JOB NO.: TCS00491/09

DSD CONTRACT NO.: DC/2009/08

CONSTRUCTION OF YUEN LONG SOUTH BRANCH SEWERS AND EXPANSION OF HA TSUEN SEWAGE PUMPING STATION

FINAL ENVIRONMENTAL MONITORING & AUDIT SUMMARY REPORT –

PREPARED FOR

CHINA STATE CONSTRUCTION ENGINEERING (HONG KONG) COMPANY LIMITED

Quality Index

Date	Reference No.	Prepared By	Certified By
24 June 2014	TCS00491/09/600/R0547v2	Nicola Hon (Environmental Consultant)	T.W. Tam (Environmental Team Leader)

Version	Date	Description
1	18 June 2014	First submission
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24 June 2014

By Email

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For attention of: Mr. T. W. Tam

Dear Mr. Tam,

Contract No.: DC/2009/08
Construction of Yuen Long South Branch Sewers and Expansion of Ha Tsuen Sewage Pumping Station
Verification Letter for Final EM&A Summary Report for Designated Project

With reference to the ET's captioned report (ET's ref.: TCS00491/09/600/R0547v2) received on 24 June 2014 via e-mail, we have no comment and hereby verify the report.

Should there be any queries, please feel free to contact us.

Yours sincerely,

WONG Fu Nam
Independent Environmental Checker
HYDER CONSULTING LIMITED

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EXECUTIVE SUMMARY

ES.01. Construction works at Ha Tsuen Sewage Station were terminated on 25 January 2014, and the EM&A programme for the construction phase was terminated on 31 January 2014 upon agreement of the IEC and RE. This is the Final EM&A Report for the Construction Phase which summarises the key environmental monitoring results throughout the construction phase between February 2010 and January 2014 (hereinafter the "Construction Period").

ES.02. The impact EM&A programme was undertaken in accordance with the relevant EM&A Manual. A summary of the monitoring activities in the Construction Period is listed in the following table:

Aspects	Environmental Monitoring Parameters / Inspection	Occasions
Air Quality	1-hour TSP	1527 events
	24-hour TSP	488 events
Construction Noise	$L_{eq(30min)}$ Daytime	504 events
Water Quality	Dissolved Oxygen	605 days
	Turbidity	605 days
	Suspended Solids (SS)	605 days
Inspection / Audit	ET Weekly Environmental Site Inspection	204 events

ES.03. In this Construction Period, several exceedances were recorded in air quality, noise and water quality monitoring. The summary of breaches of all environmental performance is shown below.

Parameter		Total Monitoring Occasions	Number of Exceedances				Source of Exceedances
			A/L		L/L		
			Number	%	Number	%	
Air Quality	1-Hr TSP	1527	0	0	0	0	Not related to the Works
	24-Hr TSP	488	4	0.08	0	0	
Noise	Leq (30min)	504	1	0.2	2	0.4	
Water Quality	DO	605	6	1	3	0.5	
	Turbidity		3	0.5	42	7	
	SS		0	0	53	9	

ES.04. Monitoring results in general consistently fluctuated below the corresponding A/L Levels, implying the implemented EM&A program for air quality, construction noise and water quality was effective to generate data carrying necessary statistical power to reflect ambient environmental trends of the area throughout the whole construction period of the Project.

ES.05. No works-related exceedances were registered during the construction period of the Project, indicating no adverse environmental impacts of air quality, construction noise and water quality were generated from the construction activities under the Project.

ES.06. There were three (3) cases of public concern/environmental complaint received by the EPD during the Construction Period. Investigations concluded that the concerns/complaints were not due to works under the Project, and thus no mitigation measures were advised by the ET. There were no documented notifications of summons and successful prosecutions received during the Construction Period. Thus, no associated mitigation action was needed.

ES.07. In general, monitoring results indicated that the implemented environmental mitigation measures were effective to alleviate adverse environmental impacts generated from the construction of the Project, confirming that the EIA predictions on the environmental impacts and the associated recommendations on the environmental mitigation measures were precise.

ES.08. The management of liquid and solid waste generated from the construction under the Project complied with the liquid and solid waste regulations or guidelines as well as the Contractor's Environmental Management Plan and the associated Waste Management Plan approved by the Engineer prior to implementation.

ES.09. The environmental protection performance of the construction works under the Project was in general satisfactory.

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1 INTRODUCTION

BACKGROUND

1.01 The China State Construction Engineering (Hong Kong) Limited (hereinafter "CSCE") was awarded the Contract DC/2009/08 *Construction of Yuen Long South Branch Sewers and Expansion of Ha Tsuen Sewage Pumping Station* (hereafter "the Project") by the Drainage Services Department (DSD) in October 2009.

1.02 The Project involved the construction of about 9km of sewers and rising mains with diameters ranging from 200-1500mm in Yuen Long South and Ha Tsuen areas, a sewage pumping station near Shio Tsiu San Tsuen Road in Yuen Long south, and the expansion of the existing Ha Tsuen Sewage Pumping Station. The site layout plan is shown in ***Appendix A***.

1.03 The expansion of Ha Tsuen Sewage Pumping Station was under a statutory EIA (Register No. AEIAR-072/2003) study for "*Upgrading and expansion of San Wai Sewage Treatment Works and expansion of Ha Tsuen Pumping Station*" commissioned by the DSD. The Variation Environmental Permit No. EP-327/2009A for upgrading and expansion of Sewage Treatment Works at San Wai (excluded for the Project) and Ha Tsuen Sewage Pumping Station was again obtained by DSD in June 2010 for the relevant works.

1.04 According to Section 25 of the Particular Specification (PS) and the Variation Environmental Permit No. EP-327/2009A, the scope of monitoring included air quality, construction noise, water quality and environmental site audit. It was undertaken in accordance with the Environmental Monitoring and Audit Manual as part of EIA report [AEIAR-072/2003] (hereafter "the EM&A Manual") by an independent Environmental Team (ET).

1.05 Baseline monitoring for water quality was conducted between 22 December 2009 and 18 January 2010. Baseline data for air and noise monitoring were taken from an adjacent project (project CV/2008/03) at Ha Tsuen Road between June 2009 and January 2010 and were adopted for the Action/Limit levels for the Project.

1.06 The EM&A for construction of the Project was commenced on 8 February 2010 and terminated on 31 January 2014 upon agreement with the IEC and RE.

1.07 This is the Final EM&A Report for the Construction Phase, presenting details of the EM&A program and the associated monitoring results, including comparison and contrast between monitoring results and the EIA predictions to review monitoring methodology, practicality and effectiveness of the EIA process and the EM&A program.

2 PROJECT ORGANIZATION AND CONSTRUCTION PROGRESS

PROJECT ORGANIZATION AND MANAGEMENT STRUCTURE

2.01 Organization structure and contact details of the Contractor and relevant parties with respect to the on-site environmental management are shown in ***Appendix B***.

WORKS UNDERTAKEN DURING THE CONSTRUCTION PERIOD

2.02 The master construction program is enclosed in ***Appendix C.***

SUMMARY OF ENVIRONMENTAL STATUS

2.03 A summary of the relevant permits, licences, and/or notifications on environmental protection for this Project is presented in ***Table 2-1***.

Table 2-1 Status of Environmental Licenses and Permits

Item	Description	License/Permit Status
1	Environmental Permit (EP-329/2009/A)	Update on 1 June 2010
2	Chemical waste Producer Registration Registration No. 5213-511-C3570-01	Issued on 13 Nov 2009
3	Water Pollution Control Ordinance (Discharge License) License No. WT00005671-2009	Issued on 12 Jan 2010 Expiry date: 31 Jan 2015
4	Billing Account for Disposal of Construction Waste (Account Number: 700947)	Issued on 7 October 2009

2.04 The baseline monitoring report - *Expansion of Ha Tsuen Sewage Pumping Station* (*Ref: TCS00491/09/600/R0023v6*) has been verified by IEC and endorsed by EPD on 16 July 2010.

3 SUMMARY OF CONSTURCTION IMPACT MONITORING REQUIREMENTS

MONITORING PARAMETERS

3.01 According to the *EM&A Manual*, the environmental aspects under the Project included air quality, construction noise and water quality, as well as landscape and visual impact monitoring by a competent landscape architect. The monitoring parameters are summarized in ***Table 3-1***.

Table 3-1 Summary of Monitoring Parameters

Environmental Aspect	Parameters
Air Quality	• 1-hour Total Suspended Particulates (hereinafter '1-hr TSP'); and • 24-hour Total Suspended Particulates (hereinafter '24-hr TSP').
Construction Noise	• A-weighted equivalent continuous sound pressure level (30min) (hereinafter '$L_{eq(30min)}$' during the normal working hours; and • A-weighted equivalent continuous sound pressure level (5min) (hereinafter '$L_{eq(5min)}$' for construction work during the restricted hours.
Water Quality – Local Stream Course	• In Situ Measurement - Dissolved Oxygen (DO) and Turbidity • Laboratory Analysis - Suspended Solids (SS)
Water Quality – Effluent Discharge	• In Situ Measurement - pH value • Laboratory Analysis - SS and Chemical oxygen demand (COD)
Landscape and Visual Resources	• Vegetation survey undertaken on an "area" basis to identify representative types and species composition; • Assessment of landscape character; and • Tree survey report

MONITORING LOCATIONS

Air Quality

3.02 The designated monitoring location Yeung Chun Pui Care & Attention Home was identified. As High Volume Sampler (HVS) installation at another designated air monitoring station Tin Shing Court was refused by the incorporated owners, the alternative location, Ho Tak Sum Primary School, as sensitive receiver mentioned in the EIA Report (Register No. AEIAR-072/2003) was proposed to be the replacement to undertake air quality monitoring in accordance with the EM&A Manual Clauses 2.2.1.20. The proposal and recommendation was agreed by IEC and endorsed by EPD. Details of monitoring stations are presented in ***Table 3-2*** and illustrated in ***Appendix D***.

3.03 As reported to the RE and IEC on 16 October 2012, the power supply for the HVS at AM2 was disconnected since the site office that provided electric support was dismantled. Therefore, the monitoring was suspended on 20 October 2012 until a new location was confirmed on 7 November 2012, when the proposal of new location at AM2(a) was formally submitted to EPD subsequent to the agreement with the RE and IEC. No further comments were received from EPD regarding the proposal.

Table 3-2 Air Quality Monitoring Stations

Monitoring Location ID	Identified Address	Remarks
AM1	Ho Tak Sum Primary School	Replace the Designated Monitoring Station Tin Shing Court
AM2(a)	Site Office opposite to the original location of Yeung Chun Pui Care & Attention Home	Replace the Designated Monitoring Station Yeung Chun Pui Care & Attention Home

Construction Noise

3.04 The air quality monitoring and the construction noise monitoring stations undertaken for EM&A programme was agreed by IEC and endorsed by EPD. Details of the monitoring stations are presented in ***Table 3-3*** and shown in ***Appendix D***.

Table 3-3 Construction Noise Monitoring Stations

Monitoring Location ID	Identified Address	Remarks
NM1	Ho Tak Sum Primary School	Replace the Designated Monitoring Station Tin Shing Court
NM2	Yeung Chun Pui Care & Attention Home	Designated in the EM&A Manual

Water Quality

3.05 One designated location of a local stream course, Tin Shui Wai Nullah, was recommended to carry out water quality monitoring in accordance with the EM&A Manual. The designated sampling location R1 was located at the midpoint between two pedestrian flyovers athwart Tin Shui Wai Nullah, which were 320 meters apart. There were technical difficulty and safety issues sampling at R1. So, a new sampling point located at approximately 160m upstream of the R1 (hereinafter as R1b) was therefore proposed for the local stream water quality impact monitoring and was agreed by IEC prior to implementation of monitoring.

3.06 Details of the monitoring station are presented in ***Table 3-4*** and shown in ***Appendix D***.

Table 3-4 Location of Local Stream Water Quality Monitoring Station

Monitoring Location ID	Identified Address	Remarks
R1b	Midpoint between two pedestrian flyovers 320 metres apart athward Tin Shui Wai Nullah.	About 160 meters upstream from the designated location as stipulated in the EM&A Manual. Also, it is closer to the existing Ha Tsuen Sewage Pumping Station

Landscape and Visual

3.07 The selected route and area, frequency and requirements of landscape & visual monitoring was proposed by a competent landscape architect.

MONITORING FREQUENCY

3.08 The impact monitoring frequency and duration for air quality, construction noise, water quality of local stream course, and landscape & visual are summarized below.

Air Quality Monitoring

Parameters: 1-hour TSP and 24-hour TSP.
Frequency: Once every six days for 24-hour TSP and three times every six days for 1-hour TSP.
Duration: Throughout the construction period.

Noise Monitoring

Parameters: One set of $L_{eq(30min)}$ as 6 consecutive $L_{eq(5min)}$ between 0700 and 1900 hours on normal weekdays.
$L_{eq(5min)}$, L_{10} and L_{90} during the construction undertaken during Restricted Hours (from 1900 to 0700 hours of the following day and full day of public holiday and Sunday)
Frequency: Once every six days during 0700 to 1900 hours on normal weekdays. Restricted Hour monitoring should depend on conditions stipulated in Construction Noise Permit.

Duration: Throughout the construction period.

Water Quality Monitoring of Local Stream Course

Parameters: DO, Turbidity and SS.
Frequency: 3 days per week.
Depth: Mid-depth
Duration: Throughout the construction period and the interval between 2 sets of monitoring is not less than 36 hours

Landscape and Visual Monitoring

Parameters: Site inspection with broad scope of audit as listed in the EM&A Manual
Frequency: Once every 2 weeks
Duration: Throughout the construction period

Site inspection and Audit

Frequency: Once per week.
Duration: Throughout the construction period

3.09 According to Section 4.4.1.9 of the EM&A Manual, a post project monitoring exercise on selected local stream water quality was to be undertaken for four weeks in the same manner as the impact monitoring.

Water Quality Monitoring of Local Stream Course

Parameters: DO, Turbidity and SS
Frequency: 3 days per week
Depths: mid-depth
Duration: 4 weeks and the interval between 2 sets of monitoring is not less than 36 hours upon completion of the construction activities

ENVIRONMENTAL QUALITY CRITERIA

3.10 The environmental quality criteria i.e. Action and Limit levels (herein after 'A/L levels') are listed in Table 3-5, 3-6 and 3-7 below.

Table 3-5 Action and Limit Levels for Air Quality Monitoring

Monitoring Location	Action Level (μg /m^3)		Limit Level (μg /m^3)	
	1-hour	24-hour	1-hour	24-hour
AM1	305	162	500	260
AM2	310	190	500	260

Table 3-6 Action and Limit Levels for Construction Noise

Monitoring Location	Action Level	Limit Level in dB(A)
	0700-1900 hrs on normal weekdays	
NM1	When one or more documented complaints are received	70 dB(A) of $L_{eq(30min)}$ during normal hours from 0700 to 1900 hours on normal weekdays, reduced to 65 dB(A) during school examination periods
NM2		70 dB(A) of $L_{eq(30min)}$ during normal hours from 0700 to 1900 hours on normal weekdays

Table 3-7 Action and Limit Levels for a Local Stream Water Quality Monitoring (R1b)

Parameter	Action Level	Limit Level
DO (mg/L)	4.6	4 mg/L or 40% saturation at 15^{o}C
Turbidity (NTU)	15.6	16.2
SS (mg/L)	31.5	31.9

ENVIRONMENTAL MITIGATION MEASURES

3.11 Environmental Mitigation Implementation Schedule (EMIS), such as the construction dust, noise, wastewater and waste management, was performed in accordance with the project EM&A Manual.

4 MONITORING RESULTS AND DISCUSSION

4.01 Monitoring results obtained during the EM&A period from 10 February 2010 to 30 January 2014 are graphically presented in ***Appendix E***.

AIR QUALITY MONITORING

4.02 A summary of the monitoring results and breaches of air quality A/L levels during the Construction Period are tabulated in ***Tables 4-1, 4-2 and 4-3*** and the relevant graphical plots are presented in ***Appendix E***.

Table 4-1 Summary of 1-hour TSP monitoring in the Construction Period, (μg/m^3)

Time Period	AM1				AM2/2(a)			
	Min	Max	Mean	Total Events	Min	Max	Mean	Total Events
2010	26	154	75.1	171	29	167	80.8	171
2011	61	216	64.5	186	59	206	103.8	186
2012	48	243	126.9	192	48	279	130.6	192
2013	13	291	98.6	189	20	230	99.6	189
2014	83	179	116.9	18	84	186	115.2	18
Full Period	**13**	**291**	**100.4**	**756**	**20**	**279**	**104.6**	**756**
Recorded Date	24-Jul-13	4-Dec-13	NA	NA	24-Jul-13	27-Jan-12	NA	NA

Table 4-2 Summary of 24-hour TSP monitoring in the Construction Period, (μg/m^3)

Time Period	AM1				AM2(a)			
	Min	Max	Mean	Total Events	Min	Max	Mean	Total Events
2010	7	153	53.6	58	11	219	64.8	57
2011	12	156	47.5	63	12	228	65.6	60
2012	16	134	54.6	60	10	232	67.3	59
2013	3	155	51.1	62	12	232	78.2	59
2014	61	151	93.4	5	24	146	105.6	5
Full Period	**3**	**156**	**52.2**	**248**	**10**	**232**	**69.8**	**240**
Recorded Date	25-Jul-13	30-Dec-11	NA	NA	26-May-12	12-Dec-13	NA	NA

Table 4-3 Summary of the Air Quality Action/Limit Level exceedances

Location	Exceedance	1-hour TSP	24-hour TSP	Total
AM1	Action Level	0	0	0
	Limit Level	0	0	0
AM2/2(a)	Action Level	0	**3**	**3**
	Limit Level	0	0	0

4.03 During the Construction Period, there were a total of 1,527 monitoring events for 1-Hr TSP, and no Action and Limit Level exceedances in 1-Hr TSP were recorded.

4.04 During the Construction Period, there were a total of 488 monitoring events for 24-Hr TSP, and three (3) Action Level exceedances were recorded. Notifications of Exceedances (hereinafter "NOE") were issued accordingly to the respective parties. Investigations concluded that the exceedances in 24-Hr TSP were not due to works under the Project.

4.05 During the Construction Period, there were two incidences of power failure of the High Volume Sampler (HVS) on 10 October 2011 and 15 October 2011 at location AM2. The HVS was then relocated to AM2(a), affecting monitoring work on 21 October 2011. Details regarding the power failure and relocation events are available in the October 2011 EM&A monthly report.

CONSTRUCTION NOISE MONITORING

4.06 A summary of the monitoring results and breaches of noise A/L levels during the Construction Period are tabulated in ***Tables 4-4 and 4-5*** and the relevant graphical plots are presented in ***Appendix E***.

Table 4-4 Summary of noise monitoring in the Construction Period, ($L_{eq(30min)}$, dB(A))

Time Period	NM1				NM2			
	Min	Max	Mean	Total Events	Min	Max	Mean	Total Events
2010	56	70.1	64.6	57	56.6	69.9	65.2	57
2011	60.7	69.8	64.9	62	62	69.9	66.7	62
2012	60.2	69.7	65.7	64	59.7	68.9	63.8	64
2013	59	69.4	64.2	63	55.2	69.9	63.7	63
2014	58	66	62.5	6	61	65	62.5	6
Full Period	**56**	**70.1**	**64.8**	**252**	**55.2**	**69.9**	**64.8**	**252**
Recorded Date	17-Feb-10	25-Nov-10	NA	NA	20-Feb-13	19-Aug-10	NA	NA

Table 4-5 Summary of noise Action/Limit Level exceedances

Location	Action Level Exceedance	Limit Level Exceedance	Total Exceedance
NM1	**1 (Noise complaint)**	**2**	**3**
NM2		0	

4.07 During the Construction Period, there were a total of 504 monitoring events for construction noise. There was one (1) noise complaint recorded (which is an Action Level exceedance), and two (2) Limit Level exceedance recorded. NOEs were issued accordingly to the respective parties involved. Investigations concluded that the exceedances were not due to works under the Project.

WATER QUALITY MONITORING – LOCAL STREAM COURSE

4.08 A summary of the breaches in water quality A/L levels during the Construction Period are tabulated in ***Table 4-6*** and the relevant graphical plots are presented in ***Appendix E***.

Table 4-6 Summary of water quality Action/Limit Level exceedances

Year	No of sample analysis in each Parameter	Exceedance	DO	Turbidity	SS	Total annual exceedance
2010	137	Action Level	3	3	0	67
		Limit Level	5	27	29	
		Sub-Total	8	30	29	
2011	152	Action Level	0	0	0	16
		Limit Level	0	5	11	
		Sub-Total	0	5	11	
2012	153	Action Level	0	0	0	13
		Limit Level	0	6	7	
		Sub-Total	0	6	7	
2013	150	Action Level	0	0	0	10
		Limit Level	1	4	5	
		Sub-Total	1	4	5	
2014	13	Action Level	0	0	0	0
		Limit Level	0	0	0	
		Sub-Total	0	0	0	
Total	605	Action Level	3	3	0	106
		Limit Level	6	42	52	

4.09 During the Construction Period, there were a total of 605 monitoring days for water quality. A total of six (6) Action Level and three (3) Limit Level exceedances in DO were recorded. A total of three (3) Action Level and 42 Limit level exceedances in turbidity were recorded. There were no Action Level exceedances but 53 Limit Level exceedances in SS recorded.

4.10 NOEs for exceedances were issued accordingly to the respective parties. Investigations concluded that the exceedances in DO, turbidity and SS were not due to works under the Project.

POST-CONSTRUCTION MONITORING FOR WATER QUALITY

4.11 Further to the instruction by the Contractor, the post construction monitoring for water quality was performed in the period of 8 February 2014 to 6 March 2014.

4.12 A total of **12** sampling days were performed for water quality monitoring at R1b of the local stream course, Tin Shui Wai Nullah. Monitoring results of the three key parameters, dissolved oxygen (DO), turbidity and suspended solids (SS), are summarized in ***Table 4-7***.

Table 4-7 Summaries of Post Construction Monitoring Water Quality Results

Sampling date	DO conc. (mg/L)	Turbidity (NTU)	SS (mg/L)	Temperature (^{O}C)	pH (unit)
8-Feb-14	5.0	8.5	15	20.1	7.3
10-Feb-14	4.9	11.8	14	18.6	7.0
12-Feb-14	4.8	10.0	29	15.5	7.4
14-Feb-14	6.4	7.2	12	15.4	6.9
18-Feb-14	5.5	22.0	71	20.9	6.8
20-Feb-14	5.0	22.7	65	21.4	6.7
22-Feb-14	5.7	7.2	8	18.5	7.4
24-Feb-14	5.0	2.7	2	20.1	6.8
26-Feb-14	4.7	4.8	4	21.5	6.6
28-Feb-14	4.7	8.9	6	17.3	6.5
4-Mar-14	4.8	13.4	8	18.0	6.8
6-Mar-14	4.7	13.7	8	16.5	6.9

Table 4-8 Comparison to the Baseline Monitoring Result

Parameters	Baseline			Post construction		
	Min	Max	Average	Min	Max	Average
DO (mg/L)	4.3	12.1	8.6	4.7	6.4	5.1
Turbidity (NTU)	8.7	16.4	12.9	2.7	22.7	11.1
SS (mg/L)	8.0	32.0	24.3	2.0	71.0	20.2

4.13 During the Reporting Period, field measurements showed that water temperature and pH value of the local stream are within 15.4℃ to 21.5℃ and 6.5 to 7.4 respectively.

4.14 As shown in ***Table 4-8***, the average values of main parameters (DO, Turbidity and SS) for post-construction water quality results are tends to decrease compare to the baseline levels, it indicated no residual construction impact was caused to the local stream course due to post construction phase of the project.

RESULTS OF LANDSCAPE AND VISUAL IMPACT

4.15 Regular landscape and visual audit was undertaken twice a month by the landscape architect. Monitoring and audit works for landscaping and visual, as part of the EM&A programme, was undertaken by the Landscape Architect of the Contractor and the monitoring findings are presented in the respective Quarterly EM&A Reports.

4.16 In the Construction Period, 96 events of site inspection were undertaken and the findings were summarized in the relevant L&V site inspection checklist and in the stand-alone monthly L&V Impact Monitoring Report.

4.17 In general, standard hoarding was erected and well maintained around the works area in Ha Tsuen Sewage Pumping Station (HTSPS). On 18 November 2013, a total 26 trees were felled under arrangement by DSD. Furthermore, DSD planted a total of 42 new trees of 4 different species. All new trees had been already planted at designated location on December 2013. The

visual impacts of the transplanted trees in overall HTSPS are good. The condition of hoarding was satisfactory. The trees which are at HTSPS have been returned to DSD for management and monitoring since January 2011, and monthly L&V monitoring and site inspection carried out since then to the termination of the Project.

DISCHARGE LICENSE AND RESULTS OF EFFLUENT MONITORING

4.18 Monitoring of effluent quality followed the requirements specified in Section 4.3 of the approved EM&A Manual. A discharge license under Water Pollution Control Ordinance was obtained by the Contractor upon commencement of the Project. The licensee has performed self-monitoring as per the requirement under the discharge license.

4.19 During the Construction Period, effluent monitoring was conducted by the Contractor on 21 June 2012. The required testing determinants, such as pH, total suspended solids and chemical oxygen demand, were carried out in a HOKLAS laboratory. As advised by the Contractor, the flow rate of the days is 13.5m^3/day and is calculated by a pumping rate of 0.09m^3/min for 150 minutes.

4.20 For effluent quality monitoring as per the discharge license requirement, the results provided by the Contractor indicate that all determinants complied with the discharge license requirement.

DISCUSSION

4.21 The EIA has predicted that with implementation of the recommended environmental mitigation measures, adverse environmental impacts can be eliminated or mitigated to acceptable levels, i.e. levels of the measured parameters will not exceed the environmental quality performance criteria (i.e. A/L Levels) as stipulated and summarized in the EM&A Manual. Comparison of the EIA prediction with the compliance of the Project with the environmental quality performance criteria (i.e. A/L Levels) demonstrated that EIA prediction was in general precise: the monitoring results in general consistently fluctuated below the corresponding A/L Levels, with occasional higher peaks synchronizing with variations of the ambient conditions not related to the works under the Project.

4.22 Trends of the monitored parameters closely synchronized with the trends of the corresponding ambient environmental conditions of the area, indicating that the acquired monitoring results carried necessary statistical power to categorically identify or confirm the absence of adverse environmental impacts attributable to the works throughout the whole construction period of the Project. The implemented EM&A program and the associated methodology for air quality, construction noise and water quality is therefore considered effective.

4.23 Absence of the adverse environmental impacts on air quality, construction noise and water quality implies that the implemented environmental mitigation measures were effective to alleviate adverse environmental impacts generated from the construction of the Project. In addition, the environmental mitigation measures recommended in the EIA are proven to be cost effective.

4.24 From the trends of graphical plots of the monitored parameters of air quality, construction noise and water quality, maintenance or return of the ambient environmental conditions was evident along the whole construction period.

5 WASTE MANAGEMENT

5.01 Waste management was performed by an on-site Environmental Officer or an Environmental Supervisor from time to time. A Billing Account (account number 700947) under the ***Waste Disposal (Charges for Disposal of Construction Waste) Regulation*** was assigned on 7 October 2009. A discharge license No. WT00005671-2009 under Section 20 of the ***Water Pollution Control Ordinance*** was issued. CSCE also registered as a Chemical Waste Producer with EPD under the Waste Disposal (Chemical Waste) (General) Regulation and the Waste Producer Number assigned is WPN: 5213-511-C3570-01 dated 13 November 2009.

RECORDS OF WASTE QUANTITIES

5.02 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.

5.03 Whenever possible, materials were reused on-site as far as practicable. The quantity for disposal is summarized in the Monthly Summary Waste Flow Tables in ***Appendix H***.

5.04 The quantities of waste for disposal in the Reporting Period are summarized in ***Tables 5-1*** and ***5-2***.

Table 5-1 Summary of Quantities of Inert C&D Materials

Type of Waste	Quantity						Disposal Location
	2010	2011	2012	2013	2014	Total	
C&D Materials (Inert) (m^3)	0	0	0	0	0	0	-
Reused in this Contract (Inert) (m^3)	0	0	0	0	0	0	-
Reused in other Projects (Inert) (m^3)	0	0	0	0	0	0	-
Disposal as Public Fill (Inert) (m^3)	9749	15,717	23,588	10,791	220	60,065	Tuen Mun Area 38

Table 5-2 Summary of Quantities of C&D Wastes

Type of Waste	Quantity						Disposal Location
	2010	2011	2012	2013	2014	Total	
Recycled Metal (kg)	0	0	0	0	0	0	-
Recycled Paper/Cardboard Packing (kg)	0	0	0	0	0	0	-
Recycled Plastic (kg)	0	2,575	0	0	0	2,575	Licensed collector
Chemical Wastes (kg)	0	0	0	0	0	0	-
General Refuses (m^3)	149	40	14	11	1	215	NENT Landfill

5.05 The Monthly Summary Waste Flow Tables provided by the Contractor can found in ***Appendix H***.

6 SITE INSPECTIONS

6.01 According to the Environmental Monitoring and Audit Manual, regular environmental site inspections was carried out by ET joined with the Contractor and ER to confirm the environmental performance.

6.02 During the Construction Period, 204 events of joint site inspections were undertaken by the ER, EO and ET to evaluate the site environmental performance. No adverse environmental impacts were registered, indicating that mitigation measures implemented were effective and sufficient for the construction activities undertaken. Minor deficiencies found during site inspections and audit were rectified by specified deadlines. The site inspection checklists can be found in their relevant EM&A monthly reports. A statistical summary of the frequency of reminders and deficiencies observed is shown in ***Table 6-1***.

Table 6-1 Summary of the number of reminders/deficiencies observed in the Construction Period

Number of Findings in the Month	**2010**											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	-	1	8	5	5	7	7	6	4	5	11	7
Number of Findings in the Month	**2011**											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	2	2	4	2	1	1	5	8	2	5	3	1
Number of Findings in the Month	**2012**											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	4	5	5	4	4	4	4	2	2	3	1	4
Number of Findings in the Month	**2013**											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	4	3	2	2	3	3	4	2	4	12	3	5
Number of Findings in the Month	**2014**											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	0	-	-	-	-	-	-	-	-	-	-	-

6.03 According to Table 6-1, the average reminders/deficiencies observed in the Construction Period was 3.98 per month and 0.995 per week. All deficiencies were generally rectified within the specified deadlines.

7 NON-COMPLIANCE, COMPLAINTS, NOTIFICATIONS OF SUMMONS AND SUCCESSFUL PROSECUTIONS

NON-COMPLIANCE

7.01 No non-compliance was identified during regular site inspection and environmental audit. No associated remedial actions were recommended.

ENVIRONMENTAL COMPLAINT

7.02 During the Construction Period, there were a total of three (3) public concerns/complaints received. The statistical summary table of environmental complaint is presented in ***Table 7-1***.

Table 7-1 Statistical Summary of Environmental Complaints

Reporting Period	Environmental Complaint Statistics		
	Frequency	Cumulative	Complaint Nature
2010	3	3	Air (2)/Noise (1)
2011	0	3	Air (2)/Noise (1)
2012	0	3	Air (2)/Noise (1)
2013	0	3	Air (2)/Noise (1)
2014	0	3	Air (2)/Noise (1)

7.03 EPD received two public concerns/complaints regarding dust at Ping Ha Road on 22 and 23 March 2010, and one verbal public concern regarding noise on 25 September 2010. Investigations concluded that the complaints/concern were not related to works under the Project, and no associated mitigation action was thus advised in all the three cases.

7.04 The detailed summary and investigations of the concerns/complaints can be found in their respective Quarterly EM&A Reports (1st Quarterly Report and 3rd Quarterly Report).

NOTIFICATIONS OF SUMMONS AND SUCCESSFUL PROSECUTIONS

7.05 No notifications of summons and successful prosecutions were recorded during the Construction Period. No associated remedial actions were recommended.

8 IMPLEMENTATION STATUS OF MITIGATION MEASURES

8.01 The environmental mitigation measures that recommended in the Environmental Monitoring and Audit Manual covered the issues of dust, noise, water quality, waste management, and landscaping and visual.

8.02 The Contractor had been implementing the required environmental mitigation measures according to the Environmental Monitoring and Audit Manual. Environmental mitigation measures implemented during the Reporting Period are summarized in ***Table 8-1***.

Table 8-1 Environmental Mitigation Measures Implementation in the Reporting Period

Issues	Environmental Mitigation Measures
Water Quality	• Wastewater were appropriately treated by treatment facilities; • Drainage channels were provided to convey run-off into the treatment facilities; • Drainage systems were regularly and adequately maintained. • De-silting facility was provided to treat the discharged water; also the treated water was reused for spraying the road surface; • Exposed stockpiles and exposed soil surfaces were covered with tarpaulin or impervious sheets to minimise dust emission; • The stockpiles of materials were placed in the locations away from the drainage channel so as to avoid releasing materials into the channel; • Wheel washing facilities has been provided at site exits to ensure that earth, mud and debris would not be carried out of the works areas by vehicles; • A discharge licence was issued by EPD for discharging effluent from the construction site; • A licensed waste collector have been applied from EPD; and • Illegal disposal of chemicals should be strictly prohibited.
Air Quality	• Regular watering to reduce dust emissions from all exposed site surface, particularly during dry weather; • Frequent watering for particularly dusty construction areas and areas close to air sensitive receivers; • Cover all excavated or stockpile of dusty material by impervious sheeting or sprayed with water to maintain the entire surface wet; • Public roads around the site entrance/exit had been kept clean and free from dust; • Tarpaulin covering of any dusty materials on a vehicle leaving the site; • Water sprinkler system was provided at haul road to reduce dust emissions during the vehicles passing through the haul road; • The vehicle speed within the site is limited to 5km/hr; and • Wheel washing facilities have been provided at the site exit.
Noise	• Good site practices to limit noise emissions at the sources; • Use of quiet plant and working methods according to EP-327/2009/A; • Use of site hoarding with noise barriers to screen noise at ground level of NSRs; • Use of shrouds/temporary noise barriers to screen noise from relatively static PMEs according to EP-327/2009/A; • Use of temporary noise barrier with surface density 7kg/m^2 to be assumed that the noise reduction is 10 dB(A) for stable plants and 5dB(A) for movable plant in accordance with approved EIA Report Appendix 4A Table 4A3.2; • Idle equipment are turned off or throttled down; • No construction works shall be undertaken during school examination period in the Ha Tsuen Sewage Pumping Station according to EP-327/2009/A; and • Alternative use of quiet plant within one worksite, where practicable.

Issues	Environmental Mitigation Measures
Waste and Chemical Management	• Excavated material was reused on site as far as possible to minimize off-site disposal. Scrap metals or abandoned equipment was recycled if possible; • Waste arising was kept to a minimum and be handled, transported and disposed of in a suitable manner; • The Contractor adopted a trip ticket system for the disposal of C&D materials to any designated public filling facility and/ or landfill; • Chemical waste was handled in accordance with the Code of Practice on the Packaging, Handling and Storage of Chemical Wastes; • 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; • To encourage collection of aluminium cans by individual collectors, separate labelled bins were provided to segregate this waste from other general refuse generated by the workforce; • Any unused chemicals or those with remaining functional capacity were recycled; • Prior to disposal of C&D waste, wood, steel and other metals were separated for re-use and recycling and inert waste utilised as fill material to minimise the quantity of waste to be disposed of to landfill; • Proper storage and site practices to minimise the potential for damage or contamination of construction materials; and • Plan and stock construction materials carefully to minimise amount of waste generated and avoid unnecessary generation of waste.
Landscape and Visual	• Hoarding was erected around site boundary properly; • The transplanted tree and landscaping plants were kept in regular inspection; • All preserved trees were protected and fenced off properly; • No construction activities were carried out in the protection zone of the preserved trees.
General	• The site was generally kept tidy and clean.

9 CONCLUSIONS

9.01 Construction works at Ha Tsuen Sewage Station were terminated on 25 January 2014, and the EM&A programme for the construction phase were terminated on 31 January 2014.

9.02 The monitoring results demonstrated that the monitoring environmental parameters generally fluctuated consistently below the corresponding A/L Levels, with occasional higher peaks that synchronized with the variations of the ambient conditions. This implies that the implemented EM&A program for air quality, construction noise, and water quality was effective in generating data of necessary statistical power to reflect the ambient environmental trends of the area.

9.03 Trends in the graphical plots of the monitored parameters of air quality, construction noise, and water quality demonstrated the maintenance or return of the ambient environmental conditions along the entire Construction Period.

9.04 ***Table 9-1*** summarizes the exceedances of the A/L Levels recorded during the Construction Period of the Project.

Table 9-1 Summary of Exceedances of A/L Levels

Parameter		Total Monitoring Occasions	Number of Exceedances				Source of Exceedances
			A/L		L/L		
			Number	%	Number	%	
Air Quality	1-Hr TSP	1527	0	0	0	0	Not related to the Works
	24-Hr TSP	488	4	0.08	0	0	
Noise	Leq (30min)	504	1	0.2	2	0.4	
Water Quality	DO	605	6	1	3	0.5	
	Turbidity		3	0.5	42	7	
	SS		0	0	53	9	

9.05 As shown in ***Table 9-1***, no works-related exceedances were registered during the Construction Period of the Project, indicating no adverse environmental impacts of air quality, construction noise, and water quality were generated from the construction activities under the Project. This also implies that the implemented environmental mitigation measures were effective to alleviate the adverse environmental impacts generated from the construction works under the Project.

9.06 A total of 4 Action Level exceedance of air quality; 1 Action Level and 2 Limit Level exceedances in construction noise; 9 Action Level and 98 Limit Level exceedances of water quality were recorded. NOEs were issued for the exceedances accordingly and investigations concluded that none of the exceedances were related to works under the Project.

9.07 During the Construction Period, there were no notifications of summons and successful prosecutions. However, there were three cases of public concern/environmental complaint received by the EPD regarding air quality (2) and construction noise (1). Investigations concluded that the concerns/complaints were not due to works under the Project, and no mitigation measures were advised.

9.08 The monitoring and audit works for landscaping and visual was undertaken by a Landscape Architect of the Contractor and the monitoring findings were submitted as a stand-alone document separately. In general, standard hoarding was erected and well maintained around the works area in Ha Tsuen Sewage Pumping Station (HTSPS). On 18 November 2013, a total of 26 trees were felled under arrangement of DSD. Furthermore, DSD has confirmed to plant a total of 42 new trees of 4 different species. All new trees had been already planted at designated location on December 2013. Details of the inspections and observations were reported in stand-alone monthly documents “Results of Landscape and Visual Impact Monitoring” of the respective months.

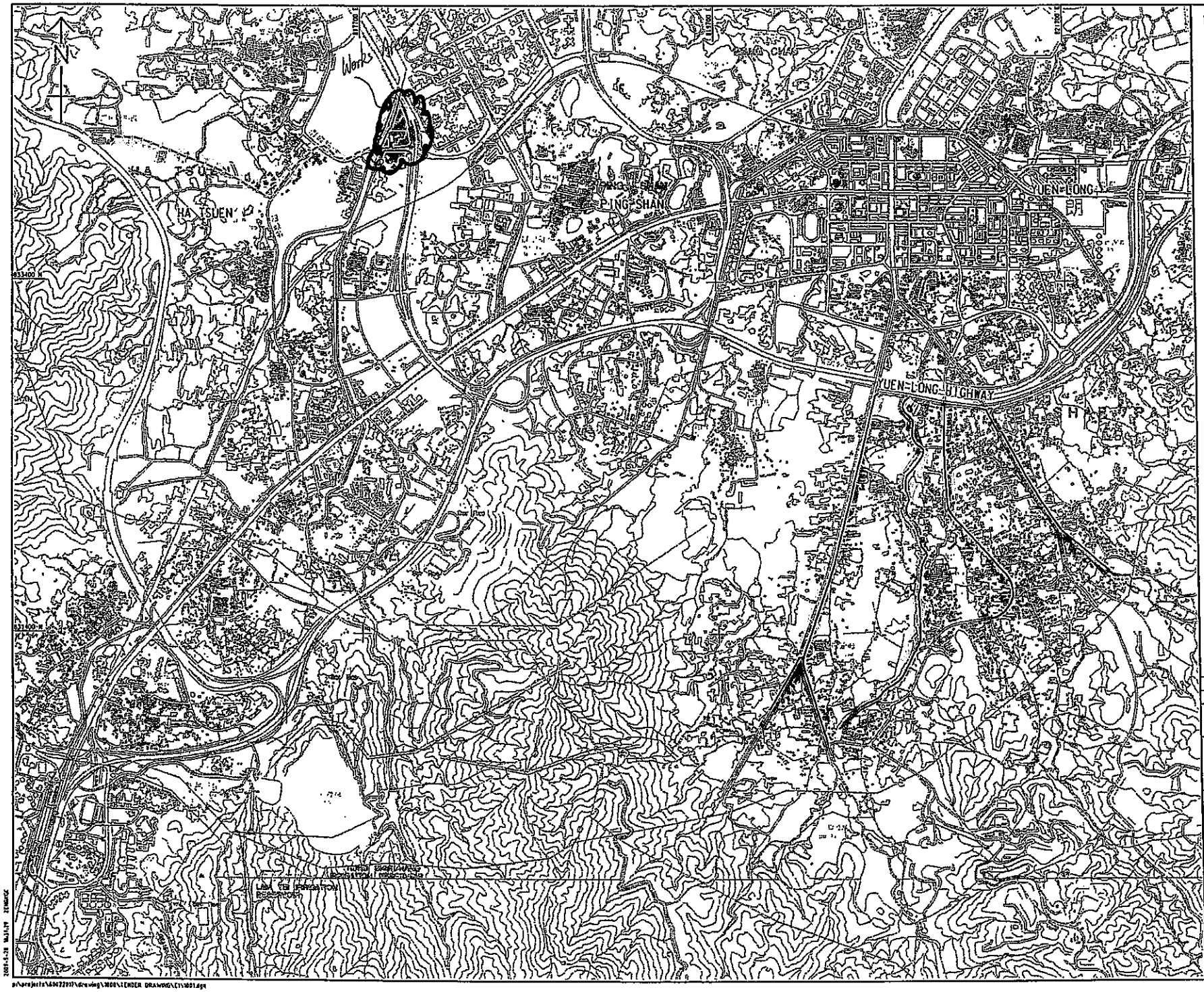
9.09 In the Construction Period, there were no incidence of non-compliance recorded by the ET, and 204 observations of minor deficiencies were found during regular site inspections or monthly site audits. The average deficiencies per month is 3.98 and the average deficiencies found per week is 0.995. All deficiencies were generally rectified within the specified deadlines.

9.10 The liquid and solid waste generated from the construction period under the Project was satisfactorily managed in accordance with the liquid and solid waste regulations or guidelines as well as the Contractor's Environmental Management Plan and the associated Waste Management Plan approved by the Engineer prior to implementation.

9.11 The environmental protection performance of the Project was in general satisfactory.

Appendix A

Site Layout Plan



-	TENDER DRAWING	DSD/ACTS	05.09

DRAINAGE SERVICES DEPARTMENT,
THE GOVERNMENT OF THE HONG KONG
SPECIAL ADMINISTRATIVE REGION

YUEN LONG AND KAM TIN SEWERAGE AND SEWAGE DISPOSAL - CONSTRUCTION OF YUEN LONG SOUTH BRANCH SEWERS AND EXPANSION OF HA TSUEN SEWAGE PUMPING STATION

LOCATION PLAN

AECOM

DRG NO. 60022017/C1/1001

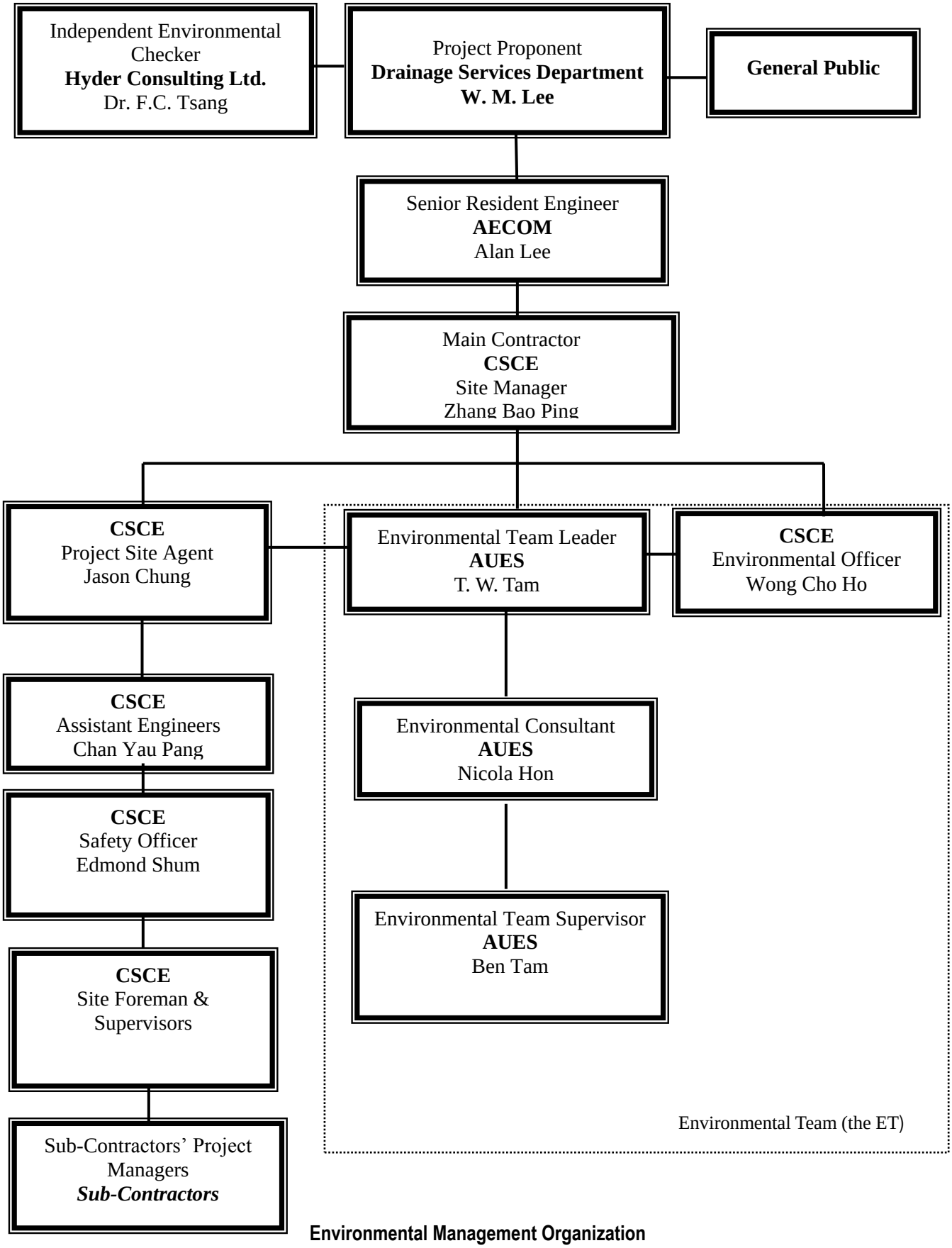
CONTRACT NO. DC/2009/08

SCALE AT A1 1 : 10000

METRES

Appendix B

Environmental Management Organization Chart



Environmental Management Organization

Contact Details of Key Personnel

Organization	Project Role	Name of Key Staff	Tel No.	Fax No.
DSD	Employer	Mr. W. M. Lee	--	2827-8700
AECOM	Senior Resident Engineer	Mr. Alan Lee	9706 9568	2472 0132
Hyder	Independent Environmental Checker	Dr. F C Tsang	2911 2744	2805 5028
CSCE	Site Manager	Mr. Zhang Bao Ping	2472 0113	2472-0229
CSCE	Site Agent	Mr. Jason Chung	2472 0113	2472-0229
CSCE	Site Engineer	Mr. Michael Kan	2472 0113	2472-0229
CSCE	Environmental Officer	Mr. Wong Cho Ho	2472 0113	2472-0229
CSCE	Safety Officer	Mr. Edmond Shum	2472 0113	2472-0229
AUES	Environmental Team Leader	Mr. T. W. Tam	2959-6059	2959-6079
AUES	Environmental Consultant	Ms. Nicola Hon	2959-6059	2959-6079
AUES	Team Supervisor	Mr. Ben Tam	2959-6059	2959-6079

Legend:

DSD (Employer) – Drainage Services Department

AECOM (Engineer) – AECOM

CSCE (Main Contractor) – China State Construction Engineering (Hong Kong) Ltd

Hyder (IEC) – Hyder Consulting Limited

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

Appendix C

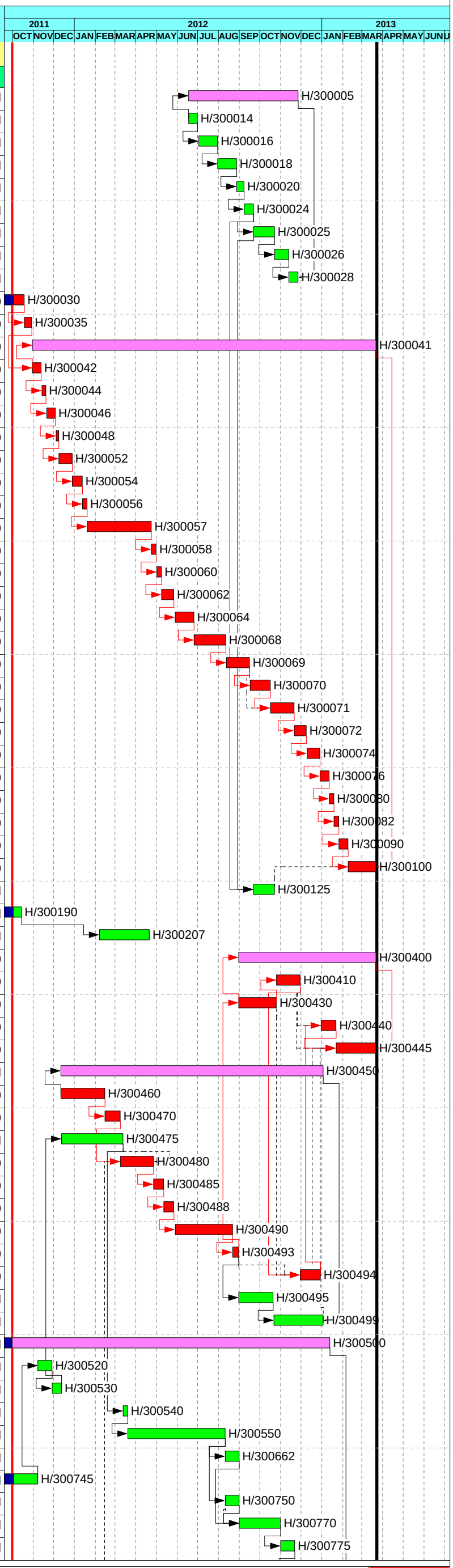
Master Construction Program

Contract No. DC/2009/08
Construction of Yuen Long South Branch Sewers and Expansion of HTS Pumping Station

Ha Tsuen Area

Rising Main

Activity ID	Description	Orig Dur	Calendar	Early Start	Early Finish	Total Float
H/300005	Rising Main bet HTPS to ChC20	136 *	1	18JUN12	26NOV12	1d
H/300014	Sheet Piling bet HTPS to ChC20	12	1	18JUN12	30JUN12	1d
H/300016	Excavation and Shoring bet HTPS to ChC20	24	1	03JUL12	30JUL12	1d
H/300018	Pipe Laying bet HTPS to ChC20	24	1	31JUL12	27AUG12	1d
H/300020	Pipe Connection at ChC20	10	1	28AUG12	07SEP12	1d
H/300024	Cast Bend Block	12	1	08SEP12	21SEP12	1d
H/300025	Water Testing HTPS to C20	24	1	22SEP12	22OCT12	1d
H/300026	Backfill and Remove Sheet Pile HTPS to ChC20	18	1	23OCT12	12NOV12	1d
H/300028	Reinstatement HTPS to ChC20	12	1	13NOV12	26NOV12	1d
H/300030	XP Application for Flow Meter Chamber	75	1	16JUL11 A	18OCT11	0
H/300035	Obtain RA for TTA	10	1	19OCT11	29OCT11	0
H/300041	Rising Main bet ChC20 to ChC57	410 *	1	31OCT11	21MAR13	0
H/300042	Erect Temp Fence	12	1	31OCT11	12NOV11	0
H/300044	Remove Extg Fence	6	1	14NOV11	19NOV11	0
H/300046	Fell and Transplant Tree	12	1	21NOV11	03DEC11	0
H/300048	Remove Wheel Washing Bay	4	1	05DEC11	08DEC11	0
H/300052	Remove Existing Planter	15	1	09DEC11	28DEC11	0
H/300054	TTA for RM bet ChC20 to ChC57	12	1	29DEC11	12JAN12	0
H/300056	Remove U-channel and Catchpit	6	1	13JAN12	19JAN12	0
H/300057	Diversion of Existing Drainage	72	1	20JAN12	23APR12	0
H/300058	Trial Pits bet ChC20 to ChC57	6	1	24APR12	30APR12	0
H/300060	Relocation of Existing Gate Control Panel	6	1	02MAY12	08MAY12	0
H/300062	Sheet Piling bet ChC20 to ChC57	15	1	09MAY12	26MAY12	0
H/300064	Excavation and Shoring bet ChC20 to chC57	24	1	29MAY12	25JUN12	0
H/300068	Laying Pipe bet ChC20 to ChC57	40	1	26JUN12	11AUG12	0
H/300069	Construct Flow Meter Chamber	30	1	13AUG12	15SEP12	0
H/300070	Water Testing Ch20 to Ch57	24	1	17SEP12	16OCT12	0
H/300071	Backfill and Remove Sheet Pile	30	1	17OCT12	20NOV12	0
H/300072	New Catchpit and DN200 DI Pipe	16	1	21NOV12	08DEC12	0
H/300074	Power Supply Cable Duct and Draw Pit	15	1	10DEC12	28DEC12	0
H/300076	Extend U-channel	11	1	29DEC12	11JAN13	0
H/300080	Formation Work	6	1	12JAN13	18JAN13	0
H/300082	Reinstatement of Gate Control Panel	6	1	19JAN13	25JAN13	0
H/300090	Kerb and Footpath	12	1	26JAN13	08FEB13	0
H/300100	Reinstate ChC20 to ChC57	30	1	09FEB13	21MAR13	0
H/300125	Testing of RM bet station and extg valve chamber	24	1	22SEP12	22OCT12	91d
H/300190	ChA0 - ChA13: Reinstate Inside HTPS	12	1	16JUL11 A	14OCT11	129d
H/300207	Connection at Ch89	60	1	07FEB12	20APR12	129d
H/300400	Rising Main bet ch267 to ch280 & Washout Chamber	164 *	1	31AUG12	21MAR13	0
H/300410	Construct Washout Chamber	30	1	26OCT12	29NOV12	0
H/300430	Rising Main between ch280 to ch267	46	1	31AUG12	25OCT12	0
H/300440	Connection at ch267	18	1	31DEC12	21JAN13	0
H/300445	Reinstatement of Area	46	1	22JAN13	21MAR13	0
H/300450	Pipe Jacking between ch280 to ch387	312 *	1	12DEC11	02JAN13	16d
H/300460	Construct Jacking pit at ch280	48	1	12DEC11 *	14FEB12	0
H/300470	Setting up Pipe Jacking at ch280	20	1	15FEB12	08MAR12	0
H/300475	Preparation Works at Receiving Pit at Ch387	70	1	13DEC11	12MAR12	10d
H/300480	DN1500 Jacking Sleeve: Ch280 to Ch387	38	1	09MAR12	26APR12	0
H/300485	Demobilization of Jacking Plant	12	1	27APR12	11MAY12	0
H/300488	Setting up for Pipe Laying Ch280 to Ch387	12	1	12MAY12	26MAY12	0
H/300490	Install RM1200 bet ch280 to ch387	72	1	29MAY12	21AUG12	0
H/300493	Grouting bet RM and Pipe Sleeve	8	1	22AUG12	30AUG12	0
H/300494	Water Testing Ch267 to Ch387	24	1	30NOV12	29DEC12	0
H/300495	Insitu Bend at Ch387 and Backfill	42	1	31AUG12	20OCT12	16d
H/300499	Reinstatement of Area at ch387	60	1	22OCT12	02JAN13	16d
H/300500	Pipe Jacking between ch387 to ch815	790 *	1	14MAY10 A	12JAN13	53d
H/300520	Setting up Pipe Laying ch580 to 387 Stage 1	18	1	08NOV11	28NOV11	10d
H/300530	Install RM1200 bet 580 to ch387 Stage 1	12	1	29NOV11	12DEC11	10d
H/300540	Setting up Pipe Laying ch580 to 387 Stage 2	6	1	13MAR12	19MAR12	53d
H/300550	Install RM1200 bet 580 to ch387 Stage 2	116	1	20MAR12	10AUG12	53d
H/300662	Grouting bet RM and Pipe Sleeve Ch580 to 387	18	1	11AUG12	31AUG12	53d
H/300745	Install RM1200 bet ch815 to ch580	215	1	30APR11 A	07NOV11	10d
H/300750	Grouting bet RM and Pipe Sleeve ch580 to 815	18	1	11AUG12	31AUG12	53d
H/300770	Bend Block and Access Chamber at ch580	50	1	01SEP12	31OCT12	53d
H/300775	Backfill / Remove Sheet Pile at ch580	18	1	01NOV12	21NOV12	53d



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Finish date	15NOV17
Run date	25OCT11
Project name	WP07
Page number	1A
c Primavera Systems, Inc.	

Early bar
Progress bar
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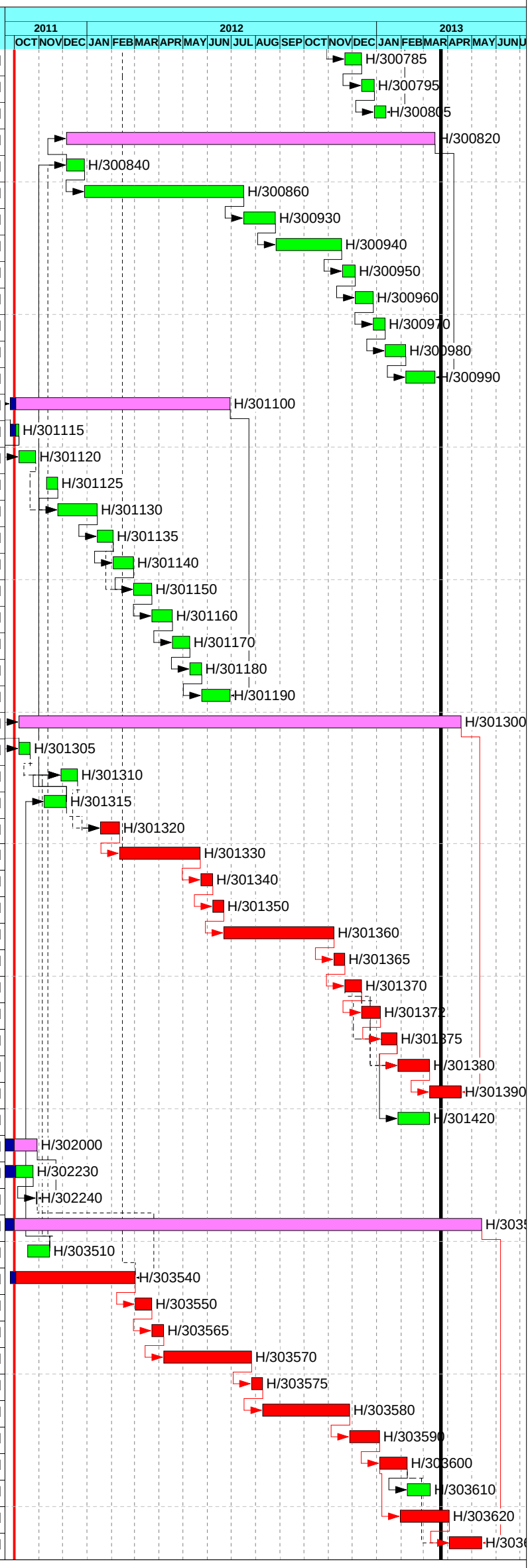
Summary bar
Start milestone point
Finish milestone point

Programme of Works (Rev. 06) - Ha Tsuen Rising Main

中國建築 CHINA STATE CONSTRUCTION

Contract No. DC/2009/08
Construction of Yuen Long South Branch Sewers and Expansion of HTS Pumping Station

Activity ID	Description	Orig Dur	Calendar	Early Start	Early Finish	Total Float
H/300785	Reinstate Box Culvert at ch580	18	1	22NOV12	12DEC12	53d
H/300795	Reinstate Planter	12	1	13DEC12	28DEC12	53d
H/300805	Bamboo Planting	12	1	29DEC12	12JAN13	53d
H/300820	RM between ch900 to ch815	374 *	1	06DEC11	15MAR13	5d
H/300840	Setting up at ch900	18	1	06DEC11	28DEC11	5d
H/300860	Excavation ch900 to ch825	158	1	29DEC11	16JUL12	5d
H/300930	Excavation between Ch815 to ch825	35	1	17JUL12	25AUG12	5d
H/300940	Pipe Laying between ch830 to ch900	70	1	27AUG12	17NOV12	5d
H/300950	Pipe Laying between ch815 to ch830	14	1	19NOV12	04DEC12	5d
H/300960	Pipe Connection and Bend Block at Ch830	18	1	05DEC12	27DEC12	5d
H/300970	Grouting between Ch815 to Ch900	12	1	28DEC12	11JAN13	5d
H/300980	Pipe Connection and Bend Block at Ch815	22	1	12JAN13	06FEB13	5d
H/300990	Backfill and Reinstatement at Ch815 and Ch825	27	1	07FEB13	15MAR13	5d
H/301100	RM between Ch1192 to Ch1156	222 *	1	26SEP11 A	29JUN12	216d
H/301115	Sheet Piling bet Ch1156 to Ch1172	8	1	26SEP11 A	06OCT11	36d
H/301120	Excavation bet Ch1156 to Ch1172	18	1	07OCT11	27OCT11	216d
H/301125	Setting up for Heading Excavation at Ch1172	12	1	11NOV11	24NOV11	216d
H/301130	Excavation between Ch1172 to Ch1192	40	1	25NOV11	13JAN12	216d
H/301135	Setting up for Pipe Laying Ch1172 to Ch1192	12	1	14JAN12	02FEB12	216d
H/301140	Pipe Laying between Ch1172 to ch1192	22	1	03FEB12	28FEB12	216d
H/301150	Pipe Connection at Ch1192	20	1	29FEB12	22MAR12	216d
H/301160	Pipe Laying between Ch1156 to 1172	18	1	23MAR12	17APR12	216d
H/301170	Pipe Connection at Ch1172	18	1	18APR12	09MAY12	216d
H/301180	Grouting between Ch1172 to 1192	12	1	10MAY12	24MAY12	216d
H/301190	Backfill and Reinstatement at Ch1192	30	1	25MAY12	29JUN12	216d
H/301300	Pipe Line between ch 1140 to ch900	449 *	1	07OCT11	17APR13	-19d
H/301305	Sheet Piling Ch1130 to 1140	12	1	07OCT11	20OCT11	36d
H/301310	Construct Jacking Pit at Ch1130	18	1	29NOV11	19DEC11	3d
H/301315	Construct Receiving Pit at Ch900	24	1	08NOV11	05DEC11	3d
H/301320	Setting up at Ch1130	16	1	18JAN12	10FEB12	-19d
H/301330	DN1500 Jacking Sleeve: Ch1130 to Ch900	82	1	11FEB12	22MAY12	-19d
H/301340	Demobilize Jacking Plant at Ch1130	12	1	24MAY12	07JUN12	-19d
H/301350	Setting up for Pipe Laying Ch1130 to Ch900	12	1	08JUN12	21JUN12	-19d
H/301360	Install Pipe between Ch1130 to ch900	116	1	22JUN12	07NOV12	-19d
H/301365	Pipe Laying bet Ch1135 to ch1140	12	1	08NOV12	21NOV12	-19d
H/301370	Grouting between Ch1130 to Ch900	18	1	22NOV12	12DEC12	-19d
H/301372	Pipe Connection at ch1135	18	1	13DEC12	05JAN13	-19d
H/301375	Bend Block at Ch1130	18	1	07JAN13	26JAN13	-19d
H/301380	Access Chamber at Ch904	30	1	28JAN13	08MAR13	-19d
H/301390	Backfill and Reinstatement at ch900	30	1	09MAR13 *	17APR13	-19d
H/301420	Backfill and Reinstatement at Ch1130	30	1	28JAN13	08MAR13	11d
H/302000	Pipe jacking between ch 1615 to ch1793	497 *	1	23FEB10 A	29OCT11	58d
H/302230	Backfill / Reinstatement at ch1680	24	1	22JUL11 A	24OCT11	58d
H/302240	Road Opening at Ch1680	1	1	29OCT11	29OCT11	58d
H/303500	Pipe Jacking between Ch1610 to Ch1256	571 *	1	06JUN11 A	13MAY13	-40d
H/303510	Construct Receiving Pit at Ch1256	24	1	18OCT11	14NOV11	3d
H/303540	DN1500 Jacking Sleeve Ch1610 to Ch1256	128	1	26SEP11 A	01MAR12	-40d
H/303550	Demobilize Jacking Plant at Ch1610	18	1	02MAR12	22MAR12	-40d
H/303565	Setting up Pipe Laying at Ch1610	12	1	23MAR12	06APR12	-40d
H/303570	Pipe Laying between Ch1610 to Ch1440	88	1	07APR12	26JUL12	-40d
H/303575	Setting up bet Ch1440 to 1256	12	1	27JUL12	09AUG12	-40d
H/303580	Pipe Laying between Ch1440 to Ch1256	92	1	10AUG12	27NOV12	-40d
H/303590	Connection at Ch1615 to 1621 and Ch1256	30	1	28NOV12	04JAN13	-40d
H/303600	Construct Access Chamber at Ch1610 and 1256	30	1	05JAN13	08FEB13	-40d
H/303610	Grouting between Ch1610 to Ch1256	20	1	09FEB13	09MAR13	10d
H/303620	Water Test of Rising Main	48	1	31JAN13 *	02APR13	-40d
H/303640	Backfill & Reinstatement at Ch1615 to 1621& 1256	30	1	03APR13	13MAY13	-40d



Start date	17SEP09
Finish date	15NOV17
Run date	25OCT11
Project name	WP07
Page number	2A
c Primavera Systems, Inc.	

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Start milestone point
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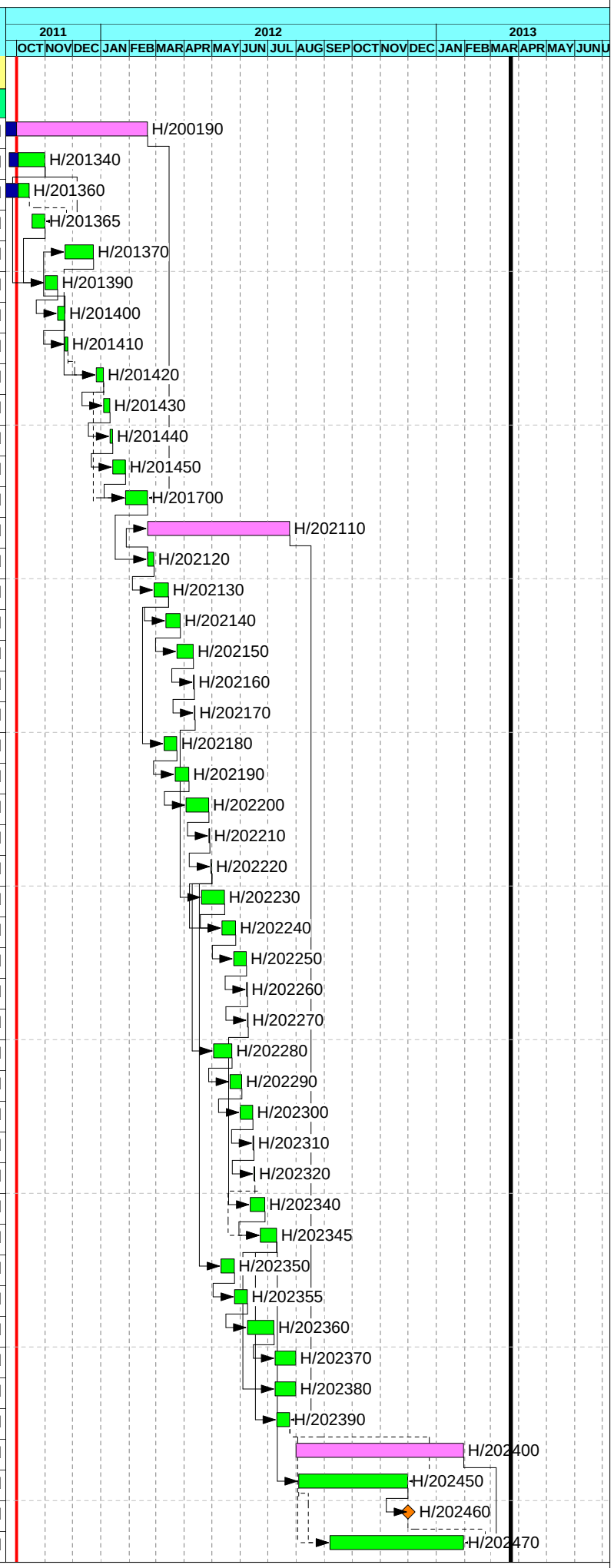
Programme of Works (Rev. 06) - Ha Tsuen Rising Main

中國建築 CHINA STATE CONSTRUCTION

Contract No. DC/2009/08
Construction of Yuen Long South Branch Sewers and Expansion of HTS Pumping Station

Activity ID	Description	Orig Dur	Calendar	Early Start	Early Finish	Total Float
Ha Tsuen Area						
Pumping Station						
H/200190	Substructure	278 *	4	01MAR11 A	20FEB12	6d
H/201340	Wall at Coarse Screen Channel Chamber (7th Pour)	26	4	23SEP11 A	31OCT11	6d
H/201360	Complete Dry Well (9th Pour) and ground floor	12	4	14SEP11 A	14OCT11	15d
H/201365	Floor Slab at +2.65 (10th Pour)	12	4	18OCT11	31OCT11	6d
H/201370	Complete Remaining Chamber Wall (11th Pour)	27	4	23NOV11	23DEC11	6d
H/201390	Backfill up to Bottom of Middle Strut	12	4	01NOV11	14NOV11	6d
H/201400	Remove Middle Strut	7	4	15NOV11	22NOV11	6d
H/201410	Touch up Left-in Mid Strutting Area	3	4	23NOV11	25NOV11	30d
H/201420	Backfill up to Bottom of Top Strut	6	4	27DEC11	03JAN12	6d
H/201430	Remove Top Strut	6	4	04JAN12	10JAN12	6d
H/201440	Touch up Left-in Top Strutting Area	3	4	11JAN12	13JAN12	6d
H/201450	Backfill up to Ground Level	7	4	14JAN12	27JAN12	6d
H/201700	Remove Sheet Pile and Backfill	20	4	28JAN12	20FEB12	6d
H/202110	Superstructure	115 *	4	21FEB12	24JUL12	6d
H/202120	Temporary Platform and Scaffolding	6	4	21FEB12	27FEB12	6d
H/202130	Internal Formwork Lower Wall 1	14	4	28FEB12	14MAR12	6d
H/202140	Steel Fixing Lower Wall 1	14	4	12MAR12	27MAR12	6d
H/202150	External Formwork Lower Wall 1	14	4	24MAR12	10APR12	6d
H/202160	Cleaning and Checking Lower Wall 1	1	4	11APR12	11APR12	6d
H/202170	Concrete to Lower Wall 1	1	4	12APR12	12APR12	6d
H/202180	Internal Formwork Lower Wall 2	12	4	10MAR12	23MAR12	6d
H/202190	Steel Fixing Lower Wall 2	12	4	22MAR12	05APR12	6d
H/202200	External Formwork Lower Wall 2	12	4	03APR12	27APR12	6d
H/202210	Cleaning and Checking Lower Wall 2	1	4	28APR12	28APR12	6d
H/202220	Concrete to Lower Wall 2	1	4	30APR12	30APR12	6d
H/202230	Internal Formwork Upper Wall 1	12	4	20APR12	14MAY12	6d
H/202240	Steel Fixing Upper Wall 1	12	4	12MAY12	26MAY12	6d
H/202250	External Formwork Upper Wall 1	12	4	25MAY12	07JUN12	6d
H/202260	Cleaning and Checking Upper Wall 1	1	4	08JUN12	08JUN12	6d
H/202270	Concrete to Upper Wall 1	1	4	09JUN12	09JUN12	6d
H/202280	Internal Formwork Upper Wall 2	12	4	03MAY12	22MAY12	7d
H/202290	Steel Fixing Upper Wall 2	12	4	21MAY12	02JUN12	7d
H/202300	External Formwork Upper Wall 2	12	4	01JUN12	14JUN12	7d
H/202310	Cleaning and Checking Upper Wall 2	1	4	15JUN12	15JUN12	7d
H/202320	Concrete to Upper Wall 2	1	4	16JUN12	16JUN12	7d
H/202340	Roof Slab 1	14	4	12JUN12	27JUN12	6d
H/202345	Roof Slab 2	14	4	23JUN12	10JUL12	6d
H/202350	Trench at Transformer and Switch Room	12	4	11MAY12	25MAY12	38d
H/202355	Ground Floor to Transformer and Switch Room	12	4	26MAY12	08JUN12	38d
H/202360	Wall and roof to Transformer and Switch Room	24	4	09JUN12	07JUL12	38d
H/202370	Remove temp support in Transformer and SR	20	4	09JUL12	31JUL12	38d
H/202380	Staircase	20	4	09JUL12	31JUL12	38d
H/202390	Parapet	12	4	11JUL12	24JUL12	6d
H/202400	Architectural Finishes	152 *	4	01AUG12	30JAN13	38d
H/202450	Internal Finishes	100	4	04AUG12	30NOV12	67d
H/202460	Handover of Pumping Station	0	4		30NOV12	87d
H/202470	External Finishes	120	4	07SEP12	30JAN13	38d



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Finish date	15NOV17
Run date	25OCT11
Project name	WP07
Page number	1A
c Primavera Systems, Inc.	

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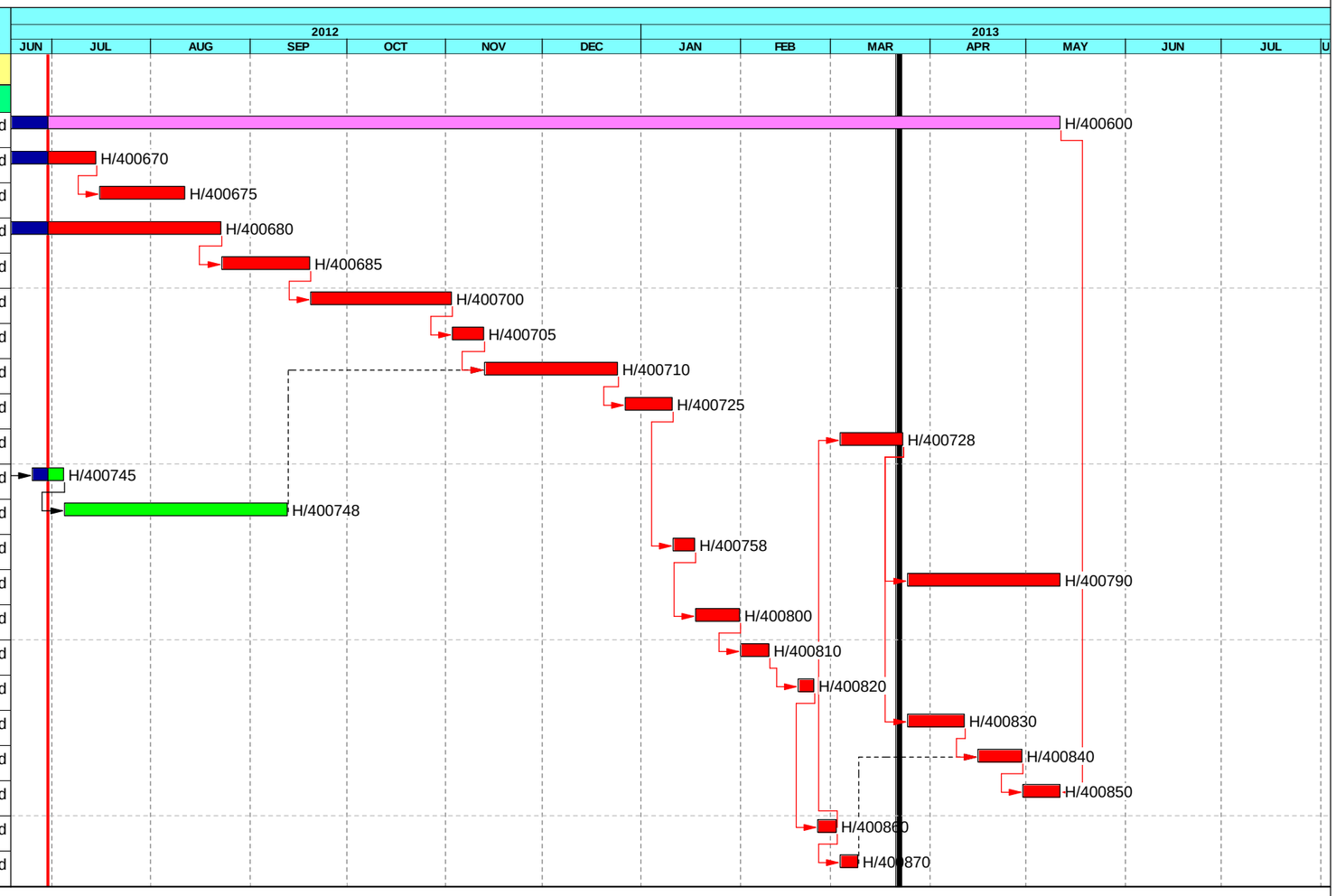
Programme of Works (Rev. 06) - Ha Tsuen Sewage Pumping Station

中國建築 CHINA STATE CONSTRUCTION

Contract No. DC/2009/08
Construction of Yuen Long South Branch Sewers and Expansion of HTS Pumping Station

Activity ID	Description	Orig Dur	Early Start	Early Finish	Total Float
Ha Tsuen Area					
Road and Drain					
H/400600	Sewerage Works at Ha Tsuen Pumping Station	520 *	04AUG11 A	11MAY13	-39d
H/400670	Construct Remaining Manhole FM17	36	23MAY12 A	14JUL12	-45d
H/400675	Backfill and Remove Sheet Pile at FM17	24	16JUL12	11AUG12	-45d
H/400680	Construct Manhole FM14	75	14MAY12 A	22AUG12	-39d
H/400685	Sheet Piling between FM14 to FM16	24	23AUG12	19SEP12	-39d
H/400700	Excavate Trench bet FM14 to M1	36	20SEP12	02NOV12	-39d
H/400705	Pipe Line between FM14 to M1	8	03NOV12	12NOV12	-39d
H/400710	Construct Manhole FM16	36	13NOV12	24DEC12	-39d
H/400725	Backfill between FM16 to FM14 stage 1	12	27DEC12	10JAN13	-39d
H/400728	Install Stop Log & Penstock at FM16 (by Others)	18	04MAR13	23MAR13	-39d
H/400745	Sheet Piling between M1 and FM6 (2)	15	25JUN12 A	04JUL12	11d
H/400748	Exc and Construct Manhole M1	60	05JUL12	12SEP12	11d
H/400758	Sheet Piling between FM16 to FM6	6	11JAN13	17JAN13	-39d
H/400790	Drainage Connection at M1	37	25MAR13	11MAY13	-39d
H/400800	Excavate Trench between FM16 to FM6	12	18JAN13	31JAN13	-39d
H/400810	Break opening and lay pipe between FM16 to FM6	8	01FEB13	09FEB13	-39d
H/400820	Make Good FM6	5	19FEB13	23FEB13	-39d
H/400830	Backfill Pipe Trenches	15	25MAR13	11APR13	-39d
H/400840	Remove Sheet Pile	12	16APR13	29APR13	-39d
H/400850	Reinstatement of Area	10	30APR13	11MAY13	-39d
H/400860	Install Cat Ladder at FM16	6	25FEB13	02MAR13	-39d
H/400870	CCTV of Sewerage bet PS to M1	6	04MAR13	09MAR13	-12d



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Finish date	13JUN19
Run date	16JUL12
Project name	WP8A
Page number	1A
c Primavera Systems, Inc.	

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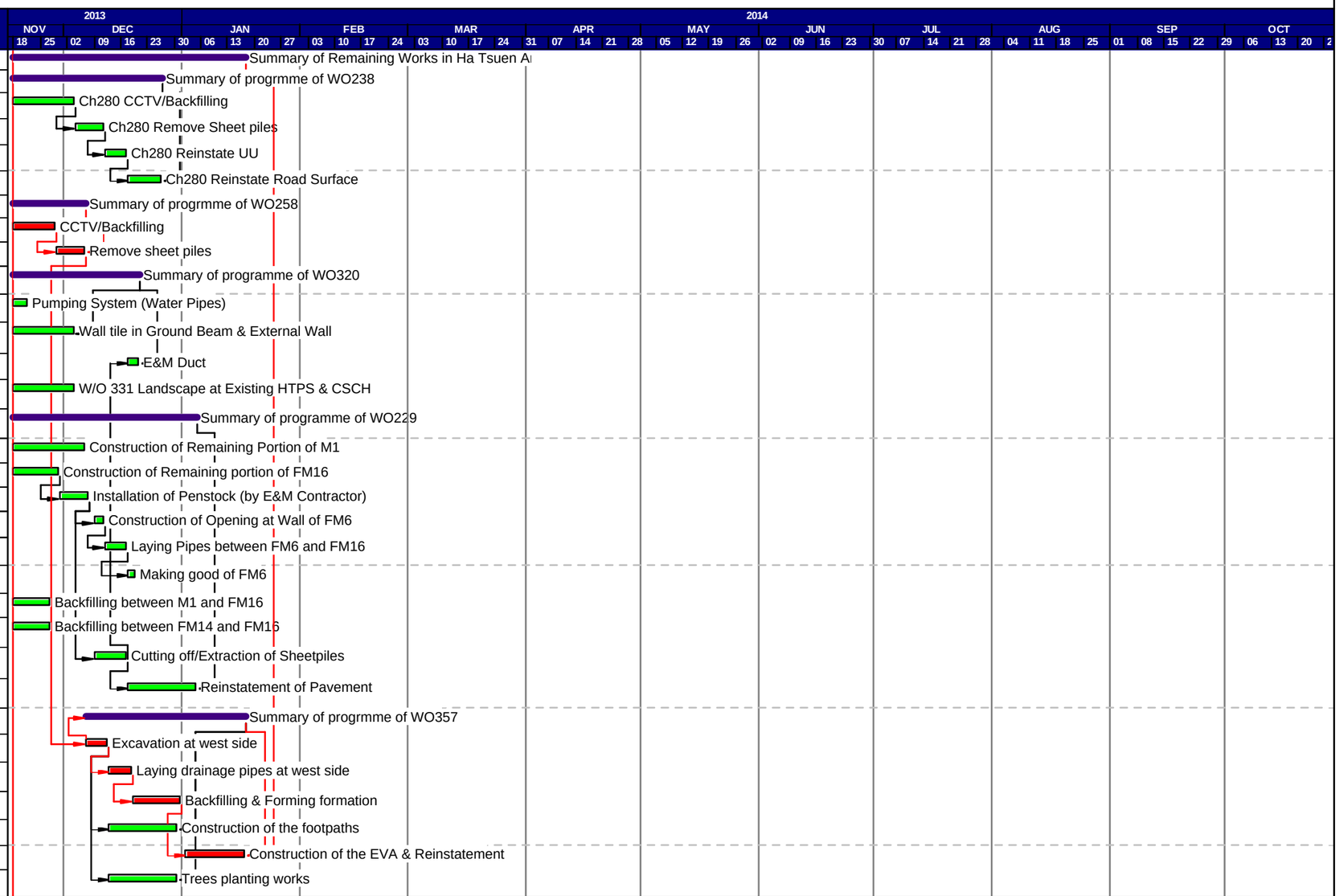
Works Programme Revision 08 - Sewerage at Ha Tsuen Pumping Station

中國建築 CHINA STATE CONSTRUCTION

Contract No. DC/2009/08
Construction of Yuen Long South Branch Sewers and Expansion of Ha Tsuen Sewage Pumping Station

Activity ID	Description	Orig Dur	Rem Dur	Early Start	Early Finish
1000	Summary of Remaining Works in Ha Tsuen Area	51 *	51 *	18NOV13	17JAN14
1900	Summary of progrmme of WO238	33 *	33 *	18NOV13	26DEC13
2070	Ch280 CCTV/Backfilling	14	14	18NOV13	03DEC13
2080	Ch280 Remove Sheet piles	7	7	04DEC13	11DEC13
2090	Ch280 Reinstate UU	5	5	12DEC13	17DEC13
2100	Ch280 Reinstate Road Surface	7	7	18DEC13	26DEC13
2200	Summary of progrmme of WO258	17 *	17 *	18NOV13	06DEC13
2260	CCTV/Backfilling	10	10	18NOV13	28NOV13
2270	Remove sheet piles	7	7	29NOV13	06DEC13
2280	Summary of programme of WO320	25 *	25 *	18NOV13	20DEC13
2510	Pumping System (Water Pipes)	4	4	18NOV13	21NOV13
2530	Wall tile in Ground Beam & External Wall	14	14	18NOV13	03DEC13
2570	E&M Duct	3	3	18DEC13 *	20DEC13
2610	W/O 331 Landscape at Existing HTPS & CSCH	14	14	18NOV13	03DEC13
2660	Summary of programme of WO229	40 *	40 *	18NOV13	04JAN14
2720	Construction of Remaining Portion of M1	17	17	18NOV13	06DEC13
2750	Construction of Remaining portion of FM16	11	11	18NOV13	29NOV13
2760	Installation of Penstock (by E&M Contractor)	7	7	30NOV13	07DEC13
2780	Construction of Opening at Wall of FM6	3	3	09DEC13	11DEC13
2790	Laying Pipes between FM6 and FM16	5	5	12DEC13	17DEC13
2800	Making good of FM6	2	2	18DEC13	19DEC13
2810	Backfilling between M1 and FM16	9	9	18NOV13	27NOV13
2850	Backfilling between FM14 and FM16	9	9	18NOV13	27NOV13
2890	Cutting off/Extraction of Sheetpiles	8	8	09DEC13	17DEC13
2900	Reinstatement of Pavement	14	14	18DEC13	04JAN14
2919	Summary of progrmme of WO357	34 *	34 *	07DEC13	17JAN14
2940	Excavation at west side	5	5	07DEC13	12DEC13
2950	Laying drainage pipes at west side	5	5	13DEC13	18DEC13
2960	Backfilling & Forming formation	10	10	19DEC13	31DEC13
2970	Construction of the footpaths	14	14	13DEC13	30DEC13
2980	Construction of the EVA & Reinstatement	14	14	02JAN14	17JAN14
2990	Trees planting works	14	14	13DEC13	30DEC13



Start date	18NOV13
Finish date	17JAN14
Run date	16NOV13
Page number	1A
Company name	CSHK
c Primavera Systems, Inc.	

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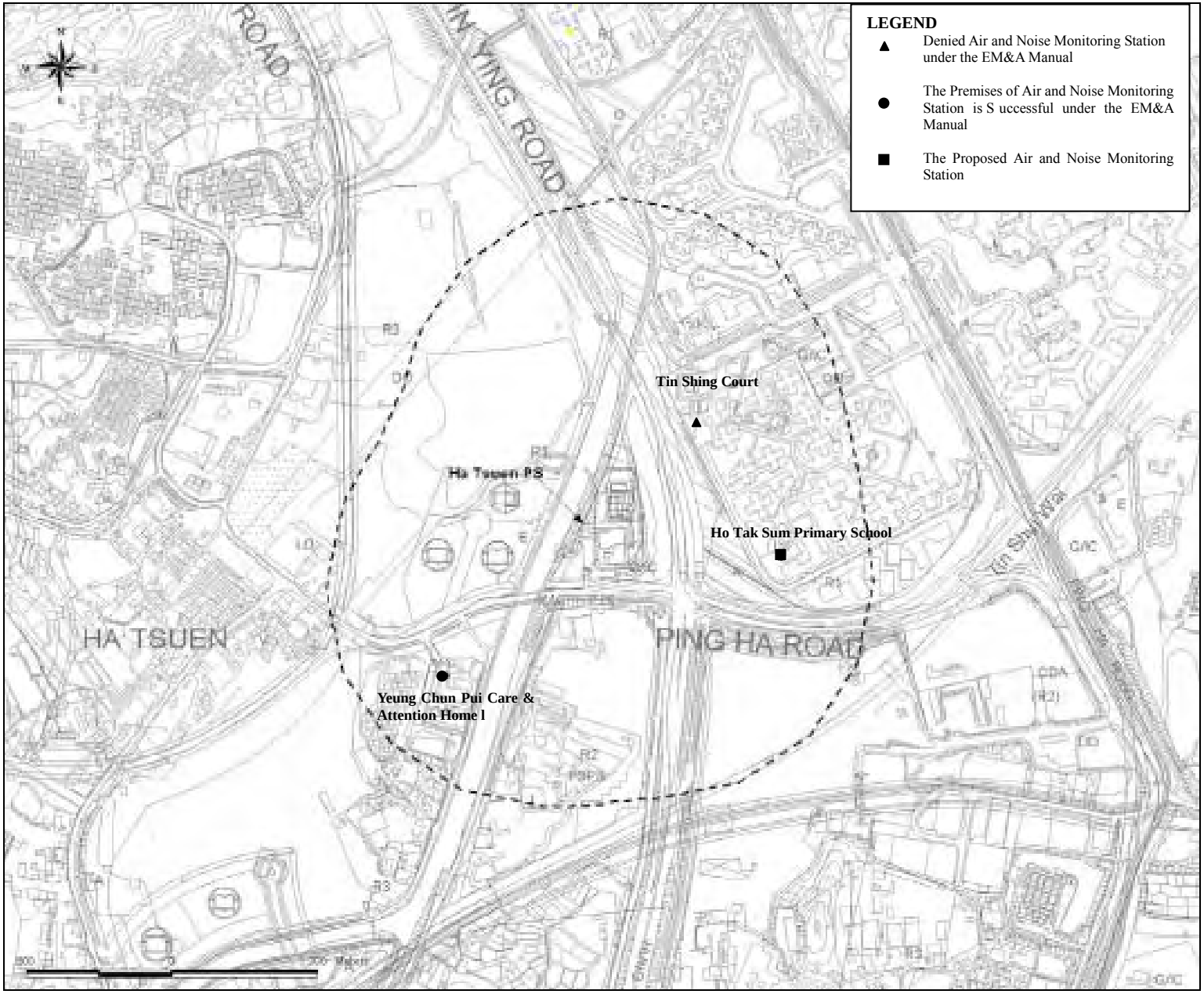
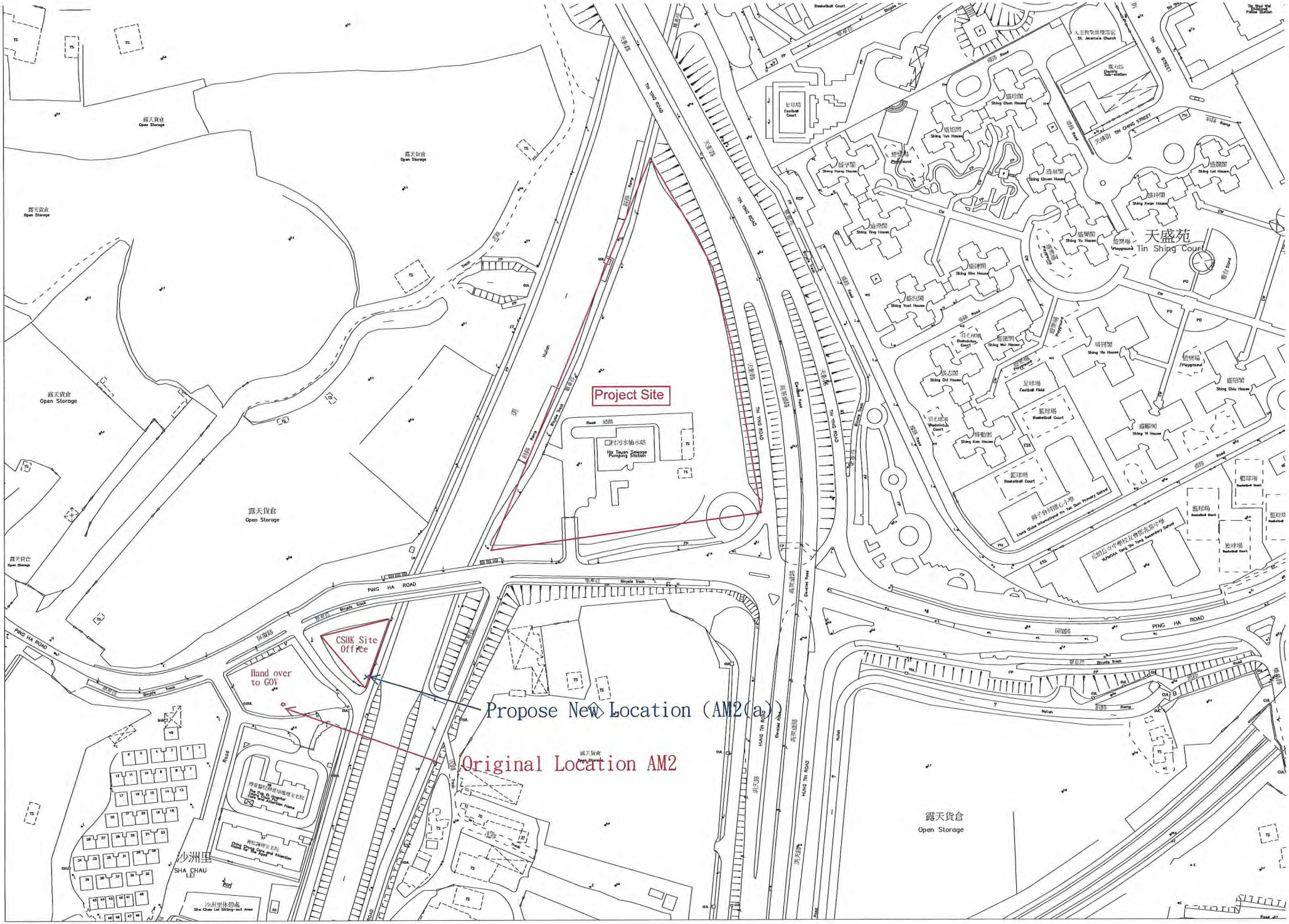
Summary of Remaining Works in Ha Tsuen Area

Appendix D

Monitoring Location of EM&A Programme

Proposed Air and Noise Monitoring Station

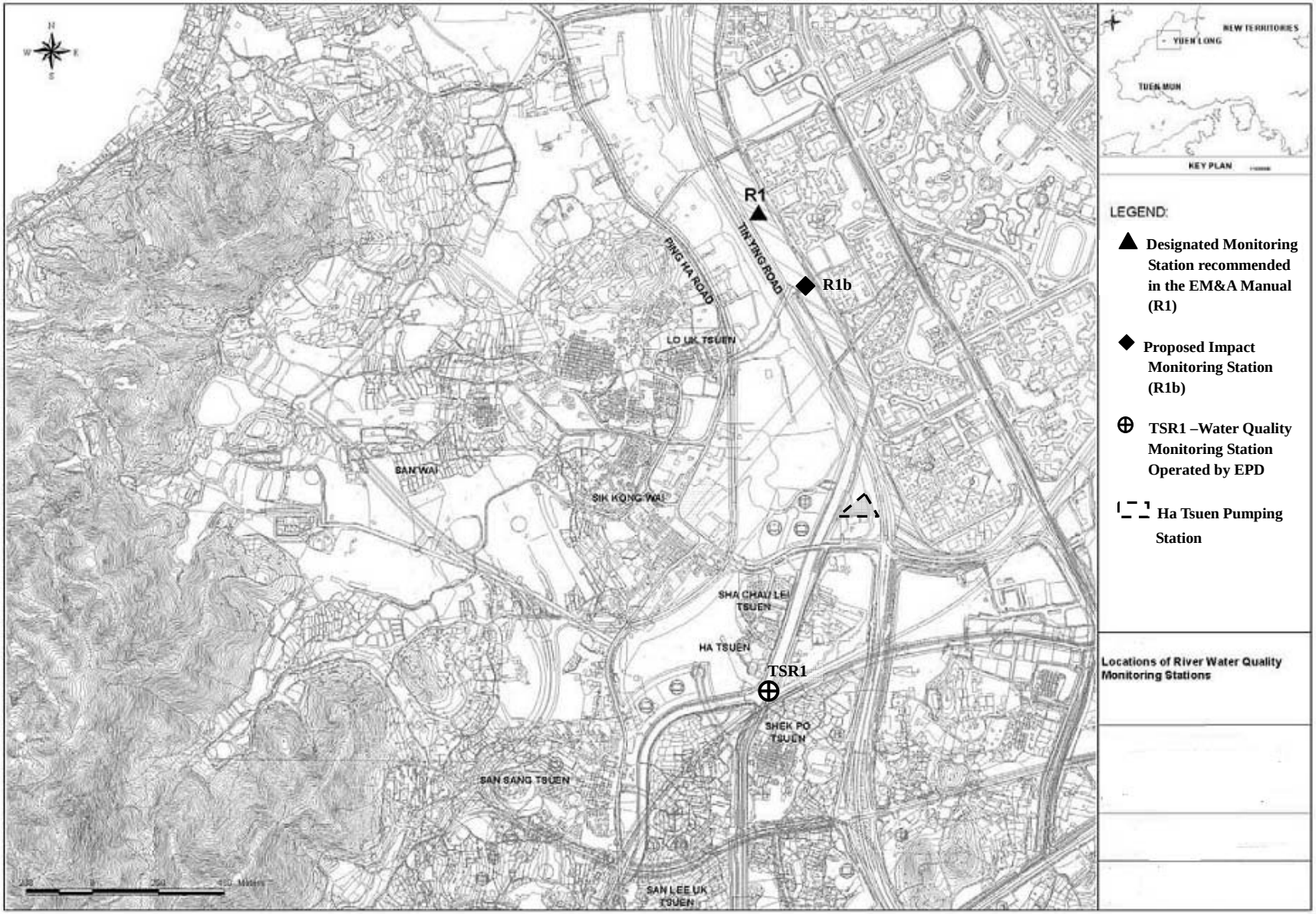



Project Site
CSHK Site Office
Hand over to GOV
Propose New Location (AM2(a))
Original Location AM2
PING HA ROAD
TIN YING ROAD
HUNG TIN ROAD
天盛苑
Tin Shing Court
露天貨倉
Open Storage
沙洲里
SHA CHAU

DSD Contract No. DC/2009/08 – Construction of Yuen Long South Branch Sewers And Extension of Ha Tsuen Sewage Pumping Station

Proposed Water Quality Monitoring Location

AUES

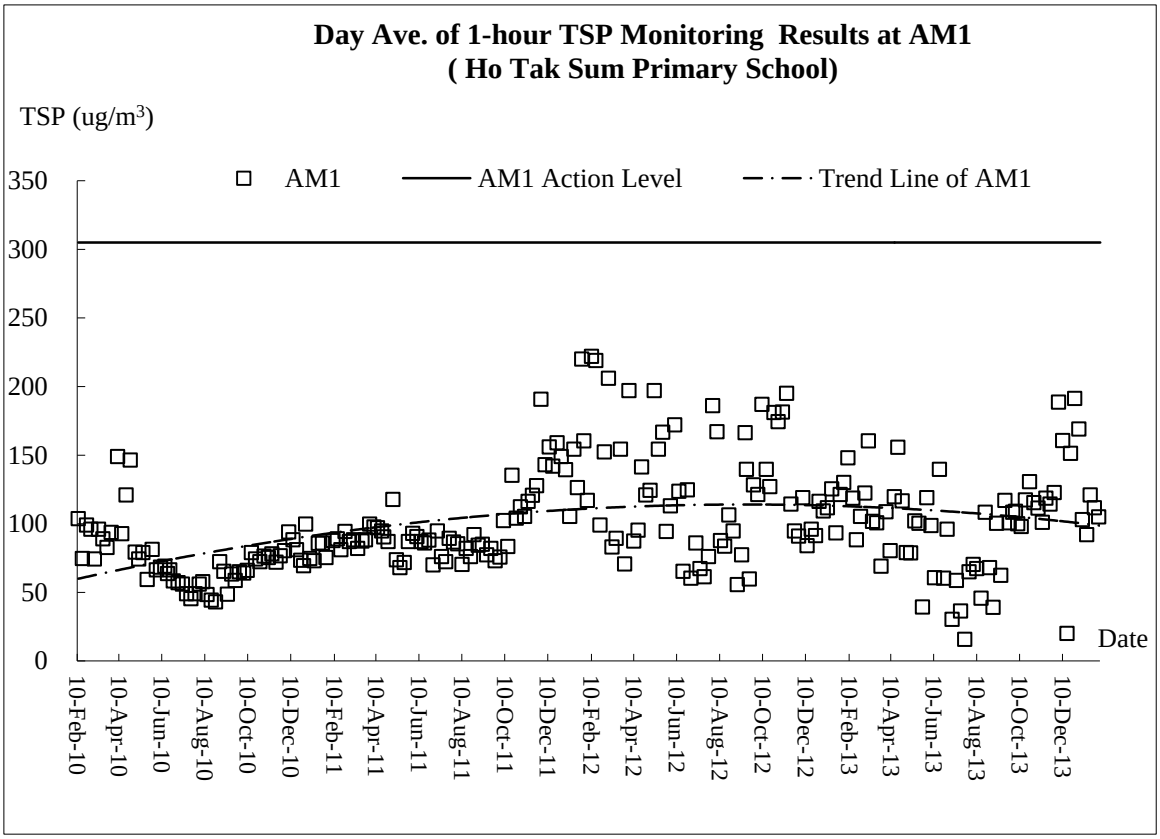


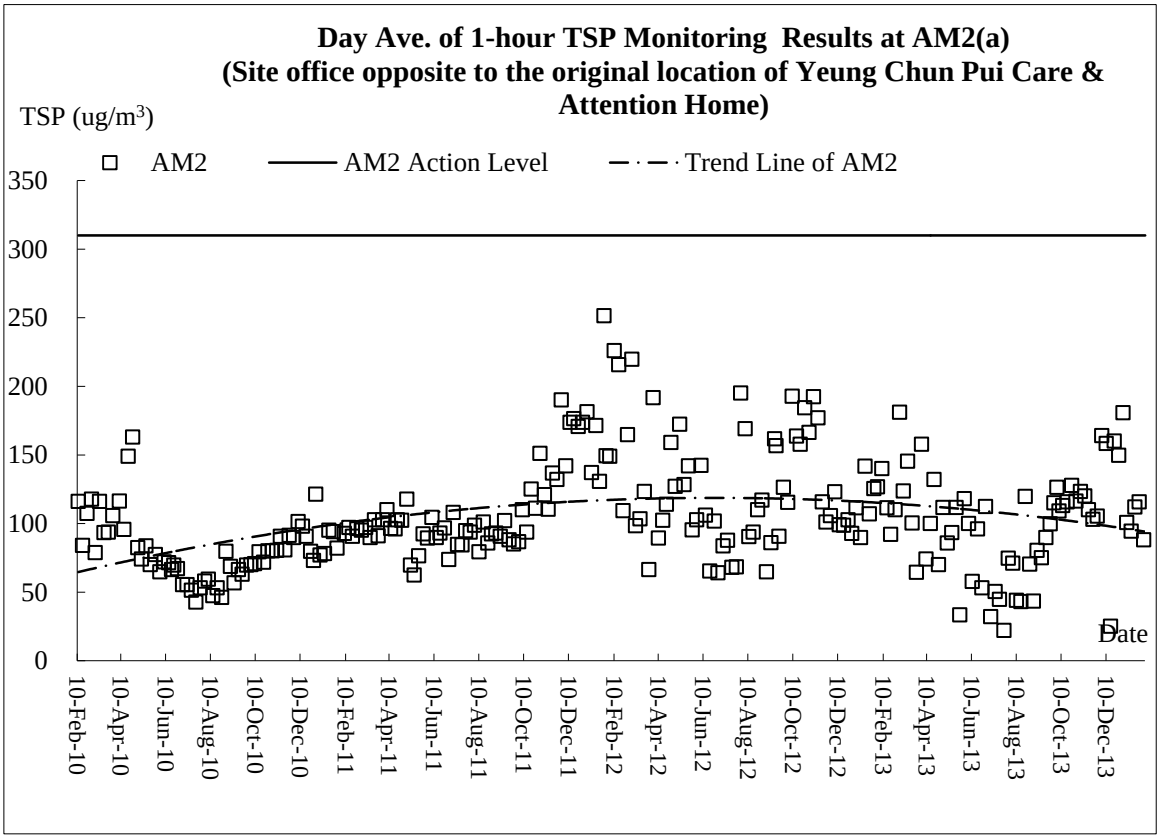
Appendix E

Graphic Plot of

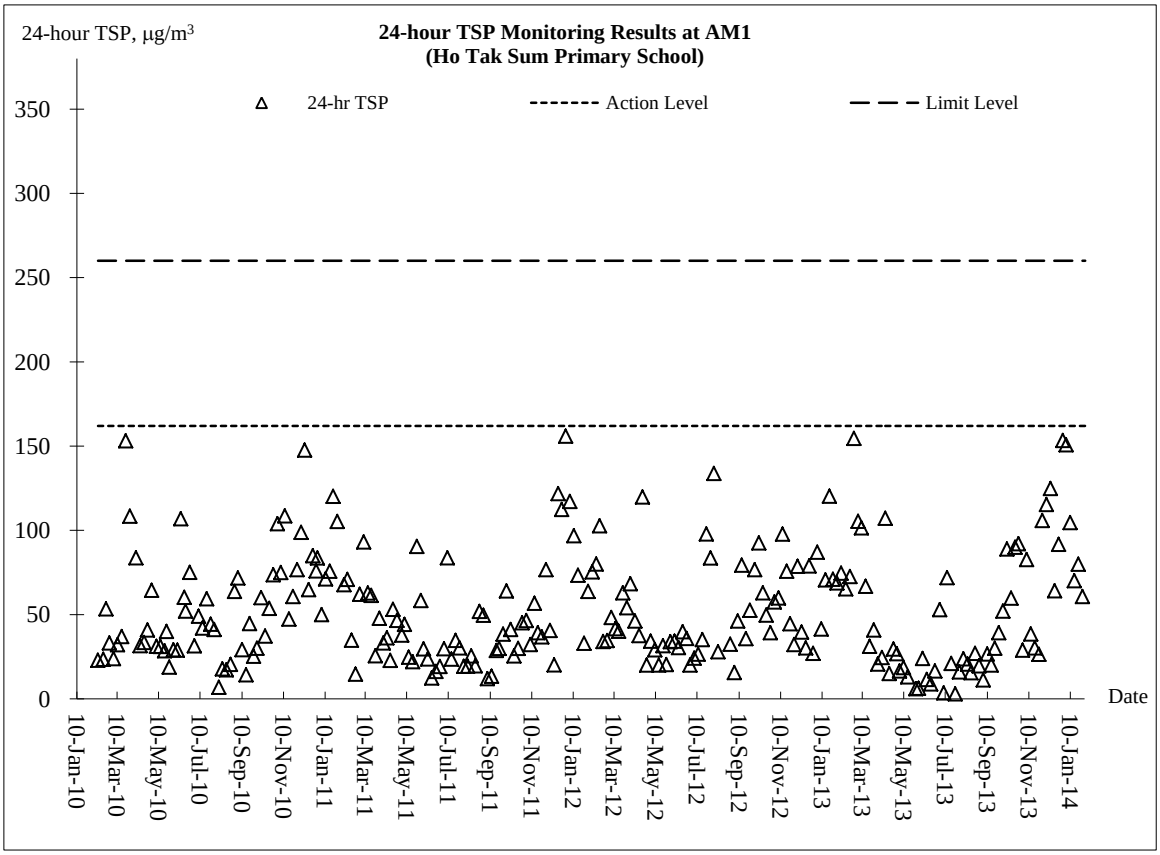
- **Air Quality**
- **Construction Noise**
- **Water Quality**

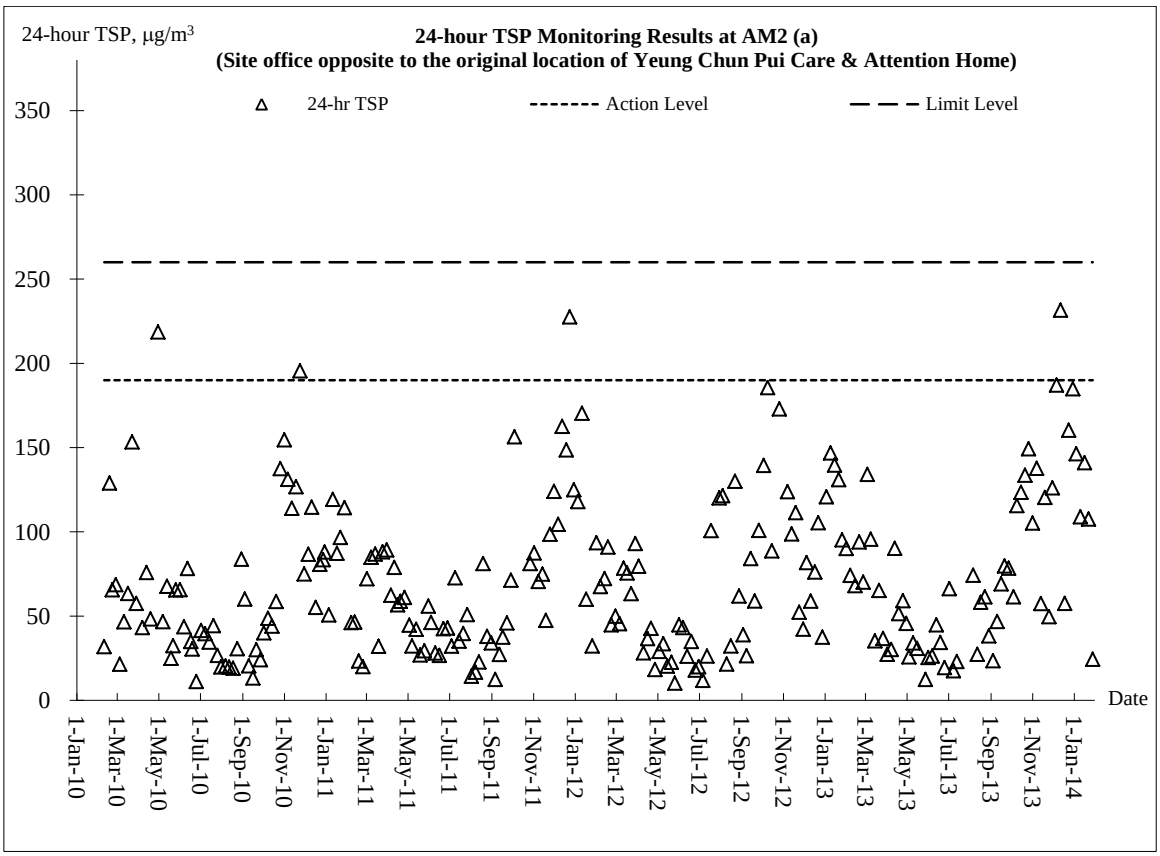
Air Quality – 1-hour TSP





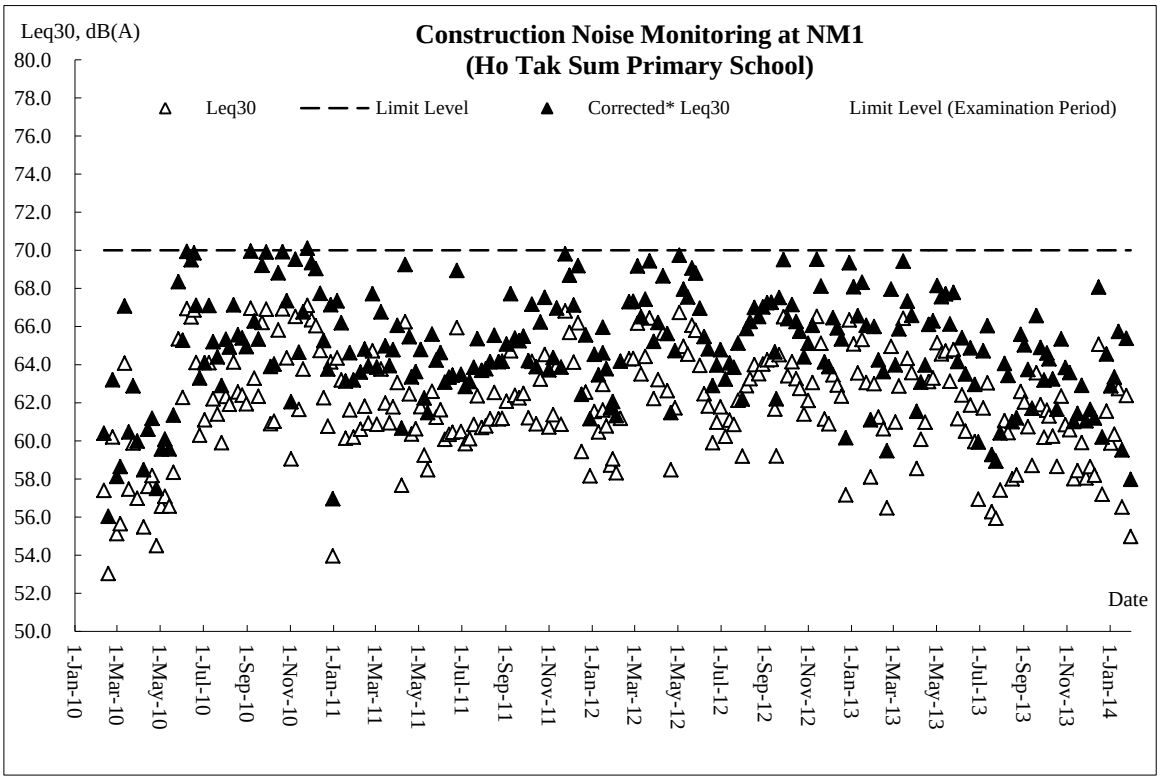
Air Quality – 24-hour TSP

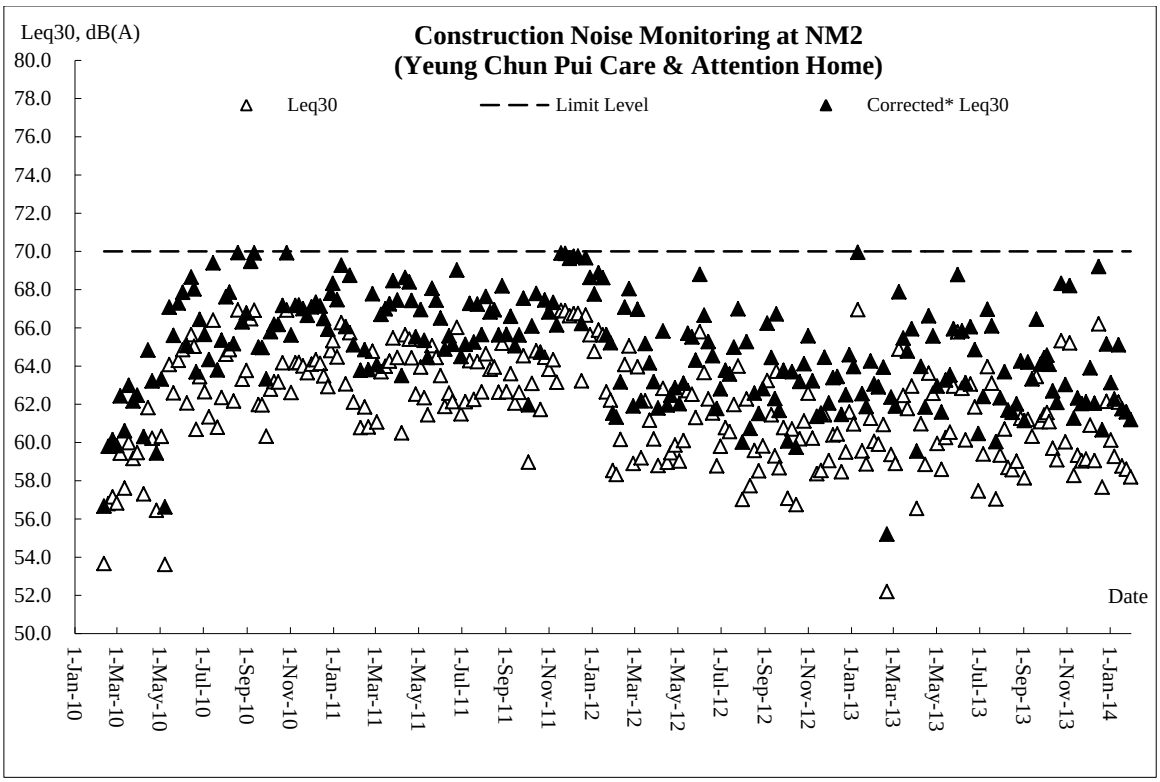




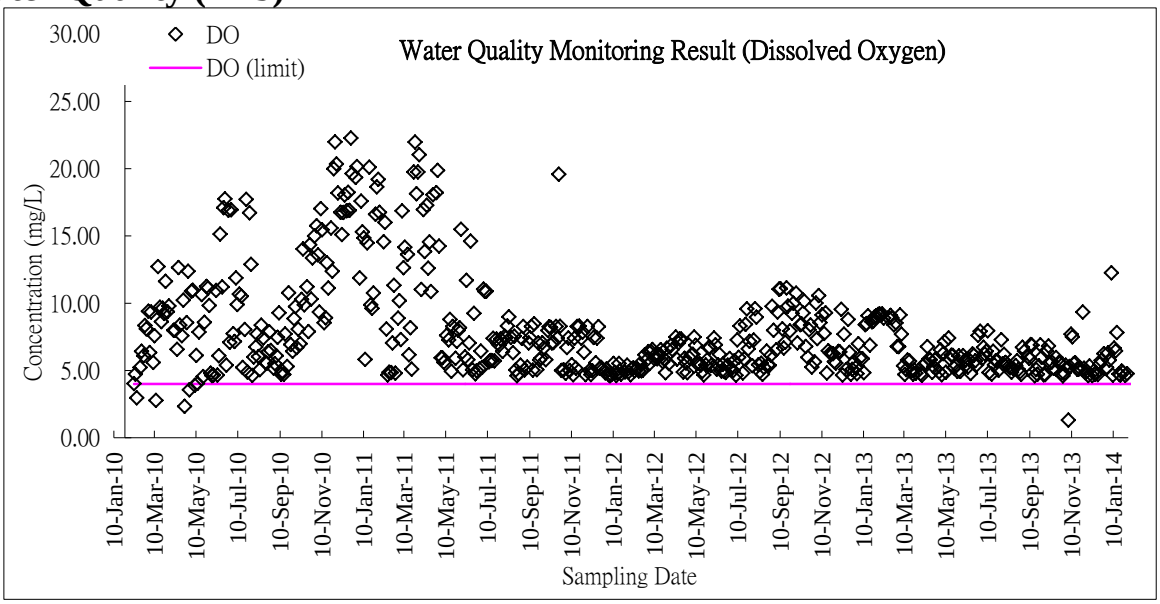
Remark: newly location AM2(a) replaced the original AM2 since 7 November 2012.

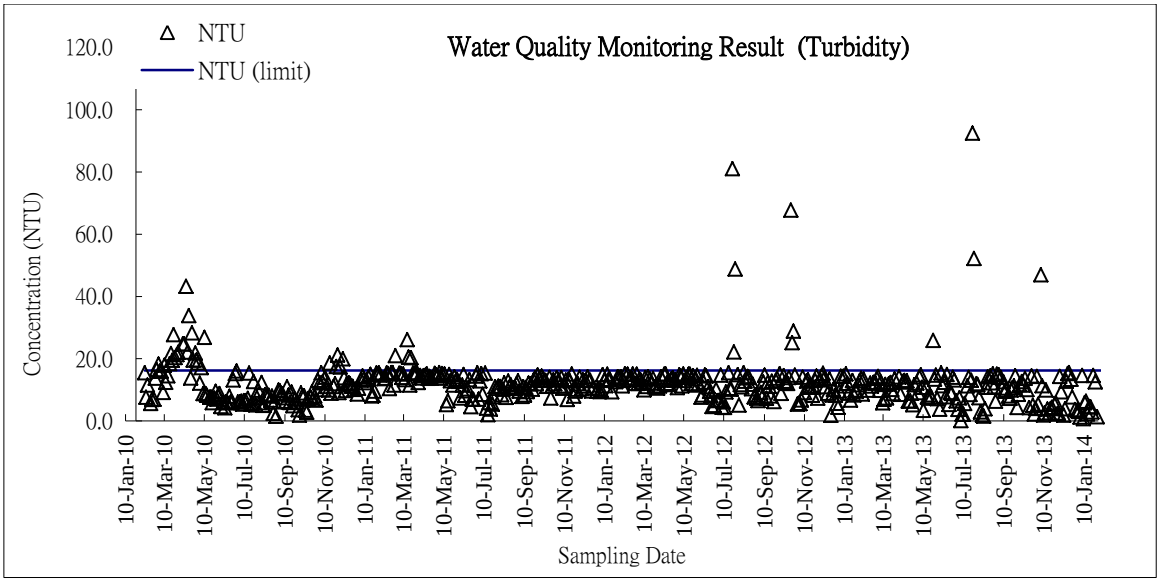
Construction Noise

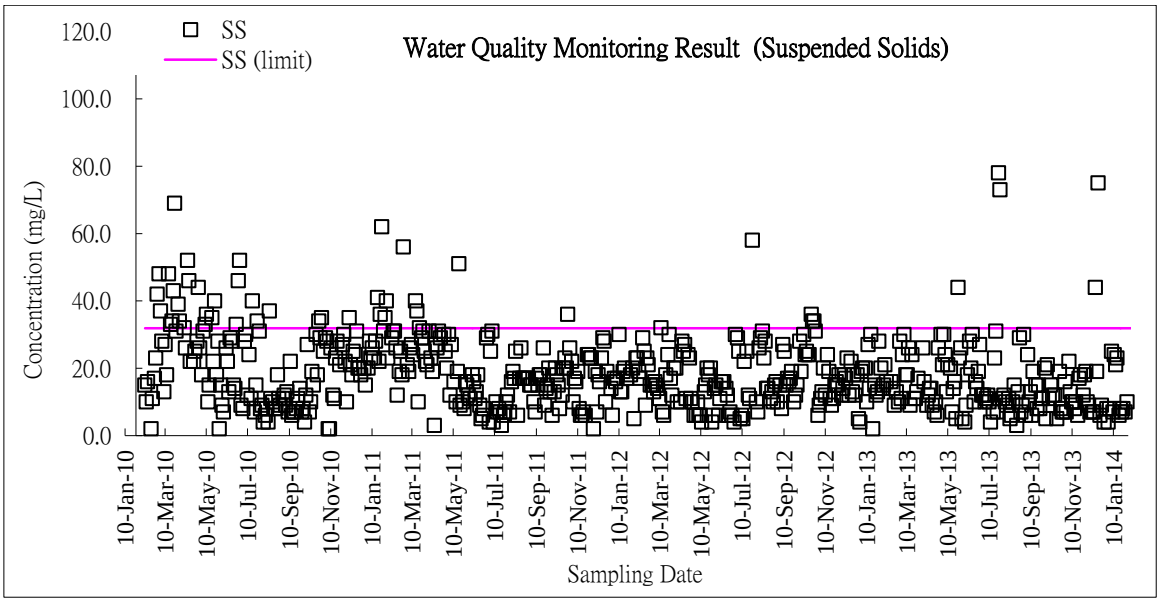




Water Quality (R1b)







Appendix F

Meteorological information

Summary of Meteorological Observations in Hong Kong, 2010

Month	Mean Pressure (hPa)	Air Temperature			Mean Dew Point (deg. C)	Mean Relative Humidity (%)	Mean Amount of Cloud (%)	Total Rainfall (mm)
		Mean Daily Maximum (deg. C)	Mean (deg. C)	Mean Daily Minimum (deg. C)				
January	1020.5	19.0	16.8	15.2	13.3	80	73	24.6
February	1016.6	19.7	17.9	16.3	15.8	88	88	113.1
March	1016.9	23.1	20.2	18.1	16.4	80	73	17.5
April	1014.7	23.6	21.0	19.0	18.6	87	84	78.9
May	1008.8	28.1	25.6	23.7	22.9	86	77	176.6
June	1007.8	29.2	27.1	25.4	24.4	85	81	474.9
July	1008.2	32.1	29.2	26.9	25.5	81	69	469.4
August	1008.1	31.9	28.8	26.6	25.2	81	67	350.3
September	1008.7	30.5	28.0	25.9	24.6	83	70	583.1
October	1012.5	27.2	24.8	22.9	19.2	72	67	22.7
November	1017.1	23.9	21.2	19.2	16.1	74	51	42.2
December	1016.3	20.8	18.1	15.6	11.1	66	45	18.4
mean or total	1013.0	25.8	23.2	21.2	19.4	80	70	2371.7
Normal*	1013.0	25.6	23.1	21.1	18.8	78	67	2382.7
Station	Hong Kong Observatory							

Summary of Meteorological Observations in Hong Kong, 2011								
Month	Mean Pressure (hPa)	Air Temperature			Mean Dew Point (deg. C)	Mean Relative Humidity (%)	Mean Amount of Cloud (%)	Total Rainfall (mm)
		Mean Daily Maximum (deg. C)	Mean Daily Maximum (deg. C)	Mean Daily Maximum (deg. C)				
January	1021.5	16.3	13.7	11.6	7.5	67	63	5.4
February	1017.1	19.1	16.2	14.2	12.0	77	65	23.7
March	1018.7	21.1	18.0	15.7	12.4	71	79	20.5
April	1014.0	26.9	22.9	20.6	18.2	76	59	36.0
May	1009.2	29.0	26.0	24.1	22.4	81	73	186.7
June	1005.3	31.3	28.6	26.7	25.0	82	74	435.6
July	1004.4	31.4	28.8	27.0	25.1	81	64	226.8
August	1006.1	32.4	29.5	27.4	24.8	77	56	157.6
September	1007.6	30.6	28.0	26.0	23.9	79	70	123.1
October	1013.9	27.3	24.8	23.2	20.6	78	62	172.4
November	1015.4	25.3	23.0	21.5	18.7	77	70	86.1
December	1020.9	19.4	16.9	14.6	9.9	65	50	2.8
Mean/Total	1012.8	25.8	23.0	21.1	18.4	76	65	1476.7
Normal*	1013.0	25.6	23.1	21.1	18.8	78	67	2382.7
Station	Hong Kong Observatory							

Summary of Meteorological Observations in Hong Kong, 2012

Month	Mean Pressure (hPa)	Air Temperature			Mean Dew Point (deg. C)	Mean Relative Humidity (%)	Mean Amount of Cloud (%)	Total Rainfall (mm)
		Mean Daily Maximum (deg. C)	Mean (deg. C)	Mean Daily Minimum (deg. C)				
January	1019.3	17.0	15.1	13.5	11.9	82	79	42.1
February	1016.8	17.8	15.8	14.0	13.1	85	84	29.5
March	1015.6	21.8	19.0	16.9	15.8	83	75	22.1
April	1011.3	26.2	23.9	22.0	21.2	85	80	294.9
May	1007.5	29.4	27.0	25.5	24.4	86	78	277.7
June	1002.6	30.5	28.1	26.4	25.0	83	78	261.5
July	1004.6	31.6	28.8	26.8	25.2	81	70	467.8
August	1003.3	32.3	29.5	27.4	24.9	77	71	149.8
September	1010.3	30.9	28.0	26.0	23.0	75	65	213.0
October	1014.3	28.3	25.6	23.7	20.4	74	59	46.4
November	1015.5	24.2	22.2	20.6	18.7	81	76	63.9
December	1018.3	19.7	17.8	15.9	13.8	78	74	56.0
Mean/Total	1011.6	25.8	23.4	21.6	19.8	81	74	1924.7
Normal*	1012.9	25.6	23.3	21.4	19.0	78	68	2398.5
Station	Hong Kong Observatory							

Summary of Meteorological Observations in Hong Kong, 2013 and 2014								
Month	Mean Pressure (hPa)	Air Temperature			Mean Dew Point (deg. C)	Mean Relative Humidity (%)	Mean Amount of Cloud (%)	Total Rainfall (mm)
		Mean Daily Maximum (deg. C)	Mean (deg. C)	Mean Daily Minimum (deg. C)				
January	1020.5	19.1	16.7	14.8	11.3	71	58	3.4
February	1018.3	22.1	19.1	17.1	15.4	80	75	1.5
March	1015.7	23.5	20.5	18.5	16.5	79	65	130.5
April	1012.3	23.9	21.5	19.7	19.0	86	81	253.8
May	1008.8	28.2	25.7	23.9	23.2	86	80	509.3
June	1005.5	30.7	28.2	26.5	25.1	84	72	438.6
July	1007.1	30.9	28.0	26.1	25.1	85	72	436.3
August	1004.9	31.1	28.6	26.5	25.3	83	68	445.4
September	1008.5	30.3	27.5	25.7	23.9	82	67	454.2
October	1014.1	28.6	25.7	23.7	18.6	66	45	2.9
November	1017.3	23.8	21.7	19.7	16.2	72	67	83.1
December	1019.6	18.6	16.1	14.0	8.6	63	40	88.3
January 2014	1021.3	19.2	16.3	14.1	9.9	67	32	few
Mean/Total	1012.7	25.9	23.3	21.4	19.0	78	66	2847.3
Normal*	1012.9	25.6	23.3	21.4	19.0	78	68	2398.5
Station	Hong Kong Observatory							

Appendix H

Monthly Waste Flow Tables

Drainage Service Department
Monthly Summary Waste Flow Table
for Contract with Waste Management Plan under ETWB TCW No. 15/2003
Reporting Year: 2010

Contract No. *DC/2009/08*

(To be submitted to C&D MM Coordinator of Respective Division/Region via Engineer's Representative before 15th of the following month)

Month	Actual Quantities of Inert C&D Materials Generated / Imported (in '000 m^3)						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 '000m^3)
January	0	0	0	0	0	0	0	0	0	0	0.011
February	0.036	0	0	0	0.036	0	0	0	0	0	0.003
March	0.654	0	0	0	0.654	0	0	0	0	0	0.014
April	0.579	0	0	0	0.579	0	0	0	0	0	0.006
May	0.403	0	0	0	0.403	0	0	0	0	0.033	0
June	0.711	0	0	0	0.711	0	0	0	0	0	0.001
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
July	0.649	0	0	0	0.649	0	0	0	0	0	0.004
August	0.507	0	0	0	0.507	0	0	0	0	0	0.003
September	0.640	0	0	0	0.640	0	0	0	0	0	0.099
October	1.086	0	0	0	1.086	0	0	0	0	0	0.005
November	1.054	0	0	0	1.054	0	0.001	0.008	0.191	0	0.003
December	2.636	0	0	0	2.636	0	0	0	0	0	0.003
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Drainage Service Department
Monthly Summary Waste Flow Table
for Contract with Waste Management Plan under ETWB TCW No. 15/2003
Reporting Year: 2011

Contract No. *DC/2009/08*

(To be submitted to C&D MM Coordinator of Respective Division/Region via Engineer's Representative before 15th of the following month)

Month	Actual Quantities of Inert C&D Materials Generated / Imported (in '000 m^3)						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 '000m^3)
January	4.579	0	0	0	4.579	0	0	0	2.575	0	0.001
February	1.123	0	0	0	1.123	0	0	0	0	0	0.002
March	0.371	0	0	0	0.371	0	0	0	0	0	0.002
April	0.375	0	0	0	0.375	0	0	0	0	0	0.009
May	1.110	0	0	0	1.110	0	0	0	0	0	0.000
June	0.751	0	0	0	0.751	0	0	0	0	0	0.002
Half-year total	8.309	0	0	0	8.309	0	0	0	2.575	0	0.016
July	0.752	0	0	0	0.752	0	0	0	0	0	0.002
August	0.754	0	0	0	0.754	0	0	0	0	0	0.002
September	1.112	0	0	0	1.112	0	0	0	0	0	0.001
October	1.483	0	0	0	1.483	0	0	0	0	0	0.002
November	1.854	0	0	0	1.854	0	0	0	0	0	0.002
December	1.445	0	0	0	1.445	0	0	0	0	0	0.001
Yearly Total	15.709	0	0	0	15.709	0	0	0	2.575	0	0.026

Drainage Service Department
Monthly Summary Waste Flow Table
for Contract with Waste Management Plan under ETWB TCW No. 15/2003
Reporting Year: 2012
Contract No. *DC/2009/08*

(To be submitted to C&D MM Coordinator of Respective Division/Region via Engineer's Representative before 15th of the following month)

2012 Month	Actual Quantities of Inert C&D Materials Generated / Imported (in '000 m^3)						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 '000m^3)
January	1.856	0	0	0	1.856	0	0	0	0.000	0	0.001
February	1.516	0	0	0	1.516	0	0	0	0.000	0	0.001
March	2.256	0	0	0	2.256	0	0	0	0.000	0	0.001
April	2.134	0	0	0	2.134	0	0	0	0.000	0	0.002
May	3.213	0	0	0	3.213	0	0	0	0.000	0	0.001
June	1.524	0	0	0	1.524	0	0	0	0.000	0	0.001
Half-year total	12.499	0	0	0	12.499	0	0	0	0.000	0	0.007
July	3.132	0	0	0	3.132	0	0	0	0.000	0	0.001
August	3.321	0	0	0	3.321	0	0	0	0.000	0	0.001
September	1.152	0	0	0	1.152	0	0	0	0.000	0	0.001
October	1.231	0	0	0	1.231	0	0	0	0.000	0	0.002
November	1.012	0	0	0	1.012	0	0	0	0.000	0	0.001
December	1.241	0	0	0	1.241	0	0	0	0.000	0	0.001
Yearly Total	23.588	0	0	0	23.588	0	0	0	0.000	0	0.014

Drainage Service Department
Monthly Summary Waste Flow Table
for Contract with Waste Management Plan under ETWB TCW No. 15/2003
Reporting Year: 2013

Contract No. *DC/2009/08*

(To be submitted to C&D MM Coordinator of Respective Division/Region via Engineer's Representative before 15th of the following month)

2013 Month	Actual Quantities of Inert C&D Materials Generated / Imported (in '000 m^3)						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 '000m^3)
January	1.765	0	0	0	1.765	0	0	0	0.000	0	0.001
February	0.082	0	0	0	0.082	0	0	0	0.000	0	0.001
March	1.925	0	0	0	1.925	0	0	0	0.000	0	0.001
April	1.025	0	0	0	1.025	0	0	0	0.000	0	0.001
May	1.815	0	0	0	1.815	0	0	0	0.000	0	0.001
June	1.521	0	0	0	1.521	0	0	0	0.000	0	0.001
Half-year total	8.133	0	0	0	8.133	0	0	0	0.000	0	0.006
July	1.361	0	0	0	1.361	0	0	0	0.000	0	0.001
August	1.132	0	0	0	1.132	0	0	0	0.000	0	0.001
September	0.823	0	0	0	0.823	0	0	0	0.000	0	0.001
October	0.530	0	0	0	0.530	0	0	0	0.000	0	0.001
November	0.352	0	0	0	0.352	0	0	0	0.000	0	0.001
December	0.225	0	0	0	0.225	0	0	0	0.000	0	0.001
Yearly Total	12.556	0	0	0	12.556	0	0	0	0.000	0	0.012

Drainage Service Department
Monthly Summary Waste Flow Table
for Contract with Waste Management Plan under ETWB TCW No. 15/2003
Reporting Year: 2014

Contract No. *DC/2009/08*

(To be submitted to C&D MM Coordinator of Respective Division/Region via Engineer's Representative before 15th of the following month)

2013 Month	Actual Quantities of Inert C&D Materials Generated / Imported (in '000 m^3)						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 '000m^3)
January	0.220	0	0	0	0.220	0	0	0	0.000	0	0.001
February											
March											
April											
May											
June											
Half-year total	0.220	0	0	0	0.220	0	0	0	0.000	0	0.001
July											
August											
September											
October											
November											
December											
Yearly Total	0.220	0	0	0	0.220	0	0	0	0.000	0	0.001