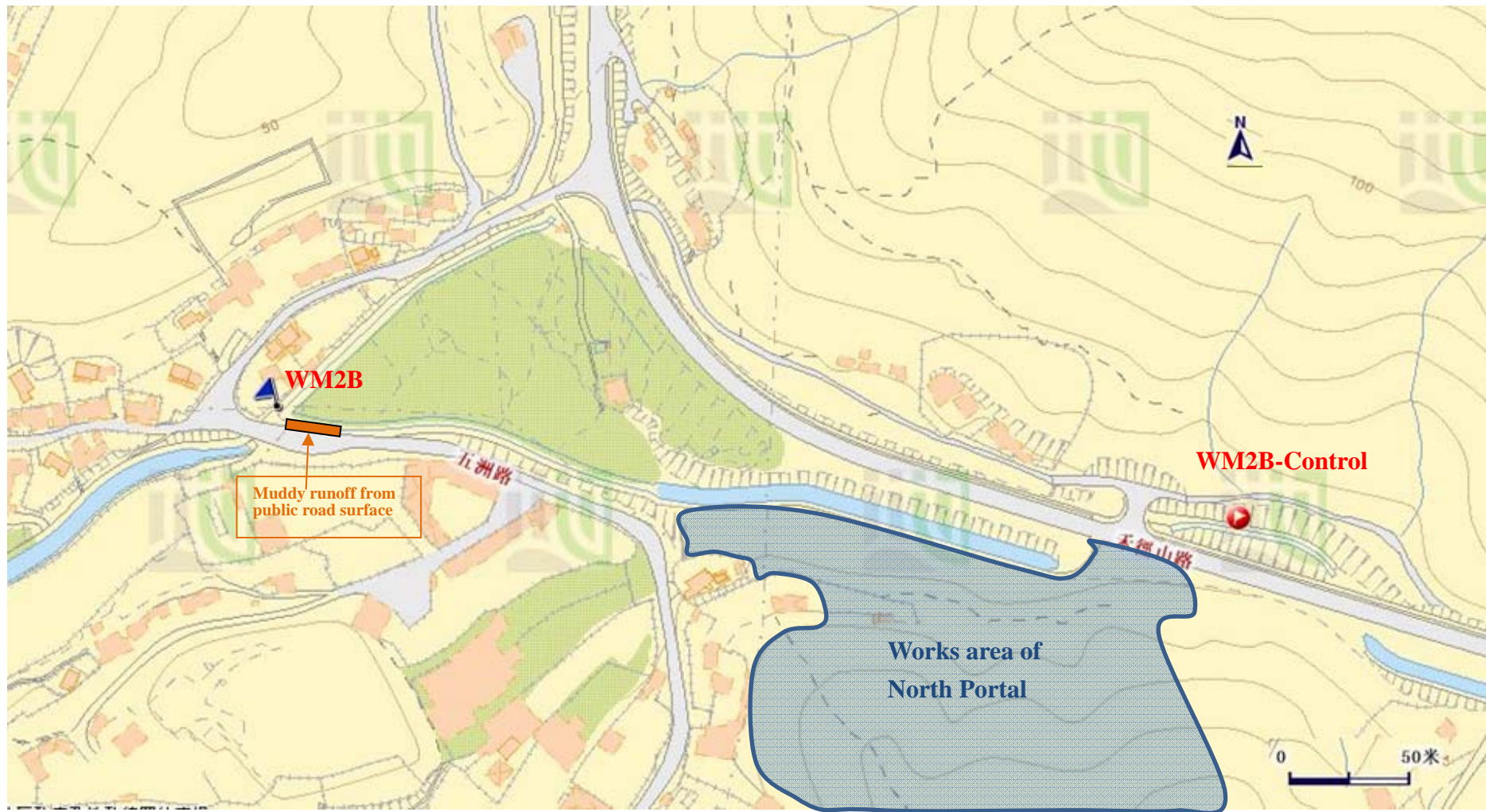


Figure 1 Location Map for Water Quality Monitoring Locations WM2B and WM2B-Control

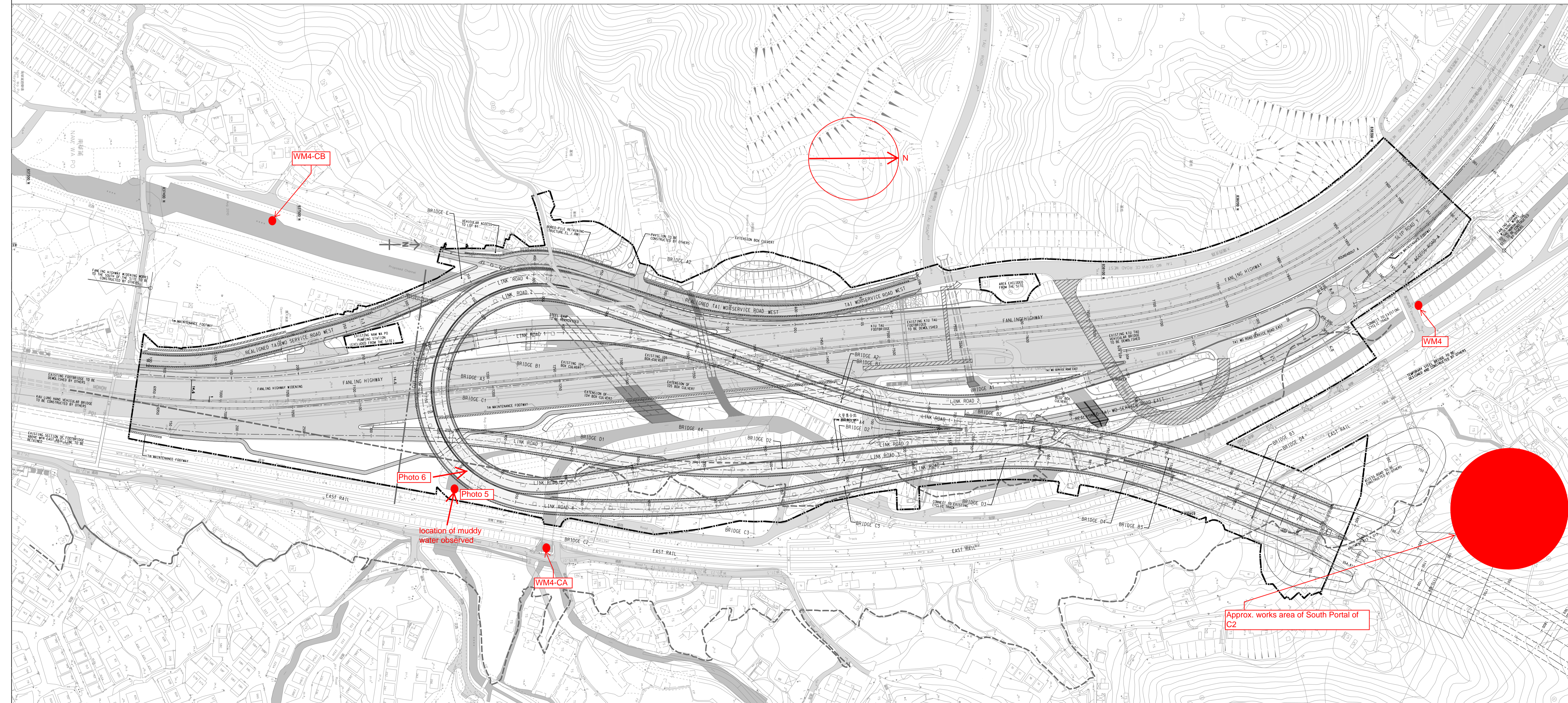



Figure 1. Location of Water Quality Monitoring Location

Agreement No. CE 45/2008
Liantang/ Heung Yuen Wai Boundary Control Point and Associated Works
Investigation Report on Action or Limit Level Non-compliance

Project		CE 45/2008			
Date		23 March 2016	24 March 2016	23 March 2016	24 March 2016
Location		WM2B			
Time		13:05	11:24	13:05	11:24
Parameter		Turbidity (NTU)		Suspended Solids (mg/L)	
Action Level		11.4 AND 120% of upstream control station of the same day		11.8 AND 120% of upstream control station of the same day	
Limit Level		12.3 AND 130% of upstream control station of the same day		12.4 AND 130% of upstream control station of the same day	
Measured Levels	WM2B-C	49.8	20.8	35.5	9.0
	WM2B	452.0	301.5	124.0	160.0
Exceedance		Limit Level	Limit Level	Limit Level	Limit Level
Investigation Results, Recommendations & Mitigation Measures		<ol style="list-style-type: none"> 1. According to the site information provided from the CCKJV, construction activities carried out on 23 and 24 March 2016 at North Portal (upstream of WM2B) was pile cap installation work only. The monitoring locations and works area are shown in Figure 1. 2. According to the site record from the monitoring team on 23 and 24 March 2016, very shallow water was measured at WM2B and the water depth was around 0.02m. (Photo 1&3) The water sampling was conducted during rain and it was observed that the water flowing in the open channel was slightly turbid due to stir up of sediment and cumulated silt at the river bed during rain. (Photo 2 & 4) 3. As advised by the Contractor, self-monitoring for the treated water in the wastewater treatment facilities was conducted and effluent was visually clear. As water mitigation measures, sump pit was constructed near the pile cap area to collect the possible runoff and wastewater generated from the works before divert to the AquaSed for proper treatment. Moreover, hydro-seeding and shotcreting were applied on the stabilized slopes which adjacent to existing open channel to minimise muddy runoff during rain. (Photo 6 & 7) 4. Apart from the disturbance of cumulated silt at the river bed during rain, it was observed trails of muddy runoff from the public road surface into the existing channel due to rain. (Photo 1 & 3 & Figure 1) It is considered that the exceedances were likely related to cumulated silt at the river bed and muddy runoff from the public road surface. 5. According to the Event and Action, the monitoring frequency at WM2B has been increase to daily due to the limit level exceedance recorded until no exceedances were triggered in consecutive days. Additional monitoring was carried out on 29 and 30 March 2016 and no exceedances were triggered. Nevertheless, CCKJV should continue fully implement the water mitigation measures as recommended in the implementation schedule for environmental mitigation measures in the EM&A Manual. 			

Prepared By : Nicola Hon

Designation : Environmental Consultant

Signature : 

Date : 7 April 2016

Photo Record



Photo 1
During water sampling on 23 March 2016, shallow water was observed at WM2B and the water quality at WM2B was turbid.



Photo 2
The water samples collected at WM2B on 23 March 2016 was turbid.



Photo 3
During water sampling on 24 March 2016, shallow water was observed at WM2B and the water quality at WM2B was slightly turbid.



Photo 4
The water samples collected at WM2B on 24 March 2016 was slightly turbid.



Photo 5

Sump pit was constructed near the pile cap area to collect the possible runoff and wastewater generated from the works before divert to the AquaSed for proper treatment.



Photo 6

Hydro-seeding and shotcreting were applied on the stabilized slopes which adjacent to existing open channel to minimise muddy runoff during rain.

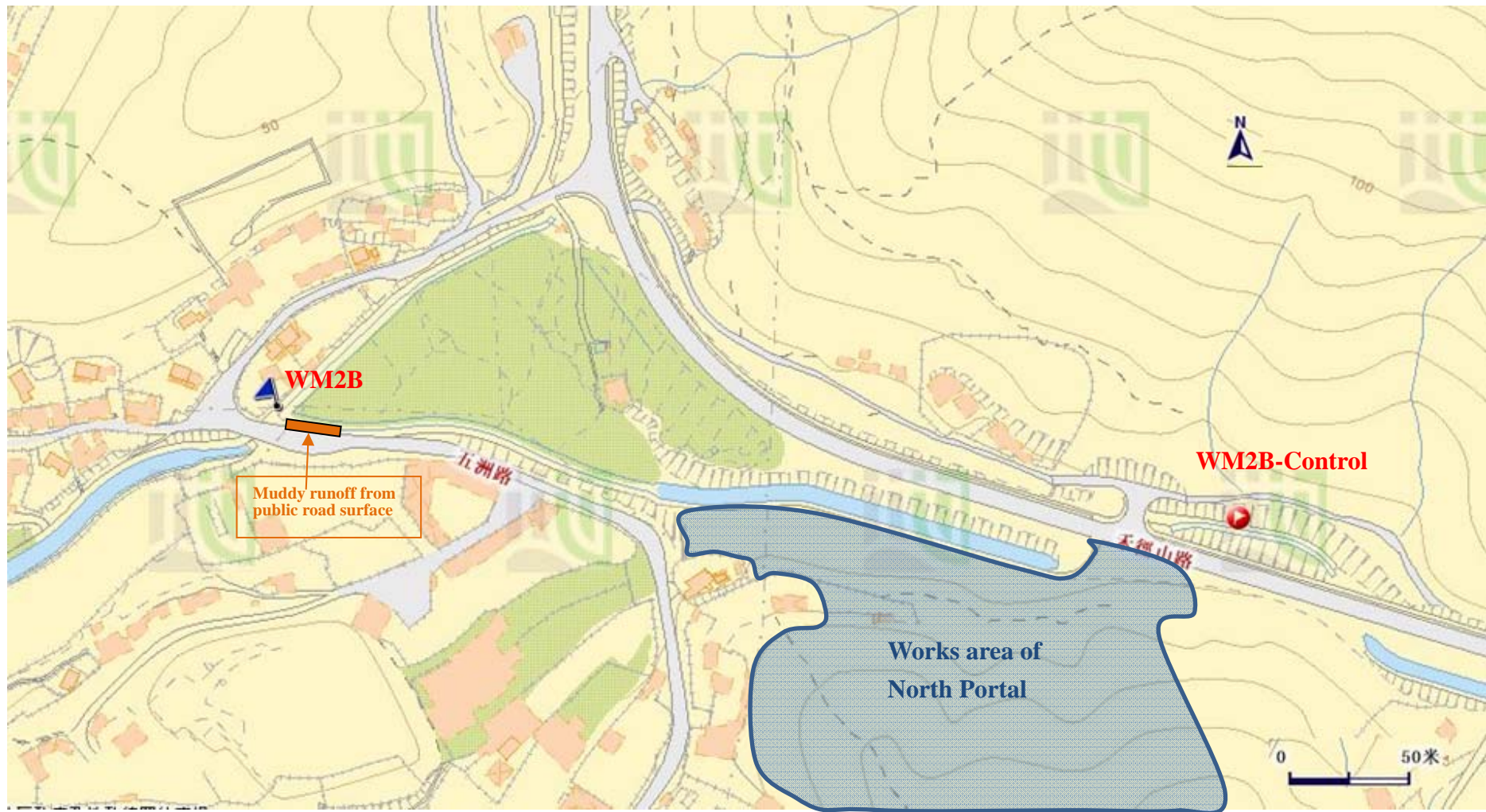


Figure 1 Location Map for Water Quality Monitoring Locations WM2B and WM2B-Control

Agreement No. CE 45/2008
Liantang/ Heung Yuen Wai Boundary Control Point and Associated Works
Investigation Report on Action or Limit Level Non-compliance

Project		CE 45/2008					
Date		29 Mar 16	30 Mar 16	31 Mar 16	29 Mar 16	30 Mar 16	31 Mar 16
Location		WM3					
Time		12:41	12:35	10:43	12:41	12:35	10:43
Parameter		Turbidity (NTU)			Suspended Solids (mg/L)		
Action Level		13.4 AND 120% of upstream control station of the same day			12.6 AND 120% of upstream control station of the same day		
Limit Level		14.0 AND 130% of upstream control station of the same day			12.9 AND 130% of upstream control station of the same day		
Measured Level	WM3-C	4.9	5.2	2.6	7.0	6.5	14.0
	WM3	72.1	121.5	35.3	109.0	54.5	16.0
Exceedance		Limit Level	Limit Level	Limit Level	Limit Level	Limit Level	Limit Level
Investigation Results, Recommendations & Mitigation Measures		<ol style="list-style-type: none"> 1. According to the site information provided from the Contractor of C6 (CCKJV), the main construction activities carried out on 29 to 31 March 2016 at upstream of WM3 was bored pile works. The monitoring locations and works area are shown in Figure 1. 2. According to the site record from the monitoring team during monitoring on 29 to 31 March 2016, the water quality at WM3 was slightly turbid. (Photo 1 to 3) 3. As water mitigation measures, CCKJV has been set up a temporary drainage channel to divert wastewater from bored pile work and wheel washing bay to the wastewater treatment facilities and they area under normal operation. The effluent from wastewater treatment facilities was mainly recirculated in the wheel washing basin and bored pile work and the excess water would be discharged to the nullah which connected to Ng Tung River. CCKJV would check the performance of discharge water every day to ensure it complied with the relevant standard. No adverse water impact was recorded during site inspection in late March 2016. 4. Upon the exceedance recorded on 29 March 2016, the ET has been liaison with CCKJV to investigate the possible source of turbid water. CCKJV and ET has inspected the treated effluent discharged into nullah which connected to Ng Tung River on 29, 30 March 2016, it was observed that the effluent quality was visually clear. Though some silt cumulated at nullah bed was observed on 31 March 2016, the water flowing in the nullah was visually clear. (Photo 4 to 6) 5. As advised by CCKJV, discharge of turbid water and accumulated silt was observed from an unknown outfall which located at between the works area of C6 and WM3. (Photo 7 to 9) There were no exceedances triggered in the additional monitoring result on 1 April 2016 when turbid discharge from the unknown outfall was not observed. It is considered that the turbid water detected at WM3 was related to the turbid discharge from the unknown outfall and unlikely due to the works under Contract 6. 					
Action to be taken		The Contractor is reminded to fully implement the water mitigation measures as recommended in the implementation schedule for environmental mitigation measures in the EM&A Manual.					

Prepared By : Nicola Hon

Designation : Environmental Consultant

Signature : 

Date : 12 April 2016

Photo Record



Photo 1
Muddy water was observed at WM3 on 29 March 2016



Photo 2
Muddy water was observed at WM3 on 29 March 2016



Photo 3
Muddy water was observed at WM3 on 31 March 2016



Photo 4
The effluent in the nullah which connected to Ng Tung River was visually clear on 29 March 2016.



Photo 5
The effluent in the temporary channel which connected to the discharge nullah and Ng Tung River was visually clear on 30 March 2016.



Photo 6
Though some silt cumulated at nullah bed was observed on 31 March 2016, the water flowing in the nullah was visually clear.



Photo 7
Discharge of turbid water and accumulated silt was observed from an unknown outfall which located at between the works area of C6 and WM3 on 29 March 2016.



Photo 8
Discharge of turbid water and accumulated silt was observed from an unknown outfall which located at between the works area of C6 and WM3 on 30 March 2016.



Photo 9
Discharge of turbid water and accumulated silt was observed from an unknown outfall which located at between the works area of C6 and WM3 on 31 March 2016.

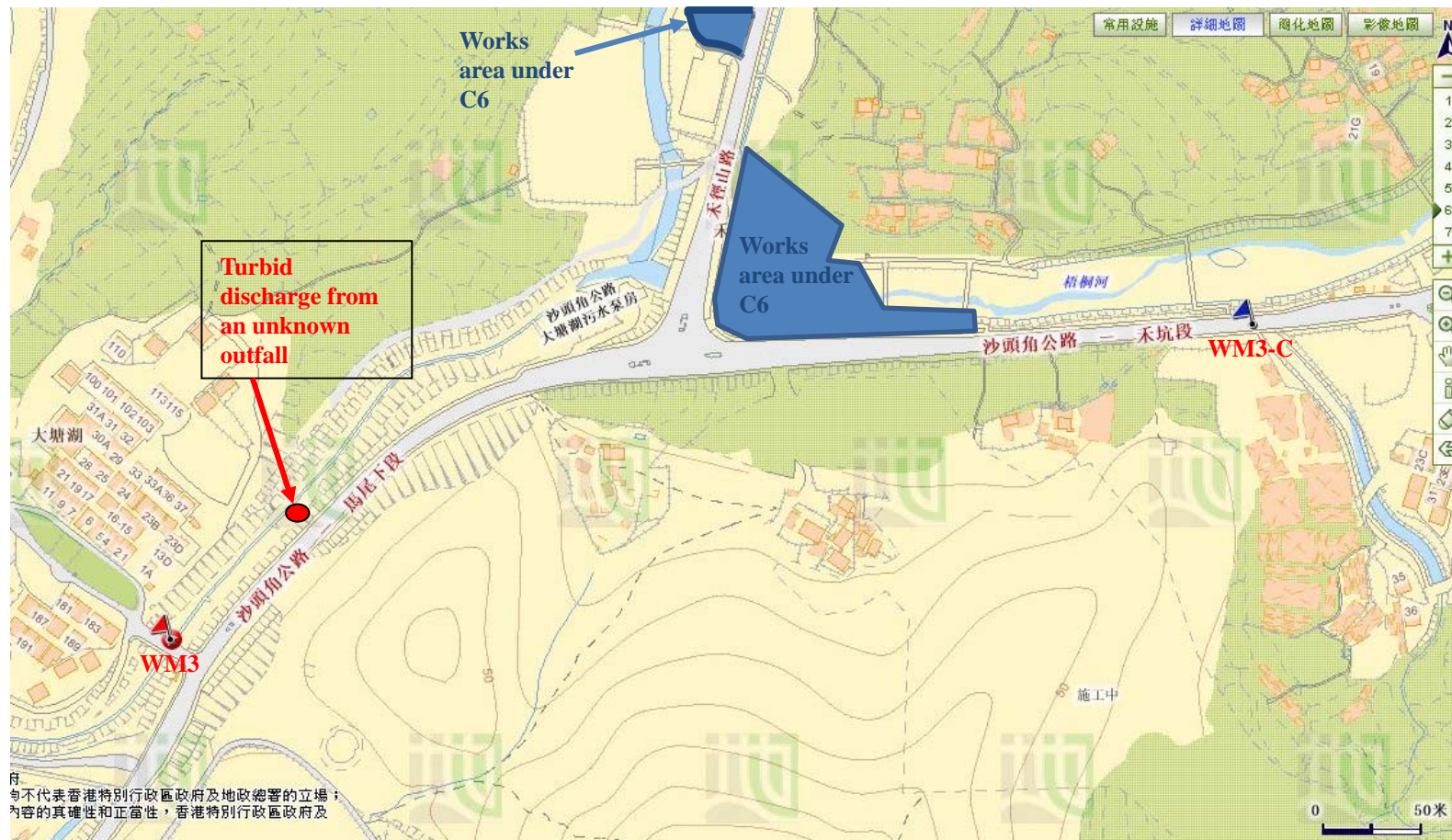


Figure 1 Location Map for Works Area under Contract 6 and Water Quality Monitoring Location

Agreement No. CE 45/2008
Liantang/ Heung Yuen Wai Boundary Control Point and Associated Works
Investigation Report on Action or Limit Level Non-compliance

Project		CE 45/2008					
Date		29 Mar 16	30 Mar 16	31 Mar 16	29 Mar 16	30 Mar 16	31 Mar 16
Location		WM3					
Time		12:41	12:35	10:43	12:41	12:35	10:43
Parameter		Turbidity (NTU)			Suspended Solids (mg/L)		
Action Level		13.4 AND 120% of upstream control station of the same day			12.6 AND 120% of upstream control station of the same day		
Limit Level		14.0 AND 130% of upstream control station of the same day			12.9 AND 130% of upstream control station of the same day		
Measured Level	WM3-C	4.9	5.2	2.6	7.0	6.5	14.0
	WM3	72.1	121.5	35.3	109.0	54.5	16.0
Exceedance		Limit Level	Limit Level	Limit Level	Limit Level	Limit Level	Limit Level
Investigation Results, Recommendations & Mitigation Measures		<ol style="list-style-type: none"> 1. According to the site information provided from the Contractor of C2 (DHK), construction activities carried out on 29 to 31 March 2016 at admin building was building foundation works (rebar fixing and concreting) and no discharge was made. The works area under C2 and the water monitoring location WM3C and WM3 are shown in Figure 1. 2. According to the site record from the monitoring team during monitoring on 29 to 31 March 2016, the water quality at WM3 was slightly turbid. (Photo 1 to 3) 3. During weekly site inspection on 1 April 2016, it was observed that building foundation works was carried out at Admin Building and the site area was mostly hard paved. (Photo 4) Temporary drainage system and water treatment system was properly implemented. Inspection was carried out at the discharge nullah outside the site boundary and no adverse water impact was observed (Photo 5) 4. As advised by the Contractor of C6, discharge of turbid water and accumulated silt was observed from an unknown outfall which located at between the works area of C2/ C6 and WM3. (Photo 6 to 8) There were no exceedances triggered in the additional monitoring result on 1 April 2016 when turbid discharge from the unknown outfall was not observed. It is considered that the turbid water detected at WM3 was related to the turbid discharge from the unknown outfall and unlikely due to the works under Contract 2. 					
Action to be taken		The Contractor is reminded to fully implement the water mitigation measures as recommended in the implementation schedule for environmental mitigation measures in the EM&A Manual.					

Prepared By : _____ Nicola Hon _____

Designation : _____ Environmental Consultant _____

Signature : _____  _____

Date : _____ 12 April 2016 _____

Photo Record



Photo 1

Muddy water was observed at WM3 on 29 March 2016



Photo 2

Muddy water was observed at WM3 on 29 March 2016



Photo 3

Muddy water was observed at WM3 on 31 March 2016



Photo 4

During weekly site inspection on 1 April 2016, it was observed that building foundation works was carried out at Admin Building and the site area was mostly hard paved.



Photo 5

Inspection was carried out at the discharge nullah outside the site boundary and no adverse water impact was observed



Photo 6

Discharge of turbid water and accumulated silt was observed from an unknown outfall which located at between the works area of C6 and WM3 on 29 March 2016.



Photo 7

Discharge of turbid water and accumulated silt was observed from an unknown outfall which located at between the works area of C6 and WM3 on 30 March 2016.



Photo 8

Discharge of turbid water and accumulated silt was observed from an unknown outfall which located at between the works area of C6 and WM3 on 31 March 2016.

