DRAINAGE SERVICES DEPARTMENT
HATS DIVISION
HATS Stage 2A

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By Hand

Your ref

Our ref 24888/(DC/2009/05)/M45/250/0013

Date 18 February 2010

Environmental Protection Department
Environmental Assessment Division
Regional Assessment Group
27/F Southern Centre
130 Hennessy Road
Wanchai
Hong Kong

ARUP

For the attention of Mr. Charles Pang

Dear Sirs

Environmental Impact Assessment Ordinance, Cap. 499
Harbour Area Treatment Scheme Stage 2A
Environmental Permit No. EP0322/2008B
Monthly Environmental Monitoring and Audit Consolidated Report for Stonecutters Island Sewage Treatment Works for January 2010

I am pleased to submit herewith three copies of the 2nd Monthly Environmental Monitoring and Audit Consolidated Report covering the month of January 2010 for the following active construction contracts at the Stonecutters Island Sewage Treatment Works (SCISTW).

(i) Contract No. DC/2007/23 - Construction of Sewage Conveyance System from North Point to Stonecutters Island;

(ii) Contract No. DC/2009/05 - Construction of Interconnection Tunnel and Diaphragm Wall for Main Pumping Station at SCISTW; and

(iii) Contract No. DE/2009/02 - Provision of Covers and Deodourisation Facilities to the Existing Sedimentation Tanks at SCISTW.

Please note that the individual reports for the above contracts and this Consolidated Report have been verified by IEC. Copies of the IEC's verification letters are enclosed for your information.

Should you have any queries, please feel free to contact my Resident Engineer (William Yu) at 9705 9566.

Ove Arup & Partners Hong Kong Ltd
Registered in England 1359968 at 13 Fitzroy Street London W1T 4BQ
An Arup Group Company

Yours faithfully

M.P. Gamini Ananda
Senior Resident Engineer

Encl.

c.c.	Mr. W. L. Chan	E5/HATS, DSD	w/e (hard copy and pdf copy)
	Mr. Raymond Wan	E10/HATS, DSD	
	Ms. Fanny Wong	EPO/HATS, DSD	
	Ms. Anne Kerr	IEC (Mott McDonald)	
	Mr. Peter Chang	Ove Arup & Partners HK Ltd (HQ)	
	Mr. Chris Leung	CSSTJV (Contractor for DC/2009/05)	w/e (pdf copy only)
	Mr. Barry Lee	ATAL (Contractor for DE/2009/02)	
	Mr. Max Ko	Gammon (Contractor for DC/2007/23)	
	Mr. Dominic Lam	AECOM (RE for DC/2007/23)	
	Ms. Edith Ng	AECOM (ET for DC/2009/05)	
	Mr. Andrew Lau	AUES (ET for DE/2009/02)	
	Ms. Winnie Ko	ERM (ET for DC/2007/23)	
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Drainage Services Department

Harbour Area Treatment Scheme Stage 2A

Monthly Environmental Monitoring and Audit Consolidated Report for Stonecutters Island Sewage Treatment Works for January 2010

Issue No. 2
(February 2010)

Drainage Services Department

Harbour Area Treatment Scheme Stage 2A

Monthly Environmental Monitoring and Audit Consolidated Report for Stonecutters Island Sewage Treatment Works for January 2010

Issue No. 2 (February 2010)

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Job number 24888

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1. EXECUTIVE SUMMARY

1.1 Purpose of this Report

This Report summarizes the key environmental monitoring and audit monthly reports for the following active construction contracts at the Stonecutters Island Sewage Treatment Works (SCISTW) under the Project of Harbour Area Treatment Scheme Stage 2A (the Project):

(i) Contract No. DC/2007/23 - Construction of Sewage Conveyance System from North Point to Stonecutters Island;

(ii) Contract No. DC/2009/05 - Construction of Interconnection Tunnel and Diaphragm Wall for Main Pumping Station at SCISTW; and

(iii) Contract No. DE/2009/02 - Provision of Covers and Deodourisation Facilities to the Existing Sedimentation Tanks at SCISTW.

These three Contracts are under the same Environmental Permit (EP) No. EP-332/2008B and separate Environmental Teams (ETs) were appointed under each contract pursuant to Condition 2.1 of the EP.

This Report is prepared in response to the request from DSD to provide a consolidated monthly summary of the environmental monitoring and audit (EM&A) at SCISTW for the purpose of ease of references. This Report, however, does not hold any responsibilities with respect to the EM&A requirements pursuant to the conditions of EP in which each contract is administered under their respective contract by different project teams including the Engineer, the Engineer's Representatives, the Contractor, and the Environmental Team.

The details of the EM&A for individual contracts can be found in the EM&A reports submitted as attached in the Appendices of this Report. This Report does not take any precedent or amendment to the individual EM&A reports. In case of ambiguity and discrepancy, the individual EM&A report shall prevail.

This Report is the second monthly EM&A consolidated report covering the period from 1 January 2010 to 31 January 2010.

1.2 Executive Summary for Contract No. DC/2007/23

At SCISTW, air quality monitoring station demarcated AM6 and noise monitoring station demarcated NM5 were established and being monitored by the ET for Contract No. DC/2007/23. One exceedance of noise monitoring was recorded at NM5 during the reporting period. The details are given in Section 7.1.2 of this Report.

1.3 Executive Summary for Contract No. DC/2009/05

At SCISTW, air quality monitoring station demarcated AM7 and noise monitoring station demarcated NM6 were established and being monitored by the ET for Contract No. DC/2009/05. One exceedance of noise monitoring was recorded at NM6 during the reporting period. The details are given in Section 7.1.2 of this Report.

1.4 Executive Summary for Contract No. DE/2009/02

At SCISTW, air quality monitoring station demarcated AM8 was established and being monitored by the ET for Contract No. DE/2009/02. No exceedance was recorded during the reporting period.

2. BASIC PROJECT INFORMATION

2.1 Project Organization

Contract No.	*DC/2007/23*	*DC/2009/05*	*DE/2009/02*
Contract Title	HATS Stage 2A Construction of Sewage Conveyance System from North Point to Stonecutters Island	HATS Stage 2A Construction of Interconnection Tunnel and Diaphragm Wall for Main Pumping Station at SCISTW	HATS Stage 2A Provision of Covers and Deodourisation Facilities to the Existing Sedimentation Tanks at SCISTW
Consultant	Metcalf & Eddy – AECOM JV	Ove Arup & Partners HK Ltd	Ove Arup & Partners HK Ltd
The Engineer	Keith Tsang (Tel: 2605 6262)	S.Y. Chan (Tel: 2528 3031)	S.Y. Chan (Tel: 2528 3031)
The Engineer Representative	Y. H. Fung (Tel: 3713 3100)	M.P. Gamini Ananda (Tel: 2370 4311)	M.P. Gamini Ananda (Tel: 2370 4311)
ER's coordinator	Dominic Lam (Tel: 9221 6319)	William Yu (Tel: 9705 9566)	William Yu (Tel: 9705 9566)
Contractor	Gammon construction Limited	China State – Shanghai Tunnel Joint Venture	ATAL Engineering Ltd
Site agent	Max Ko (Tel: 9033 1292)	Ben Siu (Tel: 6432 1490)	Barry Lee (Tel: 9025 2410)
Environmental Officer	Leo Chow (Tel: 9300 2013)	Chris Leung (Tel: 9210 7116)	L.C. Wong (Tel:9376 0414)
Environmental Team	Environmental Resources Management	AECOM Asia Co Ltd	Action-United Environmental Services and Consulting
Environmental Team Leader	Winnie Ko (Tel: 2271 3147)	Edith Ng (Tel: 3105 8525)	Andrew Lau (Tel: 2959 6059)

Table 1 Project Organization of three active contracts in SCISTW

2.2 Scope of the Works

2.2.1 Scope of the Works

The scopes of the works for the following contracts at SCISTW are briefly described as below:

Contract No. DC/2007/23

i. Construction of sewage conveyance system between Sai Ying Pun junction shaft and Stonecutters Island Sewage Treatment Works;

ii. Construction of riser shaft at Stonecutters Island Sewage Treatment Works;

iii. Construction of Stage 2 Connecting Adit between the riser shaft and Stage 2 Main Pumping Station side chamber (by others) at Stonecutters Islands Sewage Treatment Works.

Contract No. DC/2009/05

i. Construction of Diaphragm wall, base slab and pile cap for the Main Pumping Station and its Inlet Chamber;

ii. Excavation within the diaphragm walls for the Main Pumping Station and its Inlet Chamber to the founding levels;

iii. Piling works for the Main Pumping Station;

iv. Construction of Temporary launching shaft;

v. Construction of Interconnection Tunnel between the Inlet Chamber of the Main Pumping Station and the existing Riser Shaft.

Contract No. DE/2009/02

i. Design, supply, installation, construct, test and commissioning of covers and deodourisation facilities, including associated air ductworks and ancillary equipments and instruments, to the existing sedimentation tanks, flocculation tanks, prototype tanks, main distribution channels, effluent drop structures, scum pits at SCISTW.

ii. The design and construction of civil structures and foundation piles for the deodourisation facilities at SCISTW.

2.2.2 Construction Programme

Contract No.	*DC/2007/23*	*DC/2009/05*	*DE/2009/02*
Contract Commencement Date	31 July 2009	17 Sep 2009	30 Oct 2009
Contract Completion Date	6 Nov 2013	18 Dec 2011	27 Jun 2012
Contract Period (days)	1560	823	972

Table 2 Construction Programme for three active contracts in SCISTW

2.2.3 Works undertaken during the month

The major construction works undertaken at SCISTW during the reporting month includes:

Contract No. DC/2007/23

- Construction of diaphragm wall at Stonecutters Island Production Shaft (SCIPS) and Stonecutters Island Riser Shaft (SCIRS);
- Installation of Monitoring Instrumentation

Contract No. DC/2009/05

- Construction of the diaphragm wall at Stonecutters Island Main Pumping Station (SCIMPS) No. 2.

Contract No. DE/2009/02

- Initial survey and tree transplanting;
- Ground investigation works of the deodourization units.

3. ENVIRONMENTAL MONITORING REQUIREMENTS

3.1 Air Quality Monitoring

3.1.1 Locations of Air Quality Monitoring Stations

In summary, the following air quality monitoring stations are established at SCISTW:

Air Monitoring Station	*Location*	*Monitor By*
AM6	Works site boundary of DC/2007/23	DC/2007/23
AM7	North West Kowloon Sewage Pumping Station	DC/2009/05
AM8	Block A of Government Dockyard	DE/2009/02

Table 3 Location of air quality monitoring stations at SCISTW

The locations of the above air quality monitoring stations are shown in Appendix A.

3.1.2 Action and Limit Levels for Air Quality Parameter

The Action and Limit Levels of 24-hour and 1-hour Total Suspended Particulates (TSP) levels are summarized as below:

Parameter	*Air Monitoring Station*	*Action Level* (μgm^{-3})	*Limit Level* (μgm^{-3})
24-hour TSP	AM6	196	260
	AM7	207	260
	AM8	158	260
1-hour TSP	AM6	346	500
	AM7	322	500
	AM8	307	500

Table 4 Action and limit levels for air quality parameter

3.2 Noise Monitoring

3.2.1 Locations of Noise Monitoring Stations

In summary, the following noise monitoring stations are established at SCISTW:

Noise Monitoring Station	*Location*	*Monitor By*
NM5	Near FSD Diving Rescue and Training Centre	DC/2007/23
NM6	Customs Marine Base	DC/2009/05

Table 5 Locations of noise monitoring stations at SCISTW

The locations of the above noise monitoring stations are shown in Appendix A.

3.2.2 Action and Limit Levels for Noise Parameter

Weekly construction noise monitoring was conducted in accordance with the requirements stipulated in the EM&A Manual. Additional noise monitoring were also conducted as per required in the EM&A Manual when works were carried out during restricted periods. The Action and Limit Levels are given in the following table:

Noise Monitoring Station	*Action Level*	*Limit Level*
	0700-1900 hours on normal weekdays	
NM5	When one or more documented complaints are received	75 dB(A) of Leq(30min) during normal hours from 0700 to 1900 hours on normal weekdays
NM6		

Table 6 Action and limit levels for noise parameter

The construction noise levels were measured in terms of A-weighted equivalent continuous sound pressure level (Leq) in decibels dB(A). Leq (30min) were used as the monitoring parameter for the time period in between 0700 –1900 hours on normal weekdays, and Leq (5min) were used as the monitoring parameter for all restricted periods.

3.3 Landscape and Visual Monitoring

Landscape and visual mitigation measures were implemented by the Contractors and the implementation status is given in Appendices.

4. IMPLEMENTATION STATUS

The details of the implementation status were reported under the individual contracts as described in the respective EM&A report given in the Appendices.

In summary, all the contracts had implemented various environmental mitigation measures and requirements as stated in the EIA Report, the Environmental Permit and EM&A Manual.

5. CONSOLIDATED MONITORING RESULTS

5.1 Air Quality Monitoring

The monitoring results for 24-hour TSP and 1-hour TSP for January 2010 are summarized as below:

Air Monitoring Station	*Average (μgm^{-3})*	*Range (μgm^{-3})*	*Action Level (μgm^{-3})*	*Limit Level (μgm^{-3})*
24-hour TSP				
AM6 (monitor by DC/2007/23)	94	77-112	196	260
AM7 (monitor by DC/2009/05)	84.0	62.3-116.9	207	260
AM8 (monitor by DE/2009/02)	101	62-156	158	260
1-hour TSP				
AM6 (monitor by DC/2007/23)	202	142-280	346	500
AM7 (monitor by DC/2009/05)	77.1	64.9-89.9	322	500
AM8 (monitor by DE/2009/02)	121	31-236	307	500

Table 7 Air quality monitoring results for January 2010 at SCISTW

All 1-hour TSP and 24-hour TSP results were below the Action and Limit Level at all monitoring locations at SCISTW in the reporting month.

Detailed air quality monitoring results, graphical plot and the weather condition during the monitoring period are presented in the individual EM&A reports attached in the Appendices.

5.2 Noise Monitoring

The monitoring results for noise are summarized as below:

For the time period between 0700 and 1900 hours on normal weekdays			
Noise Monitoring Station	Average, dB(A), Leq (30 mins)	Range, dB(A), Leq (30 mins)	Limit Level, dB(A), Leq (30 mins)
NM5	67.8	64.8 - 71.0	75.0
NM6	73.6	71.0 - 74.9	75.0
For the evening period between 1900 and 2300 hours on normal weekdays			
Noise Monitoring Station	Average, dB(A), Leq (5 mins)	Range, dB(A), Leq (5 mins)	Limit Level, dB(A), Leq (5 mins)
NM5	66.6	63.6 -**70.8**	70.0
NM6	64.5	60.6 - 65.9	70.0
For the night-time between 2300 and 0700 hours on normal weekdays			
Noise Monitoring Station	Average, dB(A), Leq (5 mins)	Range, dB(A), Leq (5 mins)	Limit Level, dB(A), Leq (5 mins)
NM6	**63.7**	**63.7 - 63.8**	55.0

Remarks: The bolded and underlined measured noise levels indicated the exceedance of Limit Level.

Table 8 Noise monitoring results for January 2010 at SCISTW

No noise complaint was received at SCISTW in the reporting month; hence, no Action Level exceedance was recorded.

Total of two exceedance cases of noise monitoring were recorded during the reporting period. One was recorded at station NM5 on 10 January 2010 and one was recorded at station NM6 Details are given in Section 7.1 of this report.

5.3 Waste Management

Construction and demolition (C&D) materials generated from each contract were being monitored and recorded by the individual contracts. The quantities of C&D material are reported under the individual EM&A reports and summarized as below:

Contract	*Month / Year*	*inert C&D Materials*	*Non-inert C&D Material*	*Chemical Waste*
		(Tonnes)	(Tonnes)	('000L)
DC/2007/23*	Jan 2010	7,986.1	44.6	0.8
DC/2009/05	Jan 2010	2,946.0	19.6	0
DE/2009/02	Jan 2010	0	0.4	0

(* note – the quantities of C&D materials are the total quantities for the all sites within DC/2007/23)
Table 9 Summary of waste generation for January 2010 at SCISTW

5.4 Landscape and Visual Monitoring

Landscape and visual monitoring as described in the EM&A Manual has been implemented in the individual contracts on a monthly basis.

No major observation was recorded in the reporting period. Implementation and maintenance of the landscape and visual mitigation measures are reported under the individual EM&A reports as attached in the Appendices.

6. ENVIRONMENTAL SITE INSPECTIONS

6.1 Site Inspection

Site Inspections were carried out on a weekly basis under each contract to monitor the implementation of proper environmental pollution control and mitigation measures for the Project as summarized below.

Contract No.	*Nos. of Inspections*	*Inspection Date*
DC/2007/23	4	7, 14, 21 and 28 Jan 2010
DC/2009/05	4	7, 13, 20 and 27 Jan 2010
DE/2009/02	4	6, 13, 20 and 27 Jan 2010

Table 10 Summary of site inspections for January 2010 at SCISTW

The major findings and recommendations are summarized as below:

Contract No. DC/2007/23

- The marine sediment tanks at the Stonecutters Island Production Shaft should be properly labeled.

- Stagnant water was observed adjacent to a generator on the ground near the production shaft of Stonecutters Island. The Contractor was recommended to inspect and clear stagnant water inside containers, trays and depressed areas on-site regularly as part of good housekeeping practices, especially after rainy weather, to avoid mosquito breeding onsite.
- Stagnant water was observed to have accumulated in the tank near the bentonite filtering plant. The Contractor was recommended to clear the water as part of good housekeeping practices.

Contract No. DC/2009/05

- The Contractor should ensure that the wheel washing facility was operating properly.
- Regular water spraying should be provided in order to suppress fugitive dust emission. Stockpile of excavated material should be properly covered up.
- Mud deposited outside the diaphragm wall curbing area and within the bentonite slurry treatment plant area should be removed regularly. All surface run-off should be properly desilted before discharge.
- Channels/bunds should be provided at the site boundaries to avoid any surface/storm run-off discharge to other construction sites.
- Site tidiness should be improved. General refuse and C&D wastes scattered at the site areas and those accumulated in the collection bins should be removed off-site regularly.
- The Contractor should ensure the wastes were sorted properly before disposal. Additional collection bin should be provided at steel works area in order to ease the collection of recyclable steel wastes.
- Oil tank placed at the site area should be properly stored with provision of drip tray in order to retain any oil leakage.

Contract No. DE/2009/02

- The Contractor was reminded to maintain the u-channel within the site area to prevent water ponding.
- Stagnant water cumulated inside the drip tray was observed, the contractor was reminded to clean to prevent oil leakage.
- In general, it was reminded that good housekeeping practice should be maintained.

7. ENVIRONMENTAL NON-CONFORMANCE

7.1 Summary of Monitoring Exceedance

7.1.1 Exceedance of Air Quality Monitoring

No exceedance of the Action and Limit Levels of air quality monitoring stations was recorded at SCISTW during the reporting period.

7.1.2 Exceedance of Noise Monitoring

One exceedance of noise limit level was recorded at NM5 on 10 January 2010 during restricted hours. Investigation into the exceedance was made and concluded that the marginal exceedance were not solely attributable to the works from the Project as some other noise sources, such as aircrafts passing by or occasional traffic were also noticed during the monitoring period, which may have also contributed to the measured noise level.

Another exceedance case of noise level was measured on 28 January 2010 at station NM6 during night-time period (2300 – 0700 hours). Based on the observations during the course of noise measurement and information provided by the Contractor, the operation machinery was in accordance with the CNP (Ref: GW-RW0038-10) requirements (Group G) on types and number of PME. According to the baseline monitoring results, an average baseline noise level of Leq(5-min) 59.6 dB(A) was recorded at NM6 during night-time period, which already exceeded the Limit Level. Also, other external noise sources, like community noises and traffic noise from nearby piers, were also noted during the monitoring period, which may have attributed to the measured noise levels. Therefore, it is believed that the Limit Level exceedance is not project-related and not solely caused by the Contractor's construction activities.

Meanwhile, the contractors were reminded to strictly implement all noise mitigation measures as stated in the EIA, EM&A Manual, EMP, Method Statements, General and Particular Specifications of this Project to avoid any further noise Limit Level exceedance and any public complaints.

According to the EIA report, no noise sensitive receiver was identified near the site area except the FSD Diving Rescue and Diving Training Centre. It is believed that the noise exceedance recorded would have unlikely caused any impact at NSRs farther away.

7.2 Summary of Environmental Non-compliance

No non-compliance event was recorded during the reporting month.

7.3 Summary of Environmental Complaint

No complaint was received during the reporting month.

7.4 Summary of Environmental Summon and Successful Prosecution

No summon was received during the reporting month.

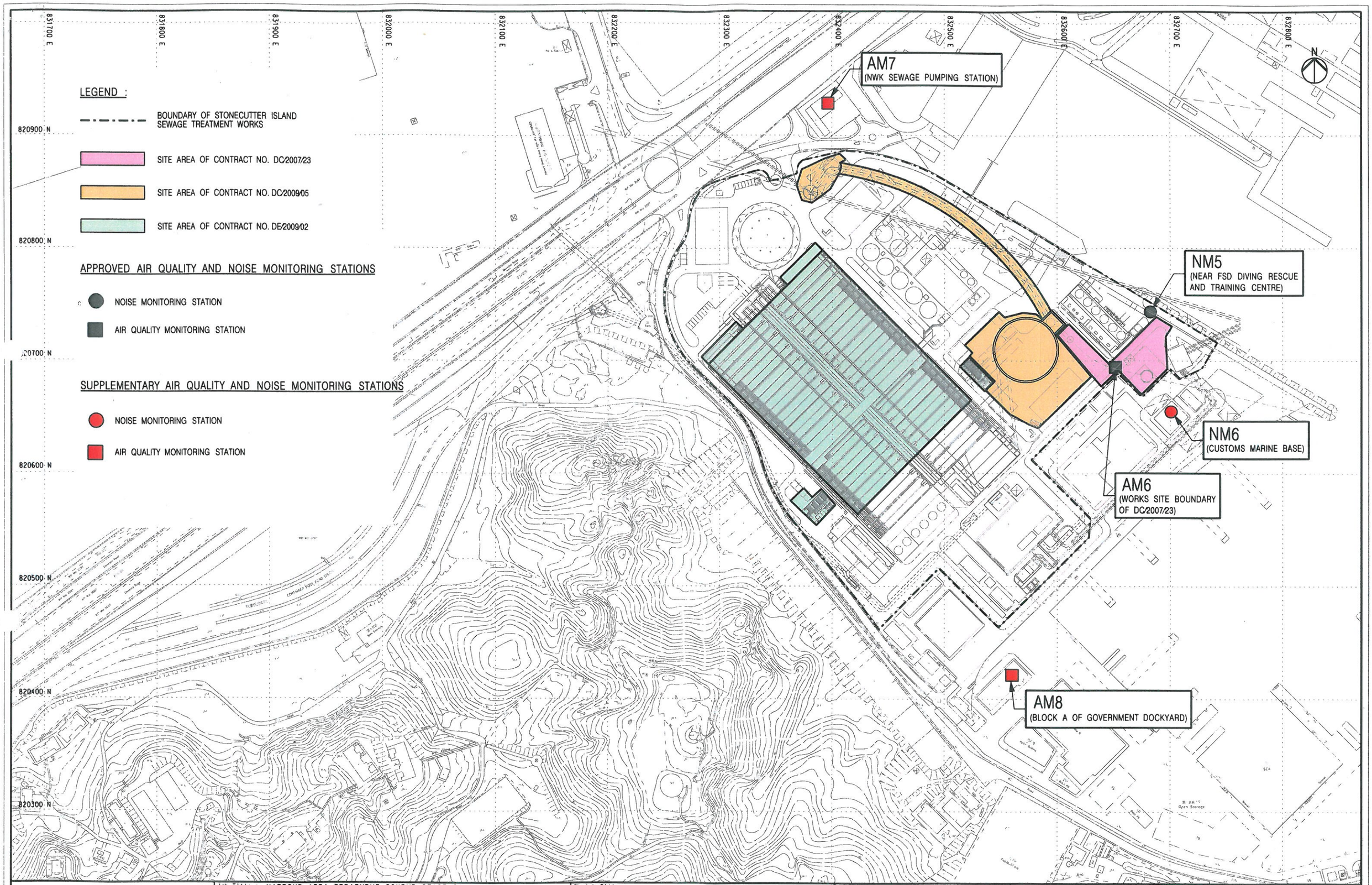
8. FUTURE KEY ISSUES

Potential environmental impacts arising from the construction activities are reported under the individual EM&A reports.

Ove Arup & Partners HK Ltd (Arup), being the Engineer for DC/2009/05 and DE/2009/02, would continue to coordinate and prepare this consolidated report on the environmental monitoring activities at SCISTW. Shall there be any exceedance recorded or complaint received, Arup will inform the parties involved at SCISTW to respond immediately.

Appendix A

Location of Air Quality and Noise Monitoring Stations at SCISTW



ARUP
Ove Arup & Partners HK Ltd

Job Title : HARBOUR AREA TREATMENT SCHEME STAGE 2A - CONSTRUCTION OF INTERCONNECTION TUNNEL AND DIAPHRAGM WALL FOR MAIN PUMPING STATION AT STONECUTTERS ISLAND SEWAGE TREATMENT WORKS		Sketch Title : LOCATIONS OF AIR AND NOISE MONITORING STATIONS AT STONECUTTER ISLAND SEWAGE TREATMENT WORKS	Drawn: KH / Checked: WY / Approved: GA
Project No.: DC0905	Contract No.: DC/2009/05		
Sketch No. : DC/2009/05/SK/0017	Rev : 1	Scale : 1:3000 @ A3	Issue Date : 15-12-2009
Other Related Ref.:	Working Dwg. No.: N/A	DAN No.: N/A	IN-O No.: N/A
		RFI No.: N/A	Others: N/A

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APPENDIX B

EM&A Monthly Report Submitted under DC/2007/23

(For SCISTW section only)

Gammon Construction Limited

Contract No. DC/2007/23 Harbour Area Treatment Scheme Stage 2A Construction of Sewage Conveyance System from North Point to Stonecutters Island: *Second Monthly EM&A Report*

February 2010

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Gammon Construction Limited

Contract No. DC/2007/23 Harbour Area Treatment Scheme Stage 2A Construction of Sewage Conveyance System from North Point to Stonecutters Island: *Second Monthly EM&A Report*

February 2010

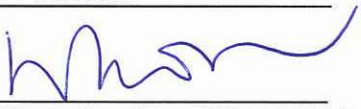
Reference 0104887

For and on behalf of
ERM-Hong Kong, Limited

Approved by: Dr Robin Kennish

Signed:

Position: Director

Certified by: 
(Environmental Team Leader - Winnie Ko)

Date: 10 February 2010

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EXECUTIVE SUMMARY

The construction works of **DC/2007/23 of Harbour Area Treatment Scheme Stage 2A (HATS2A) - Construction of Sewage Conveyance System from North Point to Stonecutters Island (the Project)** commenced on 1 December 2009. This is the second monthly Environmental Monitoring and Audit (EM&A) report presenting the EM&A works carried out during the period from 1 to 31 January 2010 in accordance with the EM&A Manual.

Stonecutters Island Production and Riser Shafts

Summary of Construction Works undertaken during Reporting Month

The major construction works undertaken during the reporting month include:

- Construction of diaphragm wall at Stonecutters Island Production Shaft and Riser Shaft
- Installation of Monitoring Instrumentation

Environmental Monitoring and Audit Progress

A summary of the monitoring activities in this reporting period is listed below:

• 24-hour TSP Monitoring at AM6	5 sets
• 1-hour TSP Monitoring at AM6	15 sets
• Construction Noise Monitoring during Normal Weekdays at NM5	4 times
• Construction Noise Monitoring during Restricted Hours at NM5	5 times
• Joint Environmental Site Inspection	4 times
• Landscape & Visual Monitoring	1 time

Air Quality

Five sets of 24-hour TSP and fifteen sets of 1-hr TSP measurements were carried out at the designated monitoring station during the reporting period. No exceedance was recorded during the reporting period.

Noise

Four sets of 30-minute construction noise measurements were carried out at the monitoring station NM5 during normal weekdays of the reporting period. Five sets of 3 x 5-minute construction noise measurements were carried out during restricted hours (between 0700 and 2300 hours on Sundays and public holidays) of the reporting period. An exceedance of limit level was reported on 10 January 2010.

Landscape & Visual

Landscape and visual monitoring has commenced since December 2009 on a monthly basis. Details of the audit findings and implementation status are presented in *Section 7.5.3*.

Cultural Heritage

No vibration monitoring was required to be conducted for this reporting month as the blasting of tunnel / shaft works has not started.

Waste Management

Wastes generated from this Project include inert construction and demolition (C&D) materials and non-inert C&D materials. A total of 7,986.1 tonnes of inert C&D materials and 44.644 tonnes of non-inert C&D materials were generated during the reporting period. Non-inert C&D materials are made up of general refuse, steel materials and paper/cardboard packaging materials. The inert C&D materials and general refuse generated from the Project were disposed of at Tuen Mun Area 38/Tseung Kwan O Area 137 Fill Bank/Chai Wan Barging Point and SENT Landfill respectively.
Paper/cardboard packaging generated was sent to recyclers for recycling.

Environmental Site Inspection

Four weekly joint environmental site inspections were carried out by the representatives of the Contractor, the Engineer and the Environmental Team (ET). Details of the audit findings and implementation status are presented in *Section 7.6*.

Environmental Exceedance/Non-conformance/Compliant/Summons and Prosecution

An exceedance of noise limit level during restricted hours was recorded at NM5 on 10 January 2010. Investigation into the incidents was made and concluded that the marginal exceedance were not solely attributable to the works from the Project as some other noise sources, such as aircrafts passing by or occasional traffic were also noticed during the monitoring period, which may have also contributed to the measured noise level.. However, the Contractor is reminded to adhere strictly to the Construction Noise Mitigation Plan and to implement all relevant noise mitigation measures recommended or specified in the EIA, EM&A Manual, EMP, Method Statements, General and Particular Specifications of this Project to avoid exceedance of noise limit levels and public complaints. The Contractor is also reminded to ensure that the construction plant deployed for the works during restricted hours is in strict accordance with the approval granted in the relevant Construction Noise Permit (CNP).

No non-compliance event was recorded during the reporting period.

No environmental complaint and summons/prosecutions was received in this reporting period.

Future Key Issues

Works to be undertaken in the next month include:
- Construction of diaphragm wall
- Installation of Monitoring Instrumentation
- Marine Dumping of excavated marine sediment

Potential environmental impacts arising from the above construction activities are mainly associated with dust, construction noise, site runoff and waste management.

1 INRODUCTION

ERM-Hong Kong, Limited (ERM) was appointed by Gammon Construction Limited (the Contractor) as an Environmental Team (ET) to undertake Environmental Monitoring and Audit (EM&A) programme for the Contract No. *DC/2007/23 of Harbour Area Treatment Scheme Stage 2A (HATS2A) - Construction of Sewage Conveyance System from North Point to Stonecutters Island (*the Project*).*

1.1 PURPOSE OF THE REPORT

This is the second EM&A report which summarizes the impact monitoring results and audit findings for the EM&A programme during the reporting period from **1** to **31 January 2010**.

1.2 STRUCTURE OF THE REPORT

The structure of the report is as follows:

Section 1 : **Introduction**
details the scope and structure of the report.

Section 2 : **Project Information**
summarizes background and scope of the project, site description, project organization and contact details

Section 3 : **North Point Production and Drop Shafts**

- **Construction Activities**
  summarizes the construction activities conducted during the reporting month.
- **Status of Environmental Approval Documents**
  summarizes the environmental documents submissions under the EP condition during the reporting month.
- **Environmental Monitoring Requirement**
  summarizes the environmental monitoring including monitoring parameters, monitoring programmes, monitoring methodologies, monitoring frequency, monitoring locations, Action and Limit Levels, Event and Action Plans, environmental mitigation measures as recommended in the EIA report and relevant environmental requirements.
- **Implementation Status on Environmental Mitigation Measures**
  summarizes the implementation of environmental protection measures during the reporting period.
- **Monitoring Results**
  summarizes the monitoring results obtained in the reporting period.

- **Environmental Site Inspection**
  summarizes the audit findings of the weekly site inspections undertaken within the reporting period.
- **Environmental Non-conformance**
  summarizes any monitoring exceedance, environmental complaints and environmental summons within the reporting period.
- **Future Key Issues**
  summarizes the impact forecast and monitoring schedule for the next three months.

Section 4 : **Wan Chai East Production and Drop Shafts**

- **Construction Activities**
  summarizes the construction activities conducted during the reporting month.
- **Status of Environmental Approval Documents**
  summarizes the environmental documents submissions under the EP condition during the reporting month.
- **Environmental Monitoring Requirement**
  summarizes the environmental monitoring including monitoring parameters, monitoring programmes, monitoring methodologies, monitoring frequency, monitoring locations, Action and Limit Levels, Event and Action Plans, environmental mitigation measures as recommended in the EIA report and relevant environmental requirements.
- **Implementation Status on Environmental Mitigation Measures**
  summarizes the implementation of environmental protection measures during the reporting period.
- **Monitoring Results**
  summarizes the monitoring results obtained in the reporting period.
- **Environmental Site Inspection**
  summarizes the audit findings of the weekly site inspections undertaken within the reporting period.
- **Environmental Non-conformance**
  summarizes any monitoring exceedance, environmental complaints and environmental summons within the reporting period.
- **Future Key Issues**
  summarizes the impact forecast and monitoring schedule for the next three months.

Section 5 : **Central Drop Shaft**

- **Construction Activities**
  summarizes the construction activities conducted during the reporting month.
- **Status of Environmental Approval Documents**
  summarizes the environmental documents submissions under the EP condition during the reporting month.

- **Environmental Monitoring Requirement**
  summarizes the environmental monitoring including monitoring parameters, monitoring programmes, monitoring methodologies, monitoring frequency, monitoring locations, Action and Limit Levels, Event and Action Plans, environmental mitigation measures as recommended in the EIA report and relevant environmental requirements.
- **Implementation Status on Environmental Mitigation Measures**
  summarizes the implementation of environmental protection measures during the reporting period.
- **Monitoring Results**
  summarizes the monitoring results obtained in the reporting period.
- **Environmental Site Inspection**
  summarizes the audit findings of the weekly site inspections undertaken within the reporting period.
- **Environmental Non-conformance**
  summarizes any monitoring exceedance, environmental complaints and environmental summons within the reporting period.
- **Future Key Issues**
  summarizes the impact forecast and monitoring schedule for the next three months.

Section 6 : **Sai Ying Pun Junction Shaft**

- **Construction Activities**
  summarizes the construction activities conducted during the reporting month.
- **Status of Environmental Approval Documents**
  summarizes the environmental documents submissions under the EP condition during the reporting month.
- **Environmental Monitoring Requirement**
  summarizes the environmental monitoring including monitoring parameters, monitoring programmes, monitoring methodologies, monitoring frequency, monitoring locations, Action and Limit Levels, Event and Action Plans, environmental mitigation measures as recommended in the EIA report and relevant environmental requirements.
- **Implementation Status on Environmental Mitigation Measures**
  summarizes the implementation of environmental protection measures during the reporting period.
- **Monitoring Results**
  summarizes the monitoring results obtained in the reporting period.
- **Environmental Site Inspection**
  summarizes the audit findings of the weekly site inspections undertaken within the reporting period.

- **Environmental Non-conformance**
  summarizes any monitoring exceedance, environmental complaints and environmental summons within the reporting period.
- **Future Key Issues**
  summarizes the impact forecast and monitoring schedule for the next three months.

Section 7 : **Stonecutters Island Production and Riser Shafts**

- **Construction Activities**
  summarizes the construction activities conducted during the reporting month.
- **Status of Environmental Approval Documents**
  summarizes the environmental documents submissions under the EP condition during the reporting month.
- **Environmental Monitoring Requirement**
  summarizes the environmental monitoring including monitoring parameters, monitoring programmes, monitoring methodologies, monitoring frequency, monitoring locations, Action and Limit Levels, Event and Action Plans, environmental mitigation measures as recommended in the EIA report and relevant environmental requirements.
- **Implementation Status on Environmental Mitigation Measures**
  summarizes the implementation of environmental protection measures during the reporting period.

- **Monitoring Results**
  summarizes the monitoring results obtained in the reporting period.
- **Environmental Site Inspection**
  summarizes the audit findings of the weekly site inspections undertaken within the reporting period.
- **Environmental Non-conformance**
  summarizes any monitoring exceedance, environmental complaints and environmental summons within the reporting period.
- **Future Key Issues**
  summarizes the impact forecast and monitoring schedule for the next three months.

Section 8 : **Conclusions**

2 PROJECT INFORMATION

2.1 BACKGROUND AND GENERAL SITE DESCRIPTION

The Project comprises the construction of production shafts, drop shafts and riser shaft and approximately 12km of tunnel excavation from North Point via Sai Ying Pun to Stonecutters Island. Shafts vary in depth from 140m and 170m below ground with 10 - 12m diameter. Tunnel face area ranges from 16 m^2 to 23 m^2. Embedded drainage pipelines will be installed upon the completion of tunnel excavation.

Construction works to be carried out under this Contract include the following major items:

- construction of sewage conveyance system (SCS) from North Point Preliminary Treatment Works (NP PTW) to Stonecutters Island Sewage Treatment Works (SCI STW) via Wan Chai East Preliminary Treatment Works (WCE PTW), Central Preliminary Treatment Works (CEN PTW) and Fung Mat Street Sai Ying Pun (SYP) junction shaft;
- construction of drop shafts at NP PTW, WCE PTW and CEN PTW;
- construction of riser shaft at SCI STW;
- construction of junction shaft at SYP;
- construction of temporary production shafts at NP, WCE and SCI to provide access for the construction of SCS;
- construction of connection channels, pipes, chambers and tunnel connecting the proposed drop shafts / riser shaft to the facilities of the preliminary treatment works / sewage treatment works;
- carrying out survey of existing buildings, taking over of existing and installation of new piezometers and ground settlement markers and subsequent monitoring thereof and vibration monitoring along the alignment of the SCS;
- miscellaneous building, civil, electrical and mechanical works; and
- landscape works.

The potential environmental impacts of the Project have been studied in the "*Harbour Area Treatment Scheme (HATS) Stage 2A*" (EIAO Register No: AEIAR-121/2008). The EIA was approved on 2 June 2008 under the *Environmental Impact Assessment Ordinance* (EIAO) and an updated Environmental Permit (EP-322/2008/B) for the works was granted on 2 November 2009. Under the requirements of Condition 4.1 of Environmental Permit EP-322/2008/B,

EM&A programme as set out in the EM&A Manual is required to be implemented.

The construction works of this Project commenced on 1 December 2009 and are scheduled to be completed by 2014.

The general layout plan of the Project is shown in *Annex A*.

2.2 STATUS OF REQUIRED SUBMISSIONS

Status of required submissions under the EP during the reporting period is presented in *Table 2.10*.

Table 2.1 Status of Required Submission for all Sites

EP Condition	Submission	Submission Date
Condition 1.11	Notification on Commencement of Construction of the Project	17 November 2009
Condition 2.3	Notification on Management Organization of the Main Construction Company	18 September 2009
Condition 4.3	Submission of Baseline Monitoring Report (final version incorporating comments from EPD)	18 December 2009
Condition 4.4	Submission of First Monthly EM&A Report	14 January 2009

2.3 PROJECT ORGANISATION

The project organization chart and contact details are shown in *Annex B*.

7.1 CONSTRUCTION ACTIVITIES DURING THE REPORTING MONTH

A summary of the major construction activities undertaken in this reporting period is shown in ***Table 7.1***. The locations of the construction activities are shown in *Annex G1*.

Table 7.1 Summary of Construction Activities Undertaken from 1 to 31 January 2010 at Stonecutters Island Production and Riser Shafts

Construction Activities Undertaken
• Construction of diaphragm wall at Stonecutters Island Production Shaft and Riser Shaft
• Installation of Monitoring Instrumentation

7.2 STATUS OF ENVIRONMENTAL APPROVAL DOCUMENTS

A summary of the relevant permits, licences, and/or notifications on environmental protection for this Project since December 2009 is presented in ***Table 7.2***.

Table 7.2 Summary of Environmental Licensing, Notification and Permit Status at Stonecutters Island Production and Riser Shafts

Permit/ Licences/ Notification	Reference	Validity Period	Remarks
Environmental Permit	EP-322/2008	Expired on 10 July 2009	• Permit granted on 19 November 2008. • Superceded on 10 July 2009.
	EP-322/2008/A	Expired on 2 November 2009	• Permit granted on 10 July 2009. • Superceded on 2 November 2009.
	EP-322/2008/B	Throughout the Contract	• Permit granted on 2 November 2009
Notification of Construction Works under Air Pollution Control (Construction Dust) Regulation	--	--	• Reference number for Notification Pursuant to APC (Construction Dust) Regulation: 308136
Water Discharge License	Stonecutters Island Production Shaft and Riser Shaft WT00005069-2009	06 October 2009 - 31 October 2014	--
Chemical Waste Producer Registration	Stonecutters Island Production Shaft and Riser Shaft 5213-269-G2449-07	--	--
Construction Noise Permit	Stonecutters Island Production Shaft and Riser Shaft	17 September 2009 - 15 March 2010	--

Permit/ Licences/ Notification	Reference	Validity Period	Remarks
	GW-RW0397-09		

7.3 ENVIRONMENTAL MONITORING REQUIREMENTS

7.3.1 Air Quality Monitoring

Monitoring Location

In accordance with the EM&A Manual, 24-hour and 1-hour Total Suspended Particulates (TSP) levels should be conducted at designated monitoring stations. Since access to some of the proposed monitoring locations stated in the EM&A Manual were rejected or not available, alternative locations, therefore, were proposed and agreed by the ER and the IEC. The construction air quality monitoring station for this Contract is listed in ***Table 7.3*** and shown in *Annex G2*.

Table 7.3 Construction Phase Air Monitoring Location at Stonecutters Island Production and Riser Shafts

Worksite	Proposed Construction Air Quality Monitoring Station			
	ID in EM&A Manual	ID	Location	Remark
SCISTW	-	AM6	Works Site Boundary	• Power Access supply for operation of HVS was not feasible to the rooftop of Government Dockyard Offices (CM_SCI1). • For COSCO HIT Terminal (CM_SCI2), access application was verbally rejected. • Club House (CM_SCI3) is blocked by a high building which will deteriorate the dust levels during measurement. • Work Site Boundary (near Ngong Shuen Chau Barracks Group 2 (CM_SCI4) was designed for the HATS2A Disinfection Facilities works and the station is separated by a small hill. • Baseline dust monitoring data measured under HATS2A – Provision of Disinfection Facilities at SCISTW will also be obtained for the establishment of the action level for the impact monitoring.

Monitoring Parameters, Frequency and Programme

Air quality monitoring was conducted in accordance with the requirements stipulated in the EM&A Manual (***Table 7.4***). The monitoring programme for this reporting period is shown in *Annex G3*.

Table 7.4 TSP Monitoring Parameter and Frequency at Stonecutters Island Production and Riser Shaft

Parameter	Frequency
24-hour TSP	Once per day for 6 days
1-hour TSP	3 times per day for 6 days

Monitoring Equipment

Continuous 24-hour and 1-hour TSP monitoring were performed using High Volume Samplers (HVS) with appropriate sampling inlets installed, located at the designated monitoring station. The performance specification of HVS complied with the standard method "*Determination of Suspended Particulate Matter in the Atmosphere (High Volume Method)*" as stipulated in *US EPA Standard Title 40, Code of Federation Regulations Chapter 1 (Part 50 Appendix B)*. *Table 7.5* summarizes the equipment that was deployed for the 24-hour and 1-hour TSP monitoring.

Table 7.5 TSP Monitoring Equipment at Stonecutters Island Production and Riser Shaft

Monitoring Station	Monitoring Equipment (HVS and Calibrator)
24-hr and 1-hr TSP	
AM6	GMW GS-2310 (S/N 1254), CM-AIR-43 (S/N 9833620)

Monitoring Methodology

Installation

The setup location of the HVS at monitoring station was listed in *Table 7.3*. The HVS was free-standing with no obstruction.

The following criteria were considered in the installation of the HVSs:

- appropriate support to secure the samplers against gusty wind were provided at AM6;
- a minimum of 2m separation from walls, parapets and penthouses was required for rooftop samplers;
- no furnace or incinerator flues were nearby;
- airflow around the sampler was unrestricted; and
- permission was obtained to set up the samplers and to gain access to the monitoring stations.

Preparation of Filter Papers

- glass fibre filters were labelled and sufficient filters that were clean and without pinholes were selected;
- all filters were equilibrated in the conditioning environment for 24 hours before weighing. The conditioning environment temperature was around 25 °C and not variable by more than ± 3 °C; the relative humidity (RH) was 40%; and
- SGS Hong Kong Ltd, a HOKLAS accredited laboratory, implements comprehensive quality assurance and quality control programmes.

Field Monitoring

- the power supply was checked to ensure that the HVSs were working properly;
- the filter holder and the area surrounding the filter were cleaned;
- the filter holder was removed by loosening the foul bolts and a new filter, with stamped number upward, on a supporting screen was aligned carefully;
- the filter was properly aligned on the screen so that the gasket formed an airtight seal on the outer edges of the filter;
- the swing bolts were fastened to hold the filter holder down to the frame. The pressure applied should be sufficient to avoid air leakage at the edges;
- then the shelter lid was closed and secured with the aluminium strip;
- the HVSs were warmed-up for about 5 minutes to establish run-temperature conditions;
- a new flowrate record sheet was set into the flow recorder;
- the flow rates of the HVSs were checked and adjusted to between 1.22 - 1.37 m^3min^{-1} which were within the range specified in the EM&A Manual (ie 0.6 – 1.7 m^3min^{-1});
- the programmable timer was set for a sampling period of 24 hours ± 1 hour, and the starting time, weather condition and the filter number were recorded;
- the initial elapsed time was recorded;
- at the end of sampling, the sampled filter was removed carefully and folder in half length so that only surfaces with collected particulate matter were in contact;
- it was then placed in a clean plastic envelope and sealed;

- all monitoring information was recorded on a standard data sheet; and
- filters were sent to SGS Hong Kong Ltd for analysis.

Maintenance and Calibration

- the HVSs and their accessories were maintained in good working condition, such as replacing motor brushes routinely and checking electrical wiring to ensure a continuous power supply; and
- the flow rate of each HVS with mass flow controller were calibrated using an orifice calibrator. Initial calibrations of the dust monitoring equipments were conducted upon installation and prior to commissioning. Five-point calibration was carried out for HVSs using CM-AIR-43 Calibration Kit. HVSs are calibrated on a bi-monthly basis. The calibration record for the HVS is given in *Annex G4*.

Wind Data Monitoring

Average wind data (wind speed and wind direction) during the monitoring period were obtained from the meteorological stations of the Hong Kong Observatory (HKO) and are presented in *Annex G6*.

Action and Limit Levels

The Action and Limit levels have been established and presented in *Table 7.6*. The baseline air monitoring data (24-hr and 1-hr TSP average) measured under *HATS2A – Provision of Disinfection Facilities at SCISTW* (DF) is also included to establish the Action Level at AM6.

Table 7.6 Action and Limit Levels for Air Quality at Stonecutters Island Production and Riser Shaft

Parameter	Air Monitoring Station	Action Level, μgm^{-3}	Limit Level, μgm^{-3}
24-hour TSP	AM6 (with 24-hr TSP data from DF project)	196	260
1-hour TSP	AM6 (with 1-hr TSP data from DF project)	346	500

Event and Action Plan

The Event and Action Plan (EAP) for air quality monitoring is presented in *Annex I*.

7.3.2 Noise Monitoring

Monitoring Location

In accordance with the EM&A Manual, monitoring of construction noise impact should be conducted at the designated monitoring stations. Since access to some of the proposed monitoring locations stated in the EM&A Manual were rejected or not available; alternative locations, therefore, were proposed and agreed by the ER and the IEC. The construction noise

monitoring location for this Contract is listed in ***Table 7.7*** and is shown in *Annex G2*.

Table 7.7 ***Construction Phase Noise Monitoring Station at Stonecutters Island Production and Riser Shafts***

Worksite	Proposed Construction Noise Monitoring Station				
	ID in EM&A Manual	ID	Location	Type of Measurement	Remark
SCISTW	-	NM5	A Location near the FSD Diving Rescue and Diving Training Centre near the Site Boundary	Free-Field (3dB(A) was added to the measured results)	• Access to FSD Fire Rescue and Diving Training Centre (M11) was rejected. • NM5 is located next to the original proposed location.

Monitoring Parameters, Frequency and Programme

Weekly construction noise monitoring was conducted in accordance with the requirements stipulated in the EM&A Manual. Additional noise monitoring were also conducted as per required in the EM&A Manual when works were carried out during restricted periods. The monitoring programme for this reporting period is shown in *Annex G3*.

The construction noise levels were measured in terms of A-weighted equivalent continuous sound pressure level (L_{eq}) in decibels dB(A). $L_{eq\ (30min)}$ were used as the monitoring parameter for the time period in between 0700 – 1900 hours on normal weekdays, and $L_{eq\ (5min)}$ were used as the monitoring parameter for all restricted periods. Supplementary information for data auditing, two statistical sound levels L_{10} and L_{90}; the levels exceeded for 10 and 90 percent of the time respectively, were also recorded during the monitoring for reference. The measured noise levels were logged in every 5 minutes throughout the impact monitoring period.

Monitoring Equipment and Methodology

Construction noise measurements were conducted in accordance with the calibration and measurement procedures as stated in *Annex – General Calibration and Measurement Procedures* of *Technical Memorandum on Noise from Construction Work other than Percussive Piling* (*GW-TM*) issued under the *Noise Control Ordinance* (*NCO*) (Cap.400).

The sound level meters and calibrator used for the noise measurement, as listed in *Table 7.8*, complies with IEC 651: 1979 and 804:1985 (Type 1) specification. The calibration certificates of the sound level meters are included in *Annex H*.

Table 7.8 ***Noise Monitoring Equipment at Stonecutters Island Production and Riser Shafts***

Monitoring Station	Monitoring Equipment (Sound Level Metre and Calibrator)
NM5	Calibrator: Rion NC-73 (S/N 10786708)
	Sound Level Metre: Rion NL-18 (S/N 00360030) or Rion NL-31 (S/N 00320533) or Rion NL-31 (S/N 00410224) or Rion NA-27 (S/N 00201194)

Immediately prior to and following the noise measurements, the accuracy of the measurement equipment was checked using an acoustic calibrator generating a known sound pressure level at a known frequency.

Measurements were accepted as the calibration level from before and after the noise measurement agree to within 1.0 dB. A correction of +3dB(A) was made to the free field measurement at NM5.

Action and Limit Levels

The action and limit levels for the noise monitoring during different monitoring periods are summarized in *Table 7.9*.

Table 7.9 ***Action and Limit Levels for Noise Monitoring at Stonecutters Island Production and Riser Shaft***

Noise Monitoring Location	Noise Criteria, Leq(30mins), dB(A)	Remark
NM5	75	During weekday normal working hours
	70	Applicable on Sundays and public holidays.

Event and Action Plan

The Event and Action Plan (EAP) for noise monitoring is presented in *Annex I*.

7.3.3 Cultural Heritage

No vibration monitoring is required for this reporting month as no blasting of tunnel / shaft works was carried out.

7.3.4 Landscape and Visual Monitoring

In accordance with the EM&A Manual, monthly landscape and visual monitoring is required to ensure that the design, implementation and maintenance of landscape and visual mitigation measures are fully achieved. The landscape and visual monitoring should be carry out on site with authorize registered landscape architect (RLA) for supervision. The monitoring procedures and criteria as described in the EM&A Manual were adopted.

Event and Action Plan

The Event and Action Plan (EAP) for landscape and visual monitoring is presented in *Annex I*.

7.4 IMPLEMENTATION STATUS ON ENVIRONMENTAL PROTECTION REQUIREMENTS

The Contractor has implemented environmental mitigation measures and requirements as stated in the EIA Report, the Environmental Permit and EM&A Manual. The implementation status during the reporting period is summarized in *Annex G5*.

7.5 MONITORING RESULTS

7.5.1 Air Quality

A total of five sets of 24-hour and fifteen sets of 1-hour TSP measurements were carried out at AM6 during the reporting period. The monitoring data for 24-hour TSP and 1-hour TSP together with wind data and graphical presentations are presented in *Annex G6*.

The weather condition during the monitoring period varied from sunny to rainy. The local impacts near the monitoring stations of AM6 were mainly associated with vehicle emissions. No exceedance of Action and Limit Levels of 1-hr and 24-hr TSP were recorded during the reporting period.

7.5.2 Noise

A total of four sets of 30-minute construction noise measurements were carried out at the monitoring station NM5 during normal weekdays of the reporting period. Construction work was also conducted on public holidays and Sundays starting on 20 December 2009. Hence, five sets of 3 x 5-minute construction noise measurements were carried out during restricted hours (between 0700 and 2300 hours on Sundays and public holidays) of the reporting period. The monitoring results together with graphical presentations are presented in *Annex C7*. The local impacts observed near the monitoring stations of NM5 included operations at the Government Dockyard, other construction sites activities and traffic within the SCI STW in the vicinity.

Exceedance of the limit level was recorded on 10 January at NM5. Investigation has been conducted to review the potential causes for the noise level recorded. A summary of the investigation result is presented in *Section 7.7.1*.

7.5.3 Landscape and Visual

In accordance with the EM&A Manual, monthly landscape and visual monitoring is required to ensure that the design, implementation and maintenance of landscape and visual mitigation measures are fully achieved.

The monitoring has commenced since December 2009 during weekly site inspections. Major findings and recommendations in the reporting period are summarized as follows:

- bentonite slurry was observed to be leaking into the soil nearby and may damage tree roots. The Contractor was recommended to clean the contaminated soil as soon as possible and provide spillage bunds to prevent bentonite slurry spillage.

7.5.4 Cultural Heritage

No vibration monitoring was conducted for this reporting month as the blasting of tunnel / shaft works have not started.

7.5.5 Waste Management

Waste generated from this Project includes inert construction and demolition (C&D) materials and non-inert C&D materials. Non-inert C&D materials is made up of general refuse, steel and paper/cardboard packaging materials. Steel materials generated from the project are also grouped into non-inert C&D materials as the materials were not disposed of with other inert C&D materials. Reference has been made on the Monthly Summary Waste Flow Table prepared by the Contractor (*Annex J*). The waste statistics provided in this section represent the cumulative quantity of wastes generated from all sites in this Project. With reference to relevant handling records and trip tickets of this Project, the quantities of different types of waste generated in the reporting month are summarised in *Table 7.10*. The inert C&D materials and general refuse generated from the Project were disposed of at Tuen Mun Area 38/Tseung Kwan O Area 137 Fill Bank/Chai Wan Barging Point and SENT Landfill respectively. 0.144 tonnes of paper/cardboard packaging were sent to recyclers for recycling during the reporting period.

Table 7.10 Quantities of Waste Generated from the Project for all Sites

Month / Year	Quantity		
	C&D Materials (inert) [a]	**C&D Materials (non-inert) [b]**	**Chemical Waste**
January 2010	7,986.1 tonnes	44.644 tonnes	800 L

Notes:

(a) Inert C&D materials include bricks, concrete, building debris, rubble and excavated soil. No inert C&D material was reused in this Project during the reporting period. Non-reused inert C&D materials were disposed of at the Tuen Mun Area 38/Tseung Kwan O Area 137 Fill Bank/ Chai Wan Barging Point.

(b) Non-inert C&D materials include steel, paper / cardboard packaging waste, plastics and other wastes such as general refuse. Steel materials generated from the project are grouped into non-inert C&D materials as the materials were not disposed of with other inert C&D materials. The non-inert C&D materials other than steel and paper/cardboard packaging were disposed of at SENT Landfill. No steel material and 0.144 tonnes of paper/cardboard packaging were sent to recyclers for recycling during the reporting period.

7.6 ENVIRONMENTAL SITE INSPECTION

Weekly site inspections were carried out by the representatives of the Contractor, Engineer and the ET. Four site inspections were conducted on 7,

14, 21 and 28 January 2010. There was no non-compliance recorded during the site inspections.

Major findings and recommendations are summarized as follows:

- On 7 January, the labels on the marine sediment tanks at the Stonecutters Island Production Shaft were observed to be missing. The Contractor was recommended to replace the labelling for all containers properly.

- On 7 January, stagnant water was observed adjacent to a generator on the ground near the production shaft of Stonecutters Island. The Contractor was recommended to inspect and clear stagnant water inside containers, trays and depressed areas on-site regularly as part of good housekeeping practices, especially after rainy weather, to avoid mosquito breeding on-site.

- On 28 January, stagnant water was observed to have accumulated in the tank near the bentonite filtering plant. The Contractor was recommended to clear the water as soon as possible as part of good housekeeping practices.

Follow-up actions were undertaken as reported by the Contractor and observed in the weekly site inspection conducted in the reporting period.

7.7 ENVIRONMENTAL NON-CONFORMANCE

7.7.1 Summary of Monitoring Exceedance

No exceedance of the Action and Limit Levels of 1-hour TSP and 24-hour TSP were recorded at monitoring stations during the reporting period.

Marginal exceedance of limit level was reported at NM5 on 10 January 2010. With reference to the investigation results at NM5, it was concluded that the marginal exceedance were not solely attributable to the works from the Project. However, the Contractor is reminded to adhere strictly to the Construction Noise Mitigation Plan and to implement all relevant noise mitigation measures recommended or specified in the EIA, EM&A Manual, EMP, Method Statements, General and Particular Specifications of this Project to avoid exceedance of noise limit levels and public complaints. The Contractor is also reminded to ensure that the construction plant deployed for the works during restricted hours is in strict accordance with the approval granted in the relevant Construction Noise Permit (CNP).

Table 7.11 ***Summary of Record of Exceedance at Stonecutters Island Production and Riser Shafts***

Station	Record of Exceedance	Result of Investigation
NM5	Marginal exceedance of Limit Level on 10 Jan 2010	Construction activities for the Project, including operations of hydro mills, bentonite filtering plants, a mobile crane, generators, welding machines and water pumps (petrol) were being conducted within the Site. PME was deployed on site in accordance with the CNP requirements with respect to types and numbers. Some other noise sources, such as aircrafts passing by or occasional traffic were also noticed during the monitoring period, which may have also contributed to the measured noise level. It is therefore concluded that the marginal noise exceedance is considered not solely caused by the Contractor's construction activities.

7.7.2 Summary of Environmental Non-Compliance

No non-compliance event was recorded during the reporting period.

7.7.3 Summary of Environmental Complaint

No complaint was received during the reporting period.

7.7.4 Summary of Environmental Summon and Successful Prosecution

No summons was received during the reporting period.

7.8 FUTURE KEY ISSUES

7.8.1 Key Issues for the Coming Month

Works to be undertaken for the coming two monitoring periods are summarized in *Table 7.12.*

Table 7.12 ***Construction Works to be Undertaken in the Coming Two Months at Stonecutters Island Production and Riser Shafts***

Work to be taken
• Construction of diaphragm wall
• Installation of Monitoring Instrumentation
• Marine Dumping of excavated marine sediment

Potential environmental impacts arising from the above construction activities are mainly associated with dust, construction noise, site runoff and waste management.

7.8.2 Monitoring Schedule for the Next Month

The tentative schedule of TSP and noise monitoring for the next reporting period is presented in *Annex G3*. Environmental monitoring will be conducted at the same monitoring locations in this reporting period.

7.8.3 Construction Programme for the Next Month

The most updated construction programme for the Project is presented in *Annex G8*.

8 CONCLUSIONS

The Environmental Monitoring and Audit (EM&A) Report presents the EM&A works undertaken during the period from 1 to 31 January 2010 in accordance with EM&A Manual and the requirement under EP-322/2008/B. The conclusions for different sites were summarised as below.

8.1 NORTH POINT PRODUCTION AND DROP SHAFT

No exceedance of Action and Limit Levels of 24-hour TSP and 1-hour TSP were recorded at the air quality monitoring stations during the reporting period.

No exceedance of Action and Limit Levels of construction noise was recorded at the noise monitoring stations during the reporting period.

No non-compliance event was recorded during the reporting period.

There was no complaint and summons/prosecution received during the reporting period.

8.2 WAN CHAI EAST PRODUCTION AND DROP SHAFTS

No exceedance of Action and Limit Levels of 24-hour TSP and 1-hour TSP were recorded at the monitoring stations during the reporting period.

Four exceedances of noise limit level during restricted hours were reported at NM2 on 10, 17 24 and 31 January 2010. Investigations into the incidents were made and concluded that the traffic noise in the vicinity of the Project was the major cause of the noise levels recorded. However, the Contractor of this Project was reminded to adhere strictly to the Construction Noise Mitigation Plan and to implement all relevant noise mitigation measures to avoid exceedance of noise limit levels or causing noise nuisance.

No non-compliance event was recorded during the reporting period.

There was no complaint and summons/prosecution received during the reporting period.

8.3 CENTRAL DROP SHAFT

No exceedance of Action and Limit Levels of 24-hour TSP and 1-hour TSP were recorded at the monitoring stations during the reporting period.

No exceedance of Action and Limit Levels of construction noise was recorded at the monitoring stations during the reporting period.

No non-compliance event was recorded during the reporting period.

There was no complaint and summons/prosecution received during the reporting period.

8.4 SAI YING PUN JUNCTION SHAFT

No exceedance of Action and Limit Levels of 24-hour TSP and 1-hour TSP were recorded at the monitoring stations during the reporting period.

No exceedance of Action and Limit Levels of construction noise was recorded at the monitoring stations during the reporting period.

No non-compliance event was recorded during the reporting period.

There was no complaint and summons/prosecution received during the reporting period.

8.5 STONECUTTERS ISLAND PRODUCTION AND RISER SHAFT

No exceedance of Action and Limit Levels of 24-hour TSP and 1-hour TSP were recorded at the monitoring stations during the reporting period.

One exceedance of noise limit level during restricted hours was recorded at NM5 on 10 January 2010. Investigation into the incidents was made and concluded that the marginal exceedance were not solely attributable to the works from the Project as some other noise sources, such as aircrafts passing by or occasional traffic were also noticed during the monitoring period, which may have also contributed to the measured noise level.. The Contractor is reminded to adhere strictly to the Construction Noise Mitigation Plan and to implement all relevant noise mitigation measures to avoid exceedance of noise limit levels and public complaints.

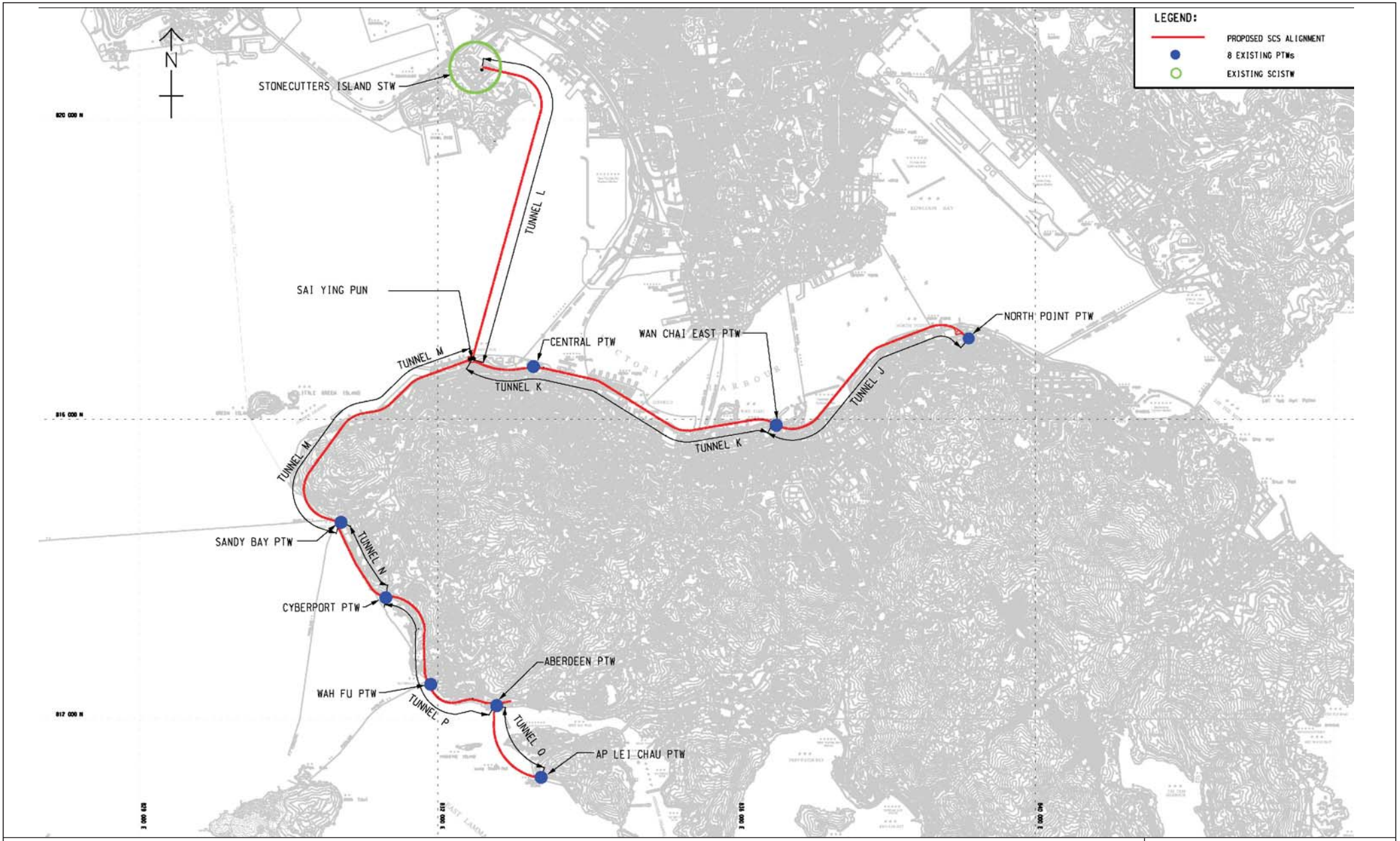
No non-compliance event was recorded during the reporting period.

There was no complaint and summons/prosecution received during the reporting period.

The ET will keep track on the EM&A programme to ensure compliance of environmental requirements and the proper implementation of all necessary mitigation measures.

Annex A

Locations of Works Areas



Annex A

General Layout Plan of HATS Stage 2A

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DATE: 07/01/2010

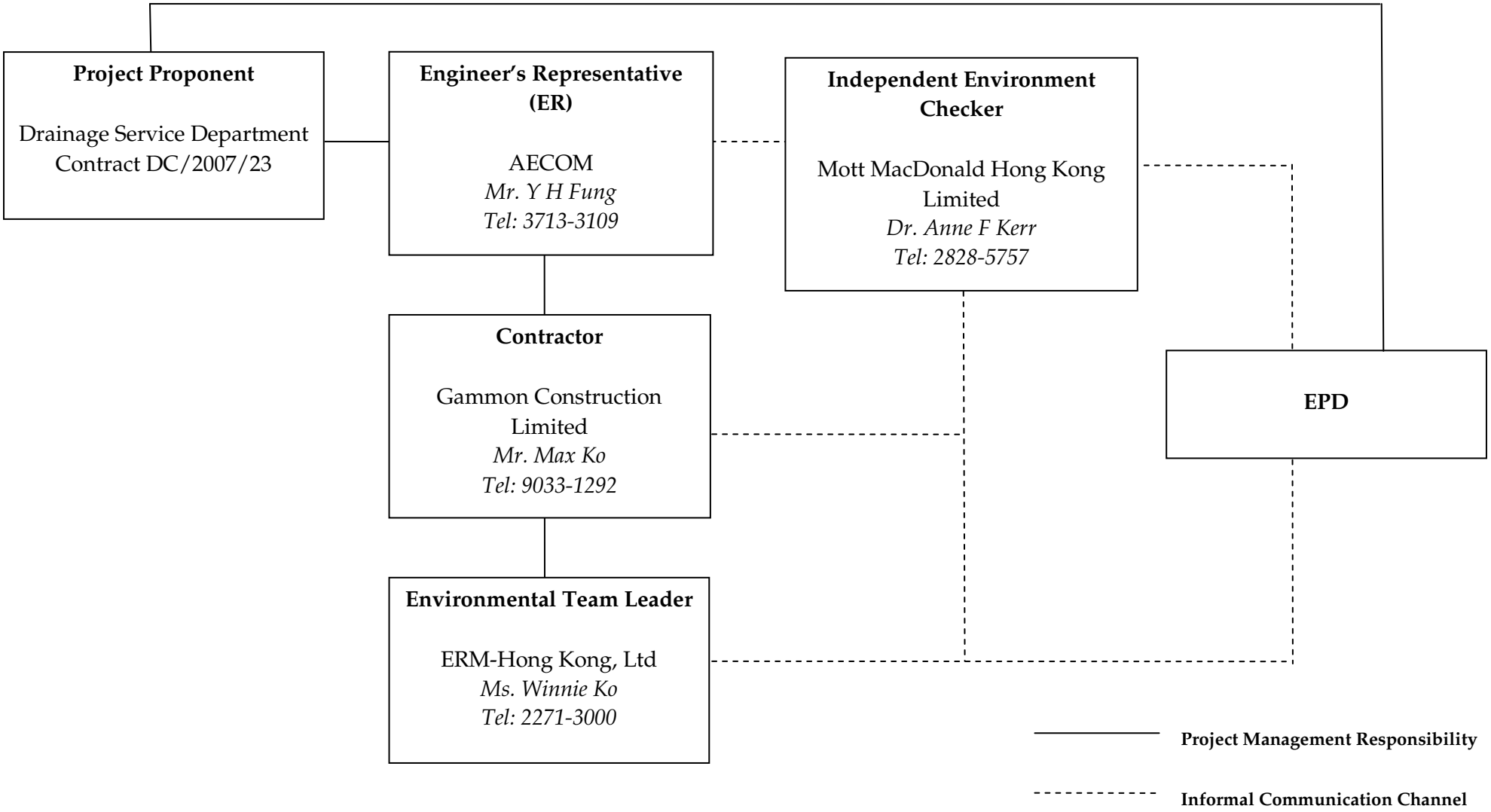
Environmental Resources Management

ERM

Annex B

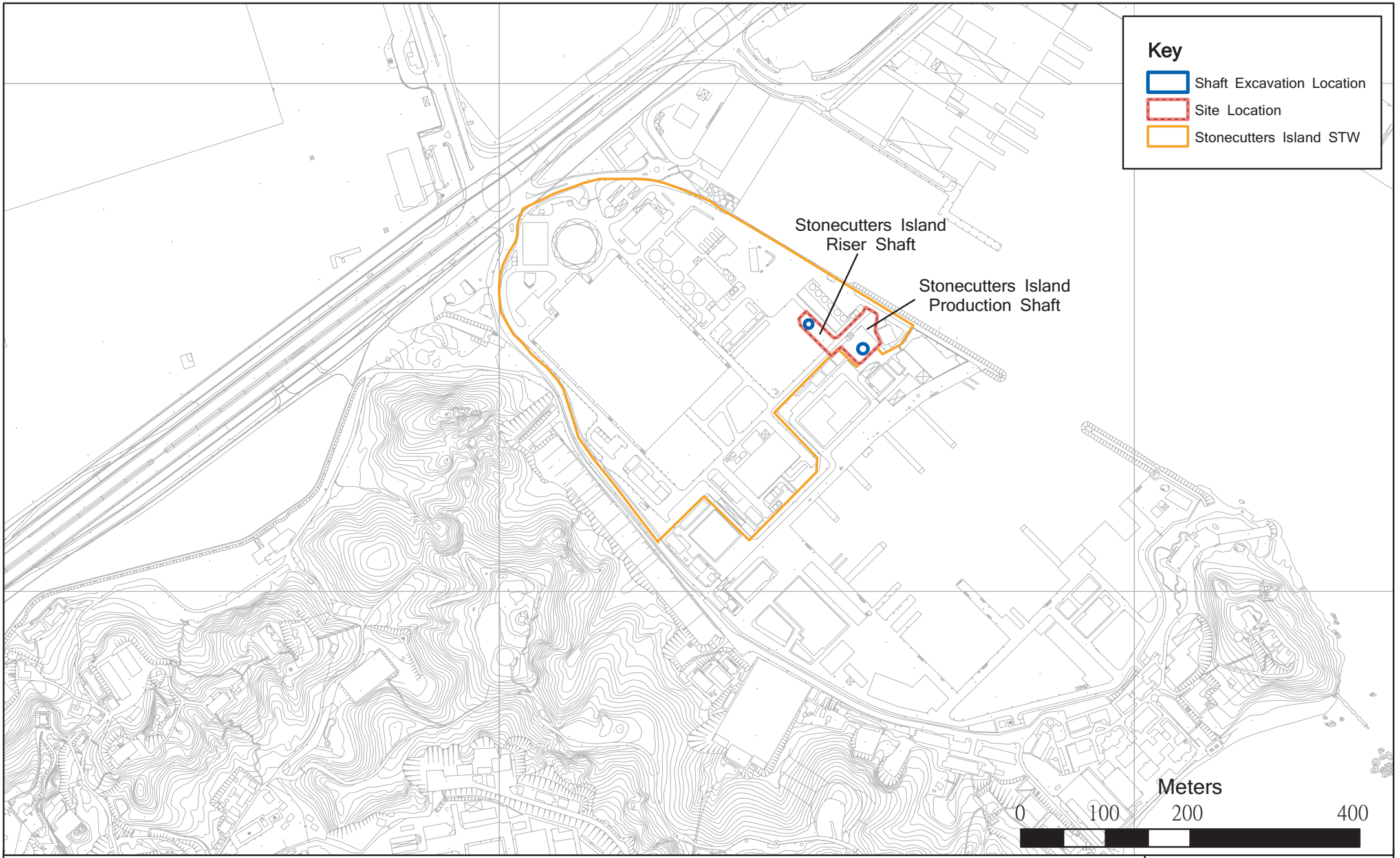
Project Organization Chart and Contact Detail

Project Organization



Annex G

Stonecutters Island Production and Riser Shafts



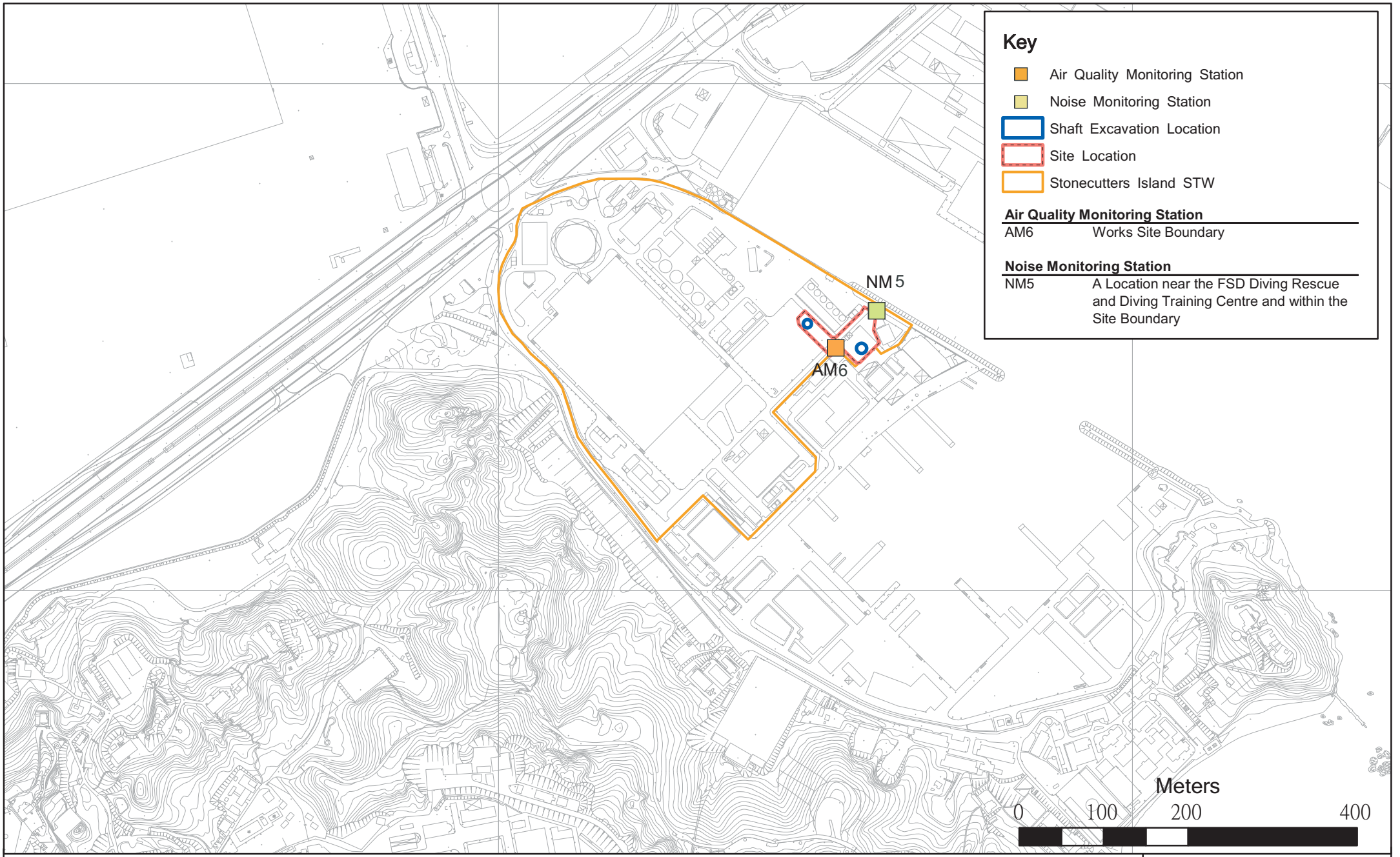
Annex G1

Contract No. DC/2007/23
Harbour Area Treatment Scheme Stage 2A
Construction of Sewage Conveyance System from North Point to Stonecutters Island
Construction Locations at Stonecutters Island STW

File: EM&A and proposed station\0104887_Stonecutters Island.mxd
Date: 29/10/2009

Environmental
Resources
Management

ERM



Annex G2

Contract No. DC/2007/23
Harbour Area Treatment Scheme Stage 2A
Construction of Sewage Conveyance System from North Point to Stonecutters Island
Impact Air Quality Monitoring Station (Stonecutters Island STW)

File: EM&A and proposed station\0104887_Stonecutters Island.mxd
Date: 29/10/2009

Environmental Resources Management

ERM

Annex G3 Monitoring Schedule of the Reporting Month and Next Month

DC/2007/23
Harbour Area Treatment Scheme Stage 2A
Construction of Sewage Conveyance System from North Point to Stonecutters Island
Impact Construction Air Quality Monitoring Schedule

AM6 - Works Site Boundary
Monitoring Month : January 2010

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1-Jan	2-Jan
					new year holiday	
3-Jan	4-Jan	5-Jan	6-Jan	7-Jan	8-Jan	9-Jan
	1-hr and 24-hr Monitoring				1-hr and 24-hr Monitoring	
10-Jan	11-Jan	12-Jan	13-Jan	14-Jan	15-Jan	16-Jan
				1-hr and 24-hr Monitoring		
17-Jan	18-Jan	19-Jan	20-Jan	21-Jan	22-Jan	23-Jan
			1-hr and 24-hr Monitoring			
24-Jan	25-Jan	26-Jan	27-Jan	28-Jan	29-Jan	30-Jan
		1-hr and 24-hr Monitoring				
31-Jan						

Annex G3 Monitoring Schedule of the Reporting Month and Next Month

DC/2007/23
Harbour Area Treatment Scheme Stage 2A
Construction of Sewage Conveyance System from North Point to Stonecutters Island
Impact Construction Air Quality Monitoring Schedule

AM6 - Works Site Boundary
Monitoring Month : February 2009

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1-Feb	2-Feb	3-Feb	4-Feb	5-Feb	6-Feb
	1-hr and 24-hr Monitoring				1-hr and 24-hr Monitoring	
7-Feb	8-Feb	9-Feb	10-Feb	11-Feb	12-Feb	13-Feb
				1-hr and 24-hr Monitoring		The day preceding Lunar New Year's Day
14-Feb	15-Feb	16-Feb	17-Feb	18-Feb	19-Feb	20-Feb
The first day of the Lunar New Year	The second day of the Lunar New Year	The third day of the Lunar New Year	1-hr and 24-hr Monitoring			
21-Feb	22-Feb	23-Feb	24-Feb	25-Feb	26-Feb	27-Feb
		1-hr and 24-hr Monitoring				
28-Feb						

Annex G3 Monitoring Schedule of the Reporting Month and Next Month

DC/2007/23
Harbour Area Treatment Scheme Stage 2A
Construction of Sewage Conveyance System from North Point to Stonecutters Island
Impact Construction Noise Monitoring Schedule

NM5 - A Location near the FSD Diving Rescue and Diving Training Centre near the Site Boundary
Monitoring Month : January 2010

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1-Jan	2-Jan
					New Year Day	
3-Jan	4-Jan	5-Jan	6-Jan	7-Jan	8-Jan	9-Jan
Noise Monitoring (during daytime of sundays/ public holidays)	Noise Monitoring					
10-Jan	11-Jan	12-Jan	13-Jan	14-Jan	15-Jan	16-Jan
Noise Monitoring (during daytime of sundays/ public holidays)				Noise Monitoring		
17-Jan	18-Jan	19-Jan	20-Jan	21-Jan	22-Jan	23-Jan
Noise Monitoring (during daytime of sundays/ public holidays)			Noise Monitoring			
24-Jan	25-Jan	26-Jan	27-Jan	28-Jan	29-Jan	30-Jan
Noise Monitoring (during daytime of sundays/ public holidays)		Noise Monitoring				
31-Jan						
Noise Monitoring (during daytime of sundays/ public holidays)						

Annex G3 Monitoring Schedule of the Reporting Month and Next Month

DC/2007/23
Harbour Area Treatment Scheme Stage 2A
Construction of Sewage Conveyance System from North Point to Stonecutters Island
Impact Construction Noise Monitoring Schedule

NM5 - A Location near the FSD Diving Rescue and Diving Training Centre near the Site Boundary
Monitoring Month : February 2009

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1-Feb	2-Feb	3-Feb	4-Feb	5-Feb	6-Feb
	Noise Monitoring					
7-Feb	8-Feb	9-Feb	10-Feb	11-Feb	12-Feb	13-Feb
Noise Monitoring (during daytime of sundays/ public holidays)				Noise Monitoring		Noise Monitoring The day preceding Lunar New Year's Day
14-Feb	15-Feb	16-Feb	17-Feb	18-Feb	19-Feb	20-Feb
The first day of the Lunar New Year	The second day of the Lunar New Year	The third day of the Lunar New Year	Noise Monitoring			
21-Feb	22-Feb	23-Feb	24-Feb	25-Feb	26-Feb	27-Feb
Noise Monitoring (during daytime of sundays/ public holidays)		Noise Monitoring				
28-Feb						
Noise Monitoring (during daytime of sundays/ public holidays)						

TSP Monitoring Equipment

Monitoring Station ID	Location	Monitoring Equipment		Last Calibration Date	Next Calibration Date
24-hr and 1-hr TSP		**HVS**	**Calibrator**		
AM6	Works Site Boundary	GMW GS-2310 (S/N 1254)	CM-AIR-43 (S/N 9833620)	25 January 2010	25 March 2010

High-Volume TSP Sampler
5-Point Calibration Record

Location	:	AM6
Calibrated by	:	P.F.Yeung
Date	:	25/01/2010

Sampler

Model	:	GMWS-2310 ACCU-VOL
Serial Number	:	S/N 1254

Calibration Orfice and Standard Calibration Relationship

Serial Number	:	9833620
Service Date	:	18 May 2009
Slope (m)	:	1.97702
Intercept (b)	:	-0.00070
Correlation Coefficient(r)	:	0.99992

Standard Conditjon

Pstd (hpa)	:	1013
Tstd (K)	:	298.18

Calibration Condition

Pa (hpa)	:	1018
Ta(K)	:	291

Resistance Plate		dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC	Y
1	18 holes	9.5	3.127	1.582	62	62.9
2	13 holes	7.4	2.760	1.396	56	56.8
3	10 holes	5.4	2.357	1.193	48	48.7
4	7 holes	3.4	1.871	0.947	40	40.6
5	5 holes	2.0	0.726	0.726	32	32.5

Sampler Calibration Relationship

Slope(m):35.660 Intercept(b): 6.614 Correlation Coefficient(r): 0.9996

Checked by: Magnum Fan Date: 26/01/2010

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Construction Phase			
Air Quality	The Air Pollution Control (Construction Dust) Regulation shall be implemented and good site practices shall be incorporated in the contract clauses to minimize construction dust impact. Control measures relevant to this Project are listed below: • skip hoist for material transport should be totally enclosed by impervious sheeting; • every vehicle should be washed to remove any dusty materials from its body and wheels before leaving a construction site; • the area where vehicle washing takes place and the section of the road between the washing facilities and the exit point should be paved with concrete, bituminous materials or hardcores; • where a site boundary adjoins a road, streets or other accessible to the public, hoarding of not less than 2.4 m high from ground level should be provided along the entire length except for a site entrance or exit; • every stock of more than 20 bags of cement should be covered entirely by impervious sheeting placed in an area sheltered on the top and the 3 sides; • regular watering, with complete coverage, to reduce dust emission from exposed site surfaces and unpaved roads, particularly during dry weather; • site enclosure and covering of any aggregate or dusty material storage piles to reduce emissions. Where this is not practicable owing to frequent usage, watering should be applied to aggregate fines; • open stock piles should be avoided or covered and prevent placing dusty material storage piles near ASRs if possible; • tarpaulin covering of all dusty vehicle loads transported to, from and between site locations; and • instigation of an environmental monitoring auditing program to monitor the construction process in order to enforce controls and modify method of work if dusty conditions arise.	All work sites / during construction	Δ

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Air Quality	The following watering measures for specific site would be required to control the fugitive dust impacts: • the barging points should be continuous watering throughout the whole unloading process; and • watering 8 times per day within worksites at the SCS works area at SCISTW and the Disinfection Facilities of SCISTW.	All work sites / during construction	Δ
Operational Phase			
Air Quality	Good housekeeping for SCISTW and PTWs listed below should be followed to ameliorate any odour impact from the plant and these standard practices should be included in the plant operator manual. • Screens should be cleaned regularly to remove any accumulated organic debris • Grit and screening transfer systems should be flushed regularly with water to remove organic debris and grit • Grit and screened materials should be transferred to closed containers to minimize odour escape • Scum and grease collection wells and troughs should be emptied and flushed regularly to prevent putrefaction of accumulated organics • Skim and remove floating solids and grease from primary clarifiers regularly • Frequent sludge withdrawal from tanks is necessary to prevent the production of gases • Sludge cake should be transferred to closed containers • Sludge containers should be flushed with water regularly	All work sites / during construction	NA. Measures not required until commencement of operational phase
Air Quality	To avoid excessive extraction of the foul air from the drop shafts of the sedimentation tanks and also from the effluent flume structure of SCISTW to deodorization system, the extraction vent(s) of the deodorization system should be located away from the top openings of the drop shafts.	SCISTW /during operational phase	NA. Measures not required until commencement of operational phase
Air Quality	Commissioning tests for all deodorization system should be included in the Design and Construction Contract Document.	All PTW and SCISTW/ during operational phase	
Construction Phase			

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Noise	Use of quiet PME, movable barriers and acoustic mats	All work sites / during construction	√
Noise	Good Site Practice: • only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction program; • silencers or mufflers on construction equipment should be utilized and should be properly maintained during the construction program; • 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 utilised, wherever practicable, in screening noise from on-site construction activities; Environmental audit shall be carried out to ensure that appropriate noise control measures would be properly implemented.	All work sites / during construction	√
Construction Phase			
Water Quality	Construction Site Runoff and General Construction Activities The mitigation measures as outlined in the ProPECC PN 1/94 Construction Site Drainage should be adopted where applicable.	All work sites / during construction	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Water Quality	Effluent Discharge There is a need to apply to EPD for a discharge licence for discharge of effluent from the construction site under the WPCO. The discharge quality must meet the requirements specified in the discharge licence. If monitoring of the treated effluent quality from the works areas is required during the construction phase of the Project, the monitoring should be carried out in accordance with the WPCO license which is under the ambit of regional office (RO) of EPD. Minimum distances of 100 m should be maintained between the discharge points of construction site effluent and the existing saltwater intakes.	All work sites / during construction	√
Water Quality	Accidental Spillage of Chemicals Contractor must register as a chemical waste producer if chemical wastes would be produced from the construction activities. The Waste Disposal Ordinance (Cap 354) and its subsidiary regulations in particular the Waste Disposal (Chemical Waste) (General) Regulation should be observed and complied with for control of chemical wastes.	All work sites / during construction	Δ
Water Quality	Any service shop and maintenance facilities should be located on hard standings within a bunded area, and sumps and oil interceptors should be provided. Maintenance of vehicles and equipment involving activities with potential for leakage and spillage should only be undertaken within the areas appropriately equipped to control these discharges.	All work sites / during construction	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Water Quality	Disposal of chemical wastes should be carried out in compliance with the Waste Disposal Ordinance. The Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes published under the Waste Disposal Ordinance details the requirements to deal with chemical wastes. General requirements are given as follows: • Suitable containers should be used to hold the chemical wastes to avoid leakage or spillage during storage, handling and transport. • Chemical waste containers should be suitably labelled, to notify and warn the personnel who are handling the wastes, to avoid accidents. • Storage area should be selected at a safe location on site and adequate space should be allocated to the storage area.	All work sites / during construction	Δ

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Water Quality	Construction Works in Close Proximity of Storm Drains or Seafront To minimize the potential water quality impacts from the construction works located at or near any watercourse, the practices outlined below should be adopted where applicable. • The use of less or smaller construction plants may be specified to reduce the disturbance to the storm water courses or marine environment. • Temporary storage of materials (e.g. equipment, filling materials, chemicals and fuel) and temporary stockpile of construction materials should be located well away from any water courses during carrying out of the construction works. • Stockpiling of construction materials and dusty materials should be covered and located away from any water courses. • Construction debris and spoil should be covered up and/or disposed of as soon as possible to avoid being washed into the nearby water receivers. • Construction activities, which generate large amount of wastewater, should be carried out in a distance away from the waterfront, where practicable. • Proper shoring may need to be erected in order to prevent soil/mud from slipping into the storm culvert or sea	All work sites / during construction	Δ

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Water Quality	Temporary Sewage Bypass It is recommended that the temporary sewage bypass required for (i) the modification to the existing pumping station at SCISTW and (ii) the interconnection between the existing main pumping station and the new pumping station on Stonecutters Island, if needed, should be scheduled at the same time as far as practicable in order to minimise the temporary discharge duration. It is also recommended that all the modification and interconnection to the existing facilities (including the modification to the existing NWKPS) should be programmed to avoid temporary sewage bypass in wet or bathing season (March to October) to minimize the potential impacts. Relevant government departments including EPD and LCSD should be informed of the planned sewage bypass prior to any discharge. During the sewage bypass period, water quality monitoring should be carried out at the water sensitive receivers to quantify the water quality impacts and to determine when the baseline water quality conditions are restored. Also, a framework of the response procedures has been formulated to minimize the impact of temporary discharges. Details are provided in the standalone EM&A Manual.	SCISTW/ construction period	√
Operational Phase			
Water Quality	Dual power supply, standby facilities for the main treatment units and standby equipment parts / accessories should be provided as far as possible at the SCISTW to minimize the chance of emergency discharge.	SCISTW and all the Stage 2 PTWs / Operation Stage	NA. Measures not required until commencement of operational phase
Water Quality	The response procedure and monitoring requirements for emergency discharge as stated in EM&A Manual should be followed.	SCISTW / Operation Stage	NA. Measures not required until commencement of operational phase

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Water Quality	In case of total power outage of the dechlorination plant, the uninterruptible power supply (UPS) system to be provided would switch the power supply of the sodium bisulphite dosing pump to a backup battery almost instantaneously, allowing continuous dosage of sodium bisulphite for at least half an hour so that sufficient time can be provided for shutting down the chlorination plant to avoid the possibility of discharge of chlorinated effluent.	SCISTW / Operation Stage	NA. Measures not required until commencement of operational phase
Water Quality	The model predicted that if Stage 2B is not implemented for HATS in 2021 as scheduled, the nutrient contents (both P and N) in the marine water would ultimately increase to exceed the baseline Stage 1 level when the HATS flow is reaching its design capacity of 2.45M m3/day. It is recommended that the future review study for Stage 2B should review the validity of the model predictions provided in this EIA and confirm the need of enhanced nutrient removal for HATS after 2021.	SCISTW / Operation Stage	NA. Measures not required until commencement of operational phase
Water Quality	It should be noted that the mixing zone for TIN predicted for Stage 2B was large with an area of about 30 km2 and the area of exceedance would encroach on the nearby water sensitive receivers (e.g. Ma Wan Fish Culture Zone). This is due to the elevated oxidized nitrogen assumed for the proposed nitrification process at Stage 2B as well as the increased HATS effluent flow assumed for Stage 2B. It is recommended that these water quality issues should be further investigated / assessed under the future EIA for Stage 2B. Further mitigation measures / alternative treatment designs should also be considered under the future EIA for Stage 2B to mitigate / minimize the potential TIN exceedances.	SCISTW / Operation Stage	NA. Measures not required until commencement of operational phase
Construction Phase			

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Waste	Reusable steel or concrete panel shutters, fencing and hoarding and signboard should be used as a preferred alternative to items made of wood, to minimise wastage of wood. Attention should be paid to WBTC No. 19/2001 - Metallic Site Hoardings and Signboards to reduce the amount of timber used on construction sites. Metallic alternatives to timber are readily available and should be used rather than new timber. Precast concrete units should be adopted wherever feasible to minimize the use of timber formwork.	All work sites / during the construction period	√
Waste	All waste materials should be segregated into categories covering: • excavated materials suitable for reuse on-site; • excavated materials suitable for public filling facilities; • remaining C&D waste for landfill; • chemical waste; and • general refuse for landfill.	All work sites / during the construction period	√
Waste	Recommendations to achieve waste reduction include: • Sort C&D waste from demolition of existing facilities to recover recyclable portions such as metals; • 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, PET bottles and paper by providing separate labelled bins to enable these wastes to be segregated from other general refuse generated by the work force; • Any unused chemicals or those with remaining functional capacity shall be recycled; and • Proper storage and site practices to minimise the potential for damage or contamination of construction materials.	All work sites / during the construction period	Δ

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Waste	Recommendations for good site practices during construction activities include:- • Nomination of an approved person, such as a site manager, to be responsible for good site practices, arrangements for collection and effective disposal to an appropriate facility, of all wastes generated at the site • Training of site personnel in proper waste management and chemical waste handling procedures • Develop and provide toolbox talk for on-site sorting of C&D materials to enhance worker's awareness in handling, sorting, reuse and recycling of C&D materials. • Provision of sufficient waste disposal points and regular collection of waste • Regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors	All work sites / during the construction period	√
Waste	Bentonite slurries used in diaphragm wall construction should be reconditioned and reused wherever practicable. The disposal of residual used bentonite slurry should follow the good practice guidelines stated in ProPECC PN 1/94 "Construction Site Drainage".	All work sites / during the construction period	√
Waste	Adequate number of portable toilets at temporary works areas or the PTWs to ensure that sewage from site staff would be properly collected.	All work sites / during the construction period	√
Waste	General refuse should be stored in enclosed bins, skips or compaction units separating from C&D material and disposed of at designated landfill.	All work sites / during the construction period	√
Waste	The recyclable component of the municipal waste generated by the workforce, such as aluminium cans, paper and cleansed plastic containers should be separated from other waste. Provision and collection of recycling bins for different types of recyclable waste should be set up by the Contractor. The Contractor should also be responsible for arranging recycling companies to collect these materials.	All work sites / during the construction period	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Waste	If chemical wastes are produced at the construction site, the Contractor would be required to register with the EPD as a chemical waste producer and to follow the guidelines stated in the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes. Good quality containers compatible with the chemical wastes should be used, and incompatible chemicals should be stored separately. Appropriate labels should be securely attached on each chemical waste container indicating the corresponding chemical characteristics of the chemical waste, such as explosive, flammable, oxidizing, irritant, toxic, harmful, corrosive, etc. The Contractor shall use a licensed collector to transport and dispose of the chemical wastes, to either the approved Chemical Waste Treatment Centre, or another licensed facility, in accordance with the Waste Disposal (Chemical Waste) (General) Regulation.	All work sites / during the construction period	√
Waste	Prior to excavation of the marine deposit layer, the deposit should be tested in accordance with the ETWB TC(W) No. 34/2002 and the results should be presented in a Preliminary Sediment Quality Report. The marine deposit should be disposed of at the disposal site designated by the Marine Fill Committee (MFC) or Director of Environmental Protection (DEP) depending on the test results.	All work sites / during the construction period	Δ
Operation Phase			
Waste	The sludge tanks should be air-tighten. Rotating brushes or other alternative devises should be installed at the upper frame of the sludge tank washing facilities to provide better cleaning of the surface around the top loading opening of the sludge tanks. Prior to making such provision, the top covers of the sludge transfer tanks should be water cleaned manually after unloading.	SCISTW / Operation Stage	NA. Measures not required until commencement of operational phase

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Waste	Since the air tightness of tankers highly relies on the effectiveness of rubber seals at the loading openings and unloading doors, odour leakage from tankers are commonly resulted from the aging rubber seals. It is recommended to develop a preventive maintenance programme for rubber seals of loading openings and unloading doors of sludge transfer tanks to ensure the tightness of covers and doors. Rubber seals should be regularly replaced within its design life as specified by suppliers.	SCISTW / Operation Stage	NA. Measures not required until commencement of operational phase
Construction Phase			
Landscape & Visual	• Topsoil, where identified, should be stripped and stored for re-use in the construction of the soft landscape works, where practical. • Existing trees to be retained on site should be carefully protected during construction. • Trees unavoidably affected by the works should be transplanted where practical. • Compensatory tree planting should be provided to compensate for felled trees. • Control of night-time lighting. • Erection of decorative screen hoarding compatible with the surrounding setting.	All the works areas, PTWs and SCISTW/ during the construction period	Δ
Operational Phase	•		
Landscape & Visual	• Aesthetic design of the façade of PTW and associated structures to harmonize with the surrounding settings. • Shrub and Climbing Plants to soften proposed structures / Roof Greening. • Buffer Tree and Shrub Planting to screen proposed associated structures. • Reinstated of disturbed area	All the works areas, PTWs and SCISTW/ during the construction period	NA. Measures not required until commencement of operational phase
Construction Phase	•		

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Cultural Heritage	The construction vibration control limit (ppv of 25mm/s) shall be strictly followed.	Identified historical buildings/structures as mentioned in Tables 15.10 and 15.11. During blasting for tunnel, shafts, effluent conveyance system and disinfection facilities in the vicinity of the buildings/ structures	NA. Vibration monitoring has not been launched during the reporting period.

Remark:

√ Compliance of Mitigation Measures

<> Compliance of Mitigation but need improvement

x Non-compliance of Mitigation Measures

Δ Deficiency of Mitigation Measures but rectified by Gammon Construction Limited

NA Not Applicable

Annex G6 24-hour and 1-hour TSP Monitoring Results

24-hour TSP Monitoring Results

Station AM6

Start		Finish		Weather	Filter Weight (g)		Elapsed Time Reading		Sampling Time (hrs)	Flow Rate (m^3/min)			TSP Conc. ($\mu g/m^3$)	Action Level ($\mu g/m^3$)	Limit Level ($\mu g/m^3$)	Observations / Remarks	Sampler ID	Filter ID
Date	Time	Date	Time		Initial	Final	Initial	Final		Initial	Final	Average						
4-Jan-10	12:06	5-Jan-10	12:06	Sunny	2.8334	2.9921	5682.03	5706.03	24.00	1.23	1.23	1.2300	90	196	260	Construction work in progress.	1254	5214
8-Jan-10	12:06	9-Jan-10	12:06	Fine	2.8986	3.0679	5709.03	5733.03	24.00	1.2300	1.2300	1.2300	96	196	260	Construction work in progress.	1254	5218
14-Jan-10	11:36	15-Jan-10	11:36	Sunny	2.8629	2.9992	5736.03	5760.03	24.00	1.2300	1.2300	1.2300	77	196	260	Construction work in progress.	1254	5222
20-Jan-10	14:12	21-Jan-10	14:12	Fine	2.8621	3.0321	5763.03	5787.03	24.00	1.2300	1.2300	1.2300	96	196	260	Construction work in progress.	1254	5226
26-Jan-10	17:06	27-Jan-10	17:06	Cloudy	2.8324	3.0101	5790.03	5814.03	24.00	1.1000	1.1000	1.1000	112	196	260	Construction work in progress.	1254	5544
												Min.	77					
												Max.	112					
												Average	94					

Annex G6 24-hour and 1-hour TSP Monitoring Results

1-hour TSP Monitoring Results

Station AM6

Date	Start Time	Finish Time	Weather	TSP Concentration ($\mu g/m^3$)	Action Level ($\mu g/m^3$)	Limit Level ($\mu g/m^3$)	Site Conditions / Observations / Remarks	Temperature (℃)	Wind Speed * (m/s)	Sampler ID	Filter ID
4-Jan-10	9:00	10:00	Sunny	248	346	500	Construction work in progress.	20		1254	5211
4-Jan-10	10:02	11:02	Sunny	280	346	500	Construction work in progress.	20		1254	5212
4-Jan-10	11:04	12:04	Sunny	224	346	500	Construction work in progress.	20		1254	5213
8-Jan-10	9:00	10:00	Fine	202	346	500	Construction work in progress.	22		1254	5215
8-Jan-10	10:02	11:02	Fine	220	346	500	Construction work in progress.	22		1254	5216
8-Jan-10	11:04	12:04	Fine	214	346	500	Construction work in progress.	22		1254	5217
14-Jan-10	8:30	9:30	Sunny	144	346	500	Construction work in progress.	17		1254	5219
14-Jan-10	9:32	10:32	Sunny	169	346	500	Construction work in progress.	17		1254	5220
14-Jan-10	10:34	11:34	Sunny	142	346	500	Construction work in progress.	17		1254	5221
20-Jan-10	10:00	11:00	Fine	171	346	500	Construction work in progress.	20		1254	5223
20-Jan-10	11:02	12:02	Fine	173	346	500	Construction work in progress.	20		1254	5224
20-Jan-10	13:10	14:10	Fine	201	346	500	Construction work in progress.	20		1254	5225
26-Jan-10	14:00	15:00	Cloudy	182	346	500	Construction work in progress.	17		1254	5227
26-Jan-10	15:02	16:02	Cloudy	214	346	500	Construction work in progress.	17		1254	5228
26-Jan-10	16:04	17:04	Cloudy	245	346	500	Construction work in progress.	17		1254	5229
			Min.	**142**							
			Max.	**280**							
			Average	**202**							

* Wind Speed data is presented in the following table

Meteorological Data Extracted from the Hong Kong Observatory

Date	Weather	King's Park Station				
		Average Air Temperature (°C)	Average Relative Humiditiy (%)	Total Rainfall (mm)	Average Wind Speed (km/h)	Wind Direction
02/01/2010	Rainy	17.4	88	5.2	0-18	SE
04/01/2010	Sunny	17.9	81	-	1-17	SE
05/01/2010	Rainy	17.3	84	0.8	0-30	SE
08/01/2010	Rainy	13.7	80	0.9	0-10	NE
09/01/2010	Sunny	15.1	78	-	0-20	E
14/01/2010	Sunny	14.4	65	-	0-26	E
15/01/2010	Sunny	16.6	65	-	1-26	SE
16/01/2010	Sunny	18.1	67	-	0-18	SE
20/01/2010	Sunny	21.4	83	-	0-15	SE
21/01/2010	Sunny	22.9	87	-	0-12	SE
22/01/2010	Sunny	18.4	86	-	1-23	SE
26/01/2010	Sunny	16.0	78	-	0-20	E
27/01/2010	Sunny	17.0	85	-	7-18	SE
28/01/2010	Sunny	19.3	90	-	0-14	E, W

Date	Weather	Kai Tak Station				
		Average Air Temperature (°C) *	Average Relative Humiditiy (%) *	Total Rainfall (mm) *	Average Wind Speed (km/h)	Wind Direction
02/01/2010	Rainy	17.4	88	5.2	1-20	E
04/01/2010	Sunny	17.9	81	-	7-20	SE
05/01/2010	Rainy	17.3	84	0.8	0-30	E
08/01/2010	Rainy	13.7	80	0.9	0-18	NW, NE
09/01/2010	Sunny	15.1	78	-	3-27	E
14/01/2010	Sunny	14.4	65	-	0-32	E
15/01/2010	Sunny	16.6	65	-	2-29	E
16/01/2010	Sunny	18.1	67	-	0-27	SE
20/01/2010	Sunny	21.4	83	-	1-22	E
21/01/2010	Sunny	22.9	87	-	2-28	SE
22/01/2010	Sunny	18.4	86	-	9-31	E
26/01/2010	Sunny	16.0	78	-	3-24	NE, E
27/01/2010	Sunny	17.0	85	-	6-26	E
28/01/2010	Sunny	19.3	90	-	0-21	SE

* king's park data
\- data were not available
\# less than 24 hourly observations per day

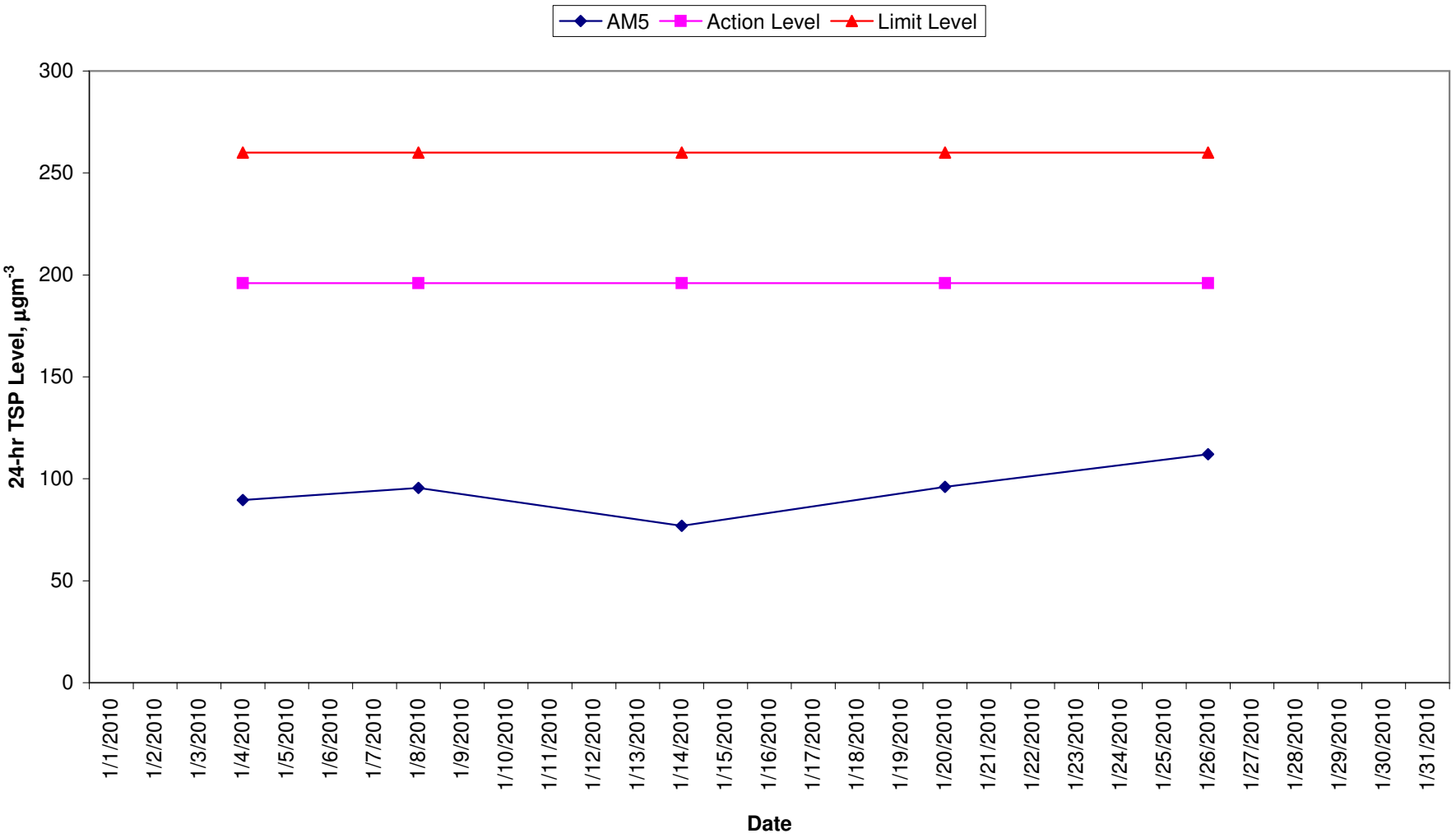
Meteorological Data Extracted from the Hong Kong Observatory

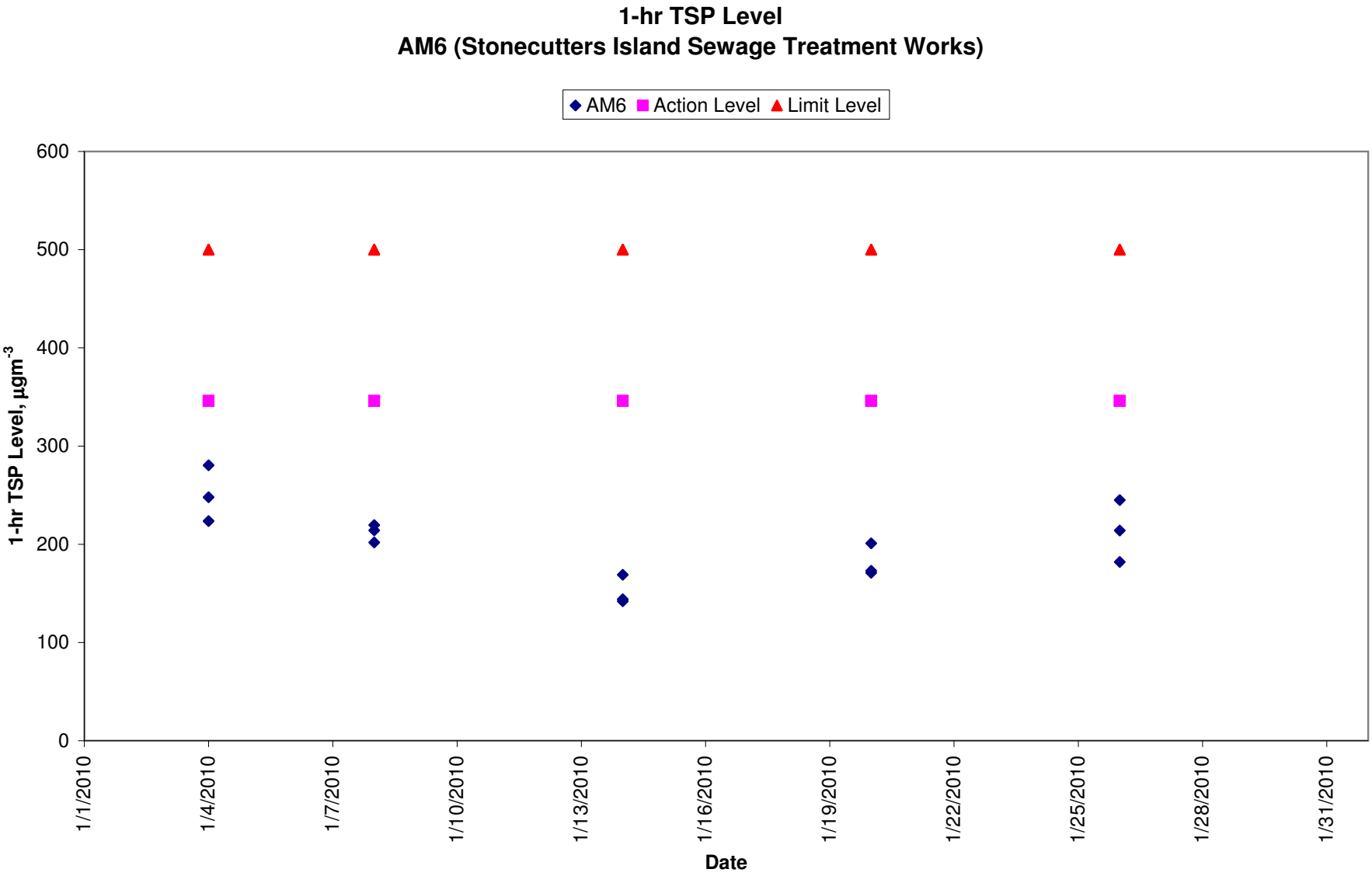
Date	Weather	Tsing Yi Station				
		Average Air Temperature (°C)	Average Relative Humiditiy (%) *	Total Rainfall (mm) *	Average Wind Speed (km/h)	Wind Direction
02/01/2010	Rainy	17.4	88	5.2	2-15	SE, NW
04/01/2010	Sunny	17.9	81	-	1-16	SE
05/01/2010	Rainy	17.3	84	0.8	1-19	E, NW
08/01/2010	Rainy	13.7	80	0.9	0-15	NW
09/01/2010	Sunny	15.1	78	-	0.5-18	SE
14/01/2010	Sunny	14.4	65	-	2-22	E
15/01/2010	Sunny	16.6	65	-	2-22	E
16/01/2010	Sunny	18.1	67	-	0-21	E
20/01/2010	Sunny	21.4	83	-	0-16	E
21/01/2010	Sunny	22.9	87	-	0-16	E
22/01/2010	Sunny	18.4	86	-	6-24	SE
26/01/2010	Sunny	16.0	78	-	0-16	E
27/01/2010	Sunny	17.0	85	-	3-19	SE
28/01/2010	Sunny	19.3	90	-	2-10	NW

Date	Weather	Green Island Station				
		Average Air Temperature (°C) *	Average Relative Humiditiy (%) *	Total Rainfall (mm) *	Average Wind Speed (km/h)	Wind Direction
02/01/2010	Rainy	17.4	88	5.2	5-43	NE
04/01/2010	Sunny	17.9	81	-	3-39	NE
05/01/2010	Rainy	17.3	84	0.8	2-58	NE
08/01/2010	Rainy	13.7	80	0.9	10-40	NW
09/01/2010	Sunny	15.1	78	-	10-51	NE
14/01/2010	Sunny	14.4	65	-	20-36	NE
15/01/2010	Sunny	16.6	65	-	40-55	NE
16/01/2010	Sunny	18.1	67	-	7-50	NE
20/01/2010	Sunny	21.4	83	-	14-33	NE
21/01/2010	Sunny	22.9	87	-	0-30	NE
22/01/2010	Sunny	18.4	86	-	15-55	NE
26/01/2010	Sunny	16.0	78	-	14-52	NE
27/01/2010	Sunny	17.0	85	-	31-49	NE
28/01/2010	Sunny	19.3	90	-	4-27	NE

* king's park data
\- data were not available
\# less than 24 hourly observations per day

24-hr TSP Level
AM6 (Stonecutters Island Sewage Treatment Works




1-hr TSP Level
AM6 (Stonecutters Island Sewage Treatment Works)
AM6
Action Level
Limit Level
600
500
400
300
200
100
0
1-hr TSP Level, µgm-3
1/1/2010
1/4/2010
1/7/2010
1/10/2010
1/13/2010
1/16/2010
1/19/2010
1/22/2010
1/25/2010
1/28/2010
1/31/2010
Date

Annex G7 Noise Monitoring Results

Daytime Noise Monitoring Results

Station NM5

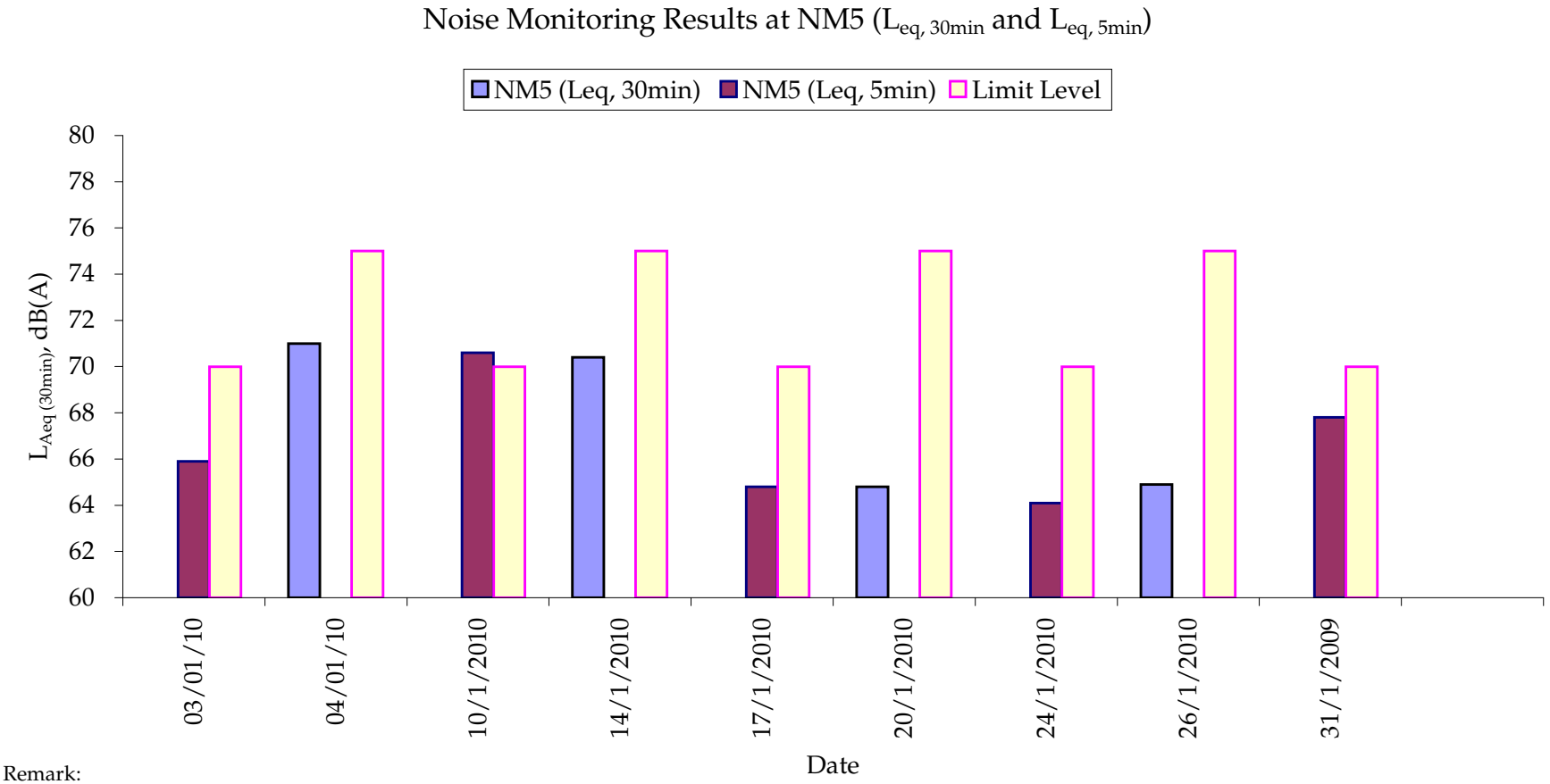
Date	Start Time	End Time	Weather	Noise level (dB(A)), 30 min			Major Construction Noise Source(s)	Other Noise Source(s)	Remarks	Temp. (°C)	Wind Speed	Noise Meter Model / ID	Calibrator Model / ID
				Leq	L10	L90							
4-Jan-10	11:10	11:40	Sunny	71.0	71.4	70.6	Excavation works, Bentonite filltering work and generator	Aricraft noise and traffic noise	-	20	0.5	RION- NA31 (S/N 00410224)	RION - NC73 (S/N 10786708)
14-Jan-10	9:00	9:30	Sunny	70.4	70.8	69.8	Excavation works, Bentonite filltering work and generator	Aricraft noise and traffic noise	-	14.5	0.3	RION- NA27 (S/N 00201194)	RION - NC73 (S/N 10786708)
20-Jan-10	13:13	13:43	Fine	64.8	65.7	64.0	Bentonite filltering work and generator	Aricraft noise and traffic noise	-	21	0.5	RION- NA27 (S/N 00201194)	RION - NC73 (S/N 10786708)
26-Jan-10	14:12	14:42	Fine	64.9	65.7	64.1	Mobile cranes movement, generator	Aircraft noise and traffic noise	-	16	0.8	RION- NA27 (S/N 00201194)	RION - NC73 (S/N 10786708)
			Min.	**64.8**									
			Max.	**71.0**									

Annex G7 Noise Monitoring Results

Restricted Hours Noise Monitoring Results

Station NM5

Date	Start Time	End Time	Weather	Noise level (dB(A)), 5 min			Major Construction Noise Source(s) Observed	Other Noise Source(s) Observed	Remarks	Temp. (°C)	Wind Speed (m/s)	Noise Meter Model / ID	Calibrator Model / ID
				Leq	L10	L90							
03-Jan-10	09:50	09:55	Fine	66.0	67.3	64.7	Bentonite filltering work and generator.	Aircraft noise and traffic noise.	-	17	0.5	RION- NA27 (S/N 00201194)	RION - NC73 (S/N 10786708)
	09:55	10:00	Fine	65.8	67.5	64.4			-				
	10:00	10:05	Fine	66.0	67.3	64.7			-				
	09:50	10:05	Fine	65.9	67.4	64.6			Average results during 15 min minitoring				
10-Jan-10	14:00	14:05	Cloudy	70.4	71.1	69.3	Bentonite filltering work.	Aircraft noise and traffic noise.	-	17	1.0	RION- NA27 (S/N 00201194)	RION - NC73 (S/N 10786708)
	14:05	14:10	Cloudy	70.5	71.4	69.6			-				
	14:10	14:15	Cloudy	70.8	71.7	69.7			-				
	14:00	14:15	Cloudy	70.6	71.4	69.5			Average results during 15 min minitoring				
17-Jan-10	10:40	10:45	Cloudy	63.7	64.5	62.5	Bentonite filltering work and generator.	Aircraft noise and traffic noise.	-	17	0.3	RION- NA27 (S/N 00201194)	RION - NC73 (S/N 10786708)
	10:45	10:50	Cloudy	63.9	65.1	63.0			-				
	10:50	10:55	Cloudy	66.4	67.5	64.2			-				
	10:40	10:55	Sunny	64.8	65.9	63.3			Average results during 15 min minitoring				
24-Jan-10	10:10	10:15	FIne	63.6	65.1	62.3	Mobile cranes movement, generator	Aircraft noise and traffic noise.	-	18	0.5	RION- NA27 (S/N 00201194)	RION - NC73 (S/N 10786708)
	10:15	10:20	Fine	63.9	65.3	62.6			-				
	10:20	10:25	Fine	64.9	66.4	63.1			-				
	10:10	10:25	Fine	64.1	65.6	62.7			Average results during 15 min minitoring				
31-Jan-10	14:10	14:15	Fine	68.0	69.7	68.0	Mobile cranes movement, generator	-	-	24	0.5	RION- NA27 (S/N 00201194)	RION - NC73 (S/N 10786708)
	14:15	14:20	Fine	68.0	67.6	66.6			-				
	14:20	14:25	Fine	67.3	68.3	66.6			-				
	14:10	14:25	Fine	67.8	68.5	67.1			Average results during 15 min minitoring				
			Min.	**63.6**									
			Max.	**70.8**									



Remark:
- 75dB(A) was adopted as the Limit Level during normal weekdays in January 2010
- 70dB(A) was dopted as the Limit Level during restricted hours in January 2010

Activity ID	Activity Description	Orig Dur	Early Start	Early Finish	% Comp
HATS Stage 2A - Contract DC/2007/23					
Stonecutters Island STW Production Shaft					
Preliminaries Works					
SCPS10070	SCPS: Construct/Install Blast Protection	2	22SEP10	24SEP10	0
SCPS10075	SCPS: Site Inspection from Mines	1	25SEP10	25SEP10	0
SCPS10080	SCPS: Issue Blasting Permit	1	27SEP10	27SEP10	0
EBS, Env. & Geotechnical Instrumentations					
Markers/UMP's/Others(Same note as Piez.)					
SCPS0391	SCPS: Install GS Markers (17 Nos.)	74	01SEP09A	01FEB10	85
SCPS0393	SCPS: JointSurvey&EstablishBaseline Readings GSM	14	02FEB10	20FEB10	0
Piezometers(NearbyPTWorPScovered inthisInstalln)					
SCPS0375	SCPS: BH907 Piezometer Baseline Establishment	26	10NOV09A	23JAN10	85
SCPS0381	SCPS: BH908 Piezometer Baseline Establishment	26	10NOV09A	27JAN10	73
SCPS0387	SCPS: BH906 Piezometer Baseline Establishment	26	15JAN10A	06FEB10	40
Electrical & Mechanical Installations					
SCPS0620	SCPS: Installation Works for 11KV Application	60	08APR10	18JUN10	0
SCPS0625	SCPS: 11 KV Connection & Power On	4	19JUN10	23JUN10	0
Marine Dumping Permit					
SCPS0370	SCPS: Request for Disposal Site&Get Permit	24	02JAN10A	05FEB10	38
Diaphragm Wall					
SCPS0279	SCPS: Excavate 3rd Panel to Formation Level	12	16JAN10A	20JAN10	92
SCPS0281	SCPS: 3rd Panel Desanding & Preparation Works	4	21JAN10	25JAN10	0
SCPS0282	SCPS: Grouting Works Phase 1	45	21JAN10	17MAR10	0
SCPS0283	SCPS: 3rd Panel Rebar Cage Installation	3	26JAN10	28JAN10	0
SCPS0285	SCPS: 3rd Panel Concreting Works	1	29JAN10	29JAN10	0
SCPS0287	SCPS: Excavate 4th Panel to Formation Level	23	30JAN10	01MAR10	0
SCPS0289	SCPS: 4th Panel Desanding & Preparation Works	9	02MAR10	11MAR10	0
SCPS0291	SCPS: 4th Panel Rebar Cage Installation	6	12MAR10	18MAR10	0
SCPS0292	SCPS: Grouting Works Phase 2	45	18MAR10	11MAY10	0
SCPS0293	SCPS: 4th Panel Concreting Works	1	19MAR10	19MAR10	0
SCPS0297	SCPS: Excavate 5th Panel to Formation Level	8	20MAR10	29MAR10	0
SCPS0299	SCPS: 5th Panel Desanding & Preparation Works	3	30MAR10	01APR10	0
SCPS0301	SCPS: 5th Panel Rebar Cage Installation	2	02APR10	03APR10	0
SCPS0303	SCPS: 5th Panel Concreting Works	1	06APR10	06APR10	0
SCPS0307	SCPS: Excavate 6th Panel to Formation Level	23	07APR10	04MAY10	0
SCPS0309	SCPS: 6th Panel Desanding & Preparation Works	9	05MAY10	14MAY10	0
SCPS0310	SCPS: Grouting Works Phase 3	50	12MAY10	10JUL10	0
SCPS0311	SCPS: 6th Panel Rebar Cage Installation	6	15MAY10	21MAY10	0
SCPS0313	SCPS: 6th Panel Concreting Works	1	22MAY10	22MAY10	0
SCPS0317	SCPS: Excavate 7th Panel to Formation Level	8	24MAY10	01JUN10	0
SCPS0319	SCPS: 7th Panel Desanding & Preparation Works	3	02JUN10	04JUN10	0
SCPS0321	SCPS: 7th Panel Rebar Cage Installation	2	05JUN10	07JUN10	0
SCPS0323	SCPS: 7th Panel Concreting Works	1	08JUN10	08JUN10	0
SCPS0327	SCPS: Excavate 8th Panel to Formation Level	8	09JUN10	18JUN10	0
SCPS0329	SCPS: 8th Panel Desanding & Preparation Works	3	19JUN10	22JUN10	0
SCPS0331	SCPS: 8th Panel Rebar Cage Installation	2	23JUN10	24JUN10	0
SCPS0333	SCPS: 8th Panel Concreting Works	1	25JUN10	25JUN10	0
SCPS0335	SCPS: Install Dewatering Wells for Pump-test	12	05JUL10	17JUL10	0
SCPS0337	SCPS: Pumping Test	6	19JUL10	24JUL10	0
SCPS0338	SCPS: Submission of Pumping Test Report	6	26JUL10	31JUL10	0
SCPS0341	SCPS: Demobilization	6	26JUL10	31JUL10	0
Shaft Excavation					
SCPS0500	SCPS: Construct Capping Beam & Shaft Collar	12	26JUL10	07AUG10	0
SCPS0510	SCPS: Initial Excavation of Shaft (7m)	4	09AUG10	12AUG10	0
SCPS0520	SCPS: Set-Up Equipment for Shaft Sink	12	13AUG10	26AUG10	0
SCPS0525	SCPS: Erect Noise Enclosure at Shaft Top	12	13AUG10	26AUG10	0
SCPS0530	SCPS: Excavate Soil & Ring Beams (50m)	22	27AUG10	21SEP10	0
SCPS0575	SCPS: Probe, Grout, D&B Rock, Muck Out (87m)	100	28SEP10	26JAN11	0
SCPS0640	SCPS: Construct Sump at Shaft Bottom	2	27JAN11	28JAN11	0
SCPS0665	SCPS: Erect Tunnel Hoist & Muck Out System	10	29JAN11	12FEB11	0
Backfill, Reinstatement & Landscaping					
SCPS0910	SCPS: Backfill Shaft (20%)	8	12SEP13	21SEP13	0
SCPS0920	SCPS: Backfill Shaft (40%)	8	23SEP13	02OCT13	0
SCPS0930	SCPS: Backfill Shaft (60%)	8	03OCT13	11OCT13	0
SCPS0940	SCPS: Backfill Shaft (80%)	8	12OCT13	22OCT13	0
SCPS0950	SCPS: Backfill Shaft (100%)	8	23OCT13	31OCT13	0
SCPS0960	SCPS: Reinstatement Around PS Area	12	01NOV13	14NOV13	0
SCPS0970	SCPS: Demobilise Clear Area	6	15NOV13	21NOV13	0
SCPS0975	SCPS: Complete All Works at SCI PS (KD-11)	0		21NOV13	0
SCPS0980	SCPS: Landscaping & Planting Works	60	22NOV13*	20JAN14	0
SCPS0990	SCPS: Period of Establishment Works	360	21JAN14	15JAN15	0
SCPS1000	SCPS: End of Establishment Period	0		15JAN15	0

Start Date	31JUL09
Finish Date	15JAN15
Data Date	20JAN10
Run Date	01FEB10 10:42

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Early Bar
Progress Bar
Critical Activity

WPU7 Sheet 1 of 1

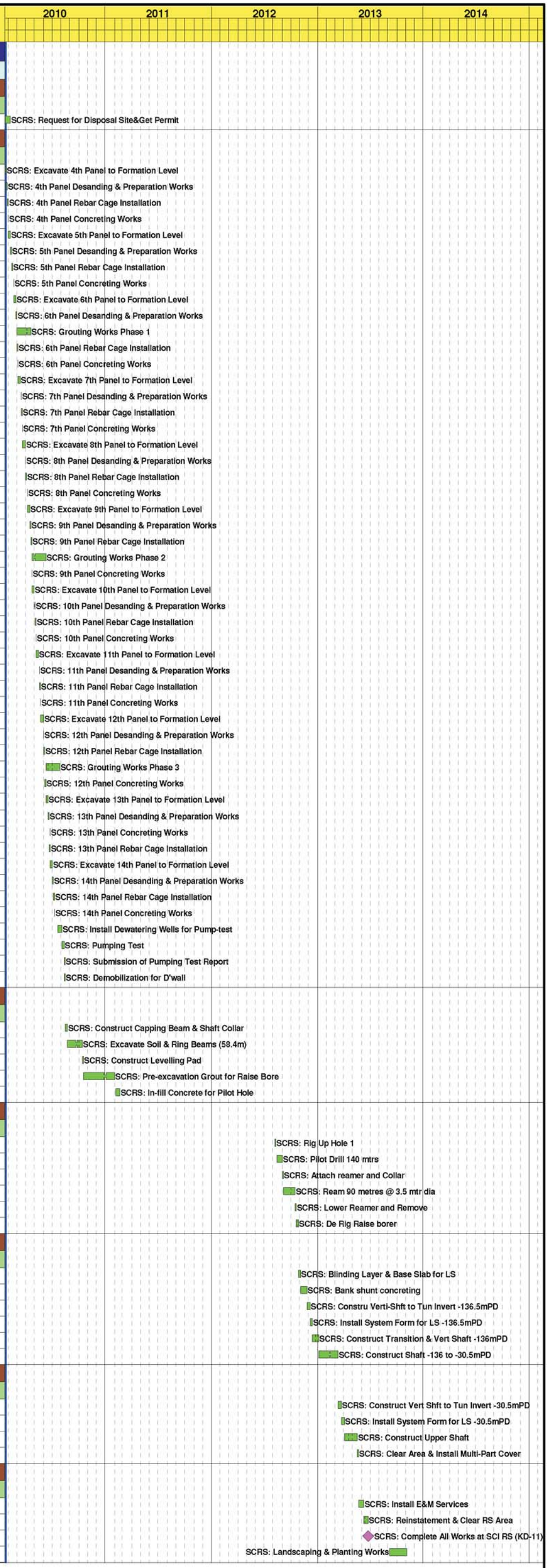
Habour Area Treatment Scheme Stage 2A
Contract No. DC/2007/23 - Construction of Sewage Conveyance from North Point to Stonecutters Island
Programme

Annex G8 Construction Programme for the Project

Gammon

Date	Revision	Checked	Approved

Activity ID	Activity Description	Orig Dur	Early Start	Early Finish	% Comp
HATS Stage 2A - Contract DC/2007/23					
Stonecutters Island STW Riser Shaft					
Marine Dumping Permit					
SCRS0370	SCRS: Request for Disposal Site&Get Permit	24	05JAN10A	06FEB10	33
Diaphragm Wall					
SCRS0287	SCRS: Excavate 4th Panel to Formation Level	7	09JAN10A	23JAN10	50
SCRS0289	SCRS: 4th Panel Desanding & Preparation Works	3	25JAN10	27JAN10	0
SCRS0291	SCRS: 4th Panel Rebar Cage Installation	2	28JAN10	29JAN10	0
SCRS0293	SCRS: 4th Panel Concreting Works	1	30JAN10	30JAN10	0
SCRS0295	SCRS: Excavate 5th Panel to Formation Level	7	01FEB10	08FEB10	0
SCRS0297	SCRS: 5th Panel Desanding & Preparation Works	3	09FEB10	11FEB10	0
SCRS0299	SCRS: 5th Panel Rebar Cage Installation	2	12FEB10	13FEB10	0
SCRS0301	SCRS: 5th Panel Concreting Works	1	18FEB10	18FEB10	0
SCRS0303	SCRS: Excavate 6th Panel to Formation Level	7	19FEB10	26FEB10	0
SCRS0305	SCRS: 6th Panel Desanding & Preparation Works	3	27FEB10	02MAR10	0
SCRS0306	SCRS: Grouting Works Phase 1	40	03MAR10	19APR10	0
SCRS0307	SCRS: 6th Panel Rebar Cage Installation	2	03MAR10	04MAR10	0
SCRS0309	SCRS: 6th Panel Concreting Works	1	05MAR10	05MAR10	0
SCRS0311	SCRS: Excavate 7th Panel to Formation Level	7	06MAR10	13MAR10	0
SCRS0313	SCRS: 7th Panel Desanding & Preparation Works	3	15MAR10	17MAR10	0
SCRS0315	SCRS: 7th Panel Rebar Cage Installation	2	18MAR10	19MAR10	0
SCRS0317	SCRS: 7th Panel Concreting Works	1	20MAR10	20MAR10	0
SCRS0319	SCRS: Excavate 8th Panel to Formation Level	7	22MAR10	29MAR10	0
SCRS0321	SCRS: 8th Panel Desanding & Preparation Works	3	30MAR10	01APR10	0
SCRS0323	SCRS: 8th Panel Rebar Cage Installation	2	02APR10	03APR10	0
SCRS0325	SCRS: 8th Panel Concreting Works	1	06APR10	06APR10	0
SCRS0327	SCRS: Excavate 9th Panel to Formation Level	7	07APR10	14APR10	0
SCRS0329	SCRS: 9th Panel Desanding & Preparation Works	3	15APR10	17APR10	0
SCRS0331	SCRS: 9th Panel Rebar Cage Installation	2	19APR10	20APR10	0
SCRS0332	SCRS: Grouting Works Phase 2	40	21APR10	07JUN10	0
SCRS0333	SCRS: 9th Panel Concreting Works	1	21APR10	21APR10	0
SCRS0335	SCRS: Excavate 10th Panel to Formation Level	7	22APR10	29APR10	0
SCRS0337	SCRS: 10th Panel Desanding & Preparation Works	3	30APR10	04MAY10	0
SCRS0339	SCRS: 10th Panel Rebar Cage Installation	2	05MAY10	06MAY10	0
SCRS0341	SCRS: 10th Panel Concreting Works	1	07MAY10	07MAY10	0
SCRS0343	SCRS: Excavate 11th Panel to Formation Level	7	08MAY10	15MAY10	0
SCRS0345	SCRS: 11th Panel Desanding & Preparation Works	3	17MAY10	19MAY10	0
SCRS0347	SCRS: 11th Panel Rebar Cage Installation	2	20MAY10	21MAY10	0
SCRS0349	SCRS: 11th Panel Concreting Works	1	22MAY10	22MAY10	0
SCRS0351	SCRS: Excavate 12th Panel to Formation Level	7	24MAY10	31MAY10	0
SCRS0353	SCRS: 12th Panel Desanding & Preparation Works	3	01JUN10	03JUN10	0
SCRS0355	SCRS: 12th Panel Rebar Cage Installation	2	04JUN10	05JUN10	0
SCRS0356	SCRS: Grouting Works Phase 3	40	08JUN10	26JUL10	0
SCRS0357	SCRS: 12th Panel Concreting Works	1	07JUN10	07JUN10	0
SCRS0359	SCRS: Excavate 13th Panel to Formation Level	7	08JUN10	15JUN10	0
SCRS0361	SCRS: 13th Panel Desanding & Preparation Works	3	17JUN10	19JUN10	0
SCRS0365	SCRS: 13th Panel Concreting Works	1	23JUN10	23JUN10	0
SCRS0366	SCRS: 13th Panel Rebar Cage Installation	2	21JUN10	22JUN10	0
SCRS0367	SCRS: Excavate 14th Panel to Formation Level	7	24JUN10	02JUL10	0
SCRS0369	SCRS: 14th Panel Desanding & Preparation Works	3	03JUL10	06JUL10	0
SCRS0371	SCRS: 14th Panel Rebar Cage Installation	2	07JUL10	08JUL10	0
SCRS0373	SCRS: 14th Panel Concreting Works	1	09JUL10	09JUL10	0
SCRS0380	SCRS: Install Dewatering Wells for Pump-test	12	20JUL10	02AUG10	0
SCRS0390	SCRS: Pumping Test	6	03AUG10	09AUG10	0
SCRS0392	SCRS: Submission of Pumping Test Report	6	10AUG10	16AUG10	0
SCRS0394	SCRS: Demobilization for D'wall	6	10AUG10	16AUG10	0
Shaft Excavation					
SCRS0400	SCRS: Construct Capping Beam & Shaft Collar	6	17AUG10	23AUG10	0
SCRS0410	SCRS: Excavate Soil & Ring Beams (58.4m)	42	24AUG10	13OCT10	0
SCRS0420	SCRS: Construct Levelling Pad	3	14OCT10	18OCT10	0
SCRS0430	SCRS: Pre-excavation Grout for Raise Bore	90	19OCT10	02FEB11	0
SCRS0440	SCRS: In-fill Concrete for Pilot Hole	12	07FEB11	19FEB11	0
Raised Boring					
SCRS0700	SCRS: Rig Up Hole 1	5	07AUG12	11AUG12	0
SCRS0710	SCRS: Pilot Drill 140 mtrs	16	13AUG12	30AUG12	0
SCRS0720	SCRS: Attach reamer and Collar	3	31AUG12	03SEP12	0
SCRS0730	SCRS: Ream 90 metres @ 3.5 mtr dia	35	04SEP12	16OCT12	0
SCRS0740	SCRS: Lower Reamer and Remove	3	17OCT12	19OCT12	0
SCRS0750	SCRS: De Rig Raise borer	5	20OCT12	26OCT12	0
Lower Shaft Construction					
SCRS0835	SCRS: Blinding Layer & Base Slab for LS	6	27OCT12	02NOV12	0
SCRS0840	SCRS: Bank shunt concreting	18	03NOV12	23NOV12	0
SCRS0875	SCRS: Constru Verti-Shft to Tun Invert -136.5mPD	9	24NOV12	04DEC12	0
SCRS0885	SCRS: Install System Form for LS -136.5mPD	9	05DEC12	14DEC12	0
SCRS0935	SCRS: Construct Transition & Vert Shaft -136mPD	15	15DEC12	03JAN13	0
SCRS0940	SCRS: Construct Shaft -136 to -30.5mPD	55	04JAN13	12MAR13	0
Upper Shaft Construction					
SCRS0975	SCRS: Construct Vert Shft to Tun Invert -30.5mPD	9	13MAR13	22MAR13	0
SCRS0995	SCRS: Install System Form for LS -30.5mPD	9	23MAR13	02APR13	0
SCRS1045	SCRS: Construct Upper Shaft	36	03APR13	16MAY13	0
SCRS1065	SCRS: Clear Area & Install Multi-Part Cover	3	17MAY13	20MAY13	0
Miscellaneous Works					
SCRS2010	SCRS: Install E&M Services	18	21MAY13	10JUN13	0
SCRS2020	SCRS: Reinstatement & Clear RS Area	12	11JUN13	25JUN13	0
SCRS2025	SCRS: Complete All Works at SCI RS (KD-11)	0		25JUN13	0
SCRS2030	SCRS: Landscaping & Planting Works	60	08SEP13*	06NOV13	0



Start Date	31JUL09
Finish Date	15JAN15
Data Date	20JAN10
Run Date	01FEB10 10:50

Early Bar
Progress Bar
Critical Activity

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WPU7 Sheet 1 of 2

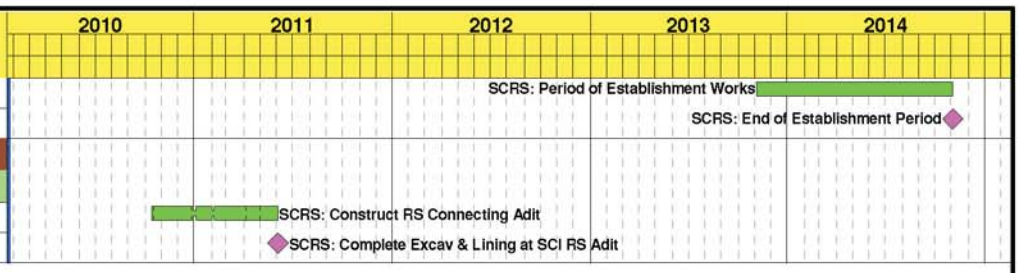
Habour Area Treatment Scheme Stage 2A
Contract No. DC/2007/23 - Construction of Sewage Conveyance from North Point to Stonecutters Island Programme

Annex G8 Construction Programme for the Project

Gammon

Date	Revision	Checked	Approved

Activity ID	Activity Description	Orig Dur	Early Start	Early Finish	% Comp
SCRS2060	SCRS: Period of Establishment Works	360	07NOV13	01NOV14	0
SCRS2070	SCRS: End of Establishment Period	0		01NOV14	0
Connecting Adit					
SCRS2040	SCRS: Construct RS Connecting Adit	192	14OCT10	03JUN11	0
SCRS2050	SCRS: Complete Excav & Lining at SCI RS Adit	0		03JUN11	0



Start Date	31JUL09
Finish Date	15JAN15
Data Date	20JAN10
Run Date	01FEB10 10:50

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Early Bar
Progress Bar
Critical Activity

WPU7 Sheet 2 of 2

Habour Area Treatment Scheme Stage 2A
Contract No. DC/2007/23 - Construction of Sewage Conveyance from North Point to Stonecutters Island Programme

Annex G8 Construction Programme for the Project

Gammon

Date	Revision	Checked	Approved

Annex H

Calibration Reports for Sound Level Meters for All Sites

Noise Monitoring Equipment

Monitoring Station ID	Monitoring Equipment	Model & Serial No.	Last Calibration Date	Next Calibration Date
NM1 – NM5 [a]	Calibrator	Rion NC-73 (S/N 10786708)	10 July 2009	10 July 2010
	Sound Level Meter	Rion NL-18 (S/N 00360030)	6 July 2009	6 July 2010
		Rion NL-31 (S/N 00320533)	16 July 2009	16 July 2010
		Rion NL-31 (S/N 00410224)	8 May 2009	8 May 2010
		Rion NA-27 (S/N 00201194)	10 July 2009	10July 2010

[a] The sound level meter (Rion NL-18 (S/N 00360030) or Rion NL-31 (S/N 00320533) or Rion NL-31 (S/N 00410224) or Rion NA-27 (S/N 00201194)) is used in NM1, NM2, NM3, NM4 and NM5.

Remarks

Monitoring Station ID	Location
NM1	Rooftop of Chan's Creative School (formerly known as Madam Chan Wai Chow Memorial School)
NM2	Rooftop of Hyde Building
NM3	Rooftop of Goldfield Building
NM4	Rooftop of Block A, Kwan Yick Building Phase III
NM5	A Location near the FSD Diving Rescue and Diving Training Centre near the Site Boundary

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

Certificate No. : C093598

Certificate of Calibration

This is to certify that the equipment

Description : Sound Level Calibrator

Manufacturer : Rion

Model No. : NC-73

Serial No. : 10786708

has been calibrated for the specific items and ranges.
The results are shown in the Calibration Report No. C093598.

The equipment is supplied by

Co. Name : Envirotech Services Co.

Address : Shop 6, G/F., Casio Mansion, 209 Shaukeiwan Road, Hong Kong

Send to: Winnie RO Ref:
Received by: Date:
Action taken:
Send to: Date: Action:

Date Received by ERM
Login Ref IC-370

Date of Issue : 10 July 2009

Certified by : H C Chan

The test equipment used for calibration are traceable to the National Standards as specified in this report.
This report shall not be reproduced except in full and with prior written approval from this laboratory.

Calibration and Testing Laboratory of Sun Creation Engineering Limited
c/o 4/F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
Tel: 2927 2606 Fax: 2744 8986 E-mail: callab@suncreation.com Website: www.suncreation.com

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

Report No. : C093598

Calibration Report

ITEM TESTED

DESCRIPTION : Sound Level Calibrator
MANUFACTURER : Rion
MODEL NO. : NC-73
SERIAL NO. : 10786708

TEST CONDITIONS

AMBIENT TEMPERATURE : (23 ± 2)°C RELATIVE HUMIDITY : (55 ± 20)%
LINE VOLTAGE : ---

TEST SPECIFICATIONS

Calibration check

DATE OF TEST : 9 July 2009 ***JOB NO.*** : IC09-1664

TEST RESULTS

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

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

Tested by : *K C Lee* *Date : 10 July 2009*

The test equipment used for calibration are traceable to the National Standards as specified in this report.
This report shall not be reproduced except in full and with prior written approval from this laboratory.

Calibration and Testing Laboratory of Sun Creation Engineering Limited
c/o 4/F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
Tel: 2927 2606 Fax: 2744 8986 E-mail: callab@suncreation.com Website: www.suncreation.com

Report No. : C093598

Calibration Report

1. The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 24 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.
TST150A	Measuring Amplifier	C080751
CL129	Universal Counter	C093121
CL281	Multifunction Acoustic Calibrator	DC090052

4. Test procedure : MA100N.

5. Results :

5.1 Sound Level Accuracy

UUT Nominal Value	Measured Value (dB)	Mfr's Spec. (dB)	Uncertainty of Measured Value (dB)
94 dB, 1 kHz	93.9	± 0.5	± 0.2

5.2 Frequency Accuracy

UUT Nominal Value (kHz)	Measured Value (Hz)	Mfr's Spec.	Uncertainty of Measured Value (Hz)
1	0.991 6	1 kHz ± 2 %	± 0.1

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

Note :
The values given in this Calibration Report 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 National Standards as specified in this report.
This report shall not be reproduced except in full and with prior written approval from this laboratory.

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

Certificate No. : C093473

Certificate of Calibration

This is to certify that the equipment

Description : Precision Integrating Sound Level Meter

Manufacturer : Rion

Model No. : NL-18

Serial No. : 00360030

has been calibrated for the specific items and ranges.
The results are shown in the Calibration Report No. C093473.

The equipment is supplied by

Co. Name : Envirotech Services Co.

Address : Shop 6, G/F., Casio Mansion, 209 Shaukeiwan Road, Hong Kong

Date of Issue : 6 July 2009

Certified by : H C Chan

The test equipment used for calibration are traceable to the National Standards as specified in this report.
This report shall not be reproduced except in full and with prior written approval from this laboratory.

Calibration and Testing Laboratory of Sun Creation Engineering Limited
c/o 4/F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
Tel: 2927 2606 Fax: 2744 8986 E-mail: caliab@suncreation.com Website: www.suncreation.com

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

Report No. : C093473

Calibration Report

ITEM TESTED

DESCRIPTION : Precision Integrating Sound Level Meter
MANUFACTURER : Rion
MODEL NO. : NL-18
SERIAL NO. : 00360030

TEST CONDITIONS

AMBIENT TEMPERATURE : (23 ± 2)°C RELATIVE HUMIDITY : (55 ± 20)%
LINE VOLTAGE : ---

TEST SPECIFICATIONS

Calibration check

DATE OF TEST : 3 July 2009 ***JOB NO.*** : IC09-1664

TEST RESULTS

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

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

Tested by : *K C Lee* *Date : 6 July 2009*

The test equipment used for calibration are traceable to the National Standards as specified in this report.
This report shall not be reproduced except in full and with prior written approval from this laboratory.

Calibration and Testing Laboratory of Sun Creation Engineering Limited
c/o 4/F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
Tel: 2927 2606 Fax: 2744 8986 E-mail: callab@suncreation.com Website: www.suncreation.com

Report No. : C093473

Calibration Report

1. The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 24 hours, and switched on to warm up for over 10 minutes before the commencement of the test.

2. Self-calibration using the internal standard (After Adjustment) was performed before the test 6.1.2 - 6.4.

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

4. Test equipment :

Equipment ID	Description	Certificate No.
CL280	40 MHz Arbitrary Waveform Generator	C090024
CL281	Multifunction Acoustic Calibrator	DC090052

5. Test procedure : MA101N.

6. Results :

6.1 Sound Pressure Level

6.1.1 Reference Sound Pressure Level

UUT Setting				Applied Value		UUT Reading (dB)		IEC 651 Type 1
Range (dB)	Mode	Weight	Response	Level (dB)	Freq. (kHz)	Before Adjustment	After Adjustment	Spec. (dB)
50 - 110	LA	A	Fast	94.00	1	93.3	94.1	± 0.7

6.1.2 Linearity

UUT Setting				Applied Value		UUT
Range (dB)	Mode	Weight	Response	Level (dB)	Freq. (kHz)	Reading (dB)
60 - 120	LA	A	Fast	94.00	1	94.2 (Ref.)
				104.00		104.2
				114.00		114.2

IEC 651 Type 1 Spec. : ± 0.4 dB per 10 dB step and ± 0.7 dB for overall different.

6.2 Time Weighting

6.2.1 Continuous Signal

UUT Setting				Applied Value		UUT	IEC 651 Type 1
Range (dB)	Mode	Weight	Response	Level (dB)	Freq. (kHz)	Reading (dB)	Spec. (dB)
50 - 110	LA	A	Fast	94.00	1	94.1	Ref.
			Slow			94.0	± 0.1

The test equipment used for calibration are traceable to the National Standards as specified in this report.
This report shall not be reproduced except in full and with prior written approval from this laboratory.

Report No. : C093473

Calibration Report

6.2.2 Tone Burst Signal (2 kHz)

UUT Setting				Applied Value		UUT Reading (dB)	IEC 651 Type 1 Spec. (dB)
Range (dB)	Mode	Weight	Response	Level (dB)	Burst Duration		
50 -110	LA	A	Fast	106.00	Continuous	106.0	Ref.
	LAmx				200 ms	105.0	-1.0 ± 1.0
	LA		Slow		Continuous	106.0	Ref.
	LAmx				500 ms	102.4	-4.1 ± 1.0

6.3 Frequency Weighting

6.3.1 A-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 651 Type 1 Spec. (dB)
Range (dB)	Mode	Weight	Response	Level (dB)	Freq.		
40 - 100	LA	A	Fast	94.00	31.5 Hz	54.7	-39.4 ± 1.5
					63 Hz	68.0	-26.2 ± 1.5
					125 Hz	78.0	-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	94.9	+1.0 ± 1.0
					8 kHz	91.7	-1.1 (+1.5 ; -3.0)

6.3.2 C-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 651 Type 1 Spec. (dB)
Range (dB)	Mode	Weight	Response	Level (dB)	Freq.		
40 - 100	LC	C	Fast	94.00	31.5 Hz	91.4	-3.0 ± 1.5
					63 Hz	93.6	-0.8 ± 1.5
					125 Hz	94.1	-0.2 ± 1.0
					250 Hz	94.2	0.0 ± 1.0
					500 Hz	94.2	0.0 ± 1.0
					1 kHz	94.1	Ref.
					2 kHz	93.9	-0.2 ± 1.0
					4 kHz	93.1	-0.8 ± 1.0
					8 kHz	89.8	-3.0 (+1.5 ; -3.0)

The test equipment used for calibration are traceable to the National Standards as specified in this report.
This report shall not be reproduced except in full and with prior written approval from this laboratory.

Report No. : C093473

Calibration Report

6.4 Time Averaging

UUT Setting				Applied Value					UUT	IEC 60804
Range (dB)	Mode	Freq. Weight	Integrating Time	Freq. (kHz)	Burst Duration (ms)	Burst Duty Factor	Burst Level (dB)	Equivalent Level (dB)	Reading (dB)	Type 1 Spec. (dB)
50 - 110	LAeq	A	10 sec.	4	1	1/10	110.0	100	100.2	± 0.5
						$1/10^2$		90	90.2	± 0.5
			60 sec.			$1/10^3$		80	79.8	± 1.0
			5 min.			$1/10^4$		70	70.2	± 1.0

Remarks : - Mfr's Spec. : IEC 651 Type 1 & IEC 60804 Type 1

- Uncertainties of Applied Value : 94 dB : 31.5Hz - 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
  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 Calibration Report 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 National Standards as specified in this report.
This report shall not be reproduced except in full and with prior written approval from this laboratory.

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

Certificate No. : C093733

Certificate of Calibration

This is to certify that the equipment

Description : Sound Level Meter

Manufacturer : Rion

Model No. : NL-31

Serial No. : 00320533

has been calibrated for the specific items and ranges.
The results are shown in the Calibration Report No. C093733.

The equipment is supplied by

Co. Name : Envirotech Services Co.

Address : Shop 6, G/F., Casio Mansion, 209 Shaukeiwan Road, Hong Kong

Date of Issue : 16 July 2009

Certified by : _____
H C Chan

The test equipment used for calibration are traceable to the National Standards as specified in this report.
This report shall not be reproduced except in full and with prior written approval from this laboratory.

Calibration and Testing Laboratory of Sun Creation Engineering Limited
c/o 4/F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
Tel: 2927 2606 Fax: 2744 8986 E-mail: callab@suncreation.com Website: www.suncreation.com

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

Report No. : C093733

Calibration Report

ITEM TESTED

DESCRIPTION : Sound Level Meter
MANUFACTURER : Rion
MODEL NO. : NL-31
SERIAL NO. : 00320533

TEST CONDITIONS

AMBIENT TEMPERATURE : (23 ± 2)°C RELATIVE HUMIDITY : (55 ± 20)%
LINE VOLTAGE : ---

TEST SPECIFICATIONS

Calibration check

DATE OF TEST : 15 July 2009 ***JOB NO.*** : IC09-1740

TEST RESULTS

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

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

Tested by : *K C Lee* *Date : 16 July 2009*

The test equipment used for calibration are traceable to the National Standards as specified in this report.
This report shall not be reproduced except in full and with prior written approval from this laboratory.

Report No. : C093733

Calibration Report

1. The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 24 hours, and switched on to warm up for over 10 minutes before the commencement of the test.

2. Self-calibration was performed before the test.

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

4. Test equipment :

Equipment ID	Description	Certificate No.
CL280	40 MHz Arbitrary Waveform Generator	C090024
CL281	Multifunction Acoustic Calibrator	DC090052

5. Test procedure : MA101N.

6. Results :

6.1 Sound Pressure Level

6.1.1 Reference Sound Pressure Level

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
30 - 120	L_A	A	Fast	94.00	1	94.2	± 0.7

6.1.2 Linearity

UUT Setting				Applied Value		UUT Reading (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	
30 - 120	L_A	A	Fast	94.00	1	94.2 (Ref.)
				104.00		104.2
				114.00		114.2

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

6.2 Time Weighting

6.2.1 Continuous Signal

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
30 - 120	L_A	A	Fast	94.00	1	94.2	Ref.
			Slow			94.1	± 0.1

The test equipment used for calibration are traceable to the National Standards as specified in this report.
This report shall not be reproduced except in full and with prior written approval from this laboratory.

Report No. : C093733

Calibration Report

6.2.2 Tone Burst Signal (2 kHz)

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Burst Duration		
20 - 110	L_A	A	Fast	106.00	Continuous	106.0	Ref.
	L_{Amax}				200 ms	105.0	-1.0 ± 1.0
	L_A		Slow		Continuous	106.0	Ref.
	L_{Amax}				500 ms	102.0	-4.1 ± 1.0

6.3 Frequency Weighting

6.3.1 A-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 120	L_A	A	Fast	94.00	31.5 Hz	55.0	-39.4 ± 1.5
					63 Hz	68.3	-26.2 ± 1.5
					125 Hz	78.3	-16.1 ± 1.0
					250 Hz	85.7	-8.6 ± 1.0
					500 Hz	91.0	-3.2 ± 1.0
					1 kHz	94.2	Ref.
					2 kHz	95.2	+1.2 ± 1.0
					4 kHz	94.4	+1.0 ± 1.0
					8 kHz	90.1	-1.1 (+1.5 ; -3.0)
					12.5 kHz	83.9	-4.3 (+3.0 ; -6.0)

6.3.2 C-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 120	L_C	C	Fast	94.00	31.5 Hz	91.4	-3.0 ± 1.5
					63 Hz	93.6	-0.8 ± 1.5
					125 Hz	94.1	-0.2 ± 1.0
					250 Hz	94.3	0.0 ± 1.0
					500 Hz	94.3	0.0 ± 1.0
					1 kHz	94.2	Ref.
					2 kHz	93.9	-0.2 ± 1.0
					4 kHz	92.7	-0.8 ± 1.0
					8 kHz	88.3	-3.0 (+1.5 ; -3.0)
					12.5 kHz	82.1	-6.2 (+3.0 ; -6.0)

The test equipment used for calibration are traceable to the National Standards as specified in this report.
This report shall not be reproduced except in full and with prior written approval from this laboratory.

Report No. : C093733

Calibration Report

6.4 Time Averaging

UUT Setting				Applied Value					UUT	IEC 60804
Range (dB)	Mode	Frequency Weighting	Time Weighting	Freq. (kHz)	Burst Duration (ms)	Burst Duty Factor	Burst Level (dB)	Equivalent Level (dB)	Reading (dB)	Type I Spec. (dB)
20 - 110	L_{Aeq}	A	10 sec.	4	1	1/10	110.0	100	100.3	± 0.5
						$1/10^2$		90	90.3	± 0.5
			60 sec.			$1/10^3$		80	80.3	± 1.0
			5 min.			$1/10^4$		70	70.3	± 1.0

Remarks : - Mfr's Spec. : IEC 60651 & 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 Calibration Report 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 National Standards as specified in this report.
This report shall not be reproduced except in full and with prior written approval from this laboratory.

輝創工程有限公司

Sun Creation Engineering Limited Calibration and Testing Laboratory

Certificate No. : C092284

Certificate of Calibration

This is to certify that the equipment

Description : Sound Level Meter

Manufacturer : Rion

Model No. : NL-31

Serial No. : 00410224

has been calibrated for the specific items and ranges.
The results are shown in the Calibration Report No. C092284.

The equipment is supplied by

Co. Name : Envirotech Services Co.

Address : Shop 6, G/F., Casio Mansion, 209 Shaukeiwan Road, Hong Kong

Date of Issue : 8 May 2009

Certified by : K C Lee

The test equipment used for calibration are traceable to the National Standards as specified in this report.
This report shall not be reproduced except in full and with prior written approval from this laboratory.

Calibration and Testing Laboratory of Sun Creation Engineering Limited
c/o 4/F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
Tel: 2927 2606 Fax: 2744 8986 E-mail: callab@suncreation.com Website: www.suncreation.com

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

Report No. : C092284

Calibration Report

ITEM TESTED

DESCRIPTION : Sound Level Meter
MANUFACTURER : Rion
MODEL NO. : NL-31
SERIAL NO. : 00410224

TEST CONDITIONS

AMBIENT TEMPERATURE : (23 ± 2)°C RELATIVE HUMIDITY : (55 ± 20)%
LINE VOLTAGE : ---

TEST SPECIFICATIONS

Calibration

DATE OF TEST : 7 May 2009 ***JOB NO.*** : IC09-1058

TEST RESULTS

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

Tested by : *H C Chan* *Date : 8 May 2009*

The test equipment used for calibration are traceable to the National Standards as specified in this report.
This report shall not be reproduced except in full and with prior written approval from this laboratory.

Report No. : C092284

Calibration Report

1. The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 24 hours, and switched on to warm up for over 10 minutes before the commencement of the test.

2. Self-calibration using the internal standard (after adjustment) was performed before the test 6.1.2 - 6.4.

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

4. Test equipment :

Equipment ID	Description	Certificate No.
CL280	40 MHz Arbitrary Waveform Generator	C090024
CL281	Multifunction Acoustic Calibrator	DC090052

5. Test procedure : MA101N.

6. Results :

6.1 Sound Pressure Level

6.1.1 Reference Sound Pressure Level

UUT Setting				Applied Value		UUT Reading (dB)		IEC 651 Type 1
Range (dB)	Mode	Weight	Response	Level (dB)	Freq. (kHz)	Before Adjustment	After Adjustment	Spec. (dB)
20 - 100	L_A	A	Fast	94.00	1	* 91.4	94.0	± 0.7

* Out of Mfr's Spec.

6.1.2 Linearity

UUT Setting				Applied Value		UUT Reading (dB)
Range (dB)	Mode	Weight	Response	Level (dB)	Freq. (kHz)	
30 - 120	L_A	A	Fast	94.00	1	94.0 (Ref.)
				104.00		104.0
				114.00		114.3

IEC 651 Type 1 Spec. : ± 0.4 dB per 10 dB step and ± 0.7 dB for overall different.

6.2 Time Weighting

6.2.1 Continuous Signal

UUT Setting				Applied Value		UUT Reading (dB)	IEC 651 Type 1 Spec. (dB)
Range (dB)	Mode	Weight	Response	Level (dB)	Freq. (kHz)		
20 - 100	L_A	A	Fast	94.00	1	94.0	Ref.
			Slow			94.0	± 0.1

The test equipment used for calibration are traceable to the National Standards as specified in this report.
This report shall not be reproduced except in full and with prior written approval from this laboratory.

Report No. : C092284

Calibration Report

6.2.2 Tone Burst Signal (2 kHz)

UUT Setting				Applied Value		UUT Reading (dB)	IEC 651 Type 1 Spec. (dB)
Range (dB)	Mode	Weight	Response	Level (dB)	Burst Duration		
20 - 110	L_A	A	Fast	106.00	Continuous	106.0	Ref.
	L_{Amax}				200 ms	105.0	-1.0 ± 1.0
	L_A		Slow		Continuous	106.0	Ref.
	L_{Amax}				500 ms	102.0	-4.1 ± 1.0

6.3 Frequency Weighting

6.3.1 A-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 651 Type 1 Spec. (dB)
Range (dB)	Mode	Weight	Response	Level (dB)	Freq.		
20 - 100	L_A	A	Fast	94.00	31.5 Hz	54.9	-39.4 ± 1.5
					63 Hz	68.1	-26.2 ± 1.5
					125 Hz	78.0	-16.1 ± 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	94.7	+1.0 ± 1.0
					8 kHz	90.2	-1.1 (+1.5 ; -3.0)

6.3.2 C-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 651 Type 1 Spec. (dB)
Range (dB)	Mode	Weight	Response	Level (dB)	Freq.		
20 - 100	L_C	C	Fast	94.00	31.5 Hz	91.3	-3.0 ± 1.5
					63 Hz	93.4	-0.8 ± 1.5
					125 Hz	93.9	-0.2 ± 1.0
					500 Hz	94.1	0.0 ± 1.0
					1 kHz	94.0	Ref.
					2 kHz	93.8	-0.2 ± 1.0
					4 kHz	92.9	-0.8 ± 1.0
					8 kHz	88.4	-3.0 (+1.5 ; -3.0)

The test equipment used for calibration are traceable to the National Standards as specified in this report.
This report shall not be reproduced except in full and with prior written approval from this laboratory.

Report No. : C092284

Calibration Report

6.4 Time Averaging

UUT Setting				Applied Value					UUT	IEC 60804
Range (dB)	Mode	Weight	Integrating Time	Freq. (kHz)	Burst Duration (ms)	Burst Duty Factor	Burst Level (dB)	Equivalent Level (dB)	Reading (dB)	Type 1 Spec. (dB)
20 - 110	L_{Aeq}	A	10 sec.	4	1	1/10	110.0	100	100.1	± 0.5
						$1/10^2$		90	90.1	± 0.5
			60 sec.			$1/10^3$		80	80.0	± 1.0
			5 min.			$1/10^4$		70	70.0	± 1.0

Remarks : - Mfr's Spec. : IEC 651 & IEC 60804 Type 1

- Uncertainties of Applied Value : 94 dB : 31.5Hz - 125 Hz : ± 0.35 dB
  500 Hz : ± 0.30 dB
  1 kHz : ± 0.20 dB
  2 kHz - 4 kHz : ± 0.35 dB
  8 kHz : ± 0.45 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 Calibration Report 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 National Standards as specified in this report.
This report shall not be reproduced except in full and with prior written approval from this laboratory.

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

Certificate No. : C093599

Certificate of Calibration

This is to certify that the equipment

Description : Precision Sound Level Meter

Manufacturer : Rion

Model No. : NA-27

Serial No. : 00201194

has been calibrated for the specific items and ranges.
The results are shown in the Calibration Report No. C093599.

The equipment is supplied by

Co. Name : Envirotech Services Co.

Address : Shop 6, G/F., Casio Mansion, 209 Shaukeiwan Road, Hong Kong

Date of Issue : 10 July 2009

Certified by : H C Chan

The test equipment used for calibration are traceable to the National Standards as specified in this report.
This report shall not be reproduced except in full and with prior written approval from this laboratory.

Calibration and Testing Laboratory of Sun Creation Engineering Limited
c/o 4/F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
Tel: 2927 2606 Fax: 2744 8986 E-mail: callab@suncreation.com Website: www.suncreation.com

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

Report No. : C093599

Calibration Report

ITEM TESTED

DESCRIPTION : Precision Sound Level Meter
MANUFACTURER : Rion
MODEL NO. : NA-27
SERIAL NO. : 00201194

TEST CONDITIONS

AMBIENT TEMPERATURE : (23 ± 2)°C RELATIVE HUMIDITY : (55 ± 20)%
LINE VOLTAGE : ---

TEST SPECIFICATIONS

Calibration check

DATE OF TEST : 9 July 2009 ***JOB NO.*** : IC09-1664

TEST RESULTS

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

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

Tested by : K C Lee *Date : 10 July 2009*

The test equipment used for calibration are traceable to the National Standards as specified in this report.
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Calibration Report

1. The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 24 hours, and switched on to warm up for over 10 minutes before the commencement of the test.

2. Self-calibration was performed before the test.

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

4. Test equipment :

Equipment ID	Description	Certificate No.
CL280	40 MHz Arbitrary Waveform Generator	C090024
CL281	Multifunction Acoustic Calibrator	DC090052

5. Test procedure : MA101N.

6. Results :

6.1 Sound Pressure Level

6.1.1 Reference Sound Pressure Level

UUT Setting			Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
50 - 110	LA	Fast	94.00	1	94.0	± 0.7

6.1.2 Linearity

UUT Setting			Applied Value		UUT Reading (dB)
Range (dB)	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	
60 - 120	LA	Fast	94.00	1	94.0 (Ref.)
			104.00		104.0
			114.00		114.0

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

6.2 Time Weighting

6.2.1 Continuous Signal

UUT Setting			Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
50 - 110	LA	Fast	94.00	1	94.0	Ref.
		Slow			94.0	± 0.1

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6.2.2 Tone Burst Signal (2 kHz)

UUT Setting			Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Frequency Weighting	Time Weighting	Level (dB)	Burst Duration		
50 -110	LA	Fast	106.00	Continuous	106.0	Ref.
	LAmax			200 ms	105.0	-1.0 ± 1.0
	LA	Slow		Continuous	106.0	Ref.
	LAmax			500 ms	102.0	-4.1 ± 1.0

6.3 Frequency Weighting

6.3.1 A-Weighting

UUT Setting			Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
50 - 110	LA	Fast	94.00	31.5 Hz	54.5	-39.4 ± 1.5
				63 Hz	68.0	-26.2 ± 1.5
				125 Hz	78.1	-16.1 ± 1.0
				250 Hz	85.5	-8.6 ± 1.0
				500 Hz	90.9	-3.2 ± 1.0
				1 kHz	94.0	Ref.
				2 kHz	95.4	+1.2 ± 1.0
				4 kHz	95.6	+1.0 ± 1.0
				8 kHz	93.7	-1.1 (+1.5 ; -3.0)
				12.5 kHz	89.2	-4.3 (+3.0 ; -6.0)

6.3.2 C-Weighting

UUT Setting			Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
50 - 110	LC	Fast	94.00	31.5 Hz	91.1	-3.0 ± 1.5
				63 Hz	93.3	-0.8 ± 1.5
				125 Hz	93.8	-0.2 ± 1.0
				250 Hz	94.0	0.0 ± 1.0
				500 Hz	94.0	0.0 ± 1.0
				1 kHz	94.0	Ref.
				2 kHz	93.9	-0.2 ± 1.0
				4 kHz	93.7	-0.8 ± 1.0
				8 kHz	91.8	-3.0 (+1.5 ; -3.0)
				12.5 kHz	87.2	-6.2 (+3.0 ; -6.0)

The test equipment used for calibration are traceable to the National Standards as specified in this report.
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Calibration Report

6.4 Time Averaging

UUT Setting			Applied Value					UUT	IEC 60804
Range (dB)	Mode	Integrating Time	Freq. (kHz)	Burst Duration (ms)	Burst Duty Factor	Burst Level (dB)	Equivalent Level (dB)	Reading (dB)	Type I Spec. (dB)
50 - 110	LAeq	10 sec.	4	1	1/10	110.0	100	100.2	± 0.5
					$1/10^2$		90	90.3	± 0.5
		60 sec.			$1/10^3$		80	80.3	± 1.0
		5 min.			$1/10^4$		70	70.3	± 1.0

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

- Uncertainties of Applied Value : 94 dB : 31.5 Hz : ± 0.85 dB
  63 Hz : ± 0.55 dB
  125 Hz : ± 0.45 dB
  250 Hz : ± 0.40 dB
  500 Hz : ± 0.40 dB
  1 kHz : ± 0.20 dB
  2 kHz : ± 0.45 dB
  4 kHz : ± 0.75 dB
  8 kHz : ± 1.35 dB
  12.5 kHz : ± 2.30 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 Calibration Report 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 National Standards as specified in this report.
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Annex I

Event /Action Plans for Air Quality, Noise and Landscape and Visual Monitoring

Table I1 Event Action Plan for Air Quality Monitoring

Action Level/Limit Level	Environmental Team Leader (ETL)	Independent Environmental Checker (IEC)	Engineer's Representative (ER)	Contractor
Action Level				
Exceedance for one sample	• Identify source, investigate the causes of exceedance and propose remedial measures; • Inform IEC and ER; • Repeat measurement to confirm finding; and, • Increase monitoring frequency to daily.	• Check monitoring data submitted by ET; and, • Check Contractor's working method.	• Notify Contractor	• Rectify any unacceptable practice; and, • Amend working methods if appropriate.
Exceedance for two or more consecutive samples	• Identify source; • Inform IEC and ER; • Advise the ER on the effectiveness of the proposed remedial measures; • Repeat measurements to confirm findings; • Increase monitoring frequency to daily; and, • Discuss with IEC and Contractor on remedial actions required;	• Check monitoring data submitted by ET; • Check Contractor's working method; • Discuss with ET and Contractor on possible remedial measures; • Advise the ET on the effectiveness of the proposed remedial measures; and, • Supervise Implementation of remedial measures.	• Confirm receipt of notification of failure in writing; • Notify Contractor, and, • Ensure remedial measures properly implemented.	• Submit proposals for remedial to ER within 3 working days of notification; • Implement the agreed proposals; • Amend proposal if appropriate.

Action Level/Limit Level	Environmental Team Leader (ETL)	Independent Environmental Checker (IEC)	Engineer's Representative (ER)	Contractor
Limit Level				
Exceedance for one sample	• Identify source, investigate the causes of exceedance and propose remedial measures; • Inform ER, Contractor and EPD; • Repeat measurement to confirm finding; • Increase monitoring frequency to daily; and, • Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results.	• Check monitoring data submitted by ET; • Check Contractor's working method; • Discuss with ET and Contractor on possible remedial measures; • Advise the ER on the effectiveness of the proposed remedial measures; and, • Supervise implementation of remedial measures.	• Confirm receipt of notification of failure in writing; • Notify Contractor; and, • Ensure remedial measures properly implemented.	• Take immediate action to avoid further exceedance; • Submit proposals for remedial actions to IEC within 3 working days of notification; • Implement the agreed proposals; and, • Amend proposal if appropriate.
Exceedance for two or more consecutive samples	• Notify IEC, ER, Contractor and EPD; • Identify source; • Repeat measurement to confirm findings; • Increase monitoring frequency to daily; • Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented; • Arrange meeting with IEC and ER to discuss the remedial actions to be taken; • Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results; and, • If exceedance stops, cease additional monitoring.	• Check monitoring data submitted by ET; • Check Contractor's working method; • Discuss amongst ER, ET, and Contractor on the potential remedial actions; • Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly; and, • Supervise the implementation of remedial measures.	• Confirm receipt of notification of failure in writing; • Notify Contractor; • In consultation with the IEC, agree with the Contractor on the remedial measures to be implemented; • Ensure remedial measures properly implemented; and, • 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.	• Take immediate action to avoid further exceedance; • Submit proposals for remedial actions to IEC within 3 working days of notification; • Implement the agreed proposals; • Resubmit proposals if problem still not under control; and, • Stop the relevant portion of works as determined by the ER until the exceedance is abated.

Table I2 Event Action Plan for Noise Monitoring

Action Level/Limit Level	Environmental Team Leader (ETL)	Independent Environmental Checker (IEC)	Engineer's Representative (ER)	Contractor
Action Level being exceeded	• Notify ER, IEC and Contractor; • Carry out investigation; • Report the results of investigation to the IEC, ER and Contractor; • Discuss with the IEC and Contractor on remedial measures required; and, • Increase monitoring frequency to check mitigation effectiveness.	• Review the investigation results submitted by the ET; • Review the proposed remedial measures by the Contractor and advise the ER accordingly; and, • Advise the ER on the effectiveness of the proposed remedial measures.	• Confirm receipt of notification of failure in writing; • Notify Contractor; • In consultation with the IEC, agree with the Contractor on the remedial measures to be implemented; and, • Supervise the implementation of remedial measures.	• Submit noise mitigation proposals to IEC and ER; and, • Implement noise mitigation proposals.

Action Level/Limit Level	Environmental Team Leader (ETL)	Independent Environmental Checker (IEC)	Engineer's Representative (ER)	Contractor
Limit Level being exceeded	• Inform IEC, ER, Contractor and EPD; • Repeat measurements to confirm findings; • Increase monitoring frequency; • Identify source and investigate the cause of exceedance; • Carry out analysis of Contractor's working procedures; • Discuss with the IEC, Contractor and ER on remedial measures required; • Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results; and, • If exceedance stops, cease additional monitoring.	• Discuss amongst ER, ET, and Contractor on the potential remedial actions; and, • Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly.	• Confirm receipt of notification of failure in writing; • Notify Contractor; • In consultation with the IEC, agree with the Contractor on the remedial measures to be implemented; • Supervise the implementation of remedial measures; and, • If exceedance continues, consider stopping the Contractor to continue working on that portion of work which causes the exceedance until the exceedance is abated.	• Take immediate action to avoid further exceedance; • Submit proposals for remedial actions to IEC and ER within 3 working days of notification; • Implement the agreed proposals; • Submit further proposal if problem still not under control; and, • Stop the relevant portion of works as instructed by the ER until the exceedance is abated.

Table I3 Event and Action Plan for Landscape and Visual Impact - Construction Phase

Action Level	Environmental Team Leader (ETL)	Independent Environmental Checker (IEC)	Engineer's Representative (ER)	Contractor
Non-conformity on one occasion	Identify source Inform the IEC and the ER Discuss remedial actions with the IEC, the ER and the Contractor Monitor remedial action until rectification has been completed	Check report Check the Contractor's working method Discuss with the ER and the Contractor on possible remedial measures Advise the ER on effectiveness of proposed remedial measures	Notify the Contractor Ensure remedial measures are properly implemented	Amend working methods Rectify damage and undertake remedial measures or any necessary replacement
Repeated Non-conformity	Identify source Inform the IEC and the ER Increase monitoring (site audit) frequency Discuss remedial actions with the IEC, the ER and the Contractor Monitor remedial actions until rectification has been completed If exceedance stops, cease additional monitoring (site audit)	Check report Check the Contractor's working method Discuss with the ER and the Contractor on possible remedial measures Advise the ER on effectiveness of proposed remedial measures Supervise implementation of remedial measures	Notify the Contractor Ensure remedial measures are properly implemented	Amend working methods Rectify damage and undertake remedial measures or any necessary replacement

Annex J

Waste Flow Table

Harbour Area Treatment Scheme Stage 2A – Construction of Sewage Conveyance System from North Point to Stonecutters Island

Contract No. : DC/2007/23
Monthly Summary Waste Flow Table for 2009 (year)

Month	Actual Quantities of Inert C&D Materials Generated Monthly					Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated	Broken Concrete (see Note 3)	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Metals (see Note 1)	Paper/ cardboard packaging (see Note 1)	Plastics (see Note 2)	Chemical Waste	Others, e.g. general refuse
	(in '000kg)	(in '000m³)	(in '000m³)	(in '000m³)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000L)	(in '000kg)
Jan										
Feb										
Mar										
Apr										
May										
June										
Sub-total										
July										
Aug										
Sept										
Oct										
Nov										
Dec	5197.55	0	0	0	5197.55	1	0.036	0	0	45.29
Total	5197.55	0	0	0	5197.55	1	0.036	0	0	45.29

Notes: (1) Metal and paper/cardboard packaging will be collected by recycler for recycling.
(2) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material and the wastes are collected by recycler for recycling.
(3) Broken concrete for recycling into aggregates

.

Harbour Area Treatment Scheme Stage 2A – Construction of Sewage Conveyance System from North Point to Stonecutters Island

Contract No. : DC/2007/23
Monthly Summary Waste Flow Table for 2010 (year)

Month	Actual Quantities of Inert C&D Materials Generated Monthly					Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated	Broken Concrete (see Note 3)	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Metals (see Note 1)	Paper/ cardboard packaging (see Note 1)	Plastics (see Note 2)	Chemical Waste	Others, e.g. general refuse
	(in '000kg)	(in '000m³)	(in '000m³)	(in '000m³)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000L)	(in '000kg)
Jan	7986.1	0	0	0	7986.1	0	0.144	0	0.8	44.5
Feb										
Mar										
Apr										
May										
June										
Sub-total										
July										
Aug										
Sept										
Oct										
Nov										
Dec										
Total	7986.1	0	0	0	7986.1	0	0.144	0	0.8	44.5

Notes: (1) Metal and paper/cardboard packaging will be collected by recycler for recycling.
(2) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material and the wastes are collected by recycler for recycling.
(3) Broken concrete for recycling into aggregates

.

APPENDIX C

EM&A Monthly Report Submitted under DC/2009/05

China State – Shanghai Tunnel Joint Venture

Contract No. DC/2009/05

Harbour Area Treatment Scheme Stage 2A, Construction of Interconnection Tunnel and Diaphragm Wall for Main Pumping Station at Stonecutters Island Sewage Treatment Works

Monthly EM&A Report for January 2010

February 2010

	Name	Signature
Prepared & Checked:	Cyrus Lau	
Reviewed, Approved and Certified:	Edith Ng	

Version: 0	Date: 10 February 2010

The information contained in this report is, to the best of our knowledge, correct at the time of printing. The interpretation and recommendations in the report are based on our experience, using reasonable professional skill and judgment, and based upon the information that was available to us. These interpretations and recommendations are not necessarily relevant to any aspect outside the restricted requirements of our brief. This report has been prepared for the sole and specific use of our client and AECOM Asia Co. Ltd. accepts no responsibility for its use by others.

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EXECUTIVE SUMMARY

The proposed construction of interconnection tunnel and diaphragm wall for main pumping station at Stonecutters Island Sewage Treatment Works (SCISTW) (the Project) is a Designated Project under the Environmental Impact Assessment Ordinance (Cap. 499) (EIAO) and is governed by an Environmental Permit (EP-322/2008/B). The Project comprises the construction of Interconnection Tunnel between the Inlet Chamber of the Main Pumping Station and the existing Riser Shaft and diaphragm wall for the Main Pumping Station.

China State - Shanghai Tunnel Joint Venture was commissioned as the Contractor of the Project. AECOM Asia Co. Ltd. was employed by China State - Shanghai Tunnel Joint Venture as the Environmental Team to undertake the EM&A works for the Project.

The construction phase of the Project commenced on 10 December 2009. The impact environmental monitoring and audit (EM&A) programme of the Project, which includes air quality, noise and landscape and visual monitoring and environmental site inspections, was commenced on 10 December 2009.

This report documents the findings of EM&A works conducted in the period between 1 and 31 January 2010. As informed by the Contractor, construction activities in the reporting period were:

- Drainage work;
- Steel cage fixing work;
- Welding work;
- Tree transplanting and protection;
- Construction of Engineer's accommodation;
- Mobilization of labours and plants;
- Establishment of bentonite slurry treatment plant at main pumping station and its inlet chamber;
- Ground treatment works at inlet chamber;
- Demolish existing abandoned sewerage at main pumping station;
- Predrilling for mini-piles at main pumping station;
- Installation of geotechnical instrument for monitoring utility settlement at main pumping station and its inlet chamber and launching shaft tunnel
- Construction of diaphragm wall for the main pumping station and its inlet chamber;
- Excavation for diaphragm wall at main pumping station and its inlet chamber;
- Lifting cage for diaphragm wall at main pumping station and its inlet chamber;
- Concreting to diaphragm wall at main pumping station and its inlet chamber;
- Construction of site access ramp at launching shaft region;
- Construction water pipe from Admin Building to launching shaft region;
- Construction of guide wall for interconnection tunnel; and
- Construction of gates for interconnection tunnel.

Breaches of Action and Limit Levels for Air Quality
No exceedance of Action and Limit Level was recorded for both 1-hour TSP and 24-hour TSP monitoring in the reporting month.

Breaches of Action and Limit Levels for Noise

According to the information provided by the Contractor, no Action Level exceedance was recorded since no noise related complaint was received in the reporting month.

No Limit Level exceedance of noise was recorded at all monitoring station in the reporting month, except the measured noise levels recorded on 28 January 2010 during night-time period. Based on the observations during the course of noise measurement and information provided by the Contractor, the list of PME deployed on site was in accordance with the CNP requirements on types and number of PME.

According to the average baseline noise level recorded during night-time period, a Limit Level exceeding noise level had been recorded.

Based on the information provided by the Engineers' Representative, no construction works were carried out within the site area under the Contract DC/2007/23 and DE/2009/02 during the noise monitoring period.

However, other external noise sources were also noted during the monitoring period. Therefore, it is believed that the Limit Level exceedance is not project-related and not solely caused by the Contractor's construction activities.

No public complaints have been received in relation to the construction noise from the site during the restricted hours on 28 January 2010.

Complaint, Notification of Summons and Successful Prosecution

According to the information provided by the Contractor, no complaint, notification of summons and successful prosecution was received in the reporting month.

Reporting Changes

There was no reporting change in the reporting month.

Future Key Issues

Key issues to be considered in the coming month included:

- Properly store and label oils and chemicals on site;
- Chemical and waste management;
- Segregation and recycling of construction waste should be properly implemented;
- Collection of construction waste should be carried out properly and regularly;
- Site runoff should be properly collected and treated prior to discharge;
- Accumulation of stagnant water in site area should be avoided;
- Suppress dust generated from bentonite slurry treatment plant, excavation activities and haul road traffic;
- Quieter powered mechanical equipment should be used; and
- Noise control measures, such as erection of movable noise barrier, should be properly maintained on site.

1 INTRODUCTION

1.1 Background

1.1.1 The proposed construction of interconnection tunnel and diaphragm wall for main pumping station at Stonecutters Island Sewage Treatment Works (SCISTW) (the Project) is a Designated Project under the Environmental Impact Assessment Ordinance (Cap. 499) (EIAO) and is governed by an Environmental Permit (EP-322/2008/B).

1.1.2 The Project site is located in the Sham Shui Po District. It is located within the existing Stonecutters Island Sewage Treatment Works (SCISTW), which is bounded by Ngong Shung Road to the north and the west. The general layout plan of the Project site showing the contract area is shown in Figure 1.1.

1.1.3 The objective of the Project "Harbour Area Treatment Scheme (HATS) Stage 2A - Construction of Interconnection Tunnel and Diaphragm Wall for Main Pumping Station at Stonecutters Island Sewage Treatment Works (SCISTW)" under Contract DC/2009/05 is to provide Interconnection Tunnel between the Inlet Chamber of the Main Pumping Station and the existing Riser Shaft and diaphragm wall for the Main Pumping Station.

1.1.4 The scope of the Project comprises mainly:

- Construction of Interconnection Tunnel with concrete lining between the Inlet Chamber of the Main Pumping Station and the existing Riser Shaft;
- Construction of diaphragm wall, base slab and pile cap for the Main Pumping Station and its Inlet Chamber;
- Excavation within the diaphragm walls for the Main Pumping Station and its Inlet Chamber to founding levels;
- Piling works for the Main Pumping Stations;
- Utilities upgrading and diversion works;
- Temporary launching shaft to be handed over to MPS Contractor;
- Carrying out ground monitoring and instrumentation works;
- Carrying out pumping test;
- Miscellaneous building, civil and electrical and mechanical works; and
- Landscape works.

1.1.5 The Project is anticipated to complete in mid 2012.

1.1.6 According to the Environmental Permit (EP-322/2008/B) and the EM&A Manual of the Project, there is a need of an EM&A programme including air quality and noise monitoring and landscape and visual impacts and environmental site inspections.

1.1.7 AECOM Asia Co. Ltd. was employed by the Contractor, China State - Shanghai Tunnel Joint Venture, as the Environmental Team (ET) to undertake the EM&A works for the Project. In accordance with the EM&A Manual of the Project, environmental monitoring of air quality, noise and landscape and visual impacts and environmental site inspections would be required for this Project.

1.1.8 The construction phase of the Project commenced on 10 December 2009. The impact environmental monitoring and audit (EM&A) programme of the Project, which includes air quality, noise and landscape and visual monitoring and environmental site inspections, was commenced on 10 December 2009.

1.2 Scope of Report

1.2.1 This is the second monthly Environmental Monitoring and Audit (EM&A) Report under the Contract DC/2009/05 – Harbour Area Treatment Scheme (HATS) Stage 2A - Construction of Interconnection Tunnel and Diaphragm Wall for Main Pumping Station at Stonecutters Island Sewage Treatment Works (SCISTW). This report presents a summary of the environmental monitoring and audit works, list of activities and mitigation measures proposed by the ET for the Project in January 2010.

1.3 Project Organization

1.3.1 The project organization structure is shown in Appendix A. The key personnel contact names and numbers are summarized in Table 1.1

Table 1.1 Contact Information of Key Personnel

Party	Position	Name	Telephone	Fax
ER (Ove Arup)	The Engineer	S.Y. Chan	2528 3031	2370 4377
	The Engineer Representative	M.P. Gamini Ananda	2370 4311	2370 4377
	The Engineer Representative's Coordinator	William Yu	9705 9566	2370 4377
IEC (Mott MacDonald)	Independent Environmental Checker	Anne Kerr	2828 5793	2827 1823
Contractor (China State – Shanghai Tunnel Joint Venture)	Site Agent	Ben Siu	6432 1490	2370 2086
	Environmental Officer	Chris Leung	2704 2095	2370 2086
ET (AECOM)	ET Leader	Edith Ng	3105 8525	2891 0305

1.4 Summary of Construction Works

1.4.1 As informed by the Contractor, the Contactor has carried out the following major activities in the reporting month:

- Drainage work;
- Steel cage fixing work;
- Welding work;
- Tree transplanting and protection;
- Construction of Engineer's accommodation;
- Mobilization of labours and plants;
- Establishment of bentonite slurry treatment plant at main pumping station and its inlet chamber;
- Ground treatment works at inlet chamber;
- Demolish existing abandoned sewerage at main pumping station;
- Predrilling for mini-piles at main pumping station;
- Installation of geotechnical instrument for monitoring utility settlement at main pumping station and its inlet chamber and launching shaft tunnel
- Construction of diaphragm wall for the main pumping station and its inlet chamber;
- Excavation for diaphragm wall at main pumping station and its inlet chamber;
- Lifting cage for diaphragm wall at main pumping station and its inlet chamber;
- Concreting to diaphragm wall at main pumping station and its inlet chamber;
- Construction of site access ramp at launching shaft region;

- Construction water pipe from Admin Building to launching shaft region;
- Construction of guide wall for interconnection tunnel; and
- Construction of gates for interconnection tunnel.

1.4.2 The Construction Programme is shown in Appendix B.

1.4.3 The mitigation measures implementation schedule (EMIS) are presented in Appendix C.

1.5 Summary of EM&A Programme Requirements

1.5.1 The EM&A programme required environmental monitoring for air quality, noise and environmental site inspections for air quality, noise and waste management. The EM&A requirements for each parameter described in the following sections include:

- All monitoring parameters;
- Monitoring schedules for the reporting month and forthcoming months;
- Action and Limit levels for all environmental parameters;
- Event / Action Plan;
- Environmental mitigation measures, as recommended in the Project EIA study final report; and
- Environmental requirement in contract documents.

2 AIR QUALITY MONITORING

2.1 Monitoring Requirements

2.1.1 In accordance with the EM&A Manual, 1-hour and 24-hour TSP levels at 4 air quality monitoring stations should be established. As accesses to some of the proposed monitoring stations as stipulated in the EM&A manual have been rejected by other parties or found to be not suitable, a Monitoring Proposal, presenting the alternative monitoring stations, requirements and methodologies for the monitoring, had been submitted.

2.1.2 Moreover, monitoring station at Block A of Government Dockyard mentioned in the Monitoring Proposal will be established by the other contract (Contract DE/2009/02: Provision of Covers and Deodourisation Facilities to the Existing Sedimentation Tanks at SCISTW), so impact monitoring details at this station are not mentioned in this report.

2.1.3 Impact monitoring of air quality at 1 monitoring station, West Kowloon No. 2 Sewage Pumping Stationas (AM7), as described in the Monitoring Proposal, was established.

2.1.4 Impact 1-hour TSP monitoring was conducted for at least three times every 6 days, while impact 24-hour TSP monitoring was carried out for at least once every 6 days. The Action and Limit level of the air quality monitoring is provided in Appendix D.

2.2 Monitoring Equipment

2.2.1 24-hour TSP air quality monitoring was performed using High Volume Sampler (HVS) located at the designated monitoring station. The HVS meets all the requirements of the EM&A Manual. Portable direct reading dust meters were used to carry out the 1-hour TSP monitoring. Brand and model of the equipment is given in Table 2.1.

Table 2.1 Air Quality Monitoring Equipment

Equipment	Brand and Model
Portable direct reading dust meter (1-hour TSP)	Sibata Digital Dust Monitor (Model No. LD-3 and LD-3B)
High Volume Sampler (24-hour TSP)	Graseby Andersen Total Suspended Particulate Mass Flow Controlled Sampling System (Model No.GMWS2310)

2.3 Monitoring Location

2.3.1 Monitoring station (AM7), was set up at the proposed location in accordance with the Monitoring Proposal submitted, as agreed by the ER and IEC. Figure 2.1 shows the location of air quality monitoring station during impact phase. Table 2.2 describes the details of the monitoring stations.

Table 2.2 Locations of Air Quality Monitoring Station

ID	Location	Monitoring Station
AM7	West Kowloon No. 2 Sewage Pumping Stationas	Roof top of the premise

2.4 Monitoring Parameters, Frequency and Duration

2.4.1 Table 2.3 summarizes the monitoring parameters, frequency and duration of impact TSP monitoring.

Table 2.3 Air Quality Monitoring Parameters, Frequency and Duration

Monitoring Station	Parameter	Frequency and Duration
AM7	1-hour TSP	At least 3 times every 6 days
	24-hour TSP	At least once every 6 days

2.5 Monitoring Methodology

2.5.1 24-hour TSP Monitoring

(a) The HVS was installed in the vicinity of the air sensitive receivers. The following criteria were considered in the installation of the HVS.

(i) A horizontal platform with appropriate support to secure the sampler against gusty wind was provided.
(ii) The distance between the HVS and any obstacles, such as buildings, was at least twice the height that the obstacle protrudes above the HVS.
(iii) A minimum of 2 meters separation from walls, parapets and penthouse for rooftop sampler.
(iv) A minimum of 2 meters separation from any supporting structure, measured horizontally is required.
(v) No furnace or incinerator flues nearby.
(vi) Airflow around the sampler was unrestricted.
(vii) Permission was obtained to set up the samplers and access to the monitoring stations.
(viii) A secured supply of electricity was obtained to operate the samplers.
(ix) The sampler was located more than 20 meters from any dripline.
(x) Any wire fence and gate, required to protect the sampler, did not obstruct the monitoring process.
(xi) Flow control accuracy was kept within ±2.5% deviation over 24-hour sampling period.

(b) Preparation of Filter Papers

(i) Glass fibre filters, G810 were labelled and sufficient filters that were clean and without pinholes were selected.
(ii) All filters were equilibrated in the conditioning environment for 24 hours before weighing. The conditioning environment temperature was around 25 °C and not variable by more than ±3 °C; the relative humidity (RH) was < 50% and not variable by more than ±5%. A convenient working RH was 40%.
(iii) All filter papers were prepared and analysed by ALS Technichem (HK) Pty Ltd., which is a HOKLAS accredited laboratory and has comprehensive quality assurance and quality control programmes.

(c) Field Monitoring

(i) The power supply was checked to ensure the HVS works properly.
(ii) The filter holder and the area surrounding the filter were cleaned.

(iii) The filter holder was removed by loosening the four bolts and a new filter, with stamped number upward, on a supporting screen was aligned carefully.
(iv) The filter was properly aligned on the screen so that the gasket formed an airtight seal on the outer edges of the filter.
(v) The swing bolts were fastened to hold the filter holder down to the frame. The pressure applied was sufficient to avoid air leakage at the edges.
(vi) Then the shelter lid was closed and was secured with the aluminium strip.
(vii) The HVS was warmed-up for about 5 minutes to establish run-temperature conditions.
(viii) A new flow rate record sheet was set into the flow recorder.
(ix) On site temperature and atmospheric pressure readings were taken and the flow rate of the HVS was checked and adjusted at around 1.1 m^3/min, and complied with the range specified in the EM&A Manual (i.e. 0.6-1.7 m^3/min).
(x) The programmable digital timer was set for a sampling period of 24 hrs, and the starting time, weather condition and the filter number were recorded.
(xi) The initial elapsed time was recorded.
(xii) At the end of sampling, on site temperature and atmospheric pressure readings were taken and the final flow rate of the HVS was checked and recorded.
(xiii) The final elapsed time was recorded.
(xiv) The sampled filter was removed carefully and folded in half length so that only surfaces with collected particulate matter were in contact.
(xv) It was then placed in a clean plastic envelope and sealed.
(xvi) All monitoring information was recorded on a standard data sheet.
(xvii) Filters were then sent to ALS Technichem (HK) Pty Ltd. for analysis.

(d) Maintenance and Calibration

(i) The HVS and its accessories were maintained in good working condition, such as replacing motor brushes routinely and checking electrical wiring to ensure a continuous power supply.
(ii) HVSs were calibrated using TE-5025A Calibration Kit upon installation and thereafter at bi-monthly intervals.
(iii) Calibration certificate of the TE-5025A Calibration Kit and the HVSs are provided in Appendix E.

2.5.2 1-hour TSP Monitoring

(a) Measuring Procedures

The measuring procedures of the 1-hour dust meter were in accordance with the Manufacturer's Instruction Manual as follows:
(i) Turn the power on.
(ii) Close the air collecting opening cover.
(iii) Push the "TIME SETTING" switch to [BG]
(iv) Push "START/STOP" switch to perform background measurement for 6 seconds.
(v) Turn the knob at SENSI ADJ position to insert the light scattering plate.
(vi) Leave the equipment for 1 minute upon "SPAN CHECK" is indicated in the display.
(vii) Push "START/STOP" switch to perform automatic sensitivity adjustment. This measurement takes 1 minute.
(viii) Pull out the knob and return it to MEASURE position.
(ix) Push the "TIME SETTING" switch the time set in the display to 3 hours.
(x) Lower down the air collection opening cover.
(xi) Push "START/STOP" switch to start measurement.

(b) Maintenance and Calibration

(i) The 1-hour TSP meter was calibrated at 1-year intervals against a continuous particulate TEOM Monitor, Series 1400ab. Calibration certificates of the Laser Dust Monitors are provided in Appendix E.

2.6 Monitoring Schedule for the Reporting Month

2.6.1 The schedule for environmental monitoring in January 2010 is provided in Appendix F.

2.7 Monitoring Results

2.7.1 The monitoring results for 1-hour TSP and 24-hour TSP are summarized in Table 2.4 and 2.5 respectively. Detailed air quality monitoring results are presented in Appendix G.

Table 2.4 Summary of 1-hour TSP Monitoring Results in the Reporting Period

	Average ($\mu g/m^3$)	Range ($\mu g/m^3$)	Action Level ($\mu g/m^3$)	Limit Level ($\mu g/m^3$)
AM7	77.1	64.9 – 89.9	322	500

Table 2.5 Summary of 24-hour TSP Monitoring Results in the Reporting Period

	Average ($\mu g/m^3$)	Range ($\mu g/m^3$)	Action Level ($\mu g/m^3$)	Limit Level ($\mu g/m^3$)
AM7	84.0	62.3 – 116.9	207	260

2.7.2 All 1-hour TSP and 24-hour TSP results were below the Action and Limit Level at all monitoring location in the reporting month.

2.7.3 The event action plan is annexed in Appendix J.

2.7.4 Weather information including wind speed and wind direction is annexed in Appendix I. The information was obtained from Hong Kong Observatory Cheung Sha Wan Anemometer Station.

3 NOISE MONITORING

3.1 Monitoring Requirements

3.1.1 In accordance with the EM&A Manual, impact noise levels should be obtained at 2 noise monitoring stations. As accesses to some of the proposed monitoring stations as stipulated in the EM&A manual have been rejected by other parties or found to be not suitable, a Monitoring Proposal, presenting the alternative monitoring stations, requirements and methodologies for the monitoring, had been submitted.

3.1.2 Impact monitoring of construction noise at 1 monitoring station, Customs' Marine Base (NM6), as described in the Monitoring Proposal, was established.

3.1.3 Impact noise monitoring was conducted for at least once per week during the construction phase of the Project. The Action and Limit level of the noise monitoring is provided in Appendix E.

3.2 Monitoring Equipment

3.2.1 Noise monitoring was performed using sound level meter at the designated monitoring station. The sound level meters deployed comply with the International Electrotechnical Commission Publications (IEC) 651:1979 (Type 1) and 804:1985 (Type 1) specifications. Acoustic calibrator was deployed to check the sound level meters at a known sound pressure level. Brand and model of the equipment is given in Table 3.1.

Table 3.1 Noise Monitoring Equipment

Equipment	Brand and Model
Integrated Sound Level Meter	B&K (Model No. 2238 and 2250L)
Acoustic Calibrator	B&K (Model no. 4231)

3.3 Monitoring Location

3.3.1 Monitoring station (NM6), was set up at the proposed location in accordance with the Monitoring Proposal submitted, as agreed by the ER and IEC. Figure 3.1 shows the location of noise monitoring station during impact phase. Table 3.2 describes the details of the monitoring stations.

Table 3.2 Locations of Impact Noise Monitoring Station

ID	Location	Monitoring Station
NM6	Customs' Marine Base	1m from the exterior of the roof top façade of Block H of Government Dockyard

3.4 Monitoring Parameters, Frequency and Duration

3.4.1 Table 3.3 summarizes the monitoring parameters, frequency and duration of impact noise monitoring.

Table 3.3 Noise Monitoring Parameters, Frequency and Duration

Monitoring Station	Parameters and Duration	Frequency
NM6	30-min measurement at monitoring station between 0700 and 1900 on normal weekdays. 3 times of 5-min measurement at monitoring station during restricted hours if construction works were carried out. L_{eq}, L_{10} and L_{90} would be recorded.	At least once per week

3.5 Monitoring Methodology

3.5.1 Monitoring Procedure

(a) The sound level meter was set on a tripod at a height of 1.2 m above the ground.

(b) Façade measurements were made at all monitoring locations.

(c) The battery condition was checked to ensure the correct functioning of the meter.

(d) Parameters such as frequency weighting, the time weighting and the measurement time were set as follows:

(i) frequency weighting: A
(ii) time weighting: Fast
(iii) time measurement: $L_{eq(30\text{-}minutes)}$ during non-restricted hours i.e. 07:00 – 1900 on normal weekdays; $L_{eq(5\text{-}minutes)}$ x3 during restricted hours i.e. 19:00 – 23:00 and 23:00 – 07:00 of normal weekdays, whole day of Sundays and Public Holidays

(e) Prior to and after each noise measurement, the meter was calibrated using the acoustic calibrator for 94dB(A) at 1000 Hz. If the difference in the calibration level before and after measurement was more than 1 dB(A), the measurement would be considered invalid and repeat of noise measurement would be required after re-calibration or repair of the equipment.

(f) During the monitoring period, the L_{eq}, L_{10} and L_{90} were recorded. In addition, site conditions and noise sources were recorded on a standard record sheet.

(g) Noise measurement was paused during periods of high intrusive noise (e.g. dog barking, helicopter noise) if possible. Observations were recorded when intrusive noise was unavoidable.

(h) Noise monitoring was cancelled in the presence of fog, rain, wind with a steady speed exceeding 5m/s, or wind with gusts exceeding 10m/s.

3.5.2 Maintenance and Calibration

(a) The microphone head of the sound level meter was cleaned with soft cloth at regular intervals.

(b) The meter and calibrator were sent to the supplier or HOKLAS laboratory to check and calibrate at yearly intervals.

(c) Calibration certificates of the sound level meters and acoustic calibrators are provided in Appendix E.

3.6 Monitoring Schedule for the Reporting Month

3.6.1 The schedule for environmental monitoring in January 2010 is provided in Appendix F.

3.7 Monitoring Results

3.7.1 As informed by the Contractor, the construction works had extended to include works during the evening time period (1900 to 2300) on all weekdays and during daytime and evening time period (0700 to 2300) on Sundays in the reporting month. Moreover, construction works had been further extended to the night-time period (2300 to 0700 of next day) on all days with effective from 28 January 2010. The construction works were conducted in accordance with the granted Construction Noise Permit (CNP) under NCO.

3.7.2 According to the requirement stipulated in Clause 3.16 of EM&A Manual, additional weekly noise impact monitoring was carried out during evening time period (1900 to 2300) on the scheduled day as stated in Appendix F (i.e. on 4, 13, 19, 25 January 2010) and during night-time period (2300 to 0700 of next day) on 28 January 2010.

3.7.3 The monitoring results for noise are summarized in Table 3.4 to 3.6and the monitoring data is provided in Appendix H.

Table 3.4 Summary of Impact Noise Monitoring Results During Daytime on Normal Weekdays in the reporting period

	Average, dB(A), $L_{eq\ (30\ mins)}$	**Range, dB(A), $L_{eq\ (30\ mins)}$**	**Limit Level, dB(A), $L_{eq\ (30\ mins)}$**
NM6	73.6	71.0 – 74.9	75

Table 3.5 Summary of Impact Noise Monitoring Results During Evening time on Normal Weekdays in the reporting period

	Average, dB(A), $L_{eq\ (5\ mins)}$	**Range, dB(A), $L_{eq\ (5\ mins)}$**	**Limit Level, dB(A), $L_{eq\ (5\ mins)}$**
NM6	64.5	60.6 – 65.9	70

Table 3.6 Summary of Impact Noise Monitoring Results During Night-time on Normal Weekdays in the reporting period

	Average, dB(A), $L_{eq\ (5\ mins)}$	**Range, dB(A), $L_{eq\ (5\ mins)}$**	**Limit Level, dB(A), $L_{eq\ (5\ mins)}$**
NM6	**63.7**	**63.7**- **63.8**	55

Remarks: The bolded and underlined measured noise levels indicated the exceedance of Limit Level.

3.7.4 According to the information provided by the Contractor, no noise complaint was received in the reporting month; hence, no Action Level exceedance was recorded.

3.7.5 No Limit Level exceedance of noise was recorded at all monitoring station in the reporting month, except the measured noise levels recorded on 28 January 2010 during night-time period. Based on the observations during the course of noise measurement and information provided by the Contractor, operation of a hydraulic extractor, a generator and two water

pumps (electric) were conducted within the Project site. The list of PME deployed on site was in accordance with the CNP (Ref: GW-RW0038-10) requirements (Group G) on types and number of PME.

According to the baseline monitoring results, an average baseline noise level of Leq(5-min) 59.6 dB(A) was recorded at NM6 during night-time period, which already exceeded the Limit Level.

Based on the information provided by the Engineers' Representative, no construction works were carried out within the site area under the Contract DC/2007/23 and DE/2009/02 during the noise monitoring period.

However, other external noise sources, like community noises and traffic noise from nearby piers, were also noted during the monitoring period, which may have attributed to the measured noise levels.

Therefore, it is believed that the Limit Level exceedance is not project-related and not solely caused by the Contractor's construction activities.

Meanwhile, the Contractor is reminded to strictly implement all noise mitigation measures as stated in the EIA, EM&A Manual, EMP, Method Statements, General and Particular Specifications of this Project to avoid any further noise Limit Level exceedance and any public complaints.

According to the EIA report, no noise sensitive receiver was identified near the site area except the FSD Diving Rescue and Diving Training Centre. It is believed that the noise exceedance recorded would have unlikely caused any impact at NSRs farther away. No public complaints have been received in relation to the construction noise from the site during the restricted hours on 28 January 2010.

3.7.6 The event action plan is annexed in Appendix J.

3.7.7 Major noise sources during the noise monitoring included nearby traffic noise, nearby cargos, other construction sites and community noises.

4 LANDSCAPE AND VISUAL

4.1 Monitoring Requirements

4.1.1 In accordance with the EM&A Manual, during the construction phase of the Project, landscape and visual monitoring should be carried out monthly with supervision by a Registered Landscape Architect (RLA). The landscape and visual monitoring is to check if the design, implementation and maintenance of the landscape and visual mitigation measures are fully effectuated.

4.1.2 A detailed report is annexed in Appendix K.

4.2 Background

4.2.1 A Baseline Review was conducted prior to the commencement of the construction contracts. The Baseline Review is to review the landscape and visual baseline conditions associated with the Project. Based on the findings given in the Baseline Review Report, the baseline landscape resources, landscape character areas and visually sensitive receivers originally identified within the EIA study area are generally unchanged and remain valid. Changes to the landscape and visual baseline are thus judged to be Insignificant.

4.3 Summary of Inspection – 20 January 2010

Matters Arising from Previous Inspections:

Nil.

Protection of Existing Trees and Tree Works:

4.3.1 It was observed existing undersized trees had been removed by Contractor to make way for the works.

4.3.2 All existing trees to be retained on site at Portion 4 works area were found to be fenced off.

4.3.3 It was advised by Engineer that application for transplanting of existing trees T500 to T509 were in progress as the trees were found to be in the works area and would affect the works.

4.3.4 It was found works has yet to be commenced in the Portion 1 area and existing trees were unaffected.

Recommendations:

4.3.5 The Contractor was reminded proper tree protection works are to be provided when carry out works near existing trees.

4.3.6 The event action plan is annexed in Appendix J.

4.4 Next Landscape and Visual Audit Schedule

4.4.1 The landscape and visual audits in the next reporting month was tentatively scheduled to 24 February 2010.

5 ENVIRONMENTAL SITE INSPECTION AND AUDIT

5.1 Site Inspection

5.1.1 Site Inspections were carried out on a weekly basis to monitor the implementation of proper environmental pollution control and mitigation measures for the Project. In the reporting month, 4 site inspections were carried out on 7, 13, 20 and 27 January 2010. Particular observations are described below. All the observations were rectified by the Contractor within the agreed time frame.

5.1.2 Air Quality

- The Contractor should ensure that the wheel washing facility at the site exit of the works area borrowed from other Contract was operating properly in order to remove deposited silt on dump trucks' wheels and bodies.
- Regular water spraying on access roads and open site areas should be provided in order to suppress any fugitive dust emission generated during dump trucks passing.
- Stockpile of excavated material placed at the work area borrowed from other Contract should be properly covered up with tarpaulin sheet to avoid fugitive dust emission.

5.1.3 Noise

- Nil.

5.1.4 Water Quality

- Mud deposited outside the diaphragm wall curbing area and within the bentonite slurry treatment plant area should be removed regularly to prevent mud washing away outside the site area, especially during raining days. Proper pumping system should be provided at the bentonite slurry treatment plant area to drain away the silty surface run-off accumulated effectively. All surface run-off should be properly desilted before discharge.
- Channels/bunds should be provided at the site boundaries to avoid any surface/storm run-off discharge to other construction sites. Proper pumping system should be deployed on site and kept in operation in order to avoid any surface/storm run-off accumulation in works area or discharge to other construction sites.

5.1.5 Chemical and Waste Management

- General refuse was observed disposed at recycle bin for plastic. It was understood from the Contractor that the old recycle bins were intended to be use as bins for general refuse, as such proper labeling should be provided for identification.

- Site tidiness should be improved. General refuse and C&D wastes scattered at the site area, site office area, works area borrowed from other Contract and those accumulated in the collection bins should be removed off-site regularly. Collection bins should be provided at site office area and works area borrowed from other Contract to ease the collection of general refuse. The Contractor should ensure the wastes were sorted properly before disposal. Additional collection bin should be provided at steel works area in order to ease the collection of recyclable steel wastes.
- Oil tank placed at the site area should be properly stored with provision of drip tray in order to retain any oil leakage.

5.2 Advice on the Solid and Liquid Waste Management Status

5.2.1 The Contractor is registered as a chemical waste producer for this Project. C & D material and waste sorting was carried out on site. Receptacles were available for general refuse and C&D wastes collection.

5.2.2 As advised by the Contractor, 2936.83 tones of C&D material were generated on site in the reporting month. 78.71 tones were mixed hard rock and soil generated on site and disposed of at Public Fill (Tuen Mun Area 38 Fill Bank). 39.12 tones were used bentonite slurry and disposed of at Public Fill (Tseung Kwan O Area 137 Fill Bank). 2819 tones were soil and slurry and disposed of at Public Fill (Tuen Mun Area 38 Fill Bank).No metals was generated and collected by registered recycling collector. No paper cardboard packing and plastic were generated on site and collected by registered recycling collector. No chemical waste was generated and collected by licensed chemical waste collectors. 19.57 tons of other types of wastes (e.g. general refuse) were generated on site and disposed of at North East New Territories (NENT) Landfill.

5.2.3 The Contractor is advised to properly maintain on site C&D material and waste sorting, collection and recording system and maximize reuse / recycle of C&D material and waste. The Contractor is reminded to properly maintain housekeeping in the site area and dispose of the wastes accumulated on site regularly and properly.

5.2.4 Moreover, the Contractor is recommended to properly plan the ordering of C&D materials required for the Project in order to avoid generation of additional C&D material for disposal.

5.3 Environmental Licenses and Permits

5.3.1 The environmental licenses and permits for this Project and valid in the reporting month is summarized in Table 5.1.

Table 5.1 Summary of Environmental Licensing and Permit Status

Statutory Reference	Description	Permit No.	Valid Period		Remarks
			From	To	
EIAO	Environmental Permit	EP-322/2008/B	02/11/09	--	- Harbour Area Treatment Scheme (HATS) Stage 2A
APCO	NA notification	--	09/11/09	19/12/11	- Whole Construction Site for Contract DC/2009/05
WPCO	Discharge License	WT00005755-2010	22/01/10	31/01/15	- Discharge of Construction Runoff from Contract DC/2009/05
WDO	Chemical Waste Producer Registration	WPN5213-269-C3572-01	23/10/2009	--	- Whole Construction Site for Contract DC/2009/05
WDO	Waste Charges Account	7009440	--	--	- Whole Construction Site for Contract DC/2009/05
NCO	Construction Noise Permit	GW-RW0500-09	13/11/09	01/05/10	- Whole Construction Site for Contract DC/2009/05
NCO	Construction Noise Permit	GW-RW0038-10	23/01/10	22/07/10	- Whole Construction Site for Contract DC/2009/05

5.4 Implementation Status of Environmental Mitigation Measures

5.4.1 In response to the site audit findings, the Contractor carried out corrective actions.

5.4.2 A summary of the Implementation Schedule of Mitigation Measures (EMIS) is presented in Appendix C. Most of the necessary mitigation measures were implemented properly.

5.5 Summary of Exceedances of the Environmental Quality Performance Limit

5.5.1 All 1-hour TSP and 24-hour TSP results were below the Action and Limit level at all monitoring location in the reporting month.

5.5.2 Referring to the information provided by the Contractor, there was no noise related complaint received in the reporting month; hence, no Action Level exceedance was recorded.

5.5.3 No Limit Level exceedance of noise was recorded at all monitoring station in the reporting month, except the measured noise levels recorded on 28 January 2010 during night-time period. Based on the observations during the course of noise measurement and information provided by the Contractor, operation of a hydraulic extractor, a generator and two water pumps (electric) were conducted within the Project site. The list of PME deployed on site was in accordance with the CNP (Ref: GW-RW0038-10) requirements (Group G) on types and number of PME.

According to the baseline monitoring results, an average baseline noise level of Leq(5-min) 59.6 dB(A) was recorded at NM6 during night-time period, which already exceeded the Limit Level.

Based on the information provided by the Engineers' Representative, no construction works were carried out within the site area under the Contract DC/2007/23 and DE/2009/02 during the noise monitoring period.

However, other external noise sources, like community noises and traffic noise from nearby piers, were also noted during the monitoring period, which may have attributed to the measured noise levels.

Therefore, it is believed that the Limit Level exceedance is not project-related and not solely caused by the Contractor's construction activities.

Meanwhile, the Contractor is reminded to strictly implement all noise mitigation measures as stated in the EIA, EM&A Manual, EMP, Method Statements, General and Particular Specifications of this Project to avoid any further noise Limit Level exceedance and any public complaints.

According to the EIA report, no noise sensitive receiver was identified near the site area except the FSD Diving Rescue and Diving Training Centre. It is believed that the noise exceedance recorded would have unlikely caused any impact at NSRs farther away. No public complaints have been received in relation to the construction noise from the site during the restricted hours on 28 January 2010.

5.5.4 Cumulative statistics of exceedances is provided in Appendix L.

5.6 Summary of Complaints, Notification of Summons and Successful Prosecutions

5.6.1 Complaints shall be referred to the ET Leader for action. The ET Leader shall undertake the following procedures upon receipt of any complaint:

- Log complaint and date of receipt onto the complaint database and inform the IC(E) immediately;
- Investigate the complaint to determine its validity, and assess whether the source of the problem is due to works activities;
- Identify mitigation measures in consultation with the IC(E) if a complaint is valid and due to works;
- Advise the Contractor and the ER if additional mitigation measures are required;
- Review the Contractor's response to identified mitigation measures, and the updated situation;
- If the complaint is transferred from EPD, submit interim report to EPD on status of the complaint investigation and follow-up action within the time frame assigned by EPD;
- Undertake additional monitoring and audit to verify the situation if necessary, and review that circumstances leading to the complaint to not recur;
- Report investigation results and subsequent actions to complainant (if the source of complaint is EPD, the results should be reported within the time frame assigned by EPD); and
- Record the complaint, investigation, the subsequent actions and the results in the monthly EM&A reports.

5.6.2 During any complaint investigation work, the Contractor and the ER shall cooperate with the ET Leader in providing all necessary information and assistance for completion of the investigation. If mitigation measures are identified in the investigation, the Contractor shall promptly carry out the mitigation. The ER shall ensure that all necessary measures have been carried out by the Contractor.

5.6.3 Referring to the information provided by the Contractor, no environmental complaint, notification of summons and successful prosecution was received in the reporting month.

5.6.4 Cumulative statistics of complaints, notification of summons and successful prosecutions is provided in Appendix L.

6 FUTURE KEY ISSUES

6.1 Construction Programme for the Coming Months

6.1.1 The major construction works in February and March 2010 will be:

- Drainage work;
- Steel cage fixing work;
- Welding work;
- Tree transplanting and protection;
- Construction of Engineer's accommodation;
- Mobilization of labours and plants;
- Establishment of bentonite slurry treatment plant at main pumping station and its inlet chamber;
- Ground treatment works at inlet chamber;
- Construction of diaphragm wall, base slab and pile cap for the main pumping station and its inlet chamber;
- Excavation for diaphragm wall at main pumping station and its inlet chamber;
- Lifting cage for diaphragm wall at main pumping station and its inlet chamber;
- Concreting to diaphragm wall at main pumping station and its inlet chamber;
- Demolish existing abandoned sewerage at main pumping station;
- Pre-drilling for mini-piles at main pumping station;
- Carrying out toe-grouting for diaphragm wall at main pumping station;
- Construction of guide wall for interconnection tunnel; and
- Diaphragm wall installation for interconnection tunnel.

6.2 Key Issues for the Coming Month

6.2.1 Key issues to be considered in the coming month included:

- Properly store and label oils and chemicals on site;
- Chemical and waste management;
- Segregation and recycling of construction waste should be properly implemented;
- Collection of construction waste should be carried out properly and regularly;
- Site runoff should be properly collected and treated prior to discharge;
- Accumulation of stagnant water in site area should be avoided;
- Suppress dust generated from bentonite slurry treatment plant, excavation activities and haul road traffic;
- Quieter powered mechanical equipment should be used; and
- Noise control measures, such as erection of movable noise barrier, should be properly maintained on site.

6.3 Monitoring Schedule for the Coming Month

6.3.1 The tentative schedule for environmental monitoring in February 2010 is provided in Appendix F.

7 CONCLUSIONS AND RECOMMENDATIONS

7.1 Conclusions

7.1.1 The construction phase of the project commenced in December 2009.

7.1.2 1-hour TSP, 24-hour TSP and noise monitoring were carried out in the reporting month.

7.1.3 All 1-hour TSP and 24-hour TSP monitoring results complied with the Action / Limit Level.

7.1.4 According to the Contractor's information, no noise complaint was received in the reporting month. Hence, no Action Level exceedance was recorded.

7.1.5 No Limit Level exceedance of noise was recorded at all monitoring station in the reporting month, except the measured noise levels recorded on 28 January 2010 during night-time period. Based on the observations during the course of noise measurement and information provided by the Contractor, the list of PME deployed on site was in accordance with the CNP requirements on types and number of PME.

According to the average baseline noise level recorded during night-time period, a Limit Level exceeding noise level had been recorded.

Based on the information provided by the Engineers' Representative, no construction works were carried out within the site area under the Contract DC/2007/23 and DE/2009/02 during the noise monitoring period.

However, other external noise sources were also noted during the monitoring period. Therefore, it is believed that the Limit Level exceedance is not project-related and not solely caused by the Contractor's construction activities.

No public complaints have been received in relation to the construction noise from the site during the restricted hours on 28 January 2010.

7.1.6 One landscape and visual audit was carried out in the reporting month. No adverse landscape and visual impact was identified during the site inspection. The Contractor was remaindered to ensure all mitigation measures listed in the EM&A Manual were properly implemented on site.

7.1.7 Environmental site inspections were carried out 4 times in January 2010. Recommendations on remedial actions were given to the Contractor for the deficiencies identified during the site audit.

7.1.8 Referring to the Contractor's information, no environmental complaint, and no notification of summons and prosecution was received in the reporting month.

7.2 Recommendations

7.2.1 According to the environmental site inspections performed in the reporting month, the following recommendations were provided:

Air Quality Impact

- Regular water spraying should be provided on all access roads and open site areas in order to avoid any fugitive dust emission generated.
- Wheel washing facilities should be provided and kept in operation at all site exits in the site area in order to remove deposited silt on dump trucks' wheels and bodies.
- Any stockpile of excavated material placed at the work area should be properly covered up with tarpaulin sheet to avoid fugitive dust emission.

Construction Noise Impact

- Nil.

Water Quality Impact

- Mud deposited outside the diaphragm wall curbing area and within the bentonite slurry treatment plant area should be removed regularly to prevent mud washing away outside the site area, especially during raining days. Proper pumping system should be provided at the bentonite slurry treatment plant area to drain away the silty surface run-off accumulated effectively. All surface run-off should be properly desilted before discharge.
- Proper drainage systems and pumping systems should be provided at the site boundaries and works area in order to cope with surface/storm run-off generated on site and prevent stagnant water accumulation in works area. All effluent discharged from the site shall be properly treated.

Chemical and Waste Management

- Housekeeping on site should be properly maintained. General refuse and C&D wastes scattered within the site area and those accumulated in the collection bins should be removed off-site regularly and sorted properly. Sufficient collection bins should be provided within the site area to ease the collection of general refuse and C&D wastes.
- Oil tank placed at the site area should be properly stored with provision of drip tray in order to retain any oil leakage.

Landscape and Visual Impact

- The Contractor was reminded proper tree protection works are to be provided when carry out works near existing trees.

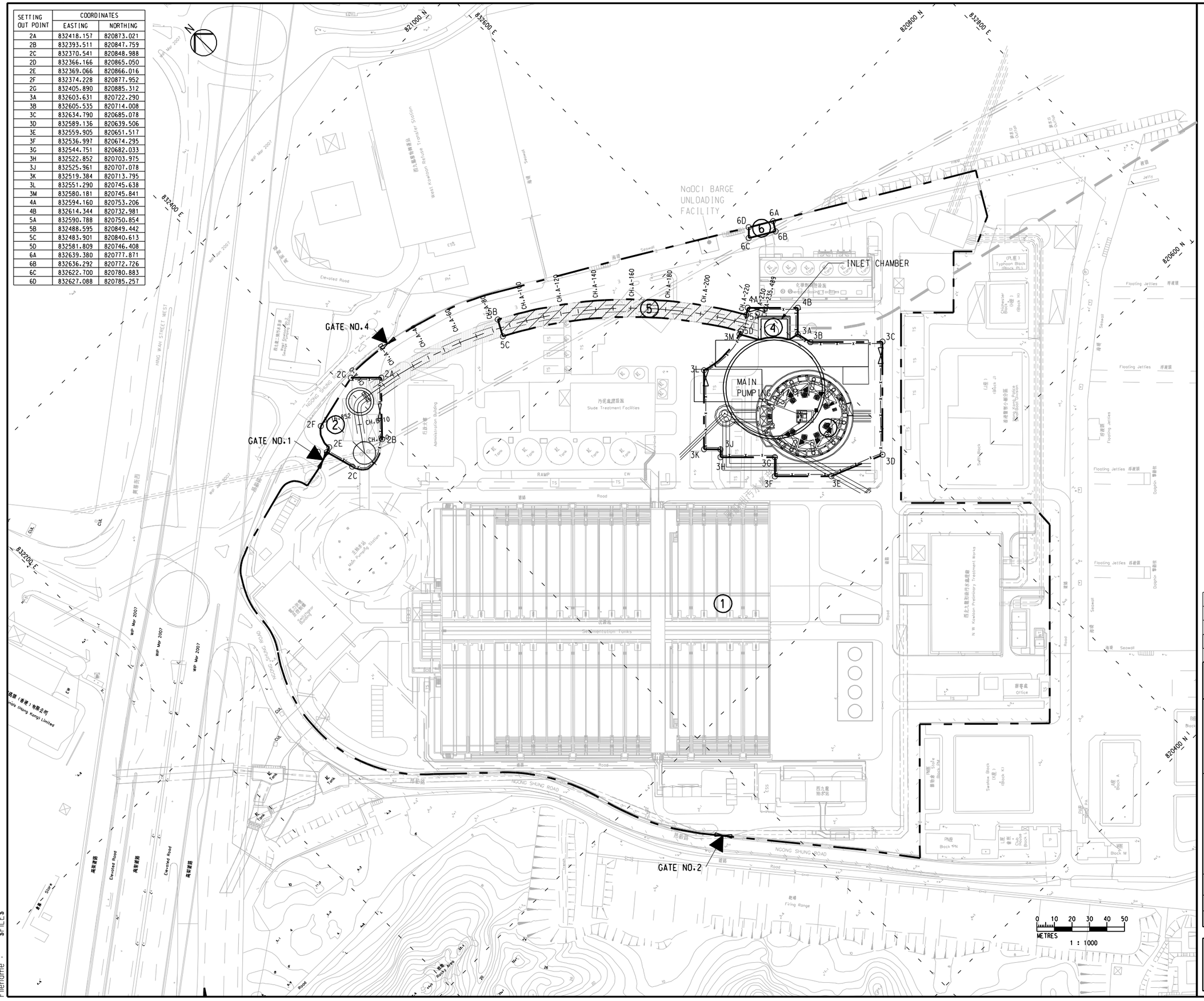
7.2.2 The Contractor has rectified all the observations as identified during environmental site inspection in the reporting month within agreed time frame.

FIGURES

FIGURE 1.1

Site Layout Plan

SETTING OUT POINT	COORDINATES	
	EASTING	NORTHING
2A	832418.157	820873.021
2B	832393.511	820847.759
2C	832370.541	820848.988
2D	832366.166	820865.050
2E	832369.066	820866.016
2F	832374.228	820877.952
2G	832405.890	820885.312
3A	832603.631	820722.290
3B	832605.535	820714.008
3C	832634.790	820685.078
3D	832589.136	820639.506
3E	832559.905	820651.517
3F	832536.997	820674.295
3G	832544.751	820682.033
3H	832522.852	820703.975
3J	832525.961	820707.078
3K	832519.384	820713.795
3L	832551.290	820745.638
3M	832580.181	820745.841
4A	832594.160	820753.206
4B	832614.344	820732.981
5A	832590.788	820750.854
5B	832488.595	820849.442
5C	832483.901	820840.613
5D	832581.809	820746.408
6A	832639.380	820777.871
6B	832636.292	820772.726
6C	832622.700	820780.883
6D	832627.088	820785.257



NOTES :

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE SPECIFIED.
2. ALL LEVELS REFER TO P.D.H.K. AND ARE IN METRES.
3. ALL GRIDS REFER TO HONG KONG 1980 GRID.

LEGEND :

- PORTION / WORKS AREA
- ① PORTION 1
- GATE
- INTERCONNECTION TUNNEL
- THE CONTRACTOR SHALL NOT COMMENCE THE TUNNELLING WORKS WITHIN THIS PORTION OF SITE UNLESS OTHER CONTRACTOR COMPLETE THE FOUNDATION WORKS FOR THE SLUDGE TREATMENT FACILITIES ON THE DATE AS SHOWN IN PS CLAUSE 1.45(7).
- — X — CHAIN LINK FENCE TYPE 1 WITH GATE

Rev	Description	By	Date
0	ISSUE FOR CONSTRUCTION	KC	09/09

Consultant
ARUP 奧雅納工程顧問 Ove Arup & Partners Hong Kong Limited

Project title
Contract No. DC/2009/05
Harbour Area Treatment Scheme Stage 2A-Construction of Interconnection Tunnel and Diaphragm Wall for Main Pumping Station at Stonecutters Island Sewage Treatment Works

Drawing title
PORTION OF SITE
(SHEET 1)

Drawing no.	Rev.
24888/DC0905/C/1003	0

Drawn	Date	Checked	Approved
NK	11/08	PW	FW

Scale: 1:1000 @A1
Status: WORKING

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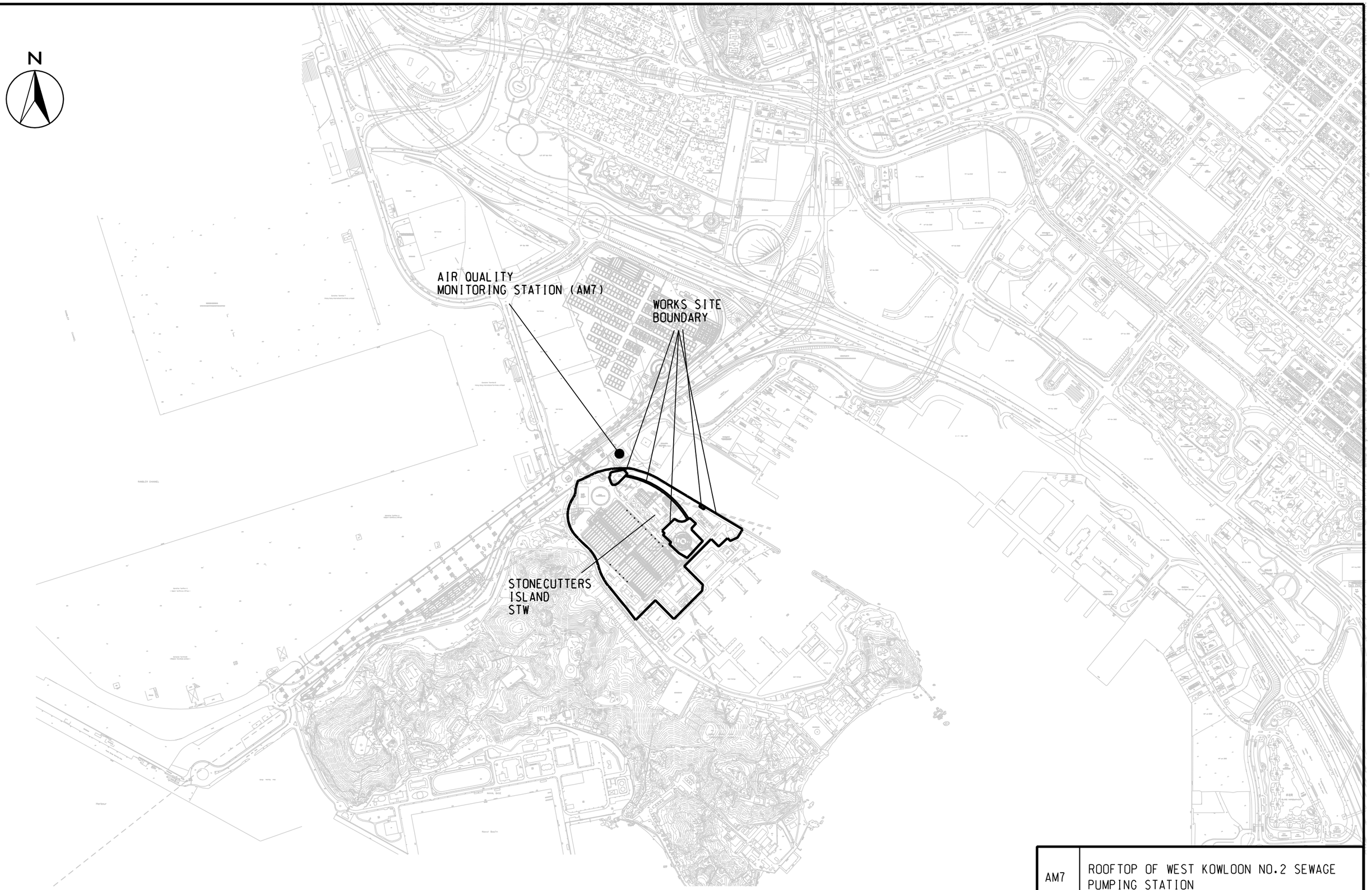
DRAINAGE SERVICES DEPARTMENT
GOVERNMENT OF THE HONG KONG SPECIAL ADMINISTRATIVE REGION

Printed by : $DATE$
Filename : $FILE$



AM7	ROOFTOP OF WEST KOWLOON NO.2 SEWAGE PUMPING STATION

AECOM

CONTRACT NO. DC/2009/05
HARBOUR AREA TREATMENT SCHEME (HATS) STAGE 2A -
CONSTRUCTION OF INTERCONNECTION TUNNEL & DIAPHRAGM WALL FOR MAIN PUMPING STATION AT SCISTW
LOCATION OF AIR QUALITY MONITORING STATION DURING IMPACT MONITORING

SCALE	N.T.S.	DATE	JAN 10
CHECK	ENFL	DRAWN	LLMC
JOB No.	60143571	FIGURE No. 2.1	REV –

P:/60143571/Drawings/DRAWING/REPORT/EM&A/BASELINE/FIG2.1.dgn

N

WORKS SITE BOUNDARY

RISER SHAFT

PRODUCTION SHAFT

STONECUTTERS ISLAND STW

NOISE MONITORING STATION (NM6)

RAMBLER CHANNEL

NAVAL BASE

NM6	CUSTOMS' MARINE BASE

AECOM

CONTRACT NO. DC/2009/05
HARBOUR AREA TREATMENT SCHEME (HATS) STAGE 2A -
CONSTRUCTION OF INTERCONNECTION TUNNEL & DIAPHRAGM WALL FOR MAIN PUMPING STATION AT SCISTW
LOCATION OF NOISE MONITORING STATION DURING IMPACT MONITORING

SCALE	N.T.S.	DATE	JAN 10
CHECK	ENFL	DRAWN	LLMC
JOB NO.	60143571	FIGURE NO.	3.1
		REV	–

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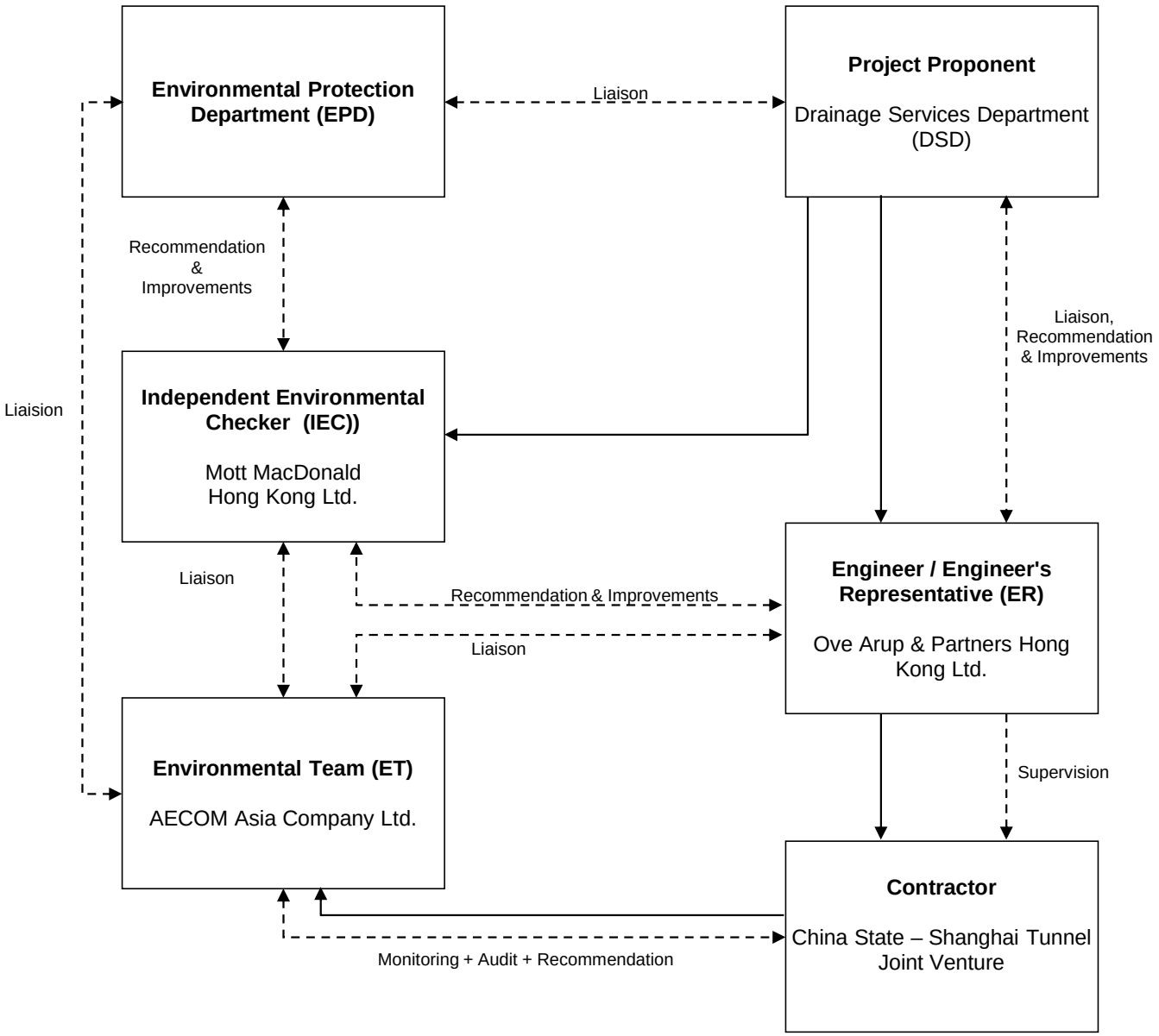
APPENDIX A

Project Organization Structure



AECOM	Contract No. DC/2009/05 **HATS Stage 2A** **Construction of Interconnection Tunnel and Diaphragm Wall for** **Main Pumping Station at SCISTW** Project Organization Structure	SCALE	N.T.S.	DATE	Dec-09
		CHECK	ENFL	DRAWN	LCHC
		JOB NO.	60143571	APPENDIX A	Rev. -

APPENDIX B

Construction Programme

Harbour Area Treatment Scheme Stage 2A
Construction of Interconnection Tunnel & D.Wall - Main Pumping Station at Stonecutters

Act ID	Description	Target Start	Target Finish	Early Start	Early Finish	Remaining Duration	Finish Variance	Total Float
KEY DATES								
Contract Dates								
(for all Works Under the Contract)								
General								
KD-1000	Letter of Acceptance	03/09/09		03/09/09 A		0	0	
KD-2000	Contract Commencement	17/09/09		17/09/09 A		0	0	
KD-2500	Contract Completion		18/12/11		16/01/12	0	-29	-29d
Sections of the Works								
(for all Works Under the Contract)								
Section I of the Works (387 days)								
KD-3000	Section I of the Works		08/10/10		08/10/10	0	0	0
Section II of the Works (730 days)								
KD-4000	Section II of the Works		16/09/11		20/09/11	0	-4	-4d
Section III of the Works (823 days)								
KD-5000	Section III of the Works		18/12/11		18/12/11	0	0	0
Access Dates								
(for all Works Under the Contract)								
Portion Handover								
KD-6000	Portion 2 (1 day)	17/09/09		17/09/09 A		0	0	
KD-6100	Portion 3 (1 day)	17/09/09		17/09/09 A		0	0	
KD-6200	Portion 4 (1 day)	17/09/09		17/09/09 A		0	0	
KD-6300	Portion 5 (Latest Possession 549 days)	19/03/11		19/03/11 *		0	0	0
KD-6400	Portion 6 (1 day)	17/09/09		17/09/09 A		0	0	
KD-6500	Portion A (1 day)	17/09/09		17/09/09 A		0	0	
KD-6600	Portion B (1 day)	17/09/09		17/09/09 A		0	0	
KD-6700	Portion C (1 day)	17/09/09		17/09/09 A		0	0	
PRELIMINARIES & GENERAL REQUIREMENTS								
Contract Preliminaries								
General Requirements								
General								
PG/10000	General Site Clearance	17/09/09	30/09/09	17/09/09 A	30/09/09 A	0	0	
PG/10010	Establish Cont & Eng's Temp Site Office	17/09/09	30/09/09	17/09/09 A	30/09/09 A	0	0	
PG/10020	Initial Survey of Site	17/09/09	07/10/09	17/09/09 A	07/10/09 A	0	0	
PG/10030	Construction of Steel Fencing & Gates	17/09/09	14/10/09	17/09/09 A	14/10/09 A	0	0	
PG/10040	Construction of Contractor Accomodation	17/09/09	15/11/09	17/09/09 A	26/11/09 A	0	-11	
PG/10050	Provision of Interim Engineer Office	17/09/09	30/09/09	17/09/09 A	30/09/09 A	0	0	
PG/10060	Submit Engineer Accomodation Proposal	17/09/09	07/10/09	17/09/09 A	18/10/09 A	0	-11	
PG/10070	Approval for Engineer's Accomodation Proposal	08/10/09	21/10/09	19/10/09 A	31/12/09	0	-70	
PG/10080	Construction of Engineer Accomodation	22/10/09	16/12/09	22/10/09 A	15/01/10	16	-30	-29d
Submissions, Approvals & Permits								
General								
PG/15000	Submission of Initial Works Programme	03/09/09	09/09/09	03/09/09 A	21/09/09 A	0	-12	
PG/15010	Engineer's Approval of Works Programme	10/09/09	24/10/09	22/09/09 A	22/10/09 A	0	2	
PG/15020	Submission of Detailed Works Programme	25/10/09	23/12/09	25/10/09 A	15/01/10	16	-23	-16d
PG/15030	Submission of 1st 3Mths Rolling Programme	29/09/09	12/10/09	03/09/09 A	16/09/09 A	0	26	
PG/15040	Submission of Draft Safety Plan	03/09/09	16/09/09	03/09/09 A	16/09/09 A	0	0	
PG/15050	Submission of Final Safety Plan	03/09/09	07/10/09	03/09/09 A	07/10/09 A	0	0	
PG/15060	Submission of Staff/ Organisation Chart	17/09/09	30/09/09	17/09/09 A	30/09/09 A	0	0	
PG/15070	Submission of Subcontractor Management Plan	03/09/09	02/10/09	03/09/09 A	02/10/09 A	0	0	
PG/15080	Submit Draft Environmental Management Plan	03/09/09	23/09/09	03/09/09 A	23/09/09 A	0	0	

Start date	03/09/09
Finish date	16/01/12
Data date	31/12/09
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Page number	1A
Project name	PR04 - December...

c Primavera Systems, Inc.

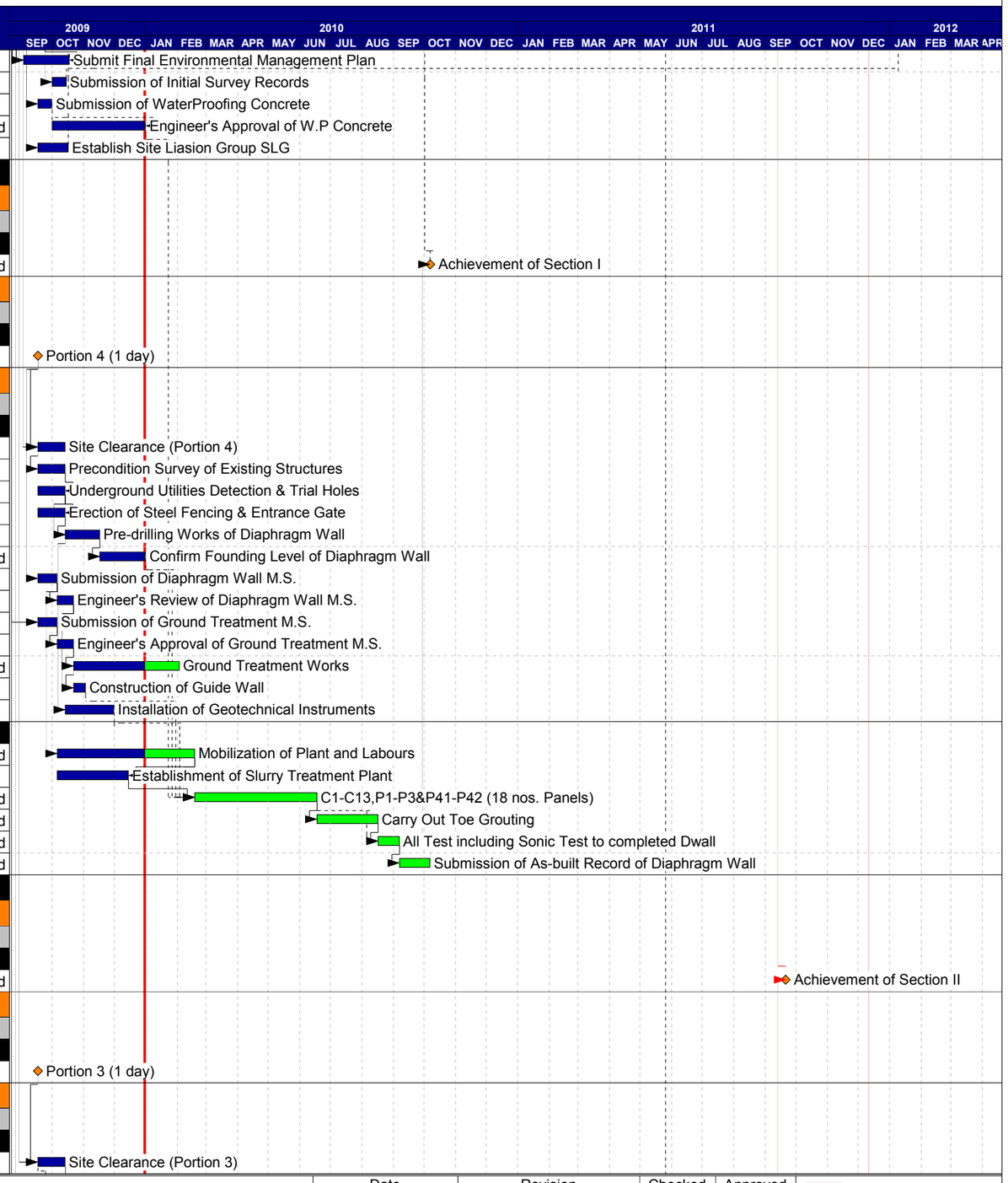
Summary of Initial Works Programme (Updated for Dec 2009)

Date	Revision	Checked	Approved

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

Harbour Area Treatment Scheme Stage 2A
Construction of Interconnection Tunnel & D.Wall - Main Pumping Station at Stonecutters

Act ID	Description	Target Start	Target Finish	Early Start	Early Finish	Remaining Duration	Finish Variance	Total Float
PG/15090	Submit Final Environmental Management Plan	09/10/09	22/11/09	03/09/09 A	17/10/09 A	0	36	
PG/15100	Submission of Initial Survey Records	01/10/09	14/10/09	01/10/09 A	14/10/09 A	0	0	
PG/15110	Submission of WaterProofing Concrete	17/09/09	30/09/09	17/09/09 A	30/09/09 A	0	0	
PG/15120	Engineer's Approval of W.P Concrete	01/10/09	04/11/09	01/10/09 A	31/12/09	1	-57	50d
PG/15130	Establish Site Liasion Group SLG	17/09/09	16/10/09	17/09/09 A	16/10/09 A	0	0	
SECTION 1 of the Works								
Sections of the Works								
(for all Works Under the Contract)								
Key Dates								
KD3000	Achievement of Section I		08/10/10		06/10/10	0	2	2d
Access Dates								
(for all Works Under the Contract)								
Portion Handover								
KD6200	Portion 4 (1 day)	17/09/09		17/09/09 A		0	0	
Inlet Chamber								
Initial Works and Associated Submissions								
S1/10000	Site Clearance (Portion 4)	17/09/09	13/10/09	17/09/09 A	13/10/09 A	0	0	
S1/10010	Precondition Survey of Existing Structures	17/09/09	13/10/09	17/09/09 A	13/10/09 A	0	0	
S1/10020	Underground Utilities Detection & Trial Holes	17/09/09	13/10/09	17/09/09 A	13/10/09 A	0	0	
S1/10030	Erection of Steel Fencing & Entrance Gate	17/09/09	13/10/09	17/09/09 A	13/10/09 A	0	0	
S1/10040	Pre-drilling Works of Diaphragm Wall	14/10/09	07/11/09	14/10/09 A	16/11/09 A	0	-7	
S1/10050	Confirm Founding Level of Diaphragm Wall	09/11/09	24/11/09	17/11/09 A	31/12/09	1	-30	39d
S1/10060	Submission of Diaphragm Wall M.S.	17/09/09	05/10/09	17/09/09 A	05/10/09 A	0	0	
S1/10070	Engineer's Review of Diaphragm Wall M.S.	06/10/09	21/10/09	06/10/09 A	21/10/09 A	0	0	
S1/10080	Submission of Ground Treatment M.S.	17/09/09	05/10/09	17/09/09 A	05/10/09 A	0	0	
S1/10090	Engineer's Approval of Ground Treatment M.S.	06/10/09	21/10/09	06/10/09 A	21/10/09 A	0	0	
S1/10100	Ground Treatment Works	22/10/09	24/11/09	22/10/09 A	02/02/10	28	-57	40d
S1/10110	Construction of Guide Wall	22/10/09	24/11/09	22/10/09 A	02/11/09 A	0	19	
S1/10120	Installation of Geotechnical Instruments	14/10/09	24/11/09	14/10/09 A	30/11/09 A	0	-5	
Diaphragm Wall								
S1/10200	Mobilization of Plant and Labours	06/10/09	24/11/09	06/10/09 A	17/02/10	38	-67	2d
S1/10205	Establishment of Slurry Treatment Plant	25/11/09	18/12/09	06/10/09 A	14/12/09 A	0	4	
S1/10210	C1-C13,P1-P3&P41-P42 (18 nos. Panels)	19/12/09	22/05/10	18/02/10	17/06/10	120	-26	2d
S1/10220	Carry Out Toe Grouting	24/05/10	06/08/10	18/06/10	16/08/10	60	-10	2d
S1/10230	All Test including Sonic Test to completed Dwall	07/08/10	01/09/10	17/08/10	06/09/10	21	-5	2d
S1/10240	Submission of As-built Record of Diaphragm Wall	02/09/10	08/10/10	07/09/10	06/10/10	30	2	2d
SECTION 2 of the Works								
Sections of the Works								
(for all Works Under the Contract)								
Key Dates								
KD4000	Achievement of Section II		16/09/11		20/09/11	0	-4	-4d
Access Dates								
(for all Works Under the Contract)								
Portion Handover								
KD6100	Portion 3 (1 day)	17/09/09		17/09/09 A		0	0	
Main Pumping Station								
Initial Works and Associated Submissions								
S2/10000	Site Clearance (Portion 3)	17/09/09	13/10/09	17/09/09 A	13/10/09 A	0	0	



Start date	03/09/09
Finish date	16/01/12
Data date	31/12/09
Run date	08/01/10
Page number	2A
Project name	PR04 - December...
c Primavera Systems, Inc.	

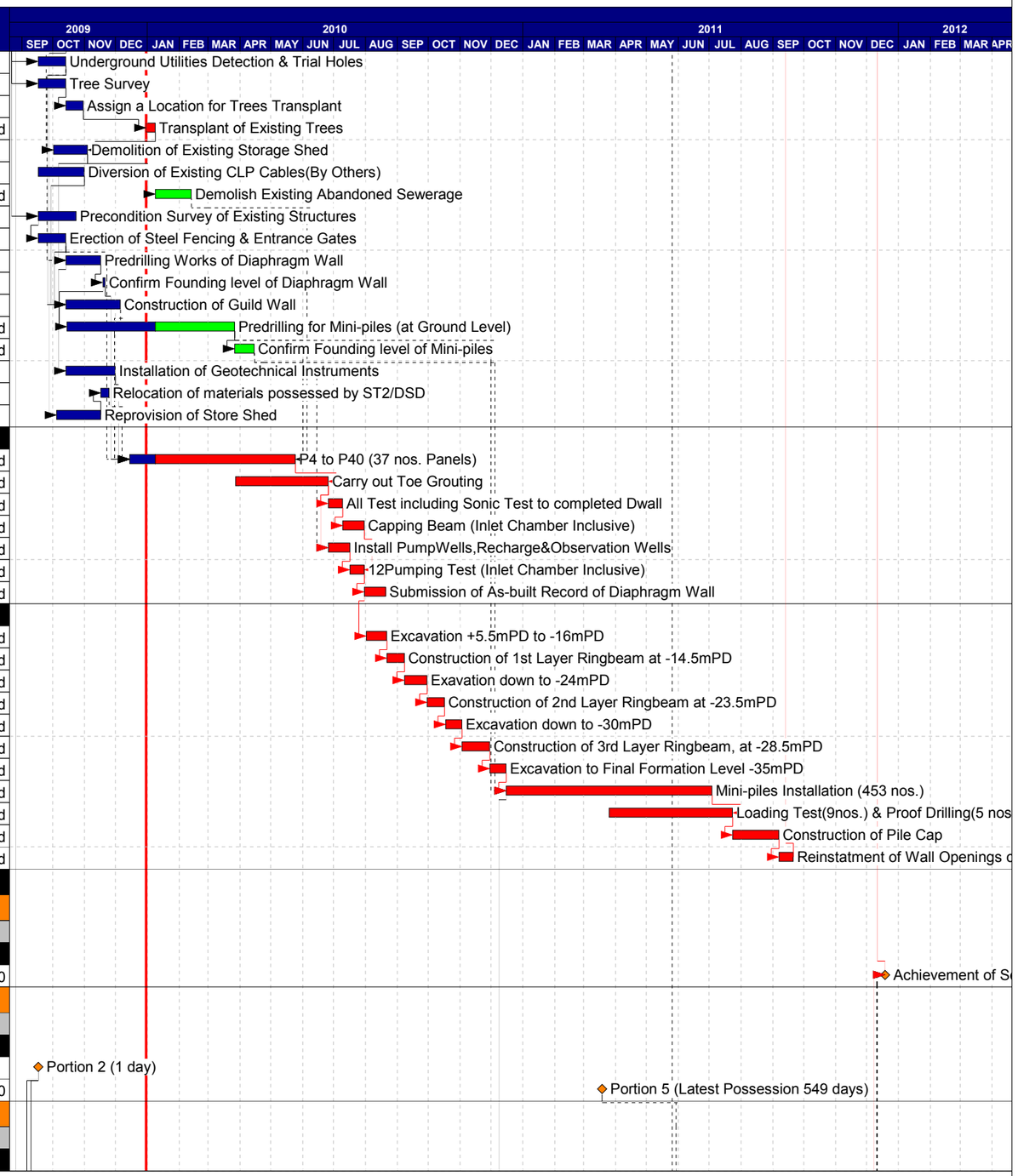
Summary of Initial Works Programme (Updated for Dec 2009)

Date	Revision	Checked	Approved

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

Harbour Area Treatment Scheme Stage 2A
Construction of Interconnection Tunnel & D.Wall - Main Pumping Station at Stonecutters

Act ID	Description	Target Start	Target Finish	Early Start	Early Finish	Remaining Duration	Finish Variance	Total Float
S2/10010	Underground Utilities Detection & Trial Holes	17/09/09	13/10/09	17/09/09 A	13/10/09 A	0	0	
S2/10020	Tree Survey	17/09/09	13/10/09	17/09/09 A	13/10/09 A	0	0	
S2/10030	Assign a Location for Trees Transplant	14/10/09	30/10/09	14/10/09 A	30/10/09 A	0	0	
S2/10040	Transplant of Existing Trees	31/10/09	07/11/09	31/12/09	08/01/10	7	-50	-4d
S2/10050	Demolition of Existing Storage Shed	02/10/09	07/11/09	02/10/09 A	03/11/09 A	0	4	
S2/10060	Diversion of Existing CLP Cables(By Others)	03/09/09	14/11/09	17/09/09 A	31/10/09 A	0	12	
S2/10070	Demolish Existing Abandoned Sewerage	03/11/09	07/12/09	09/01/10	12/02/10	30	-55	72d
S2/10080	Precondition Survey of Existing Structures	17/09/09	23/10/09	17/09/09 A	23/10/09 A	0	0	
S2/10090	Erection of Steel Fencing & Entrance Gates	17/09/09	13/10/09	17/09/09 A	13/10/09 A	0	0	
S2/10100	Predrilling Works of Diaphragm Wall	14/10/09	18/11/09	14/10/09 A	16/11/09 A	0	2	
S2/10110	Confirm Founding level of Diaphragm Wall	19/11/09	02/12/09	19/11/09 A	20/11/09 A	0	12	
S2/10120	Construction of Guild Wall	14/10/09	15/12/09	14/10/09 A	05/12/09 A	0	8	
S2/10130	Predrilling for Mini-piles (at Ground Level)	19/11/09	18/03/10	15/10/09 A	26/03/10	63	-7	39d
S2/10140	Confirm Founding level of Mini-piles	19/03/10	01/04/10	27/03/10	14/04/10	12	-7	53d
S2/10150	Installation of Geotechnical Instruments	14/10/09	05/12/09	14/10/09 A	30/11/09 A	0	5	
S2/10160	Relocation of materials possessed by ST2/DSD	25/11/09	15/12/09	17/11/09 A	24/11/09 A	0	18	
S2/10170	Reprovision of Store Shed	14/10/09	24/11/09	05/10/09 A	16/11/09 A	0	7	
Diaphragm Wall								
S2/20000	P4 to P40 (37 nos. Panels)	16/12/09	18/05/10	15/12/09 A	24/05/10	106	-4	-4d
S2/20010	Carry out Toe Grouting	24/03/10	21/06/10	28/03/10	25/06/10	90	-4	-4d
S2/20020	All Test including Sonic Test to completed Dwall	22/06/10	05/07/10	26/06/10	09/07/10	14	-4	-4d
S2/20030	Capping Beam (Inlet Chamber Inclusive)	06/07/10	26/07/10	10/07/10	30/07/10	21	-4	-4d
S2/20040	Install PumpWells,Recharge&Observation Wells	22/06/10	12/07/10	26/06/10	16/07/10	21	-4	-4d
S2/20050	12Pumping Test (Inlet Chamber Inclusive)	13/07/10	26/07/10	17/07/10	30/07/10	14	-4	-4d
S2/20060	Submission of As-built Record of Diaphragm Wall	27/07/10	16/08/10	31/07/10	20/08/10	21	-4	-4d
Other Works								
S2/30000	Excavation +5.5mPD to -16mPD	27/07/10	17/08/10	02/08/10	21/08/10	18	-4	-4d
S2/30010	Construction of 1st Layer Ringbeam at -14.5mPD	18/08/10	03/09/10	22/08/10	07/09/10	17	-4	-4d
S2/30020	Exavation down to -24mPD	04/09/10	25/09/10	08/09/10	29/09/10	18	-3	-3d
S2/30030	Construction of 2nd Layer Ringbeam at -23.5mPD	26/09/10	12/10/10	30/09/10	16/10/10	17	-4	-4d
S2/30040	Excavation down to -30mPD	13/10/10	29/10/10	18/10/10	02/11/10	14	-3	-3d
S2/30050	Construction of 3rd Layer Ringbeam, at -28.5mPD	30/10/10	25/11/10	03/11/10	29/11/10	27	-4	-4d
S2/30060	Excavation to Final Formation Level -35mPD	26/11/10	11/12/10	30/11/10	15/12/10	14	-3	-3d
S2/30070	Mini-piles Installation (453 nos.)	12/12/10	29/06/11	16/12/10	03/07/11	200	-4	-4d
S2/30080	Loading Test(9nos.) & Proof Drilling(5 nos.)	22/03/11	19/07/11	26/03/11	23/07/11	120	-4	-4d
S2/30090	Construction of Pile Cap	20/07/11	02/09/11	24/07/11	06/09/11	45	-4	-4d
S2/30100	Reinstatment of Wall Openings of Base Slab	03/09/11	16/09/11	07/09/11	20/09/11	14	-4	-4d
SECTION 3 of the Works								
Sections of the Works								
(for all Works Under the Contract)								
Key Dates								
KD5000	Achievement of Section III		18/12/11		18/12/11	0	0	0
Access Dates								
(for all Works Under the Contract)								
Portion Handover								
KD6000	Portion 2 (1 day)	17/09/09		17/09/09 A		0	0	
KD6300	Portion 5 (Latest Possession 549 days)	19/03/11		19/03/11 *		0	0	0
Inlet Chamber								
General								



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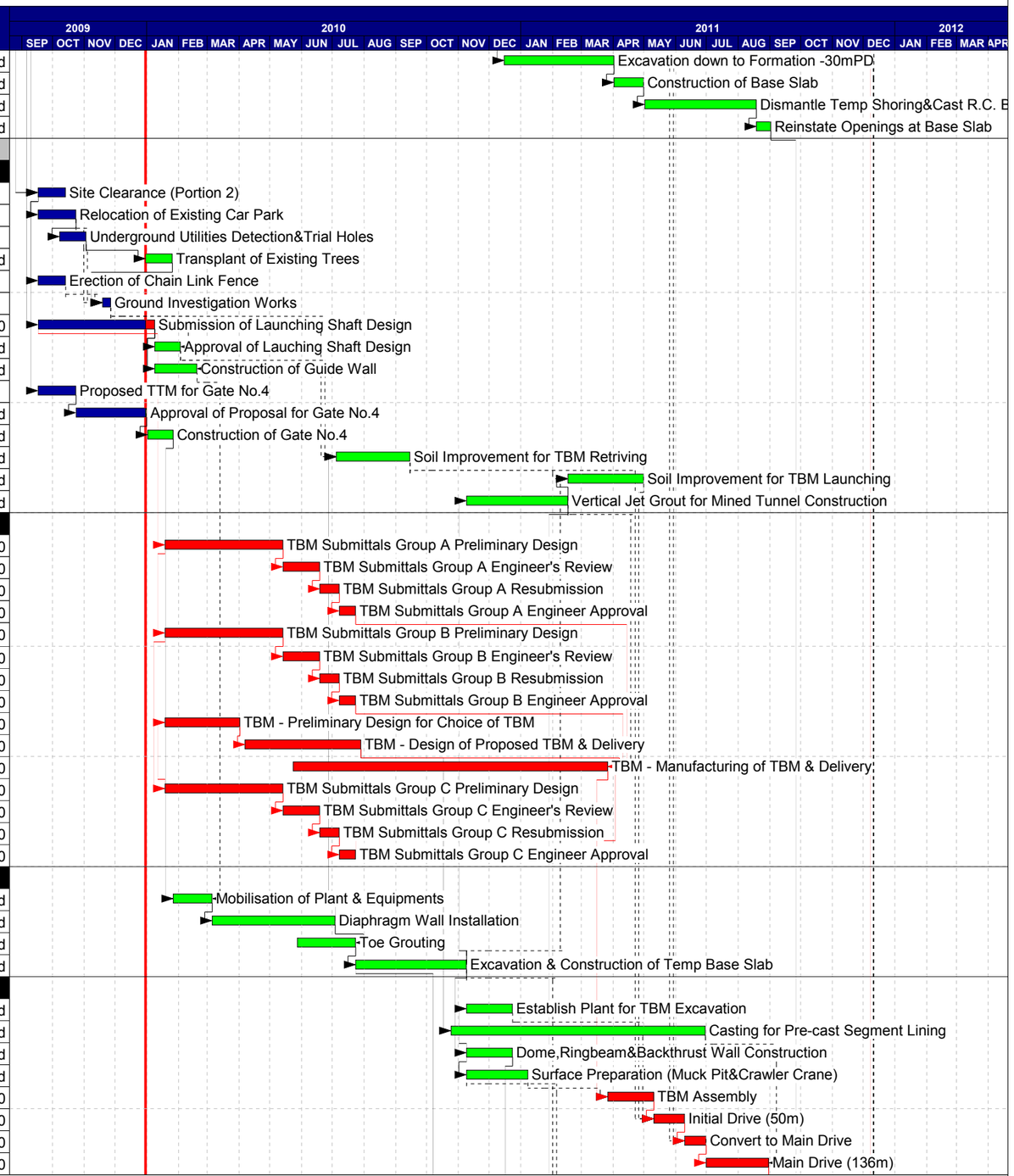
Harbour Area Treatment Scheme Stage 2A
Construction of Interconnection Tunnel & D.Wall - Main Pumping Station at Stonecutters

Act ID	Description	Target Start	Target Finish	Early Start	Early Finish	Remaining Duration	Finish Variance	Total Float
S3/10000	Excavation down to Formation -30mPD	13/12/10	29/03/11	16/12/10	01/04/11	87	-3	3d
S3/10010	Construction of Base Slab	30/03/11	27/04/11	02/04/11	30/04/11	21	-3	3d
S3/10020	Dismantle Temp Shoring&Cast R.C. Beams	28/04/11	15/08/11	02/05/11	18/08/11	88	-3	3d
S3/10030	Reinstate Openings at Base Slab	16/08/11	01/09/11	19/08/11	01/09/11	14	0	4d
Interconnection Tunnel								
Initial Works and Associated Submissions								
S3/10100	Site Clearance (Portion 2)	17/09/09	13/10/09	17/09/09 A	13/10/09 A	0	0	
S3/10110	Relocation of Existing Car Park	17/09/09	23/10/09	17/09/09 A	23/10/09 A	0	0	
S3/10120	Underground Utilities Detection&Trial Holes	08/10/09	02/11/09	08/10/09 A	02/11/09 A	0	0	
S3/10130	Transplant of Existing Trees	15/10/09	09/11/09	31/12/09	25/01/10	21	-63	37d
S3/10140	Erection of Chain Link Fence	17/09/09	13/10/09	17/09/09 A	13/10/09 A	0	0	
S3/10150	Ground Investigation Works	10/11/09	14/12/09	19/11/09 A	26/11/09 A	0	15	
S3/10160	Submission of Launching Shaft Design	17/09/09	22/12/09	17/09/09 A	08/01/10	7	-12	0
S3/10170	Approval of Lauching Shaft Design	23/12/09	19/01/10	09/01/10	02/02/10	21	-12	30d
S3/10180	Construction of Guide Wall	23/12/09	01/02/10	09/01/10	18/02/10	32	-12	19d
S3/10190	Proposed TTM for Gate No.4	17/09/09	23/10/09	17/09/09 A	23/10/09 A	0	0	
S3/10200	Approval of Proposal for Gate No.4	24/10/09	18/11/09	24/10/09 A	31/12/09	1	-35	6d
S3/10210	Construction of Gate No.4	19/11/09	12/12/09	02/01/10	26/01/10	21	-35	6d
S3/10220	Soil Improvement for TBM Retriving	08/07/10	17/09/10	05/07/10	14/09/10	60	3	131d
S3/10230	Soil Improvement for TBM Launching	24/02/11	09/05/11	16/02/11	30/04/11	60	7	7d
S3/10240	Vertical Jet Grout for Mined Tunnel Construction	10/12/10	23/02/11	09/11/10	15/02/11	80	7	7d
Detailed Design								
S3/10300	TBM Submittals Group A Preliminary Design	19/01/10	13/05/10	19/01/10	13/05/10	90	0	0
S3/10310	TBM Submittals Group A Engineer's Review	14/05/10	18/06/10	14/05/10	18/06/10	28	0	0
S3/10320	TBM Submittals Group A Resubmission	19/06/10	07/07/10	19/06/10	07/07/10	14	0	0
S3/10330	TBM Submittals Group A Engineer Approval	08/07/10	23/07/10	08/07/10	23/07/10	14	0	0
S3/10340	TBM Submittals Group B Preliminary Design	19/01/10	13/05/10	19/01/10	13/05/10	90	0	0
S3/10350	TBM Submittals Group B Engineer's Review	14/05/10	18/06/10	14/05/10	18/06/10	28	0	0
S3/10360	TBM Submittals Group B Resubmission	19/06/10	07/07/10	19/06/10	07/07/10	14	0	0
S3/10370	TBM Submittals Group B Engineer Approval	08/07/10	23/07/10	08/07/10	23/07/10	14	0	0
S3/10380	TBM - Preliminary Design for Choice of TBM	19/01/10	01/04/10	19/01/10	01/04/10	60	0	0
S3/10390	TBM - Design of Proposed TBM & Delivery	07/04/10	28/07/10	07/04/10	28/07/10	90	0	0
S3/10400	TBM - Manufacturing of TBM & Delivery	24/05/10	26/03/11	24/05/10	26/03/11	250	0	0
S3/10410	TBM Submittals Group C Preliminary Design	19/01/10	13/05/10	19/01/10	13/05/10	90	0	0
S3/10420	TBM Submittals Group C Engineer's Review	14/05/10	18/06/10	14/05/10	18/06/10	28	0	0
S3/10430	TBM Submittals Group C Resubmission	19/06/10	07/07/10	19/06/10	07/07/10	14	0	0
S3/10440	TBM Submittals Group C Engineer Approval	08/07/10	23/07/10	08/07/10	23/07/10	14	0	0
Launching Shaft Construction (Diaphragm Wall)								
S3/10500	Mobilisation of Plant & Equipments	28/12/09	01/02/10	27/01/10	05/03/10	30	-25	6d
S3/10510	Diaphragm Wall Installation	02/02/10	07/07/10	06/03/10	03/07/10	120	4	7d
S3/10520	Toe Grouting	05/06/10	30/07/10	28/05/10	23/07/10	45	6	6d
S3/10530	Excavation & Construction of Temp Base Slab	02/08/10	09/12/10	24/07/10	08/11/10	108	31	7d
Bored Tunnel Construction								
S3/10580	Establish Plant for TBM Excavation	10/12/10	23/01/11	09/11/10	23/12/10	45	31	138d
S3/10590	Casting for Pre-cast Segment Lining	25/10/10	29/06/11	25/10/10	29/06/11	200	0	5d
S3/10600	Dome,Ringbeam&Backthrust Wall Construction	10/12/10	23/01/11	09/11/10	23/12/10	45	31	7d
S3/10610	Surface Preparation (Muck Pit&Crawler Crane)	10/12/10	07/02/11	09/11/10	07/01/11	60	31	78d
S3/10620	TBM Assembly	27/03/11	10/05/11	27/03/11	10/05/11	45	0	0
S3/10630	Initial Drive (50m)	11/05/11	09/06/11	11/05/11	09/06/11	30	0	0
S3/10640	Convert to Main Drive	10/06/11	30/06/11	10/06/11	30/06/11	21	0	0
S3/10650	Main Drive (136m)	01/07/11	30/08/11	01/07/11	30/08/11	61	0	0



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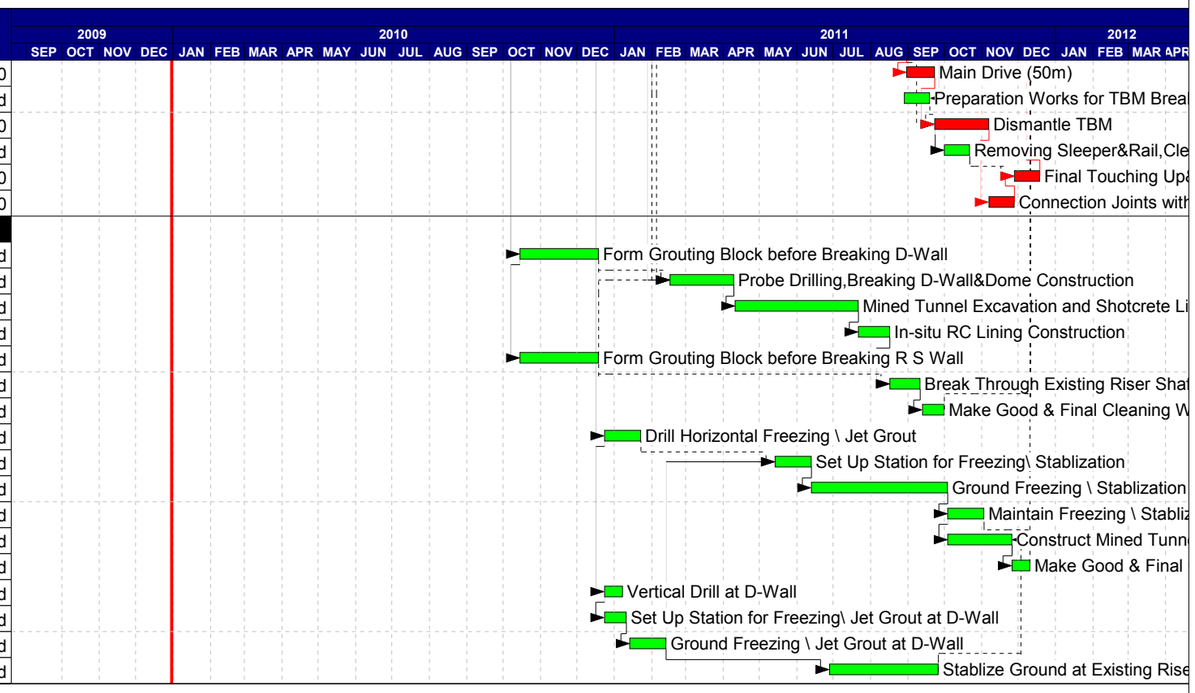
Harbour Area Treatment Scheme Stage 2A
Construction of Interconnection Tunnel & D.Wall - Main Pumping Station at Stonecutters

Act ID	Description	Target Start	Target Finish	Early Start	Early Finish	Remaining Duration	Finish Variance	Total Float
S3/10655	Main Drive (50m)	31/08/11	22/09/11	31/08/11	22/09/11	23	0	0
S3/10660	Preparation Works for TBM Breakthrough	02/09/11	22/09/11	29/08/11	18/09/11	21	4	4d
S3/10670	Dismantle TBM	23/09/11	06/11/11	23/09/11	06/11/11	45	0	0
S3/10680	Removing Sleeper&Rail,Cleaning Works	01/10/11	21/10/11	01/10/11	21/10/11	21	0	37d
S3/10690	Final Touching Up&Cleaning of Inlet Chamber	28/11/11	18/12/11	28/11/11	18/12/11	21	0	0
S3/10700	Connection Joints with Inlet Chamber	07/11/11	27/11/11	07/11/11	27/11/11	21	0	0
Mined Tunnel Construction								
S3/10750	Form Grouting Block before Breaking D-Wall			15/10/10	18/12/10	55	0	110d
S3/10800	Probe Drilling,Breaking D-Wall&Dome Construction			16/02/11	09/04/11	45	0	65d
S3/10810	Mined Tunnel Excavation and Shotcrete Lining			11/04/11	21/07/11	80	0	65d
S3/10820	In-situ RC Lining Construction			22/07/11	16/08/11	21	0	65d
S3/10825	Form Grouting Block before Breaking R S Wall			15/10/10	18/12/10	55	0	110d
S3/10830	Break Through Existing Riser Shaft Wall			17/08/11	10/09/11	21	0	65d
S3/10840	Make Good & Final Cleaning Works			13/09/11	30/09/11	15	0	65d
S3/10910	Drill Horizontal Freezing \ Jet Grout	24/01/11	22/02/11	24/12/10	22/01/11	30	31	7d
S3/10920	Set Up Station for Freezing\ Stablization	14/06/11	13/07/11	14/05/11	12/06/11	30	31	7d
S3/10930	Ground Freezing \ Stablization	14/07/11	11/10/11	13/06/11	03/10/11	90	6	6d
S3/10940	Maintain Freezing \ Stablization Environment	12/10/11	10/11/11	04/10/11	02/11/11	30	8	8d
S3/10950	Construct Mined Tunnel	12/10/11	03/12/11	04/10/11	25/11/11	53	8	8d
S3/10960	Make Good & Final Cleaning Works	04/12/11	18/12/11	26/11/11	10/12/11	15	8	8d
S3/10970	Vertical Drill at D-Wall	24/01/11	07/02/11	24/12/10	07/01/11	15	31	7d
S3/10980	Set Up Station for Freezing\ Jet Grout at D-Wall	24/01/11	10/02/11	24/12/10	10/01/11	18	31	7d
S3/10990	Ground Freezing \ Jet Grout at D-Wall	14/02/11	15/03/11	14/01/11	12/02/11	30	31	7d
S3/11000	Stablize Ground at Existing Riser Shaft Wall	29/07/11	26/10/11	28/06/11	25/09/11	90	31	69d



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APPENDIX C

Implementation Schedule of Environmental Mitigation Measures (EMIS)

APPENDIX C IMPLEMENTATION SCHEDULE OF ENVIRONMENTAL MITIGATION MEASURES (EMIS)

EIA Ref.	Recommended Mitigation Measures	Location of the measure	Implementation Status
A	***Air Quality***		
3.74	Skip hoist for material transport should be totally enclosed by impervious sheeting.	All construction sites	V
	Vehicle washing facilities should be provided at every vehicle exit point.		@
	The area where vehicle washing takes place and the section of the road between the washing facilities and the exit point should be paved with concrete, bituminous materials or hardcore.		V
	Where a site boundary adjoins a road, streets or other areas accessible to the public, hoarding of not less than 2.4 m high from ground level should be provided along the entire length except for a site entrance or exit.		N/A
	Use of regular watering, with complete coverage, to reduce dust emissions from exposed site surfaces and unpaved roads, particularly during dry weather.		@
	Side enclosure and covering of any aggregate or dusty material storage piles to reduce emissions. Where this is not practicable owing to frequent usage, watering shall be applied to aggregate fines.		@
	Open stockpiles shall be avoided or covered. Where possible, prevent placing dusty material storage piles near ASRs		@
	Tarpaulin covering of all dusty vehicle loads transported to, from and between site locations.		V
	Imposition of speed controls for vehicles on unpaved site roads. Ten kilometers per hour is the recommended limit.		V
	Every stock of more than 20 bags of cement should be covered entirely by impervious sheeting placed in an area sheltered on the top and the 3 sides.		N/A
	Every vehicle should be washed to remove any dusty materials from its body and wheels before leaving the construction sites.		@

EIA Ref.	Recommended Mitigation Measures	Location of the measure	Implementation Status
3.74	Instigation of an environmental monitoring and auditing program to monitor the construction process in order to enforce controls and modify method of work if dusty conditions arise.	All construction sites	V
B	***Airborne Noise***		
4.56–4.61	Use of quiet PME, movable barriers and acoustic mats.	All construction sites	V
4.67	Only well-maintained plant shall be operated on-site and plant shall be serviced regularly during the construction program.		V
	Silencers or mufflers on construction equipment shall be utilized and shall be properly maintained during the construction program.		V
	Mobile plant, if any, shall be sited as far away from NSRs as possible.		V
	Machines and plant (such as trucks) that may be in intermittent use shall be shut down between works periods or shall be throttled down to a minimum.		V
4.67	Plant known to emit noise strongly in one direction shall, wherever possible, be orientated so that the noise is directed away from the nearby NSRs.		V
	Material stockpiles and other structures shall be effectively utilized, wherever practicable, in screening noise from on-site construction activities.		V
C	***Water Quality***		
6.349 to 6.375	*Construction Site Runoff and General Construction Activities* The mitigation measures as outlined in the *ProPECC PN 1/94 Construction Site Drainage* should be adopted where applicable.	All construction sites	@

EIA Ref.	Recommended Mitigation Measures	Location of the measure	Implementation Status
6.376	*Effluent Discharge* There is a need to apply to EPD for a discharge licence for discharge of effluent from the construction site under the WPCO. The discharge quality must meet the requirements specified in the discharge licence. If monitoring of the treated effluent quality from the works areas is required during the construction phase of the Project, the monitoring should be carried out in accordance with the WPCO license which is under the ambit of regional office (RO) of EPD. Minimum distances of 100 m should be maintained between the discharge points of construction site effluent and the existing saltwater intakes.	All construction sites	V Application in process by EPD
6.377	*Accidental Spillage of Chemicals* Contractor must register as a chemical waste producer if chemical wastes would be produced from the construction activities. The Waste Disposal Ordinance (Cap 354) and its subsidiary regulations in particular the Waste Disposal (Chemical Waste) (General) Regulation should be observed and complied with for control of chemical wastes.		V Application in process by EPD
6.378	Any service shop and maintenance facilities should be located on hard standings within a bunded area, and sumps and oil interceptors should be provided. Maintenance of vehicles and equipment involving activities with potential for leakage and spillage should only be undertaken within the areas appropriately equipped to control these discharges.		N/A
6.379	Disposal of chemical wastes should be carried out in compliance with the Waste Disposal Ordinance. The Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes published under the Waste Disposal Ordinance details the requirements to deal with chemical wastes. General requirements are given as follows: • Suitable containers should be used to hold the chemical wastes to avoid leakage or spillage during storage, handling and transport. • Chemical waste containers should be suitably labelled, to notify and warn the personnel who are handling the wastes, to avoid accidents. • Storage area should be selected at a safe location on site and adequate space should be allocated to the storage area.		N/A

EIA Ref.	Recommended Mitigation Measures	Location of the measure	Implementation Status
6.380	*Construction Works in Close Proximity of Storm Drains or Seafront* To minimize the potential water quality impacts from the construction works located at or near any watercourse, the practices outlined below should be adopted where applicable. • The use of less or smaller construction plants may be specified to reduce the disturbance to the storm water courses or marine environment. • Temporary storage of materials (e.g. equipment, filling materials, chemicals and fuel) and temporary stockpile of construction materials should be located well away from any water courses during carrying out of the construction works. • Stockpiling of construction materials and dusty materials should be covered and located away from any water courses. • Construction debris and spoil should be covered up and/or disposed of as soon as possible to avoid being washed into the nearby water receivers. • Construction activities, which generate large amount of wastewater, should be carried out in a distance away from the waterfront, where practicable. • Proper shoring may need to be erected in order to prevent soil/mud from slipping into the storm culvert or sea.	All construction sites	@
D	***Waste Management***		
9.107	Reusable steel or concrete panel shutters, fencing and hoarding and signboard should be used as a preferred alternative to items made of wood, to minimise wastage of wood. Attention should be paid to WBTC No. 19/2001 - Metallic Site Hoardings and Signboards to reduce the amount of timber used on construction sites. Metallic alternatives to timber are readily available and should be used rather than new timber. Precast concrete units should be adopted wherever feasible to minimize the use of timber formwork.	All construction sites	V

EIA Ref.	Recommended Mitigation Measures	Location of the measure	Implementation Status
9.109	All waste materials should be segregated into categories covering: • excavated materials suitable for reuse on-site; • excavated materials suitable for public filling facilities; • remaining C&D waste for landfill; • chemical waste; and • general refuse for landfill.	All construction sites	V
9.113	Sort C&D waste from demolition of existing facilities to recover recyclable portions such as metals;		N/A
	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, PET bottles and paper by providing separate labelled bins to enable these wastes to be segregated from other general refuse generated by the work force.		V
	Any unused chemicals or those with remaining functional capacity shall be recycled.		V
	Proper storage and site practices to minimise the potential for damage or contamination of construction materials.		@
9.115	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.		V
	Training of site personnel in proper waste management and chemical waste handling procedures.		V
9.115	Develop and provide toolbox talk for on-site sorting of C&D materials to enhance worker's awareness in handling, sorting, reuse and recycling of C&D materials.		V
	Provision of sufficient waste disposal points and regular collection of waste.		@
	Regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors.		V

EIA Ref.	Recommended Mitigation Measures	Location of the measure	Implementation Status
9.125	Bentonite slurries used in diaphragm wall construction should be reconditioned and reused wherever practicable. The disposal of residual used bentonite slurry should follow the good practice guidelines stated in ProPECC PN 1/94 “Construction Site Drainage”	All construction sites	V
9.131	Adequate number of portable toilets at temporary works areas or the PTWs to ensure that sewage from site staff would be properly collected.		V
9.133	General refuse should be stored in enclosed bins, skips or compaction units separating from C&D material and disposed of at designated landfill.		V
9.135	The recyclable component of the municipal waste generated by the workforce, such as aluminium cans, paper and cleansed plastic containers should be separated from other waste. Provision and collection of recycling bins for different types of recyclable waste should be set up by the Contractor. The Contractor should also be responsible for arranging recycling companies to collect these materials.		V
9.137	If chemical wastes are produced at the construction site, the Contractor would be required to register with the EPD as a chemical waste producer and to follow the guidelines stated in the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes. Good quality containers compatible with the chemical wastes should be used, and incompatible chemicals should be stored separately. Appropriate labels should be securely attached on each chemical waste container indicating the corresponding chemical characteristics of the chemical waste, such as explosive, flammable, oxidizing, irritant, toxic, harmful, corrosive, etc. The Contractor shall use a licensed collector to transport and dispose of the chemical wastes, to either the approved Chemical Waste Treatment Centre, or another licensed facility, in accordance with the Waste Disposal (Chemical Waste) (General) Regulation.		V Application in process by EPD
9.142	Prior to excavation of the marine deposit layer, the deposit should be tested in accordance with the ETWB TC(W) No. 34/2002 and the results should be presented in a Preliminary Sediment Quality Report. The marine deposit should be disposed of at the disposal site designated by the Marine Fill Committee (MFC) or Director of Environmental Protection (DEP) depending on the test results.		N/A

EIA Ref.	Recommended Mitigation Measures	Location of the measure	Implementation Status
E	***Terrestrial Ecology***		
10.93	To implement effective noise mitigation measures as recommended in Section 4 of EIA.	All construction sites	V
10.94	Dust control practices such as regular watering, complete coverage of any aggregate or dusty material storage piles, and re-schedule of dusty activities during high-wind conditions as well as other measures recommended in Section 3 of EIA, should be implemented.		@
10.95	Fences/hoardings should be erected and installed along the boundary of the works areas.		V
10.96	Standard good site practices as suggested in Section 10 of EIA should be implemented.		@
10.97	Provision of proper drainage system and runoff control measures such as use of sand/silt traps, oil/grease separators, sedimentation tanks, etc.		@
F	***Landscape and Visual***		
Table 13.7	Topsoil, where identified, should be stripped and stored for re-use in the construction of the soft landscape works, where practical.	All construction sites	N/A
	Existing trees to be retained on site should be carefully protected during construction.		V
	Trees unavoidably affected by the works should be transplanted where practical.		V
	Compensatory tree planting should be provided to compensate for felled trees.		N/A
	Control of night-time lighting.		V

EIA Ref.	Recommended Mitigation Measures	Location of the measure	Implementation Status
Table 13.7	Erection of decorative screen hoarding compatible with the surrounding setting.	All construction sites	N/A
G	***Marine Ecology***		
11.135	To minimize the potential indirect impacts on water quality from construction site runoff and various construction activities, the practices outlined in ProPECC PN 1/94 Construction Site Drainage should be adopted.	All construction sites	@
H	***Hazard to Life***		
14A.201	Limiting use of cranes in terms of locations, lifting height, swing angle and setting up safety zone.	Exact location will be determined on construction site by the engineer	V

Legend: V = implemented;
x = not implemented;
@ = partially implemented;
N/A = not applicable

APPENDIX D

Summary of Action and Limit Levels

Appendix D - Summary of Action and Limit Levels

Table 1 – Action and Limit Levels for 1-hour TSP

Monitoring Station	Action Level ($\mu g/m^3$)	Limit Level ($\mu g/m^3$)
AM7	322	500

Table 2 – Action and Limit Levels for 24-hour TSP

Monitoring Station	Action Level ($\mu g/m^3$)	Limit Level ($\mu g/m^3$)
AM7	207	260

Table 3 – Action and Limit Levels for Construction Noise

Time Period	Monitoring Station	Action Level	Limit Level
0700-1900 hrs on normal weekdays	NM6	When one documented complaint is received from any one of the sensitive receivers	75 dB(A)
1900-2300 hrs on normal weekdays, 0700-2300 hrs on General Holidays and			70 dB(A)
2300-0700 hrs of next day on all days			55 dB(A)

APPENDIX E

Calibration Certificates of Equipments

AECOM Asia Company Limited
TSP High Volume Sampler
Field Calibration Report

Station	Rooftop of West Kowloon No. 2 Sewage Pumping Station (AM2)	Operator:	Fu Cho Yiu
Cal. Date:	23-Nov-09	Next Due Date:	23-Jan-10
Equipment No.:	A.001.12T	Serial No.	10373

Ambient Condition			
Temperature, Ta (K)	293.4	Pressure, Pa (mmHg)	762.8

Orifice Transfer Standard Information					
Serial No:	1559	Slope, mc	1.97702	Intercept, bc	-0.0007
Last Calibration Date:	18-May-09	$mc \times Qstd + bc = [DH \times (Pa/760) \times (298/Ta)]^{1/2}$			
Next Calibration Date:	18-May-10	$Qstd = \{[DH \times (Pa/760) \times (298/Ta)]^{1/2} - bc\} / mc$			

Calibration of TSP Sampler

Resistance Plate No.	Orfice			HVS Flow Recorder	
	DH (orifice), in. of water	$[DH \times (Pa/760) \times (298/Ta)]^{1/2}$	Qstd (m^3/min) **X - axis**	Flow Recorder Reading (CFM)	Continuous Flow Recorder Reading IC (CFM) **Y-axis**
18	10.6	3.29	1.66	56.0	56.54
13	7.4	2.75	1.39	49.0	49.47
10	6.3	2.53	1.28	43.0	43.42
7	4.1	2.04	1.03	36.0	36.35
5	2.5	1.60	0.81	28.0	28.27

By Linear Regression of Y on X

Slope , mw = 33.4288 **Intercept, bw =** 1.5106

Correlation Coefficient* = 0.9925

*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation

From the TSP Field Calibration Curve, take Qstd = 1.30m^3/min

From the Regression Equation, the "Y" value according to

$$mw \times Qstd + bw = IC \times [(Pa/760) \times (298/Ta)]^{1/2}$$

Therefore, Set Point; IC = (mw x Qstd + bw) x [(760 / Pa) x (Ta / 298)]$^{1/2}$= **44.54**

Remarks: _____

QC Reviewer: Yu Cho Yiu Signature: _____ Date: 24 Nov 09

Station	Rooftop of West Kowloon No. 2 Sewage Pumping St
Cal. Date:	23-Nov-09
Next Due Date:	23-Jan-10
Set Point (IC)	44.54

IC (CFM)	Qstd (m^3/min)
24	0.673
25	0.703
26	0.733
27	0.762
28	0.792
29	0.822
30	0.852
31	0.882
32	0.912
33	0.942
34	0.972
35	1.002
36	1.032
37	1.062
38	1.092
39	1.121
40	1.151
41	1.181
42	1.211
43	1.241
44	1.271
45	1.301
46	1.331
47	1.361
48	1.391
49	1.421
50	1.451
51	1.480
52	1.510
53	1.540
54	1.570
55	1.600
56	1.630
57	1.660
58	1.690
59	1.720
60	1.750
61	1.780
62	1.809
63	1.839
64	1.869
65	1.899

AECOM Asia Company Limited
TSP High Volume Sampler
Field Calibration Report

Station	Rooftop of West Kowloon No.2 Sewage Pumping Station (AM2)	Operator:	Shum Kam Yuen
Cal. Date:	19-Jan-10	Next Due Date:	19-Mar-10
Equipment No.:	A.001.12T	Serial No.	10373

Ambient Condition			
Temperature, Ta (K)	293	Pressure, Pa (mmHg)	764.5

Orifice Transfer Standard Information					
Serial No:	843	Slope, mc	2.00851	Intercept, bc	-0.02006
Last Calibration Date:	16-Nov-09	$mc \times Qstd + bc = [DH \times (Pa/760) \times (298/Ta)]^{1/2}$			
Next Calibration Date:	16-Nov-10	$Qstd = \{[DH \times (Pa/760) \times (298/Ta)]^{1/2} - bc\} / mc$			

Calibration of TSP Sampler

Resistance Plate No.	Orfice			HVS Flow Recorder	
	DH (orifice), in. of water	$[DH \times (Pa/760) \times (298/Ta)]^{1/2}$	Qstd (m^3/min) X - axis	Flow Recorder Reading (CFM)	Continuous Flow Recorder Reading IC (CFM) Y-axis
18	10.6	3.29	1.65	56.0	56.64
13	7.6	2.79	1.40	48.0	48.55
10	6.2	2.52	1.26	44.0	44.51
7	4.2	2.07	1.04	38.0	38.44
5	2.4	1.57	0.79	28.0	28.32

By Linear Regression of Y on X

Slope , mw = 32.2938 **Intercept, bw =** 3.6085

Correlation Coefficient* = 0.9953

*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation

From the TSP Field Calibration Curve, take Qstd = 1.30m^3/min

From the Regression Equation, the "Y" value according to

$$mw \times Qstd + bw = IC \times [(Pa/760) \times (298/Ta)]^{1/2}$$

Therefore, Set Point; IC = (mw x Qstd + bw) x [(760 / Pa) x (Ta / 298)]$^{1/2}$= **45.07**

Remarks:

QC Reviewer: K. H. Chek Signature: Mike Date: 19 Jan. 10

F:\High Volume Sampler\60143571\HATS-AM2

Station Rooftop of West Kowloon No.2 Sewage Pumping Sta

Cal. Date: **19-Jan-10**

Next Due Date: **19-Mar-10**

Set Point (IC) **45.07**

IC (CFM)	Qstd (m^3/min)
24	0.631
25	0.662
26	0.693
27	0.724
28	0.755
29	0.786
30	0.817
31	0.848
32	0.879
33	0.910
34	0.941
35	0.972
36	1.003
37	1.034
38	1.065
39	1.096
40	1.127
41	1.158
42	1.189
43	1.220
44	1.251
45	1.282
46	1.313
47	1.344
48	1.375
49	1.406
50	1.437
51	1.468
52	1.498
53	1.529
54	1.560
55	1.591
56	1.622
57	1.653
58	1.684
59	1.715
60	1.746
61	1.777
62	1.808
63	1.839
64	1.870
65	1.901

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AIR POLLUTION MONITORING EQUIPMENT

ORIFICE TRANSFER STANDARD CERTIFICATION WORKSHEET TE-5025A

Date - May 18, 2009 Rootsmeter S/N 9833620 Ta (K) - 293
Operator Tisch Orifice I.D. - 1559 Pa (mm) - 765.81

PLATE OR Run #	VOLUME START (m3)	VOLUME STOP (m3)	DIFF VOLUME (m3)	DIFF TIME (min)	METER DIFF Hg (mm)	ORFICE DIFF H2O (in.)
1	NA	NA	1.00	1.4130	3.2	2.00
2	NA	NA	1.00	0.9900	6.4	4.00
3	NA	NA	1.00	0.8850	7.9	5.00
4	NA	NA	1.00	0.8420	8.7	5.50
5	NA	NA	1.00	0.6970	12.7	8.00

DATA TABULATION

Vstd	(x axis) Qstd	(y axis)
1.0205	0.7222	1.4317
1.0163	1.0266	2.0247
1.0142	1.1460	2.2637
1.0132	1.2033	2.3742
1.0078	1.4459	2.8633

Qstd slope (m) = 1.97702
intercept (b) = -0.00070
coefficient (r) = 0.99992

y axis = SQRT[H2O(Pa/760)(298/Ta)]

Va	(x axis) Qa	(y axis)
0.9958	0.7047	0.8748
0.9917	1.0017	1.2371
0.9896	1.1182	1.3831
0.9886	1.1741	1.4506
0.9834	1.4109	1.7495

Qa slope (m) = 1.23797
intercept (b) = -0.00043
coefficient (r) = 0.99992

y axis = SQRT[H2O(Ta/Pa)]

CALCULATIONS

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

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

For subsequent flow rate calculations:

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

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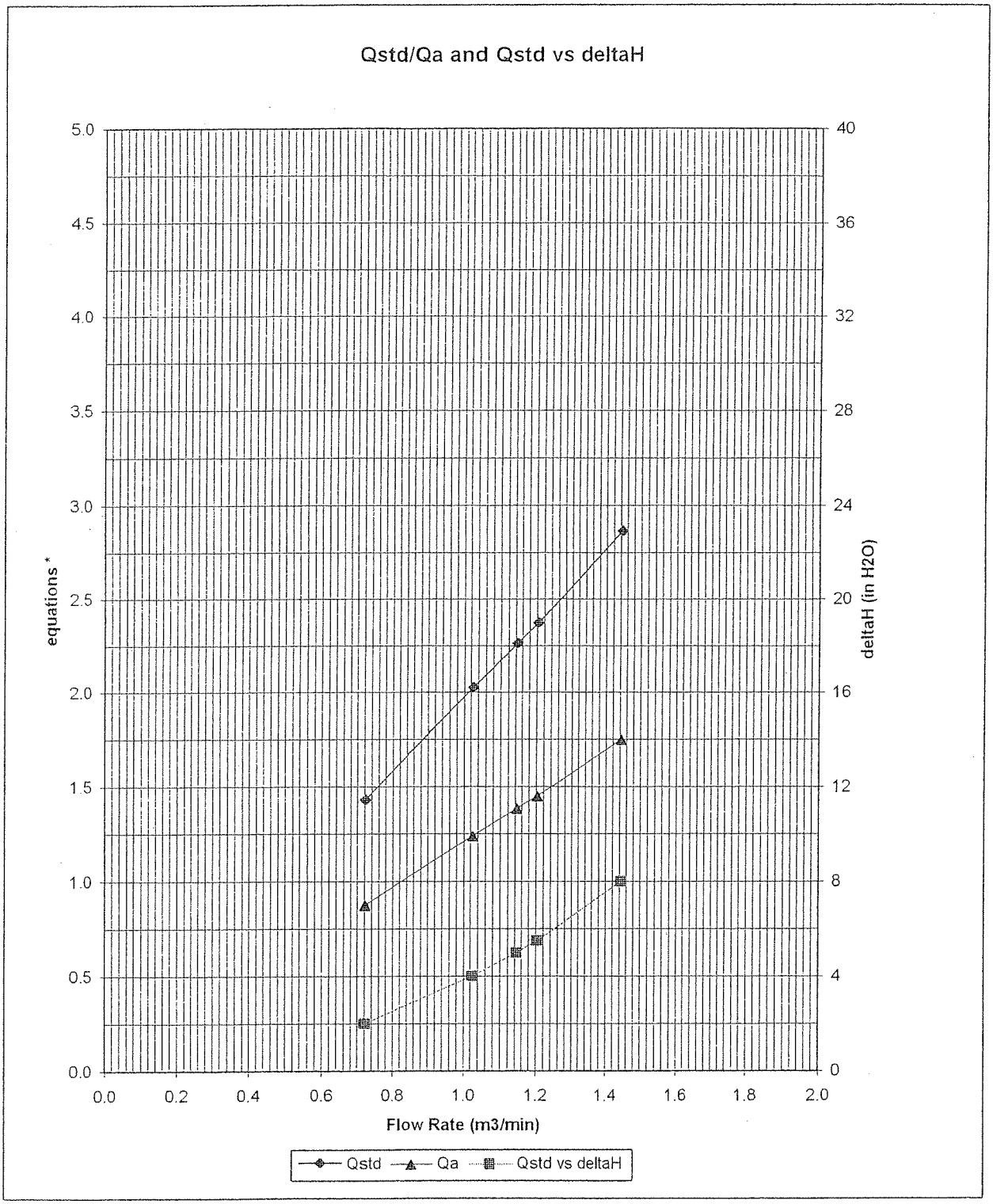
AIR POLLUTION MONITORING EQUIPMENT



* y-axis equations:

Qstd series: $\sqrt{\Delta H \left(\frac{Pa}{Pstd}\right)\left(\frac{Tstd}{Ta}\right)}$

Qa series: $\sqrt{(\Delta H\ (Ta\ /\ Pa))}$

#1559

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AIR POLLUTION MONITORING EQUIPMENT

ORIFICE TRANSFER STANDARD CERTIFICATION WORKSHEET TE-5025A

Date - Nov 16, 2009 Rootsmeter S/N 9833620 Ta (K) - 293
Operator Tisch Orifice I.D. - 0843 Pa (mm) - 753.11

PLATE OR Run #	VOLUME START (m3)	VOLUME STOP (m3)	DIFF VOLUME (m3)	DIFF TIME (min)	METER DIFF Hg (mm)	ORFICE DIFF H2O (in.)
1	NA	NA	1.00	1.4040	3.2	2.00
2	NA	NA	1.00	0.9880	6.4	4.00
3	NA	NA	1.00	0.8830	7.9	5.00
4	NA	NA	1.00	0.8420	8.8	5.50
5	NA	NA	1.00	0.6970	12.8	8.00

DATA TABULATION

Vstd	(x axis) Qstd	(y axis)
1.0035	0.7148	1.4197
0.9993	1.0114	2.0078
0.9972	1.1293	2.2448
0.9960	1.1830	2.3544
0.9907	1.4214	2.8395

Qstd slope (m) = 2.00851
intercept (b) = -0.02006
coefficient (r) = 0.99994

y axis = SQRT[H2O(Pa/760)(298/Ta)]

Va	(x axis) Qa	(y axis)
0.9957	0.7092	0.8821
0.9915	1.0036	1.2475
0.9894	1.1205	1.3947
0.9883	1.1738	1.4628
0.9830	1.4103	1.7642

Qa slope (m) = 1.25769
intercept (b) = -0.01247
coefficient (r) = 0.99994

y axis = SQRT[H2O(Ta/Pa)]

CALCULATIONS

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

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

For subsequent flow rate calculations:

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

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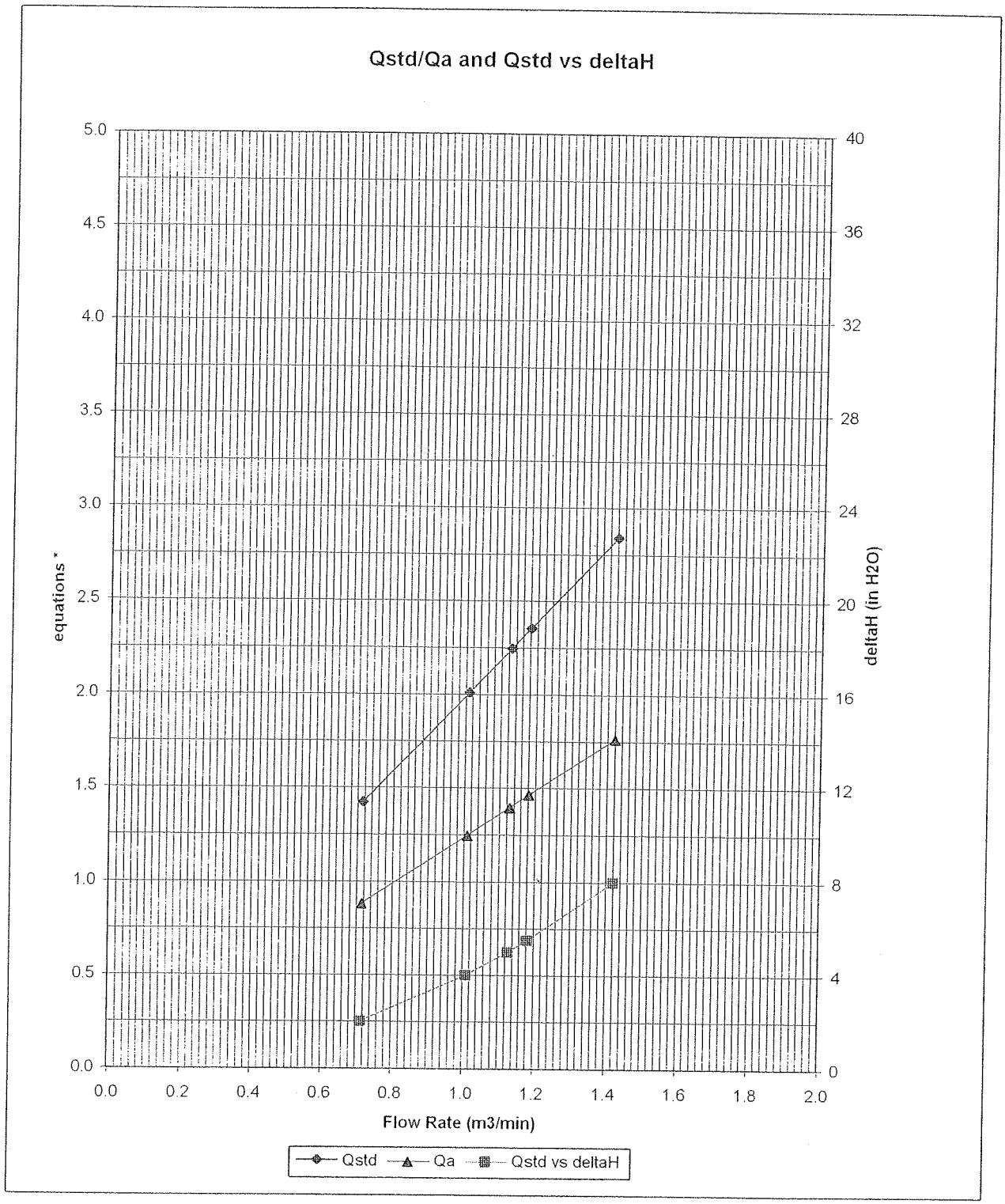
AIR POLLUTION MONITORING EQUIPMENT



* y-axis equations:

Qstd series: $\sqrt{\Delta H \left(\frac{Pa}{Pstd}\right)\left(\frac{Tstd}{Ta}\right)}$

Qa series: $\sqrt{(\Delta H\ (Ta\ /\ Pa))}$

#0843

EQUIPMENT CALIBRATION RECORD

Type: ***Laser Dust Monitor***
Manufacturer/Brand: ***SIBATA***
Model No.: ***LD-3***
Equipment No.: ***A.005.08a***
Sensitivity Adjustment Scale Setting: ***702 CPM***

Operator: *Mike Shek (MSKM)*

Standard Equipment

Equipment: *Rupprecht & Patashnick TEOM®*
Venue: *Cyberport (Pui Ying Secondary School)*
Model No.: *Series 1400AB*
Serial No: Control: *140AB219899803*
Sensor: *1200C143659803* K_o: *12500*
Last Calibration Date*: *5 June 2009*

*Remarks: Recommended interval for hardware calibration is 1 year

Calibration Result

Sensitivity Adjustment Scale Setting (Before Calibration): *702* CPM
Sensitivity Adjustment Scale Setting (After Calibration): *702* CPM

Hour	Date (dd-mm-yy)	Time	Ambient Condition		Concentration[1] (mg/m^3) **Y-axis**	Total Count[2]	Count/ Minute[3] **X-axis**
			Temp (°C)	R.H. (%)			
1	06-06-09	14:00 - 15:00	31.5	75	0.04325	2046	34.10
2	06-06-09	15:00 - 16:00	31.7	76	0.04278	2019	33.65
3	06-06-09	16:00 - 17:00	31.4	76	0.04351	2059	34.32
4	06-06-09	17:00 - 18:00	31.4	75	0.04152	1965	32.75

Note: 1. Monitoring data was measured by Rupprecht & Patashnick TEOM®
2. Total Count was logged by Laser Dust Monitor
3. Count/minute was calculated by (Total Count/60)

By Linear Regression of Y or X
Slope (K-factor): *0.0013*
Correlation coefficient: *0.9959*

Validity of Calibration Record: *5 June 2010*

Remarks:

QC Reviewer: *YW Fung* Signature: Date: 8 June 2009

EQUIPMENT CALIBRATION RECORD

Type:	***Laser Dust Monitor***
Manufacturer/Brand:	***SIBATA***
Model No.:	***LD-3B***
Equipment No.:	***A.005.12a***
Sensitivity Adjustment Scale Setting:	***805 CPM***
Operator:	*Mike Shek (MSKM)*

Standard Equipment

Equipment:	*Rupprecht & Patashnick TEOM®*		
Venue:	*Cyberport (Pui Ying Secondary School)*		
Model No.:	*Series 1400AB*		
Serial No:	Control: *140AB219899803*		
	Sensor: *1200C143659803*	K_o: *12500*	
Last Calibration Date*:	*5 June 2009*		

*Remarks: Recommended interval for hardware calibration is 1 year

Calibration Result

Sensitivity Adjustment Scale Setting (Before Calibration): *805* CPM
Sensitivity Adjustment Scale Setting (After Calibration): *805* CPM

Hour	Date (dd-mm-yy)	Time	Ambient Condition		Concentration[1] (mg/m^3) **Y-axis**	Total Count[2]	Count/ Minute[3] **X-axis**
			Temp (°C)	R.H. (%)			
1	*24-10-09*	*08:00 - 09:00*	*29.9*	*74*	*0.03432*	*1302*	*21.70*
2	*24-10-09*	*09:00 - 10:00*	*29.9*	*74*	*0.02947*	*1092*	*18.20*
3	*24-10-09*	*10:00 - 11:00*	*30.0*	*74*	*0.03588*	*1352*	*22.53*
4	*24-10-09*	*11:00 - 12:00*	*30.0*	*76*	*0.02855*	*1078*	*17.97*

Note: 1. Monitoring data was measured by Rupprecht & Patashnick TEOM®
2. Total Count was logged by Laser Dust Monitor
3. Count/minute was calculated by (Total Count/60)

By Linear Regression of Y or X
Slope (K-factor): *0.0016*
Correlation coefficient: *0.9924*

Validity of Calibration Record: *23 October 2010*

Remarks:

QC Reviewer: *YW Fung* Signature: Date: 27 Oct 2009

綜合試驗有限公司
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香港黃竹坑道37號利達中心地下、9樓、12樓、13樓及20樓 Fax : (852) 2555 7533
E-mail: smec@cigismec.com Website: www.cigismec.com

HOKLAS 026

CERTIFICATE OF CALIBRATION

Certificate No.: 09CA0311 02-05 Page 1 of 2

Item tested

Description:	Sound Level Meter (Type I)	,	Microphone
Manufacturer:	B & K	,	B & K
Type/Model No.:	2238	,	4188
Serial/Equipment No.:	2285692	,	2565556
Adaptors used:	-	,	-

Item submitted by

Customer Name:	ENSR ASIA (HK) LTD.
Address of Customer:	-
Request No.:	-
Date of request:	11-Mar-2009

Date of test: 14-Mar-2009

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Multi function sound calibrator	B&K 4226	2288444	12-Jan-2010	CIGISMEC
Signal generator	DS 360	33873	12-Jun-2009	CEPREI
Signal generator	DS 360	61227	18-Jul-2009	CEPREI

Ambient conditions

Temperature:	(22 ± 2) °C
Relative humidity:	(65 ± 15) %
Air pressure:	(1000 ± 10) hPa

Test specifications

1, The Sound Level Meter has been calibrated in accordance with the requirements as specified in BS 7580: Part 1: 1997 and the lab calibration procedure SMTP004-CA-152.
2, The electrical tests were performed using an electrical signal substituted for the microphone which was removed and replaced by an equivalent capacitance within a tolerance of ±20%.
3, The acoustic calibration was performed using an B&K 4226 sound calibrator and corrections was applied for the difference between the free-field and pressure responsess of the Sound Level Meter.

Test results

This is to certify that the Sound Level Meter conforms to BS 7580: Part 1: 1997 for the conditions under which the test was performed.

Details of the performed measurements are presented on page 2 of this certificate.

Actual Measurement data are documented on worksheets.

Approved Signatory: Huang Jian Min/Feng Jun Qi Date: 17-Mar-2009 Company Chop:

Comments: The results reported in this certificate refer to the condition of the instrument on the date of calibration and carry no implication regarding the long-term stability of the instrument.

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Hong Kong Accreditation Service (HKAS) has accredited this laboratory under the Hong Kong Laboratory Accreditation Scheme (HOKLAS) for specific laboratory activities as listed in the HOKLAS Directory of Accredited Laboratories. The results shown in this certificate were determined by this laboratory in accordance with its terms of accreditation. Such terms of accreditation stipulate that the results shall be traceable to the International System of Units (S.I.) or recognised measurement standards. This certificate shall not be reproduced except in full.

OB. NR	LOC.

MANUFACTURER'S CERTIFICATE OF CONFORMANCE

We certify that Brüel & Kjær -2250-L-- Serial No 2681366 has been tested and passed all production tests, confirming compliance with the manufacturer's published specification at the date of the test.

The final test has been performed using calibrated equipment, traceable to National or International Standards or by ratio measurements.

Brüel & Kjær is certified under ISO 9001:2000 assuring that all calibration data for test equipment are retained on file and are available for inspection upon request.

Nærum 05-maj-2009

Torben Bjørn
Vice President
Operations

Please note that this document is not a calibration certificate, for information on our calibration services please contact your nearest Brüel & Kjær Service Center.

BA 0238 – 15

WORLD HEADQUARTERS: DK-2850 Nærum · Denmark
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Brüel & Kjær

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香港黃竹坑道37號利達中心地下、9樓、12樓、13樓及20樓 Fax : (852) 2555 7533
E-mail: smec@cigismec.com Website: www.cigismec.com
HKAS 026

CERTIFICATE OF CALIBRATION

Certificate No.: 09CA0710 04-05 Page: 1 of 2

Item tested

Description:	Acoustical Calibrator (Class 1)
Manufacturer:	B&K
Type/Model No.:	BK4231
Serial/Equipment No.:	1790985 / N.004.001
Adaptors used:	-

Item submitted by

Curstomer:	ENSR ASIA (HK) LTD.
Address of Customer:	-
Request No.:	-
Date of request:	10-Jul-2009

Date of test: 14-Jul-2009

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Lab standard microphone	B&K 4180	2341427	23-Jun-2010	SCL
Preamplifier	B&K 2673	2239857	02-Dec-2009	CEPREI
Measuring amplifier	B&K 2610	2346941	03-Dec-2009	CEPREI
Signal generator	DS 360	61227	22-Jun-2010	CEPREI
Digital multi-meter	34401A	US36087050	03-Dec-2009	CIGISMEC
Audio analyzer	8903B	GB41300350	27-Nov-2009	CEPREI
Universal counter	53132A	MY40003662	23-Jun-2010	CEPREI

Ambient conditions

Temperature:	23 ± 1 °C
Relative humidity:	55 ± 10 %
Air pressure:	995 ± 10 hPa

Test specifications

1, The Sound Calibrator has been calibrated in accordance with the requirements as specified in IEC 60942 1997 Annex B and the lab calibration procedure SMTP004-CA-156.

2, The calibrator was tested with its axis vertical facing downwards at the specific frequency using insert voltage technique.

3, The results are rounded to the nearest 0.01 dB and 0.1 Hz and have not been corrected for variations from a reference pressure of 1013.25 hectoPascals as the maker's information indicates that the instrument is insensitive to pressure changes.

Test results

This is to certify that the sound calibrator conforms to the requirements of annex B of IEC 60942: 1997 for the conditions under which the test was performed. This does not imply that the sound calibrator meets IEC 60942 under any other conditions.

Details of the performed measurements are presented on page 2 of this certificate.

Approved Signatory: Huang Jian Min/Feng Jun Qi Date: 14-Jul-2009 Company Chop: SOILS & MATERIALS ENGINEERING COMPANY LTD. 綜合試驗有限公司

Comments: The results reported in this certificate refer to the conditon of the instrument on the date of calibration and carry no implication regarding the long-term stability of the instrument.

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APPENDIX F

EM&A Monitoring Schedules

DC/2009/05 - HATS Stage 2A Construction of Interconnection Tunnel and Diaphragm Wall for Main Pumping Station at SCISTW
Impact Air Quality and Noise Monitoring Schedule for January 2010

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1-Jan	2-Jan
					Public Holiday	24-hour TSP
3-Jan	4-Jan	5-Jan	6-Jan	7-Jan	8-Jan	9-Jan
	1-hour TSP Noise				24-hour TSP	1-hour TSP
10-Jan	11-Jan	12-Jan	13-Jan	14-Jan	15-Jan	16-Jan
		24-hour TSP	1-hour TSP Noise			
17-Jan	18-Jan	19-Jan	20-Jan	21-Jan	22-Jan	23-Jan
	24-hour TSP	1-hour TSP Noise				24-hour TSP
24-Jan	25-Jan	26-Jan	27-Jan	28-Jan	29-Jan	30-Jan
	1-hour TSP Noise			Noise (Night-time only)	24-hour TSP	1-hour TSP
31-Jan						

DC/2009/05 - HATS Stage 2A Construction of Interconnection Tunnel and Diaphragm Wall for Main Pumping Station at SCISTW
Tentative Impact Air Quality and Noise Monitoring Schedule for February 2010

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1-Feb	2-Feb	3-Feb	4-Feb	5-Feb	6-Feb
				24-hour TSP	1-hour TSP Noise	
7-Feb	8-Feb	9-Feb	10-Feb	11-Feb	12-Feb	13-Feb
			24-hour TSP	1-hour TSP Noise		**Public Holiday**
14-Feb	15-Feb	16-Feb	17-Feb	18-Feb	19-Feb	20-Feb
Public Holiday	**Public Holiday**	**Public Holiday**	**As informed by Contractor, no works will be carried out.**	24-hour TSP 1-hour TSP Noise		
21-Feb	22-Feb	23-Feb	24-Feb	25-Feb	26-Feb	27-Feb
	24-hour TSP	1-hour TSP Noise				24-hour TSP
28-Feb						

The schedule is subject to change due to unforeseeable circumstances (adverse weather, etc)

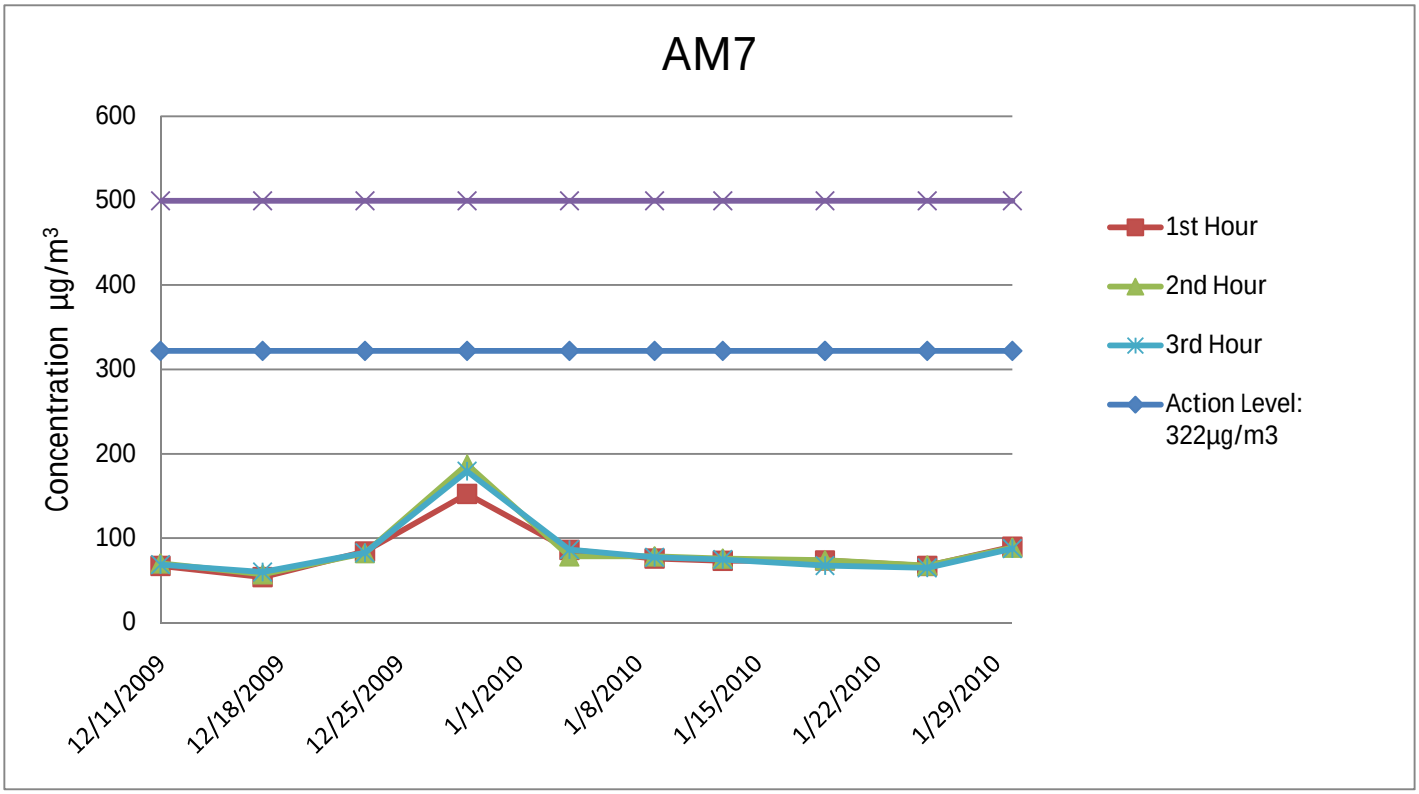
APPENDIX G

Air Quality Monitoring Results

Appendix G Air Quality Monitoring Results

1-hour TSP Monitoring Results at Station AM7 (Rooftop of West Kowloon No.2 Sewage Pumping Station)

Date	Weather Condition	Start Time (hh:mm)	1st Hour Conc. ($\mu g/m^3$)	2nd Hour Conc. ($\mu g/m^3$)	3rd Hour Conc. ($\mu g/m^3$)	Action Level Conc. ($\mu g/m^3$)	Limit Level Conc. ($\mu g/m^3$)
4-Jan-10	Sunny	9:05	86.0	78.4	86.4	**322.0**	**500.0**
9-Jan-10	Sunny	14:11	76.0	78.5	77.4	**322.0**	**500.0**
13-Jan-10	Sunny	10:21	73.2	75.7	74.7	**322.0**	**500.0**
19-Jan-10	Fine	10:30	73.6	73.9	67.4	**322.0**	**500.0**
25-Jan-10	Fine	11:00	67.1	67.6	64.9	**322.0**	**500.0**
30-Jan-10	Sunny	10:29	89.9	88.8	87.7	**322.0**	**500.0**
				Average	77.1		
				Min	64.9		
				Max	89.9		



AECOM	HATS Stage 2A - Construction of Interconnection Tunnel and Diaphragm Wall for Main Pumping Station at SCISTW	SCALE	N.T.S.	DATE	Feb-10
		CHECK	ENFL	DRAWN	LCHC
	Graphical Presentation of 1-hour TSP Monitoring Results	JOB NO.	60143571	APPENDIX No. G	Rev. -

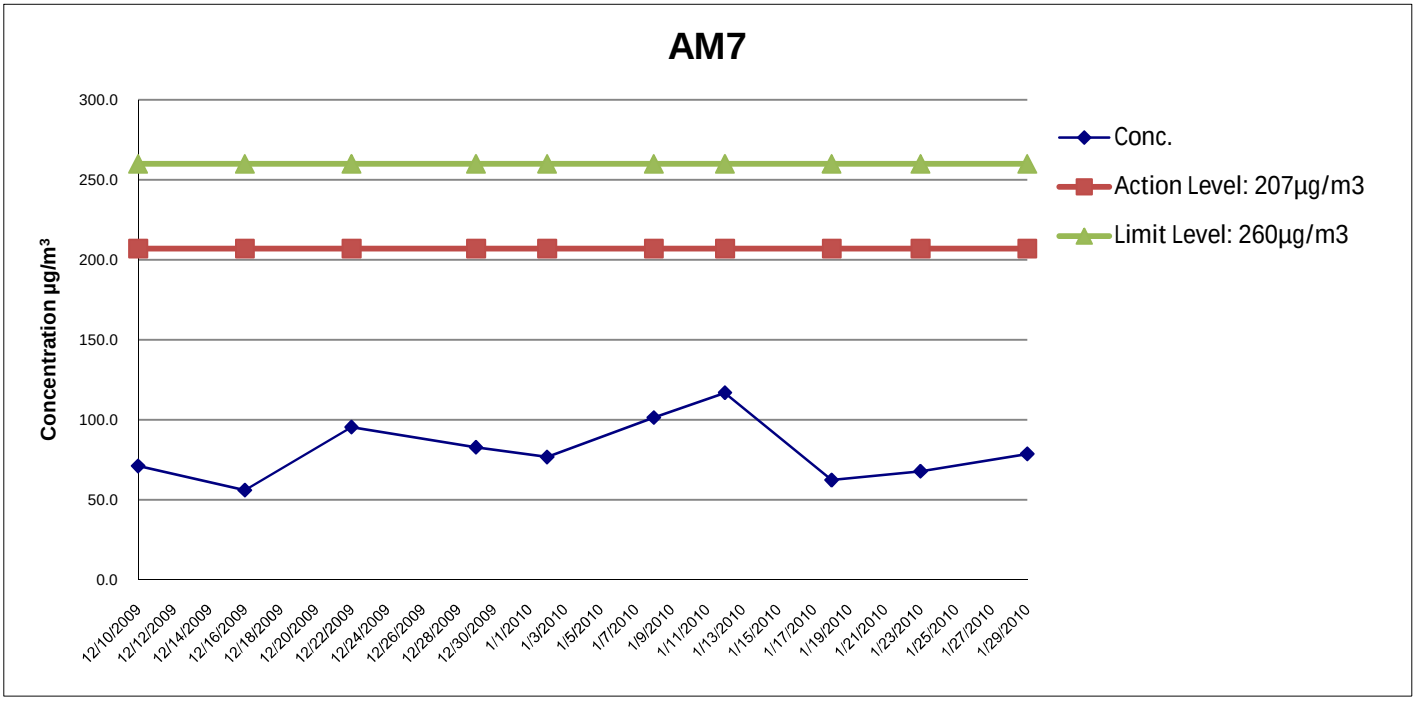
Appendix G
Air Quality Monitoring Results

24-hour TSP Monitoring Results at Station AM7 (Rooftop of West Kowloon No.2 Sewage Pumping Station)

Date	Weather Condition	Air Temp. (^{o}C)	Atmospheric Pressure(hPa)	Flow Rate (m^3/min.)		Av. flow (m^3/min)	Total vol. (m^3)	Filter Weight (g)		Particulate weight(g)	Elapse Time		Sampling Time(hrs.)	Conc. ($\mu g/m^3$)
				Initial	Final			Initial	Final		Initial	Final		
2-Jan-10	Sunny	20	1016.1	1.33	1.33	1.33	1916.6	3.4495	3.5965	0.1470	5805.89	5829.89	24.00	76.7
8-Jan-10	Sunny	15	1020.6	1.33	1.33	1.33	1916.6	3.4457	3.6399	0.1942	5829.89	5853.89	24.00	101.3
12-Jan-10	Sunny	15	1023	1.33	1.33	1.33	1916.6	3.4471	3.6711	0.2240	5853.89	5877.89	24.00	116.9
18-Jan-10	Sunny	19.7	1023.8	1.33	1.33	1.33	1916.6	3.4448	3.5643	0.1195	5877.89	5901.89	24.00	62.3
23-Jan-10	Sunny	16.6	1022.7	1.33	1.33	1.33	1916.6	3.4407	3.5707	0.1300	5901.89	5925.89	24.00	67.8
29-Jan-10	Sunny	19.5	1019.4	1.33	1.33	1.33	1916.6	3.4971	3.6479	0.1508	5924.86	5948.86	24.00	78.7
													Average	84.0
													Min	62.3
													Max	116.9

Remarks:

Action Level	Limit Level
Conc. ($\mu g/m^3$)	***Conc.*** ($\mu g/m^3$)
207.0	**260.0**



AECOM	HATS Stage 2A - Construction of Interconnection Tunnel and Diaphragm Wall for Main Pumping Station at SCISTW	SCALE	N.T.S.	DATE	Feb-10
		CHECK	ENFL	DRAWN	LCHC
	Graphical Presentation of 24-hour TSP Monitoring Results	JOB NO.	60143571	APPENDIX No. G	Rev. -

APPENDIX H

Noise Monitoring Results

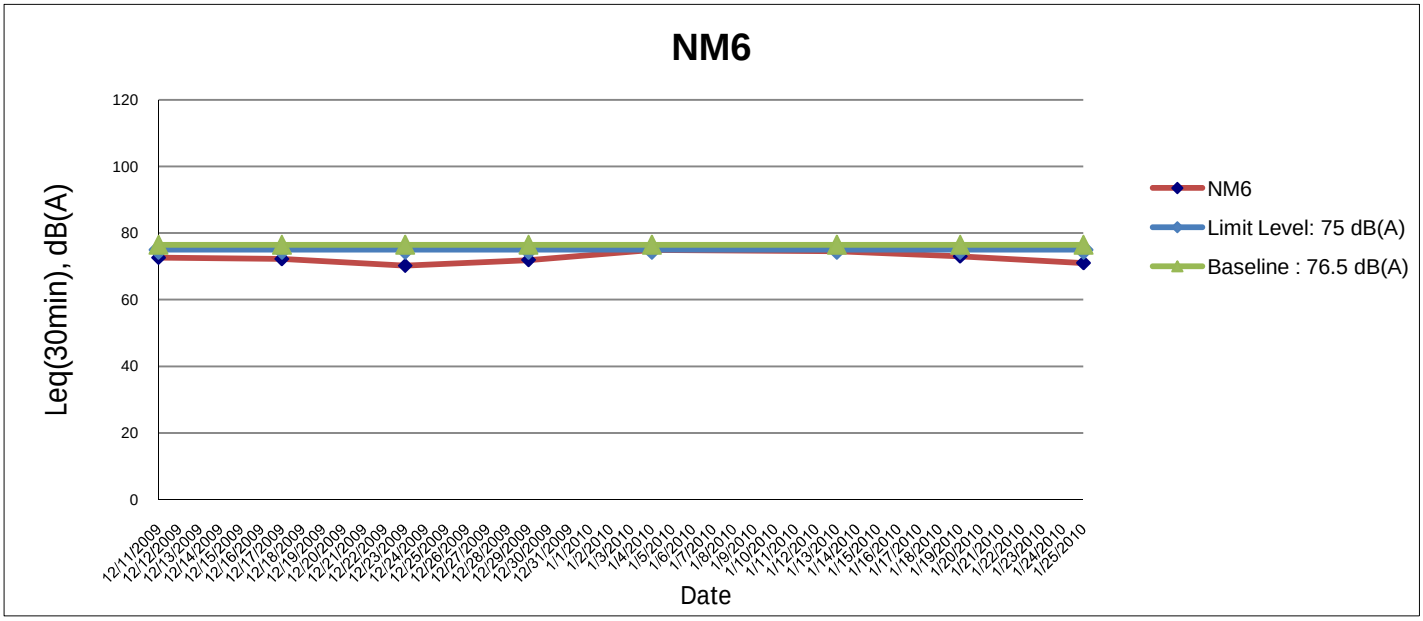
Appendix H Noise Monitoring Results

Location : NM6 Customs' Marine Base (Block H of Government Dockyard) Rooftop

Daytime (07:00-19:00 hrs) Noise Monitoring Results on Normal Weekdays

Date	Weather Condition	Time	Noise Level for 30-min, dB(A)[+]			Baseline Noise Level, dB(A)	Limit Level, dB(A)	Exceedance (Y/N)
		hh:mm	Leq	L10	L90			
4-Jan-10	Sunny	16:23	74.9	75.0	74.0	76.5	75	N
13-Jan-10	Sunny	16:37	74.5	76.1	72.2	76.5	75	N
19-Jan-10	Fine	16:31	73.0	74.0	71.8	76.5	75	N
25-Jan-10	Fine	14:06	71.0	71.7	70.1	76.5	75	N
		Average	73.6	-	-			
		Min	71.0	71.7	70.1			
		Max	74.9	76.1	74.0			

[+] - Façade measurement



AECOM	HATS Stage 2A - Construction of Interconnection Tunnel and Diaphragm Wall for Main Pumping Station at SCISTW	SCALE	N.T.S.	DATE	Feb-10
		CHECK	ENFL	DRAWN	LCHC
	Graphical Presentation of Daytime Noise Monitoring Results on Normal Weekdays	JOB NO.	60143571	APPENDIX No. H	Rev. -

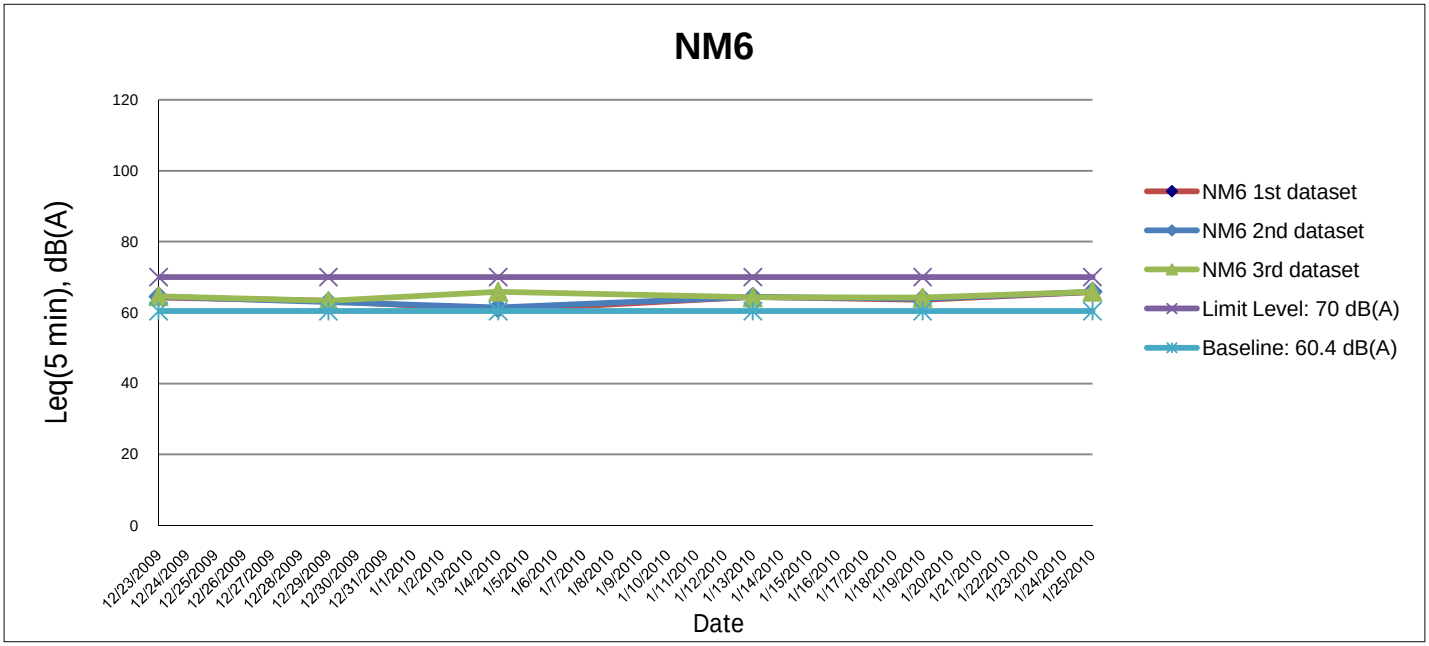
Appendix H Noise Monitoring Results

Location : NM6 Customs' Marine Base (Block H of Government Dockyard) Rooftop

Evening time (19:00-23:00 hrs) Noise Monitoring Results on Normal Weekdays

Date	Start Time	End Time	Noise Level for 5-min, dB(A)[+]			Baseline Noise Level, dB(A)	Limit Level, dB(A)	Exceedance (Y/N)
	hh:mm	hh:mm	Leq	L10	L90			
4-Jan-10	19:01	19:06	60.6	61.6	58.7	60.4	70	N
	19:06	19:11	61.4	62.8	59.7	60.4	70	N
	19:11	19:16	65.9	66.5	59.2	60.4	70	N
13-Jan-10	19:01	19:06	64.4	64.5	64.0	60.4	70	N
	19:06	19:11	64.4	64.5	64.0	60.4	70	N
	19:11	19:16	64.3	64.5	63.5	60.4	70	N
19-Jan-10	19:01	19:06	63.6	64.0	63.0	60.4	70	N
	19:06	19:11	63.9	64.5	63.0	60.4	70	N
	19:11	19:16	64.2	64.5	63.5	60.4	70	N
25-Jan-10	19:06	19:11	65.8	66.5	65.0	60.4	70	N
	19:11	19:16	65.9	66.5	65.0	60.4	70	N
	19:16	19:21	65.9	66.5	65.0	60.4	70	N
		Average	64.5	-	-			
		Min	60.6	61.6	58.7			
		Max	65.9	66.5	65.0			

[+] - Façade measurement



AECOM	**HATS Stage 2A - Construction of Interconnection Tunnel and Diaphragm Wall for Main Pumping Station at SCISTW**	SCALE	N.T.S.	DATE	Feb-10
		CHECK	ENFL	DRAWN	LCHC
	Graphical Presentation of Evening Noise Monitoring Results on Normal Weekdays	JOB NO.	60143571	**APPENDIX No.** H	**Rev.** -

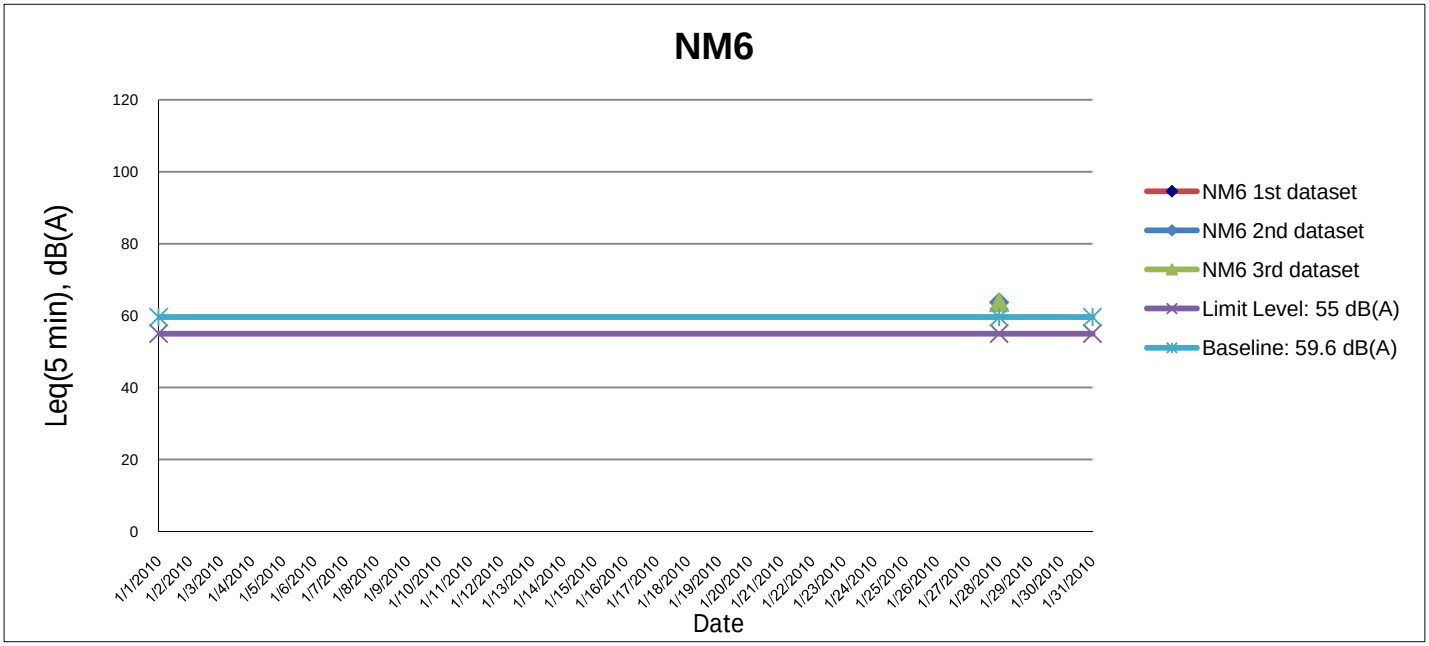
Appendix H Noise Monitoring Results

Location : NM6 Customs' Marine Base (Block H of Government Dockyard) Rooftop

Night-time (23:00 - 0700 hrs of next day) Noise Monitoring Results on Normal Weekdays

Date	Start Time	End Time	Noise Level for 5-min, dB(A)+			Baseline Noise Level, dB(A)	Limit Level, dB(A)	Exceedance (Y/N)
	hh:mm	hh:mm	Leq	L10	L90			
28-Jan-10	23:01	23:06	63.8	64.2	63.5	59.6	55	N
	23:06	23:11	63.7	64.1	63.4	59.6	55	N
	23:11	23:16	63.7	64.1	63.4	59.6	55	N
		Average	63.7	-	-			
		Min	63.7	64.1	63.4			
		Max	63.8	64.2	63.5			

+ - Façade measurement



AECOM	**HATS Stage 2A - Construction of Interconnection Tunnel and Diaphragm Wall for Main Pumping Station at SCISTW**	SCALE	N.T.S.	DATE	Feb-10
		CHECK	ENFL	DRAWN	LCHC
	Graphical Presentation of Evening Noise Monitoring Results on Normal Weekdays	JOB NO.	60143571	**APPENDIX No.** H	**Rev.** -

APPENDIX I

Meteorological Data for January 2010

E X T R A C T O F M E T E O R O L O G I C A L O B S E R V A T I O N S

CHEUNG SHA WAN AUTOMATIC WEATHER STATION

JANUARY 2010

Date	Mean Pressure AT M.S.L.	Air Temperature Max.	Air Temperature Mean	Air Temperature Min.	Mean Dew Point	Relative Humidity Max.	Relative Humidity Mean	Relative Humidity Min.	Total Rainfall	Prevailing Wind Direction	Mean Wind Speed	Maximum Gust
JAN	hPa	°C	°C	°C	°C	%	%	%	mm	degrees	km/h	km/h
1	******	****	****	****	*****	***	***	***	*****	100	8.7	34.0
2	******	****	****	****	*****	***	***	***	*****	100#	5.9#	40.0#
3	******	****	****	****	*****	***	***	***	*****	100	5.3	20.0
4	******	****	****	****	*****	***	***	***	*****	110	5.7	22.0
5	******	****	****	****	*****	***	***	***	*****	090	10.8	41.0
6	******	****	****	****	*****	***	***	***	*****	070	6.5	27.0
7	******	****	****	****	*****	***	***	***	*****	060	4.9	22.0
8	******	****	****	****	*****	***	***	***	*****	350	3.9	22.0
9	******	****	****	****	*****	***	***	***	*****	100	7.5	22.0
10	******	****	****	****	*****	***	***	***	*****	100	7.4	25.0
11	******	****	****	****	*****	***	***	***	*****	090	4.8	40.0
12	******	****	****	****	*****	***	***	***	*****	010	7.4	40.0
13	******	****	****	****	*****	***	***	***	*****	060	6.2	31.0
14	******	****	****	****	*****	***	***	***	*****	100	8.0	31.0
15	******	****	****	****	*****	***	***	***	*****	110	8.3	27.0
16	******	****	****	****	*****	***	***	***	*****	100	6.0	23.0
17	******	****	****	****	*****	***	***	***	*****	050	6.0	23.0
18	******	****	****	****	*****	***	***	***	*****	100	7.4	23.0
19	******	****	****	****	*****	***	***	***	*****	110#	7.3#	25.0#
20	******	****	****	****	*****	***	***	***	*****	120	4.5	16.0
21	******	****	****	****	*****	***	***	***	*****	110	5.2	20.0
22	******	****	****	****	*****	***	***	***	*****	110	10.0	31.0
23	******	****	****	****	*****	***	***	***	*****	050	6.1	30.0
24	******	****	****	****	*****	***	***	***	*****	110	4.8	16.0
25	******	****	****	****	*****	***	***	***	*****	220	4.3	27.0
26	******	****	****	****	*****	***	***	***	*****	070	6.8	22.0
27	******	****	****	****	*****	***	***	***	*****	110	7.1	25.0
28	******	****	****	****	*****	***	***	***	*****	210	4.3	14.0
29	******	****	****	****	*****	***	***	***	*****	090	8.6	31.0
30	******	****	****	****	*****	***	***	***	*****	100	8.4	31.0
31	******	****	****	****	*****	***	***	***	*****	100	5.1	20.0
MEAN	******	****	****	****	*****	***	***	***	-----	100#	6.6#	-----
TOTAL	------	----	----	----	-----	--	--	--	******	---	-----	-----
MAXIMUM	******	****	****	****	*****	***	***	***	*****	---	10.8#	41.0#
MINIMUM	******	****	****	****	*****	***	***	***	*****	---	3.9#	-----

60-minute mean wind (ending on the hour) used

*** unavailable

missing (less than 24 hourly observations a day)

APPENDIX J

Event Action Plan

Appendix J – Event Action Plan

Event and Action Plan for Construction Air Quality

Event	ACTION			
	ET	**IEC**	**ER**	**Contractor**
ACTION LEVEL				
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.
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. Supervise 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.

Event and Action Plan for Construction Air Quality

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

Event and Action Plan for Construction Noise

Event	Action			
	ET	**IEC**	**ER**	**Contractor**
Exceedance for Action Level	1. Notify ER, IEC and Contractor; 2. Carry out investigation; 3. Report the results of investigation to ER, IEC and Contractor; 4. Discuss with IEC and Contractor on remedial measures required; 5. Increase monitoring frequency to check mitigation effectiveness.	1. Review the investigation results submitted by ET; 2. Review the proposed remedial measures by Contractor and advise ER accordingly; 3. Advise 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 IEC, agree with Contractor on 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.
Exceedance for 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 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 ER accordingly.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. In consolidation with IEC, agree with Contractor on the remedial measures to be implemented; 4. Supervise the implementation of remedial measures; 5. If exceedance continues, consider stopping 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 ER until the exceedance is abated.

Event and Action Plan for Landscape and Visual Impact during Construction Phase

Event	Action			
	ET	**IEC**	**ER**	**Contractor**
Non-conformity on one occasion	1. Identify source; 2. Inform IEC and ER; 3. Discuss remedial actions with IEC, ER and Contractor; 4. Monitor remedial action until rectification has been completed.	1. Check report; 2. Check Contractor's working method; 3. Discuss with ER and Contractor on possible remedial measures; 4. Advise ER on effectiveness of proposed remedial measures.	1. Notify Contractor; 2. Ensure remedial measures are properly implemented.	1. Amend working methods; 2. Rectify damage and undertake remedial measures or any necessary replacement.
Repeated Non-conformity	1. Identify source; 2. Inform IEC and ER; 3. Increase monitoring (site audit) frequency; 4. Discuss remedial actions with IEC, ER and Contractor; 5. Monitor remedial actions until rectification has been completed; 6. If exceedance stops, cease additional monitoring (site audit).	1. Check report; 2. Check Contractor's working method; 3. Discuss with ER and Contractor on possible remedial measures; 4. Advise ER on effectiveness of Proposed remedial measures; 5. Supervise implementation of remedial.	1. Notify Contractor; 2. Ensure remedial measures are properly implemented.	1. Amend working methods; 2. Rectify damage and undertake remedial measures or any necessary replacement.

APPENDIX K

Detailed Landscape and Visual Monitoring Report

DRAINAGE SERVICES DEPARTMENT

Contract No. DC/2009/05
Harbour Area Treatment Scheme Stage 2A –
Construction of Interconnection Tunnel and Diaphragm Wall for Main Pumping Station at Stonecutters Island Sewage Treatment Works

Landscape & Visual Audit and Monitoring (Construction Phase)

Monthly Inspection Report No. 01

(January 2010)

Prepared by

URBIS LIMITED

Prepared by : *Tran Tuan Huy* 4th February 2010

Approved by : *Alexander Duggie* 4th February 2010

1.0 INTRODUCTION

The Landscape and Visual Audit & Monitoring are conducted to fulfill the requirements of the EIA Report during the Construction and Operational Phases of the project, and are based on the procedures and requirements as set out in the Agreement No. CE 43/2005 (EP) Harbour Area Treatment Works (HATS) Stage 2A EIA Study – Final Environmental Monitoring and Audit Manual.

As stated in section 11.7 and 11.08 of the EM&A Manual, all landscape and visual mitigation measures undertaken by the Contractor during the Construction Phase and the first 12 months of the Operational Phase shall be audited on a monthly basis to ensure compliance with the intended aims of the mitigation measures as stated in section 11.10.

2.0 SCOPE OF AUDIT and MONITORING

The broad scope of landscape and visual monitoring and audit on mitigation measures is as detailed below:

2.1 Construction Phase

Indentify any potential conflicts between the proposed landscape measures and any other project works or operation requirements, and recorded for the contractor to resolve in early stage, without compromising the intention of the mitigation measures. Also, the followings shall be monitored:

- Identify topsoil where suitable to be stripped and stored for re-use in the construction of soft landscape works;
- Regular review of the progress of engineering works to identify the earliest practical opportunity for the landscape works;
- Monitoring of tree transplanting and planting operations;
- Monitoring of works around the area of existing trees to be retained and protected;
- Monitoring of protection works for existing trees;
- Ensure planting works are carried out in accordance with the Specification and within the right planting season;
- Ensure decorative screen hoarding erected on site are compatible with the surrounding setting;
- Monitoring of night-time lighting to avoid light pollution and glare.

2.2 Operation Phase

Ensure the effectiveness of the landscape and visual mitigations measures during the Operation Phase, including:

- Monitoring of the maintenance operations during the Establishment Period to ensure all plants are well established;
- Ensure the aesthetic design of the façade of PTW and associated structures are harmonized with the surroundings;
- Ensure buffer tree and shrub plantings provides adequate screening to structures, including rooftop greening and vertical greening.

3.0 INSPECTION

3.1 Summary of Inspection – 20th January 2010

3.1.1 Protection of Existing Trees and Tree Works

- It was observed existing undersized trees had been removed by Contractor to make way for the works.
- All existing trees to be retained on site at Portion 4 works area were found to be fenced off.
- It was advised by Engineer that application for transplanting of existing trees T500 to T509 were in progress as the trees were found to be in the works area and would affect the works.
- It was found works has yet to be commenced in the Portion 1 area and existing trees were unaffected.

3.1.2 Recommendations

- The Contractor was reminded proper tree protection works are to be provided when carry out works near existing trees.

4.0 AUDIT SCHEULE

4.1 Audit Schedule for February 2010

The next monthly audit is schedule to be conducted on 24th February 2010.

APPENDIX L

Cumulative Statistics of Exceedance, Complaints, Notification of Summons and Successful Prosecutions

Cumulative statistics on Exceedances

		Total no. recorded in this month	Total no. recorded since project commencement
1-Hour TSP	Action	-	-
	Limit	-	-
24-Hour TSP	Action	-	-
	Limit	-	-
Noise	Action	-	-
	Limit	-	-

Cumulative statistics on Complaints, Notifications of Summons and Successful Prosecutions

	Date Received	Subject	Status	Total no. recorded in this month	Total no. recorded since project commencement
Environmental complaints	-	-	-	0	0
Notification of summons	-	-	-	0	0
Successful Prosecutions	-	-	-	0	0

APPENDIX D

EM&A Monthly Report Submitted under DE/2009/02

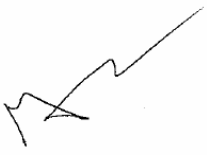
PROJECT NO.: TCS/00502/09

DSD CONTRACT NO. DE/2009/02
HARBOUR AREA TREATMENT SCHEME STAGE 2A

PROVISION OF COVERS AND DEODOURISATION FACILITIES TO THE EXISTING SEDIMENTATION TANKS AT STONECUTTERS ISLAND SEWAGE TREATMENT WORKS

MONTHLY ENVIRONMENTAL MONITORING AND AUDIT (EM&A) REPORT (NO.2) – JANUARY 2010

PREPARED FOR
ATAL ENGINEERING LTD

Quality Index Date	Reference No.	Prepared By	Certified By
5 February 2010	TCS00502/09/600/R0022v1		
		Nicola Hon Environmental Consultant	Andrew Lau Environmental Team Leader

Version	Date	Description
1	5 February 2010	First Submission
2	10 February 2010	Amended against IEC's comments on 9 February 2010

EXECUTIVE SUMMARY

ES.01 ATAL Engineering Limited (hereinafter 'ATAL') was awarded the *Contract DE/2009/02 – Harbour Area Treatment Scheme Stage 2A - Provision of Covers and Deodourisation Facilities to the Existing Sedimentation Tanks at Stonecutters Island Sewage Treatment Works* (the Project) by the Drainage Services Department (DSD) on 30 October 2009. The duration of the project is about 972 days from 30 October 2009 to 27 June 2012. Action-United Environmental Services and Consulting (AUES) have been commissioned by ATAL as the Environmental Team (ET) to implement the relevant EM&A program.

ES.02 The Project covers preliminary treatment and civil engineering infrastructure works to be undertaken at the existing Stonecutters Island Sewage Treatment Plant under Environmental Permit No. EP-322/2008/B. The Permit also covers works undertaken by others such as DSD Contracts DC/2007/23 by Gammon Construction Ltd. & DC/2009/05 by China State Construction Engineering (HK).

ES.03 This is the **2nd** monthly Environmental Monitoring and Audit Report of the Project covering the period from **1** to **31 January 2010 (**the Reporting Month).

ENVIRONMENTAL MONITORING AND AUDIT ACTIVITIES

ES.04 Environmental monitoring activities under the EM&A program in this Reporting Month are summarized in the following table.

Issues	Environmental Monitoring Parameters / Inspection	Occasions undertaken by the Contract DE/2009/02
Air Quality	1-hour TSP	5
	24-hour TSP	5
Inspection / Audit	ET Regular Environmental Site Inspection	4
	IEC Monthly Environmental Site Audit	-

BREACH OF ACTION AND LIMIT (A/L) LEVELS

ES.05 No exceedance of air quality or construction noise monitoring was recorded in this Reporting Month. No Notification of Exceedance (NOE) was, therefore, issued. The statistics of environmental exceedance, NOE issued and investigation of exceedance are summarized in the following table.

Environmental Issues	Monitoring Parameters	Action Level	Limit Level	Event & Action		
				NOE Issued	Investigation	Corrective Action
Air Quality	1-hour TSP	0	0	0	0	0
	24-hour TSP	0	0	0	0	0

Note: NOE – Notification of Exceedance

ENVIRONMENTAL COMPLAINT

ES.06 No environmental complaint was recorded or received in this Reporting Month. The statistics of environmental complaint are summarized in the following table.

Reporting Period	Environmental Complaint Statistics		
	Frequency	Cumulative	Complaint Nature
1 -31 December 2009	0	0	0
1-31 January 2010	0	0	0

NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTIONS

ES.07 No environmental summons or successful prosecutions were recorded in this Reporting Month.

The statistics of environmental complaint are summarized in the following tables.

Reporting Period	Environmental Summons Statistics		
	Frequency	Cumulative	Complaint Nature
1 -31 December 2009	0	0	0
1-31 January 2010	0	0	0

Reporting Period	Environmental Prosecution Statistics		
	Frequency	Cumulative	Complaint Nature
1 -31 December 2009	0	0	0
1-31 January 2010	0	0	0

REPORTING CHANGE

ES.08 There are no reporting changes in this Reporting Month.

SITE INSPECTION BY EXTERNAL PARTIES

ES.09 No site inspection was undertaken by external parties i.e. EPD or AFCD in this Reporting Month.

FUTURE KEY ISSUES

ES.10 During dry season, special attention should be paid to provide air quality mitigation measures such as wheel wash facilities, watering of haul roads and covering of dusty materials with tarpaulin sheet, etc for suppression of construction dust. Moreover, mitigation measures to avoid ingress of surface runoff into nearby water bodies from the construction site during occasional rains should be properly maintained.

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1 INTRODUCTION

1.1 PROJECT BACKGROUND OF DE/2009/02

ATAL Engineering Limited (hereinafter 'ATAL') was awarded the *Contract DE/2009/02 – Harbour Area Treatment Scheme Stage 2A - Provision of Covers and Deodourisation Facilities to the Existing Sedimentation Tanks at Stonecutters Island Sewage Treatment Works* (the Project) by the Drainage Services Department (DSD) on 30 October 2009. The duration of the project is about 972 days from 30 October 2009 to 27 June 2012. Action-United Environmental Services and Consulting (AUES) have been commissioned by ATAL as the Environmental Team (ET) to implement the relevant EM&A program.

The Project covers preliminary treatment and civil engineering infrastructure works to be undertaken at the existing Stonecutters Island Sewage Treatment Plant under Environmental Permit No. EP-322/2008/B. The major construction activities include the following:

(a) Construction of covers for flocculation tanks, prototype tanks, main distribution channels, sedimentation tanks, scum chambers and effluent drop structures
(b) Two deodourisation facilities;
(c) Piling Works of Foundation;
(d) Construction of Foundation for Deodourisation facilities;
(e) Erection of Structure of Control Room at DOU Foundation;
(f) Construction of public access road with footpath;
(g) Water main laying works;
(h) Associated ancillary works;
(i) Tree transplanting, landscaping works; and all other works as required under the Contract

The site layout plan of the Project is shown in ***Annex A***.

According to Section 25 of the Particular Specification (PS) and the Environmental Permit No. EP-322/2008/B, the overall scope of environmental monitoring includes air quality and construction noise; and site environmental audit should be undertaken in accordance with the Project Environmental Monitoring and Audit Manual by an independent Environmental Team (ET). Although landscaping and visual monitoring is requested as part of the EM&A programme, it has been covered by others such as DC/2007/23 and DC2009/03 and therefore results from these contracts are incorporated for this project use as agreed by all parties.

This is the **2nd** monthly EM&A report presenting the monitoring results and inspection findings for the reporting period from **1** to **31 January 2010** under the Project.

1.2 REPORT STRUCTURE

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 MONITORING REQUIREMENTS**
SECTION 4 **IMPACT MONITORING RESULTS**
SECTION 5 **WASTE MANAGEMENT**
SECTION 6 **SITE INSPECTIONS**
SECTION 7 **ENVIRONMENTAL COMPLAINTS AND NON-COMPLIANCE**
SECTION 8 **IMPLEMENTATION STATUES OF MITIGATION MEASURES**
SECTION 9 **IMPACT FORECAST**
SECTION 10 **CONCLUSIONS AND RECOMMENDATION**

2 PROJECT ORGANIZATION AND CONSTRUCTION PROGRESS

2.1 PROJECT ORGANIZATION AND MANAGEMENT STRUCTURE

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

2.2 CONSTRUCTION PROGRESS

The master and three-month rolling construction programs are enclosed in ***Annex C*** and the major construction activities undertaken in this Reporting Month are listed below:-

- Site preparation;
- Tree transplant; and
- Pre-drilling work

2.3 SUMMARY OF ENVIRONMENTAL SUBMISSIONS

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

Table 2-1 Status of Environmental Licenses and Permits

Item	Description	License/Permit Status
1	Air pollution Control (Construction Dust)	In progress
2	Chemical waste Producer Registration	In progress
3	Water Pollution Control Ordinance (Discharge License)	In progress
4	Billing Account for Disposal of Construction Waste	In progress
5	Construction Noise Permit (ref.: GW-RW0023-10)	Valid on 1 February 2010 Expiry on 3 April 2010
6	Construction Noise Permit for steel pile during 07:00-19:00 (ref.: GW-RW001-10)	Valid on 1 February 2010 Expiry on 3 April 2010

The Project Specific Environmental Management Plan (EMP) with the Waste Management Plan was set out in accordance with the tender requirements and ATAL internal policy. It has been submitted to the ER for endorsement.

Baseline Monitoring Report for the Project was issued by the ETL and verified by the IEC. The report was also submitted to the RE and sent to the EPD for endorsement.

3 SUMMARY OF MONITORING REQUIREMENTS

The Environmental Monitoring and Audit requirements are set out in the project EM&A manual. The ET implements the EM&A program in accordance with the aforementioned requirements. Details of the EM&A program are presented in the following sub-sections.

3.1 MONITORING PARAMETERS

According to the *PS Appendix 22*-EM&A Manual stipulation, the EM&A impact monitoring program covers the following environmental issues:

- Air quality;
- Construction noise;
- Water quality;
- Marine ecology;
- Landscape and visual impact assessment; and
- Cultural heritage

As instructed by the Engineer's Representative (ER), AUES is only requested to carry out air quality impact monitoring at the designated monitoring station AM8 (Block A of Government Dockyard) under the project. Other environmental monitoring including construction noise, water quality, marine ecology, landscape & visual impact assessment, and cultural heritage will be performed by the other two Contracts: DC2007/23 and DC/2009/05. The monitoring parameters undertaken by the Project are presented in ***Table 3-1***:

Table 3-1 Summary of Environmental Issue Monitoring Requirements under the Project

Environmental Issue	Parameters
Air Quality	• 1-hour TSP Monitoring by Real-Time Portable Dust Meter; and • 24-hour TSP Monitoring by High Volume Air Sampler.

3.2 MONITORING LOCATIONS

According to ***Section 2.19*** and ***3.8*** of the PS Appendix 22 *EM&A Manual,* air and noise monitoring locations have been designated as shown in ***Annex D***.

Air Quality

For Stonecutter Island Sewage Treatment Works (SCISTW), there are other two concurrent projects undertaking in the same study area and they are encountered the same air sensitive receivers SCI1, SCI3, SCI6 and SCI7 as recommended in the *EM&A Manual*. Owing to the experiences from the concurrent projects that the identified ASRs in the *EM&A Manual* are not accessible to conduct monitoring, the identified ASR has to be relocated. As agreed with the RE, a total of three (3) existing air monitoring stations as used in the concurrent project would be adopted for this Project. The identified monitoring station is named AM6, AM7 and AM8 which are listed in ***Table 3-2*** and illustrated in ***Annex E***.

Table 3-2 Recommended Air Monitoring Station within the Stonecutter Island Sewage Treatment Works (SCISTW)

Monitoring Station	Location	Monitored by the Contract
AM6	Works site boundary of DC/2007/23	DC/2007/23
AM7	North West Kowloon pumping station	DC/2009/05
AM8	Block A of Government Dockyard	DE/2009/02

3.3 MONITORING FREQUENCY AND PERIOD

The requirements of baseline and impact monitoring are stipulated in *Sections 2.22 to 2.29 and 3.12 to 3.18* of the *EM&A Manual* and listed as follows.

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.

3.4 MONITORING EQUIPMENT

Due to the Construction Noise monitoring result is sheared with two concurrent projects, so only air monitoring equipments are proposed by the ET for the impact EM&A program are listed below:

Table 3-4 Air Quality Monitoring Equipments Used in EM&A Program

Equipment	Model
Air Quality Monitoring	
High Volume Sampler – **24 hour TSP**	Grasby Anderson GMWS 2310 HVS
Calibration Kit – **24-hour TSP**	TISCH Model TE-5025A
Portable dust meter – **1-hour TSP**	TSI DustTrak Model 8520 / Sibata LD-3 Laser Dust Meter

A valid of Calibration certificates will be shown in ***Annex F*** of Environmental Monitoring Report accordingly

3.5 MONITORING PROCEDURES

Air Quality

24-hour TSP

The equipment used for 24-hour TSP measurement will be a Thermo Andersen. Model GS2310 TSP high volume air sampling system, which complied with "*EPA Code of Federal Regulation, Appendix B to Part 50"*. The 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

The HVS will be operated and calibrated on a regular basis in accordance with the manufacturer's instruction using the NIST-certified standard calibrator (Tisch Calibration Kit Model TE-5025A).

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

1-hour TSP

The 1-hour TSP monitor, a TSI Dust Track Aerosol Monitor Model 8520, or Sibata LD-3 Laser Dust Meter is a portable, battery-operated laser photometer. The 1-hour TSP meter provides a real time 1-hour TSP measurement based on 90^{0} light scattering. The 1-hour TSP monitor consisted 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.

The 1-hour TSP meter to be used will be within the valid period, calibrated by the manufacturer prior to purchasing. Zero response of the instrument will be checked before and after each monitoring event. Operation of the 1-hour TSP meter will follow manufacturer's Operation and Service Manual.

3.6 METEOROLOGICAL INFORMATION

The meteorological information will down loaded from the Hong Kong Observatory (Tsing Yi station). The data will include wind direction, wind speed, humidity, rainfall, air pressure and temperature etc that in general is required for evaluating the air quality impact arising from the construction activities.

3.7 DATA MANAGEMENT AND DATA QA/QC CONTROL

The impact monitoring data are handled by the ET's systematic data recording and management, which complies with in-house Quality Management System. Standard Field Data Sheets (FDS) are used in the impact monitoring program.

The monitoring data recorded in the equipment e.g. 1-hour TSP meter and noise meter is downloaded directly from the equipment at the end of each monitoring day. The downloaded monitoring data are input into a computerized database properly maintained by the ET. The laboratory results are input directly into the computerized database and QA/QC checked by personnel other than those who input the data. For monitoring activities require laboratory analysis, the local laboratory follows the QA/QC requirements as set out under the HOKLAS scheme for all laboratory testing.

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

According to the Project Environmental Monitoring and Audit Manual, the air quality and construction noise criteria were set up, namely Action and Limit levels are listed in ***Tables 3-5*** and ***3-6*** as below.

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

Monitoring Stations	Action Level ($\mu g/m^3$)		Limit Level ($\mu g/m^3$)	
	1-hour	24-hour	1-hour	24-hour
AM6	346	196	500	260
AM7	322	207	500	260
AM8	307	158	500	260

Table 3-6 Action and Limit Levels for Construction Noise at Monitoring

Monitoring Stations	Time Period	Action Level	Limit Level in dB(A)
NM5 NM6	0700-1900 hours on normal weekdays	When one documented complaint is received	75
	0700-2300 hours on holidays; and 1900-2300 hours on all other days		70
	2300-0700 hours of next day		55

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

4 IMPACT MONITORING RESULTS

The monitoring schedule had been issued to relevant parties during prior end of month and listed in ***Annex H***. The works undertaken during the report month has been illustrated in ***Section 2.2*** of this report**.** The monitoring results are presented in the following sub-sections.

4.1 RESULTS OF AIR QUALITY MONITORING

In this monthly report period, impact monitoring was commenced on 12 December 2009 upon notification from the Contractor. A total of **15** events of 1-hour TSP monitoring and **5** events of 24-hour TSP monitoring and were undertaken under SCISTW in this month. The results for 24-hour and 1-hour TSP are summarized in ***Tables 4-1***. The 24-hour TSP data (AM8) as undertaken by the Project are shown in ***Annex I***. Also, the graphical plots of 24-hour and 1-hour TSP are shown in ***Annex J***.

Table 4-1 Summary of 24-hour and 1-hour TSP Monitoring Results – AM8 as Monitored by DE/2009/02

Date	24-hour TSP ($\mu g/m^3$)	1-hour TSP ($\mu g/m^3$)				
		Date	Start Time	1st hour measured	2nd hour measured	3rd hour measured
4-Jan-10	93	5-Jan-10	13:12	216	236	200
9-Jan-10	62	11-Jan-10	14:23	38	30	31
15-Jan-10	156	16-Jan-10	09:35	110	128	121
21-Jan-10	72	22-Jan-10	13:06	84	76	60
27-Jan-10	123	28-Jan-10	12:05	146	172	164
Average (Range)	**101 (62-156)**	Average (Range)		**121 (31-236)**		

As shown in above tables, 24-hour and 1-hour TSP results fluctuated well below the Action Level during the Reporting Period. No Notification of Exceedance (NOE) of 24-hour and 1-hour TSP air quality criteria or corrective action was therefore required.

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

4.2 RESULTS OF CONSTRUCTION NOISE MONITORING

The construction noise monitoring results were undertaken at the identified monitoring locations NM5 and NM6 by Project DC/2007/23 and DC/2009/05. As informed by the RE's representative, two exceedances were recorded on 10 and 28 January 2010 at NM5 (monitor by DC/2007/23) and NM6 (monitor by DC/2009/05) respectively. Since there were no construction activities being carried out in this project except for the site preparation works, it is concluded that the exceedances were not related to the works under the Project of DE/2009/02 and no corrective action is required.

5 WASTE MANAGEMENT

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

5.1 RECORDS OF WASTE QUANTITIES

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

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

The quantities of waste under the Project for off site disposal in this Reporting Period are summarized in ***Table 5-1*** and ***5-2*** and the Monthly Summary Waste Flow Table is shown in ***Annex L***. Whenever possible, materials were reused on-site as far as practicable.

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

Type of Waste	Quantity	Disposal Location
C&D Materials (Inert) (m3)	0	NA
Reused in this Contract (Inert) (m3)	0	NA
Reused in other Projects (Inert) (m3)	0	NA
Disposal as Public Fill (Inert) (m3)	0	NA

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

Type of Waste	Quantity	Disposal Location
Recycled Metal (kg)	0	NA
Recycled Paper / Cardboard Packing (kg)	0	NA
Recycled Plastic (kg)	0	NA
Chemical Wastes (kg)	0	NA
General Refuses (m3)	20	NENT

5.01 There was no site effluent discharged and the estimated volume of surface runoff was less than 50m^3 during wet season.

6 SITE INSPECTION

According to the Project Environmental Monitoring and Audit Manual, the environmental site inspection should be formulated by the ET Leader. Regular environmental site inspections had been carried out by the ET to confirm the environmental performance. **Four** site inspections were carried out on **6, 13, 20 and 27 January 2010** with the Representatives of the Engineer and the Contractor to evaluate the site environmental performance in this Reporting Month. No non-compliance was noted.

Observations for the site inspections and monthly audit within this Reporting Month are summarized in ***Table 6-1*** and inspection checklist is attached in ***Annex M***.

Table 6-1 Observations for weekly site inspection in the Reporting Month

Date	Findings / Deficiencies	Follow-Up Status
6 January 2010	The Contractor is reminded to maintain the u-channel within the site area to prevent water ponding.	The deficiency has not been rectified during site inspection on 13 January 2010
13 January 2010	No new environmental issue was observed during the site inspection.	The deficiency on 6 January has not been rectified during site inspection on 20 January 2010
20 January 2010	Stagnant water cumulated inside the drip tray was observed, the contractor was reminded to clean to prevent oil leakage.	Stagnant water cumulated inside the drip tray has been cleared. However, the deficiency on 6 January has not been rectified during site inspection on 27 January 2010.
27 January 2010	No new environmental issue was observed during the site inspection	The deficiencies on 6 January have been rectified during site inspection on 27 January 2010

7 ENVIRONMENTAL COMPLAINT AND NON-COMPLIANCE

7.1 ENVIRONMENTAL COMPLAINT, SUMMONS AND PROSECUTION

No environmental complaint, summons and prosecution was received in this reporting period. The statistical summary tables of environmental complaint are presented in ***Tables 7-1, 7-2*** and ***7-3***.

Table 7-1 Statistical Summary of Environmental Complaints

Reporting Period	Environmental Complaint Statistics		
	Frequency	Cumulative	Complaint Nature
1 – 31 December 2009	0	0	0
1-31 January 2010	0	0	0

Table 7-2 Statistical Summary of Environmental Summons

Reporting Period	Environmental Summons Statistics		
	Frequency	Cumulative	Complaint Nature
1 – 31 December 2009	0	0	0
1-31 January 2010	0	0	0

Table 7-3 Statistical Summary of Environmental Prosecution

Reporting Period	Environmental Prosecution Statistics		
	Frequency	Cumulative	Complaint Nature
1 – 31 December 2009	0	0	0
1-31 January 2010	0	0	0

8 IMPLEMENTATION STATUS OF MITIGATION MEASURES

The environmental mitigation measures recommended in the Project Environmental Monitoring and Audit Manual cover issues of dust, noise and waste and they are summarized as following:

Dust Mitigation Measure

(a) The contractor shall frequently clean and water the site to minimize fugitive dust emissions.

(b) Effective water sprays shall be used during the delivery ad handling of aggregate, and other similar materials, when dust is likely to be created and to dampen all sited material during dry and windy weather.

(c) Watering of exposed surfaces shall be exercised as often as possible depending on the circumstance.

(d) Areas within the site where there is regular movement of vehicles must be regularly watered as often as necessary for effective suppression of dust or as often as directed by the Engineer.

(e) Where dusty materials are being discharged to vehicle from a conveying system at a fixed transfer point, a three-sided roofed enclosure with a flexible curtain across the entry shall be provided. Exhausted fans shall be provided for this enclosure and vented to a suitable fabric filer system.

(f) The Contractor shall restrict all motorized vehicles within the site, excluding those on public roads, to a maximum speed of 15km per hour and confine haulage and delivery vehicles to designated roadways inside the site.

(g) Wheel washing facilities shall be installed and used by all vehicles leaving the site. No earth, mud, debris, dust and the like shall be deposited on public roads, water in wheel cleaning facility shall be changed at frequent intervals and sediments shall be removed regularly. The Contractor shall submit detailed proposals for the wheel cleaning facilities to the Engineer prior to construction of the facility. Such wheel washing facilities shall be usable prior to any earthworks excavating activity in the site.

(h) Any material dropped in the roads will need to be cleaned up immediately to prevent dust nuisance.

Noise Mitigation Measure

(a) Noisy equipment and activities should be sited by the Contractor as far from close-proximity sensitive receivers as practical. Prolonged operation of noisy equipment close to dwellings and schools should be avoided.

(b) The Contractor should minimise construction noise exposure to the schools (especially during examination periods) as much as possible. The Contractor should liaise with the school and the Examination Authority to ascertain the exact dates and times of all examination periods during the course of the contract and to avoid noisy activities during these periods.

(c) Noisy plant or processes should be replaced by quieter alternatives where possible. Silenced diesel and gasoline generators and power units, as well as silenced and super-silenced air compressors should be used.

(d) Noisy activities should be scheduled to minimise exposure of nearby sensitive receivers to high levels of construction noise. For example, noisy activities can be scheduled for midday, or at times coinciding with periods of high background noise (such as during peak traffic hours).

(e) Idle equipment should be turned off or throttled down. Noisy equipment should be properly maintained and used no more often than is necessary.

(f) The power units of non-electric stationary plant and earth-moving plant should be quietened by vibration isolation and partial or full acoustic enclosures for individual noise-generating components.

(g) Construction activities should be planned so that parallel operation of several sets of equipment close to a given receiver is avoided, thus reducing the cumulative impacts between operations. The numbers of operating items of powered mechanical equipment should be minimised.

(h) Construction plant should be properly maintained (well-greased, damage and worn parts promptly replaced) and operated. Construction equipment often has silencing measures built in or added on, e.g. bulldozer silencers, compressor panels, and mufflers. Silencing measures should be properly maintained and utilised. Where possible, rubber or damping materials should be introduced between metal panels to avoid rattle and reverberation of noise.

(i) Equipment known to emit sound strongly in one direction, should where possible, be oriented so that the noise is directed away from nearby NSRs.

(j) Material stockpiles and other structures (such as site offices) should be effectively utilised, where practicable, to screen noise from on-site construction activities. Alternatively, noise barriers having a surface density of 10 kg/m2 should be used to\ protect nearby NSRs if necessary.

(k) The Contractor should devise, arrange methods of working and carry out the works insuch manner as to minimise noise impacts on the surrounding environment, andshould provide experienced personnel with suitable training to ensure that thesemeasures are implemented properly.

Waste Mitigation Measures

(a) The Contractor shall observe and comply with the Waste Disposal Ordinance (WDO) and its subsidiary regulations.

(b) The Contractor shall submit to the Engineer for approval a Waste Management Plan with appropriate mitigation measures including the allocation of an area for waste segregation and shall ensure that the day-to-day site operations comply with the approved waste management plan.

(c) The Contractor shall minimise the generation of waste from his work. Avoidance and minimisation of waste generation can be achieved through changing or improving design and practices, careful planning and good site management.

(d) The reuse and recycling of waste shall be practised as far as possible. The recycled materials shall include paper/cardboard, timber and metal etc.

(e) The Contractor shall ensure that Construction and Demolition (C&D) materials are sorted into public fill (inert portion) and C&D waste (non-inert portion). The public fill which comprises soil, rock, concrete, brick, cement plaster/mortar, inert building debris, aggregates and asphalt shall be reused in earth filling, reclamation or site formation works. The C&D waste which comprises metal, timber, paper, glass, junk and general garbage shall be reused or recycled where possible and, as the last resort, disposal of at landfills.

(f) The Contractor shall record the amount of wastes generated, recycled and disposed of (including the disposal sites). The Contractor shall use a trip ticket system for the disposal of C&D materials to any designated public filling facility and/or landfill.

(g) In order to avoid dust or odour impacts, any vehicles leaving a works area carrying construction waste or public fill shall have their load covered.

(h) To avoid the excessive use of wood, reusable steel shutters shall be used as a preferred alternative to formwork and falsework where possible.

(i) The Contractor shall observe and comply with the Waste Disposal (Chemical Waste) (General) Regulation. The Contractor shall apply for registration as chemical waste producer under the Waste Disposal (Chemical Waste) (General) Regulation when chemical waste is produced. All chemical waste shall be properly stored, labeled, packaged and collected in accordance with the Regulation.

ATAL had been implementing the required environmental mitigation measures according to the Project Environmental Monitoring and Audit Manual subject to the site condition.

Environmental mitigation measures generally implemented by ATAL in this Reporting Month are summarized in ***Table 8-1***.

Table 8-1 Environmental Mitigation Measures

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; and • Drainage systems were regularly and adequately maintained.
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; and • Tarpaulin covering of any dusty materials on a vehicle leaving the site.
Noise	• Good site practices to limit noise emissions at the sources; • Use of quite plant and working methods; • Use of site hoarding or other mass materials as noise barrier to screen noise at ground level of NSRs; • Use of shrouds/temporary noise barriers to screen noise from relatively static PMEs; • Scheduling of construction works outside school examination period in critical area; and • Alternative use of plant items within one worksite, where practicable.
Waste and Chemical Management	• Excavated material should be reused on site as far as possible to minimize off-site disposal. Scrap metals or abandoned equipment should be recycled if possible; • Waste arising should be kept to a minimum and be handled, transported and disposed of in a suitable manner; • The Contractor should adopt a trip ticket system for the disposal of C&D materials to any designed public filling facility and/or landfill; and • Chemical waste shall be handled in accordance with the Code of Practice on the Packaging, Handling and Storage of Chemical Wastes.
General	• The site was generally kept tidy and clean.

9 IMPLEMENTATION STATUS OF MITIGATION MEASURES

9.1 WORKS TO BE UNDERTAKEN IN THE FORTH-COMING MONTH

According to the three-month construction roll program, construction works which will be undertaken in the coming month (**February 2010**) are shown as follows:

- Site preparation;
- Tree transplant; and
- Pre-drilling work

EM&A monitoring schedules this month and the next month are shown in ***Annex H***.

9.2 KEY ISSUES FOR THE COMING MONTH

Key issues to be considered in the coming month include:

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

10 CONCLUSIONS AND RECOMMENTATIONS

10.1 CONCLUSIONS

This is the **2nd** monthly Environmental Monitoring and Audit Report of the Project covering the period from **1 to 31 January 2010** (the Reporting Month).

No 24-hour or 1-hour TSP monitoring results that triggered the Action or Limit Levels were recorded. No NOEs or the associated corrective actions were, therefore, issued.

No breaches of environmental quality criteria on marine water were recorded during the Reporting Period. No NOEs or the associated corrective actions were therefore issued.

No documented complaint, notification of summons or successful prosecution was received.

Four occasions of weekly site inspection had been carried out by the ET in this reporting month. No non-compliance was observed during the inspection. In general, it was reminded that good house keeping practice should be maintained. The environmental performance of the Project was therefore considered satisfactory.

No site inspection was undertaken by any external party in this Reporting Month.

The landscape and visual impacts monitoring was undertaken by the landscape sub-contractor. The monitoring results will be submitted separately as a stand-alone document.

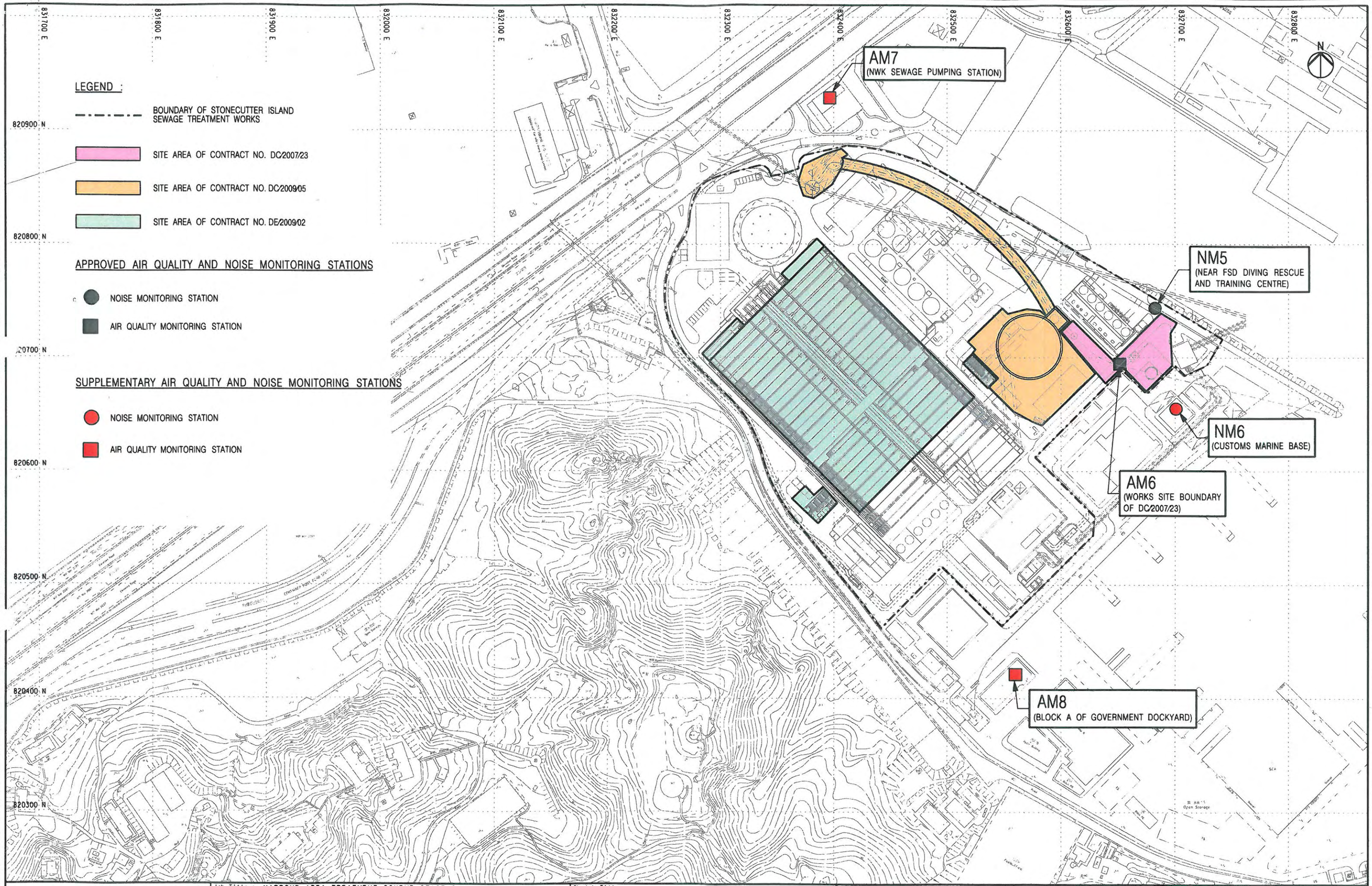
10.2 RECOMMENDATIONS

During dry season, special attention should be paid to provide air quality mitigation measures including wheel wash facilities, watering of haul roads and covering of dusty materials with tarpaulin sheet, etc. Moreover, mitigation measures to avoid ingress of surface runoff into nearby water bodies from the construction site during occasional rains should be properly maintained.

To control the site performance on waste management, ATAL shall ensure that all solid and liquid waste management works are fully in compliance with the relevant license/permit requirements, such as the effluent discharge licence and the chemical waste producer registration. ATAL is also reminded to implement the recommended environmental mitigation measures according to the Project Environmental Monitoring and Audit Manual.

Annex A

Project Site Layout Plan



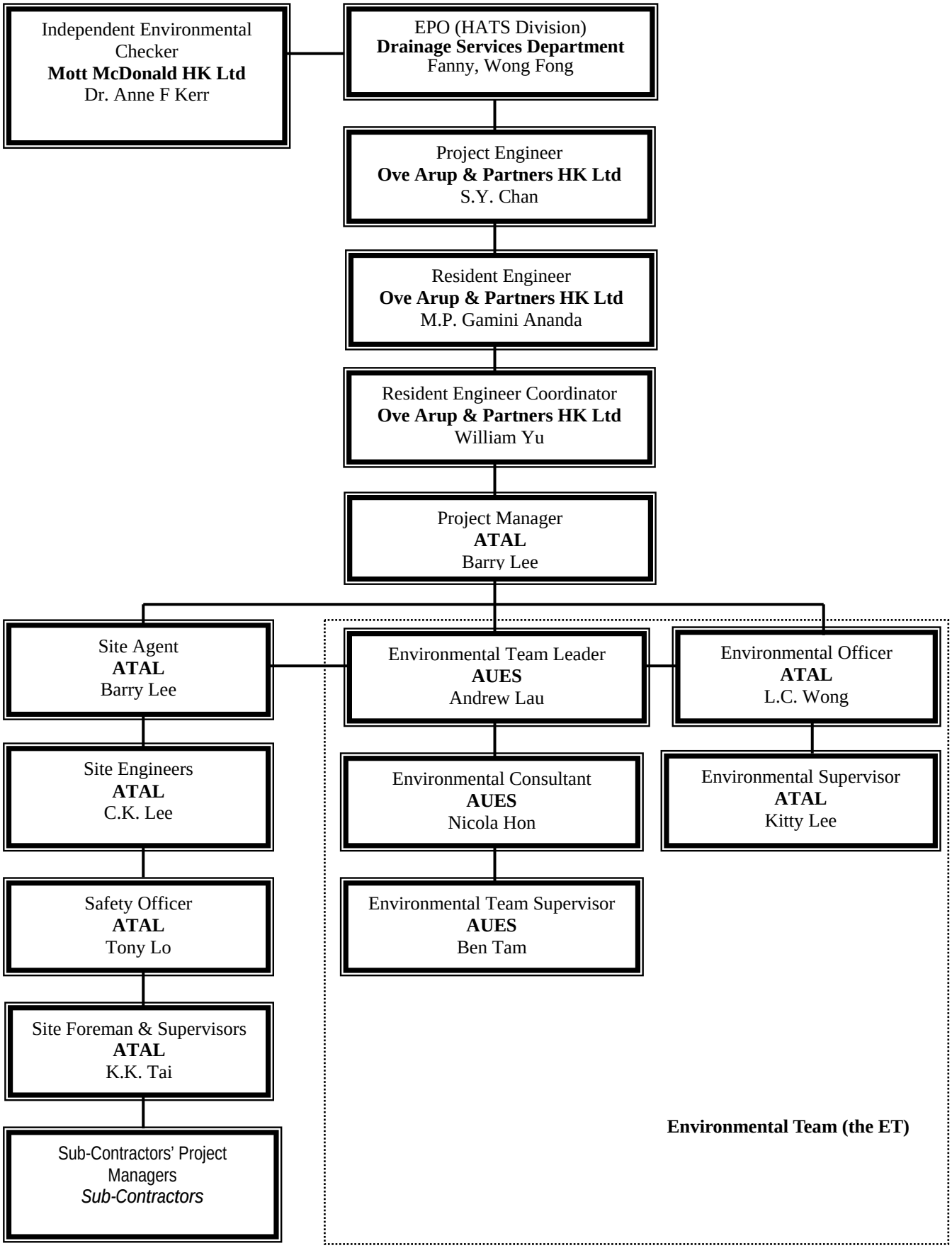
ARUP
Ove Arup & Partners HK Ltd

Job Title : HARBOUR AREA TREATMENT SCHEME STAGE 2A - CONSTRUCTION OF INTERCONNECTION TUNNEL AND DIAPHRAGM WALL FOR MAIN PUMPING STATION AT STONECUTTERS ISLAND SEWAGE TREATMENT WORKS		Sketch Title : LOCATIONS OF AIR AND NOISE MONITORING STATIONS AT STONECUTTER ISLAND SEWAGE TREATMENT WORKS	Drawn: KH / Checked: WY / Approved: GA
Project No.: DC0905	Contract No.: DC/2009/05		
Sketch No. : DC/2009/05/SK/0017	Rev : 1	Scale : 1:3000 @ A3	Issue Date : 15-12-2009
Other Related Ref.:	Working Dwg. No.: N/A	DAN No.: N/A	IN-0 No.: N/A
		RFI No.: N/A	Others: N/A

15/12/2009 C:\DC200905-Sketch Drawing\SK0017_REV.1\DC200905_SK0017_REV.1.dgn

Annex B

Organization Structure and Contact Details of the ATAL & Relevant Parties



Environmental Management Organization – DE/2009/02

Contact Details of Key Personnel

Organization	Project Role	Name of Key Staff	Tel No.	Fax No.
DSD	EPO (HATS Division)	Ms. Fanny Wong	2159-3596	2833-9162
OAP	The Engineer	Mr. S.Y. Chan	2528-3031	2370-4377
OAP	Engineer's Representative	Mr. M.P. Gamini Ananda	2370-4311	2370-4377
OAP	Engineer's Coordinator	Mr. William Yu	9705-9566	2370-4377
MM	Independent Environmental Checker	Dr. Anne F Kerr	2828-5757	2827-1823
ATAL	Project Manager	Mr. Barry Lee	2743-1205	2565-7638
ATAL	Site Agent	Mr. Barry Lee	2743-1205	2565-7638
ATAL	Site Engineer	Mr. C.K. Lee	2743-1205	2565-7638
ATAL	Environmental Officer	Mr. L.C. Wong	2743-1205	2565-7638
ATAL	Safety Supervisor	Mr. K.K. Tai	9367 3186	2565-7638
AUES	Environmental Team Leader	Mr. Andrew Lau	2959-6059	2959-6079
AUES	Environmental Consultant	Ms. Nicola Hon	2959-6059	2959-6079
AUES	Environmental Site Inspector	Mr. Ben Tam	2959-6059	2959-6079

Legend:

DSD *(Employer) – Drainage Services Department*
OAP *(Engineer) – Ove Arup & Partners HK Ltd*
MM *(IEC) – Mott McDonald Ltd*
ATAL *(Main Contractor) – ATAL Engineering Ltd.*
AUES *(ET) – Action-United Environmental Services & Consulting*

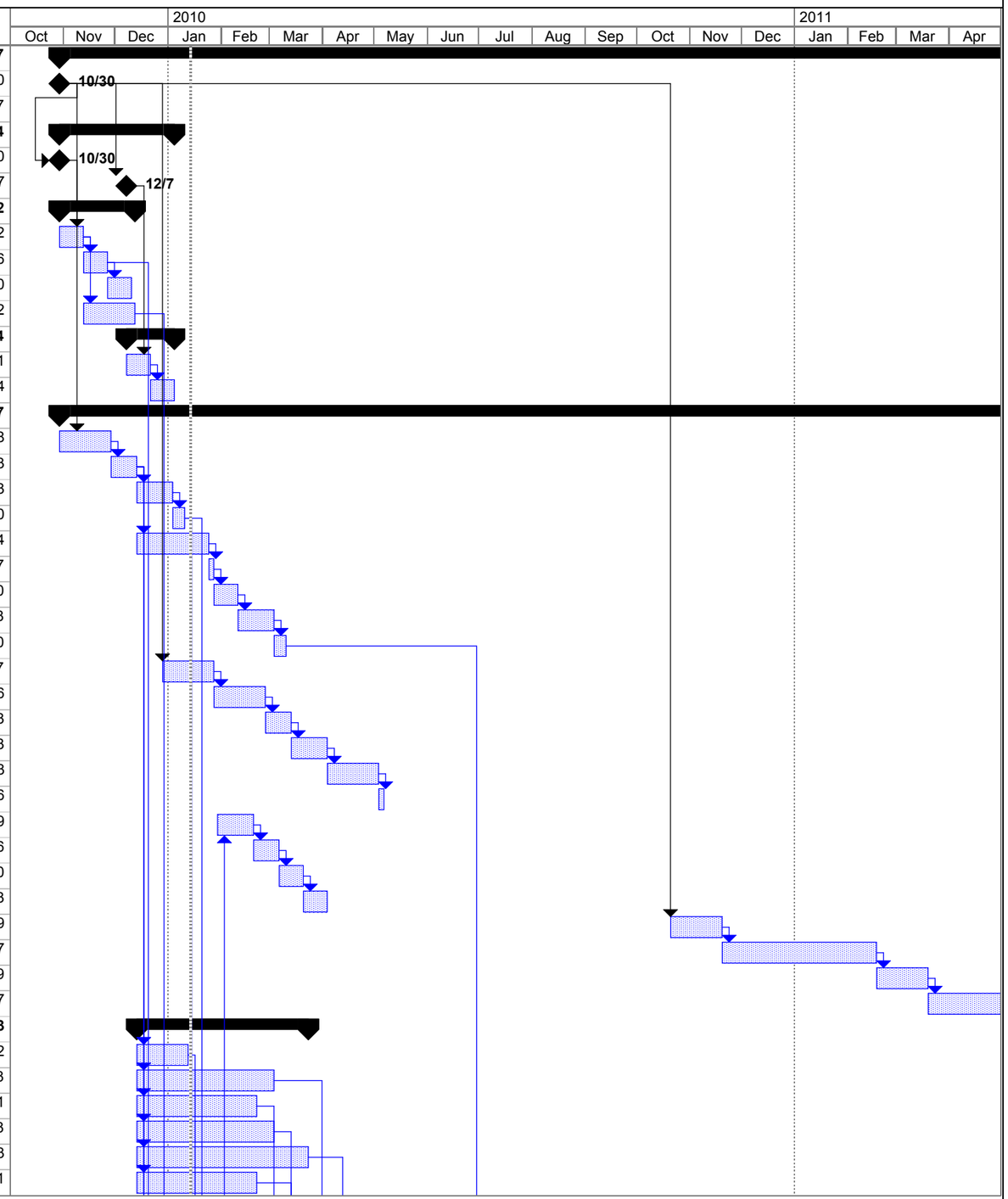
Annex C

Master and Three-Month Rolling Construction Programs

Three Months Rolling Programme for Contract No. DE/2009/02
Provision of Covers and Deodourisation Facilities to the Existing Sedimentation Tanks at Stonecutters Island Sewage Treatment Works (Jan10 to Mar10)

(Revision 0)

ID	Task Name	Duration	Start	Finish
1	**Contract Duration**	**972 days**	**Fri 09/10/30**	**Wed 12/6/27**
2	Project Commencement Date	0 days	Fri 09/10/30	Fri 09/10/30
3	Project Substantial Completion Date	0 days	Wed 12/6/27	Wed 12/6/27
4	**Site Preparation**	**67 days**	**Fri 09/10/30**	**Mon 10/1/4**
5	Handover of Site Portion 6 (DOU1), A, B and C	0 days	Fri 09/10/30	Fri 09/10/30
6	Handover of Site Portion 5 for DOU2 (Early Handover)	0 days	Mon 09/12/7	Mon 09/12/7
7	**Portion 6 (DOU1), A, B & C of the Site**	**44 days**	**Fri 09/10/30**	**Sat 09/12/12**
8	Conduct site survey	14 days	Fri 09/10/30	Thu 09/11/12
9	Conduct Tree Survey	14 days	Fri 09/11/13	Thu 09/11/26
10	Conduct Initial Condition Survey	14 days	Fri 09/11/27	Thu 09/12/10
11	Erect Site Fencing	30 days	Fri 09/11/13	Sat 09/12/12
12	**Portion 5 of the Site (DOU2)**	**28 days**	**Tue 09/12/8**	**Mon 10/1/4**
13	Conduct site survey	14 days	Tue 09/12/8	Mon 09/12/21
14	Erect Site Fencing	14 days	Tue 09/12/22	Mon 10/1/4
15	**Preliminary and Detailed Design Submission**	**626 days**	**Fri 09/10/30**	**Sun 11/7/17**
16	Preparation of Preliminary Design Submission	30 days	Fri 09/10/30	Sat 09/11/28
17	First review and comment Preliminary Design by the Engineer	15 days	Sun 09/11/29	Sun 09/12/13
18	Revise Preliminary Design (PD) Submission	21 days	Mon 09/12/14	Sun 10/1/3
19	Review and Approval of revised PD by the Engineer	7 days	Mon 10/1/4	Sun 10/1/10
20	Preparation of Detailed Design (DD) Submission	42 days	Mon 09/12/14	Sun 10/1/24
21	Obtain of ICE Certificate of DD Submission	3 days	Mon 10/1/25	Wed 10/1/27
22	First review and comment DD by the Engineer	14 days	Thu 10/1/28	Wed 10/2/10
23	Revise DD Submission & obtain ICE Certificate	21 days	Thu 10/2/11	Wed 10/3/3
24	Review and Approval of revised DD by the Engineer	7 days	Thu 10/3/4	Wed 10/3/10
25	Preparation of Preliminary General Building Plan (GBP) Design Submission	30 days	Tue 09/12/29	Wed 10/1/27
26	First review and comment Preliminary GBP Design by the Engineer	30 days	Thu 10/1/28	Fri 10/2/26
27	Review Preliminary GBP Design Submission	15 days	Sat 10/2/27	Sat 10/3/13
28	Review and Approval of revised GBP Design by the Engineer	21 days	Sun 10/3/14	Sat 10/4/3
29	Preparation of Detailed GBP Design Submission	30 days	Sun 10/4/4	Mon 10/5/3
30	Obtain of ICE Certificate of Detailed GBP Submission	3 days	Tue 10/5/4	Thu 10/5/6
31	Preparation of Preliminary Foundation Design Submission	21 days	Sat 10/1/30	Fri 10/2/19
32	First review and comment Preliminary Foundation Design by the Engineer	15 days	Sat 10/2/20	Sat 10/3/6
33	Revise Preliminary Foundation Design Submission	14 days	Sun 10/3/7	Sat 10/3/20
34	Review and Approval of revised Foundation Design by the Engineer	14 days	Sun 10/3/21	Sat 10/4/3
35	Preparation of Commissioning Test Plan	30 days	Thu 10/10/21	Fri 10/11/19
36	Review and Approval of Commissioning by the Engineer	90 days	Sat 10/11/20	Thu 11/2/17
37	Preparation of Training Plan	30 days	Fri 11/2/18	Sat 11/3/19
38	Review and Approval of Training Plan by the Engineer	120 days	Sun 11/3/20	Sun 11/7/17
39	**Equipment Submission and Approval**	**100 days**	**Mon 09/12/14**	**Tue 10/3/23**
40	Odour Containment System (FRP Cover) - Prototype	30 days	Mon 09/12/14	Tue 10/1/12
41	Odour Containment System (FRP Cover) - Other Covers / walkway	80 days	Mon 09/12/14	Wed 10/3/3
42	Deodourizing System	70 days	Mon 09/12/14	Sun 10/2/21
43	LV Switchboard	80 days	Mon 09/12/14	Wed 10/3/3
44	Modification proposal of SCADA System	100 days	Mon 09/12/14	Tue 10/3/23
45	FRP Ductwork and Support	70 days	Mon 09/12/14	Sun 10/2/21



Contract No. DE/2009/02
Revision: 0
Date: 11 January 2010

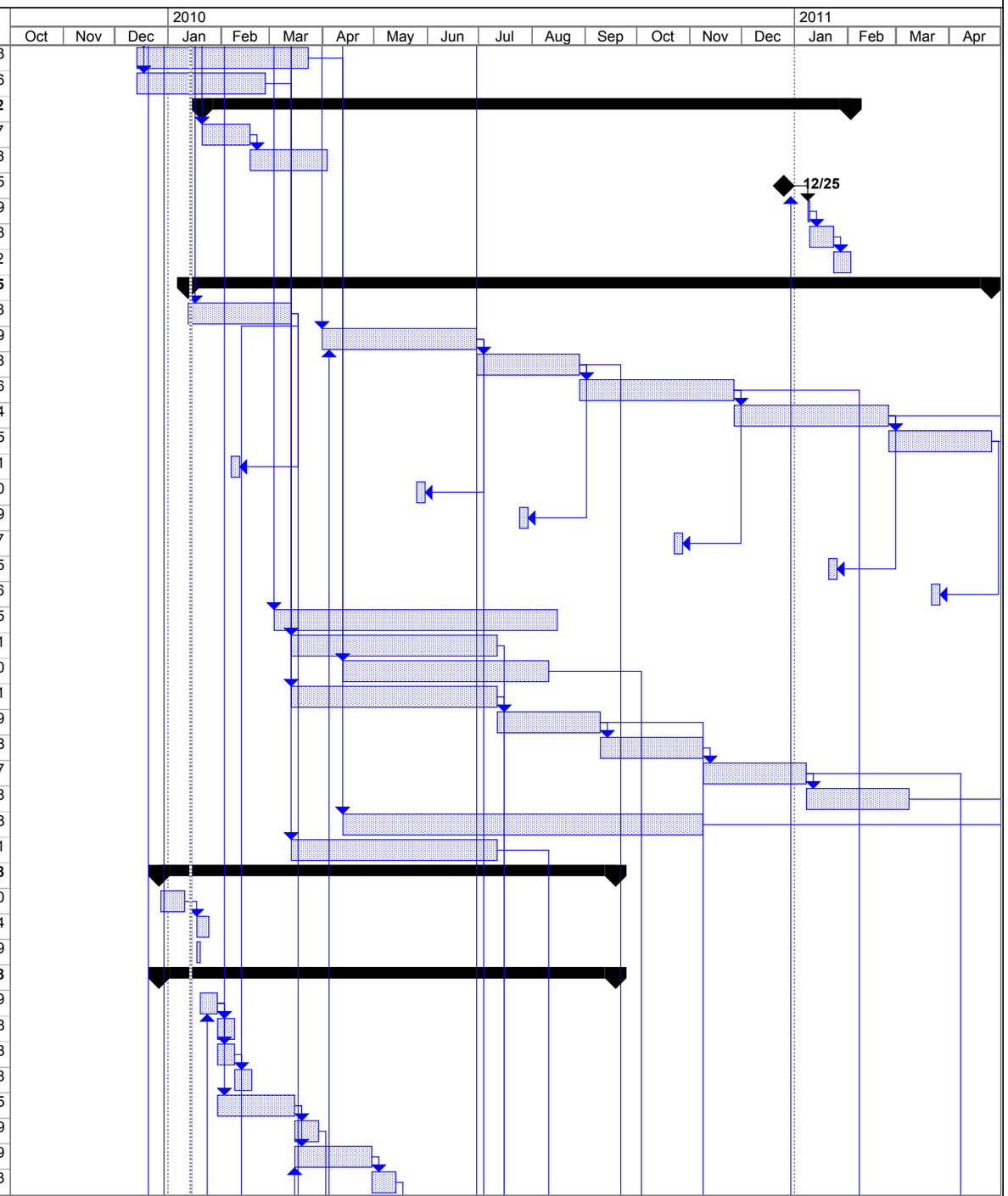
Task | Progress | Summary | External Tasks | Deadline
Split | Milestone | Project Summary | External Milestone

ATAL Engineering Limited

Three Months Rolling Programme for Contract No. DE/2009/02
Provision of Covers and Deodourisation Facilities to the Existing Sedimentation Tanks at Stonecutters Island Sewage Treatment Works (Jan10 to Mar10)

(Revision 0)

ID	Task Name	Duration	Start	Finish
46	CCTV System	100 days	Mon 09/12/14	Tue 10/3/23
47	Electrical Accessories	75 days	Mon 09/12/14	Fri 10/2/26
48	**Statutory Submission and Inspection**	**378 days**	**Thu 10/1/21**	**Wed 11/2/2**
49	Preparation of revised FS Plan including DG goods store application	28 days	Thu 10/1/21	Wed 10/2/17
50	Approval of revised FS Plan including DG goods store application by FSD	45 days	Thu 10/2/18	Sat 10/4/3
51	Submission of Form 501 for FS Inspection	0 days	Sat 10/12/25	Sat 10/12/25
52	First FS Inspection	1 day	Sun 11/1/9	Sun 11/1/9
53	Defect rectification following to the first FS Inspection	14 days	Mon 11/1/10	Sun 11/1/23
54	Final FS Inspection and Issue of FS Certificate	10 days	Mon 11/1/24	Wed 11/2/2
55	**Equipment Manufacturing, Factory Testing, Shipment and Delivery**	**468 days**	**Wed 10/1/13**	**Mon 11/4/25**
56	Odour Containment System (FRP Cover) - Prototype	60 days	Wed 10/1/13	Sat 10/3/13
57	Odour Containment System (FRP Cover) - First Batch	90 days	Thu 10/4/1	Tue 10/6/29
58	Odour Containment System (FRP Cover) - Second Batch	60 days	Wed 10/6/30	Sat 10/8/28
59	Odour Containment System (FRP Cover) - Third Batch	90 days	Sun 10/8/29	Fri 10/11/26
60	Odour Containment System (FRP Cover) - Fourth Batch	90 days	Sat 10/11/27	Thu 11/2/24
61	Odour Containment System (FRP Cover) - Fifth Batch	60 days	Fri 11/2/25	Mon 11/4/25
62	Factory Testing (FRP Cover) - Prototype	5 days	Sun 10/2/7	Thu 10/2/11
63	Factory Testing (FRP Cover) - First Batch	5 days	Wed 10/5/26	Sun 10/5/30
64	Factory Testing (FRP Cover) - Second Batch	5 days	Sun 10/7/25	Thu 10/7/29
65	Factory Testing (FRP Cover) - Third Batch	5 days	Sat 10/10/23	Wed 10/10/27
66	Factory Testing (FRP Cover) - Fourth Batch	5 days	Fri 11/1/21	Tue 11/1/25
67	Factory Testing (FRP Cover) - Fifth Batch	5 days	Tue 11/3/22	Sat 11/3/26
68	Deodourizing System (DOU1 & 2)	165 days	Thu 10/3/4	Sun 10/8/15
69	LV Switchboard	120 days	Sun 10/3/14	Sun 10/7/11
70	Modification proposal of SCADA System	120 days	Tue 10/4/13	Tue 10/8/10
71	FRP Ductwork and Support - First Batch	120 days	Sun 10/3/14	Sun 10/7/11
72	FRP Ductwork and Support - Second Batch	60 days	Mon 10/7/12	Thu 10/9/9
73	FRP Ductwork and Support - Third Batch	60 days	Fri 10/9/10	Mon 10/11/8
74	FRP Ductwork and Support - Fourth Batch	60 days	Tue 10/11/9	Fri 11/1/7
75	FRP Ductwork and Support - Fifth Batch	60 days	Sat 11/1/8	Tue 11/3/8
76	CCTV System	210 days	Tue 10/4/13	Mon 10/11/8
77	Electrical Accessories	120 days	Sun 10/3/14	Sun 10/7/11
78	**Civil Construction**	**266 days**	**Sun 09/12/27**	**Sat 10/9/18**
79	Condition Survey on Existing Structure	14 days	Mon 09/12/28	Sun 10/1/10
80	Setting Up Condition Monitoring Points for Existing Structure	7 days	Mon 10/1/18	Sun 10/1/24
81	Construction Video Recording	2 days	Mon 10/1/18	Tue 10/1/19
82	**Piling Works**	**266 days**	**Sun 09/12/27**	**Sat 10/9/18**
83	Pre-drilling Works at DOU2	10 days	Wed 10/1/20	Fri 10/1/29
84	Approval of Pre-drilling Report at DOU2	10 days	Sat 10/1/30	Mon 10/2/8
85	Pre-drilling Works at DOU1	10 days	Sat 10/1/30	Mon 10/2/8
86	Approval of Pre-drilling Report at DOU1	10 days	Tue 10/2/9	Thu 10/2/18
87	Main Piling Work at DOU2	45 days	Sat 10/1/30	Mon 10/3/15
88	Load Test (4% of the total) at DOU2	14 days	Tue 10/3/16	Mon 10/3/29
89	Main Piling Work at DOU1	45 days	Tue 10/3/16	Thu 10/4/29
90	Load Test (4% of the total) at DOU2	14 days	Fri 10/4/30	Thu 10/5/13



Contract No. DE/2009/02
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Task | Progress | Summary | External Tasks | Deadline
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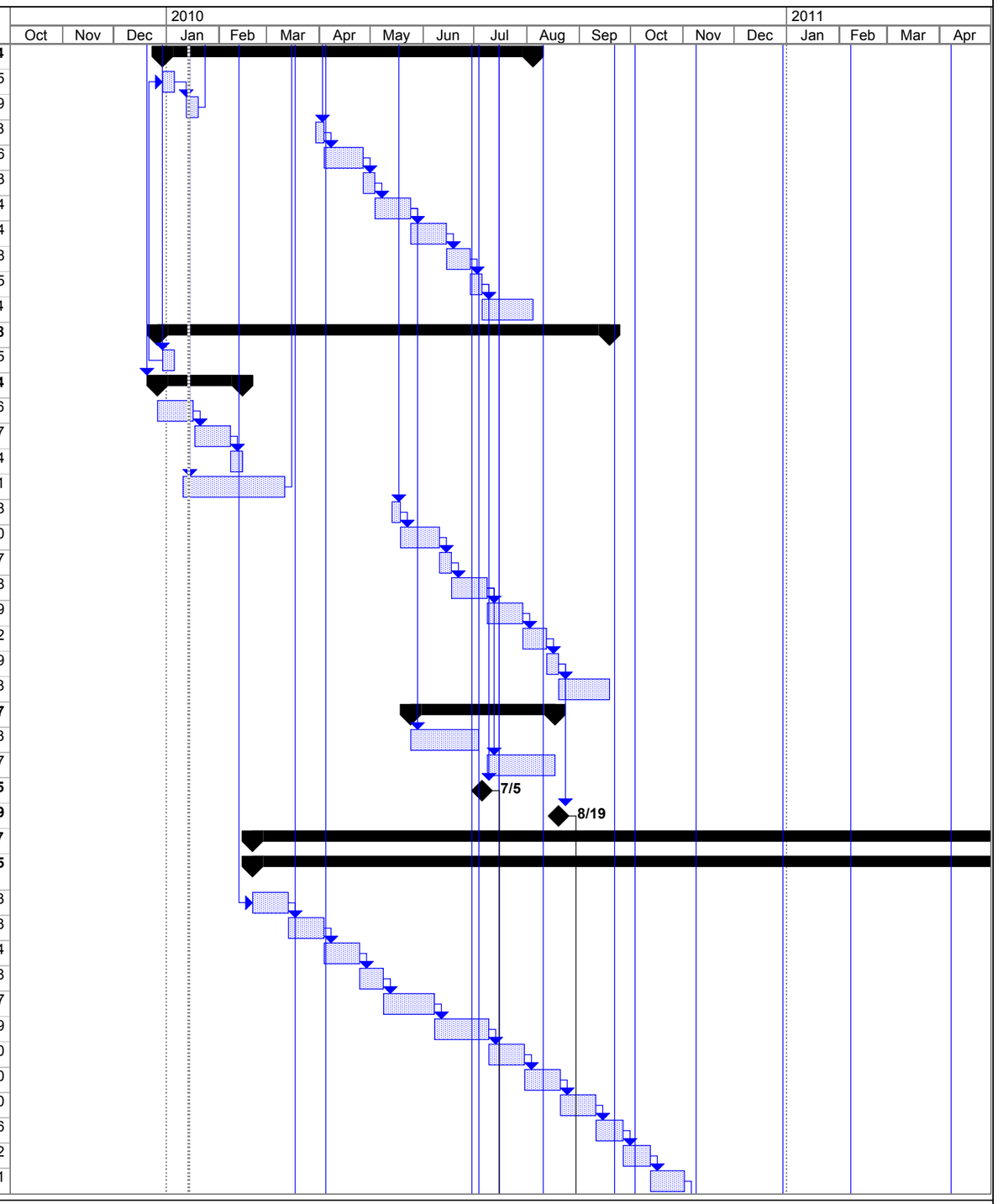
ATAL Engineering Limited

Three Months Rolling Programme for Contract No. DE/2009/02
Provision of Covers and Deodourisation Facilities to the Existing Sedimentation Tanks at Stonecutters Island Sewage Treatment Works (Jan10 to Mar10)

(Revision 0)

ID	Task Name	Duration	Start	Finish
91	**Construction of Concrete Plinth for DOU2**	**218 days**	**Wed 09/12/30**	**Wed 10/8/4**
92	Underground Utility Survey at DOU2	7 days	Wed 09/12/30	Tue 10/1/5
93	Demolition of Existing Concrete Slab at DOU2	7 days	Wed 10/1/13	Tue 10/1/19
94	Excavation including temporary works and safety measures	5 days	Tue 10/3/30	Sat 10/4/3
95	Pile Cap	23 days	Sun 10/4/4	Mon 10/4/26
96	Backfill to Ground Level	7 days	Tue 10/4/27	Mon 10/5/3
97	Concrete Plinth	21 days	Tue 10/5/4	Mon 10/5/24
98	Pour 2a - Wall of Control Room	21 days	Tue 10/5/25	Mon 10/6/14
99	Pour 2b - Roof of Control Room	14 days	Tue 10/6/15	Mon 10/6/28
100	Block work wall of Control Room and Finishing works	7 days	Tue 10/6/29	Mon 10/7/5
101	Reinstatement of road and drainage	30 days	Tue 10/7/6	Wed 10/8/4
102	**Construction of Concrete Plinth for DOU1**	**266 days**	**Sun 09/12/27**	**Sat 10/9/18**
103	Underground Utility Survey at DOU1	7 days	Wed 09/12/30	Tue 10/1/5
104	**Tree transplant**	**50 days**	**Sun 09/12/27**	**Sun 10/2/14**
105	1st Stage Root Pruning and Under Cutting	21 days	Sun 09/12/27	Sat 10/1/16
106	2nd Stage Root Pruning and Under Cutting	21 days	Mon 10/1/18	Sun 10/2/7
107	Tree Uplifting and Transplanting	7 days	Mon 10/2/8	Sun 10/2/14
108	Diversion of underground utilities	60 days	Mon 10/1/11	Thu 10/3/11
109	Excavation including temporary works and safety measures	5 days	Fri 10/5/14	Tue 10/5/18
110	Pile Cap	23 days	Wed 10/5/19	Thu 10/6/10
111	Backfill to Ground Level	7 days	Fri 10/6/11	Thu 10/6/17
112	Concrete Plinth	21 days	Fri 10/6/18	Thu 10/7/8
113	Pour 1a - Wall of Control Room	21 days	Fri 10/7/9	Thu 10/7/29
114	Pour 2b - Roof of Control Room	14 days	Fri 10/7/30	Thu 10/8/12
115	Block work wall of Control Room and Finishing works	7 days	Fri 10/8/13	Thu 10/8/19
116	Reinstatement of road and drainage	30 days	Fri 10/8/20	Sat 10/9/18
117	**Erection of Odour Bridge**	**85 days**	**Tue 10/5/25**	**Tue 10/8/17**
118	Odour Bridge connecting DOU2	40 days	Tue 10/5/25	Sat 10/7/3
119	Odour Bridge connecting DOU1	40 days	Fri 10/7/9	Tue 10/8/17
120	**Site Availability of the Plinth and Control Room for DOU2**	**0 days**	**Mon 10/7/5**	**Mon 10/7/5**
121	**Site Availability of the Plinth and Control Room for DOU1**	**0 days**	**Thu 10/8/19**	**Thu 10/8/19**
122	**Site Installation**	**858 days**	**Sun 10/2/21**	**Wed 12/6/27**
123	**Replacement/ relocation/ modification of existing installations and utilities**	**694 days**	**Sun 10/2/21**	**Sun 12/1/15**
124	Sedimentation Tank 43 & 45	21 days	Sun 10/2/21	Sat 10/3/13
125	Sedimentation Tank 39 & 41	21 days	Sun 10/3/14	Sat 10/4/3
126	Sedimentation Tank 35 & 37	21 days	Sun 10/4/4	Sat 10/4/24
127	Prototype Sedimentation Tank 33	14 days	Sun 10/4/25	Sat 10/5/8
128	Main Distribution Channel (between Sed tk. 33 to 45)	30 days	Sun 10/5/9	Mon 10/6/7
129	Sedimentation Tank 25, 27, 29 & 31	32 days	Tue 10/6/8	Fri 10/7/9
130	Sedimentation Tank 21 & 23	21 days	Sat 10/7/10	Fri 10/7/30
131	Flocculation Tank 5 & 7	21 days	Sat 10/7/31	Fri 10/8/20
132	Flocculation Tank 1 & 3	21 days	Sat 10/8/21	Fri 10/9/10
133	Main Distribution Channel (between Sed tk. 21 to 31)	16 days	Sat 10/9/11	Sun 10/9/26
134	Main Distribution Channel (between Sed tk. 9 to 19)	16 days	Mon 10/9/27	Tue 10/10/12
135	Main Distribution Channel (between Floc tk. 1 to 7)	20 days	Wed 10/10/13	Mon 10/11/1



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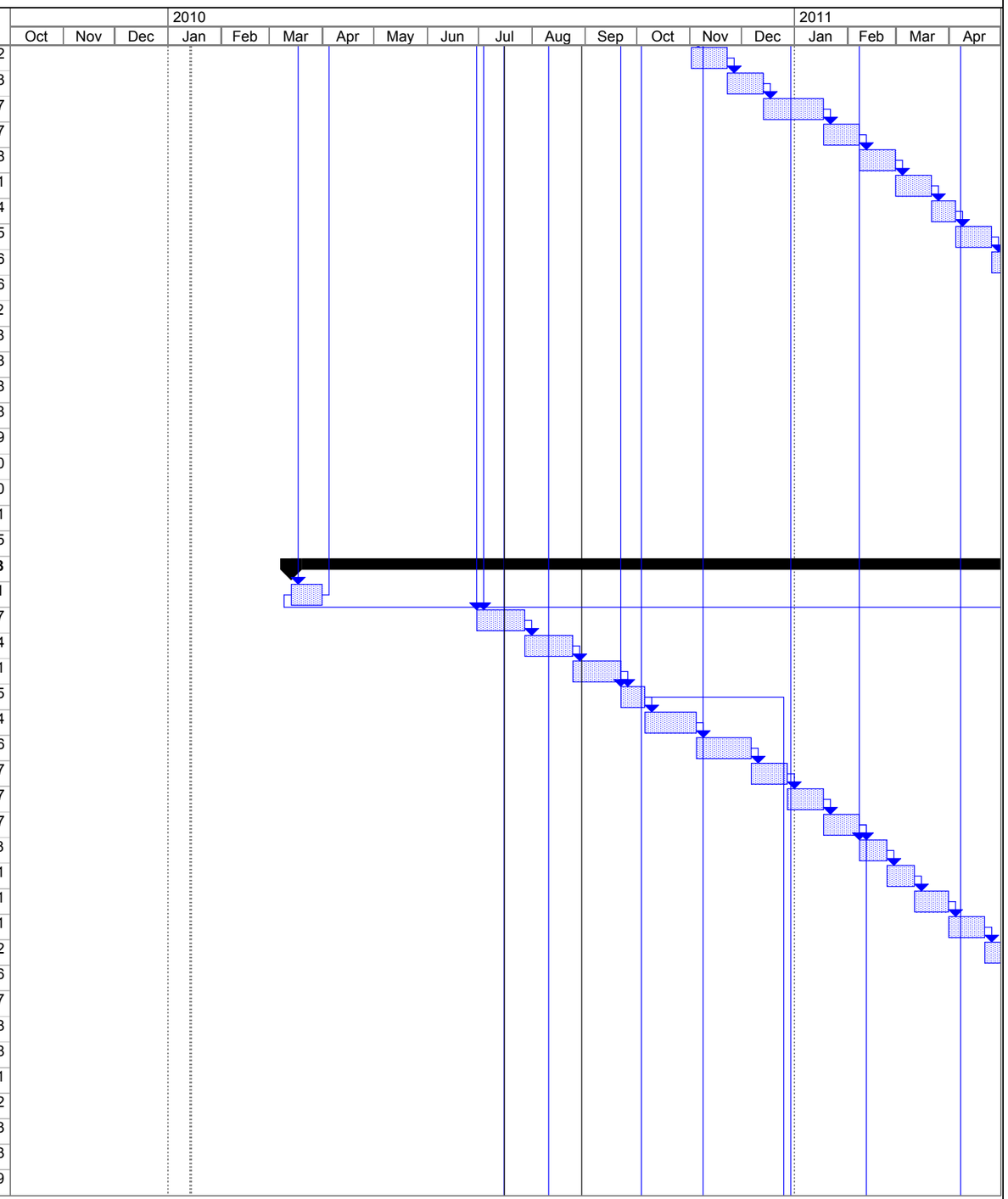
Three Months Rolling Programme for Contract No. DE/2009/02
Provision of Covers and Deodourisation Facilities to the Existing Sedimentation Tanks at Stonecutters Island Sewage Treatment Works (Jan10 to Mar10)

(Revision 0)

ID	Task Name	Duration	Start	Finish
136	Sedimentation Tank 17 & 19	21 days	Tue 10/11/2	Mon 10/11/22
137	Sedimentation Tank 13 & 15	21 days	Tue 10/11/23	Mon 10/12/13
138	Sedimentation Tank 9, 11 and associated walkway	35 days	Tue 10/12/14	Mon 11/1/17
139	Sedimentation Tank 44 & 46	21 days	Tue 11/1/18	Mon 11/2/7
140	Sedimentation Tank 40 & 42	21 days	Tue 11/2/8	Mon 11/2/28
141	Sedimentation Tank 36 & 38	21 days	Tue 11/3/1	Mon 11/3/21
142	Prototype Sedimentation Tank 34	14 days	Tue 11/3/22	Mon 11/4/4
143	Sedimentation Tank 30 & 32	21 days	Tue 11/4/5	Mon 11/4/25
144	Sedimentation Tank 26 & 28	21 days	Tue 11/4/26	Mon 11/5/16
145	Sedimentation Tank 22 & 24	21 days	Tue 11/5/17	Mon 11/6/6
146	Main Distribution Channel (between Sed tk. 34 to 46)	16 days	Tue 11/6/7	Wed 11/6/22
147	Main Distribution Channel (between Sed tk. 22 to 32)	16 days	Thu 11/6/23	Fri 11/7/8
148	Main Distribution Channel (between Sed tk. 10 to 20)	20 days	Sat 11/7/9	Thu 11/7/28
149	Flocculation Tank 6 & 8	21 days	Fri 11/7/29	Thu 11/8/18
150	Flocculation Tank 2 & 4	21 days	Fri 11/8/19	Thu 11/9/8
151	Main Distribution Channel (between Floc tk. 2 to 8)	21 days	Fri 11/9/9	Thu 11/9/29
152	Inlet Works	31 days	Fri 11/9/30	Sun 11/10/30
153	Sedimentation Tank 18 & 20	21 days	Mon 11/10/31	Sun 11/11/20
154	Sedimentation Tank 14 & 16	21 days	Mon 11/11/21	Sun 11/12/11
155	Sedimentation Tank 10, 12 and associated walkway	35 days	Mon 11/12/12	Sun 12/1/15
156	**Containment System**	**823 days**	**Sun 10/3/14**	**Wed 12/6/13**
157	Mock Installation of GRP Cover at one Sedimentation Tank	18 days	Sun 10/3/14	Wed 10/3/31
158	Sedimentation Tank 43 & 45	28 days	Wed 10/6/30	Tue 10/7/27
159	Sedimentation Tank 39 & 41	28 days	Wed 10/7/28	Tue 10/8/24
160	Sedimentation Tank 35 & 37	28 days	Wed 10/8/25	Tue 10/9/21
161	Prototype Sedimentation Tank 33	14 days	Wed 10/9/22	Tue 10/10/5
162	Main Distribution Channel (between Sed tk. 33 to 45)	30 days	Wed 10/10/6	Thu 10/11/4
163	Sedimentation Tank 25, 27, 29 & 31	32 days	Fri 10/11/5	Mon 10/12/6
164	Sedimentation Tank 21 & 23	21 days	Tue 10/12/7	Mon 10/12/27
165	Flocculation Tank 5 & 7	21 days	Tue 10/12/28	Mon 11/1/17
166	Flocculation Tank 1 & 3	21 days	Tue 11/1/18	Mon 11/2/7
167	Main Distribution Channel (between Sed tk. 21 to 31)	16 days	Tue 11/2/8	Wed 11/2/23
168	Main Distribution Channel (between Sed tk. 9 to 19)	16 days	Thu 11/2/24	Fri 11/3/11
169	Main Distribution Channel (between Floc tk. 1 to 7)	20 days	Sat 11/3/12	Thu 11/3/31
170	Sedimentation Tank 17 & 19	21 days	Fri 11/4/1	Thu 11/4/21
171	Sedimentation Tank 13 & 15	21 days	Fri 11/4/22	Thu 11/5/12
172	Sedimentation Tank 9, 11 and associated walkway	35 days	Fri 11/5/13	Thu 11/6/16
173	Sedimentation Tank 44 & 46	21 days	Fri 11/6/17	Thu 11/7/7
174	Sedimentation Tank 40 & 42	21 days	Fri 11/7/8	Thu 11/7/28
175	Sedimentation Tank 36 & 38	21 days	Fri 11/7/29	Thu 11/8/18
176	Prototype Sedimentation Tank 34	14 days	Fri 11/8/19	Thu 11/9/1
177	Sedimentation Tank 30 & 32	21 days	Fri 11/9/2	Thu 11/9/22
178	Sedimentation Tank 26 & 28	21 days	Fri 11/9/23	Thu 11/10/13
179	Sedimentation Tank 22 & 24	21 days	Fri 11/10/14	Thu 11/11/3
180	Main Distribution Channel (between Sed tk. 34 to 46)	16 days	Fri 11/11/4	Sat 11/11/19



Contract No. DE/2009/02
Revision: 0
Date: 11 January 2010

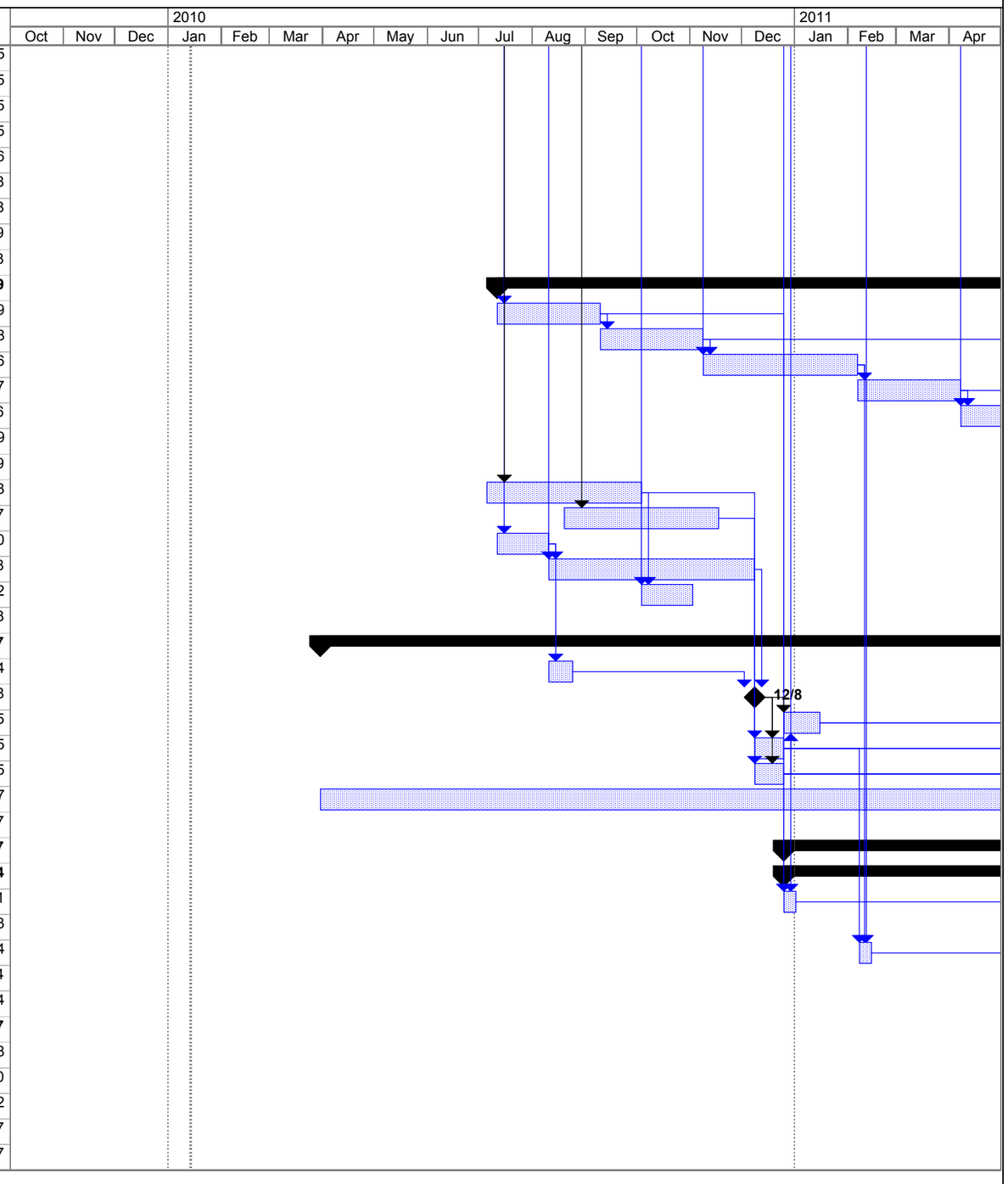
Task | Progress | Summary | External Tasks | Deadline
Split | Milestone | Project Summary | External Milestone

ATAL Engineering Limited

Three Months Rolling Programme for Contract No. DE/2009/02
Provision of Covers and Deodourisation Facilities to the Existing Sedimentation Tanks at Stonecutters Island Sewage Treatment Works (Jan10 to Mar10)

(Revision 0)

ID	Task Name	Duration	Start	Finish
181	Main Distribution Channel (between Sed tk. 22 to 32)	16 days	Sun 11/11/20	Mon 11/12/5
182	Main Distribution Channel (between Sed tk. 10 to 20)	20 days	Tue 11/12/6	Sun 11/12/25
183	Flocculation Tank 6 & 8	21 days	Mon 11/12/26	Sun 12/1/15
184	Flocculation Tank 2 & 4	21 days	Mon 12/1/16	Sun 12/2/5
185	Main Distribution Channel (between Floc tk. 2 to 8)	21 days	Mon 12/2/6	Sun 12/2/26
186	Inlet Works	31 days	Mon 12/2/27	Wed 12/3/28
187	Sedimentation Tank 18 & 20	21 days	Thu 12/3/29	Wed 12/4/18
188	Sedimentation Tank 14 & 16	21 days	Thu 12/4/19	Wed 12/5/9
189	Sedimentation Tank 10, 12 and associated walkway	35 days	Thu 12/5/10	Wed 12/6/13
190	**FRP Ductwork**	**465 days**	**Mon 10/7/12**	**Wed 11/10/19**
191	Sedimentation Tank (33-45, Odd Number)	60 days	Mon 10/7/12	Thu 10/9/9
192	Sedimentation Tank (9 -31, Odd Number)	60 days	Fri 10/9/10	Mon 10/11/8
193	Flocculation Tank (Odd Number)	90 days	Tue 10/11/9	Sun 11/2/6
194	Sedimentation Tank (34 -46, Even Number)	60 days	Mon 11/2/7	Thu 11/4/7
195	Sedimentation Tank (10 -32, Even Number)	90 days	Fri 11/4/8	Wed 11/7/6
196	Flocculation Tank (Even Number)	75 days	Thu 11/7/7	Mon 11/9/19
197	Inlet Works	30 days	Tue 11/9/20	Wed 11/10/19
198	Deodourization System No. 2	90 days	Tue 10/7/6	Sun 10/10/3
199	Deodourization System No. 1	90 days	Fri 10/8/20	Wed 10/11/17
200	LV Switchboard	30 days	Mon 10/7/12	Tue 10/8/10
201	Cabling Laying and Termination for DOU and SCADA	120 days	Wed 10/8/11	Wed 10/12/8
202	Modification of SCADA System	30 days	Mon 10/10/4	Tue 10/11/2
203	CCTV System and associated cabling work	100 days	Tue 12/3/6	Wed 12/6/13
204	**Testing and Commissioning**	**820 days**	**Wed 10/3/31**	**Wed 12/6/27**
205	LV Switchboard	14 days	Wed 10/8/11	Tue 10/8/24
206	Power Energization	0 days	Wed 10/12/8	Wed 10/12/8
207	SCADA System	21 days	Sun 10/12/26	Sat 11/1/15
208	Deodourization System No. 2	17 days	Thu 10/12/9	Sat 10/12/25
209	Deodourization System No. 1	17 days	Thu 10/12/9	Sat 10/12/25
210	FRP Covers	454 days	Wed 10/3/31	Mon 11/6/27
211	CCTV System	14 days	Thu 12/6/14	Wed 12/6/27
212	**System Performance Test**	**550 days**	**Sun 10/12/26**	**Wed 12/6/27**
213	**Deodourization System No. 2**	**496 days**	**Sun 10/12/26**	**Fri 12/5/4**
214	Sedimentation Tank (33-45, Odd Number)	7 days	Sun 10/12/26	Sat 11/1/1
215	Sedimentation Tank (9 -31, Odd Number)	7 days	Fri 11/6/17	Thu 11/6/23
216	Flocculation Tank (odd number)	7 days	Tue 11/2/8	Mon 11/2/14
217	Inlet Works	7 days	Thu 12/3/29	Wed 12/4/4
218	Final DOU2 System Acceptance Test	30 days	Thu 12/4/5	Fri 12/5/4
219	**Deodourization System No. 1**	**300 days**	**Fri 11/9/2**	**Wed 12/6/27**
220	Sedimentation Tank (34 -46, Even Number)	7 days	Fri 11/9/2	Thu 11/9/8
221	Sedimentation Tank (10 -32, Even Number)	7 days	Thu 12/6/14	Wed 12/6/20
222	Flocculation Tank (Even number)	7 days	Mon 12/2/6	Sun 12/2/12
223	Final DOU1 System Acceptance Test	30 days	Tue 12/5/29	Wed 12/6/27
224	**Substantial Completion of Project**	0 days	Wed 12/6/27	Wed 12/6/27



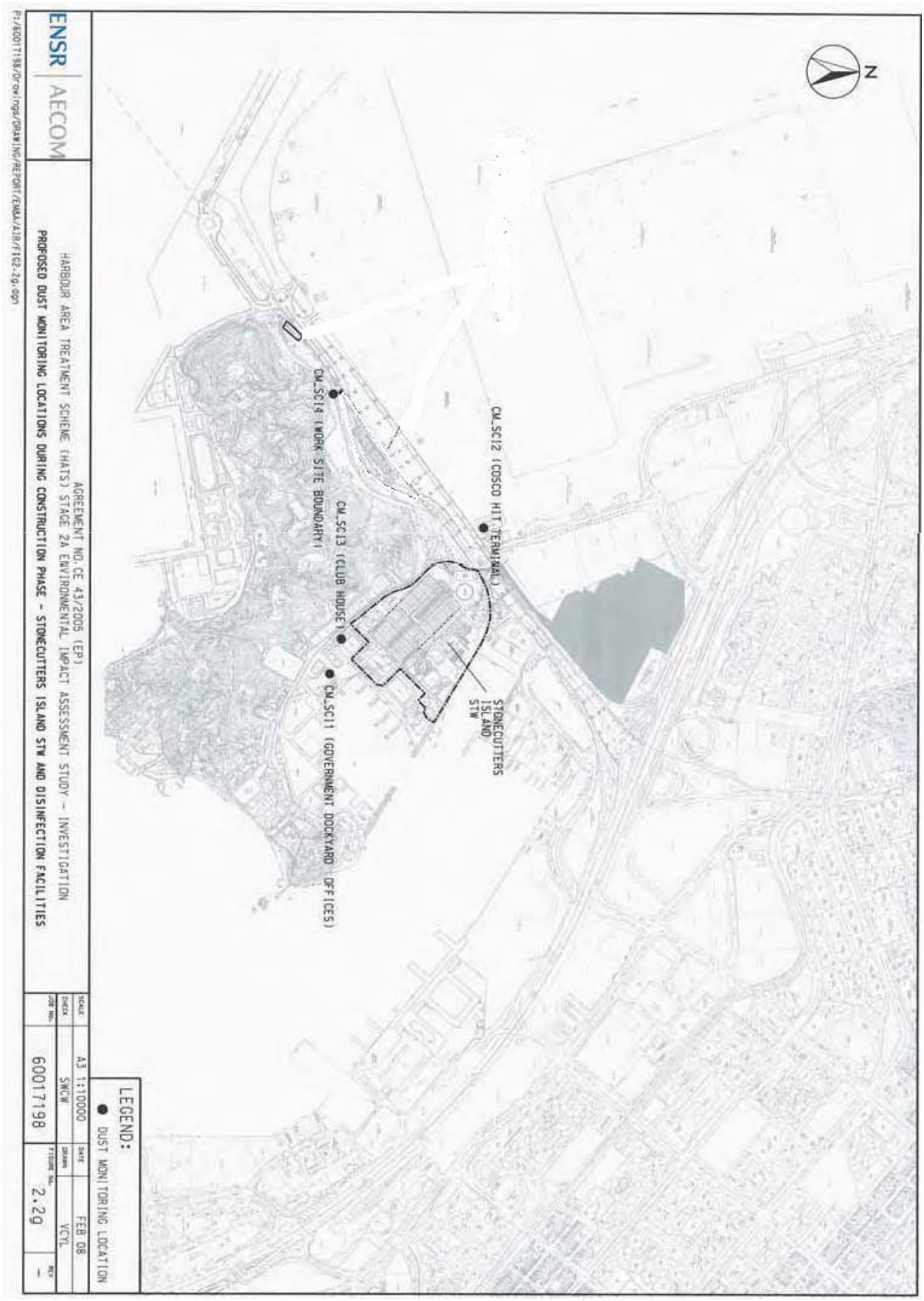
Contract No. DE/2009/02
Revision: 0
Date: 11 January 2010

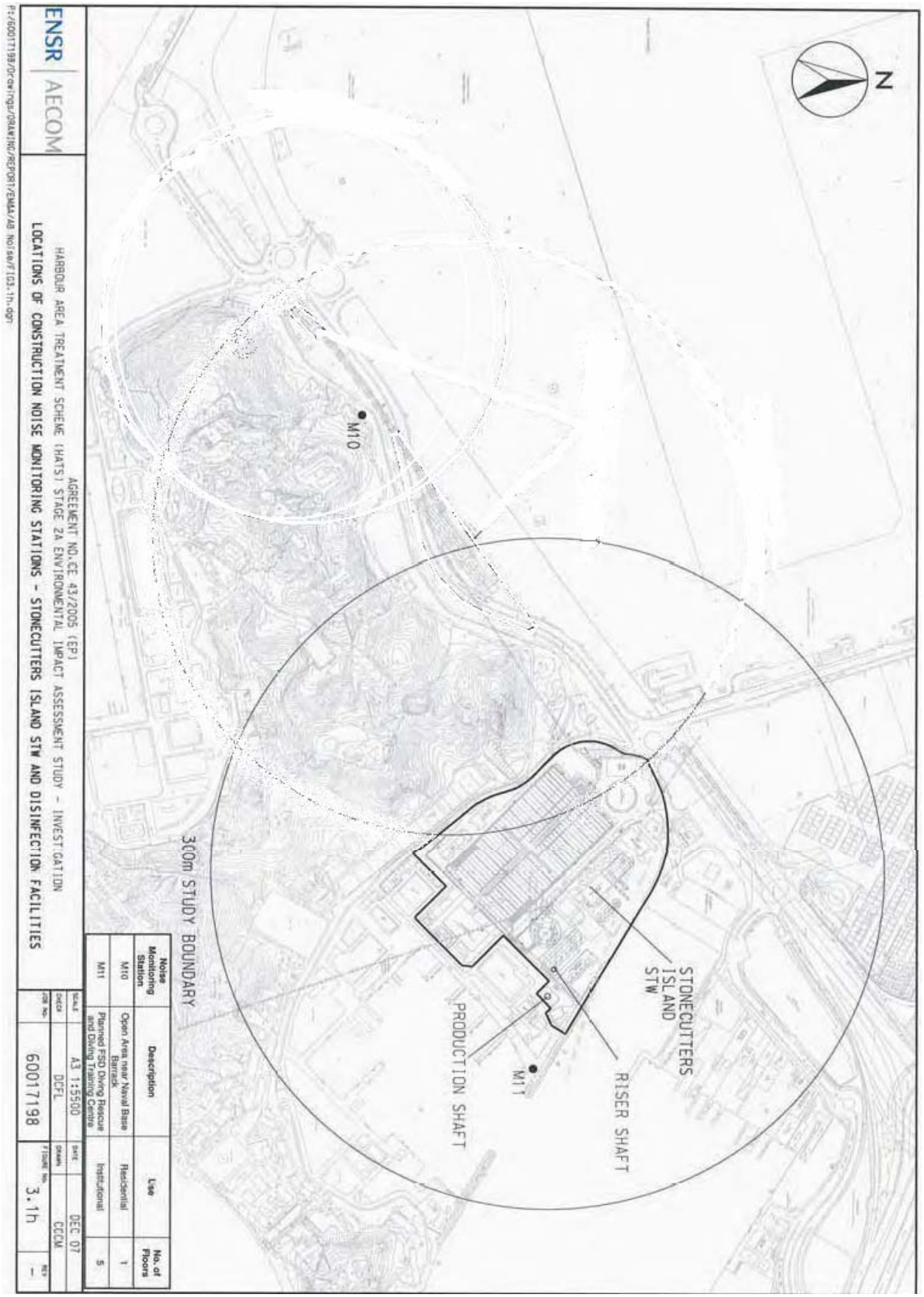
Task | Progress | Summary | External Tasks | Deadline
Split | Milestone | Project Summary | External Milestone

ATAL Engineering Limited

Annex D

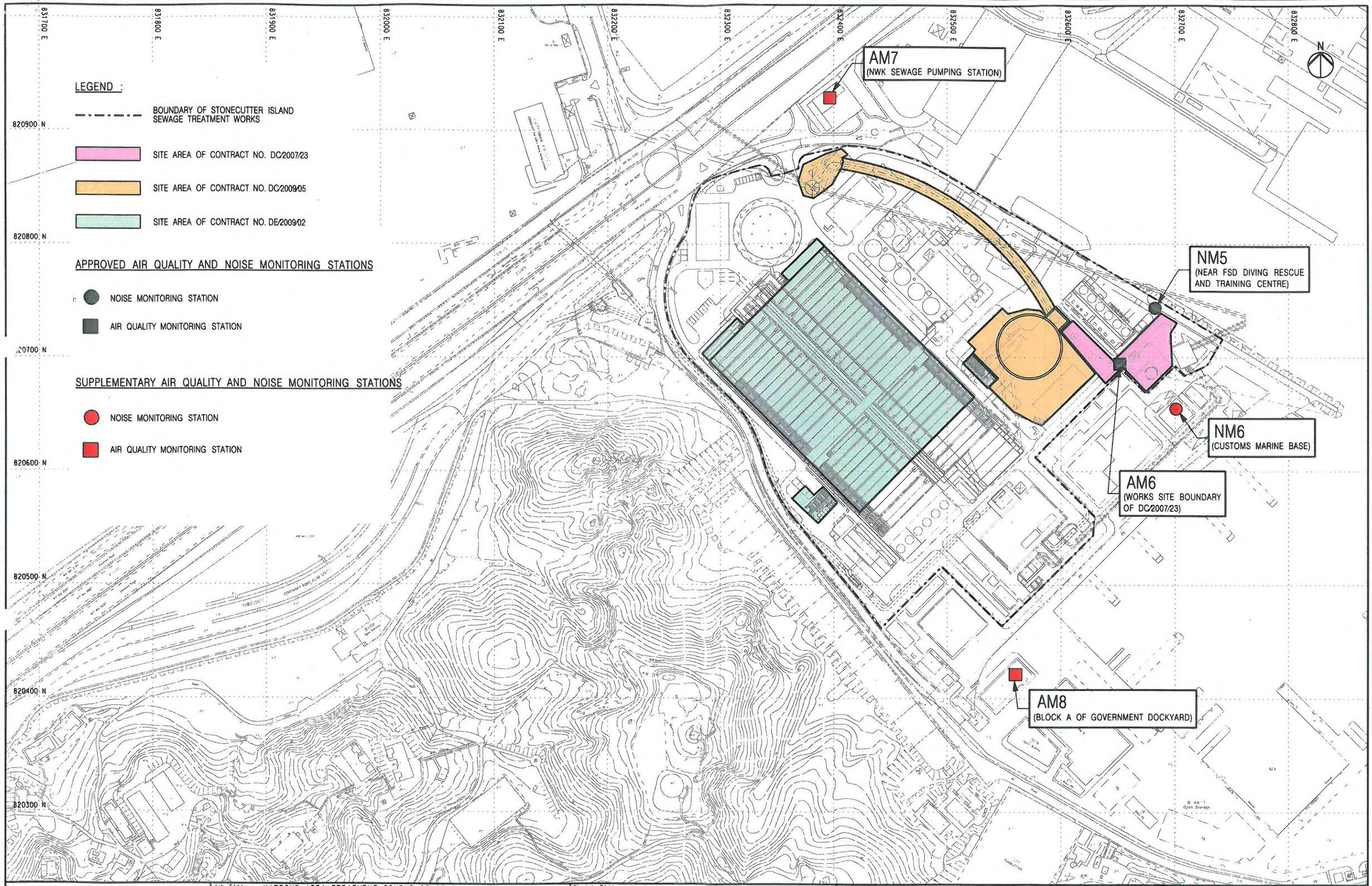
Monitoring Locations Designated in the EM&A Manual


N
CM_SC12 (COSCO HIT TERMINAL)
CM_SC14 (WORK SITE BOUNDARY)
CM_SC13 (CLUB HOUSE)
CM_SC11 (GOVERNMENT DOCKYARD OFFICES)
STONECUTTERS ISLAND STW
LEGEND:
DUST MONITORING LOCATION
ENSR | AECOM
HARBOUR AREA TREATMENT SCHEME (HATS) STAGE 2A ENVIRONMENTAL IMPACT ASSESSMENT STUDY – INVESTIGATION
AGREEMENT NO. CE 43/2005 (EP)
PROPOSED DUST MONITORING LOCATIONS DURING CONSTRUCTION PHASE – STONECUTTERS ISLAND STW AND DISINFECTION FACILITIES
SCALE A3 1:10000
DATE FEB 08
CHECK SWCW
DRAWN YCYL
JOB NO. 60017198
FIGURE No. 2.2g
REV -
P:/60017198/Drawings/DRAWING/REPORT/EM&A/AIR/FIG2-2g.dgn


N
M10
M11
300m STUDY BOUNDARY
STONECUTTERS ISLAND STW
RISER SHAFT
PRODUCTION SHAFT
ENSR | AECOM
HARBOUR AREA TREATMENT SCHEME (HATS) STAGE 2A ENVIRONMENTAL IMPACT ASSESSMENT STUDY - INVESTIGATION
AGREEMENT NO. CE 43/2005 (EP)
LOCATIONS OF CONSTRUCTION NOISE MONITORING STATIONS - STONECUTTERS ISLAND STW AND DISINFECTION FACILITIES
Noise Monitoring Station
Description
Use
No. of Floors
M10
Open Area near Naval Base Barrack
Residential
1
M11
Planned FSD Diving Rescue and Diking Training Centre
Institutional
5
SCALE A3 1:5500
DATE DEC 07
JOB No. 60017198
DRAWN CCCM
FIGURE No. 3.1h
REV -

Annex E

Current Impact Monitoring Stations



ARUP
Ove Arup & Partners HK Ltd

Job Title : HARBOUR AREA TREATMENT SCHEME STAGE 2A - CONSTRUCTION OF INTERCONNECTION TUNNEL AND DIAPHRAGM WALL FOR MAIN PUMPING STATION AT STONECUTTERS ISLAND SEWAGE TREATMENT WORKS		Sketch Title : LOCATIONS OF AIR AND NOISE MONITORING STATIONS AT STONECUTTER ISLAND SEWAGE TREATMENT WORKS	Drawn: KH / Checked: WY / Approved: GA
Project No.: DC0905	Contract No.: DC/2009/05		
Sketch No. : DC/2009/05/SK/0017	Rev : 1	Scale : 1:3000 @ A3	Issue Date : 15-12-2009
Other Related Ref.:	Working Dwg. No.: N/A	DAN No.: N/A	IN-0 No.: N/A
		RFI No.: N/A	Others: N/A

15/12/2009 C:\DC200905-Sketch Drawing\SK0017_REV.1\DC200905_SK0017_REV.1.dgn

Annex F

Monitoring Equipment Calibrated Certificates and Laboratory Certificates

TISCH ENVIROMENTAL, INC.
145 SOUTH MIAMI AVE.
VILLAGE OF CLEVES, OH 45002
513.467.9000
877.263.7610 TOLL FREE
513.467.9009 FAX
WWW.TISCH-ENV.COM

AIR POLLUTION MONITORING EQUIPMENT

ORIFICE TRANSFER STANDARD CERTIFICATION WORKSHEET TE-5025A

Date - Jun 02, 2009 Rootsmeter S/N 9833620 Ta (K) - 296
Operator Tisch Orifice I.D. - 1612 Pa (mm) - 751.84

PLATE OR Run #	VOLUME START (m3)	VOLUME STOP (m3)	DIFF VOLUME (m3)	DIFF TIME (min)	METER DIFF Hg (mm)	ORFICE DIFF H2O (in.)
1	NA	NA	1.00	1.3890	3.2	2.00
2	NA	NA	1.00	0.9820	6.4	4.00
3	NA	NA	1.00	0.8780	7.9	5.00
4	NA	NA	1.00	0.8390	8.7	5.50
5	NA	NA	1.00	0.6920	12.7	8.00

DATA TABULATION

Vstd	(x axis) Qstd	(y axis)		Va	(x axis) Qa	(y axis)
0.9917	0.7139	1.4113		0.9957	0.7169	0.8874
0.9875	1.0056	1.9959		0.9915	1.0097	1.2549
0.9854	1.1223	2.2315		0.9894	1.1269	1.4030
0.9844	1.1733	2.3405		0.9884	1.1781	1.4715
0.9791	1.4149	2.8227		0.9831	1.4206	1.7747
Qstd slope (m) =		2.01546		Qa slope (m) =		1.26205
intercept (b) =		-0.02851		intercept (b) =		-0.01792
coefficient (r) =		0.99997		coefficient (r) =		0.99997
y axis = SQRT[H2O(Pa/760)(298/Ta)]				y axis = SQRT[H2O(Ta/Pa)]		

CALCULATIONS

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

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

For subsequent flow rate calculations:

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

TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : Block A of Government Dockyard Offices
Location ID : AM8

Date of Calibration: 2-Dec-09
Next Calibration Date: 2-Mar-10
Technician: Mr. Ben Tam

CONDITIONS

Sea Level Pressure (hPa)	1020.9	Corrected Pressure (mm Hg)	765.675
Temperature (°C)	19.8	Temperature (K)	293

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.01546
Model->	TE-5025	Qstd Intercept ->	-0.02851
Serial # ->	1612		

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected
18	4.9	4.9	9.8	1.587	59	60.27
13	4	4	8	1.435	53	54.14
10	3.5	3.5	7	1.343	46	46.99
7	2.2	2.2	4.4	1.068	38	38.82
5	1.4	1.4	2.8	0.855	29	29.63

LINEAR REGRESSION

Slope = 41.0617
Intercept = -5.6729
Corr. coeff. = 0.9931

Calculations :

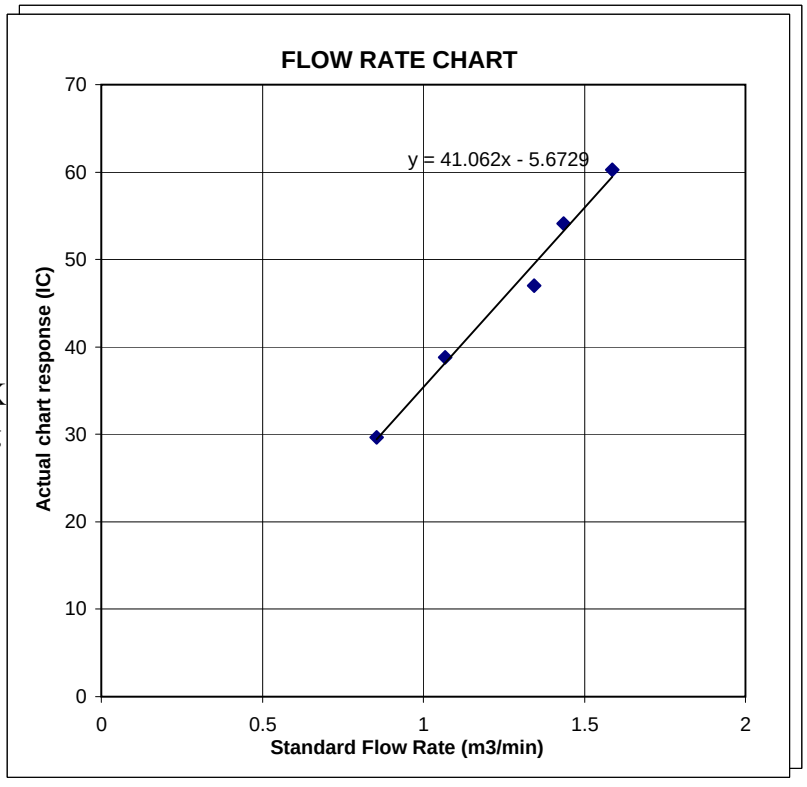
Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

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

For subsequent calculation of sampler flow:

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

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



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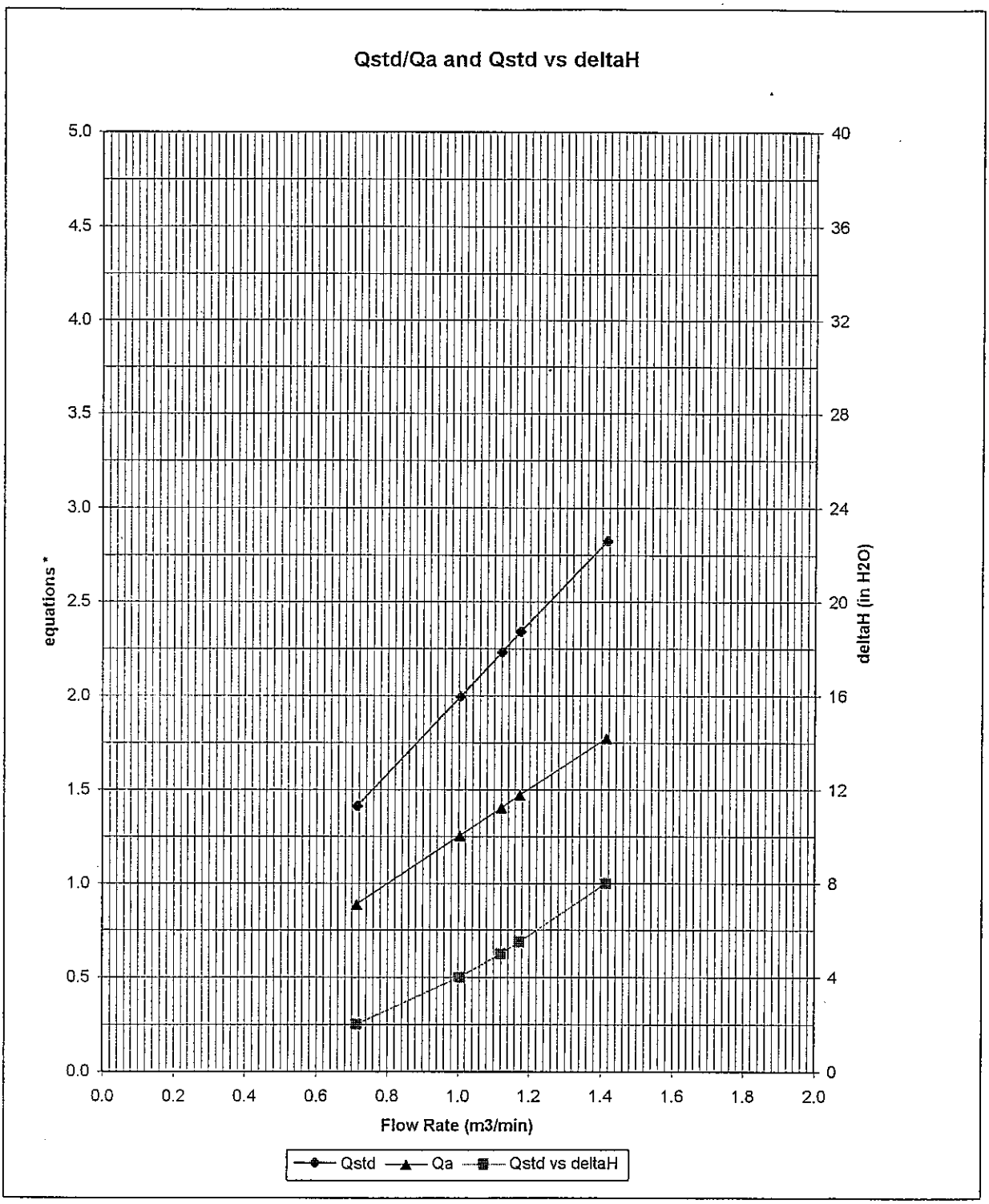
AIR POLLUTION MONITORING EQUIPMENT



* y-axis equations:

Qstd series: $\sqrt{\Delta H \left(\frac{Pa}{Pstd}\right)\left(\frac{Tstd}{Ta}\right)}$

Qa series: $\sqrt{(\Delta H\ (Ta\ /\ Pa))}$

#1612

AUES

Equipment Calibration Record

Equipment Calibrated:

Type:	Dust Trak Model 8520
Manufacturer:	TSI
Serial No.	21060
Equipment Ref:	EQ021

Standard Equipment:

Standard Equipment:	Higher Volume Sampler
Location & Location ID:	No.1 Ma On Kong Village
Equipment Ref:	ASR15 (A2)
Last Calibration Date:	15-Jun-09

Equipment Calibration Results:

Calibration Date: 18-Jun-09

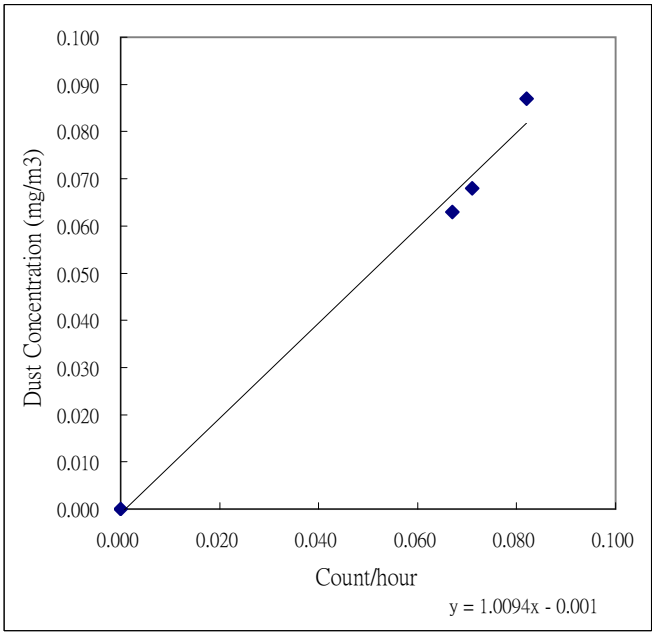
Hour	Time	Temp °C	RH %	Dust Concentration in mg/m^3	
				(Standard Equipment)	(Calibrated Equipment)
1	11:00 ~ 12:00	31.6	67.2	0.071	0.068
1	12:05 ~ 13:05	32.4	68.7	0.067	0.063
1	13:10 ~ 14:10	32.7	68.1	0.082	0.087

Sensitivity Adjustment Zero Calibration (Before Calibration) 0 (mg/m^3)

Sensitivity Adjustment Zero Calibration (After Calibration) 0 (mg/m^3)

Linear Regression of Y or X

Slope:	**0.0122**
Correlation Coefficient	**0.9943**
Validity of Calibration Record	**18-Jun-10**



Operator : Carson Chan Signature : Carson Date : 2009/6/18

QC Reviewer Ben Tam Signature : Date : 2009/6/18

Annex G

Event and Action Plan

Event and Action Plan for Air Quality

EVENT	ACTION			
	ET leader	*IEC*	*ER*	*Contractor*
ACTION LEVEL				
1. Exceedance for one sample	1. Identify source 2. Inform IEC, ER and Contractor 3. Repeat measurement to confirm findings 4. Increase monitoring frequency to daily	1. Check monitoring data submitted by ET leader 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, ER and Contractor 3. Repeat measurement to confirm findings 4. Increase monitoring frequency to daily 5. Discuss with IEC, Contractor and ER on remedial actions required 6. If exceedance continue, arrange meeting with IEC, ER and Contractor 7. If exceedance stops, cease additional monitoring	1. Checking monitoring data submitted by ET leader. 2. Check Contractor's working method 3. Discuss with ET leader and Contractor on possible remedial measures 4. Advise the ER on the effectiveness of the proposed remedial measures 5. Supervise 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 actions to IEC and 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 2. Inform IEC, ER, EPD and Contractor 3. Repeat measurement to confirm findings 4. Increase monitoring frequency to daily 5. Assess effectiveness of Contractor's remedial actions and kept IEC, EPD and ER informed of the results	1. Check monitoring data submitted by ET leader 2. Check Contractor's working method 3. Discuss with ET leader and Contractor on possible remedial measures 4. Advise the ER on the effectiveness of the proposed remedial measures 5. Audit 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 for the exceedance 2. Submit proposals for remedial actions to IEC and ER within 3 working days of notification 3. 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, Contractor and ER to discuss the remedial actions to be taken 7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results 8. If exceedance stops, cease additional monitoring	1. Discuss amongst ER, ET leader and Contractor on the potential remedial actions 2. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly 3. Audit the implementation of remedial measures	1. Confirm receipt of notification of failure in writing 2. Notify Contractor 3. In consultation with IEC, agree with the Contractor on the remedial measures to be implemented 4. Ensure remedial measures properly implemented 5. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated.	1. Take immediate action to avoid for the exceedance 2. Submit proposals for remedial actions to IEC and ER within 3 working days of notification 3. Implement the agreed proposals 4. Resubmit proposals if problem still not under control 5. Stop the relevant portion of works as determined by the ER until the exceedance is abate.

Event and Action Plan for Construction Noise Quality

EVENT	ACTION			
	ET Leader	IEC	ER	Contractor
Action Level	1. Notify IEC, Contractor and ER 2. Carry out investigation 3. Report the results of investigation to the IEC, Contractor and ER 4. Discuss with the Contractor and formulate remedial measures 5. Double monitoring frequency 6. Check compliance to Action/Limit Levels after application of mitigation measures	1. Review the analysed results submitted by the ET leader 2. Review the proposed remedial measures by the Contractor and advise the ER accordingly 3. Review the implementation of remedial measures	1. Confirm receipt of notification of complaint in writing 2. Notify Contractor 3. Require Contractor to propose remedial measures for the analysed noise problem 4. Ensure remedial measures are properly implemented	1. Submit noise mitigation proposals to ER and IEC 2. Implement noise mitigation proposals
Limit Level	1. Notify IEC, ER, EPD and Contractor 2. Identify Source 3. Repeat measurement to confirm findings 4. Increase monitoring frequency 5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented 6. Inform IEC, ER and EPD the causes & actions taken for the exceedances 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 leader and Contractor on the potential remedial actions 2. Review remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly 3. Audit the implementation of remedial measures	1. Confirm receipt of notification of failure in writing 2. Notify Contractor 3. Require Contractor to propose remedial measures for the analysed noise problem 4. Ensure remedial measures are properly implemented 5. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated	1. Take immediate action to avoid further exceedance 2. Submit proposals for remedial actions to within 3 working days of notification 3. Implement the agreed proposals 4. Resubmit proposals if problem still not under control 5. Stop the relevant portion of works as determined by the ER until the exceedance is abated

Annex H

Monitoring Schedule of the Reporting Month and forthcoming Month

Monitoring Schedule in Reporting Month

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

Remarks: 1-hour TSP and Noise monitoring running time were cover 0700-1900 hours.

Predicted Monitoring Schedule in Forthcoming Month

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

Remarks: 1-hour TSP and Noise monitoring running time should be cover 0700-1900 hours.

Annex I

Data Base of Monitoring Results

Impact 24-hour TSP Monitoring Results - AM8

Date of Calibration: 2-Dec-09 Slope = 41.0617

Next Calibration Date: 2-Mar-10 Intercept = -5.6729

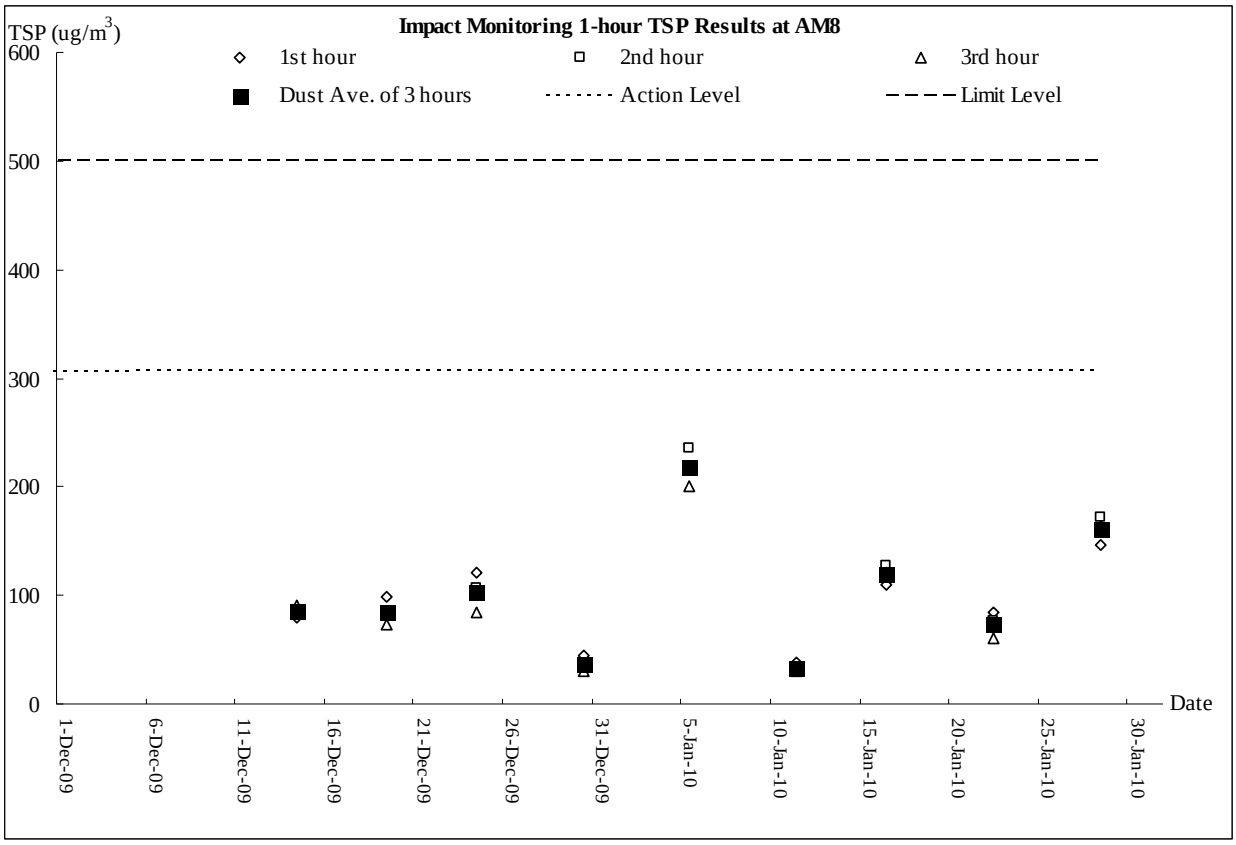
DATE	SAMPLE NUMBER	ELAPSED TIME INITIAL	ELAPSED TIME FINAL	ELAPSED TIME (min)	MIN CHART READING	MAX CHART READING	AVG CHART READING	AVG TEMP (oC)	STANDARD AVG PRESS (hPa)	STANDARD FLOW RATE (m3/min)	STANDARD AIR VOLUME (std m3)	INITIAL FILTER WEIGHT (g)	FINAL FILTER WEIGHT (g)	WEIGHT DUST COLLECTED (g)	DUST 24-hour TSP IN AIR (ug/m^3)
4-Jan-10	021306	2652.50	2676.62	1447.20	31	31	31.0	18.8	1015.1	0.90	1305	2.7306	2.8516	0.1210	93
9-Jan-10	021344	2676.62	2700.67	1443.00	32	31	31.5	15.1	1018.9	0.92	1328	2.7695	2.8509	0.0814	62
15-Jan-10	021364	2700.67	2724.67	1440.00	30	31	30.5	15.8	1025	0.90	1292	2.8241	3.026	0.2019	156
21-Jan-10	021397	2724.67	2748.72	1443.00	30	30	30.0	22.3	1018.5	0.87	1261	2.8648	2.955	0.0902	72
27-Jan-10	021422	2748.72	2772.85	1447.80	30	30	30.0	18.4	1021.1	0.88	1274	2.8101	2.9672	0.1571	123

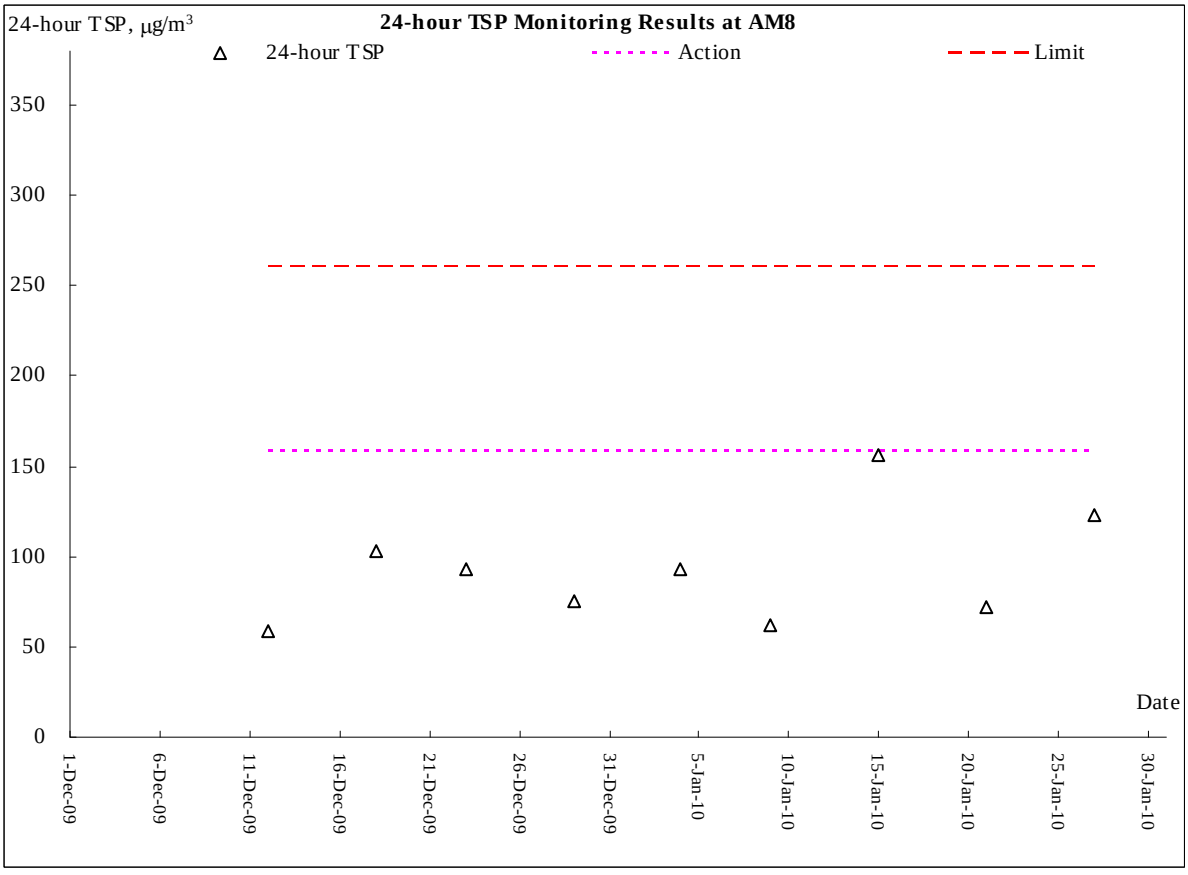
Annex J

Graphical Plots of Impact Monitoring

1. Air Quality

1. Air Quality





Annex K

Meteorological Data of Reporting Month

Meteorological Data

Date		Weather	Total Rainfall (mm)	Tsing Yi Station			
				Mean Air Temp. (°C)	Wind Speed (km/h)	Mean Relative Humidity (%)	Wind Direction
Fri	1-Jan-10	holiday					
Sat	2-Jan-10	Sunny periods in the afternoon. Mainly cloudy tonight. Light to moderate easterly winds.	5.2	18.4	7.5	84.5	E/SE
Sun	3-Jan-10	Overcast with rain patches and low visibility. Moderate to fresh northerly winds.	3.5	16.9	6.7	75.5	E/SE
Mon	4-Jan-10	Moderate to fresh northerly winds.	0	18.8	8.9	68.5	E/SE
Tue	5-Jan-10	Overcast with rain patches.Moderate to fresh northerly winds.	0.8	17.3	14.5	76	E
Wed	6-Jan-10	Mainly cloudy at first, becoming fine. Moderate northeasterly winds.	1.2	14.9	6.7	87	E/SE
Thu	7-Jan-10	Overcast and cold with light rain patches. Moderate to fresh northerly winds.	0.5	12.6	8.2	82	NW
Fri	8-Jan-10	Mainly cloudy. Moderate north to northeasterly winds, occasionally fresh.	0.9	12.8	7.6	78	N/NW
Sat	9-Jan-10	Moderate east to northeasterly winds, fresh over offshore waters at first.	0	15.7	9.5	69.2	E/SE
Sun	10-Jan-10	Overcast with a few rain patches.	Trace	18	12.2	73.5	E
Mon	11-Jan-10	Fresh northerly wind, occasionally strong over offshore waters and on high ground.	12.5	14.7	11.6	83.5	N/NW
Tue	12-Jan-10	Fine and dry. It will be cold. Fresh northerly winds	0	12.1	17.5	58	N/NW
Wed	13-Jan-10	Fine and very dry. Cold in the morning. Moderate north to northeasterly winds.	0	14	7.6	41.7	N/NW
Thu	14-Jan-10	Dry with sunny periods. Moderate easterly winds, occasionally fresh over offshore waters.	Trace	15.1	11.7	53.7	E/SE
Fri	15-Jan-10	Sunny periods. Moderate east to northeasterly winds, fresh over offshore waters at first.	0	17.6	12	48	E
Sat	16-Jan-10	Mainly fine.Moderate easterly winds, occasionally fresh over offshore waters.	0	18.6	7.7	56.2	E/NE
Sun	17-Jan-10	Mainly fine apart from some haze. Moderate easterly winds.	0	18.1	7.5	65	E/SE
Mon	18-Jan-10	Sunny periods.Moderate easterly winds, occasionally fresh over offshore waters at first.	0	18.7	9.7	63.5	E/SE
Tue	19-Jan-10	Cloudy with sunny intervals. Visibility relatively low over parts of the territory. Moderate easterly winds.	0	18.4	9.7	74.5	E/SE
Wed	20-Jan-10	Cloudy. Humid with fog and a few light rain patches.	Trace	21.9	8	80.5	E/SE
Thu	21-Jan-10	Mainly cloudy. Moderate easterly winds, becoming fresh northeasterlies with a few rain patches overnight.	0	23.2	8.5	80	E/SE
Fri	22-Jan-10	Mainly cloudy. There will be a few light rain patches.	Trace	18.8	13..7	78.5	E/SE
Sat	23-Jan-10	Cloudy with a few light rain patches. It will be cool.	Trace	14.9	5.5	84.5	E/SE
Sun	24-Jan-10	Cloudy.Sunny intervals during the day. Moderate north to northeasterly winds.	Trace	14.9	5.5	84.5	E/SE
Mon	25-Jan-10	Cloudy with haze.Moderate north to northeasterly winds.	0	18.1	11.2	75.7	NW
Tue	26-Jan-10	Cloudy with a few light rain patches. Moderate to fresh easterly winds.	Trace	15.9	9	75	E/SE
Wed	27-Jan-10	Cloudy and misty with one or two light rain patches.	Trace	17.2	11.7	79	E/SE
Thu	28-Jan-10	Cloudy with fog patches. Light to moderate easterly winds.	Trace	20.6	5.5	82.5	N/NW
Fri	29-Jan-10	Cloudy with a few rain patches. Misty at first.	Trace	18.5	11.2	85.5	E
Sat	30-Jan-10	Mist patches. Light winds.	0	19.5	14.5	75.5	E/SE
Sun	31-Jan-10	Mainly fine. There will be coastal fog. Light winds.	0	22.8	7	75	S/SE

Annex L

Monthly Summary Waste Flow Table

Contract No. DE/2009/02

ATAL ENGINEERING LTD. 安樂工程有限公司

Harbour Area Treatment Scheme Stage 2A - Provision of Covers and Deodourisation Facilities to the Existing Sedimentation Tanks at Stonecutters Island Sewage Treatment Works

(To be submitted to the C&D MM Coordinator of Respective Division/Region via the Engineer's Representative by not later than 1 st of June and December of each year)

Month	Annual Quantities of Inert C&D Materials Generated / Imported (in '000 m^3)												Annual Quantities of Other C&D Materials / Wastes Generated									
	Total Quantities Generated		Broken Concrete (including rock for recycling into aggregates)		Reused in the Contract		Reused in Other Projects		Disposed as Public Fill		Imported C&D Material		Metal		Paper/ Cardboard Packaging		Plastic (bottles/containers, plastic sheets/ foams from package material)		Chemical Waste		Others (e.g General Refuse)	
	(a)		(b)		(c)		(d)		(a-b-c-d)				(in '000kg)		(in '000kg)		(in '000kg)		(in '000kg)		(in '000m^3)	
	Est.	Act.	Est.	Act.	Est.	Act.	Est.	Act.	Est.	Act.	Est.	Act.	Est.	Act.	Est.	Act.	Est.	Act.	Est.	Act.	Est.	Act.
2009																						
January																						
February																						
March																						
April																						
May																						
June																						
July																						
August																						
September																						
October																						
November	1.11	0.00	0.01	0.00	0.00	0.00	0.00	0.00	1.10	0.00	0.00	0.000	0.005	0.000	0.005	0.000	0.001	0.00	0.00	0.00	0.02	0.00
December	1.11	0.00	0.01	0.00	0.00	0.00	0.00	0.00	1.10	0.00	0.00	0.00	0.005	0.00	0.005	0.00	0.001	0.00	0.00	0.00	0.02	0.02
1st half		**0.00**		**0.00**		**0.00**		**0.00**		**0.00**		**0.00**		**0.00**		**0.00**		**0.00**		**0.00**		**0.00**
2nd half		**0.00**		**0.00**		**0.00**		**0.00**		**0.00**		**0.00**		**0.00**		**0.00**		**0.00**		**0.00**		**0.02**
Total		**0.00**		**0.00**		**0.00**		**0.00**		**0.00**		**0.00**		**0.00**		**0.00**		**0.00**		**0.00**		**0.02**
2010																						
January	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.02
February																						
March																						
April																						
May																						
June																						
July																						
Total																						
Grand Total																						

Annex M

Inspection and Audit Checklist

Environmental Site Inspection Checklist

Project:	**DSD Contract No. DE/2009/02**	**Inspected by**	
	Harbour Area Treatment Scheme Stage 2A	**RE's representative:**	William Yu
Inspection		**IEC's representative:**	
Date:	6 January 2010	**ET's representative:**	Ben Tam
Time:	13:15	**Contractor's representative:**	LC Wong
		Checklist No.	**DE0902-060110**

PART A: GENERAL INFORMATION **Environmental Permit No.: N/A**

Weather:	☐ Sunny	☑ Fine	☐ Cloudy	☐ Rainy
Temperature:	16 °C			
Humidity:	☐ High	☑ Moderate	☐ Low	
Wind:	☐ Strong	☐ Breeze	☑ Light	☐ Calm

PART B: SITE AUDIT

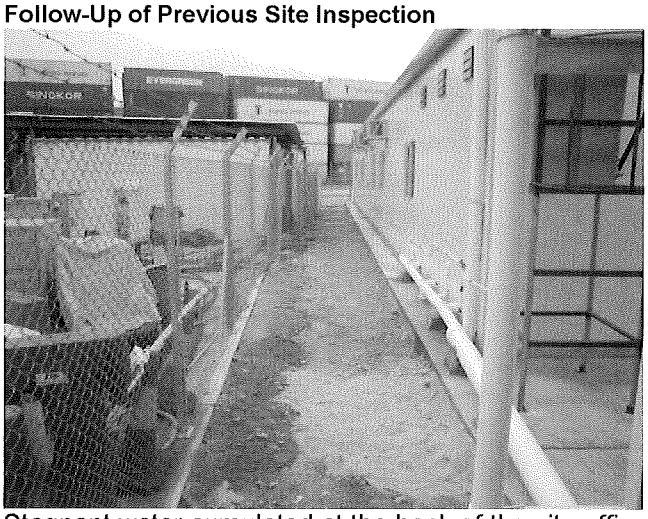
		Not Obs.	Yes	No	Follow up	N/A	Photo/ Remarks
Section 1: Water Quality							
1.01	Is an effluent discharge license obtained for the Project?	☐	☐	☐	☐	☑	
1.02	Is the effluent discharged in accordance with the discharge licence?	☐	☐	☐	☐	☑	
1.03	Is the discharge of turbid water avoided?	☑	☐	☐	☐	☐	
1.04	Are there proper desilting facilities in the drainage systems to reduce SS levels in effluent?	☑	☐	☐	☐	☐	
1.05	Are there channels, sandbags or bunds to divert the surface run-off to sedimentation tanks/desilting system prior discharge?	☑	☐	☐	☐	☐	
1.06	Are there any temporary perimeter channels provided at site boundaries to intercept storm runoff from crossing the site?	☐	☑	☐	☐	☐	
1.07	Is temporary drainage system (within site boundaries) and the nearby permanent drainage system (outside site boundaries) are well maintained?	☐	☐	☐	☑	☐	Remark 1
1.08	As excavation proceeds, are temporary access roads protected by crushed stone or gravel?	☑	☐	☐	☐	☐	
1.09	Are temporary exposed slopes properly covered?	☑	☐	☐	☐	☐	
1.10	Are earthworks final surfaces well compacted or protected?	☑	☐	☐	☐	☐	
1.11	Are manholes adequately covered or temporarily sealed?	☑	☐	☐	☐	☐	
1.12	Are there any procedures and equipment for rainstorm protection?	☑	☐	☐	☐	☐	
1.13	Are wheel washing facilities well maintained?	☑	☐	☐	☐	☐	
1.14	Is overflow runoff from wheel washing facilities avoided?	☑	☐	☐	☐	☐	
1.15	Are there chemical toilets provided on site?	☐	☑	☐	☐	☐	
1.16	Are chemical toilets properly maintained?	☐	☑	☐	☐	☐	
1.17	Are the vehicle and plant servicing areas paved and located within roofed areas?	☐	☑	☐	☐	☐	
1.18	Is the oil leakage from the on-site vehicles/plants or spillage during the fuel refilling avoided?	☐	☑	☐	☐	☐	
1.19	Are there any measures to prevent oil leakage entering the temporary/permanent drainage system?	☐	☑	☐	☐	☐	
1.20	Are there any measures to collect spilt cement and concrete washings during concreting works?	☑	☐	☐	☐	☐	
1.21	Are there any oil interceptors/grease traps in the drainage systems for vehicle and plant servicing areas, canteen kitchen, etc?	☑	☐	☐	☐	☐	
1.22	Are the oil interceptors/grease traps maintained properly?	☑	☐	☐	☐	☐	

		Not Obs.	Yes	No	Follow up	N/A	Photo/ Remarks
1.23	Is used bentonite recycled where appropriate?	☑	☐	☐	☐	☐	
1.24	Is the sediment laden runoff from the unpaved surface to avoid discharge into the nearby aquatic environments, mash lands and moat ponds?	☑	☐	☐	☐	☐	
Section 2: Air Quality							
2.01	Are there wheel washing facilities with high pressure jets provided at every vehicle exit point?	☑	☐	☐	☐	☐	
2.02	Are vehicles washed to remove any dusty materials from their bodies and wheels before leaving construction sites?	☑	☐	☐	☐	☐	
2.03	Are the excavated materials or exposure soil surface sprayed with water during handling?	☑	☐	☐	☐	☐	
2.04	Are stockpiles of dusty materials sprayed with water, covered or placed in sheltered areas?	☑	☐	☐	☐	☐	
2.05	Is the exposed earth properly treated within six months after the last construction activities?	☑	☐	☐	☐	☐	
2.06	Are the access roads sprayed with water to maintain the entire road surface wet or paved and speed control (<15km/hr)?	☐	☑	☐	☐	☐	
2.07	Is the surface where any drilling, cutting, polishing or breaking operation continuously sprayed with water?	☑	☐	☐	☐	☐	
2.08	Is the load on vehicles covered entirely by clean impervious sheeting?	☑	☐	☐	☐	☐	
2.09	Is the loading of materials to a level higher than the side and tail boards during transportation by vehicles avoided?	☑	☐	☐	☐	☐	
2.10	Is the road leading to the construction site within 30m of the vehicle entrance kept clear of dusty materials?	☐	☑	☐	☐	☐	
2.11	Is dark smoke emission from plant/equipment avoided?	☐	☑	☐	☐	☐	
2.12	Are de-bagging, batching and mixing processes carried out in sheltered areas (3-sided roofed enclosure) during the use of bagged cement?	☑	☐	☐	☐	☐	
2.13	Are site vehicles travelling within the speed limit (<15km/hour)?	☐	☑	☐	☐	☐	
2.14	Are hoardings of not less than 2.4m high provided along the site boundary, which adjoins areas accessible to the public?	☑	☐	☐	☐	☐	
2.15	Is open burning avoided?	☐	☑	☐	☐	☐	
2.16	Are any materials dropped on the roads (Outside the site boundaries) had clean up immediately?	☑	☐	☐	☐	☐	
Section 3: Noise							
3.01	Are noisy equipment and activities positioned as far as practicable from the sensitive receivers?	☑	☐	☐	☐	☐	
	Is silenced equipment adopted?	☐	☑	☐	☐	☐	
3.03	Is idle equipment turned off or throttled down?	☐	☑	☐	☐	☐	
3.04	Are all plant and equipment well maintained and in good condition?	☐	☑	☐	☐	☐	
3.05	Are noise barriers or enclosures provided at areas where construction activities cause noise impact on sensitive receivers?	☑	☐	☐	☐	☐	
3.06	Are hand held breakers fitted with valid noise emission labels during operation?	☑	☐	☐	☐	☐	
3.07	Are air compressors fitted with valid noise emission labels during operation?	☑	☐	☐	☐	☐	
3.08	Are flaps and panels of mechanical equipment closed during operation?	☐	☑	☐	☐	☐	
3.09	Are Construction Noise Permit(s) applied for percussive piling works?	☐	☐	☐	☑	☐	
3.10	Are Construction Noise Permit(s) applied for general construction works during restricted hours?	☐	☐	☐	☐	☑	
3.11	Are valid Construction Noise Permit(s) posted at site entrances?	☐	☐	☐	☑	☐	
Section 4: Waste/Chemical Management							
4.01	Are receptacles available for general refuse collection?	☐	☑	☐	☐	☐	

Environmental Site Inspection Checklist

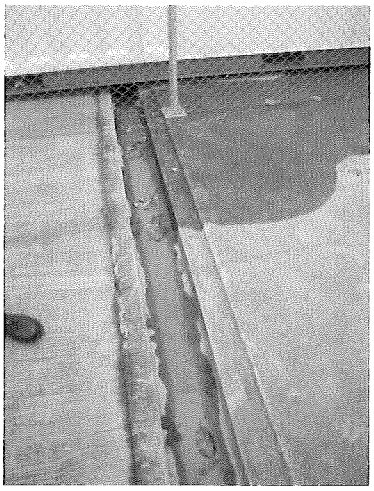
		Not Obs.	Yes	No	Follow up	N/A	Photo/ Remarks
4.02	Is general refuse sorting or recycling implemented?	☐	☑	☐	☐	☐	
4.03	Is general refuse disposed of properly and regularly?	☑	☐	☐	☐	☐	
4.04	Is the Contractor registered as a chemical waste producer?	☑	☐	☐	☐	☐	
4.05	Are the chemical waste containers properly labelled?	☑	☐	☐	☐	☐	
4.06	Are the chemical wastes stored in proper storage areas?	☑	☐	☐	☐	☐	
4.07	Is the chemical waste storage area properly labelled?	☑	☐	☐	☐	☐	
4.08	Is the chemical waste storage area used for storage of chemical waste only?	☑	☐	☐	☐	☐	
4.09	Are incompatible chemical wastes stored in different areas?	☑	☐	☐	☐	☐	
4.10	Are the chemical wastes disposed of by licensed collectors?	☑	☐	☐	☐	☐	
4.11	Are trip tickets for chemical wastes disposal available for inspection?	☑	☐	☐	☐	☐	
4.12	Are chemical/fuel storage areas bunded?	☑	☐	☐	☐	☐	
4.13	Are designated areas identified for storage and sorting of construction wastes?	☑	☐	☐	☐	☐	
4.14	Are construction wastes sorted on site?	☑	☐	☐	☐	☐	
4.15	Are construction wastes reused?	☑	☐	☐	☐	☐	
4.16	Are construction wastes disposed of properly?	☑	☐	☐	☐	☐	
4.17	Are site hoardings and signboards made of durable materials instead of timber?	☑	☐	☐	☐	☐	
4.18	Is trip ticket system implemented for the disposal of construction wastes and records available for inspection?	☑	☐	☐	☐	☐	
4.19	Are appropriate procedures followed if contaminated material exists?	☑	☐	☐	☐	☐	
4.20	Is relevant license/ permit for disposal of construction waste or excavated materials available for inspection?	☐	☑	☐	☐	☐	
Section 5: Landscape & Visual							
5.01	Are retained and transplanted trees in health condition?	☑	☐	☐	☐	☐	
5.02	Are retained and transplanted trees properly protected?	☑	☐	☐	☐	☐	
5.03	Are surgery works carried out for the damaged trees?	☐	☑	☐	☐	☐	
5.04	Is damage to trees outside site boundary due to construction activities avoided?	☐	☑	☐	☐	☐	
5.05	Is the night-time lighting controlled to minimize glare to sensitive receivers?	☐	☑	☐	☐	☐	
Section 6: Others							
6.01	Are relevant Environmental Permits posted at all vehicle site entrances/exits?	☐	☑	☐	☐	☐	

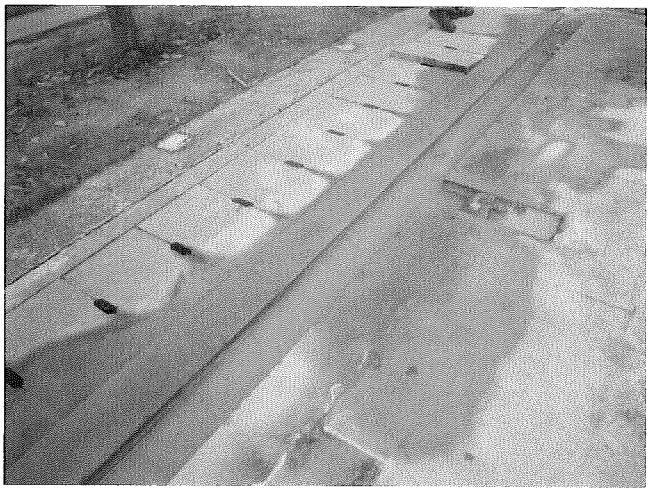
Follow-Up of Previous Site Inspection



Stagnant water cumulated at the back of the site office was cleared.

Remarks





Remark 1: The Contractor is reminded to maintain the u-channel within the site area to prevent water retain.

RE's representative	*IEC's representative*	*ET's representative*	*Contractor's representative*
(WILLIAM YU)	( )	(Ben Tam)	( )

Environmental Site Inspection Checklist

Project:	DSD Contract No. DE/2009/02 Harbour Area Treatment Scheme Stage 2A	**Inspected by**	
		RE representative:	William Yu
Inspection		**IEC representative:**	
Date:	13 January 2010	**ET representative:**	Ben Tam
Time:	15:00	**Contractor representative:**	LC Wong
		Checklist No.	DE0902-130110

PART A: GENERAL INFORMATION **Environmental Permit No.: N/A**

Weather:	☐ Sunny	☑ Fine	☐ Cloudy	☐ Rainy
Temperature:	14 °C			
Humidity:	☐ High	☑ Moderate	☐ Low	
Wind:	☐ Strong	☐ Breeze	☑ Light	☐ Calm

PART B: SITE AUDIT

		Not Obs.	Yes	No	Follow up	N/A	Photo/ Remarks
Section 1: Water Quality							
1.01	Is an effluent discharge license obtained for the Project?	☐	☐	☐	☐	☑	
1.02	Is the effluent discharged in accordance with the discharge licence?	☐	☐	☐	☐	☑	
1.03	Is the discharge of turbid water avoided?	☑	☐	☐	☐	☐	
1.04	Are there proper desilting facilities in the drainage systems to reduce SS levels in effluent?	☑	☐	☐	☐	☐	
1.05	Are there channels, sandbags or bunds to divert the surface run-off to sedimentation tanks/desilting system prior discharge?	☑	☐	☐	☐	☐	
1.06	Are there any temporary perimeter channels provided at site boundaries to intercept storm runoff from crossing the site?	☐	☑	☐	☐	☐	
1.07	Is temporary drainage system (within site boundaries) and the nearby permanent drainage system (outside site boundaries) are well maintained?	☐	☐	☐	☑	☐	Remark 1
1.08	As excavation proceeds, are temporary access roads protected by crushed stone or gravel?	☑	☐	☐	☐	☐	
1.09	Are temporary exposed slopes properly covered?	☑	☐	☐	☐	☐	
1.10	Are earthworks final surfaces well compacted or protected?	☑	☐	☐	☐	☐	
1.11	Are manholes adequately covered or temporarily sealed?	☑	☐	☐	☐	☐	
1.12	Are there any procedures and equipment for rainstorm protection?	☑	☐	☐	☐	☐	
1.13	Are wheel washing facilities well maintained?	☑	☐	☐	☐	☐	
1.14	Is overflow runoff from wheel washing facilities avoided?	☑	☐	☐	☐	☐	
1.15	Are there chemical toilets provided on site?	☐	☑	☐	☐	☐	
1.16	Are chemical toilets properly maintained?	☐	☑	☐	☐	☐	
1.17	Are the vehicle and plant servicing areas paved and located within roofed areas?	☐	☑	☐	☐	☐	
1.18	Is the oil leakage from the on-site vehicles/plants or spillage during the fuel refilling avoided?	☐	☑	☐	☐	☐	
1.19	Are there any measures to prevent oil leakage entering the temporary/permanent drainage system?	☐	☑	☐	☐	☐	
1.20	Are there any measures to collect spilt cement and concrete washings during concreting works?	☑	☐	☐	☐	☐	
1.21	Are there any oil interceptors/grease traps in the drainage systems for vehicle and plant servicing areas, canteen kitchen, etc?	☑	☐	☐	☐	☐	
1.22	Are the oil interceptors/grease traps maintained properly?	☑	☐	☐	☐	☐	

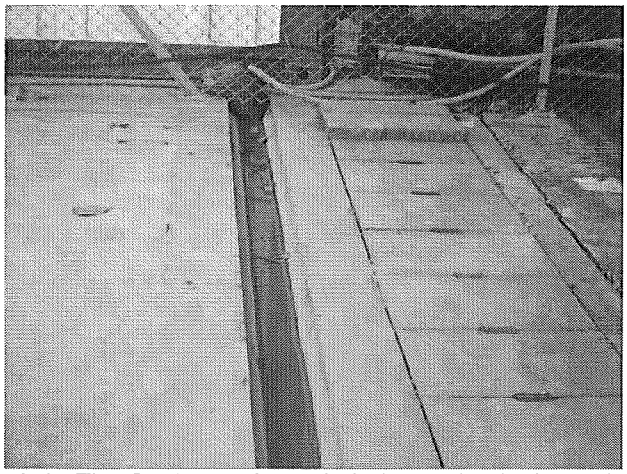
Environmental Site Inspection Checklist

		Not Obs.	Yes	No	Follow up	N/A	Photo/ Remarks
1.23	Is used bentonite recycled where appropriate?	☑	☐	☐	☐	☐	
1.24	Is the sediment laden runoff from the unpaved surface to avoid discharge into the nearby aquatic environments, mash lands and moat ponds?	☑	☐	☐	☐	☐	
Section 2: Air Quality							
2.01	Are there wheel washing facilities with high pressure jets provided at every vehicle exit point?	☑	☐	☐	☐	☐	
2.02	Are vehicles washed to remove any dusty materials from their bodies and wheels before leaving construction sites?	☑	☐	☐	☐	☐	
2.03	Are the excavated materials or exposure soil surface sprayed with water during handling?	☑	☐	☐	☐	☐	
2.04	Are stockpiles of dusty materials sprayed with water, covered or placed in sheltered areas?	☑	☐	☐	☐	☐	
2.05	Is the exposed earth properly treated within six months after the last construction activities?	☑	☐	☐	☐	☐	
2.06	Are the access roads sprayed with water to maintain the entire road surface wet or paved and speed control (<15km/hr)?	☐	☑	☐	☐	☐	
	Is the surface where any drilling, cutting, polishing or breaking operation continuously sprayed with water?	☑	☐	☐	☐	☐	
2.08	Is the load on vehicles covered entirely by clean impervious sheeting?	☑	☐	☐	☐	☐	
2.09	Is the loading of materials to a level higher than the side and tail boards during transportation by vehicles avoided?	☑	☐	☐	☐	☐	
2.10	Is the road leading to the construction site within 30m of the vehicle entrance kept clear of dusty materials?	☐	☑	☐	☐	☐	
2.11	Is dark smoke emission from plant/equipment avoided?	☐	☑	☐	☐	☐	
2.12	Are de-bagging, batching and mixing processes carried out in sheltered areas (3-sided roofed enclosure) during the use of bagged cement?	☑	☐	☐	☐	☐	
2.13	Are site vehicles travelling within the speed limit (<15km/hour)?	☐	☑	☐	☐	☐	
2.14	Are hoardings of not less than 2.4m high provided along the site boundary, which adjoins areas accessible to the public?	☑	☐	☐	☐	☐	
2.15	Is open burning avoided?	☐	☑	☐	☐	☐	
2.16	Are any materials dropped on the roads (Outside the site boundaries) had clean up immediately?	☑	☐	☐	☐	☐	
Section 3: Noise							
3.01	Are noisy equipment and activities positioned as far as practicable from the sensitive receivers?	☑	☐	☐	☐	☐	
3.02	Is silenced equipment adopted?	☐	☑	☐	☐	☐	
3.03	Is idle equipment turned off or throttled down?	☐	☑	☐	☐	☐	
3.04	Are all plant and equipment well maintained and in good condition?	☐	☑	☐	☐	☐	
3.05	Are noise barriers or enclosures provided at areas where construction activities cause noise impact on sensitive receivers?	☑	☐	☐	☐	☐	
3.06	Are hand held breakers fitted with valid noise emission labels during operation?	☑	☐	☐	☐	☐	
3.07	Are air compressors fitted with valid noise emission labels during operation?	☑	☐	☐	☐	☐	
3.08	Are flaps and panels of mechanical equipment closed during operation?	☐	☑	☐	☐	☐	
3.09	Are Construction Noise Permit(s) applied for percussive piling works?	☐	☐	☐	☑	☐	
3.10	Are Construction Noise Permit(s) applied for general construction works during restricted hours?	☐	☐	☐	☐	☑	
3.11	Are valid Construction Noise Permit(s) posted at site entrances?	☐	☐	☐	☑	☐	
Section 4: Waste/Chemical Management							
4.01	Are receptacles available for general refuse collection?	☐	☑	☐	☐	☐	

Environmental Site Inspection Checklist

		Not Obs.	Yes	No	Follow up	N/A	Photo/ Remarks
4.02	Is general refuse sorting or recycling implemented?	☐	☑	☐	☐	☐	
4.03	Is general refuse disposed of properly and regularly?	☑	☐	☐	☐	☐	
4.04	Is the Contractor registered as a chemical waste producer?	☑	☐	☐	☐	☐	
4.05	Are the chemical waste containers properly labelled?	☑	☐	☐	☐	☐	
4.06	Are the chemical wastes stored in proper storage areas?	☑	☐	☐	☐	☐	
4.07	Is the chemical waste storage area properly labelled?	☑	☐	☐	☐	☐	
4.08	Is the chemical waste storage area used for storage of chemical waste only?	☑	☐	☐	☐	☐	
4.09	Are incompatible chemical wastes stored in different areas?	☑	☐	☐	☐	☐	
4.10	Are the chemical wastes disposed of by licensed collectors?	☑	☐	☐	☐	☐	
4.11	Are trip tickets for chemical wastes disposal available for inspection?	☑	☐	☐	☐	☐	
4.12	Are chemical/fuel storage areas bunded?	☑	☐	☐	☐	☐	
4.13	Are designated areas identified for storage and sorting of construction wastes?	☑	☐	☐	☐	☐	
4.14	Are construction wastes sorted on site?	☑	☐	☐	☐	☐	
4.15	Are construction wastes reused?	☑	☐	☐	☐	☐	
4.16	Are construction wastes disposed of properly?	☑	☐	☐	☐	☐	
4.17	Are site hoardings and signboards made of durable materials instead of timber?	☑	☐	☐	☐	☐	
4.18	Is trip ticket system implemented for the disposal of construction wastes and records available for inspection?	☑	☐	☐	☐	☐	
4.19	Are appropriate procedures followed if contaminated material exists?	☑	☐	☐	☐	☐	
4.20	Is relevant license/ permit for disposal of construction waste or excavated materials available for inspection?	☐	☑	☐	☐	☐	
Section 5: Landscape & Visual							
5.01	Are retained and transplanted trees in health condition?	☑	☐	☐	☐	☐	
5.02	Are retained and transplanted trees properly protected?	☑	☐	☐	☐	☐	
5.03	Are surgery works carried out for the damaged trees?	☐	☑	☐	☐	☐	
5.04	Is damage to trees outside site boundary due to construction activities avoided?	☐	☑	☐	☐	☐	
5.05	Is the night-time lighting controlled to minimize glare to sensitive receivers?	☐	☑	☐	☐	☐	
Section 6: Others							
6.01	Are relevant Environmental Permits posted at all vehicle site entrances/exits?	☐	☑	☐	☐	☐	

Follow-Up of Previous Site Inspection



Remark 1: The Contractor is reminded to maintain the u-channel within the site area to prevent water retain. (follow-up)

Remarks

No new environmental issue was observed during the site inspection.

RE representative	*IEC representative*	*ET representative*	*Contractor representative*
(WILLIAM YU)	( )	(Ben Tam)	(LCWONG)

Environmental Site Inspection Checklist

Project:	DSD Contract No. DE/2009/02	**Inspected by**	
	Harbour Area Treatment Scheme Stage 2A	**RE's representative:**	William Yu
Inspection		**IEC's representative:**	
Date:	20 January 2010	**ET's representative:**	Ben Tam
Time:	11:30	**Contractor's representative:**	LC Wong
		Checklist No.	DE0902-200110

PART A: GENERAL INFORMATION **Environmental Permit No.: N/A**

Weather:	☐ Sunny	☑ Fine	☐ Cloudy	☐ Rainy
Temperature:	19 °C			
Humidity:	☐ High	☑ Moderate	☐ Low	
Wind:	☐ Strong	☐ Breeze	☑ Light	☐ Calm

PART B: SITE AUDIT

		Not Obs.	Yes	No	Follow up	N/A	Photo/ Remarks
Section 1: Water Quality							
1.01	Is an effluent discharge license obtained for the Project?	☐	☐	☐	☐	☑	
1.02	Is the effluent discharged in accordance with the discharge licence?	☐	☐	☐	☐	☑	
1.03	Is the discharge of turbid water avoided?	☑	☐	☐	☐	☐	
1.04	Are there proper desilting facilities in the drainage systems to reduce SS levels in effluent?	☑	☐	☐	☐	☐	
1.05	Are there channels, sandbags or bunds to divert the surface run-off to sedimentation tanks/desilting system prior discharge?	☑	☐	☐	☐	☐	
1.06	Are there any temporary perimeter channels provided at site boundaries to intercept storm runoff from crossing the site?	☐	☑	☐	☐	☐	
1.07	Is temporary drainage system (within site boundaries) and the nearby permanent drainage system (outside site boundaries) are well maintained?	☐	☐	☐	☑	☐	Remark 1
1.08	As excavation proceeds, are temporary access roads protected by crushed stone or gravel?	☑	☐	☐	☐	☐	
1.09	Are temporary exposed slopes properly covered?	☑	☐	☐	☐	☐	
1.10	Are earthworks final surfaces well compacted or protected?	☑	☐	☐	☐	☐	
1.11	Are manholes adequately covered or temporarily sealed?	☑	☐	☐	☐	☐	
1.12	Are there any procedures and equipment for rainstorm protection?	☑	☐	☐	☐	☐	
1.13	Are wheel washing facilities well maintained?	☑	☐	☐	☐	☐	
1.14	Is overflow runoff from wheel washing facilities avoided?	☑	☐	☐	☐	☐	
1.15	Are there chemical toilets provided on site?	☐	☑	☐	☐	☐	
1.16	Are chemical toilets properly maintained?	☐	☑	☐	☐	☐	
1.17	Are the vehicle and plant servicing areas paved and located within roofed areas?	☐	☑	☐	☐	☐	
1.18	Is the oil leakage from the on-site vehicles/plants or spillage during the fuel refilling avoided?	☐	☐	☐	☑	☐	Remarks 2
1.19	Are there any measures to prevent oil leakage entering the temporary/permanent drainage system?	☐	☑	☐	☐	☐	
1.20	Are there any measures to collect spilt cement and concrete washings during concreting works?	☑	☐	☐	☐	☐	
1.21	Are there any oil interceptors/grease traps in the drainage systems for vehicle and plant servicing areas, canteen kitchen, etc?	☑	☐	☐	☐	☐	
1.22	Are the oil interceptors/grease traps maintained properly?	☑	☐	☐	☐	☐	

Environmental Site Inspection Checklist

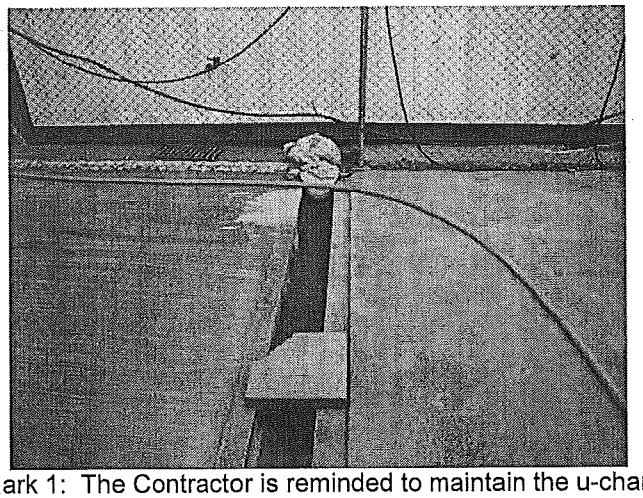
		Not Obs.	Yes	No	Follow up	N/A	Photo/ Remarks
1.23	Is used bentonite recycled where appropriate?	☑	☐	☐	☐	☐	
1.24	Is the sediment laden runoff from the unpaved surface to avoid discharge into the nearby aquatic environments, mash lands and moat ponds?	☑	☐	☐	☐	☐	
Section 2: Air Quality							
2.01	Are there wheel washing facilities with high pressure jets provided at every vehicle exit point?	☑	☐	☐	☐	☐	
2.02	Are vehicles washed to remove any dusty materials from their bodies and wheels before leaving construction sites?	☑	☐	☐	☐	☐	
2.03	Are the excavated materials or exposure soil surface sprayed with water during handling?	☑	☐	☐	☐	☐	
2.04	Are stockpiles of dusty materials sprayed with water, covered or placed in sheltered areas?	☑	☐	☐	☐	☐	
2.05	Is the exposed earth properly treated within six months after the last construction activities?	☑	☐	☐	☐	☐	
2.06	Are the access roads sprayed with water to maintain the entire road surface wet or paved and speed control (<15km/hr)?	☐	☑	☐	☐	☐	
2.07	Is the surface where any drilling, cutting, polishing or breaking operation continuously sprayed with water?	☐	☑	☐	☐	☐	
2.08	Is the load on vehicles covered entirely by clean impervious sheeting?	☑	☐	☐	☐	☐	
2.09	Is the loading of materials to a level higher than the side and tail boards during transportation by vehicles avoided?	☑	☐	☐	☐	☐	
2.10	Is the road leading to the construction site within 30m of the vehicle entrance kept clear of dusty materials?	☐	☑	☐	☐	☐	
2.11	Is dark smoke emission from plant/equipment avoided?	☐	☑	☐	☐	☐	
2.12	Are de-bagging, batching and mixing processes carried out in sheltered areas (3-sided roofed enclosure) during the use of bagged cement?	☑	☐	☐	☐	☐	
2.13	Are site vehicles travelling within the speed limit (<15km/hour)?	☐	☑	☐	☐	☐	
2.14	Are hoardings of not less than 2.4m high provided along the site boundary, which adjoins areas accessible to the public?	☑	☐	☐	☐	☐	
2.15	Is open burning avoided?	☐	☑	☐	☐	☐	
2.16	Are any materials dropped on the roads (Outside the site boundaries) had clean up immediately?	☑	☐	☐	☐	☐	
Section 3: Noise							
3.01	Are noisy equipment and activities positioned as far as practicable from the sensitive receivers?	☑	☐	☐	☐	☐	
3.02	Is silenced equipment adopted?	☐	☑	☐	☐	☐	
3.03	Is idle equipment turned off or throttled down?	☐	☑	☐	☐	☐	
3.04	Are all plant and equipment well maintained and in good condition?	☐	☑	☐	☐	☐	
3.05	Are noise barriers or enclosures provided at areas where construction activities cause noise impact on sensitive receivers?	☑	☐	☐	☐	☐	
3.06	Are hand held breakers fitted with valid noise emission labels during operation?	☐	☑	☐	☐	☐	
3.07	Are air compressors fitted with valid noise emission labels during operation?	☑	☐	☐	☐	☐	
3.08	Are flaps and panels of mechanical equipment closed during operation?	☐	☑	☐	☐	☐	
3.09	Are Construction Noise Permit(s) applied for percussive piling works?	☐	☐	☐	☑	☐	
3.10	Are Construction Noise Permit(s) applied for general construction works during restricted hours?	☐	☑	☐	☐	☐	
3.11	Are valid Construction Noise Permit(s) posted at site entrances?	☐	☑	☐	☐	☐	
Section 4: Waste/Chemical Management							
4.01	Are receptacles available for general refuse collection?	☐	☑	☐	☐	☐	

Environmental Site Inspection Checklist

		Not Obs.	Yes	No	Follow up	N/A	Photo/ Remarks
4.02	Is general refuse sorting or recycling implemented?	☐	☑	☐	☐	☐	
4.03	Is general refuse disposed of properly and regularly?	☑	☐	☐	☐	☐	
4.04	Is the Contractor registered as a chemical waste producer?	☑	☐	☐	☐	☐	
4.05	Are the chemical waste containers properly labelled?	☑	☐	☐	☐	☐	
4.06	Are the chemical wastes stored in proper storage areas?	☑	☐	☐	☐	☐	
4.07	Is the chemical waste storage area properly labelled?	☑	☐	☐	☐	☐	
4.08	Is the chemical waste storage area used for storage of chemical waste only?	☑	☐	☐	☐	☐	
4.09	Are incompatible chemical wastes stored in different areas?	☑	☐	☐	☐	☐	
4.10	Are the chemical wastes disposed of by licensed collectors?	☑	☐	☐	☐	☐	
4.11	Are trip tickets for chemical wastes disposal available for inspection?	☑	☐	☐	☐	☐	
4.12	Are chemical/fuel storage areas bunded?	☑	☐	☐	☐	☐	
4.13	Are designated areas identified for storage and sorting of construction wastes?	☑	☐	☐	☐	☐	
4.14	Are construction wastes sorted on site?	☑	☐	☐	☐	☐	
4.15	Are construction wastes reused?	☑	☐	☐	☐	☐	
4.16	Are construction wastes disposed of properly?	☑	☐	☐	☐	☐	
4.17	Are site hoardings and signboards made of durable materials instead of timber?	☑	☐	☐	☐	☐	
4.18	Is trip ticket system implemented for the disposal of construction wastes and records available for inspection?	☑	☐	☐	☐	☐	
4.19	Are appropriate procedures followed if contaminated material exists?	☑	☐	☐	☐	☐	
4.20	Is relevant license/ permit for disposal of construction waste or excavated materials available for inspection?	☐	☑	☐	☐	☐	
Section 5: Landscape & Visual							
5.01	Are retained and transplanted trees in health condition?	☑	☐	☐	☐	☐	
5.02	Are retained and transplanted trees properly protected?	☑	☐	☐	☐	☐	
5.03	Are surgery works carried out for the damaged trees?	☐	☑	☐	☐	☐	
5.04	Is damage to trees outside site boundary due to construction activities avoided?	☐	☑	☐	☐	☐	
5.05	Is the night-time lighting controlled to minimize glare to sensitive receivers?	☐	☑	☐	☐	☐	
Section 6: Others							
6.01	Are relevant Environmental Permits posted at all vehicle site entrances/exits?	☐	☑	☐	☐	☐	

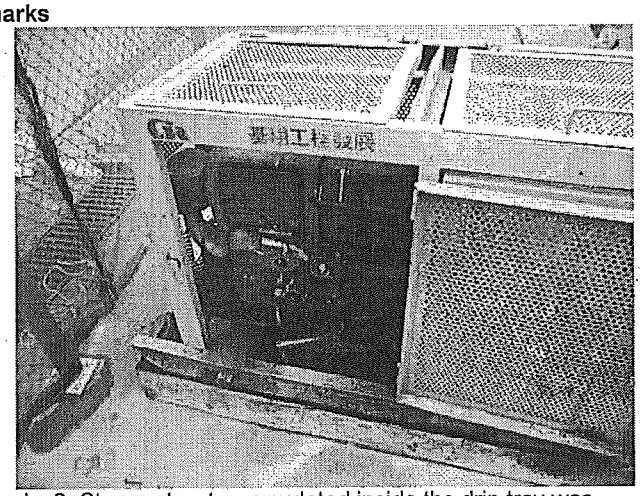
Environmental Site Inspection Checklist

Follow-Up of Previous Site Inspection



Remark 1: The Contractor is reminded to maintain the u-channel within the site area to prevent water retain. (in progress)

Remarks



Remarks 2: Stagnant water cumulated inside the drip tray was observed, the contractor was reminded to clean to prevent oil leakage.

RE's representative	*IEC's representative*	*ET's representative*	*Contractor's representative*
(WILLIAM YU)	( )	(Ben Tam)	(LCWONG)

Environmental Site Inspection Checklist

Project:	DSD Contract No. DE/2009/02	**Inspected by**	
	Harbour Area Treatment Scheme Stage 2A	**RE representative:**	William Yu
Inspection		**IEC representative:**	
Date:	28 January 2010	**ET representative:**	Ben Tam
Time:	11:30	**Contractor representative:**	LC Wong
		Checklist No.	DE0902-280110

PART A: GENERAL INFORMATION **Environmental Permit No.: N/A**

Weather:	☐ Sunny	☐ Fine	☑ Cloudy	☐ Rainy
Temperature:	17.6 °C			
Humidity:	☑ High	☐ Moderate	☐ Low	
Wind:	☐ Strong	☑ Breeze	☐ Light	☐ Calm

PART B: SITE AUDIT

		Not Obs.	Yes	No	Follow up	N/A	Photo/ Remarks
Section 1: Water Quality							
1.01	Is an effluent discharge license obtained for the Project?	☐	☐	☐	☐	☑	
1.02	Is the effluent discharged in accordance with the discharge licence?	☐	☐	☐	☐	☑	
1.03	Is the discharge of turbid water avoided?	☑	☐	☐	☐	☐	
1.04	Are there proper desilting facilities in the drainage systems to reduce SS levels in effluent?	☑	☐	☐	☐	☐	
1.05	Are there channels, sandbags or bunds to divert the surface run-off to sedimentation tanks/desilting system prior discharge?	☑	☐	☐	☐	☐	
1.06	Are there any temporary perimeter channels provided at site boundaries to intercept storm runoff from crossing the site?	☐	☑	☐	☐	☐	
1.07	Is temporary drainage system (within site boundaries) and the nearby permanent drainage system (outside site boundaries) are well maintained?	☐	☑	☐	☐	☐	
1.08	As excavation proceeds, are temporary access roads protected by crushed stone or gravel?	☑	☐	☐	☐	☐	
1.09	Are temporary exposed slopes properly covered?	☑	☐	☐	☐	☐	
1.10	Are earthworks final surfaces well compacted or protected?	☑	☐	☐	☐	☐	
1.11	Are manholes adequately covered or temporarily sealed?	☑	☐	☐	☐	☐	
1.12	Are there any procedures and equipment for rainstorm protection?	☑	☐	☐	☐	☐	
1.13	Are wheel washing facilities well maintained?	☑	☐	☐	☐	☐	
1.14	Is overflow runoff from wheel washing facilities avoided?	☑	☐	☐	☐	☐	
1.15	Are there chemical toilets provided on site?	☐	☑	☐	☐	☐	
1.16	Are chemical toilets properly maintained?	☐	☑	☐	☐	☐	
1.17	Are the vehicle and plant servicing areas paved and located within roofed areas?	☐	☑	☐	☐	☐	
1.18	Is the oil leakage from the on-site vehicles/plants or spillage during the fuel refilling avoided?	☐	☑	☐	☐	☐	
1.19	Are there any measures to prevent oil leakage entering the temporary/permanent drainage system?	☐	☑	☐	☐	☐	
1.20	Are there any measures to collect spilt cement and concrete washings during concreting works?	☑	☐	☐	☐	☐	
1.21	Are there any oil interceptors/grease traps in the drainage systems for vehicle and plant servicing areas, canteen kitchen, etc?	☑	☐	☐	☐	☐	
1.22	Are the oil interceptors/grease traps maintained properly?	☑	☐	☐	☐	☐	

Environmental Site Inspection Checklist

		Not Obs.	Yes	No	Follow up	N/A	Photo/ Remarks
1.23	Is used bentonite recycled where appropriate?	☑	☐	☐	☐	☐	
1.24	Is the sediment laden runoff from the unpaved surface to avoid discharge into the nearby aquatic environments, mash lands and moat ponds?	☑	☐	☐	☐	☐	
Section 2: Air Quality							
2.01	Are there wheel washing facilities with high pressure jets provided at every vehicle exit point?	☑	☐	☐	☐	☐	
2.02	Are vehicles washed to remove any dusty materials from their bodies and wheels before leaving construction sites?	☑	☐	☐	☐	☐	
2.03	Are the excavated materials or exposure soil surface sprayed with water during handling?	☑	☐	☐	☐	☐	
2.04	Are stockpiles of dusty materials sprayed with water, covered or placed in sheltered areas?	☑	☐	☐	☐	☐	
2.05	Is the exposed earth properly treated within six months after the last construction activities?	☑	☐	☐	☐	☐	
2.06	Are the access roads sprayed with water to maintain the entire road surface wet or paved and speed control (<15km/hr)?	☐	☑	☐	☐	☐	
2.07	Is the surface where any drilling, cutting, polishing or breaking operation continuously sprayed with water?	☐	☑	☐	☐	☐	
2.08	Is the load on vehicles covered entirely by clean impervious sheeting?	☑	☐	☐	☐	☐	
2.09	Is the loading of materials to a level higher than the side and tail boards during transportation by vehicles avoided?	☑	☐	☐	☐	☐	
2.10	Is the road leading to the construction site within 30m of the vehicle entrance kept clear of dusty materials?	☐	☑	☐	☐	☐	
2.11	Is dark smoke emission from plant/equipment avoided?	☐	☑	☐	☐	☐	
2.12	Are de-bagging, batching and mixing processes carried out in sheltered areas (3-sided roofed enclosure) during the use of bagged cement?	☑	☐	☐	☐	☐	
2.13	Are site vehicles travelling within the speed limit (<15km/hour)?	☐	☑	☐	☐	☐	
2.14	Are hoardings of not less than 2.4m high provided along the site boundary, which adjoins areas accessible to the public?	☑	☐	☐	☐	☐	
2.15	Is open burning avoided?	☐	☑	☐	☐	☐	
2.16	Are any materials dropped on the roads (Outside the site boundaries) had clean up immediately?	☑	☐	☐	☐	☐	
Section 3: Noise							
3.01	Are noisy equipment and activities positioned as far as practicable from the sensitive receivers?	☑	☐	☐	☐	☐	
3.02	Is silenced equipment adopted?	☐	☑	☐	☐	☐	
3.03	Is idle equipment turned off or throttled down?	☐	☑	☐	☐	☐	
3.04	Are all plant and equipment well maintained and in good condition?	☐	☑	☐	☐	☐	
3.05	Are noise barriers or enclosures provided at areas where construction activities cause noise impact on sensitive receivers?	☑	☐	☐	☐	☐	
3.06	Are hand held breakers fitted with valid noise emission labels during operation?	☐	☑	☐	☐	☐	
3.07	Are air compressors fitted with valid noise emission labels during operation?	☑	☐	☐	☐	☐	
3.08	Are flaps and panels of mechanical equipment closed during operation?	☐	☑	☐	☐	☐	
3.09	Are Construction Noise Permit(s) applied for percussive piling works?	☐	☐	☐	☑	☐	
3.10	Are Construction Noise Permit(s) applied for general construction works during restricted hours?	☐	☑	☐	☐	☐	
3.11	Are valid Construction Noise Permit(s) posted at site entrances?	☐	☑	☐	☐	☐	
Section 4: Waste/Chemical Management							
4.01	Are receptacles available for general refuse collection?	☐	☑	☐	☐	☐	

Environmental Site Inspection Checklist

		Not Obs.	Yes	No	Follow up	N/A	Photo/ Remarks
4.02	Is general refuse sorting or recycling implemented?	☐	☑	☐	☐	☐	
4.03	Is general refuse disposed of properly and regularly?	☑	☐	☐	☐	☐	
4.04	Is the Contractor registered as a chemical waste producer?	☑	☐	☐	☐	☐	
4.05	Are the chemical waste containers properly labelled?	☑	☐	☐	☐	☐	
4.06	Are the chemical wastes stored in proper storage areas?	☑	☐	☐	☐	☐	
4.07	Is the chemical waste storage area properly labelled?	☑	☐	☐	☐	☐	
4.08	Is the chemical waste storage area used for storage of chemical waste only?	☑	☐	☐	☐	☐	
4.09	Are incompatible chemical wastes stored in different areas?	☑	☐	☐	☐	☐	
4.10	Are the chemical wastes disposed of by licensed collectors?	☑	☐	☐	☐	☐	
4.11	Are trip tickets for chemical wastes disposal available for inspection?	☑	☐	☐	☐	☐	
4.12	Are chemical/fuel storage areas bunded?	☑	☐	☐	☐	☐	
4.13	Are designated areas identified for storage and sorting of construction wastes?	☑	☐	☐	☐	☐	
4.14	Are construction wastes sorted on site?	☑	☐	☐	☐	☐	
4.15	Are construction wastes reused?	☑	☐	☐	☐	☐	
4.16	Are construction wastes disposed of properly?	☑	☐	☐	☐	☐	
4.17	Are site hoardings and signboards made of durable materials instead of timber?	☑	☐	☐	☐	☐	
4.18	Is trip ticket system implemented for the disposal of construction wastes and records available for inspection?	☑	☐	☐	☐	☐	
4.19	Are appropriate procedures followed if contaminated material exists?	☑	☐	☐	☐	☐	
4.20	Is relevant license/ permit for disposal of construction waste or excavated materials available for inspection?	☐	☑	☐	☐	☐	
Section 5: Landscape & Visual							
5.01	Are retained and transplanted trees in health condition?	☑	☐	☐	☐	☐	
5.02	Are retained and transplanted trees properly protected?	☑	☐	☐	☐	☐	
5.03	Are surgery works carried out for the damaged trees?	☐	☑	☐	☐	☐	
5.04	Is damage to trees outside site boundary due to construction activities avoided?	☐	☑	☐	☐	☐	
5.05	Is the night-time lighting controlled to minimize glare to sensitive receivers?	☐	☑	☐	☐	☐	
Section 6: Others							
6.01	Are relevant Environmental Permits posted at all vehicle site entrances/exits?	☐	☑	☐	☐	☐	

Environmental Site Inspection Checklist

Follow-Up of Previous Site Inspection

1. The U-channel within the site area has maintained. (case closed)
2: The stagnant water cumulated inside the drip tray has cleared. (case closed)

Remarks:

No adverse environmental impact was observed during site inspection.

RE's representative	*IEC's representative*	*ET's representative*	*Contractor's representative*
(WILLIAM YU.)	( )	(Ben Tam)	(LCW)