


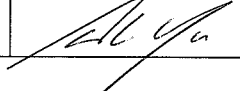
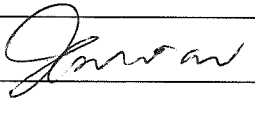
Drainage Services Department  
**Harbour Area Treatment Scheme  
Stage 2A**

Quarterly Environmental Monitoring  
and Audit Consolidated Report for  
Stonecutters Island Sewage  
Treatment Works for  
June to August 2010

Issue No. 3 | September 2010

# Document Verification

# ARUP

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<b>Document title</b>		Quarterly EM&A Consolidated Report for Stonecutters Island Sewage Treatment Works for June to August 2010		<b>File reference</b>	
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Issue Document Verification with Document



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Locations of Air Quality and Noise Monitoring Stations

**APPENDIX B**

EM&amp;A Report submitted under DC/2007/23 (SCISTW only)

**APPENDIX C**

EM&amp;A Report submitted under DC/2009/05

**APPENDIX D**

EM&amp;A Report submitted under DE/2009/02



## **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-332/2008D 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 quarterly 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 third quarterly EM&A consolidated report covering the period from 1 June 2010 to 31 August 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. No exceedance was recorded during the reporting period.

### **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 were recorded on 10 July 2010 during evening-time period. Details of exceedance are given in Section 6.1.2 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 quarter.

## 2. BASIC PROJECT INFORMATION

### 2.1 Project Organization

Contract No.	<i>DC/2007/23</i>	<i>DC/2009/05</i>	<i>DE/2009/02</i>
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 (AUES)
Environmental Team Leader	Winnie Ko (Tel: 2271 3147)	Edith Ng (Tel: 3105 8525)	T.W. Tam (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.	<i>DC/2007/23</i>	<i>DC/2009/05</i>	<i>DE/2009/02</i>
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 Reporting Quarter

The major construction works undertaken at SCISTW during the reporting quarter include:

#### Contract No. DC/2007/23

- Construction of guide wall and diaphragm wall at Stonecutters Island Production Shaft (SCIPS) and Stonecutters Island Riser Shaft (SCIRS);
- Transportation and temporary storage of excavated marine sediment to the derrick lighter berthed at Sai Ying Pun Junction Shaft.

#### Contract No. DC/2009/05

- Drainage work;
- Construction of diaphragm wall for the Main Pumping Station and its Inlet Chamber;
- Construction of diaphragm wall for Launching Shaft;
- Tree transplanting and protection; and
- Utility diversion work and construction of cable trough.

#### Contract No. DE/2009/02

- Piling works at DOU No. 1 and DOU No. 2;
- Testing and commission of prototype cover at Sedimentation Tank No. 43; and
- Cover installation at Sedimentation Tanks Nos. 33, 35 and 37.

### 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:

<i>Air Monitoring Station</i>	<i>Location</i>	<i>Monitor By</i>
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:

<i>Parameter</i>	<i>Air Monitoring Station</i>	<i>Action Level (<math>\mu\text{gm}^{-3}</math>)</i>	<i>Limit Level (<math>\mu\text{gm}^{-3}</math>)</i>
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:

<i>Noise Monitoring Station</i>	<i>Location</i>	<i>Monitor By</i>
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:

<i>Noise Monitoring Station</i>	<i>Action Level</i>	<i>Limit Level</i>
	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 reports 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 June 2010 to August 2010 are summarized as below:

<i>Air Monitoring Station</i>	<i>Reporting Month</i>	<i>Average (<math>\mu\text{gm}^{-3}</math>)</i>	<i>Range (<math>\mu\text{gm}^{-3}</math>)</i>	<i>Action Level (<math>\mu\text{gm}^{-3}</math>)</i>	<i>Limit Level (<math>\mu\text{gm}^{-3}</math>)</i>
	24-hour TSP				
AM6 (monitored by DC/2007/23)	Jun 2010	105	102-112	196	260
	Jul 2010	104	92-115		
	Aug 2010	103	94-114		
AM7 (monitored by DC/2009/05)	Jun 2010	41	29-57	207	260
	Jul 2010	42	34-57		
	Aug 2010	45	26-65		
AM8 (monitored by DE/2009/02)	Jun 2010	50	30-95	158	260
	Jul 2010	27	13-42		
	Aug 2010	38	10-49		
	1-hour TSP				
AM6 (monitored by DC/2007/23)	Jun 2010	207	136-304	346	500
	Jul 2010	178	137-233		
	Aug 2010	197	158-227		
AM7 (monitored by DC/2009/05)	Jun 2010	71	35-107	322	500
	Jul 2010	66	37-85		
	Aug 2010	78	69-84		
AM8 (monitored by DE/2009/02)	Jun 2010	57	38-78	307	500
	Jul 2010	48	15-82		
	Aug 2010	52	23-85		

Table 7 Air quality monitoring results for June 2010 to August 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 quarter.

Detailed air quality monitoring results, graphical plot and the weather condition during the monitoring quarter 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	Reporting Month	Average, dB(A), Leq (30 mins)	Range, dB(A), Leq (30 mins)	Limit Level, dB(A), Leq (30 mins)
NM5 (monitored by DC/2007/23)	Jun 2010	67.1	64.9-69.5	75.0
	Jul 2010	68.3	65.8-71.0	
	Aug 2010	67.3	65.2-68.8	
NM6 (monitored by DC/2009/05)	Jun 2010	72.9	69.9-74.4	75.0
	Jul 2010	72.1	67.0-74.0	
	Aug 2010	70.2	67.3-71.9	
For the evening period between 1900 and 2300 hours on normal weekdays				
Noise Monitoring Station	Reporting Month	Average, dB(A), Leq (5 mins)	Range, dB(A), Leq (5 mins)	Limit Level, dB(A), Leq (5 mins)
NM6 (monitored by DC/2009/05)	Jun 2010	67.0	65.2-68.5	70.0
	Jul 2010	<u>71.7</u>	62.8- <u>76.6</u>	
	Aug 2010	67.5	65.7-68.4	
For the time period between 0700 and 1900 hours during Public Holiday				
Noise Monitoring Station	Reporting Month	Average, dB(A), Leq (5 mins)	Range, dB(A), Leq (5 mins)	Limit Level, dB(A), Leq (5 mins)
NM5 (monitored by DC/2007/23)	Jun 2010	65.2	63.4-66.7	70.0
	Jul 2010	66.6	65.0-67.9	
	Aug 2010	62.8	57.7-64.8	

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

Table 8 Noise monitoring results for June 2010 to August 2010 at SCISTW

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

One exceedance of noise monitoring was recorded at NM6 on 10 July 2010 during evening-time period. Details of investigation are given in Section 6.1.2 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:

<i>Contract</i>	<i>Month / Year</i>	<i>Inert C&amp;D Materials</i>	<i>Non-inert C&amp;D Waste</i>	<i>Chemical Waste</i>	<i>Marine Deposit</i>
		(Tonnes)	(Tonnes)	('000L)	('000 m <sup>3</sup> )
DC/2007/23*	Jun 2010	8,614	117.2	0.40	--
	Jul 2010	8,401	88.8	--	0.43
	Aug 2010	6,002	41.6	0.20	1.91
DC/2009/05	Jun 2010	7,787	14.1	2.40	--
	Jul 2010	6,170	9.5	1.40	--
	Aug 2010	5,318	16.3	1.00	--
DE/2009/02	Jun 2010	0	3.2	--	--
	Jul 2010	252	0.5	--	--
	Aug 2010	75	1.5	--	--

(\* 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 June 2010 to August 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.

The major findings and recommendations are summarized as below:

#### Contract No. DC/2009/05 – 30 June 2010

- On 30 June 2010, it was observed that the Contractor had installed nylon netting as visual precautionary measures to prevent accidental damage to upper portion of trees that may be caused by machinery swing movements for trees retained within the tree protection zone in the Portion 2 area. However, it was noted that one of the anchor ropes was tied to the existing T5 tree trunk. The Contractor was requested to untie the anchor rope from the tree trunk and use other means to anchor the ropes.
- The Contractor had carried out tree protection works for all existing trees at the excavated material stockpile area. However, the Contractor was reminded to remove all the dead trees as soon as possible to prevent accidents that may be caused by falling of dead trees.

#### Contract No. DC/2009/05 – 28 July 2010

- On 28 July 2010, it was observed that the Contractor had removed the nylon netting anchor rope previously tied to the existing T5 tree trunk at Portion 2 planter area.
- The Contractor had transplanted the existing trees out of the excavated material stockpile area to holding nursery. However, removal of the dead trees was still outstanding. The Contractor was reminded to remove all the dead trees as soon as possible to prevent accidents that may be caused by dead trees fallen over.

- It was observed that the barriers used to demarcate the tree protection zone at Portion 2 area was either fallen over or dismantled. The Contractor was requested to properly re-instate the tree protection zone in order to prevent workers from trespass into the area.

Contract No. DC/2009/05 – 25 August 2010

- It was noted that removal of the dead trees at the excavated material stockpile area was still outstanding. The Contractor was reminded to remove all the dead trees as soon as possible to prevent accidents that may be caused by dead trees fallen over.
- Rectification of barriers demarcating the tree protection zone at the Portion 2 area was outstanding. The Contractor was reminded to rectify the barriers as soon as possible to prevent workers from trespassing and causing damage to the trees.

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 NON-CONFORMANCE**

### **6.1 Summary of Monitoring Exceedance**

#### **6.1.1 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.

#### **6.1.2 Exceedance of Noise Monitoring**

One Limit Level exceedance was recorded at NM6 on 10 July 2010 during the evening time period for Contract No. DC/2009/05.

Based on on-site observation during the noise monitoring, Diaphragm Wall construction was the major work process within the Project site.

Other external noise sources, including construction noise from excavation work undergoing at the other construction site nearby, engine noise from barge anchored at nearby piers and traffic noise from aircrafts passing by and from nearby piers, were also noted during the monitoring period, which might have contributed to the measured noise levels.

According to the Contractor, two concrete lorry mixers, a hydromill, a bentonite filtering plan, a generator and a crane were operating within the Project site during the course of the noise measurement. Types and number of PME operated complies with the requirements as stipulated in the CNP (Ref.: GW-RW0154-10).

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

### **6.2 Summary of Environmental Non-compliance**

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

### **6.3 Summary of Environmental Complaint**

No complaint was received during the reporting quarter.

## **6.4 Summary of Environmental Summon and Successful Prosecution**

No summon was received during the reporting quarter.

## **7. FUTURE KEY ISSUES**

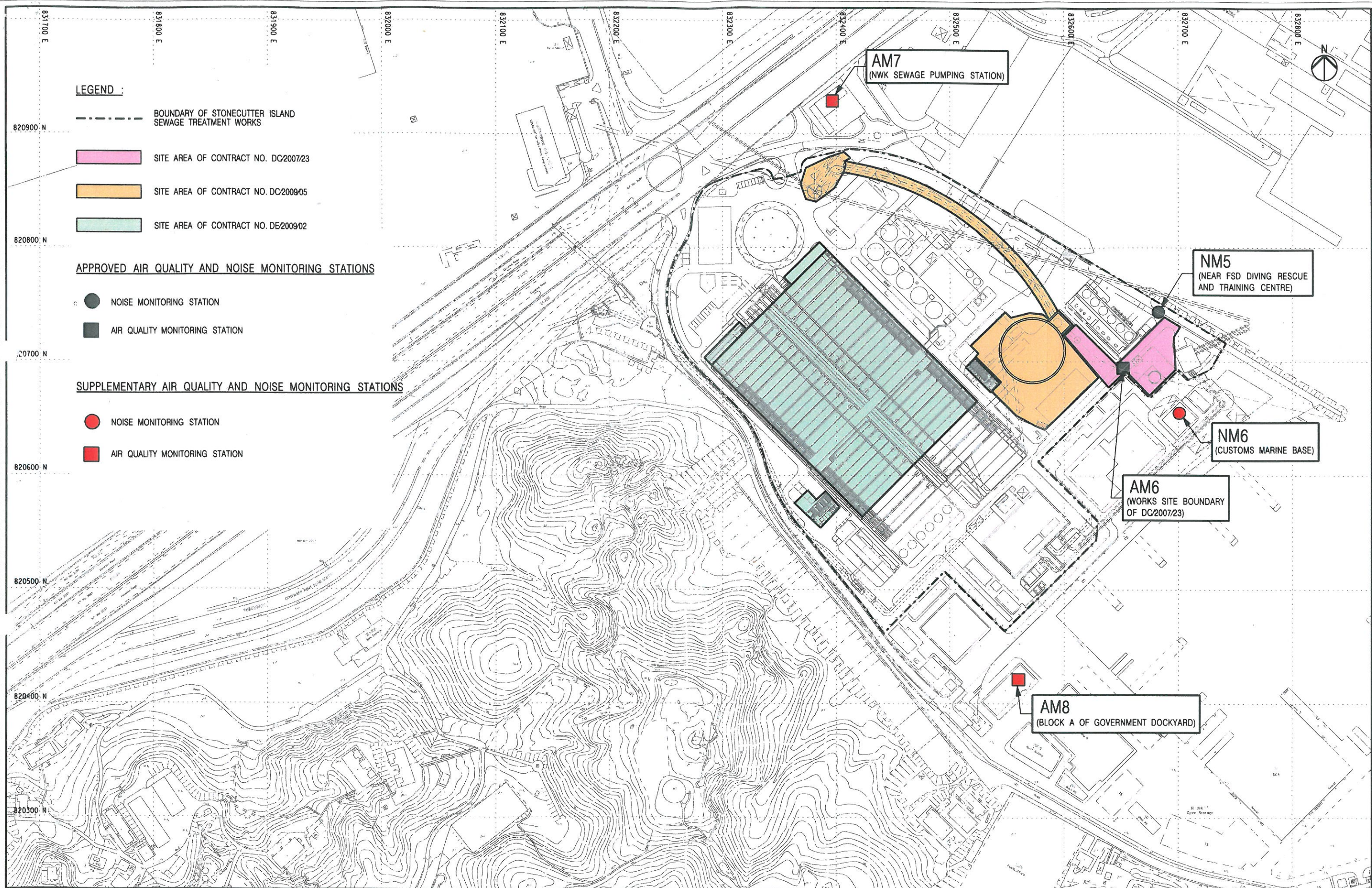
Potential environmental impacts arising from the construction activities are reported under the individual EM&A reports.

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  
Project No. : DC0905 Contract No. : DC/2009/05  
Sketch No. : DC/2009/05/SK/0017

Rev : 1

Sketch Title :  
LOCATIONS OF AIR AND NOISE MONITORING  
STATIONS AT STONECUTTER ISLAND SEWAGE  
TREATMENT WORKS

Scale : 1:3000 @ A3

Issue Date : 15-12-2009

Drawn: KH

Other Related Ref.:

Working Dwg. No. :  
N/A

Checked: WY

DAN No. : N/A  
RFI No. : N/A

Approved: GA

IN-0 No. : N/A  
Others: N/A



## ***APPENDIX B***

### ***EM&A Quarterly 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: *Third  
Quarterly EM&A Report*

September 2010

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<http://www.erm.com>

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: *Third  
Quarterly EM&A Report*

September 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: 20 September 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 third quarterly Environmental Monitoring and Audit (EM&A) report presenting the EM&A works carried out during the period from 1 June 2010 to 31 August 2010 in accordance with the EM&A Manual.



## *Stonecutters Island Production and Riser Shafts*

### Summary of Construction Works undertaken during Reporting Period

The major construction works undertaken included:

- Construction of diaphragm wall at Stonecutters Island Production Shaft and Riser Shaft; and
- Transportation and temporary storage of excavated marine sediment to the derrick lighter berthed at Sai Ying Pun Junction Shaft; and
- Toe grouting and fissure grouting at Stonecutters Island Production Shaft.

### Environmental Monitoring and Audit Progress

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

- |  |          |
|--|----------|
| • 24-hour TSP Monitoring at AM6                                | 17 sets  |
| • 1-hour TSP Monitoring at AM6                                 | 51 sets  |
| • Construction Noise Monitoring during Normal Weekdays at NM5  | 14 times |
| • Construction Noise Monitoring during Restricted Hours at NM5 | 12 times |
| • Joint Environmental Site Inspection                          | 13 times |
| • Landscape & Visual Monitoring                                | 3 times  |

### Air Quality

Seventeen sets of 24-hour TSP and fifty-one 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

Forteen sets of 30-minute construction noise measurements were carried out at the monitoring station NM5 during normal weekdays of the reporting period. Twelve sets of 3 x 5-minute construction noise measurements were carried out during restricted hours (between 0700 and 1900 hours on Sundays and public holidays) on 6, 13, 20, 27 June 2010, 4, 11, 18, 25 July and 1, 8, 15, 22, 29 August 2010. No exceedance was recorded during the reporting period.

### Landscape & Visual

Landscape and visual monitoring commenced in December 2009. 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 period 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 23,017.03 tonnes of inert C&D materials, 247.6 tonnes of non-inert C&D materials, 1,210 m<sup>3</sup> of type 1 marine deposit, 1,123 m<sup>3</sup> of type 2 marine deposit and 9 m<sup>3</sup> of type 3 marine deposit were generated for this Project 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. The type 1, type 2 and type 3 marine deposit generated from the Project were disposed of at MP21 with the South Cheung Chau Spoil Disposal Area, the East Sha Chau Contaminated Mud Disposal and SENT Landfill respectively.

## Environmental Site Inspection

Thirteen 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/Complaint/Summons and Prosecution

No exceedance was recorded during the reporting period.

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

No environmental complaint, summon or prosecution was received in this reporting period.

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 third quarterly EM&A report which summarizes the impact monitoring results and audit findings for the EM&A programme during the reporting period from **1 June 2010** to **31 August 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 period.

- **Status of Environmental Approval Documents**

summarizes the environmental documents submissions under the EP condition during the reporting period.

- **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.

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

- **Construction Activities**

summarizes the construction activities conducted during the reporting period.

- **Status of Environmental Approval Documents**

summarizes the environmental documents submissions under the EP condition during the reporting period.

- **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.

**Section 5 : Central Drop Shaft**

- **Construction Activities**

summarizes the construction activities conducted during the reporting period.

- **Status of Environmental Approval Documents**

summarizes the environmental documents submissions under the EP condition during the reporting period.

- **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.

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

- **Construction Activities**

summarizes the construction activities conducted during the reporting period.

- **Status of Environmental Approval Documents**

summarizes the environmental documents submissions under the EP condition during the reporting period.

- **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.

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

- **Construction Activities**

summarizes the construction activities conducted during the reporting period.

- **Status of Environmental Approval Documents**

summarizes the environmental documents submissions under the EP condition during the reporting period.

- **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.

## Section 8 : **Conclusions**

### 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<sup>2</sup> to 23 m<sup>2</sup>. 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/D) for the works was granted on 14 July 2010. Under the requirements of Condition 4.1 of Environmental Permit EP-322/2008/D,

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 ENVIRONMENTAL APPROVAL DOCUMENTS AND REQUIRED SUBMISSIONS

A summary of the relevant permits, licences, and/or notifications on environmental protection for this Project since December 2009 is presented in *Table 2.1*.

**Table 2.1** *Summary of Environmental Licensing, Notification and Permit Status for the Contract <sup>(a)</sup>*

Permit/ Licences/ Notification	Reference	Validity Period	Remarks
Environmental Permit	EP-322/2008	Expired on 10 July 2009	<ul style="list-style-type: none"> <li>Permit granted on 19 November 2008.</li> <li>Superseded on 10 July 2009.</li> </ul>
	EP-322/2008/A	Expired on 2 November 2009	<ul style="list-style-type: none"> <li>Permit granted on 10 July 2009.</li> <li>Superseded on 2 November 2009.</li> </ul>
	EP-322/2008/B	Expired on 14 May 2010	<ul style="list-style-type: none"> <li>Permit granted on 2 November 2009.</li> <li>Superseded on 14 May 2010.</li> </ul>
	EP-322/2008/C	Expired on 14 July 2010	<ul style="list-style-type: none"> <li>Permit granted on 14 May 2010</li> <li>Superseded on 14 July 2010.</li> </ul>
	EP-322/2008/D	Throughout the Contract	<ul style="list-style-type: none"> <li>Permit granted on 14 July 2010</li> </ul>
Notification of Construction Works under Air Pollution Control (Construction Dust) Regulation	--	04 August 2009 – 06 November 2013	<ul style="list-style-type: none"> <li>Reference number for Notification Pursuant to APC (Construction Dust) Regulation: 308136</li> </ul>
<b>Marine Dumping Permits</b>			
Type 1 Marine Deposit	EP/MD/10-078	18 March 2010 – 17 September 2010	--
Type 2 Marine Deposit	EP/MD/11-019	14 June 2010 – 13 July 2010	Superseded by EP/MD/11-038
	EP/MD/11-038	28 July 2010 – 27 August 2010	--
Type 3 Marine Deposit	8477	18 February 2010 – 17 August 2010	Superseded by 8771
	8771	23 July 2010 – 22 January 2011	--
<b>Note:</b>			



Permit/ Licences/ Notification	Reference	Validity Period	Remarks
(a)	The status on environmental licensing and permit for each worksite is discussed in the following sections.		

Status of required submissions under the EP during the reporting period is presented in *Table 2.2*.

**Table 2.2**      *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 seventh Monthly EM&A Report	14 July 2010
	Submission of eighth Monthly EM&A Report	15 August 2010
	Submission of ninth Monthly EM&A Report	11 September 2010

## 2.3      *PROJECT ORGANISATION*

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

### 7.1 CONSTRUCTION ACTIVITIES DURING THE REPORTING PERIOD

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 June 2010 to 31 August 2010 at Stonecutters Island Production and Riser Shafts*

Construction Activities Undertaken
<ul style="list-style-type: none"> <li>• Toe grouting and fissure grouting at Stonecutters Island Production Shaft</li> <li>• Transportation and temporary storage of excavated marine sediment to the derrick lighter berthed at Sai Ying Pun Junction Shaft</li> <li>• Construction of diaphragm wall at Stonecutters Island Production and Riser Shaft</li> </ul>

### 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
Wastewater 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 GW-RW0066-10	8 February 2010 - 7 August 2010	Superseded by GW-RW0405-10
	Stonecutters Island Production Shaft and Riser Shaft GW-RW0405-10	16 August 2010 - 15 February 2011	

### 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	Construction Air Quality Monitoring Station			
	ID in EM&A Manual	ID	Location	Remark
SCISTW	-	AM6	Works Site Boundary	<ul style="list-style-type: none"> <li>Power Access supply for operation of HVS was not feasible to the rooftop of Government Dockyard Offices (CM_SCI1).</li> <li>For COSCO HIT Terminal (CM_SCI2), access application was verbally rejected.</li> <li>Club House (CM_SCI3) is blocked by a high building which will deteriorate the dust levels during measurement.</li> <li>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.</li> <li>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.</li> </ul>

#### *Monitoring Parameters, Frequency and Programme*

Air quality monitoring was conducted in accordance with the requirements stipulated in the EM&A Manual (*Table 7.4*).

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

Parameter	Frequency
24-hour TSP	Once in every 6 days
1-hour TSP	3 times in every 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 Shafts*

Monitoring Station	Monitoring Equipment (HVS and Calibrator)
<i>24-hr and 1-hr TSP</i>	
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  $\pm 3$  °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<sup>3</sup>min<sup>-1</sup> which were within the range specified in the EM&A Manual (ie 0.6 – 1.7 m<sup>3</sup>min<sup>-1</sup>);
- 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 folded 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 H*.

#### Wind Data Monitoring

The nearest weather station to Stonecutters Island Production and Riser Shafts is Tsing Yi Station. Average wind data (wind speed and wind direction) during the monitoring period were obtained from the meteorological station at Tsing Yi of the Hong Kong Observatory (HKO) and are presented in *Annex G4*.

#### *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 Shafts*

Parameter	Air Monitoring Station	Action Level, $\mu\text{gm}^{-3}$	Limit Level, $\mu\text{gm}^{-3}$
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	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)	<ul style="list-style-type: none"> <li>Access to FSD Fire Rescue and Diving Training Centre (M11) was rejected.</li> <li>NM5 is located next to the original proposed location.</li> </ul>

#### *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 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	<ul style="list-style-type: none"> <li>Calibrator: Rion NC-73 (S/N 10786708) or RION - NC73 (S/N 10997142) or B&amp;K4231 (S/N 2699361)</li> <li>Sound Level Meters: Rion NL-31 (S/N 00320533) or Rion NL-31 (S/N 00410224) or Rion NA-73 (S/N 10786708) or Rion NA-73 (S/N 10997142) or Rion NL-31 (S/N 00983400)</li> </ul>

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	Measurement Parameter	Noise Criteria (dB(A))	Remark
NM5	L <sub>eq</sub> (30mins)	75	Normal working hours during weekdays
	L <sub>eq</sub> (5mins)	70	Evening (1900-2300); and Sundays and public holidays (0700-2300)
	L <sub>eq</sub> (5mins)	55	Night-time (2300-0700)

#### *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 period as no blasting of tunnel / shaft works was carried out.

### **7.3.4** *Landscape and Visual Monitoring*

In accordance with the EM&A Manual, 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 is carried out on site within the environmental site inspection. 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 G3*.

### **7.5 MONITORING RESULTS**

#### **7.5.1 Air Quality**

A total of seventeen sets of 24-hour and fifty-one 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 G4*.

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 fourteen 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. Twelve sets of 3 x 5-minute construction noise measurements were carried out during restricted hours (between 0700 and 1900 hours on Sundays and public holidays) on 6, 13, 20 June 2010, 4, 11, 18, 25 July and 1, 8, 15, 22, 29 August 2010. The restricted hours noise monitoring on 27 June was cancelled due to bad weather. The monitoring results together with graphical presentations are presented in *Annex G5*. 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.

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

#### **7.5.3 Landscape and Visual**

In general, maintenance of landscape and visual mitigation measures has been implemented by Contractor. Major findings observed during the reporting period are summarised as follows:

- On 29 July, protective fencing for trees near the site entrance on the north eastern end of the site was observed to be damaged. The Contractor was recommended to repair the protective fencing as soon as possible to avoid intrusion of site personnel or equipment to within the tree protection zones.
- On 5 August, construction equipments were placed near retained tree No. 260 without fencing near the entrance of the site. The Contractor was recommended to implement proper protective measures (erection of fencing) to avoid damages to the retained trees.
- On 26 August, the protective fencing of a retained tree near the entrance of the site was damaged after demobilisation of equipment on site. The Contractor was recommended to reinstate the fencing around the tree as soon as possible to avoid potential damages.

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

#### **7.5.4 Cultural Heritage**

No vibration monitoring was conducted for this reporting period 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 are 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 period 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. 0.252 tonnes of paper/cardboard packaging were sent to recyclers for recycling during the reporting period. The type 1, type 2 and type 3 marine deposit generated from the Project were disposed of at MP21 with the South Cheung Chau Spoil Disposal Area, the East Sha Chau Contaminated Mud Disposal and SENT Landfill respectively.

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

Month / Year	Quantity					
	C&D Materials (inert) <sup>(a)</sup>	C&D Materials (non-inert) <sup>(b)</sup>	Chemical Waste	Marine Deposit <sup>(c)</sup>		
				Type 1	Type 2	Type 3
June 2010 to August 2010	23017.03 tonnes	247.6 tonnes	600 L	1,210 m <sup>3</sup>	1,123 m <sup>3</sup>	9 m <sup>3</sup>

**Notes:**

(m) 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.

(n) 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 0.252 tonnes paper/cardboard packaging were sent to recyclers for recycling during the reporting period.

(o) The type 1, type 2 and type 3 marine deposit generated from the Project were disposed of at MP21 with the South Cheung Chau Spoil Disposal Area, the East of Sha Chau Contaminated Mud Disposal and SENT Landfill respectively.

## 7.6 ENVIRONMENTAL SITE INSPECTION

Weekly site inspections were carried out by the representatives of the Contractor, Engineer and the ET. Thirteen site inspections were conducted on 3, 10, 17, 24, 29 June 2010, 7, 15, 22, 29 July 2010 and 5, 12, 19, 26 August 2010. There was no non-compliance recorded during the site inspections.

Major findings and recommendations are summarized as follows:

### *Riser Shaft*

- On 3, 24 and 29 June, stagnant water was observed on the ground, tarpaulin covers and drip trays in the inspected sites after raining. The Contractor was recommended to arrange clearance of the stagnant water as soon as possible to avoid mosquito breeding as part of a good housekeeping practice. The Contractor was also recommended to keep drip trays dry so that sufficient capacity is maintained for containment of potential spillages.
- On 10 June, stagnant water was observed underneath the wetsep near the riser shaft after raining. The Contractor was recommended to arrange clearance of the stagnant water as soon as possible to avoid mosquito breeding as part of a good housekeeping practice.
- On 24 June, an oil sheen was observed near the Wetsep. The Contractor has immediately cleared the oil sheen to avoid runoff into drainages. The Contractor was also recommended to dispose of the collected chemical wastes via licensed collectors.
- On 7 July, stagnant water was observed in the u-channel at the intersection of the production shaft site and the access road and in a waste steel storage tank near the bentonite filtering plan. The Contractor was recommended to arrange clearance of the stagnant water after raining as soon as possible to avoid mosquito breeding as part of a good housekeeping practice.

- On 15 July, a stop plug for the drip tray underneath an air compressor near the bentonite silos was observed to be missing. Oil sheens were also observed near the outlet of the drip tray. The Contractor was recommended to provide stop plugs for all drip trays on site and clear all oil sheens and dispose as chemical waste as soon as possible.
- On 15 July, stagnant water was observed along the northern border of the production shaft site. The Contractor was recommended to clear all stagnant water on site, especially after rainy weather, as part of a good housekeeping practice to avoid mosquito breeding.
- On 22 July, a stop plug for the drip tray underneath an air compressor near the bentonite silos was observed to be missing. The stop plug was replaced by the Contractor immediately. The Contractor was recommended to check if stop plugs were provided for all drip trays on site to avoid any oil leakage.
- On 22 July, a tin of chemical was placed on the ground without a drip tray. The Contractor removed the chemical container immediately for proper storage.
- On 19 August, oil sheens were observed at multiple places on site. The Contractor was recommended to immediately clear the oil sheens to avoid runoff into drainages and dispose of the chemical wastes via licensed chemical waste collector.
- On 26 August, stagnant water was observed on site at multiple locations. 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 surface water run-off from site and mosquito breeding.

#### *Production Shaft*

- On 3, 24 and 29 June, stagnant water was observed on the ground, tarpaulin covers and drip trays in the inspected sites after raining. The Contractor was recommended to arrange clearance of the stagnant water as soon as possible to avoid mosquito breeding as part of a good housekeeping practice. The Contractor was also recommended to keep drip trays dry so that sufficient capacity is maintained for containment of potential spillages.
- On 10 June, bentonite slurry was observed to be overflowing from the bentonite slurry tank adjacent to the bentonite filtering plant. The Contractor was recommended to keep checking the capacity of the bentonite slurry tank and provide proper mitigation measures as soon as possible to avoid further overflow.
- On 7 July, stagnant water was observed in the u-channel at the intersection of the production shaft site and the access road and in a waste steel storage tank near the bentonite filtering plan. The Contractor was recommended to arrange clearance of the stagnant water after raining as soon as possible to avoid mosquito breeding as part of a good housekeeping practice.
- On 5 August, oil sheens were observed near the bentonite filtering plant. The Contractor was recommended to immediately clear the oil sheens to avoid runoff into drainages and dispose of the chemical wastes via licensed chemical waste collector.

- On 12 August, a tin of chemical without drip tray and label were observed behind the bentonite filtering plant. The Contractor was recommended to provide a proper label and secondary spillage containments for the chemicals. The Contractor was recommended to provide secondary spillage containments for all chemicals on site to avoid leakage/ spillage.
- On 19 August, oil sheens were observed at multiple places on site. The Contractor was recommended to immediately clear the oil sheens to avoid runoff into drainages and dispose of the chemical wastes via licensed chemical waste collector.
- On 26 August, muddy water was observed in the bushes behind the bentonite silos at the production shaft site. The Contractor was recommended to clear the muddy water as soon as possible. The Contractor was also recommended to implement proper control measures to avoid site run-off into adjacent areas. All discharges from site should also be properly treated by sedimentation facilities prior to discharge.
- On 26 August, stagnant water was observed on site at multiple locations. 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 surface water run-off from site and mosquito breeding.

Follow-up actions were undertaken as reported by the Contractor and observed in the 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.

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

### **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. The cumulative complaint log is shown in *Annex G6*.

### **7.7.4 Summary of Environmental Summon and Successful Prosecution**

No summon or prosecution was received during the reporting period. The cumulative summon and prosecution log is shown in *Annex G6*.

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

#### **8.1 NORTH POINT PRODUCTION AND DROP SHAFT**

No exceedances 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 exceedances of Action and Limit Levels for construction noise were recorded at the noise monitoring station during the reporting period.

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

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

#### **8.2 WAN CHAI EAST PRODUCTION AND DROP SHAFTS**

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

Two exceedances of the noise limit level during restricted hours were reported at NM2 on 22 and 29 August 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 or summons/prosecution received during the reporting period

#### **8.3 CENTRAL DROP SHAFT**

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

No exceedances of Action and Limit Levels for construction noise were recorded at the monitoring station during the reporting period.

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

There was no complaint or 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 air quality monitoring station during the reporting period.

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

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

One complaint regarding the night-time general construction noise from 2300 to 0100 on both 27 and 28 July 2010 was received in the reporting month. Investigations into the complaint were conducted on 29 July 2010 and it revealed that no works were conducted at the worksite of Contract 23 after 1930 hours on both 27 and 28 July 2010 and this has also been confirmed by the Engineer Representative on 29 July 2010. As a result, the detected night-time construction noise is unrelated to Contract 23's works and should be due to other construction activities in the area. No further action was therefore, required. However, the Contractor will continue to ensure all requirements in the CNP are strictly complied with to avoid nuisance to nearby sensitive receivers.

There was no summons/prosecution received during the reporting period

#### 8.5

##### *STONECUTTERS ISLAND PRODUCTION AND RISER 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.

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.

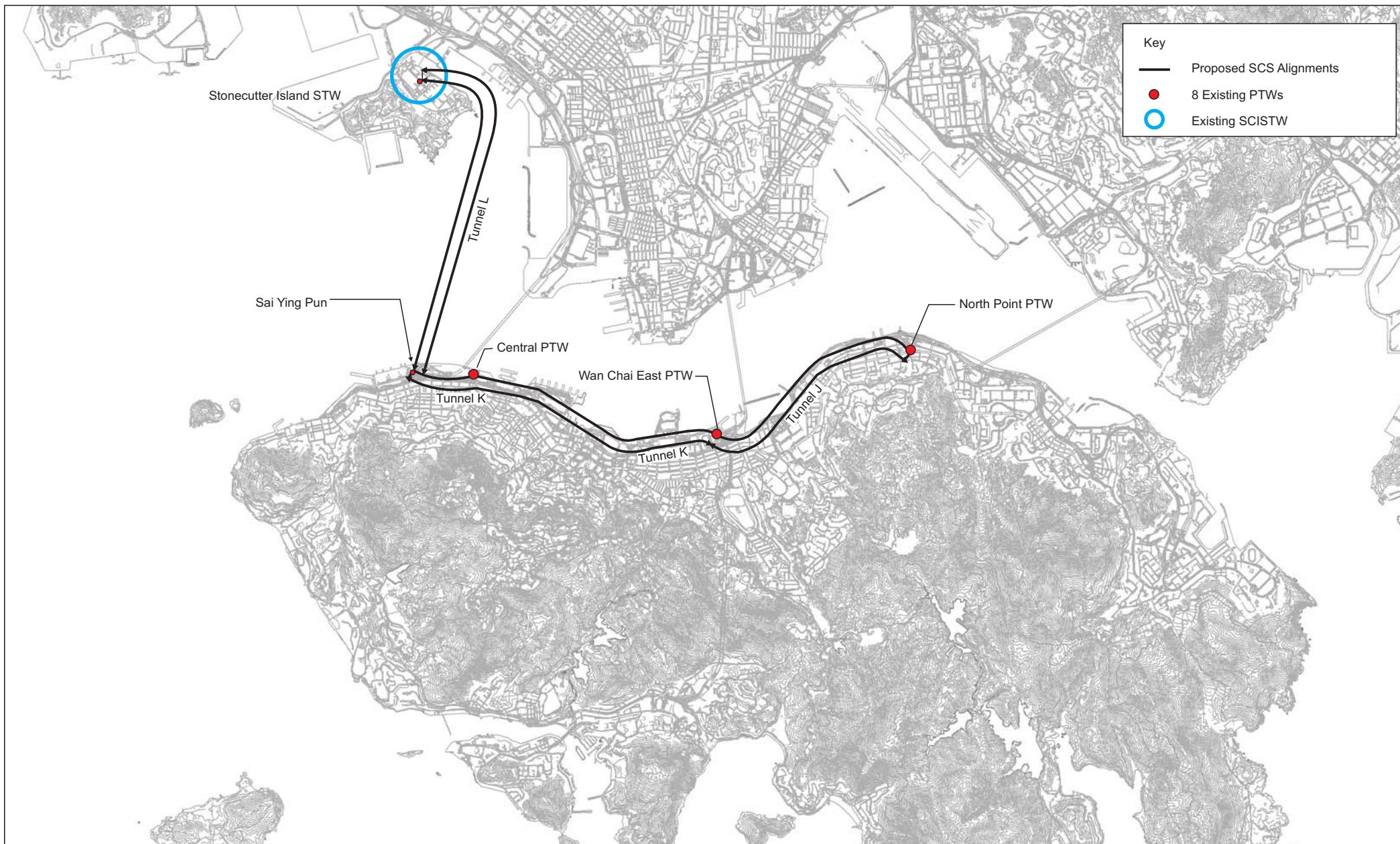
There was no complaint, summon or prosecution received during the reporting period.

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

Annex A

## Locations of Works Areas

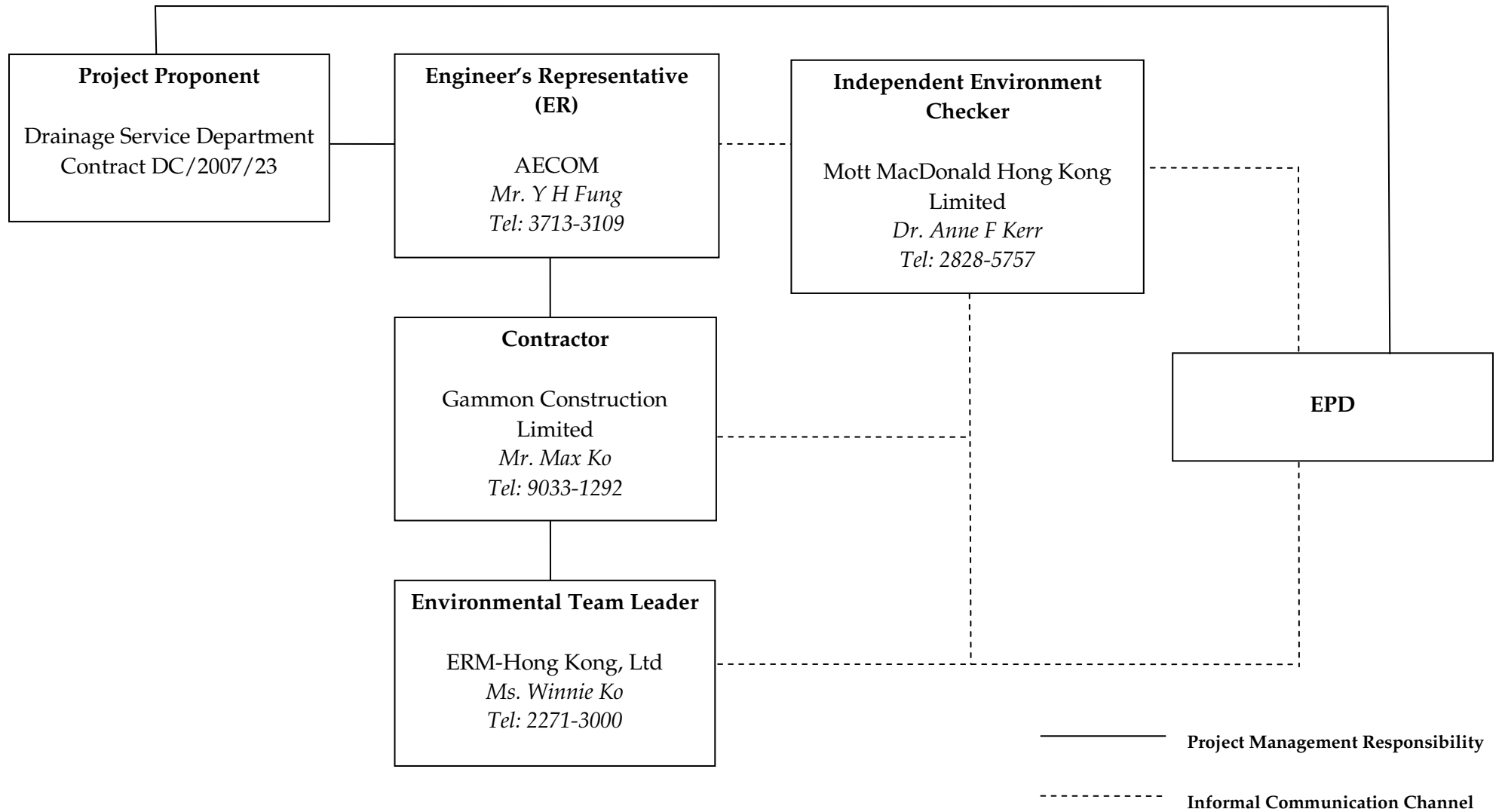




Annex B

## Project Organization Chart and Contact Detail

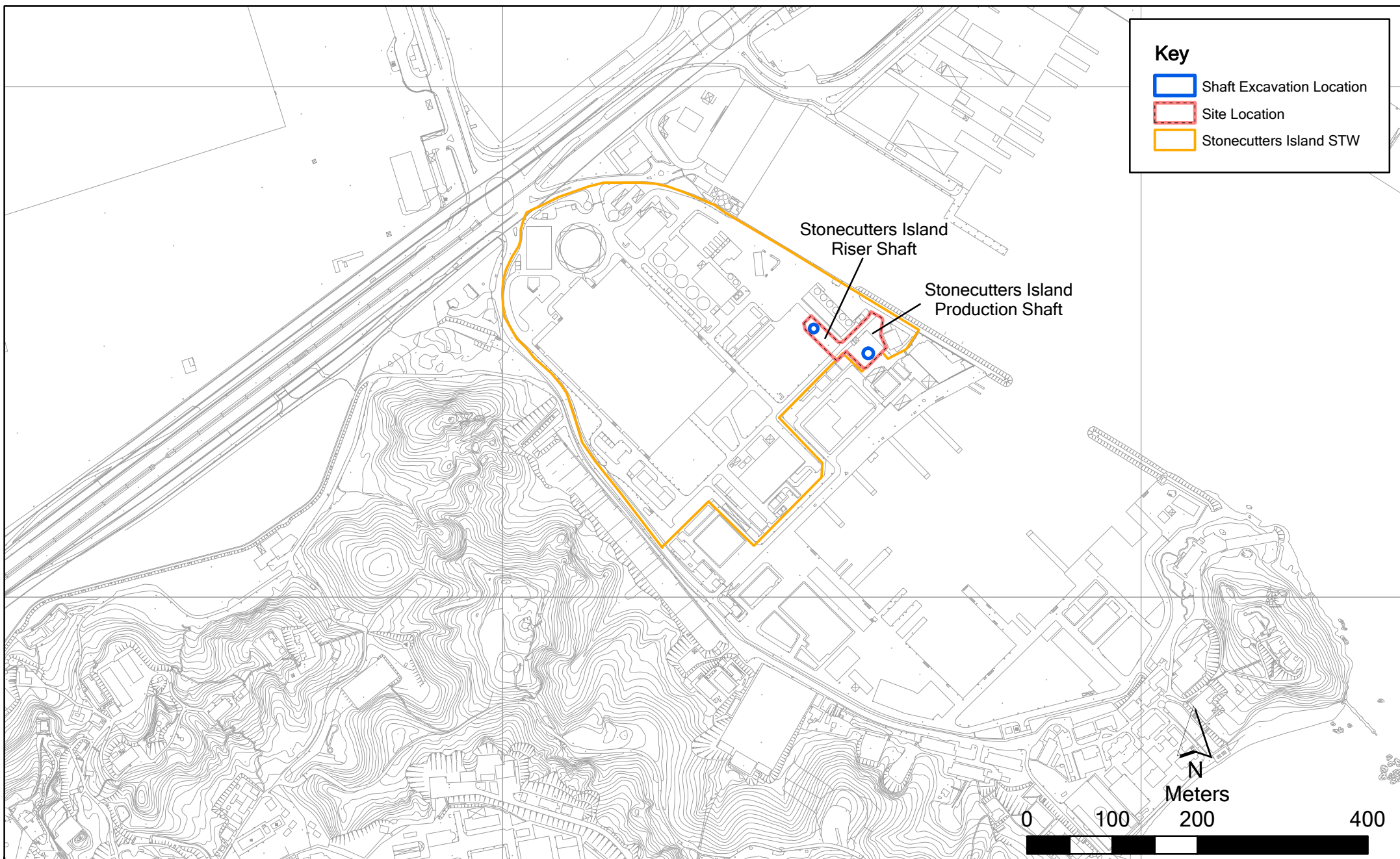
Project Organization



Annex G

## Stonecutters Island Production and Riser Shafts





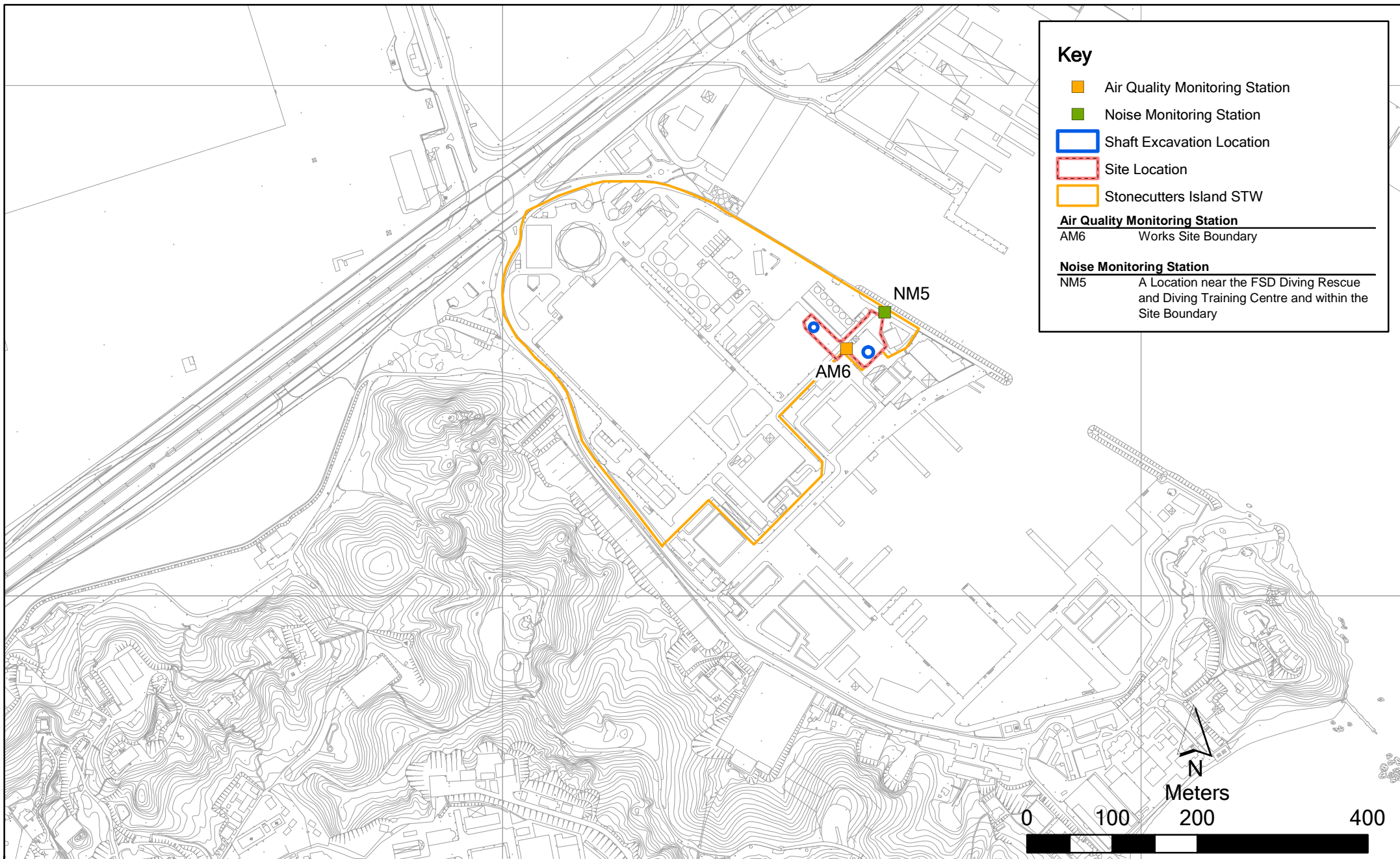
Annex G1

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

File: EM&A and proposed station/  
 0104887\_Stonecutters Island.mxd  
 Date: 03/03/2010

Environmental  
 Resources  
 Management





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 & Noise Monitoring Station (Stonecutters Island STW)*

File: EM&A and proposed station/  
0104887\_Stonecutters Island\_NMAM.mxd  
Date: 03/03/2010

Environmental  
Resources  
Management



### ANNEX G3 - SUMMARY OF MITIGATION MEASURES IMPLEMENTATION SCHEDULE

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
<i>Construction Phase</i>			
Air Quality	<p>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:</p> <ul style="list-style-type: none"> <li>• skip hoist for material transport should be totally enclosed by impervious sheeting;</li> <li>• every vehicle should be washed to remove any dusty materials from its body and wheels before leaving a construction site;</li> <li>• 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;</li> <li>• 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;</li> <li>• 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;</li> <li>• regular watering, with complete coverage, to reduce dust emission from exposed site surfaces and unpaved roads, particularly during dry weather;</li> <li>• 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;</li> <li>• open stock piles should be avoided or covered and prevent placing dusty material storage piles near ASRs if possible;</li> <li>• tarpaulin covering of all dusty vehicle loads transported to, from and between site locations; and</li> <li>• 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.</li> </ul>	All work sites / during construction	√

### ANNEX G3 - SUMMARY OF MITIGATION MEASURES IMPLEMENTATION SCHEDULE

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Air Quality	<p>The following watering measures for specific site would be required to control the fugitive dust impacts:</p> <ul style="list-style-type: none"> <li>the barging points should be continuous watering throughout the whole unloading process; and</li> <li>watering 8 times per day within worksites at the SCS works area at SCISTW and the Disinfection Facilities of SCISTW.</li> </ul>	All work sites / during construction	√
<i>Operational Phase</i>			
Air Quality	<p>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.</p> <ul style="list-style-type: none"> <li>Screens should be cleaned regularly to remove any accumulated organic debris</li> <li>Grit and screening transfer systems should be flushed regularly with water to remove organic debris and grit</li> <li>Grit and screened materials should be transferred to closed containers to minimize odour escape</li> <li>Scum and grease collection wells and troughs should be emptied and flushed regularly to prevent putrefaction of accumulated organics</li> <li>Skim and remove floating solids and grease from primary clarifiers regularly</li> <li>Frequent sludge withdrawal from tanks is necessary to prevent the production of gases</li> <li>Sludge cake should be transferred to closed containers</li> <li>Sludge containers should be flushed with water regularly</li> </ul>	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	NA. Measures not required until commencement of operational phase
<i>Construction Phase</i>			



# ANNEX G3 - SUMMARY OF MITIGATION MEASURES IMPLEMENTATION SCHEDULE

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	<p>Good Site Practice:</p> <ul style="list-style-type: none"> <li>only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction program;</li> <li>silencers or mufflers on construction equipment should be utilized and should be properly maintained during the construction program;</li> <li>mobile plant, if any, should be sited as far from NSRs as possible;</li> <li>machines and plant (such as trucks) that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum;</li> <li>plant known to emit noise strongly in one direction should, wherever possible, be orientated so that the noise is directed away from the nearby NSRs; and</li> <li>material stockpiles and other structures should be effectively utilised, wherever practicable, in screening noise from on-site construction activities;</li> </ul> <p>Environmental audit shall be carried out to ensure that appropriate noise control measures would be properly implemented.</p>	All work sites / during construction	√
<i>Construction Phase</i>			
Water Quality	<p>Construction Site Runoff and General Construction Activities</p> <p>The mitigation measures as outlined in the ProPECC PN 1/94 Construction Site Drainage should be adopted where applicable.</p>	All work sites / during construction	√

# ANNEX G3 - SUMMARY OF MITIGATION MEASURES IMPLEMENTATION SCHEDULE

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Water Quality	<p>Effluent Discharge</p> <p>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.</p>	All work sites / during construction	√
Water Quality	<p>Accidental Spillage of Chemicals</p> <p>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.</p>	All work sites / during construction	Δ
Water Quality	<p>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.</p>	All work sites / during construction	√

### ANNEX G3 - SUMMARY OF MITIGATION MEASURES IMPLEMENTATION SCHEDULE

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Water Quality	<p>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.</p> <p>General requirements are given as follows:</p> <ul style="list-style-type: none"><li>• Suitable containers should be used to hold the chemical wastes to avoid leakage or spillage during storage, handling and transport.</li><li>• Chemical waste containers should be suitably labelled, to notify and warn the personnel who are handling the wastes, to avoid accidents.</li><li>• Storage area should be selected at a safe location on site and adequate space should be allocated to the storage area.</li></ul>	All work sites / during construction	Δ

# ANNEX G3 - SUMMARY OF MITIGATION MEASURES IMPLEMENTATION SCHEDULE

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Water Quality	<p>Construction Works in Close Proximity of Storm Drains or Seafront</p> <p>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.</p> <ul style="list-style-type: none"> <li>• The use of less or smaller construction plants may be specified to reduce the disturbance to the storm water courses or marine environment.</li> <li>• 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.</li> <li>• Stockpiling of construction materials and dusty materials should be covered and located away from any water courses.</li> <li>• 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.</li> <li>• Construction activities, which generate large amount of wastewater, should be carried out in a distance away from the waterfront, where practicable.</li> <li>• Proper shoring may need to be erected in order to prevent soil/mud from slipping into the storm culvert or sea</li> </ul>	All work sites / during construction	√

# ANNEX G3 - SUMMARY OF MITIGATION MEASURES IMPLEMENTATION SCHEDULE

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Water Quality	<p>Temporary Sewage Bypass</p> <p>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&amp;A Manual.</p>	SCISTW/ construction period	√
<i>Operational Phase</i>			
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

### ANNEX G3 - SUMMARY OF MITIGATION MEASURES IMPLEMENTATION SCHEDULE

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
<i>Construction Phase</i>			

# ANNEX G3 - SUMMARY OF MITIGATION MEASURES IMPLEMENTATION SCHEDULE

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	<p>All waste materials should be segregated into categories covering:</p> <ul style="list-style-type: none"> <li>• excavated materials suitable for reuse on-site;</li> <li>• excavated materials suitable for public filling facilities;</li> <li>• remaining C&amp;D waste for landfill;</li> <li>• chemical waste; and</li> <li>• general refuse for landfill.</li> </ul>	All work sites / during the construction period	√
Waste	<p>Recommendations to achieve waste reduction include:</p> <ul style="list-style-type: none"> <li>• Sort C&amp;D waste from demolition of existing facilities to recover recyclable portions such as metals;</li> <li>• Segregation and storage of different types of waste in different containers, skips or stockpiles to enhance reuse or recycling of materials and their proper disposal;</li> <li>• Encourage collection of aluminium cans, 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;</li> <li>• Any unused chemicals or those with remaining functional capacity shall be recycled; and</li> <li>• Proper storage and site practices to minimise the potential for damage or contamination of construction materials.</li> </ul>	All work sites / during the construction period	√

# ANNEX G3 - SUMMARY OF MITIGATION MEASURES IMPLEMENTATION SCHEDULE

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Waste	<p>Recommendations for good site practices during construction activities include:-</p> <ul style="list-style-type: none"> <li>Nomination of an approved person, such as a site manager, to be responsible for good site practices, arrangements for collection and effective disposal to an appropriate facility, of all wastes generated at the site</li> <li>Training of site personnel in proper waste management and chemical waste handling procedures</li> <li>Develop and provide toolbox talk for on-site sorting of C&amp;D materials to enhance worker's awareness in handling, sorting, reuse and recycling of C&amp;D materials.</li> <li>Provision of sufficient waste disposal points and regular collection of waste</li> <li>Regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors</li> </ul>	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	√



# ANNEX G3 - SUMMARY OF MITIGATION MEASURES IMPLEMENTATION SCHEDULE

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	Δ
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	√
<i>Operation Phase</i>			
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

### ANNEX G3 - SUMMARY OF MITIGATION MEASURES IMPLEMENTATION SCHEDULE

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
<i>Construction Phase</i>			
Landscape & Visual	<ul style="list-style-type: none"> <li>Topsoil, where identified, should be stripped and stored for re-use in the construction of the soft landscape works, where practical.</li> <li>Existing trees to be retained on site should be carefully protected during construction.</li> <li>Trees unavoidably affected by the works should be transplanted where practical.</li> <li>Compensatory tree planting should be provided to compensate for felled trees.</li> <li>Control of night-time lighting.</li> <li>Erection of decorative screen hoarding compatible with the surrounding setting.</li> </ul>	All the works areas, PTWs and SCISTW / during the construction period	Δ
<i>Operational Phase</i>			
Landscape & Visual	<ul style="list-style-type: none"> <li>Aesthetic design of the façade of PTW and associated structures to harmonize with the surrounding settings.</li> <li>Shrub and Climbing Plants to soften proposed structures / Roof Greening.</li> <li>Buffer Tree and Shrub Planting to screen proposed associated structures.</li> <li>Reinstated of disturbed area</li> </ul>	All the works areas, PTWs and SCISTW / during the construction period	NA. Measures not required until commencement of operational phase
<i>Construction Phase</i>			

### ANNEX G3 - SUMMARY OF MITIGATION MEASURES IMPLEMENTATION SCHEDULE

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 G4 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 <sup>3</sup> /min)			TSP Conc. (µg/m <sup>3</sup> )	Action Level (µg/m <sup>3</sup> )	Limit Level (µg/m <sup>3</sup> )	Observations / Remarks	Sampler ID	Filter ID
Date	Time	Date	Time		Initial	Final	Initial	Final		Initial	Final	Average						
1-Jun-10	12:06	2-Jun-10	12:06	Fine	2.8494	3.0177	6384.03	6408.03	24.00	1.13	1.13	1.13	103	196	260	Construction work in progress	1254	6392
7-Jun-10	16:16	8-Jun-10	16:16	Sunny	2.8495	3.0178	6411.03	6435.03	24.00	1.13	1.13	1.13	103	196	260	Construction work in progress	1254	6357
11-Jun-10	16:14	12-Jun-10	16:14	Fine	2.8571	3.0387	6438.03	6462.03	24.00	1.13	1.13	1.13	112	196	260	Construction work in progress	1254	6479
17-Jun-10	16:11	18-Jun-10	16:11	Fine	2.8356	3.0014	6465.03	6489.03	24.00	1.13	1.13	1.13	102	196	260	Construction work in progress	1254	6483
23-Jun-10	16:06	24-Jun-10	16:06	Cloudy	2.8381	3.0140	6492.03	6516.03	24.00	1.13	1.13	1.13	108	196	260	Construction work in progress	1255	6367
29-Jun-10	16:24	30-Jun-10	16:24	Sunny	2.8727	3.0421	6519.03	6543.03	24.00	1.13	1.13	1.13	104	196	260	Construction work in progress	1255	6551
													Min.	102				
													Max.	112				
													Average	105				

## Annex G4 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 <sup>3</sup> /min)			TSP Conc. (µg/m <sup>3</sup> )	Action Level (µg/m <sup>3</sup> )	Limit Level (µg/m <sup>3</sup> )	Observations / Remarks	Sampler ID	Filter ID
Date	Time	Date	Time		Initial	Final	Initial	Final		Initial	Final	Average						
5-Jul-10	16:16	6-Jul-10	16:16	Sunny	2.8807	3.0685	6546.03	6570.03	24.00	1.13	1.13	1.13	115	196	260	Construction work in progress	1254	6555
9-Jul-10	16:26	10-Jul-10	16:26	Sunny	2.8345	3.0086	6573.03	6597.03	24.00	1.13	1.13	1.13	107	196	260	Construction work in progress	1254	6571
15-Jul-10	16:16	16-Jul-10	16:16	Cloudy	2.8610	3.0269	6600.03	6624.03	24.00	1.13	1.13	1.13	102	196	260	Construction work in progress	1254	6683
21-Jul-10	12:16	22-Jul-10	12:16	Rainy	2.8751	3.0249	6627.03	6651.03	24.00	1.13	1.13	1.13	92	196	260	Construction work in progress	1254	6687
27-Jul-10	14:07	28-Jul-10	14:07	Cloudy	2.8357	2.9989	6654.03	6678.03	24.00	1.11	1.11	1.11	102	196	260	Construction work in progress	1255	6757
													Min.	92				
													Max.	92				
													Average	92				

## Annex G4 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 <sup>3</sup> /min)			TSP Conc. (µg/m <sup>3</sup> )	Action Level (µg/m <sup>3</sup> )	Limit Level (µg/m <sup>3</sup> )	Observations / Remarks	Sampler ID	Filter ID
Date	Time	Date	Time		Initial	Final	Initial	Final		Initial	Final	Average						
2-Aug-10	14:09	3-Aug-10	14:09	Sunny	2.8701	3.0229	6681.03	6705.03	24.00	1.13	1.13	1.13	94	196	260	Construction work in progress	1254	6761
6-Aug-10	16:18	7-Aug-10	16:18	Sunny	2.8255	2.9912	6708.03	6732.03	24.00	1.13	1.13	1.13	102	196	260	Construction work in progress	1254	6805
12-Aug-10	16:23	13-Aug-10	16:23	Sunny	2.8215	3.0008	6735.03	6759.03	24.00	1.13	1.13	1.13	110	196	260	Construction work in progress	1254	6809
18-Aug-10	17:06	19-Aug-10	17:06	Fine	2.8566	3.0199	6762.03	6786.03	24.00	1.13	1.13	1.13	100	196	260	Construction work in progress	1254	6813
24-Aug-10	16:16	25-Aug-10	16:16	Rainy	2.8696	3.0234	6789.03	6813.03	24.00	1.11	1.11	1.11	96	196	260	Construction work in progress	1255	6817
30-Aug-10	16:16	31-Aug-10	16:16	Sunny	2.8309	3.0124	6816.03	6840.03	24.00	1.11	1.11	1.11	114	196	260	Construction work in progress	1255	6821
													Min.	94				
													Max.	114				
													Average	103				

## Annex G4 24-hour and 1-hour TSP Monitoring Results

### 1-hour TSP Monitoring Results

#### Station AM6

Date	Start Time	Finish Time	Weather	TSP Concentration (µg/m <sup>3</sup> )	Action Level (µg/m <sup>3</sup> )	Limit Level (µg/m <sup>3</sup> )	Site Conditions / Observations / Remarks	Temperature (°C)	Wind Speed * (m/s)	Sampler ID	Filter ID
1-Jun-10	9:00	10:00	Fine	283	346	500	Construction work in progress	24		1254	6389
1-Jun-10	10:02	11:02	Fine	304	346	500	Construction work in progress	24		1254	6390
1-Jun-10	11:04	12:04	Fine	254	346	500	Construction work in progress	24		1254	6391
7-Jun-10	13:10	14:10	Sunny	226	346	500	Construction work in progress	28		1254	6354
7-Jun-10	14:12	15:12	Sunny	260	346	500	Construction work in progress	28		1254	6355
7-Jun-10	15:14	16:14	Sunny	208	346	500	Construction work in progress	28		1254	6356
11-Jun-10	14:10	15:10	Fine	190	346	500	Construction work in progress	27		1254	6476
11-Jun-10	15:12	16:12	Fine	168	346	500	Construction work in progress	27		1254	6477
11-Jun-10	16:14	17:14	Fine	180	346	500	Construction work in progress	27		1254	6478
17-Jun-10	13:05	14:05	Fine	136	346	500	Construction work in progress	29		1254	6480
17-Jun-10	14:07	15:07	Fine	152	346	500	Construction work in progress	29		1254	6481
17-Jun-10	15:09	16:09	Fine	177	346	500	Construction work in progress	29		1254	6482
23-Jun-10	13:00	14:00	Cloudy	220	346	500	Construction work in progress	29		1254	6364
23-Jun-10	14:02	15:05	Cloudy	192	346	500	Construction work in progress	29		1254	6365
23-Jun-10	15:04	16:04	Cloudy	202	346	500	Construction work in progress	29		1254	6366
29-Jun-10	13:18	14:18	Sunny	195	346	500	Construction work in progress	30		1254	6548
29-Jun-10	14:20	15:20	Sunny	201	346	500	Construction work in progress	30		1254	6459
29-Jun-10	15:22	16:22	Sunny	184	346	500	Construction work in progress	30		1254	6550
				Min.	136						
				Max.	304						
				Average	207						

\* Wind Speed data is presented in the Meteorological Data table

## Annex G4 24-hour and 1-hour TSP Monitoring Results

### 1-hour TSP Monitoring Results

#### Station AM6

Date	Start Time	Finish Time	Weather	TSP Concentration (µg/m <sup>3</sup> )	Action Level (µg/m <sup>3</sup> )	Limit Level (µg/m <sup>3</sup> )	Site Conditions / Observations / Remarks	Temperature (°C)	Wind Speed * (m/s)	Sampler ID	Filter ID
5-Jul-10	13:10	14:10	Sunny	167	346	500	Construction work in progress	31		1254	6552
5-Jul-10	14:12	15:12	Sunny	137	346	500	Construction work in progress	31		1254	6553
5-Jul-10	15:14	16:14	Sunny	152	346	500	Construction work in progress	31		1254	6554
9-Jul-10	13:20	14:20	Sunny	181	346	500	Construction work in progress	33		1254	6558
9-Jul-10	14:22	15:22	Sunny	180	346	500	Construction work in progress	33		1254	6559
9-Jul-10	15:24	16:24	Sunny	187	346	500	Construction work in progress	33		1254	6570
15-Jul-10	13:10	14:10	Cloudy	169	346	500	Construction work in progress	30		1254	6680
15-Jul-10	14:12	15:12	Cloudy	161	346	500	Construction work in progress	30		1254	6681
15-Jul-10	15:14	16:14	Cloudy	202	346	500	Construction work in progress	30		1254	6682
21-Jul-10	9:10	10:10	Rainy	180	346	500	Construction work in progress	27		1254	6684
21-Jul-10	10:12	11:12	Rainy	233	346	500	Construction work in progress	27		1254	6685
21-Jul-10	11:14	12:14	Rainy	170	346	500	Construction work in progress	27		1254	6686
27-Jul-10	10:10	11:10	Cloudy	170	346	500	Construction work in progress	29		1254	6754
27-Jul-10	11:12	12:12	Cloudy	185	346	500	Construction work in progress	29		1254	6755
27-Jul-10	13:05	14:05	Cloudy	200	346	500	Construction work in progress	29		1254	6756
				Min.	137						
				Max.	233						
				Average	178						

\* Wind Speed data is presented in the Meteorological Data table



## Annex G4 24-hour and 1-hour TSP Monitoring Results

### 1-hour TSP Monitoring Results

#### Station AM6

Date	Start Time	Finish Time	Weather	TSP Concentration (µg/m <sup>3</sup> )	Action Level (µg/m <sup>3</sup> )	Limit Level (µg/m <sup>3</sup> )	Site Conditions / Observations / Remarks	Temperature (°C)	Wind Speed * (m/s)	Sampler ID	Filter ID
2-Aug-10	11:00	12:00	Sunny	194	346	500	Construction work in progress	31		1254	6758
2-Aug-10	12:05	13:05	Sunny	192	346	500	Construction work in progress	31		1254	6759
2-Aug-10	13:07	14:07	Sunny	158	346	500	Construction work in progress	31		1254	6760
6-Aug-10	13:10	14:10	Sunny	206	346	500	Construction work in progress	32		1254	6802
6-Aug-10	14:12	15:12	Sunny	215	346	500	Construction work in progress	32		1254	6803
6-Aug-10	15:16	16:16	Sunny	206	346	500	Construction work in progress	32		1254	6804
12-Aug-10	13:17	14:17	Sunny	188	346	500	Construction work in progress	31		1254	6806
12-Aug-10	14:19	15:19	Sunny	227	346	500	Construction work in progress	31		1254	6807
12-Aug-10	15:21	16:21	Sunny	194	346	500	Construction work in progress	31		1254	6808
18-Aug-10	14:00	15:00	Fine	177	346	500	Construction work in progress	30		1254	6810
18-Aug-10	15:02	16:02	Fine	183	346	500	Construction work in progress	30		1254	6811
18-Aug-10	16:04	17:04	Fine	222	346	500	Construction work in progress	30		1254	6812
24-Aug-10	13:10	14:10	Rainy	170	346	500	Construction work in progress	28		1254	6814
24-Aug-10	14:12	15:12	Rainy	198	346	500	Construction work in progress	28		1254	6815
24-Aug-10	15:14	16:14	Rainy	201	346	500	Construction work in progress	28		1254	6816
30-Aug-10	13:10	14:10	Sunny	206	346	500	Construction work in progress	31		1254	6818
30-Aug-10	14:12	15:12	Sunny	212	346	500	Construction work in progress	31		1254	6819
30-Aug-10	15:14	16:14	Sunny	200	346	500	Construction work in progress	31		1254	6820
				Min.	158						
				Max.	227						
				Average	197						

\* Wind Speed data is presented in the Meteorological Data table

Meteorological Data Extracted from the Hong Kong Observatory

Date	Weather	King's Park Station				
		Average Air Temperature (°C)	Average Relative Humidity (%)	Total Rainfall (mm)	Average Wind Speed (km/h)	Wind Direction
6/1/2010	Rainy	24	70-96	16.1	8-30	E
6/3/2010	Rainy	22.9	75-98	1.0	0-18	NE
6/4/2010	Rainy	24.8	75-94	Trace	0-14	E
6/7/2010	Sunny	26.2	67-89	0.0	6-20	E
6/9/2010	Rainy	25.7	83-98	16.7	0-20	E
6/10/2010	Rainy	25.7	93-99	58.4	0-16	E
6/11/2010	Rainy	27.8	74-96	Trace	0-18	W
6/14/2010	Rainy	29.2	76-91	6.4	5-17	SW
6/15/2010	Rainy	29.4	81-87	0.1	3-17	SW
6/17/2010	Rainy	30.2	72-84	Trace	4-20	SW
6/19/2010	Rainy	30.0	71-82	Trace	2-18	SW
6/21/2010	Rainy	30.2	69-87	1.4	0-15	SW
6/23/2010	Rainy	27.3	75-99	41.0	0-15	SW
6/25/2010	Rainy	28.7	77-87	2.9	0-18	W
6/26/2010	Rainy	26.4	84-97	127.6	0-15	W
6/29/2010	Rainy	27.7	80-97	0.1	0-15	E

Date	Weather	Tsing Yi Station				
		Average Air Temperature (°C)	Average Relative Humidity (%) *	Total Rainfall (mm) *	Average Wind Speed (km/h)	Wind Direction
6/1/2010	Rainy	24	70-96	16.1	4-30	E
6/3/2010	Rainy	22.9	75-98	1.0	0-11	NW
6/4/2010	Rainy	24.8	75-94	Trace	4-11	SE
6/7/2010	Sunny	26.2	67-89	0.0	3-23	SE
6/9/2010	Rainy	25.7	83-98	16.7	0-23	E
6/10/2010	Rainy	25.7	93-99	58.4	0-18	SE
6/11/2010	Rainy	27.8	74-96	Trace	0-13	SE
6/14/2010	Rainy	29.2	76-91	6.4	6-18	SE
6/15/2010	Rainy	29.4	81-87	0.1	6-18	SE
6/17/2010	Rainy	30.2	72-84	Trace	8-17	-
6/19/2010	Rainy	30.0	71-82	Trace	3-18	SE
6/21/2010	Rainy	30.2	69-87	1.4	3-19	SE
6/23/2010	Rainy	27.3	75-99	41.0	0-24	SE
6/25/2010	Rainy	28.7	77-87	2.9	2-24	S
6/26/2010	Rainy	26.4	84-97	127.6	0-21	SE
6/29/2010	Rainy	27.7	80-97	0.1	3-15	E

Date	Weather	Kai Tak Station				
		Average Air Temperature (°C) *	Average Relative Humidity (%) *	Total Rainfall (mm) *	Average Wind Speed (km/h)	Wind Direction
6/1/2010	Rainy	24	70-96	16.1	10-32	E
6/3/2010	Rainy	22.9	75-98	1.0	0-18	SE
6/4/2010	Rainy	24.8	75-94	Trace	0-16	SE
6/7/2010	Sunny	26.2	67-89	0.0	0-20	E
6/9/2010	Rainy	25.7	83-98	16.7	2-24	SE
6/10/2010	Rainy	25.7	93-99	58.4	0-23	SE
6/11/2010	Rainy	27.8	74-96	Trace	0-18	SE
6/14/2010	Rainy	29.2	76-91	6.4	8-26	SW
6/15/2010	Rainy	29.4	81-87	0.1	7-26	SW
6/17/2010	Rainy	30.2	72-84	Trace	6-19	-
6/19/2010	Rainy	30.0	71-82	Trace	4-23	SW
6/21/2010	Rainy	30.2	69-87	1.4	0-18	S
6/23/2010	Rainy	27.3	75-99	41.0	0-25	S
6/25/2010	Rainy	28.7	77-87	2.9	12-34	SW
6/26/2010	Rainy	26.4	84-97	127.6	0-17	SW
6/29/2010	Rainy	27.7	80-97	0.1	3-19	E

Date	Weather	Green Island Station				
		Average Air Temperature (°C) *	Average Relative Humidity (%) *	Total Rainfall (mm) *	Average Wind Speed (km/h)	Wind Direction
6/1/2010	Rainy	24	70-96	16.1	5-65	NE
6/3/2010	Rainy	22.9	75-98	1.0	1-24	N
6/4/2010	Rainy	24.8	75-94	Trace	1-21	S
6/7/2010	Sunny	26.2	67-89	0.0	0-37	NE
6/9/2010	Rainy	25.7	83-98	16.7	4-28	-
6/10/2010	Rainy	25.7	93-99	58.4	1-32	S,N
6/11/2010	Rainy	27.8	74-96	Trace	0-27	S,N
6/14/2010	Rainy	29.2	76-91	6.4	25-42	S
6/15/2010	Rainy	29.4	81-87	0.1	17-38	S
6/17/2010	Rainy	30.2	72-84	Trace	24-39	S
6/19/2010	Rainy	30.0	71-82	Trace	15-32	S
6/21/2010	Rainy	30.2	69-87	1.4	16-30	S
6/23/2010	Rainy	27.3	75-99	41.0	0-42	S
6/25/2010	Rainy	28.7	77-87	2.9	10-53	S
6/26/2010	Rainy	26.4	84-97	127.6	5-40	S
6/29/2010	Rainy	27.7	80-97	0.1	1-30	NE

\* 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	King's Park Station				
		Average Air Temperature (°C)	Average Relative Humidity (%)	Total Rainfall (mm)	Average Wind Speed (km/h)	Wind Direction
2/7/2010	Sunny	30.3	55-90	0.0	0-12	W
5/7/2010	Sunny	30.8	68-87	0.0	3-18	W
7/7/2010	Rainy	30.5	66-87	Trace	0-17	W
8/7/2010	Rainy	31.0	65-89	0.4	0-15	W
9/7/2010	Rainy	29.5	68-85	1.7	4-18	W
13/7/2010	Rainy	30.5	69-85	Trace	0-20	SE
14/7/2010	Sunny	31.1	64-88	0.0	0-20	SE
15/7/2010	Rainy	29.5	74-97	8.4	3-24	SE
19/7/2010	Sunny	30.5	57-92	0.0	0-14	E
20/7/2010	Sunny	25.8	81.0	0.0	0-16	SE
21/7/2010	Rainy	25.8	91.0	29.6	7-28	E
24/7/2010	Rainy	25.6	86.0	1.1	0-18	E
26/7/2010	Sunny	25.3	80.0	0.0	0-21	E
27/7/2010	Rainy	25.2	86.0	33.6	0-23	W
30/7/2010	Rainy	25.8	80.0	5.1	0-16	W
31/7/2010	Rainy	25.7	78.0	0.8	0-118	W

Date	Weather	Tsing Yi Station				
		Average Air Temperature (°C)	Average Relative Humidity (%) *	Total Rainfall (mm) *	Average Wind Speed (km/h)	Wind Direction
2/7/2010	Sunny	30.3	55-90	0.0	0-15	SE
5/7/2010	Sunny	30.8	68-87	0.0	0-18	SE
7/7/2010	Rainy	30.5	66-87	Trace	3-17	SE
8/7/2010	Rainy	31.0	65-89	0.4	3-18	SE
9/7/2010	Rainy	29.5	68-85	1.7	6-17	SE
13/7/2010	Rainy	30.5	69-85	Trace	0-18	SE
14/7/2010	Sunny	31.1	64-88	0.0	0-22	SE
15/7/2010	Rainy	29.5	74-97	8.4	0-34	SE
19/7/2010	Sunny	30.5	57-92	0.0	0-16	SE
20/7/2010	Sunny	25.8	81.0	0.0	0-21	SE
21/7/2010	Rainy	25.8	91.0	29.6	3-28	E
24/7/2010	Rainy	25.6	86.0	1.1	0-12	E
26/7/2010	Sunny	25.3	80.0	0.0	0-21	NW
27/7/2010	Rainy	25.2	86.0	33.6	0-23	SE
30/7/2010	Rainy	25.8	80.0	5.1	0-15	SE
31/7/2010	Rainy	25.7	78.0	0.8	0-17	SE

Date	Weather	Kai Tak Station				
		Average Air Temperature (°C) *	Average Relative Humidity (%) *	Total Rainfall (mm) *	Average Wind Speed (km/h)	Wind Direction
2/7/2010	Sunny	30.3	55-90	0.0	3-18	W
5/7/2010	Sunny	30.8	68-87	0.0	9-25	W
7/7/2010	Rainy	30.5	66-87	Trace	5-23	W
8/7/2010	Rainy	31.0	65-89	0.4	3-17	SW
9/7/2010	Rainy	29.5	68-85	1.7	1-19	SW
13/7/2010	Rainy	30.5	69-85	Trace	3-20	SE
14/7/2010	Sunny	31.1	64-88	0.0	2-24	SE
15/7/2010	Rainy	29.5	74-97	8.4	7-27	E
19/7/2010	Sunny	30.5	57-92	0.0	3-20	SE
20/7/2010	Sunny	25.8	81.0	0.0	0-22	SE
21/7/2010	Rainy	25.8	91.0	29.6	12-45	E
24/7/2010	Rainy	25.6	86.0	1.1	3-19	SE
26/7/2010	Sunny	25.3	80.0	0.0	0-20	SE
27/7/2010	Rainy	25.2	86.0	33.6	0-27	SW
30/7/2010	Rainy	25.8	80.0	5.1	0-17	SW
31/7/2010	Rainy	25.7	78.0	0.8	0-15	SW

Date	Weather	Green Island Station				
		Average Air Temperature (°C) *	Average Relative Humidity (%) *	Total Rainfall (mm) *	Average Wind Speed (km/h)	Wind Direction
2/7/2010	Sunny	30.3	55-90	0.0	3-30	S
5/7/2010	Sunny	30.8	68-87	0.0	22-46	SW
7/7/2010	Rainy	30.5	66-87	Trace	17-35	SW
8/7/2010	Rainy	31.0	65-89	0.4	12-35	SW
9/7/2010	Rainy	29.5	68-85	1.7	14-30	SW
13/7/2010	Rainy	30.5	69-85	Trace	0-32	S
14/7/2010	Sunny	31.1	64-88	0.0	1-40	NE
15/7/2010	Rainy	29.5	74-97	8.4	12-48	NE
19/7/2010	Sunny	30.5	57-92	0.0	9-34	S
20/7/2010	Sunny	25.8	81.0	0.0	0-15	NE
21/7/2010	Rainy	25.8	91.0	29.6	12-40	NE
24/7/2010	Rainy	25.6	86.0	1.1	6-31	NE
26/7/2010	Sunny	25.3	80.0	0.0	6-21	NE
27/7/2010	Rainy	25.2	86.0	33.6	8-56	S
30/7/2010	Rainy	25.8	80.0	5.1	13-28	S
31/7/2010	Rainy	25.7	78.0	0.8	9-31	S

\* 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	King's Park Station				
		Average Air Temperature (°C)	Average Relative Humidity (%)	Total Rainfall (mm)	Average Wind Speed (km/h)	Wind Direction
2/8/2010	Rainy	30	64-90	1.1	0-17	SE
5/8/2010	Rainy	29.0	63-95	41.6	0-45	W
6/8/2010	Rainy	29.0	69-91	1.6	0-19	SE
9/8/2010	Rainy	30.0	71-93	0.2	1-18	E
11/8/2010	Rainy	29.0	81-98	22.2	0-20	SE
12/8/2010	Rainy	30.0	60-95	3.0	0-17	SE
17/8/2010	Rainy	30.0	68-95	3.2	0-18	SE
18/8/2010	Sunny	28.0	72-94	0.0	0-100	E
23/8/2010	Rainy	28.0	75-97	23.7	5-23	E
24/8/2010	Rainy	27.0	77-99	42.6	0-18	E
28/8/2010	Rainy	27.0	67-96	30.1	0-24	W
30/8/2010	Sunny	30.0	62-87	0.0	0-17	W

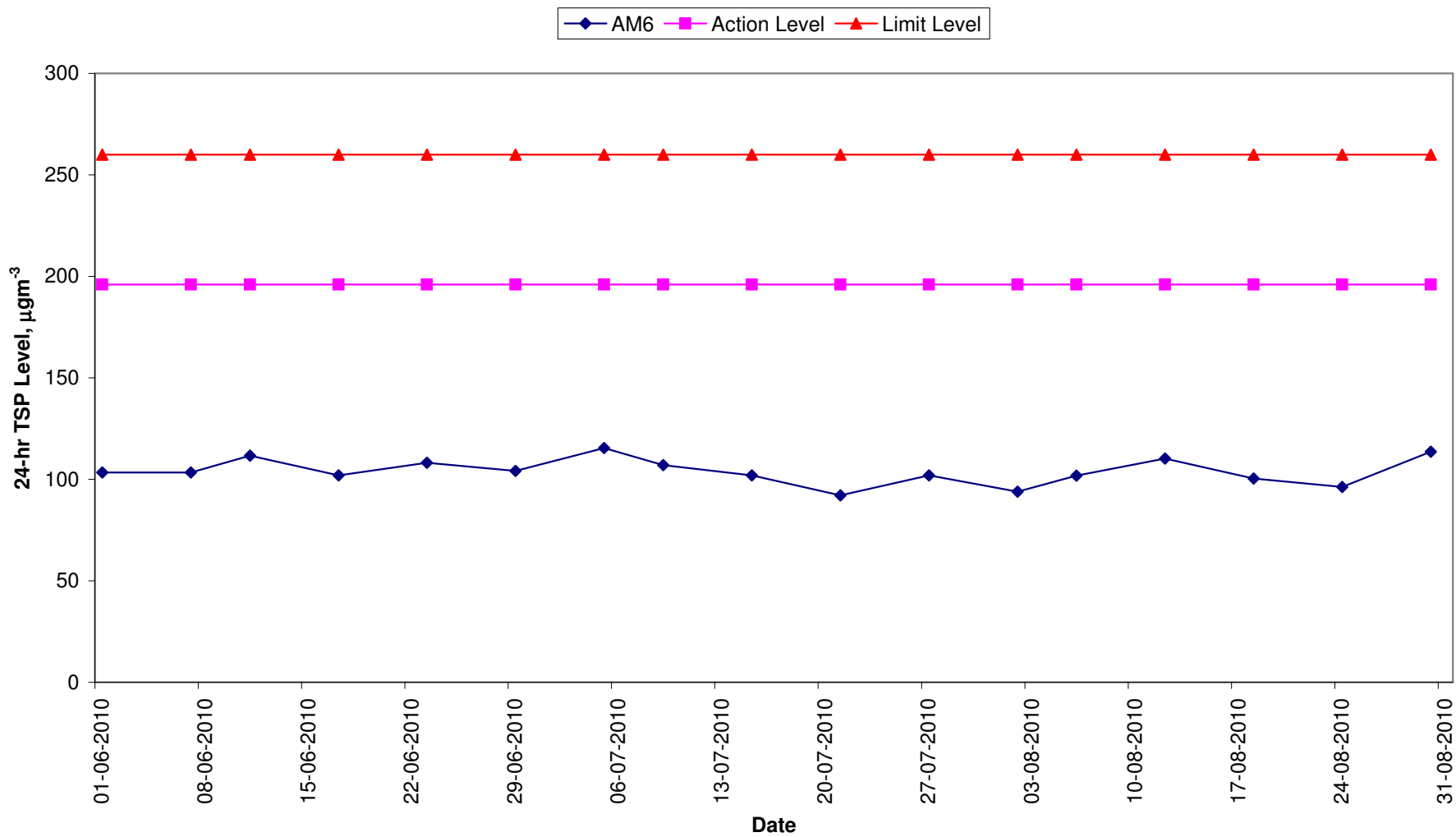
Date	Weather	Tsing Yi Station				
		Average Air Temperature (°C)	Average Relative Humidity (%) *	Total Rainfall (mm) *	Average Wind Speed (km/h)	Wind Direction
2/8/2010	Rainy	30	64-90	1.1	3-24	E
5/8/2010	Rainy	29.0	63-95	41.6	0-37	E
6/8/2010	Rainy	29.0	69-91	1.6	0-13	E
9/8/2010	Rainy	30.0	71-93	0.2	1-17	E
11/8/2010	Rainy	29.0	81-98	22.2	0-15	SE
12/8/2010	Rainy	30.0	60-95	3.0	0-17	SE
17/8/2010	Rainy	30.0	68-95	3.2	0-21	SE
18/8/2010	Sunny	28.0	72-94	0.0	0-18	SE
23/8/2010	Rainy	28.0	75-97	23.7	3-25	SE
24/8/2010	Rainy	27.0	77-99	42.6	0-28	SE
28/8/2010	Rainy	27.0	67-96	30.1	0-14	NW
30/8/2010	Sunny	30.0	62-87	0.0	0-21	NW

Date	Weather	Kai Tak Station				
		Average Air Temperature (°C) *	Average Relative Humidity (%) *	Total Rainfall (mm) *	Average Wind Speed (km/h)	Wind Direction
2/8/2010	Rainy	30	64-90	1.1	3-13	SE
5/8/2010	Rainy	29.0	63-95	41.6	0-40	SW
6/8/2010	Rainy	29.0	69-91	1.6	0-24	E
9/8/2010	Rainy	30.0	71-93	0.2	6-20	E
11/8/2010	Rainy	29.0	81-98	22.2	0-21	SE
12/8/2010	Rainy	30.0	60-95	3.0	0-17	SE
17/8/2010	Rainy	30.0	68-95	3.2	0-20	SE
18/8/2010	Sunny	28.0	72-94	0.0	0-26	E
23/8/2010	Rainy	28.0	75-97	23.7	0-32	E
24/8/2010	Rainy	27.0	77-99	42.6	0-27	E
28/8/2010	Rainy	27.0	67-96	30.1	0-24	SW
30/8/2010	Sunny	30.0	62-87	0.0	0-23	W

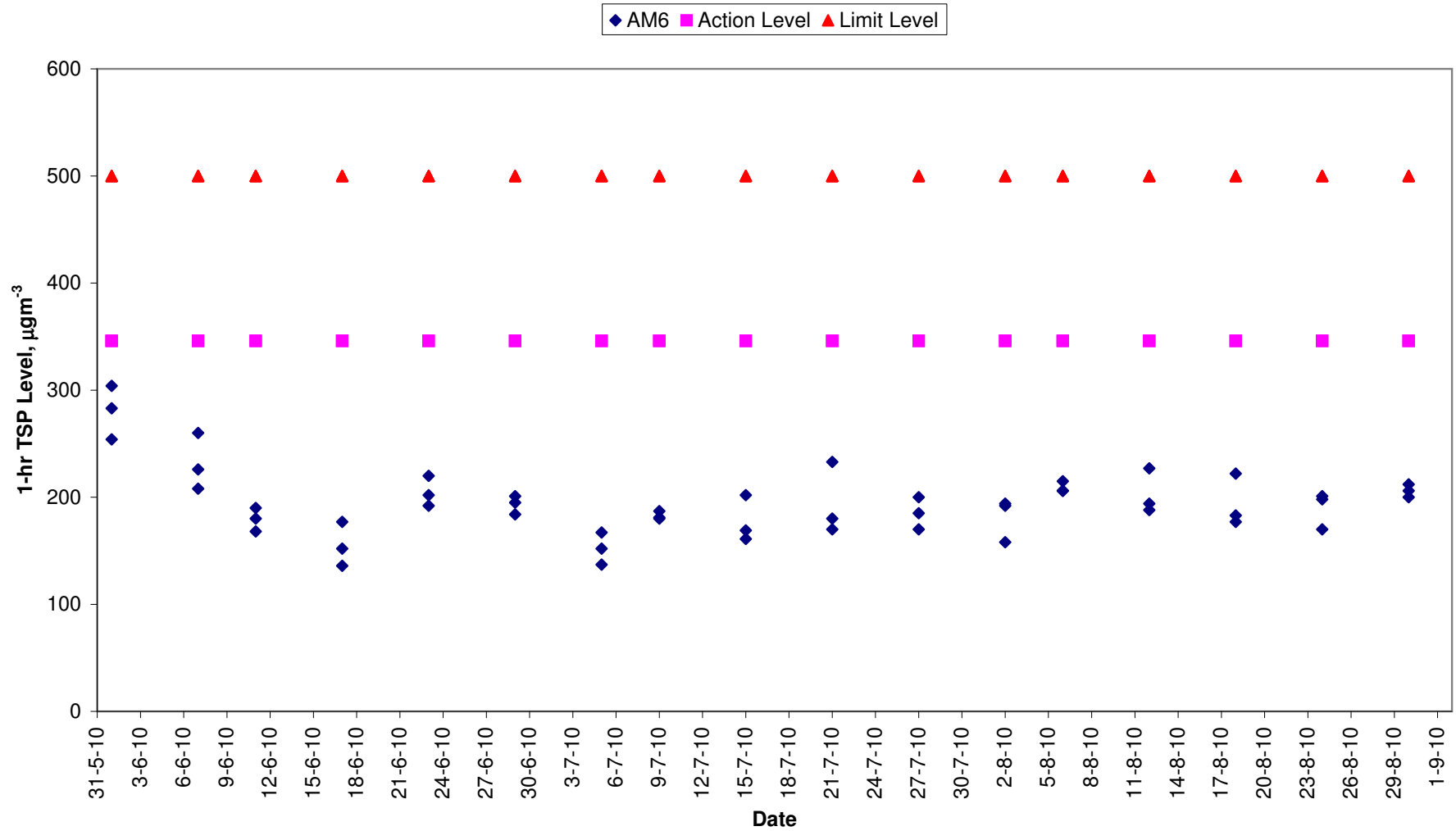
Date	Weather	Green Island Station				
		Average Air Temperature (°C) *	Average Relative Humidity (%) *	Total Rainfall (mm) *	Average Wind Speed (km/h)	Wind Direction
2/8/2010	Rainy	30	64-90	1.1	0-35	S
5/8/2010	Rainy	29.0	63-95	41.6	1-15	NE
6/8/2010	Rainy	29.0	69-91	1.6	10-43	NE
9/8/2010	Rainy	30.0	71-93	0.2	10-34	NE
11/8/2010	Rainy	29.0	81-98	22.2	0-30	S
12/8/2010	Rainy	30.0	60-95	3.0	0-31	S
17/8/2010	Rainy	30.0	68-95	3.2	0-31	S
18/8/2010	Sunny	28.0	72-94	0.0	2-37	S
23/8/2010	Rainy	28.0	75-97	23.7	10-45	NE
24/8/2010	Rainy	27.0	77-99	42.6	4-50	NE
28/8/2010	Rainy	27.0	67-96	30.1	1-43	NW
30/8/2010	Sunny	30.0	62-87	0.0	3-30	NW

\* 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)**



## Annex G5 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) Observed	Other Noise Source(s) Observed	Remarks	Temp. (°C)	Wind Speed (m/s)	Noise Meter Model / ID	Calibrator Model / ID
				Leq	L10	L90							
1-Jun-10	11:08	11:38	Fine	64.9	66.0	63.9	Mobile cranes movement, generator and excavator	Traffic Noise	-	26	0.3	RION- NA27 (S/N 00201194)	RION - NC73 (S/N 10786708)
7-Jun-10	15:20	15:50	Sunny	67.8	69.1	66.8	Mobile cranes movement, generator and excavator	Traffic Noise	-	28	0.5	RION- NA27 (S/N 00201194)	RION - NC73 (S/N 10786708)
17-Jun-10	13:10	13:40	Fine	66.3	67.2	65.3	Mobile cranes movement, generator and excavator	Traffic Noise	-	28	0.7	RION- NA27 (S/N 00201194)	RION - NC73 (S/N 10786708)
23-Jun-10	13:18	13:48	Cloudy	67.0	67.4	66.3	Mobile cranes movement, generator and excavator	Traffic Noise	-	29	0.4	RION- NA27 (S/N 00201194)	RION - NC73 (S/N 10786708)
29-Jun-10	13:25	13:55	Sunny	69.5	70.5	68.2	Mobile cranes movement, generator and excavator	Traffic Noise	-	30	0.5	RION- NA27 (S/N 00201194)	RION - NC73 (S/N 10786708)
			Min.	64.9									
			Max.	69.5									

### **Restricted Hours Noise Monitoring Results**

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							
6-Jun-10	11:00	11:05	Fine	63.8	65.1	62.6	Mobile cranes movement, generator	Traffic Noise	-	25	0.7	RION- NL31 (S/N 00201194)	RION - NC73 (S/N 10786708)
	11:05	11:10	Fine	63.4	64.4	62.5			-				
	11:10	11:15	Fine	64.1	65.2	62.7			-				
	11:00	11:15	Fine	63.8	64.9	62.6			Average results during 15 min monitoring				
13-Jun-10	10:12	10:17	Fine	65.3	66.3	64.0	Mobile cranes movemnt, Generator	Traffic Noise	-	29	0.5	RION- NA27 (S/N 00201194)	RION - NC73 (S/N 10786708)
	10:17	10:22	Fine	65.7	66.9	64.0			-				
	10:22	10:27	Fine	65.1	65.8	64.3			-				
	10:12	10:27	Fine	65.4	66.4	64.1			Average results during 15 min monitoring				
20-Jun-10	10:10	10:15	Fine	66.7	67.1	65.9	Mobile cranes movemnt, Generator	Traffic Noise	-	31	0.5	RION- NA27 (S/N 00201194)	RION - NC73 (S/N 10786708)
	10:15	10:20	Fine	66.1	66.8	65.2			-				
	10:20	10:25	Fine	66.3	67.0	65.5			-				
	10:10	10:25	Fine	66.4	67.0	65.5			Average results during 15 min monitoring				
27-Jun-10									Noise monitoring was cancelled due to bad weather.				
			Min.	66.1									
			Max.	66.7									



## Annex G5 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) Observed	Other Noise Source(s) Observed	Remarks	Temp. (°C)	Wind Speed (m/s)	Noise Meter Model / ID	Calibrator Model / ID
				Leq	L10	L90							
5-Jul-10	13:18	13:48	Sunny	67.4	69.2	65.9	Mobile cranes movement, generator and excavator	Traffic Noise	-	31	0.5	RION- NA27 (S/N 00201194)	RION - NC73 (S/N 10786708)
15-Jul-10	13:57	14:27	Cloudy	71.0	71.5	70.2	Mobile cranes movement, generator and excavator	Traffic Noise	-	30	0.3	RION- NL31 (S/N 00320533)	RION - NC73 (S/N 10786708)
21-Jul-10	9:18	9:48	Rainy	65.8	66.4	65.2	Mobile cranes movement, generator and excavator	Traffic Noise	-	28	0.5	RION- NL31 (S/N 00320533)	RION - NC73 (S/N 10786708)
27-Jul-10	10:15	10:45	Cloudy	68.9	70.0	67.7	Mobile cranes movement, generator and excavator	Traffic Noise	-	29	0.2	RION- NA27 (S/N 00201194)	RION - NC73 (S/N 10786708)
			Min.	65.8									
			Max.	71.0									

### **Restricted Hours Noise Monitoring Results**

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							
4-Jul-10	10:15	10:20	Sunny	65.9	67.5	64.8	Mobile cranes movement, generator, excavator	Traffic Noise	-	32	0.3	RION- NA27 (S/N 00201194)	RION - NC73 (S/N 10786708)
	10:20	10:25	Sunny	65.8	67.1	64.8			-				
	10:25	10:30	Sunny	65.7	67.0	64.7			-				
	10:15	10:30	Sunny	65.8	67.2	64.8			Average results during 15 min monitoring				
11-Jul-10	10:18	10:23	Sunny	67.9	69.0	66.7	Mobile cranes movemnt, Generator, excavator	Traffic Noise	-	33	0.3	RION- NL31 (S/N 00410224)	B&K4231 (S/N 2699361)
	10:23	10:28	Sunny	67.6	68.6	66.5			-				
	10:28	10:33	Sunny	67.8	69.0	66.7			-				
	10:18	10:33	Sunny	67.8	68.9	66.6			Average results during 15 min monitoring				
18-Jul-10	13:55	14:00	Sunny	65.1	66.0	64.3	Mobile cranes movemnt, Generator	Traffic Noise	-	31	0.3	RION- NL31 (S/N 00320533)	RION - NC73 (S/N 10786708)
	14:00	14:05	Sunny	65.0	65.7	64.1			-				
	14:05	14:10	Sunny	65.3	66.0	64.2			-				
	13:55	14:10	Sunny	65.1	65.9	64.2			Average results during 15 min monitoring				
25-Jul-10	10:12	10:17	Sunny	67.9	68.7	67.2	Mobile cranes movemnt, Generator	Traffic Noise	-	31	0.5	RION- NL31 (S/N 00320533)	RION - NC73 (S/N 10786708)
	10:17	10:22	Sunny	67.8	68.4	67.2			-				
	10:22	10:27	Sunny	67.8	68.5	67.1			-				
	10:12	10:27	Sunny	67.8	68.5	67.2			Average results during 15 min monitoring				
			Min.	65.0									
			Max.	67.9									

## Annex G5 Noise Monitoring Results

### Daytime Noise Monitoring Results

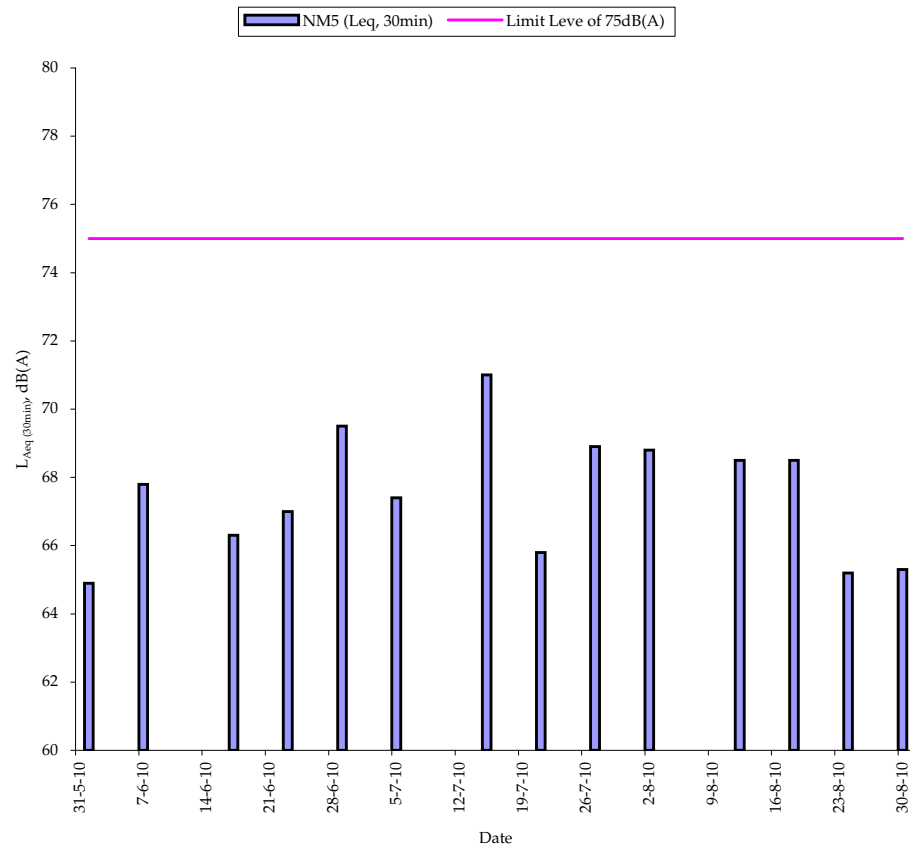
### Station NM5

Date	Start Time	End Time	Weather	Noise level (dB(A)), 30 min			Major Construction Noise Source(s) Observed	Other Noise Source(s) Observed	Remarks	Temp. (°C)	Wind Speed (m/s)	Noise Meter Model / ID	Calibrator Model / ID
				Leq	L10	L90							
2-Aug-10	13:10	13:40	Sunny	68.8	69.6	68.0	Mobile cranes movement, generator and excavator	Traffic Noise	-	31	0.3	RION- NL31 (S/N 00320533)	RION - NC73 (S/N 10786708)
12-Aug-10	14:25	14:55	Sunny	68.5	69.4	67.7	Mobile cranes movement, generator and excavator	Traffic Noise	-	31	0.5	RION- NL31 (S/N 00320533)	RION - NC73 (S/N 10786708)
18-Aug-10	15:10	15:40	Fine	68.5	69.5	67.6	Mobile cranes movement, generator and excavator	Traffic Noise	-	30	0.2	RION- NL31 (S/N 00320533)	RION - NC73 (S/N 10786708)
24-Aug-10	13:18	13:48	Rainy	65.2	66.1	64.0	Mobile cranes movement, generator and excavator	Traffic Noise	-	28	0.5	RION- NL31 (S/N 00320533)	RION - NC73 (S/N 10786708)
30-Aug-10	13:18	13:48	Sunny	65.3	66.2	64.5	Mobile cranes movement, generator and excavator	Traffic Noise	-	31	0.5	RION- NA27 (S/N 00201194)	RION - NC73 (S/N 10786708)
			Min.	65.2									
			Max.	68.8									

### **Restricted Hours Noise Monitoring Results**

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							
1-Aug-10	10:18	10:23	Sunny	64.4	64.8	64.0	Mobile cranes movement, generator	Traffic Noise	-	33	0.6	RION- NA27 (S/N 00201194)	RION - NC73 (S/N 10786708)
	10:23	10:28	Sunny	64.3	64.8	63.8			-				
	10:28	10:33	Sunny	64.5	65.0	64.0			-				
	10:18	10:33	Sunny	64.4	64.9	63.9			Average results during 15 min monitoring				
8-Aug-10	10:20	10:25	Sunny	64.2	65.1	63.4	Mobile cranes movemnt, Generator	Traffic Noise	-	30	0.5	RION- NL31 (S/N 00320533)	RION - NC73 (S/N 10786708)
	10:25	10:30	Sunny	64.2	65.2	63.5			-				
	10:30	10:35	Sunny	64.0	64.9	63.4			-				
	10:20	10:35	Sunny	64.1	65.1	63.4			Average results during 15 min monitoring				
15-Aug-10	13:12	13:17	Fine	62.3	62.6	61.7	Mobile cranes movemnt, Generator	Traffic Noise	-	29	0.3	RION- NL31 (S/N 00320533)	RION - NC73 (S/N 10786708)
	13:17	13:22	Fine	62.0	62.5	61.5			-				
	13:22	13:27	Fine	62.2	62.5	61.6			-				
	13:12	13:27	Fine	62.2	62.5	61.6			Average results during 15 min monitoring				
22-Aug-10	10:20	10:25	Sunny	64.8	65.5	63.7	Mobile cranes movemnt, Generator, excavator	Traffic Noise	-	32	0.8	RION- NL31 (S/N 00320533)	RION - NC73 (S/N 10786708)
	10:25	10:30	Sunny	64.6	65.3	63.6			-				
	10:30	10:35	Sunny	64.6	65.3	63.5			-				
	10:20	10:35	Sunny	64.7	65.4	63.6			Average results during 15 min monitoring				
29-Aug-10	10:00	10:05	Sunny	57.7	58.7	56.7	Generator	Traffic Noise	-	32	0.5	RION- NL31 (S/N 00320533)	RION - NC73 (S/N 10786708)
	10:05	10:10	Sunny	57.7	59.2	56.9			-				
	10:10	10:15	Sunny	59.9	60.7	57.7			-				
	10:00	10:15	Sunny	58.4	59.5	57.1			Average results during 15 min monitoring				
			Min.	57.7									
			Max.	64.8									

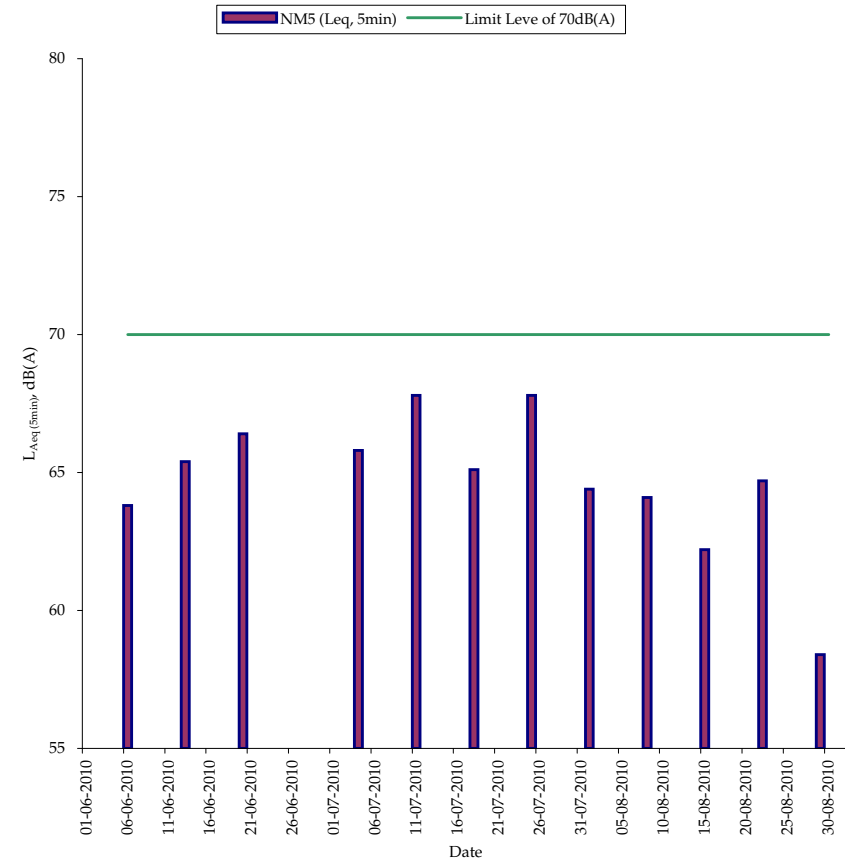
Normal Weekdays Noise Monitoring Results at NM5 ( $L_{eq, 30min}$ )



Remark:

- 75dB(A) was adopted as the Limit Level during normal weekdays in the reporting period

Restricted Hours Noise Monitoring Results at NM5 ( $L_{eq, 5min}$ )



Remark:

- 70dB(A) was adopted as the Limit Level during restricted hours in the reporting period

**Annex G6**      *Cumulative Complaint and Summons/Prosecutions Log*

Reporting Month	Number of Complaints in Reporting Month	Number of Summons/Prosecutions in Reporting Month
December 2009	0	0
January 2010	0	0
February 2010	0	0
March 2010	0	0
April 2010	0	0
May 2010	0	0
June 2010	0	0
July 2010	0	0
August 2010	0	0
Overall Total	0	0

## Annex H

# Calibration Reports for HVSs and Sound Level Meters for All Sites

### *TSP Monitoring Equipment*

Monitoring Station ID	Location	Monitoring Equipment		Last Calibration Date	Next Calibration Date
<i>24-hr and 1-hr TSP</i>		HVS	Calibrator		
AM1	Chan's Creative School (formerly known as Madam Chan Wai Chow Memorial School)	GMW GS-2310 (S/N 1808)	CM-AIR-43 (S/N 9833620)	24 July 2010	24 September 2010
AM2	Rooftop of Hong Kong & Islands Regional Office, WSD	GMW GS-2310 (S/N 0145)	CM-AIR-43 (S/N 9833620)	24 July 2010	24 September 2010
AM3	Rooftop of Wan Chai East PTW	GMW GS-2310 (S/N 0481)	CM-AIR-43 (S/N 9833620)	24 July 2010	24 September 2010
AM4	A Location within the DSD Central PTW	GMW GS-2310 (S/N 9315)	CM-AIR-43 (S/N 9833620)	24 July 2010	24 September 2010
AM5	Western Wholesale Food Market	GMW GS-2310 (S/N 2145)	CM-AIR-43 (S/N 9833620)	25 July 2010	25 September 2010
AM6	Works Site Boundary	GMW GS-2310 (S/N 1254)	CM-AIR-43 (S/N 9833620)	24 July 2010	24 September 2010



### Monitoring Equipment

Monitoring Station ID	Monitoring Equipment	Model & Serial No.	Last Calibration Date	Next Calibration Date
NM1 – NM5 <sup>(a)</sup>	Calibrator	Rion NC-73 (S/N 10786708)	10 July 2009	10 July 2010
		Rion NA-73 (S/N 10997142)	13 July 2010	13 July 2011
		B&K4231 (S/N 2699361)	29 December 2009	29 December 2010
	Sound Level Meter	Rion NL-31 (S/N 00320533)	13 July 2010	13 July 2011
		Rion NL-31 (S/N 00410224)	31 May 2010	31 May 2011
		Rion NA-73 (S/N 10786708)	13 July 2010	13 July 2011
		Rion NL-31 (S/N 00983400)	23 October 2009	23 October 2010

<sup>(a)</sup> 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) or Rion NL-31 (S/N 00983400) or Rion NA-73 (S/N 10786708) ) and the calibrator (Rion NC-73 (S/N 10786708) or B&K4231 (S/N 2699361) or Rion NA-73 (S/N 10997142) ) 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

High-Volume TSP Sampler  
5-Point Calibration Record

Location : AM6  
Calibrated by : P.F.Yeung  
Date : 22/07/2010

Sampler

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

Calibration Orifice and Standard Calibration Relationship

Serial Number : 1785  
Service Date : 10 May 2010  
Slope (m) : 2.01637  
Intercept (b) : -0.02316  
Correlation Coefficient(r) : 0.99996

Standard Condition

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

Calibration Condition

Pa (hpa) : 1005  
Ta(K) : 303

Resistance Plate		dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC	Y
1	18 holes	8.5	2.875	1.437	60	59.2
2	13 holes	7.0	2.609	1.305	54	53.3
3	10 holes	5.3	2.270	1.137	46	45.4
4	7 holes	3.3	1.791	0.900	35	34.5
5	5 holes	2.7	1.620	0.815	30	29.6

Sampler Calibration Relationship

Slope(m): 47.102 Intercept(b): -8.334 Correlation Coefficient(r): 0.9996

Checked by: Magnum Fan

Date: 24/07/2010

Certificate No. : C103766

## *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. C103766.*

*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 : 13 July 2010*

*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. : C103766

## Calibration Report

### ITEM TESTED

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

### TEST CONDITIONS

AMBIENT TEMPERATURE :  $(23 \pm 2)^{\circ}\text{C}$  RELATIVE HUMIDITY :  $(55 \pm 20)\%$   
LINE VOLTAGE : ---

### TEST SPECIFICATIONS

Calibration check

DATE OF TEST : 12 July 2010

JOB NO. : IC10-1738

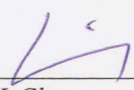
### TEST RESULTS

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
- Agilent Technologies, USA
- Fluke Everett Service Center, USA
- Rohde & Schwarz Laboratory, Germany
- The Bruel & Kjaer Calibration Laboratory, Denmark

Tested by :

  
L L Cheung

Date : 13 July 2010

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

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E-mail: callab@suncreation.com

Website: www.suncreation.com

Page 1 of 2

Report No. : C103766

## 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 :

<u>Equipment ID</u>	<u>Description</u>	<u>Certificate No.</u>
TST150A	Measuring Amplifier	C101008
CL130	Universal Counter	C103289
CL281	Multifunction Acoustic Calibrator	C1005490

4. Test procedure : MA100N.

5. Results :

### 5.1 Sound Level Accuracy

UUT Nominal Value	Measured Value (dB)	Mfr's Spec. (dB)	Uncertainty of Measured Value (dB)
94 dB, 1 kHz	94.0	$\pm 0.5$	$\pm 0.2$

### 5.2 Frequency Accuracy

UUT Nominal Value (kHz)	Measured Value (kHz)	Mfr's Spec.	Uncertainty of Measured Value (Hz)
1	0.991 0	1 kHz $\pm 2\%$	$\pm 0.1$

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.

Certificate No. : C103778

## *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. C103778.*

*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 : 13 July 2010*

*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.





輝創工程有限公司

Sun Creation Engineering Limited Calibration and Testing Laboratory

Report No. : C103778

## Calibration Report

### ITEM TESTED

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

### TEST CONDITIONS

AMBIENT TEMPERATURE :  $(23 \pm 2)^{\circ}\text{C}$  RELATIVE HUMIDITY :  $(55 \pm 20)\%$   
LINE VOLTAGE : ---

### TEST SPECIFICATIONS

Calibration check

DATE OF TEST : 12 July 2010

JOB NO. : IC10-1738

### 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
- Agilent Technologies, USA
- Fluke Everett Service Center, USA
- Rohde & Schwarz Laboratory, Germany
- The Bruel & Kjaer Calibration Laboratory, Denmark

Tested by :

  
L L Cheung

Date : 13 July 2010

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

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E-mail: callab@suncreation.com

Website: www.suncreation.com

Page 1 of 4

Report No. : C103778

## 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  
CL280  
CL281

Description  
40 MHz Arbitrary Waveform Generator  
Multifunction Acoustic Calibrator

Certificate No.  
C100067  
C1005490

5. Test procedure : MA101N.

6. Results :

- 6.1 Sound Pressure Level

- 6.1.1 Reference Sound Pressure Level

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
30 - 120	L <sub>A</sub>	A	Fast	94.00	1	94.3	± 0.7

- 6.1.2 Linearity

UUT Setting				Applied Value		UUT Reading (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	
30 - 120	L <sub>A</sub>	A	Fast	94.00	1	94.3 (Ref.)
				104.00		104.3
				114.00		114.3

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

- 6.2 Time Weighting

- 6.2.1 Continuous Signal

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
30 - 120	L <sub>A</sub>	A	Fast	94.00	1	94.3	Ref.
			Slow			94.2	± 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.



## Calibration Report

### 6.3 Frequency Weighting

#### 6.3.1 A-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 120	L <sub>A</sub>	A	Fast	94.00	31.5 Hz	55.3	-39.4 ± 1.5
					63 Hz	68.4	-26.2 ± 1.5
					125 Hz	78.4	-16.1 ± 1.0
					250 Hz	85.8	-8.6 ± 1.0
					500 Hz	91.1	-3.2 ± 1.0
					1 kHz	94.3	Ref.
					2 kHz	95.3	+1.2 ± 1.0
					4 kHz	94.5	+1.0 ± 1.0
					8 kHz	90.5	-1.1 (+1.5 ; -3.0)
					12.5 kHz	85.0	-4.3 (+3.0 ; -6.0)

#### 6.3.2 C-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 120	L <sub>C</sub>	C	Fast	94.00	31.5 Hz	91.5	-3.0 ± 1.5
					63 Hz	93.7	-0.8 ± 1.5
					125 Hz	94.2	-0.2 ± 1.0
					250 Hz	94.4	0.0 ± 1.0
					500 Hz	94.4	0.0 ± 1.0
					1 kHz	94.3	Ref.
					2 kHz	94.0	-0.2 ± 1.0
					4 kHz	92.8	-0.8 ± 1.0
					8 kHz	88.7	-3.0 (+1.5 ; -3.0)
					12.5 kHz	82.4	-6.2 (+3.0 ; -6.0)

### 6.4 Time Averaging

UUT Setting				Applied Value					UUT Reading (dB)	IEC 60804 Type 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Freq. (kHz)	Burst Duration (ms)	Burst Duty Factor	Burst Level (dB)	Equivalent Level (dB)		
20 - 110	L <sub>Aeq</sub>	A	60 sec.	4	1	1/10 <sup>3</sup>	110.0	80	80.7	± 1.0
			5 min.			1/10 <sup>4</sup>		70	70.7	± 1.0

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. : C103778

## Calibration Report

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

- Uncertainties of Applied Value : 94 dB : 31.5 Hz - 125 Hz :  $\pm 0.35$  dB  
250 Hz - 1 kHz :  $\pm 0.30$  dB  
2 kHz - 4 kHz :  $\pm 0.35$  dB  
8 kHz :  $\pm 0.45$  dB  
12.5 kHz :  $\pm 0.70$  dB  
104 dB : 1 kHz :  $\pm 0.10$  dB (Ref. 94 dB)  
114 dB : 1 kHz :  $\pm 0.10$  dB (Ref. 94 dB)

- 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.



輝創工程有限公司

Sun Creation Engineering Limited Calibration and Testing Laboratory

Certificate No. : C102904

## *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. C102904.*

*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 : 31 May 2010*

*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



Report No. : C102904

## Calibration Report

### ITEM TESTED

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

### TEST CONDITIONS

AMBIENT TEMPERATURE :  $(23 \pm 2)^{\circ}\text{C}$  RELATIVE HUMIDITY :  $(55 \pm 20)\%$   
LINE VOLTAGE : ---

### TEST SPECIFICATIONS

Calibration check

DATE OF TEST : 31 May 2010

JOB NO. : IC10-1356

### 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 :

  
L L Cheung

Date : 31 May 2010

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. : C102904

## 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	C100067
CL179	Acoustical Calibrator	C095223

5. Test procedure : MA101N.

6. Results :

- 6.1 Sound Pressure Level

- 6.1.1 Reference Sound Pressure Level

UUT Setting				Applied Value		UUT Reading	IEC 60651 Type 1 Spec.
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	(dB)	(dB)
30 - 120	L <sub>A</sub>	A	Fast	94.00	1	93.9	± 0.7

- 6.1.2 Linearity

UUT Setting				Applied Value		UUT Reading
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	(dB)
30 - 120	L <sub>A</sub>	A	Fast	94.00	1	93.9 (Ref.)
				114.00		113.9

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	IEC 60651 Type 1 Spec.
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	(dB)	(dB)
30 - 120	L <sub>A</sub>	A	Fast	94.00	1	93.9	Ref.
			Slow			93.8	± 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.

# Calibration Report

## 6.3 Frequency Weighting

### 6.3.1 A-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 120	L <sub>A</sub>	A	Fast	94.00	31.5 Hz	54.2	-39.4 ± 1.5
					63 Hz	67.6	-26.2 ± 1.5
					125 Hz	77.7	-16.1 ± 1.0
					250 Hz	85.2	-8.6 ± 1.0
					500 Hz	90.6	-3.2 ± 1.0
					1 kHz	93.9	Ref.
					2 kHz	95.2	+1.2 ± 1.0
					4 kHz	95.0	+1.0 ± 1.0
					8 kHz	92.9	-1.1 (+1.5 ; -3.0)
					12.5 kHz	90.0	-4.3 (+3.0 ; -6.0)

### 6.3.2 C-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 120	L <sub>C</sub>	C	Fast	94.00	31.5 Hz	90.6	-3.0 ± 1.5
					63 Hz	93.1	-0.8 ± 1.5
					125 Hz	93.7	-0.2 ± 1.0
					250 Hz	93.9	0.0 ± 1.0
					500 Hz	93.9	0.0 ± 1.0
					1 kHz	93.9	Ref.
					2 kHz	93.9	-0.2 ± 1.0
					4 kHz	93.3	-0.8 ± 1.0
					8 kHz	91.0	-3.0 (+1.5 ; -3.0)
					12.5 kHz	88.1	-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.



## Calibration Report

### 6.4 Time Averaging

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

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

- Uncertainties of Applied Value : 94 dB : 31.5 Hz - 125 Hz : ± 0.35 dB  
250 Hz - 1 kHz : ± 0.30 dB  
2 kHz - 4 kHz : ± 0.35 dB  
8 kHz : ± 0.45 dB  
12.5 kHz : ± 0.70 dB  
114 dB : 1 kHz : ± 0.10 dB (Ref. 94 dB)

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

#### Note :

The values given in this 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.

Certificate No. : C095683

## *Certificate of Calibration*

*This is to certify that the equipment*

*Description : Sound Level Meter*

*Manufacturer : Rion*

*Model No. : NL-31*

*Serial No. : 00983400*

*has been calibrated for the specific items and ranges.  
The results are shown in the Calibration Report No. C095683.*

*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 : 23 October 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.



Report No. : C095683

## Calibration Report

### ITEM TESTED

DESCRIPTION : Sound Level Meter  
MANUFACTURER : Rion  
MODEL NO. : NL-31  
SERIAL NO. : 00983400

### TEST CONDITIONS

AMBIENT TEMPERATURE :  $(23 \pm 2)^{\circ}\text{C}$   
LINE VOLTAGE : ---

RELATIVE HUMIDITY :  $(55 \pm 20)\%$

### TEST SPECIFICATIONS

Calibration check

DATE OF TEST : 22 October 2009

JOB NO. : IC09-2709

### 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

Tested by :

  
L L Cheung

Date : 23 October 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. : C095683

# Calibration Report

- 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.
- Self-calibration was performed before the test.
- The results presented are the mean of 3 measurements at each calibration point.
- Test equipment :

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

- Test procedure : MA101N.

- Results :

## 6.1 Sound Pressure Level

### 6.1.1 Reference Sound Pressure Level

UUT Setting				Applied Value		UUT Reading	IEC 61672 Class 1 Spec.
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	(dB)	(dB)
30 - 120	L <sub>A</sub>	A	Fast	94.00	1	94.2	± 1.1

### 6.1.2 Linearity

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

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

## 6.2 Time Weighting

UUT Setting				Applied Value		UUT Reading	IEC 61672 Class 1 Spec.
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	(dB)	(dB)
30 - 120	L <sub>A</sub>	A	Fast	94.00	1	94.2	Ref.
			Slow			94.2	± 0.3

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. : C095683

# Calibration Report

## 6.3 Frequency Weighting

### 6.3.1 A-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 120	L <sub>A</sub>	A	Fast	94.00	31.5 Hz	54.3	-39.4 ± 2.0
					63 Hz	67.7	-26.2 ± 1.5
					125 Hz	77.9	-16.1 ± 1.5
					250 Hz	85.4	-8.6 ± 1.4
					500 Hz	90.9	-3.2 ± 1.4
					1 kHz	94.2	Ref.
					2 kHz	95.5	+1.2 ± 1.6
					4 kHz	95.3	+1.0 ± 1.6
					8 kHz	93.2	-1.1 (+2.1 ; -3.1)
					12.5 kHz	90.3	-4.3 (+3.0 ; -6.0)

### 6.3.2 C-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 120	L <sub>C</sub>	C	Fast	94.00	31.5 Hz	90.9	-3.0 ± 2.0
					63 Hz	93.3	-0.8 ± 1.5
					125 Hz	94.0	-0.2 ± 1.5
					250 Hz	94.2	0.0 ± 1.4
					500 Hz	94.2	0.0 ± 1.4
					1 kHz	94.2	Ref.
					2 kHz	94.1	-0.2 ± 1.6
					4 kHz	93.5	-0.8 ± 1.6
					8 kHz	91.3	-3.0 (+2.1 ; -3.1)
					12.5 kHz	88.4	-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. : C095683

# Calibration Report

Remarks : - Mfr's Spec. : IEC 61672 Class 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)

- 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.



Certificate No. : C103765

## *Certificate of Calibration*

*This is to certify that the equipment*

*Description : Sound Level Calibrator*

*Manufacturer : Rion*

*Model No. : NC-73*

*Serial No. : 10997142*

*has been calibrated for the specific items and ranges.  
The results are shown in the Calibration Report No. C103765.*

*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 : 13 July 2010*

*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.



輝創工程有限公司

Sun Creation Engineering Limited Calibration and Testing Laboratory

Report No. : C103765

## Calibration Report

### ITEM TESTED

DESCRIPTION : Sound Level Calibrator  
MANUFACTURER : Rion  
MODEL NO. : NC-73  
SERIAL NO. : 10997142

### TEST CONDITIONS

AMBIENT TEMPERATURE :  $(23 \pm 2)^{\circ}\text{C}$  RELATIVE HUMIDITY :  $(55 \pm 20)\%$   
LINE VOLTAGE : ---

### TEST SPECIFICATIONS

Calibration check

DATE OF TEST : 12 July 2010

JOB NO. : IC10-1738

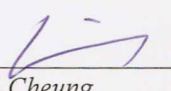
### TEST RESULTS

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
- Agilent Technologies, USA
- Fluke Everett Service Center, USA
- Rohde & Schwarz Laboratory, Germany
- The Bruel & Kjaer Calibration Laboratory, Denmark

Tested by :

  
L L Cheung

Date : 13 July 2010

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



## 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	C101008
CL130	Universal Counter	C103289
CL281	Multifunction Acoustic Calibrator	C1005490

4. Test procedure : MA100N.

5. Results :

5.1 Sound Level Accuracy

UUT Nominal Value	Measured Value (dB)	Mfr's Spec. (dB)	Uncertainty of Measured Value (dB)
94 dB, 1 kHz	94.1	$\pm 0.5$	$\pm 0.2$

5.2 Frequency Accuracy

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

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.



Brüel & Kjær

## Calibration Chart

Type 4231

Serial No. 2699361

**Sound Pressure Level:** 94.00 or 114.00 dB  $\pm 0.20$  dB  
(re 20  $\mu$ Pa at reference conditions)

**Frequency:** 1000 Hz  $\pm 0.1\%$

**Distortion:**  $< 1\%$

**Reference Conditions:**

Temperature: 23°C  
Pressure: 101.325 kPa  
Humidity: 50% RH  
Load: 0.25 cm<sup>3</sup> ( $\frac{1}{2}$ " Brüel & Kjær Mic.)

Date: 29.12.9 Signed: [Signature]



Brüel & Kjær

## Sound Calibrator Type 4231

**Levels for Brüel & Kjær  $\frac{1}{2}$ " Microphones:**

Equivalent Free Field:	93.85 dB or 113.85 dB
Equivalent Diffuse Field:	94.00 dB or 114.00 dB
Pressure Field:	94.00 dB or 114.00 dB

**Frequency:** 1000 Hz

**Conforms to:**

ANSI S1.40-1984 and IEC 60942 (2003) Class 1 & LS

**Ambient Conditions:**





Temperature:  $-10^{\circ}$  to  $50^{\circ}$ C, Class LS  $+16^{\circ}$  to  $30^{\circ}$ C  
Pressure: 65 kPa to 108 kPa  
Humidity: 25% to 90% RH

For further information refer to the User Manual

BC0210-12



Item	Description
-4231---	Sound Calibrator Class 1 and LS, 94 and 114 dB, 1 kHz Akustischer Kalibrator der Klasse 1 - 94 dB / 1 kHz und 114 dB / 1 kHz - Bauartgeprüft und eichfähig Calibreur acoustique de classe 1 (94 et 114 dB à 1kHz)


Item	Qty	Description
BA-5341---	 1	Trilingual Manual Pack for Type 4231 Trilingual Manual Pack for Type 4231 Trilingual Manual Pack for Type 4231
BC-0210---	 1	Calibration Chart Type 4231 Calibration Chart Type 4231 Calibration Chart Type 4231
KE-0317---	 1	Leather Case for 4231 Teilverpackung Leather Case for 4231
QB-0013---	 2	Battery 1,5V Alkaline, Non-Rechargeable, size AA (LR6) ø14,5x 50,5mm Battery 1,5V Alkaline, Non-Rechargeable, size AA (LR6) ø14,5x 50,5mm Battery 1,5V Alkaline, Non-Rechargeable, size AA (LR6) ø14,5x 50,5mm



Packing List		
Delivery Number	Ship Date (DD-MM-YYYY)	Page
2314552 	05-02-2010	1/1

Ship To

Spectris China Ltd.  
Attn. Jacky Leung  
132 Nathan Road  
Unit 706, 7/F Miramar Tower  
Tsimshatsui  
Kowloon  
Hong Kong

Forwarder	<b>Geodis Wilson / Airfreight</b>		
Sales Order Number	<b>6551240</b>		
Your Reference	<b>SF# 1-201034558</b>		
Our Reference			
No. of Colli	<b>1</b>	Gross Weight	<b>1 kg</b> Net Weight <b>0.45 kg</b> Volume <b>0.006 m³</b>

Colli	B&K Item No.	QTY	Net Weight	Serial No.	Description	Included In Item
1	-4231---	1	0.45 kg	2699361	Sound Calibrator Class 1 and LS, 94 and 114 dB, 1 kHz	

**Note**

If the accessories included specified in the Product Data Sheet or Manual differ from the items supplied, the items mentioned on the Packing Slip are valid.  
In case of any question, please contact your local Brüel & Kjær office.

55258809

**Brüel & Kjær Sound & Vibration Measurement A/S**  
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CVR : 23 95 84 14 • VAT : DK11 94 84 56  
Tel : +45 77 41 20 00 • Fax : +45 45 80 14 05  
E-mail : [info@bksv.com](mailto:info@bksv.com)  
Website : [www.bksv.com](http://www.bksv.com)

Danske bank : Account : 3001-3015 081260  
Swift address : DABADKKK  
IBAN nos :  
(DKK) DK 75 3000 3015081260  
(EUR) DK 25 3000 3001963589  
(USD) DK 26 3000 4451045504

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
<i>Action Level</i>				
Exceedance for one sample	<ul style="list-style-type: none"> <li>Identify source, investigate the causes of exceedance and propose remedial measures;</li> <li>Inform IEC and ER;</li> <li>Repeat measurement to confirm finding; and,</li> <li>Increase monitoring frequency to daily.</li> </ul>	<ul style="list-style-type: none"> <li>Check monitoring data submitted by ET; and,</li> <li>Check Contractor's working method.</li> </ul>	<ul style="list-style-type: none"> <li>Notify Contractor</li> </ul>	<ul style="list-style-type: none"> <li>Rectify any unacceptable practice; and,</li> <li>Amend working methods if appropriate.</li> </ul>
Exceedance for two or more consecutive samples	<ul style="list-style-type: none"> <li>Identify source;</li> <li>Inform IEC and ER;</li> <li>Advise the ER on the effectiveness of the proposed remedial measures;</li> <li>Repeat measurements to confirm findings;</li> <li>Increase monitoring frequency to daily; and,</li> <li>Discuss with IEC and Contractor on remedial actions required;</li> </ul>	<ul style="list-style-type: none"> <li>Check monitoring data submitted by ET;</li> <li>Check Contractor's working method;</li> <li>Discuss with ET and Contractor on possible remedial measures;</li> <li>Advise the ET on the effectiveness of the proposed remedial measures; and,</li> <li>Supervise Implementation of remedial measures.</li> </ul>	<ul style="list-style-type: none"> <li>Confirm receipt of notification of failure in writing;</li> <li>Notify Contractor, and,</li> <li>Ensure remedial measures properly implemented.</li> </ul>	<ul style="list-style-type: none"> <li>Submit proposals for remedial to ER within 3 working days of notification;</li> <li>Implement the agreed proposals;</li> <li>Amend proposal if appropriate.</li> </ul>

Action Level/Limit Level	Environmental Team Leader (ETL)	Independent Environmental Checker (IEC)	Engineer's Representative (ER)	Contractor
<i>Limit Level</i>				
Exceedance for one sample	<ul style="list-style-type: none"> <li>Identify source, investigate the causes of exceedance and propose remedial measures;</li> <li>Inform ER, Contractor and EPD;</li> <li>Repeat measurement to confirm finding;</li> <li>Increase monitoring frequency to daily; and,</li> <li>Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results.</li> </ul>	<ul style="list-style-type: none"> <li>Check monitoring data submitted by ET;</li> <li>Check Contractor's working method;</li> <li>Discuss with ET and Contractor on possible remedial measures;</li> <li>Advise the ER on the effectiveness of the proposed remedial measures; and,</li> <li>Supervise implementation of remedial measures.</li> </ul>	<ul style="list-style-type: none"> <li>Confirm receipt of notification of failure in writing;</li> <li>Notify Contractor; and,</li> <li>Ensure remedial measures properly implemented.</li> </ul>	<ul style="list-style-type: none"> <li>Take immediate action to avoid further exceedance;</li> <li>Submit proposals for remedial actions to IEC within 3 working days of notification;</li> <li>Implement the agreed proposals; and,</li> <li>Amend proposal if appropriate.</li> </ul>
Exceedance for two or more consecutive samples	<ul style="list-style-type: none"> <li>Notify IEC, ER, Contractor and EPD;</li> <li>Identify source;</li> <li>Repeat measurement to confirm findings;</li> <li>Increase monitoring frequency to daily;</li> <li>Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented;</li> <li>Arrange meeting with IEC and ER to discuss the remedial actions to be taken;</li> <li>Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results; and,</li> <li>If exceedance stops, cease additional monitoring.</li> </ul>	<ul style="list-style-type: none"> <li>Check monitoring data submitted by ET;</li> <li>Check Contractor's working method;</li> <li>Discuss amongst ER, ET, and Contractor on the potential remedial actions;</li> <li>Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly; and,</li> <li>Supervise the implementation of remedial measures.</li> </ul>	<ul style="list-style-type: none"> <li>Confirm receipt of notification of failure in writing;</li> <li>Notify Contractor;</li> <li>In consultation with the IEC, agree with the Contractor on the remedial measures to be implemented;</li> <li>Ensure remedial measures properly implemented; and,</li> <li>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.</li> </ul>	<ul style="list-style-type: none"> <li>Take immediate action to avoid further exceedance;</li> <li>Submit proposals for remedial actions to IEC within 3 working days of notification;</li> <li>Implement the agreed proposals;</li> <li>Resubmit proposals if problem still not under control; and,</li> <li>Stop the relevant portion of works as determined by the ER until the exceedance is abated.</li> </ul>

**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	<ul style="list-style-type: none"> <li>• Notify ER, IEC and Contractor;</li> <li>• Carry out investigation;</li> <li>• Report the results of investigation to the IEC, ER and Contractor;</li> <li>• Discuss with the IEC and Contractor on remedial measures required; and,</li> <li>• Increase monitoring frequency to check mitigation effectiveness.</li> </ul>	<ul style="list-style-type: none"> <li>• Review the investigation results submitted by the ET;</li> <li>• Review the proposed remedial measures by the Contractor and advise the ER accordingly; and,</li> <li>• Advise the ER on the effectiveness of the proposed remedial measures.</li> </ul>	<ul style="list-style-type: none"> <li>• Confirm receipt of notification of failure in writing;</li> <li>• Notify Contractor;</li> <li>• In consultation with the IEC, agree with the Contractor on the remedial measures to be implemented; and,</li> <li>• Supervise the implementation of remedial measures.</li> </ul>	<ul style="list-style-type: none"> <li>• Submit noise mitigation proposals to IEC and ER; and,</li> <li>• Implement noise mitigation proposals.</li> </ul>

Action Level/Limit Level	Environmental Team Leader (ETL)	Independent Environmental Checker (IEC)	Engineer's Representative (ER)	Contractor
Limit Level being exceeded	<ul style="list-style-type: none"> <li>• Inform IEC, ER, Contractor and EPD;</li> <li>• Repeat measurements to confirm findings;</li> <li>• Increase monitoring frequency;</li> <li>• Identify source and investigate the cause of exceedance;</li> <li>• Carry out analysis of Contractor's working procedures;</li> <li>• Discuss with the IEC, Contractor and ER on remedial measures required;</li> <li>• Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results; and,</li> <li>• If exceedance stops, cease additional monitoring.</li> </ul>	<ul style="list-style-type: none"> <li>• Discuss amongst ER, ET, and Contractor on the potential remedial actions; and,</li> <li>• Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly.</li> </ul>	<ul style="list-style-type: none"> <li>• Confirm receipt of notification of failure in writing;</li> <li>• Notify Contractor;</li> <li>• In consultation with the IEC, agree with the Contractor on the remedial measures to be implemented;</li> <li>• Supervise the implementation of remedial measures; and,</li> <li>• If exceedance continues, consider stopping the Contractor to continue working on that portion of work which causes the exceedance until the exceedance is abated.</li> </ul>	<ul style="list-style-type: none"> <li>• Take immediate action to avoid further exceedance;</li> <li>• Submit proposals for remedial actions to IEC and ER within 3 working days of notification;</li> <li>• Implement the agreed proposals;</li> <li>• Submit further proposal if problem still not under control; and,</li> <li>• Stop the relevant portion of works as instructed by the ER until the exceedance is abated.</li> </ul>

**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 for All Sites

## 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					Marine Deposit		
	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	Type 1	Type 2	Type 3
	(in '000kg)	(in '000m³)	(in '000m³)	(in '000m³)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000L)	(in '000kg)	(in '000m³)	(in '000m³)	(in '000m³)
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	0	0	0
Total	5197.55	0	0	0	5197.55	1	0.036	0	0	45.29	0	0	0

- 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					Marine Deposit		
	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	Type 1	Type 2	Type 3
	(in '000kg)	(in '000m³)	(in '000m³)	(in '000m³)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000L)	(in '000kg)	(in '000m³)	(in '000m³)	(in '000m³)
Jan	7986.1	0	0	0	7986.1	0	0.144	0	0.8	44.5	0	0	0
Feb	4116.23	0	0	0	4116.23	0	0	0	0	41.75	0	0	0
Mar	7876.37	0	0	0	7876.37	0	0.09	0	0	44.58	0.46	0.42	0.027
Apr	7239.31	0	0	0	7239.31	0	0.054	0	0	33.34	0.39	0	0.005
May	9998.4	0	0	0	9998.4	0	0.144	0	0.3	37.79	0	0.661	0.012
June	8614	0	0	0	8614	0	0.09	0	0.4	117.2	0	0	0
Sub-total	45830.4	0	0	0	45830.4	0	0.522	0	1.5	319.16	0.85	1.081	0.044
July	8401.37	0	0	0	8401.37	0	0.162	0	0	88.77	0	0.422	0.009
Aug	6001.66	0	0	0	6001.66	0	0	0	0.2	41.63	1.21	0.701	0
Sept													
Oct													
Nov													
Dec													
Total	60233.43	0	0	0	60233.43	0	0.684	0	1.7	449.56	2.06	2.204	0.053

- 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 Quarterly Report Submitted under DC/2009/05*


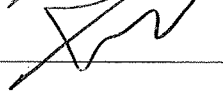
China State – Shanghai Tunnel Joint Venture

**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**

**Quarterly EM&A Report for  
June 2010 to August 2010  
(3<sup>rd</sup> Quarterly EM&A Report)**

September 2010

	Name	Signature
Prepared & Checked:	Cyrus Lau	
Reviewed & Approved:	Edith Ng (ETL)	

Version: 0

Date: 27 September 2010

**Disclaimer**

This report is prepared for China State – Shanghai Tunnel Joint Venture and is given for its sole benefit in relation to and pursuant to 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 and may not be disclosed to, quoted to or relied upon by any person other than China State – Shanghai Tunnel Joint Venture without our prior written consent. No person (other than China State – Shanghai Tunnel Joint Venture) into whose possession a copy of this report comes may rely on this report without our express written consent and China State – Shanghai Tunnel Joint Venture may not rely on it for any purpose other than as described above.

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Your ref -

CE/Harbour Area Treatment Scheme  
Drainage Services Department  
Sewage Services Branch  
Harbour Area Treatment Scheme Division  
5/F, Western Magistracy,  
2A Pokfulam Road, Hong Kong

29 September 2010  
By Fax (2833 9162) and Post

**Attn: Mr. Danny Tang**

Dear Sir,

**Agreement No. CE 8/2009(EP)**  
**Harbour Area Treatment Scheme (HATS) Stage 2A**  
**Independent Environmental Checker for Construction Phase – Investigation**

**Contract No. DC/2009/05**  
**Construction of Interconnection Tunnel and Diaphragm Wall for Main Pumping Station**  
**at Stonecutters Island Sewage Treatment Works**  
**Submission of 3<sup>rd</sup> Quarterly EM&A Report for June to August 2010**

We refer to the revised Quarterly EM&A Report for June to August 2010 received on 28 September 2010 and we confirm we have no further comment.

Yours faithfully  
for MOTT MACDONALD HONG KONG LIMITED



Dr. Anne F Kerr  
Independent Environmental Checker

c.c.	ARUP	Mr. Gamini Ananda	Fax: 2370 4377
	AECOM	Ms. Edith Ng	Fax: 2891 0305
	CSSTJV	Mr. Y L Chan	Fax: 2370 2086

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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/D). 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 is the third Quarterly Environmental Monitoring and Audit Report prepared for the captioned Project. This report documents the findings of EM&A works conducted in the period between 1 June 2010 and 31 August 2010. As informed by the Contractor, construction activities in the reporting quarter were:

- Drainage work;
- Tree transplanting and protection;
- Construction of diaphragm wall for the main pumping station and its inlet chamber and at launching shaft region of interconnection tunnel; and
- Construction of Utility diversion and cable trough.

## Environmental Monitoring Works

### EM&A Programme

A summary of monitoring and audit activities conducted in the reporting quarter is listed below:

24-hour TSP monitoring	14 sessions*
1-hour TSP monitoring	45 sessions
Daytime Noise monitoring	13 sessions
Evening Time Noise monitoring	39 sessions
Night-time Noise monitoring	0 sessions
Landscape and Visual Inspection	3 sessions
Environmental Site Inspection	13 sessions

Remarks: \* The scheduled monitoring on 3 July 2010 was suspended due to malfunction of High Volume Sampler.

### 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 quarter.

### 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 quarter.

No Limit Level exceedance of noise was recorded at all monitoring station in the reporting quarter, except the measured noise levels recorded on 10 July 2010 during evening time period.

Based on on-site observations during the course of noise measurements, diaphragm wall construction was the major work process undertaking within the Project site.

Other external noise sources were also noted during the monitoring periods, which may have attributed to the measured noise levels.

Referring to the information provided by the Contractor, type and number of PMEs operated within the Project site on exceedance day comply with the requirements in the CNP (Ref: GW-RW0154-10).

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

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 10 July 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 quarter.

### **Reporting Changes**

As confirmed by the Officer from FSD Diving Rescue and Diving Rescue Centre, there is no class during night-time for Year 2010. According to the EIA report, no other noise sensitive receiver was identified near the site area. Thus, the noise monitoring during the night-time period was considered not necessary for Year 2010.

With the approval from IEC & ER, the noise monitoring at monitoring station (NM6) during night-time period was suspended from April 2010 until the end of Year 2010. The necessity of conducting noise monitoring at this station from Year 2011 will be reviewed later.

# 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/D).
- 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 Station;
  - 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/D) 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 third Quarterly 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 the period between 1 June 2010 and 31 August 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 Contractor has carried out the following major activities in the reporting quarter:
- Drainage work;
  - Tree transplanting and protection;
  - Construction of diaphragm wall for the main pumping station and its inlet chamber and at launching shaft region of interconnection tunnel; and
  - Construction of Utility diversion and cable trough.
- 1.4.2 The latest Construction Programme of the Project is shown in Appendix B.
- 1.4.3 The mitigation measures implementation schedule (EMIS) are presented in Appendix C.

## 2 SUMMARY OF EM&A PROGRAMME REQUIREMENTS

### 2.1 Monitoring Parameters and Locations

- 2.1.1 The EM&A Manual and Monitoring Proposal designated locations for the monitoring of environmental impacts in terms of construction noise and air quality impact due to the Project. The description of monitoring parameters, frequencies and durations and detailed locations of monitoring stations for air quality and construction noise are listed below. The monitoring stations for air quality impact and construction noise are depicted in Figure 2.1 and 3.1 respectively.

**Table 2-1 Locations of Air Quality Monitoring Station**

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

**Table 2-2 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

**Table 2-3 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

**Table 2-4 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.	At least once per week
	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.	

- 2.1.2 The EM&A Manual also required monthly landscape and visual audit and weekly environmental site inspections for air quality, noise, water quality, as well as waste management.

## **2.2 Environmental Quality Performance Limits (Action/Limit Levels)**

- 2.2.1 The environmental quality performance limits, i.e. Action and Limit Levels for air quality impact and construction noise monitoring works were derived from the baseline monitoring results as detailed in the EM&A Manual and Monitoring Proposal. Appendix D shows the established Action and Limit Levels for all monitoring parameters.

## **2.3 Environmental Mitigation Measures**

- 2.3.1 Relevant environmental mitigation measures as recommended in the Project EIA final report were stipulated in the EM&A Manual and environmental requirement in contract documents for the Contractor to adopt. A list of mitigation measures and their implementation statuses, i.e. Implementation Schedule of Mitigation Measures (EM(S)), are given in Appendix C.

### 3 MONITORING RESULTS

#### 3.1 Air Quality

- 3.1.1 Air quality monitoring, including 1-hr and 24-hr TSP, was conducted for at least three times every 6 days (for 1-hr TSP) and for at least once every 6 days (for 24-hr TSP) respectively at the designated monitoring station (AM7, Rooftop of West Kowloon No.2 Sewage Pumping Station), in accordance with the EM&A Manual and Monitoring Proposal.
- 3.1.2 Forty-five (45) sessions of 1-hr TSP monitoring and fourteen (14) sessions of 24-hr TSP monitoring were conducted at the designated monitoring station (AM7) in the reporting quarter. The scheduled monitoring on 3 July 2010 was suspended due to malfunction of High Volume Sampler.
- 3.1.3 The weather was mostly sunny, with occasional cloudy/rainy events in the reporting quarter. The trend of air quality monitoring results for the reporting quarter is given in Appendix E. Major dust source included construction activities of the Project and nearby traffic emissions.
- 3.1.4 There was no Action and Limit Level exceedance recorded for 1-hr TSP and 24-hr TSP in the reporting quarter.
- 3.1.5 Table 3-1 presents the number of exceedances recorded in each month of the reporting quarter. The number of monitoring events included regular impact monitoring events and additional ones, if any.

**Table 3-1 Summary of Number of Exceedances for 1-hr and 24-hr TSP Concentration**

Monitoring Parameter	Location	Level of Exceedance	Month		
			Jun 10	Jul 10	Aug 10
1-hr TSP	AM7	No. of monitoring events	15	15	15
		Action	0	0	0
		Limit	0	0	0
	<b>Total</b>		<b>0</b>	<b>0</b>	<b>0</b>
24-hr TSP	AM7	No. of monitoring events	5	4*	5
		Action	0	0	0
		Limit	0	0	0
	<b>Total</b>		<b>0</b>	<b>0</b>	<b>0</b>

**Remarks:** \* The scheduled monitoring on 3 July 2010 was suspended due to malfunction of High Volume Sampler.



## 3.2 Construction Noise

- 3.2.1 Noise measurement was conducted at the designed monitoring station NM6, rooftop of Customs' Marine Base (Block H of Government Dockyard), for at least once per week during the construction phase (daytime (0700 – 1900) and evening time (1900 – 2300)) of the Project. Monitoring station (NM6) serves as an alternative location for FSD Diving Rescue and Diving Training Centre, which is regarded as a Noise Sensitive Receiver (NSR) as it is an institution.
- 3.2.1 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 and Public Holidays in the reporting quarter, except on 1 July 2010. Moreover, construction works had been further extended to the night-time period (2300 to 0700 of next day) on all days, except on 1 July 2010. The construction works were conducted in accordance with the granted Construction Noise Permit (CNP) under NCO.
- 3.2.2 As confirmed by the Officer from FSD Diving Rescue and Diving Rescue Centre, there is no class during night-time period (from 2300 to 0700) for Year 2010. According to the EIA report, no noise sensitive receiver was identified near the site area except the FSD Diving Rescue and Diving Training Centre. Thus, the noise monitoring during the night-time period was considered not necessary for Year 2010.
- 3.2.3 With the approval from IEC & ER, the noise monitoring at monitoring station (NM6) during night-time period (from 2300 to 0700) was suspended from April 2010 until the end of Year 2010. The necessity of conducting noise monitoring at this station from Year 2011 will be reviewed later.
- 3.2.4 Thirteen (13) daytime noise monitoring events and thirty-nine (39) evening time noise monitoring events were carried out at the designated monitoring station (NM6) in the reporting quarter.
- 3.2.5 The weather was mostly sunny, with occasional cloudy events in the reporting quarter. The trend of construction noise impacts for the reporting quarter is given in Appendix F. Major noise source included construction activities of the Project, other construction sites nearby, operational noise from cargo transportation, engine noise from ships anchored at nearby piers, community noise and traffic noise from nearby piers.
- 3.2.6 According to the Contractor's information, no noise complaint was received in the reporting quarter; hence, no Action Level exceedance was recorded.
- 3.2.7 No Limit Level exceedance of noise was recorded at monitoring station NM6 in the reporting quarter, except the measured noise levels recorded on 10 July 2010 during evening time period.

Based on on-site observations during the course of noise measurements, diaphragm wall construction was the major work process undertaking within the Project site.

Other external noise sources, including construction noise from excavation work undergoing at other construction site nearby, engine noise from barge anchored at nearby piers and traffic noise from aircrafts passing by and from nearby piers, were also noted during the monitoring period, which may have attributed to the measured noise levels.

According to the information provided by the Contractor, two concrete lorry mixers, a hydromill, a bentonite filtering plant, a generator and a crane were operating within the Project site during the course of noise measurement. Type and number of PMEs operated comply with the requirements in the CNP (Ref: GW-RW0154-10).

Therefore, it is believed that the Limit Level exceedances are 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.

Moreover, the Contractor was reminded to ensure that the types and number of PME deployed on site during the restricted hours should strictly comply with the granted CNPs.

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 10 July 2010.

Please refer to the monthly EM&A report (July 2010) accordingly for the details of the captioned exceedances.

- 3.2.8 Table 3-2 presents the number of exceedances recorded in each month of the reporting quarter. The number of monitoring events included regular monitoring events and additional ones, if any.

**Table 3-2 Summary of Number of Exceedances for Daytime, Evening Time and Night-time Construction Impact Noise Monitoring**

Monitoring Parameter	Location	Level of Exceedance	Month		
			Jun 10	Jul 10	Aug 10
Daytime Construction Noise	NM6	No. of monitoring events	5	4	4
		Action	0	0	0
		Limit	0	0	0
	<b>Total</b>		<b>0</b>	<b>0</b>	<b>0</b>
Evening Time Construction Noise	NM6	No. of monitoring events	15	12	12
		Action	0	0	0
		Limit	0	0	0
	<b>Total</b>		<b>0</b>	<b>0</b>	<b>0</b>
Night-time Construction Noise	NM6	No. of monitoring events	0	0	0
		Action	0	0	0
		Limit	0	0	0
	<b>Total</b>		<b>0</b>	<b>0</b>	<b>0</b>

**Remarks:** Exceedances which are not project-related are not presented in this table.

### 3.3 Landscape and Visual

- 3.3.1 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.
- 3.3.2 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.
- 3.3.3 Three (3) landscape and visual audits were conducted in the reporting quarter. Observations recorded during the audits in the reporting quarter are described below.

#### Protection of Existing Trees and Tree Works:

- 3.3.4 The Contractor had installed nylon netting as visual precautionary measures to prevent accidental damage to upper portion of trees that may be caused by machinery swing movements for trees retained within the tree protection zone in the Portion 2 area. However, it was noted that one of the anchor ropes was tied to the existing T5 tree trunk. The Contractor was requested to untie the anchor rope from the tree trunk and use other means to anchor the ropes.
- 3.3.5 It was observed that the barriers used to demarcate the tree protection zone at the Portion 2 area was either fallen over or dismantled. The Contractor was requested to properly re-instate the tree protection zone in order to prevent workers from trespassing and causing damage to the trees.
- 3.3.6 The Contractor had carried out tree protection works for all existing trees at the excavated material stockpile area and the existing trees had been transplanted to holding nursery. However, the Contractor was reminded to remove all the dead trees as soon as possible to prevent accidents that may be caused by dead trees fallen over.

### **3.4 Environmental Site Inspection**

3.4.1 There were thirteen (13) site inspections conducted in the reporting quarter to monitor the implementation of proper environmental pollution control and mitigation measures for the Project. The major concerns for the Project are air quality, noise, water quality and chemical and waste management. Observations recorded are described below.

3.4.2 The Contractor has rectified most of the observations as identified during environmental site inspections in the reporting quarter within agreed time frame. Rectifications of remaining identified items are undergoing by the Contractor. Follow-up inspections on the status on provision of mitigation measures will be conducted to ensure all identified items are mitigated properly.

#### **3.4.3 Air Quality**

- No water spraying or coverage is observed at excavation works area and exposed soil stockpiles at Utility diversion works area. The Contractor should provide proper dust mitigation measures (e.g. regular water spraying and tarpaulin sheet coverage to exposed soil stockpile) to suppress the fugitive dust emission from excavation works and exposed soil stockpiles.
- Access road at main pumping station is found to be dusty. The Contractor is advised to provide regular watering to the access road, pave the access road with blacktop or compact the road surface to minimize the dust impact.

#### **3.4.4 Noise**

- Nil.

#### **3.4.5 Water Quality**

- Accumulation of slurry, oily liquid and stagnant water on the ground was observed at works area at main pumping station, although pumping systems were provided on site and clearance by machineries and workers were observed. The Contractor was recommended to provide effective measures on avoidance of slurry and oily liquid spreading and clearance of accumulated slurry, stagnant water and oily liquid on site, in order to avoid generation of silty and oily surface run-off during rainstorm. Oily mixture and slurry accumulated inside the drip trays for oil drums should be treated properly and disposed of as chemical wastes. Moreover, the Contractor should ensure that proper bunds/channels had been provided at the site boundaries to confine/collect the surface run-off from work site.
- The Contractor should ensure that the rainwater pumped out from the works area at cable trenches should be properly discharged into silt removal facilities before discharge into storm drains.
- No bund/channel was provided at site boundaries of excavated material stockpile area. Proper sand bags/bunds/channels should be provided at the concerned area to collect/direct the surface run-off to sedimentation facilities provided within the works area.

- Exposed soil stockpiles were observed at Utility diversion works area and Launching Shaft (Portion 2). The Contractor should cover them up with tarpaulin sheet to avoid generation of silty run-off during rainstorm.
- Stagnant water accumulation was observed in an abandoned sedimentation tank placed at utility diversion works area. The Contractor should clear the accumulated stagnant water to avoid mosquito breeding.

#### 3.4.6 Chemical and Waste Management

- Site tidiness within the Project site area should be improved. General refuse and C&D wastes scattered and/or accumulated at designated collection receptacles/ storage areas within the site area at main pumping station and Utility diversion works area (especially works area near seawall) should be removed off-site regularly and disposed of properly. The Contractor should ensure the wastes were sorted properly before disposal.
- The setting of chemical waste storage area provided at main pumping station was found improper. The designated chemical waste storage area should be kept locked at all times. Proper panels with correct Chinese characters of “Chemical Waste” should be provided at the designated chemical waste storage area. The designated chemical waste storage area should be relocated to a place where it is accessible by the workers.
- Improper stored oil drum and chemical containers are found within the works area at main pumping station, Launching Shaft (Portion 2), excavated material stockpile area and cable trough works area. The Contractor should ensure that all oil drums and chemical containers placed within the works area should be properly stored with provision of drip trays and were covered up properly to avoid any leakage of oil and chemicals. Empty chemical containers placed at main pumping station should be properly labelled. Moreover, drip trays should be provided for works with potential oil leakage as oil stains were observed on the bare ground near site office area. Oil stains should be cleared and treated as chemical wastes.
- Oil leakage was observed from an excavator worked at Utility diversion works area. The Contractor should repair the concerned excavator and provide proper measures to avoid any oil leakage onto the ground. Oil stains found on the ground should be cleared and dispose of as chemical waste.
- Oily slurry accumulations on ground and inside the drip tray placed within works area at main pumping station were observed. The Contractor should clear the mixture and dispose of it as chemical waste.
- Oil stains were observed on the bare ground near the chemical waste storage area at main pumping station. The Contractor should clear the oil stains and dispose of them as chemical waste.

#### 3.4.7 Others

- Environmental Permit posted at all vehicle site entrances/exits was found to be not up-to-date. The Contractor should post the relevant Environmental Permit at all vehicle site entrances/exits.
- Newly obtained Construction Noise Permit (CNP) was not found posted at all vehicle site entrances/exits. The Contractor should post the newly obtained CNP at all vehicle site entrances/exits.

- Construction materials and machinery parts were found placed near the existing trees at excavated material stockpile area and no protective measures were provided to the existing trees at the concerned area. Proper tree protective measures (e.g. protective net) should be provided to the existing trees at concerned works area. Construction materials and machinery parts should be removed and kept away from the existing trees to avoid accidental damage to the trees.

## 4 ADVICE ON SOLID AND LIQUID WASTE MANAGEMENT STATUS

### 4.1 Solid and Liquid Waste Management Status and Recommendations

- 4.1.1 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.
- 4.1.2 As advised by the Contractor, quantity of waste for disposal in the reporting quarter is summarized in the Table 4-1.

**Table 4-1 Summary of Quantity of Waste for Disposal**

Type of waste	Month			Total
	Jun 10	Jul 10	Aug 10	
C&D materials generated				
Total C&D material generated	7,786.81 tonnes	6,169.93 tonnes	5,317.84 tonnes	19,274.58tonnes
Hard Rock and Large Broken Concrete	0 tonnes	71.51 tonnes	10.17 tonnes	81.68tonnes
Soil, slurry and building debris	5,422.83 tonnes	5,365.55 tonnes	4,115.80 tonnes	14,904.18tonnes
Mixed rock, concrete and soil	141.42 tonnes	154.88 tonnes	41.73 tonnes	338.03tonnes
Used bentonite slurry	2,222.56 tonnes	577.99 tonnes	1,150.14 tonnes	3,950.69tonnes
Reuse in other projects	0 tonnes	0 tonnes	0 tonnes	0 tonnes
Disposed to barging point	0 tonnes	0 tonnes	0 tonnes	0 tonnes
C&D wastes generated/collected				
Metals	7,000 kg	8,890 kg	17,410 kg	33,300kg
Paper cardboard packing	0 kg	0 kg	0 kg	0 kg
Plastics	0 kg	0 kg	0 kg	0 kg
Chemical waste	2,400 L	1,400 L	1,000 L	4,800L
General refuse	14,14 tonnes	9.48 tonnes	16.34 tonnes	39.96tonnes

- 4.1.3 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 the site tidiness and dispose of the wastes accumulated on site regularly and properly.
- 4.1.4 The Contractor should ensure that the setting of the chemical waste storage area on site should comply with Code of Practice on the Packing, Labelling and Storage of Chemical Wastes.



## **5 SUMMARY OF NON-COMPLIANCE (EXCEEDANCES) OF ENVIRONMENTAL QUALITY PERFORMANCE LIMITS (ACTION AND LIMIT LEVELS)**

### **5.1 Summary of Exceedances and Review of the Reasons for and the Implications of Non-compliance**

5.1.1 There was no Action and Limit Level exceedance recorded for 1-hr TSP and 24-hr TSP in the reporting quarter.

5.1.2 According to the Contractor's information, no noise complaint was received in the reporting quarter; hence, no Action Level exceedance was recorded.

5.1.3 No Limit Level exceedance of noise was recorded at monitoring station NM6 in the reporting quarter, except the measured noise levels recorded on 10 July 2010 during evening time period.

Based on on-site observations during the course of noise measurements, diaphragm wall construction was the major work process undertaking within the Project site.

Other external noise sources, including construction noise from excavation work undergoing at other construction site nearby, engine noise from barge anchored at nearby piers and traffic noise from aircrafts passing by and from nearby piers, were also noted during the monitoring period, which may have attributed to the measured noise levels.

According to the information provided by the Contractor, two concrete lorry mixers, a hydromill, a bentonite filtering plant, a generator and a crane were operating within the Project site during the course of noise measurement. Type and number of PME operated comply with the requirements in the CNP (Ref: GW-RW0154-10).

Therefore, it is believed that the Limit Level exceedances are 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.

Moreover, the Contractor was reminded to ensure that the types and number of PME deployed on site during the restricted hours should strictly comply with the granted CNPs.

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 10 July 2010.

Please refer to the monthly EM&A report (July 2010) accordingly for the details of the captioned exceedances.

5.1.4 Cumulative statistics of exceedances is provided in Appendix G.

## 6 COMPLAINT, NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTION

### 6.1 Summary of Complaints, Notification of Summons and Successful Prosecutions

6.1.1 Referring to the information provided by the Contractor, there was no complaint, notification of summons and successful prosecution received in the reporting quarter.

6.1.2 Table 6-1 summarized the complaint, summons and successful prosecution received in the reporting period.

**Table 6-1 Summary of Environmental Complaints and Prosecutions**

	<b>Jun 10</b>	<b>Jul 10</b>	<b>Aug 10</b>	<b>Total</b>
Complaint Logged	0	0	0	<b>0</b>
Summons Served	0	0	0	<b>0</b>
Successful Prosecution	0	0	0	<b>0</b>

6.1.3 Cumulative Statistics of Exceedance, Complaints, Notification of Summons and Successful Prosecutions recorded in the reporting quarter and since the commencement of the Project are given in Appendix G.

## **7 COMMENTS, RECOMMENDATIONS AND CONCLUSIONS**

### **7.1 Comments on Mitigation Measures**

7.1.1 According to the environmental site inspections performed in the reporting quarter, the following comments are provided:

#### **7.1.2 Air Quality Impact**

- Dust mitigation measures should be provided (e.g. regular water spraying and tarpaulin sheet coverage to exposed soil stockpile) to suppress the fugitive dust emission from excavation works and exposed soil stockpiles.
- Dust suppressive measures should be provided to the access roads within site area, like regular watering to access road, pave the access road with blacktop or compact the road surface.

#### **7.1.3 Noise**

- Nil.

#### **7.1.4 Water Quality**

- The Contractor should inspect the site condition regularly and provide proper and effective measures on clearance and avoidance of slurry, stagnant water and oily liquid accumulation within the works area and their spreading, especially during rainstorm. Oily mixture found within the works area should be collected properly and treated as chemical wastes.
- Rainwater pumped out from the works area should be properly discharged into silt removal facilities before discharge into storm drains.
- Proper sand bags/bunds/channels should be provided at the site boundaries of the works area to collect/direct the surface run-off to sedimentation facilities provided within the works area.
- Exposed soil stockpile should be covered up with tarpaulin sheet properly to avoid generation of silty run-off during rainstorm.

#### **7.1.5 Chemical and Waste Management**

- Site tidiness within the Project site area should be improved. General refuse and C&D wastes scattered and/or accumulated at designated collection receptacles/ storage areas within the site area should be removed off-site regularly and disposed of properly. The Contractor should ensure the wastes were sorted properly before disposal.
- Setting of the chemical waste storage area on site should comply with Code of Practice on the Packing, Labelling and Storage of Chemical Wastes. The designated chemical waste storage area should be kept locked at all times. Proper panels with correct Chinese characters of “chemical waste” should be provided at the designated chemical

wastes storage area. The designated chemical wastes storage area should be relocated to a place where it is accessible by the workers.

- All oil drums and chemical containers placed within the works area should be properly stored with provision of drip trays and were covered up properly to avoid any leakage of oil and chemicals. Empty chemical containers placed at main pumping station should be properly labelled.
- Drip trays should be provided for works with potential oil leakage to avoid any oil spillage.
- Regular inspections of machineries worked on site should be conducted to avoid any oil leakage from them. Any malfunction machineries should be repaired properly.
- Any oil mixed material, like oily liquid/slurry in drip trays and oil stains, found within the works area should be cleared and disposed of properly as chemical wastes. Regular inspection on the site condition should be conducted to avoid any accumulation of oil mixture within works area, especially after rainstorm.

#### **7.1.6 Landscape and Visual Impact**

- Proper tree protective measures (e.g. protective net) should be provided to the existing trees within the works area. Construction materials and machinery parts should be kept away from the existing trees to avoid accidental damage to the trees.
- The Contractor was requested to untie the anchor rope from the existing tree trunk at Portion 2 area as soon as possible.
- The Contractor was reminded to remove dead trees at the excavated material stockpile area as soon as possible.
- The Contractor was requested to re-instate the barriers for the tree protection zone of the existing trees at Portion 2 area as soon as possible.

#### **7.1.7 Others**

- Relevant Environmental Permit and Construction Noise Permit should be posted at all vehicle site entrances/exits.

## **7.2 Recommendations on EM&A Programme**

- 7.2.1 The impact air quality and noise monitoring programme ensured that any environmental impact to the receivers would be readily detected and timely actions could be taken to rectify any non-compliance. Assessment and analysis of monitoring results collected demonstrated the environmental acceptability of the Project. The monthly landscape and visual audit and weekly site inspection ensured that all the environmental mitigation measures recommended in the EIA final report were effectively implemented.
- 7.2.2 The EM&A programme, which include environmental monitoring of air quality, noise and landscape and visual impacts and environmental site inspections, effectively monitored the environmental impacts from the construction activities and no particular recommendation was advised for the improvement of the programme.

## **7.3 Conclusions**

- 7.3.1 Air quality and noise monitoring and weekly site inspection were carried out from June 2010 to August 2010, in accordance with the EM&A Manual.
- 7.3.2 All 1-hour and 24-hour TSP monitoring results complied with the Action/Limit Level in the reporting quarter.
- 7.3.3 As per Contractor's information, no Action Level exceedance of noise was recorded as complaints was recorded in the reporting quarter.
- 7.3.4 No Limit Level exceedance of noise was recorded at all monitoring station in the reporting quarter, except the measured noise levels recorded on 10 July 2010 during evening time period. The Limit Level exceedances are not considered as project-related and not solely caused by the Contractor's construction activities.
- 7.3.5 Three landscape and visual audit was carried out in the reporting quarter. Recommendations on remedial actions were given to the Contractor for the deficiencies identified during the landscape and visual audit.
- 7.3.6 Referring to the information given by the Contractor, no environmental complaint, summons or prosecution was made against the Project in the reporting quarter.
- 7.3.7 Environmental site inspections were carried out 13 times in the reporting period. Recommendations on remedial actions were given to the Contractor for the deficiencies identified during the site audit.

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## FIGURES

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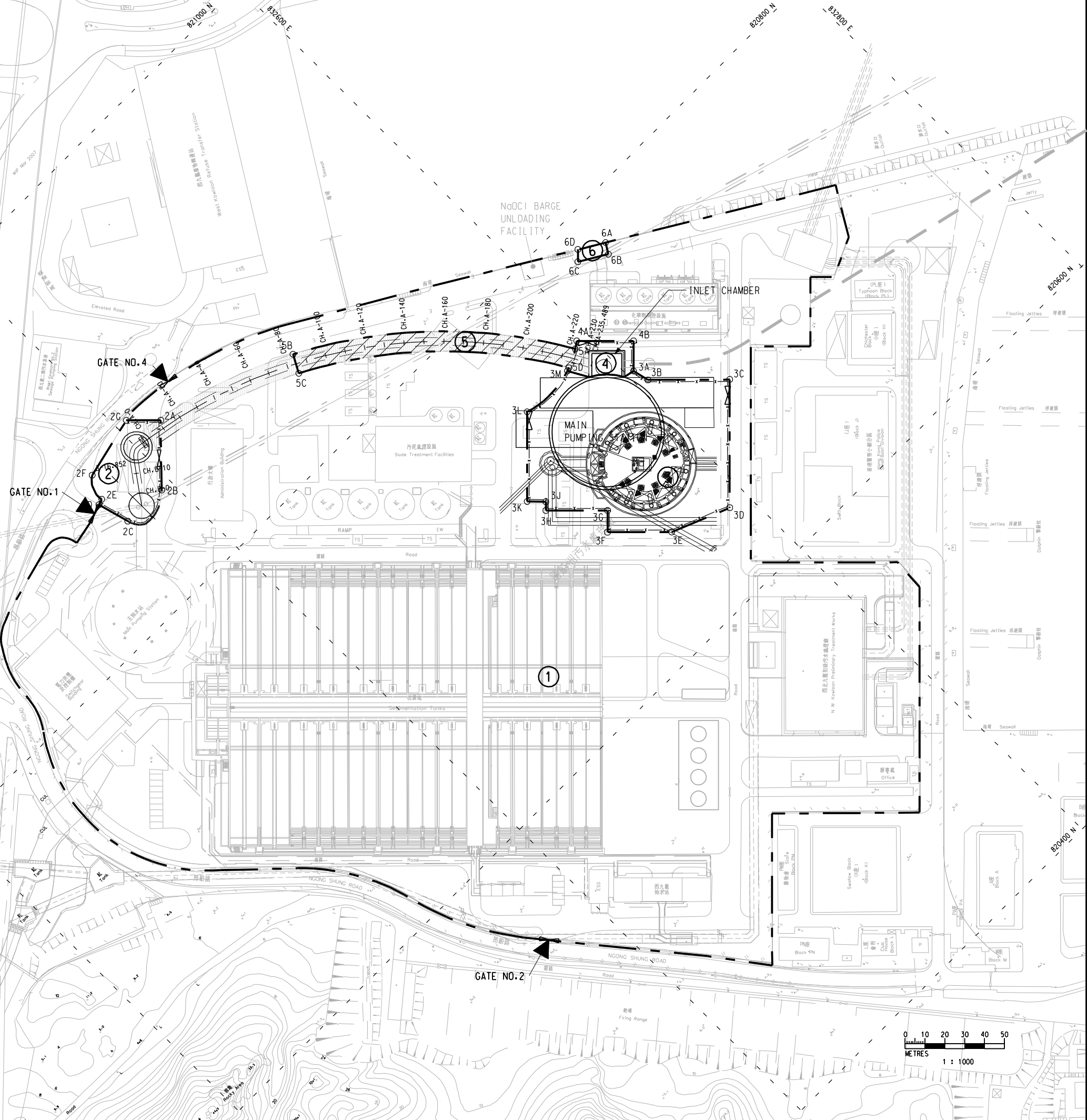
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**FIGURE 1.1**

**General Layout Plan of the Project Site**

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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
- PORTION 1
- GATE
- INTERCONNECTION TUNNEL
- CHAIN LINK FENCE TYPE 1 WITH GATE
- 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).

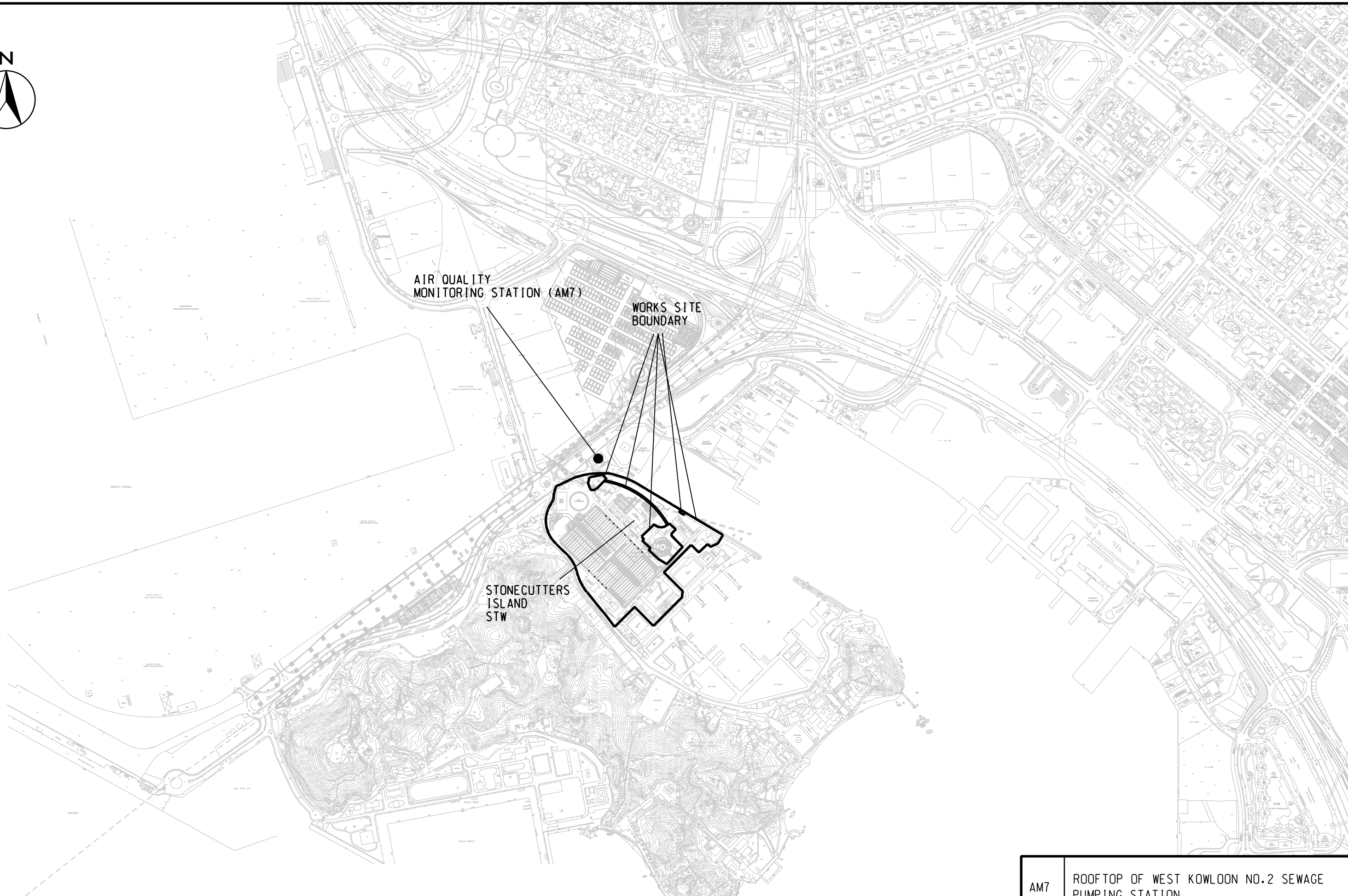
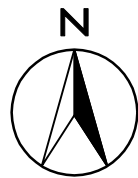
0	ISSUE FOR CONSTRUCTION	KC	09/09
Rev	Description	By	Date
Consultant <b>ARUP</b> 奧雅納工程顧問 Ove Arup & Partners Hong Kong Limited			
Project title Contract No. DC/2009/05 Harbour Area Treatment Scheme Stage 2A- Construction of Interconnection Tunnel and Diaphragm Wall for Main Pumping Station at Stonecutters Island Sewage Treatment Works			
Drawing title  PORTION OF SITE  (SHEET 1)			
Drawing no. 24888/DC0905/C/1003	Rev. 0		
Drawn NK	Date 11/08	Checked PW	Approved FW
Scale 1:1000 @A1	Status WORKING		

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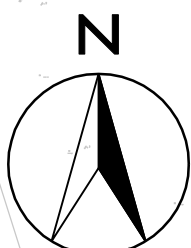
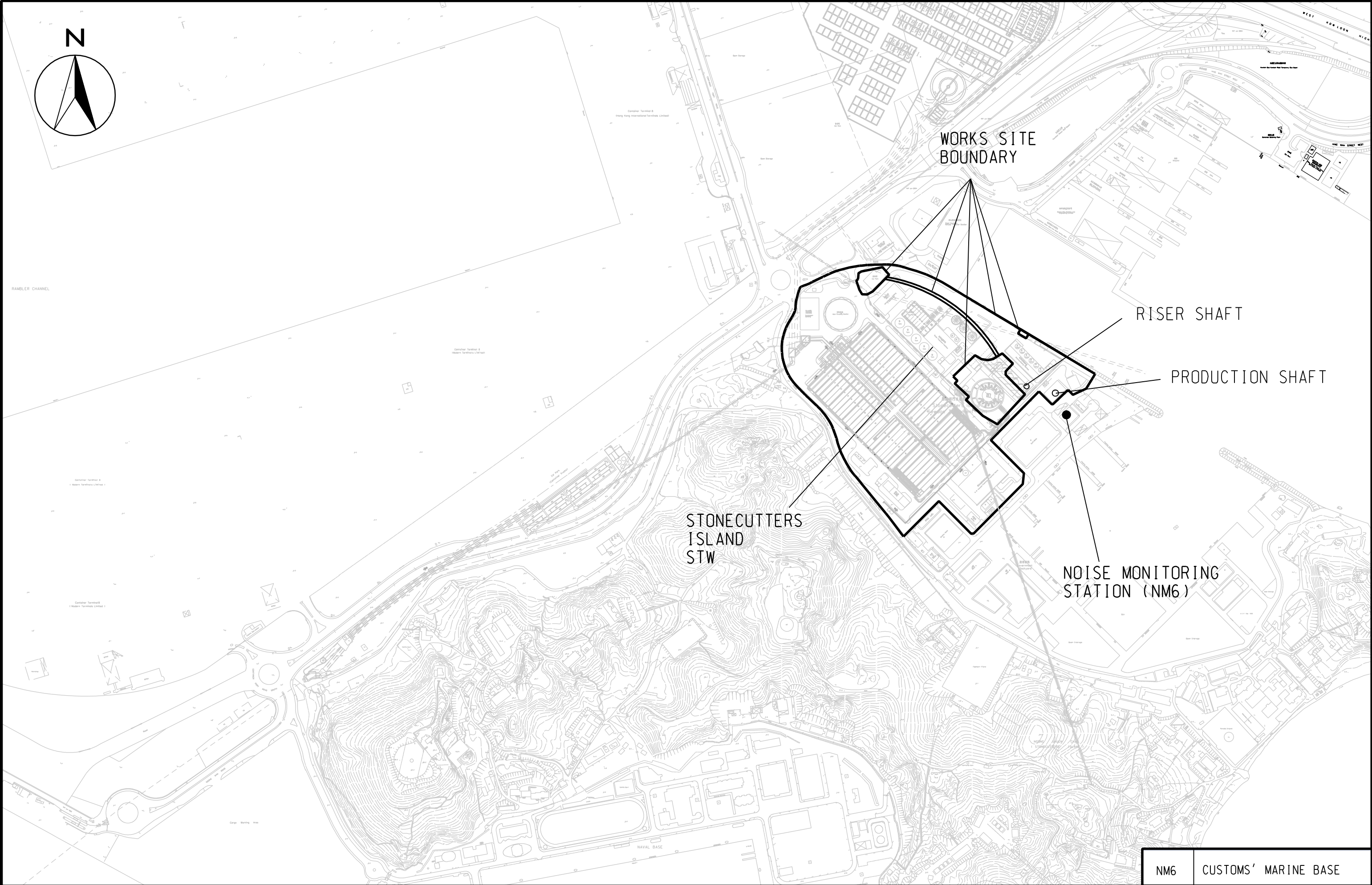


AM7	ROOFTOP OF WEST KOWLOON NO.2 SEWAGE PUMPING STATION			
SCALE	N.T.S.	DATE	JAN 10	
CHECK	ENFL	DRAWN	LLMC	
JOB No.	60143571	FIGURE No.	2.1	REV -

**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**





NM6	CUSTOMS' MARINE BASE
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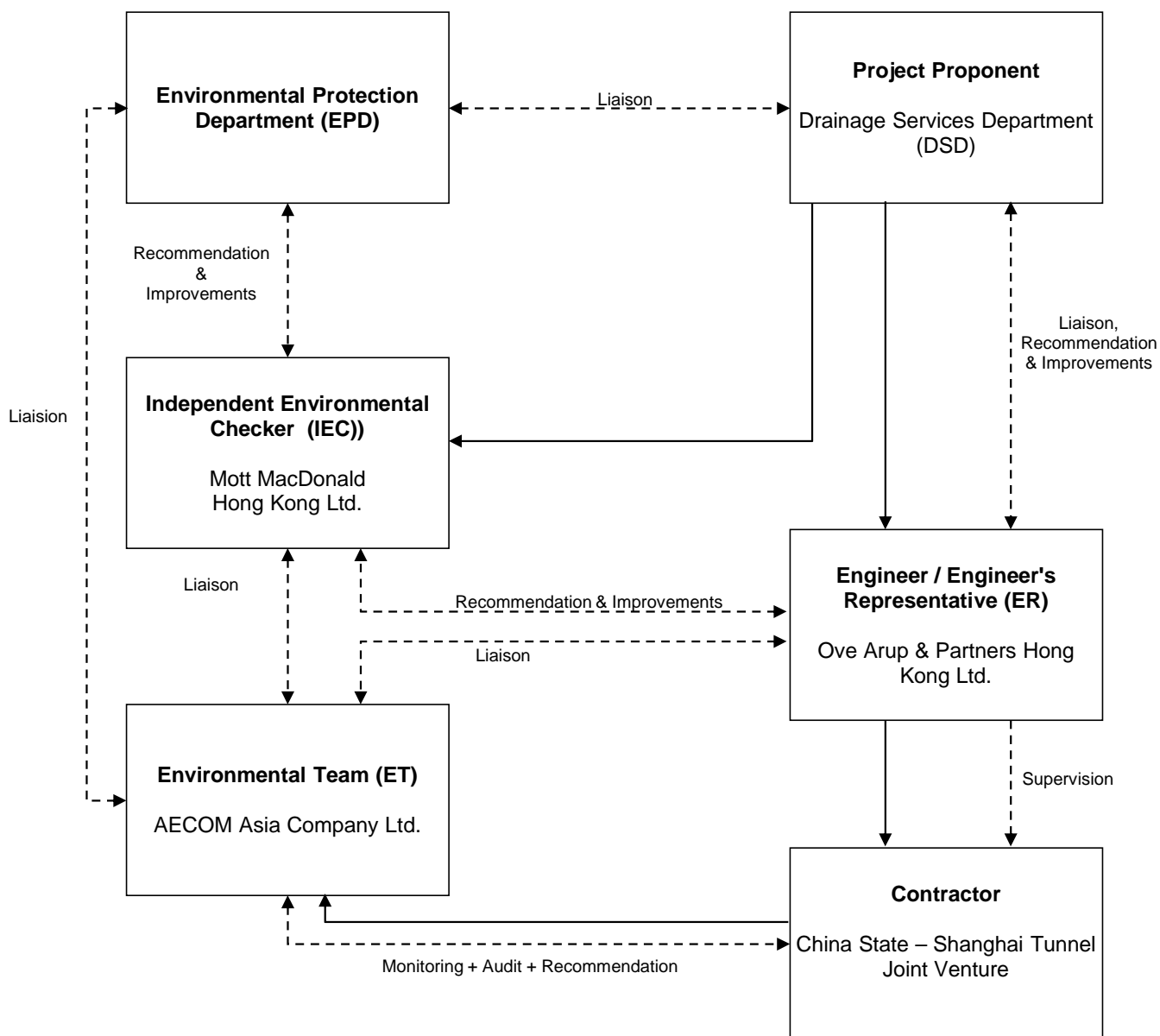
AECOM	CONTRACT NO. DC/2009/05				SCALE	N.T.S.	DATE	JAN 10
	HARBOUR AREA TREATMENT SCHEME (HATS) STAGE 2A -				CHECK	ENFL	DRAWN	LLMC
	CONSTRUCTION OF INTERCONNECTION TUNNEL & DIAPHRAGM WALL FOR MAIN PUMPING STATION AT SCISTW				JOB No.	60143571	FIGURE No.	3.1
	LOCATION OF NOISE MONITORING STATION DURING IMPACT MONITORING						REV	-

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## **APPENDIX A**

### **Project Organization Structure**

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———— Employment Relationship  
 - - - - - Working Relationship



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	Rev.
		A	-

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## **APPENDIX B**

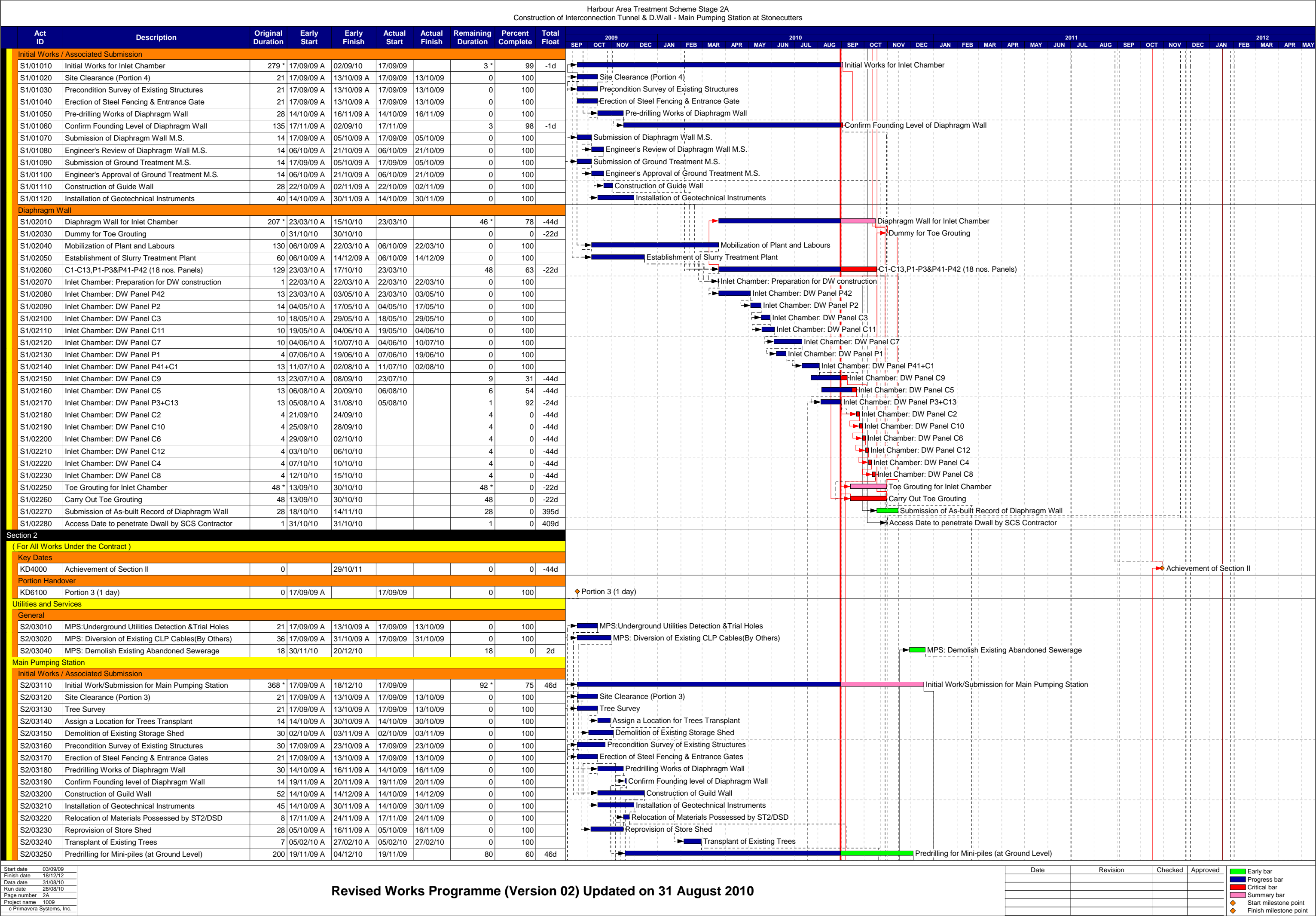
### **Construction Programme**

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<p>Harbour Area Treatment Scheme Stage 2A</p> <p>Construction of Interconnection Tunnel &amp; D.Wall - Main Pumping Station at Stonecutters</p>
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Act ID		Description	Original Duration	Early Start	Early Finish	Actual Start	Actual Finish	Remaining Duration	Percent Complete	Total Float	2009												2010												2011												2012																																		
											SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY																																						
Key Dates																																																																																	
( For All Works Under the Contract )																																																																																	
General																																																																																	
KD-1000	Letter of Acceptance		0	03/09/09 A		03/09/09			0	100	◆ Letter of Acceptance																																																																						
KD-2000	Contract Commencement		0	17/09/09 A		17/09/09			0	100	◆ Contract Commencement																																																																						
KD-2500	Contract Completion		0		18/12/11 *				0	0																																																																							
KD-2600	End of Maintenance Period		0		18/12/12 *				0	0																																																																							
Section I of the Works (387 days)																																																																																	
KD-3000	Section I of the Works		0		08/10/10 *				0	0	◆ Section I of the Works																																																																						
Section II of the Works (730 days)																																																																																	
KD-4000	Section II of the Works		0		16/09/11 *				0	0	◆ Section II of the Works																																																																						
Section III of the Works (823 days)																																																																																	
KD-5000	Section III of the Works		0		18/12/11 *				0	0	◆ Section III of the Works																																																																						
Portion Handover																																																																																	
KD-6000	Portion 2 (1 day)		0	17/09/09 A		17/09/09			0	100	◆ Portion 2 (1 day)																																																																						
KD-6100	Portion 3 (1 day)		0	17/09/09 A		17/09/09			0	100	◆ Portion 3 (1 day)																																																																						
KD-6200	Portion 4 (1 day)		0	17/09/09 A		17/09/09			0	100	◆ Portion 4 (1 day)																																																																						
KD-6300	Portion 5 (Latest Possession 549 days)		0	19/03/11 *					0	0	◆ Portion 5 (Latest Possession 549 days)																																																																						
KD-6400	Portion 6 (1 day)		0	17/09/09 A		17/09/09			0	100	◆ Portion 6 (1 day)																																																																						
KD-6500	Portion A (1 day)		0	17/09/09 A		17/09/09			0	100	◆ Portion A (1 day)																																																																						
KD-6600	Portion B (1 day)		0	17/09/09 A		17/09/09			0	100	◆ Portion B (1 day)																																																																						
KD-6700	Portion C (1 day)		0	17/09/09 A		17/09/09			0	100	◆ Portion C (1 day)																																																																						
Preliminaries and General Requirement																																																																																	
General Requirement																																																																																	
General																																																																																	
PG/00010	General Preliminaries Requirement	148 *	17/09/09 A	11/02/10 A	17/09/09	11/02/10		0 *	100		General Preliminaries Requirement																																																																						
PG/00020	General Site Clearance	14	17/09/09 A	30/09/09 A	17/09/09	30/09/09		0	100		General Site Clearance																																																																						
PG/00030	Establish Cont & Eng's Temp Site Office	14	17/09/09 A	30/09/09 A	17/09/09	30/09/09		0	100		Establish Cont & Eng's Temp Site Office																																																																						
PG/00040	Initial Survey of Site	21	17/09/09 A	07/10/09 A	17/09/09	07/10/09		0	100		Initial Survey of Site																																																																						
PG/00050	Construction of Steel Fencing & Gates	28	17/09/09 A	14/10/09 A	17/09/09	14/10/09		0	100		Construction of Steel Fencing & Gates																																																																						
PG/00060	Construction of Contractor Accommodation	71	17/09/09 A	26/11/09 A	17/09/09	26/11/09		0	100		Construction of Contractor Accommodation																																																																						
PG/00070	Provision of Interim Engineer Office	14	17/09/09 A	30/09/09 A	17/09/09	30/09/09		0	100		Provision of Interim Engineer Office																																																																						
PG/00080	Submit Engineer Accommodation Proposal	32	17/09/09 A	18/10/09 A	17/09/09	18/10/09		0	100		Submit Engineer Accommodation Proposal																																																																						
PG/00090	Approval for Engineer's Accommodation Proposal	80	19/10/09 A	31/12/09 A	19/10/09	31/12/09		0	100		Approval for Engineer's Accommodation Proposal																																																																						
PG/00100	Construction of Engineer Accommodation	125	22/10/09 A	11/02/10 A	22/10/09	11/02/10		0	100		Construction of Engineer Accommodation																																																																						
PG/00110	Take Over Control Gate No.2 from ADF Contractor	1	15/10/09 A	15/10/09 A	15/10/09	15/10/09		0	100		Take Over Control Gate No.2 from ADF Contractor																																																																						
PG/00120	Handover Portion 3 to MPS Contractor	1	30/10/11	30/10/11				1	0	-44d	Handover Portion 3 to MPS Contractor																																																																						
PG/00130	Handover Control Gate No2 to 4 to MPS Contractor	1	31/01/12	31/01/12				1	0	322d	Handover Control Gate No2 to 4 to MPS Contractor																																																																						
PG/00140	Handover Portions 2 & 4 to MPS Contractor	1	31/01/12	31/01/12				1	0	-44d	Handover Portions 2 & 4 to MPS Contractor																																																																						
PG/00150	Handover Portions A & D to MPS Contractor	1	31/01/12	31/01/12				1	0	322d	Handover Portions A & D to MPS Contractor																																																																						
PG/00160	Handover Eng Accommodation to MPS Contractor	1	31/01/12	31/01/12				1	0	322d	Handover Eng Accommodation to MPS Contractor																																																																						
PG/00170	Handover Switchboard to MPS Contractor(deleted)	0	31/01/12	30/01/12				0	0	323d	Handover Switchboard to MPS Contractor(deleted)																																																																						
Submission, Approvals and Permits																																																																																	
General																																																																																	
PG/00210	Submission and Permits	199 *	03/09/09 A	24/03/10 A	03/09/09	24/03/10		0 *	100		Submission and Permits																																																																						
PG/00220	Submission of Initial Works Programme	19	03/09/09 A	21/09/09 A	03/09/09	21/09/09		0	100		Submission of Initial Works Programme																																																																						
PG/00230	Engineer's Approval of Works Programme	31	22/09/09 A	22/10/09 A	22/09/09	22/10/09		0	100		Engineer's Approval of Works Programme																																																																						
PG/00240	Submission of Detailed Works Programme	150	23/10/09 A	24/03/10 A	23/10/09	24/03/10		0	100		Submission of Detailed Works Programme																																																																						
PG/00250	Submission of 1st 3Mths Rolling Programme	14	17/09/09 A	16/09/09 A	17/09/09	16/09/09		0	100		Submission of 1st 3Mths Rolling Programme																																																																						
PG/00260	Submission of Draft Safety Plan	14	03/09/09 A	16/09/09 A	03/09/09	16/09/09		0	100		Submission of Draft Safety Plan																																																																						
PG/00270	Submission of Final Safety Plan	35	03/09/09 A	07/10/09 A	03/09/09	07/10/09		0	100		Submission of Final Safety Plan																																																																						
PG/00280	Submission of Staff/ Organisation Chart	14	17/09/09 A	30/09/09 A	17/09/09	30/09/09		0	100		Submission of Staff/ Organisation Chart																																																																						
PG/00290	Submission of Subcontractor Management Plan	30	03/09/09 A	02/10/09 A	03/09/09	02/10/09		0	100		Submission of Subcontractor Management Plan																																																																						
PG/00300	Submit Draft Environmental Management Plan	21	03/09/09 A	23/09/09 A	03/09/09	23/09/09		0	100		Submit Draft Environmental Management Plan																																																																						
PG/00310	Submit Final Environmental Management Plan	45	03/09/09 A	17/10/09 A	03/09/09	17/10/09		0	100		Submit Final Environmental Management Plan																																																																						
PG/00320	Submission of Initial Survey Records	14	01/10/09 A	14/10/09 A	01/10/09	14/10/09		0	100		Submission of Initial Survey Records																																																																						
PG/00330	Submission of WaterProofing Concrete	14	17/09/09 A	30/09/09 A	17/09/09	30/09/09		0	100		Submission of WaterProofing Concrete																																																																						
PG/00340	Engineer's Approval of W.P Concrete	135	01/10/09 A	04/01/10 A	01/10/09	04/01/10		0	100		Engineer's Approval of W.P Concrete																																																																						
PG/00350	Establish Site Liaison Group SLG	30	17/09/09 A	16/10/09 A	17/09/09	16/10/09		0	100		Establish Site Liaison Group SLG																																																																						
Section 1																																																																																	
( For All Works Under the Contract )																																																																																	
Key Dates																																																																																	
KD3000	Achievement of Section I		0		30/10/10				0	0	Achievement of Section I																																																																						
Portion Handover																																																																																	
KD6200	Portion 4 (1 day)		0	17/09/09 A		17/09/09			0	100	◆ Portion 4 (1 day)																																																																						
Utilities and Services																																																																																	
General																																																																																	
S1/01000	Underground Utilities Detection & Trial Holes	14	17/09/09 A	13/10/09 A	17/09/09	13/10/09		0	100		Underground Utilities Detection & Trial Holes																																																																						
Inlet Chamber																																																																																	
Start date 03/09/09																						Date										Revision										Checked										Approved										Early bar																			
Finish date 18/12/12																																																														Progress bar																			
Data date 31/08/10																																																														Critical bar																			
Run date 28/08/10																																																														Summary bar																			
Page number 1A																																																														Start milestone point																			
Project name 1009																																																														Finish milestone point																			
c Primavera Systems, Inc.																																																																																	
Revised Works Programme (Version 02) Updated on 31 August 2010																																																																																	






<p>Harbour Area Treatment Scheme Stage 2A</p> <p>Construction of Interconnection Tunnel &amp; D.Wall - Main Pumping Station at Stonecutters</p>	
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[illegible]

Start date	03/09/09
Finish date	18/12/12
Data date	31/08/10
Run date	28/08/10
Page number	3A
Project name	1009
c Primavera Systems, Inc.	

## Revised Works Programme (Version 02) Updated on 31 August 2010

Date	Revision	Checked	Approved	
				Early bar
				Progress bar
				Critical bar
				 Summary bar
				 Start milestone point
				 Finish milestone point



[illegible]




Date	Revision	Checked	Approved	
				Early bar
				Progress bar
				Critical bar
				Summary bar
				Start milestone point
				Finish milestone point

<p>Harbour Area Treatment Scheme Stage 2A</p> <p>Construction of Interconnection Tunnel &amp; D.Wall - Main Pumping Station at Stonecutters</p>	
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[illegible]

Start date	03/09/09
Finish date	18/12/12
Data date	31/08/10
Run date	28/08/10
Page number	5A
Project name	1009
c Primavera Systems, Inc.	

## Revised Works Programme (Version 02) Updated on 31 August 2010

Date	Revision	Checked	Approved	
				Early bar
				Progress bar
				Critical bar
				 Summary bar
				 Start milestone point
				 Finish milestone point

<p>Harbour Area Treatment Scheme Stage 2A</p> <p>Construction of Interconnection Tunnel &amp; D.Wall - Main Pumping Station at Stonecutters</p>
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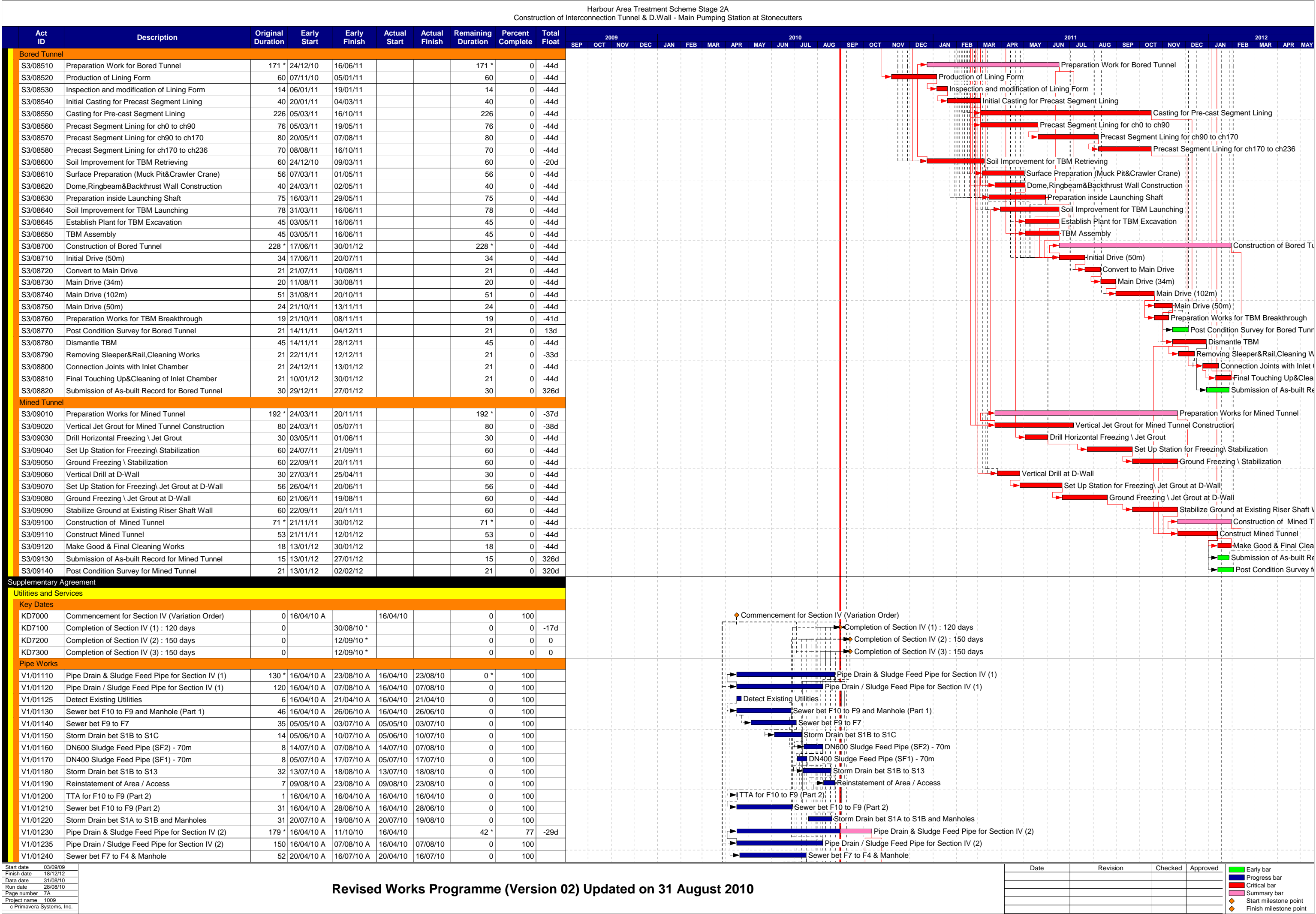
[illegible]

Start date	03/09/09
Finish date	18/12/12
Data date	31/08/10
Run date	28/08/10
Page number	6A
Project name	1009
c Primavera Systems, Inc.	

## Revised Works Programme (Version 02) Updated on 31 August 2010






Date	Revision	Checked	Approved	
				Early bar
				Progress bar
				Critical bar
				Summary bar
				Start milestone point
				Finish milestone point





<p>Harbour Area Treatment Scheme Stage 2A</p> <p>Construction of Interconnection Tunnel &amp; D.Wall - Main Pumping Station at Stonecutters</p>	
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Date	Revision	Checked	Approved	
				 Early bar
				 Progress bar
				 Critical bar
				Summary bar
				 Start milestone point
				 Finish milestone point

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## **APPENDIX C**

### **Implementation Schedule of Environmental Mitigation Measures (EMIS)**

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**APPENDIX C IMPLEMENTATION SCHEDULE OF ENVIRONMENTAL MITIGATION MEASURES (EMIS)**

EIA Ref.	Recommended Mitigation Measures	Location of the measure	Implementation Status		
			Jun 10	Jul 10	Aug 10
A     Air Quality					
3.74	Skip hoist for material transport should be totally enclosed by impervious sheeting.	All construction sites	V	V	V
	Vehicle washing facilities should be provided at every vehicle exit point.		V	V	V
	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	V	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	N/A	N/A
	Use of regular watering, with complete coverage, to reduce dust emissions from exposed site surfaces and unpaved roads, particularly during dry weather.		V	@	V
	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.		@	@	V
	Open stockpiles shall be avoided or covered. Where possible, prevent placing dusty material storage piles near ASRs		@	@	V
	Tarpaulin covering of all dusty vehicle loads transported to, from and between site locations.		V	V	V
	Imposition of speed controls for vehicles on unpaved site roads. Ten kilometers per hour is the recommended limit.		V	V	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	N/A	N/A

EIA Ref.	Recommended Mitigation Measures	Location of the measure	Implementation Status		
			Jun 10	Jul 10	Aug 10
3.74	Every vehicle should be washed to remove any dusty materials from its body and wheels before leaving the construction sites.	All construction sites	V	V	V
	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.		V	V	V
<b>B    Airborne Noise</b>					
4.56–4.61	Use of quiet PME, movable barriers and acoustic mats.	All construction sites	V	V	V
4.67	Only well-maintained plant shall be operated on-site and plant shall be serviced regularly during the construction program.		V	V	V
	Silencers or mufflers on construction equipment shall be utilized and shall be properly maintained during the construction program.		V	V	V
	Mobile plant, if any, shall be sited as far away from NSRs as possible.		V	V	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	V	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	V	V
	Material stockpiles and other structures shall be effectively utilized, wherever practicable, in screening noise from on-site construction activities.		V	V	V



EIA Ref.	Recommended Mitigation Measures	Location of the measure	Implementation Status		
			Jun 10	Jul 10	Aug 10
C Water Quality					
6.349 to 6.375	<i>Construction Site Runoff and General Construction Activities</i> The mitigation measures as outlined in the <i>ProPECC PN 1/94 Construction Site Drainage</i> should be adopted where applicable.	All construction sites	@	@	@
6.376	<i>Effluent Discharge</i> 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.		V	V	V
6.377	<i>Accidental Spillage of Chemicals</i> 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
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	N/A	N/A

EIA Ref.	Recommended Mitigation Measures	Location of the measure	Implementation Status		
			Jun 10	Jul 10	Aug 10
6.379	<p>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:</p> <ul style="list-style-type: none"> <li>• Suitable containers should be used to hold the chemical wastes to avoid leakage or spillage during storage, handling and transport.</li> <li>• Chemical waste containers should be suitably labelled, to notify and warn the personnel who are handling the wastes, to avoid accidents.</li> <li>• Storage area should be selected at a safe location on site and adequate space should be allocated to the storage area.</li> </ul>	All construction sites	@	@	V
6.380	<p><i>Construction Works in Close Proximity of Storm Drains or Seafront</i></p> <p>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.</p> <ul style="list-style-type: none"> <li>• The use of less or smaller construction plants may be specified to reduce the disturbance to the storm water courses or marine environment.</li> <li>• 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.</li> <li>• Stockpiling of construction materials and dusty materials should be covered and located away from any water courses.</li> </ul>	All construction sites	@	@	V

EIA Ref.	Recommended Mitigation Measures	Location of the measure	Implementation Status		
			Jun 10	Jul 10	Aug 10
	<ul style="list-style-type: none"> <li>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.</li> <li>Construction activities, which generate large amount of wastewater, should be carried out in a distance away from the waterfront, where practicable.</li> <li>Proper shoring may need to be erected in order to prevent soil/mud from slipping into the storm culvert or sea.</li> </ul>				
<b>D Waste Management</b>					
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	V	V
9.109	All waste materials should be segregated into categories covering: <ul style="list-style-type: none"> <li>excavated materials suitable for reuse on-site;</li> <li>excavated materials suitable for public filling facilities;</li> <li>remaining C&amp;D waste for landfill;</li> <li>chemical waste; and</li> <li>general refuse for landfill.</li> </ul>		V	V	V
9.113	Sort C&D waste from demolition of existing facilities to recover recyclable portions such as metals;		N/A	N/A	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.		V	@	@

EIA Ref.	Recommended Mitigation Measures	Location of the measure	Implementation Status		
			Jun 10	Jul 10	Aug 10
9.113	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.	All construction sites	V	V	V
	Any unused chemicals or those with remaining functional capacity shall be recycled.		V	V	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	V	V
	Training of site personnel in proper waste management and chemical waste handling procedures.		V	V	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	V	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	V	V
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"		V	V	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	V	V

EIA Ref.	Recommended Mitigation Measures	Location of the measure	Implementation Status		
			Jun 10	Jul 10	Aug 10
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.	All construction sites	V	V	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	V	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
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	N/A	N/A

EIA Ref.	Recommended Mitigation Measures	Location of the measure	Implementation Status		
			Jun 10	Jul 10	Aug 10
<b>E    Terrestrial Ecology</b>					
10.93	To implement effective noise mitigation measures as recommended in Section 4 of EIA.	All construction sites	V	V	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.		@	@	V
10.95	Fences/hoardings should be erected and installed along the boundary of the works areas.		V	V	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.		@	@	@
<b>F    Landscape and Visual</b>					
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	N/A	N/A
	Existing trees to be retained on site should be carefully protected during construction.		@	@	@
	Trees unavoidably affected by the works should be transplanted where practical.		V	V	V
	Compensatory tree planting should be provided to compensate for felled trees.		N/A	N/A	N/A
	Control of night-time lighting.		V	V	V

EIA Ref.	Recommended Mitigation Measures	Location of the measure	Implementation Status		
			Jun 10	Jul 10	Aug 10
Table 13.7	Erection of decorative screen hoarding compatible with the surrounding setting.	All construction sites	N/A	N/A	N/A
<b>G Marine Ecology</b>					
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	@	@	@
<b>H Hazard to Life</b>					
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	V	V

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

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## **APPENDIX D**

### **Summary of Action and Limit Levels**

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## Appendix D - Summary of Action and Limit Levels

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

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

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

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

Table 3 – Action and Limit Levels for Construction Noise

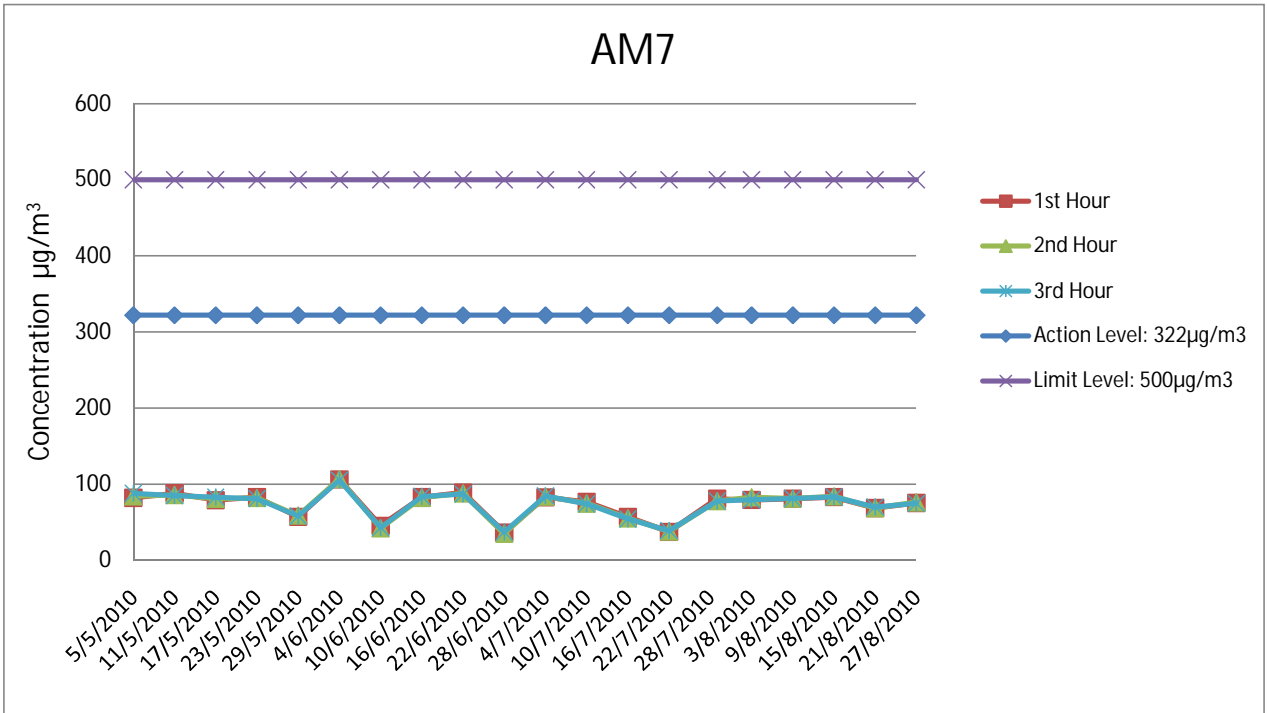
Time Period	Monitoring Station	Action Level	Limit Level
0700-1900 hrs on normal weekdays	NM6	When one documented complaint is received from any one of the sensitive receivers	75 dB(A)
1900-2300 hrs on normal weekdays, 0700-2300 hrs on General Holidays and			70 dB(A)
2300-0700 hrs of next day on all days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

---

## **APPENDIX E**

### **Graphical Presentation of Air Quality Monitoring Results over Past Four Months**

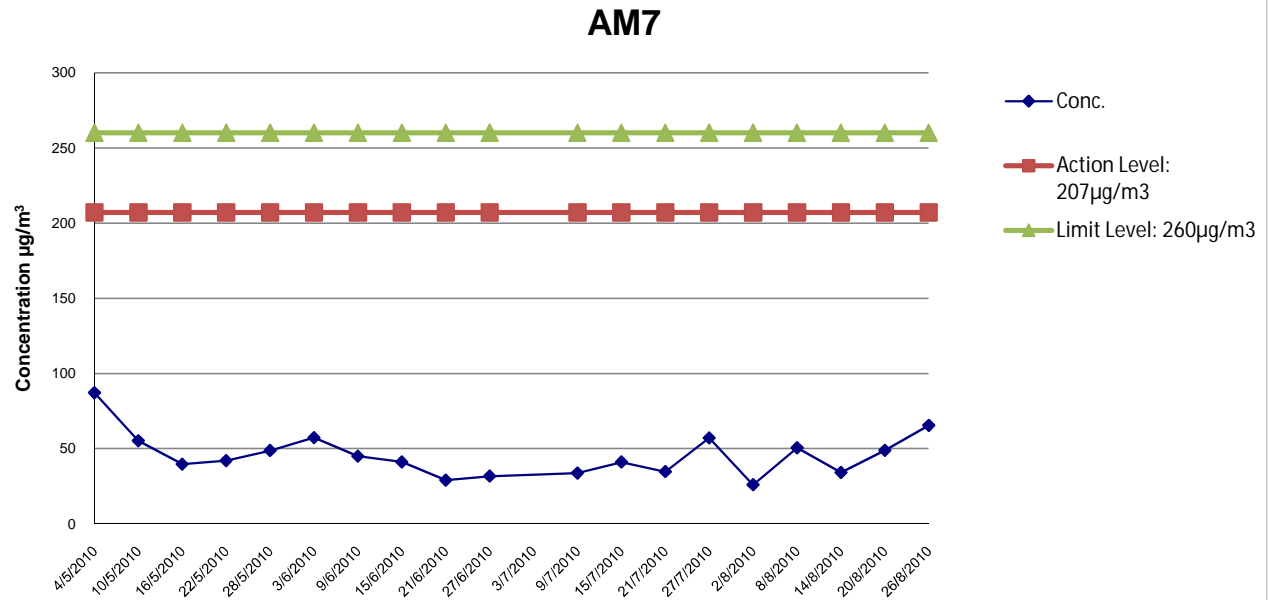
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**HATS Stage 2A - Construction of Interconnection  
Tunnel and Diaphragm Wall for Main Pumping Station  
at SCISTW**

**Graphical Presentation of 1-hour TSP Monitoring  
Results over Past Four Months**

SCALE	N.T.S.	DATE	Sep-10
CHECK	ENFL	DRAWN	LCHC
JOB NO.	60143571	APPENDIX No. E	Rev. -



**HATS Stage 2A - Construction of Interconnection  
Tunnel and Diaphragm Wall for Main Pumping Station  
at SCISTW**

**Graphical Presentation of 24-hour TSP Monitoring  
Results over Past Four Months**

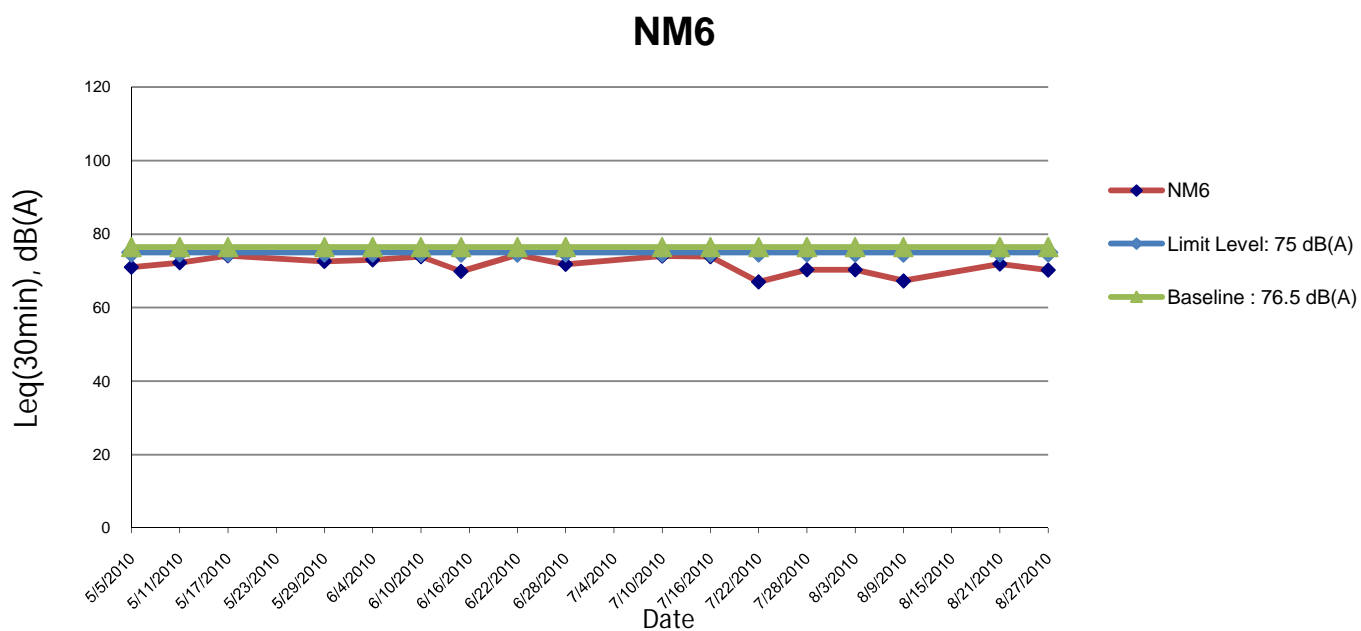
SCALE	N.T.S.	DATE	Sep-10
CHECK	ENFL	DRAWN	LCHC
JOB NO.	60143571	APPENDIX No. E	Rev. -

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## **APPENDIX F**

### **Graphical Presentation of Noise Monitoring Results over Past Four Months**

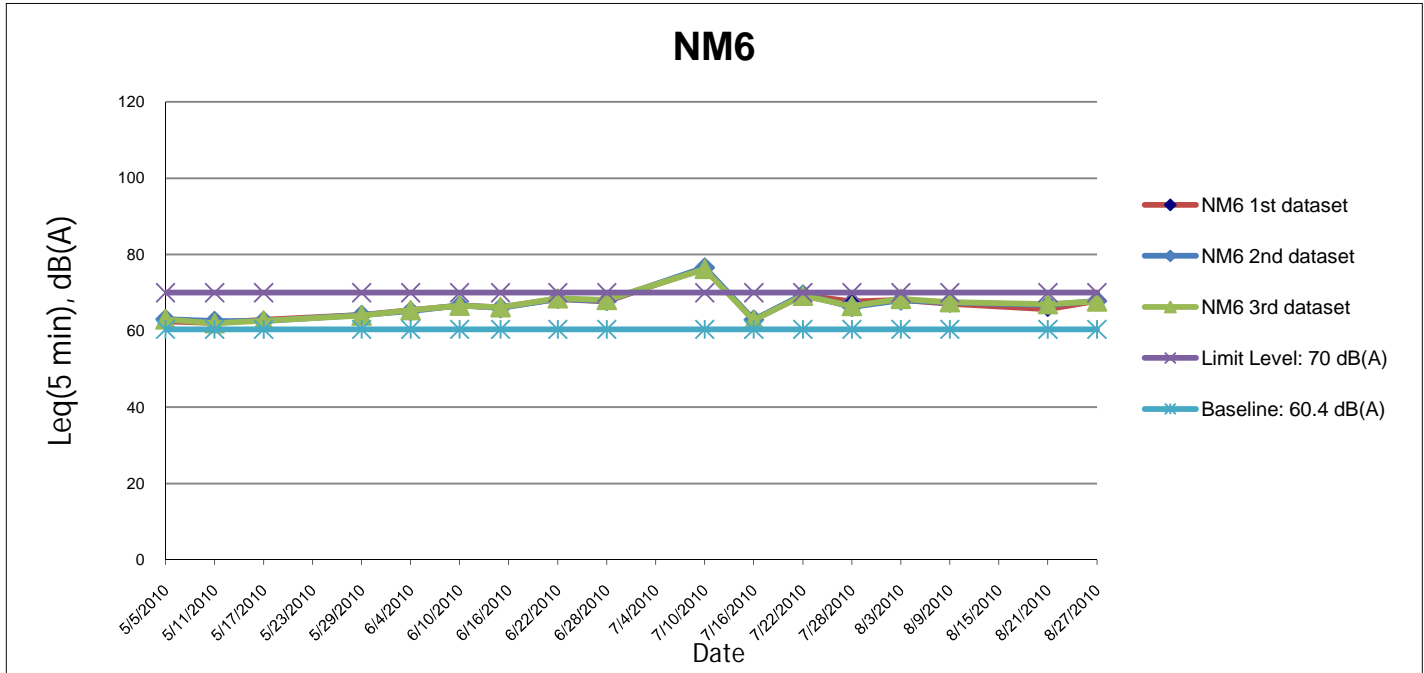
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**HATS Stage 2A - Construction of Interconnection Tunnel  
and Diaphragm Wall for Main Pumping Station at  
SCISTW**

**Graphical Presentation of Daytime Noise Monitoring  
Results on Normal Weekdays over Past Four Months**

SCALE	N.T.S.	DATE	Sep-10
CHECK	ENFL	DRAWN	LCHC
JOB NO.	60143571	APPENDIX No.	Rev.
		F	-



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

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## **APPENDIX G**

### **Cumulative Statistics of Exceedances, Complaints, Notification of Summons and Successful Prosecutions**

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### Cumulative statistics on Exceedances

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

**Remarks:** Exceedances which are not project-related are not presented in this table.

### Cumulative statistics on Complaints, Notifications of Summons and Successful Prosecutions

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

## *APPENDIX D*

### *EM&A Quarterly 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**

**QUARTERLY SUMMARY ENVIRONMENTAL MONITORING  
AND AUDIT (EM&A) REPORT (NO.3) –  
JUNE - AUGUST 2010**

PREPARED FOR  
**ATAL ENGINEERING LTD**

Quality Index Date	Reference No.	Prepared By	Certified By
15 September 2010	TCS00502/09/600/R0068v2		
		Nicola Hon Environmental Consultant	T.W. Tam Environmental Team Leader

Version	Date	Description
1	13 Sep 2010	First Submission
2	15 Sep 2010	Amended against IEC's comments on 15 Sep 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/D. 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 According to the Project EM&A Manual, baseline monitoring was carried out to determine the ambient environmental conditions i.e. air quality and noise before commencement of the Projects. The Baseline Report summarized the key findings and the rationale behind determining a set of Action and Limit Levels (A/L Levels) from the baseline data. It has been verified by the Independent Environmental Checker (IEC) and submitted to EPD for endorsement before commencement of impact monitoring.
- ES.04 According to the EM&A Manual requirements, quarterly summary EM&A report should be prepared every three months. This is the **3<sup>rd</sup>** Quarterly Summary EM&A Report to present the monitoring results and inspection findings for the period from **1 June** to **31 August 2010**.

## ENVIRONMENTAL MONITORING AND AUDIT ACTIVITIES

- ES.05 Environmental monitoring activities under the EM&A program in this Reporting Quarter are summarized in the following table.

Issues	Environmental Monitoring Parameters / Inspection	Occasions undertaken by the Contract DE/2009/02
Air Quality	1-hour TSP	48
	24-hour TSP	16
Inspection Audit	ET Regular Environmental Site Inspection	13
	IEC Monthly Environmental Site Audit	3

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

- ES.06 No exceedance of air quality or construction noise monitoring was recorded in this Reporting Quarter. 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.07 No environmental complaint was recorded or received in this Reporting Quarter. The statistics of environmental complaint are summarized in the following table.

Reporting Period	Environmental Complaint Statistics		
	Frequency	Cumulative	Complaint Nature
1–30 June 2010	0	0	N/A
1-31 July 2010	0	0	N/A
1-31 August 2010	0	0	N/A

#### NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTIONS

ES.08 No environmental summons or successful prosecutions were recorded in this Reporting Quarter. The statistics of environmental complaint are summarized in the following tables.

Reporting Period	Environmental Summons Statistics		
	Frequency	Cumulative	Complaint Nature
1–30 June 2010	0	0	N/A
1-31 July 2010	0	0	N/A
1-31 August 2010	0	0	N/A

Reporting Period	Environmental Prosecution Statistics		
	Frequency	Cumulative	Complaint Nature
1–30 June 2010	0	0	N/A
1-31 July 2010	0	0	N/A
1-31 August 2010	0	0	N/A

#### REPORTING CHANGE

ES.09 There are no reporting changes in this Reporting Quarter.

#### SITE INSPECTION BY EXTERNAL PARTIES

ES.10 No site inspection was undertaken by external parties i.e. EPD or AFCD during this Reporting Quarter.

#### FUTURE KEY ISSUES

ES.11 During wet season, special attention should be paid on the potential water quality impact and the quality of discharge water. As informed by the Contractor, a sedimentation tank was installed at DOU 1 portion 6 on 31 July 2010. On the other hand, water quality 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 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/D. 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.

As baseline conditions had already been monitored by other current contracts, AUES was required to present the Project Baseline Report only by drawing relevant findings from other approved baseline reports without undertaking the relevant monitoring. The Baseline Report summarized the key findings and the rationale behind determining a set of Action and Limit Levels (A/L Levels) from the baseline data as provided by other current contracts. It has been submitted and verified by Independent Environmental Checker (IEC) and endorsed by EPD before impact monitoring commencement.

This is the **3<sup>rd</sup>** quarterly summary EM&A report presenting the monitoring results and inspection findings for the reporting period from **1 June to 31 August 2010** under the Project.

### 1.2 REPORT STRUCTURE

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

<b>SECTION 1</b>	<b>INTRODUCTION</b>
<b>SECTION 2</b>	<b>PROJECT ORGANIZATION AND CONSTRUCTION PROGRESS</b>
<b>SECTION 3</b>	<b>SUMMARY OF MONITORING REQUIREMENTS</b>
<b>SECTION 4</b>	<b>IMPACT MONITORING RESULTS</b>
<b>SECTION 5</b>	<b>WASTE MANAGEMENT</b>



<b>SECTION 6</b>	<b>SITE INSPECTIONS</b>
<b>SECTION 7</b>	<b>ENVIRONMENTAL COMPLAINTS AND NON-COMPLIANCE</b>
<b>SECTION 8</b>	<b>IMPLEMENTATION STATUES OF MITIGATION MEASURES</b>
<b>SECTION 9</b>	<b>CONCLUSIONS AND RECOMMENDATION</b>

## 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 construction programs are enclosed in [Annex C](#) and the major construction activities undertaken in this Reporting Quarter are listed below:-

- Piling works at DOU1 & 2;
- T&C for Prototype cover for tank 43; and
- Cover installation for tank 33, 35 & 37

### 2.3 SUMMARY OF ENVIRONMENTAL SUBMISSIONS

Summary of the relevant permits, licences, and/or notifications on environmental protection for this Project in this Reporting Quarter 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)	Notified EPD on 9 March 2010
2	Chemical waste Producer Registration	Waste producer number: 5213-269-A2605-01
3	Water Pollution Control Ordinance (Discharge License)	Ref: WT00006432-2010 Expiry on 30 April 2015
4	Billing Account for Disposal of Construction Waste (account number: 7009673)	Approved by EPD on 9 November 2009
5	Construction Noise Permit for steel pile during 07:00-19:00 (ref.: GW-RW001-10)	Issued on 23 April 2010 Valid on 1 May 2010 Expiry on 31 October 2010
6	Construction Noise Permit (ref.: GW-RW0194-10)	Issued on 23 April 2010 Valid on 1 May 2010 Expiry on 31 October 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	<ul style="list-style-type: none"> <li>• 1-hour TSP Monitoring by Real-Time Portable Dust Meter; and</li> <li>• 24-hour TSP Monitoring by High Volume Air Sampler.</li> </ul>

#### 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 stations are 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* 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 shared with two concurrent projects, so only air monitoring equipments are proposed by the ET for the impact EM&A program are listed below:

**Table 3-3 Air Quality Monitoring Equipments Used in EM&A Program**

Equipment	Model
<b><u>Air Quality Monitoring</u></b>	
High Volume Sampler – <b><u>24 hour TSP</u></b>	Grasby Anderson GMWS 2310 HVS
Calibration Kit – <b><u>24-hour TSP</u></b>	TISCH Model TE-5025A
Portable dust meter – <b><u>1-hour TSP</u></b>	TSI DustTrak Model 8520 / Sibata LD-3 Laser Dust Meter

The valid calibration certificates in this period are shown in relevant monthly EM&A report.

### 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:

- An anodized aluminum shelter;
- A 8”x10” stainless steel filter holder;
- A blower motor assembly;
- A continuous flow/pressure recorder;
- A motor speed-voltage control/elapsed time indicator;
- A 7-day mechanical timer, and
- A power supply of 220v/50 hz

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° light scattering. The 1-hour TSP monitor consisted of the following:

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

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. The meteorological data during the reporting quarter are summarized in [Annex F](#).

### 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 3-4** and **3-5** as below.

**Table 3-4 Action and Limit Levels for Air Quality Monitoring**

Monitoring Stations	Action Level ( $\mu\text{g}/\text{m}^3$ )		Limit Level ( $\mu\text{g}/\text{m}^3$ )	
	1-hour	24-hour	1-hour	24-hour
AM6	346	196	500	260
AM7	322	207	500	260
AM8	307	158	500	260

**Table 3-5 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

## 4 IMPACT MONITORING RESULTS

The impact EM&A program was carried out by the ET in compliance with the project EM&A Manual in the Reporting Quarter. The impact monitoring schedules and the detail monitoring results are presented in respective Monthly EM&A Reports.

During this Reporting Quarter, there were a total of 16 and 48 events of 24-hour TSP and 1-hour TSP monitoring respectively for air quality undertaken at the designated monitoring station AM8. Environmental monitoring activities under the EM&A program in this Reporting Quarter are summarized in *Table 4-1*.

**Table 4-1 Environmental Monitoring Activities in the Quarter Month**

Location	Aspects	Environmental Monitoring Parameters	Occasions
AM8	Air Quality	1-hour TSP	48
		24-hour TSP	16

### 4.1 RESULTS OF AIR QUALITY MONITORING

The graphical plot of the 1-hour TSP and 24-hour TSP monitoring results are shown in *Annex G*.

In this Reporting Quarter, no exceedance was found both in 24-hour TSP and 1-hour TSP monitoring at AM8, all the results were well below the A/L levels. No NOEs were issued to notify IEC, Contractor and RE in this Reporting Quarter. The results for 24-hour and 1-hour TSP are summarized in *Tables 4-2*.

**Table 4-2 Summary of 24-hour and 1-hour TSP Monitoring Results – AM8 as Monitored by DE/2009/02**

Date	24-hour TSP ( $\mu\text{g}/\text{m}^3$ )	1-hour TSP ( $\mu\text{g}/\text{m}^3$ )				
		Date	Start Time	1 <sup>st</sup> hour measured	2 <sup>nd</sup> hour measured	3 <sup>rd</sup> hour measured
1-Jun-10	56	2-Jun-10	13:15	63	55	68
7-Jun-10	54	8-Jun-10	13:30	52	60	65
12-Jun-10	95	14-Jun-10	13:17	49	78	62
18-Jun-10	34	19-Jun-10	13:07	39	63	55
23-Jun-10	30	24-Jun-10	09:07	38	57	42
29-Jun-10	32	30-Jun-10	09:02	51	70	62
5-Jul-10	42	6-Jul-10	13:04	48	65	57
10-Jul-10	28	12-Jul-10	13:24	59	82	73
16-Jul-10	32	17-Jul-10	14:00	48	68	59
22-Jul-10	13	23-Jul-10	09:07	24	37	33
28-Jul-10	18	29-Jul-10	09:07	15	31	27
3-Aug-10	49	4-Aug-10	13:17	42	59	53
9-Aug-10	39	10-Aug-10	13:12	23	39	32
14-Aug-10	47	16-Aug-10	13:07	43	52	46
20-Aug-10	43	21-Aug-10	13:00	59	51	55
26-Aug-10	10	27-Aug-10	13:07	63	85	71
Average	39	Average		53		
Min	10	Min		15		
Max	95	Max		85		

### 4.2 RESULTS OF CONSTRUCTION NOISE MONITORING

The construction noise monitoring at the identified monitoring locations NM5 and NM6 were undertaken by concurrent Project DC/2007/23 and DC/2009/05. The results of construction noise monitoring at Locations NM5 and NM6 could be referred to Monthly EM&A Report (March, April and May 2010) of DSD Project DC/2007/23 and DC/2009/05.

## 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 Quarter are summarized in [Table 5-1](#) and [5-2](#) and the Monthly Summary Waste Flow Table is shown in [Annex H](#). 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
	Jun 10	Jul 10	Aug 10	
C&D Materials (Inert) (m <sup>3</sup> )	0	0	0	NA
Reused in this Contract (Inert) (m <sup>3</sup> )	0	0	0	NA
Reused in other Projects (Inert) (m <sup>3</sup> )	0	0	0	NA
Disposal as Public Fill (Inert) (m <sup>3</sup> )	0	500	80	Tuen Mun Area 38

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

Type of Waste	Quantity			Disposal Location
	Jun 10	Jul 10	Aug 10	
Recycled Metal (kg)	0	0	0	NA
Recycled Paper / Cardboard Packing (kg)	0	0	0	NA
Recycled Plastic (kg)	0	0	0	NA
Chemical Wastes (kg)	0	0	0	NA
General Refuses (m <sup>3</sup> )	20	20	20	NENT

- 5.01 There was no site effluent discharged but the estimated monthly volume of surface runoff was less than 50m<sup>3</sup> 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. In this Reporting Quarter, a total of 13 site inspections were carried out with the Representatives of the Engineer and the Contractor to evaluate the site environmental performance. No non-compliance was noted in this Reporting Quarter.

Observations for the site inspections and monthly audits within this Reporting Quarter are summarized in [Table 6-1](#).

**Table 6-1 Observations for weekly site inspection in the Reporting Quarter**

Date	Findings / Deficiencies	Follow-Up Status
2 June 2010	<ul style="list-style-type: none"> <li>Chemical containers were observed at the edge of the plant; the contractor was reminded to provide proper location for chemical storage.</li> </ul>	Chemical container was found to be removed during site inspection on 9 June 2010.
9 June 2010	<ul style="list-style-type: none"> <li>Housekeeping should be improved, C&amp;D material scattered at Portion 2 was observed, the contractor was reminded to maintain the site clean and tidy.</li> </ul>	C&D material at Portion 2 was found to be removed during site inspection on 17 June 2010.
17 June 2010	<ul style="list-style-type: none"> <li>Stagnant water cumulated inside the drip tray was observed, the contractor was reminded to clean to prevent mosquito breeding and prevent overflow from the drip tray.</li> <li>Free standing chemical containers without drip tray was observed, the contractor was reminded to provide drip tray for all chemical containers.</li> </ul>	Stagnant water cumulated inside the drip tray and free standing chemical containers without drip tray was found to be removed during site inspection on 24 June 2010
24 June 2010	<ul style="list-style-type: none"> <li>No environmental issue was observed during the site inspection.</li> </ul>	N/A
30 June 2010	<ul style="list-style-type: none"> <li>As a reminder, the place for cement mixing should be covered 3- sided and the top with tarpaulin sheet when the process takes place.</li> </ul>	N/A
7 July 2010	<ul style="list-style-type: none"> <li>Free standing chemical container without drip tray was observed at DOU 1, the contractor was reminded to provide drip tray for all chemical containers.</li> </ul>	Chemical container was found to be removed during site inspection on 14 July 2010.
14 July 2010	<ul style="list-style-type: none"> <li>The soil stockpiled on the site should be sprayed with water or covered with tarpaulin sheets in order to minimize the dust nuisance and surface runoff.</li> <li>As a general reminder, the contractor was reminded to set up the sediment tank as soon as possible for the water discharge in the future.</li> </ul>	The stockpile was found to be removed during site inspection on 21 July 2010.
21 July 2010	<ul style="list-style-type: none"> <li>No environmental issue was observed during the site inspection.</li> </ul>	N/A
28 July 2010	<ul style="list-style-type: none"> <li>Free standing chemical containers without drip tray were observed, the Contractor was reminded to provide drip tray for all chemical containers or placed them in proper storage area.</li> <li>As a general reminder, the contractor was reminded to set up the sediment tank as soon as possible for the water discharge in the future.</li> </ul>	The chemical waste practice shall be improved as observed during the site inspection on 2 August 2010.



2 August 2010	<ul style="list-style-type: none"> <li>Free standing chemical containers without drip tray and label was observed, the Contractor was reminded to provide drip tray and proper label for all chemical containers.</li> <li>Stagnant water cumulated in the site area was observed, the contractor was reminded to clean to prevent mosquito breeding.</li> </ul>	The deficiencies shall be improved as observed during the site inspection on 11 August 2010.
11 August 2010	<ul style="list-style-type: none"> <li>Free standing chemical containers without drip tray was observed, the Contractor was reminded to provide drip tray for all chemical containers.</li> <li>C&amp;D waste scattered at the site area was observed, housekeeping should be improve to maintain the site area clean and tidy.</li> </ul>	The deficiencies shall be further improved as observed during the site inspection on 18 August 2010.
18 August 2010	<ul style="list-style-type: none"> <li>Free standing chemical containers without drip tray and label was observed, the Contractor was reminded to provide drip tray and proper label for all chemical containers.</li> <li>C&amp;D waste scattered at the site area was observed, housekeeping should be improve to maintain the site area clean and tidy</li> </ul>	Housekeeping on site was improved, however, the chemical waste practice shall be improved as observed during the site inspection on 25 August 2010.
25 August 2010	<ul style="list-style-type: none"> <li>Stagnant water cumulated in the site area, the contractor was reminded to clean and provide the sand bags to prevent surface runoff discharged without treatment.</li> <li>Free standing chemical containers without drip tray and label was observed, the Contractor was reminded to provide drip tray and proper label for all chemical containers.</li> <li>As a reminder, C&amp;D waste should be sorted before disposal.</li> </ul>	To be followed.

## 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
1–30 June 2010	0	0	N/A
1-31 July 2010	0	0	N/A
1-31 August 2010	0	0	N/A

**Table 7-2 Statistical Summary of Environmental Summons**

Reporting Period	Environmental Summons Statistics		
	Frequency	Cumulative	Complaint Nature
1–30 June 2010	0	0	N/A
1-31 July 2010	0	0	N/A
1-31 August 2010	0	0	N/A

**Table 7-3 Statistical Summary of Environmental Prosecution**

Reporting Period	Environmental Prosecution Statistics		
	Frequency	Cumulative	Complaint Nature
1–30 June 2010	0	0	N/A
1-31 July 2010	0	0	N/A
1-31 August 2010	0	0	N/A

## 8 IMPLEMENTATION STATUS OF MITIGATION MEASURES

The environmental mitigation measures that recommended in the Project Environmental Monitoring and Audit Manual covered the issues of dust, noise and waste and they are summarized as following:

### **Dust Mitigation Measures**

- (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 and 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 filter 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 Measures**

- (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 minimize 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 minimize 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/m<sup>2</sup> should be used to protect nearby NSRs if necessary.
- (k) The Contractor should devise, arrange methods of working and carry out the works in such manner as to minimise noise impacts on the surrounding environment, and should provide experienced personnel with suitable training to ensure that these measures 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 Quater are summarized in [Table 8-1](#).

**Table 8-1 Environmental Mitigation Measures**

Issues	Environmental Mitigation Measures
Water Quality	<ul style="list-style-type: none"> <li>• Wastewater were appropriately treated by treatment facilities;</li> <li>• Drainage channels were provided to convey run-off into the treatment facilities; and</li> <li>• Drainage systems were regularly and adequately maintained.</li> </ul>
Air Quality	<ul style="list-style-type: none"> <li>• Regular watering to reduce dust emissions from all exposed site surface, particularly during dry weather;</li> <li>• Frequent watering for particularly dusty construction areas and areas close to air sensitive receivers;</li> <li>• Cover all excavated or stockpile of dusty material by impervious sheeting or sprayed with water to maintain the entire surface wet;</li> <li>• Public roads around the site entrance/exit had been kept clean and free from dust; and</li> <li>• Tarpaulin covering of any dusty materials on a vehicle leaving the site.</li> </ul>
Noise	<ul style="list-style-type: none"> <li>• Good site practices to limit noise emissions at the sources;</li> <li>• Use of quiet plant and working methods;</li> <li>• Use of site hoarding or other mass materials as noise barrier to screen noise at ground level of NSRs;</li> <li>• Use of shrouds/temporary noise barriers to screen noise from relatively static PMEs;</li> <li>• Scheduling of construction works outside school examination period in critical area; and</li> <li>• Alternative use of plant items within one worksite, where practicable.</li> </ul>
Waste and Chemical Management	<ul style="list-style-type: none"> <li>• 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;</li> <li>• Waste arising should be kept to a minimum and be handled, transported and disposed of in a suitable manner;</li> <li>• The Contractor should adopt a trip ticket system for the disposal of C&amp;D materials to any designed public filling facility and/or landfill; and</li> <li>• Chemical waste shall be handled in accordance with the Code of Practice on the Packaging, Handling and Storage of Chemical Wastes.</li> </ul>
General	<ul style="list-style-type: none"> <li>• The site was generally kept tidy and clean.</li> </ul>

## **9 CONCLUSIONS AND RECOMMENTATIONS**

### **9.1 CONCLUSIONS**

This is the **3<sup>rd</sup>** Quarterly Summary EM&A report covers the construction period from **1 June to 31 August 2010**.

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 documented complaint, notification of summons or successful prosecution was received.

**13** occasions of weekly site inspection had been carried out by the ET in this Reporting Quarterly. 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 Quarter.

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.

### **9.2 RECOMMENDATIONS**

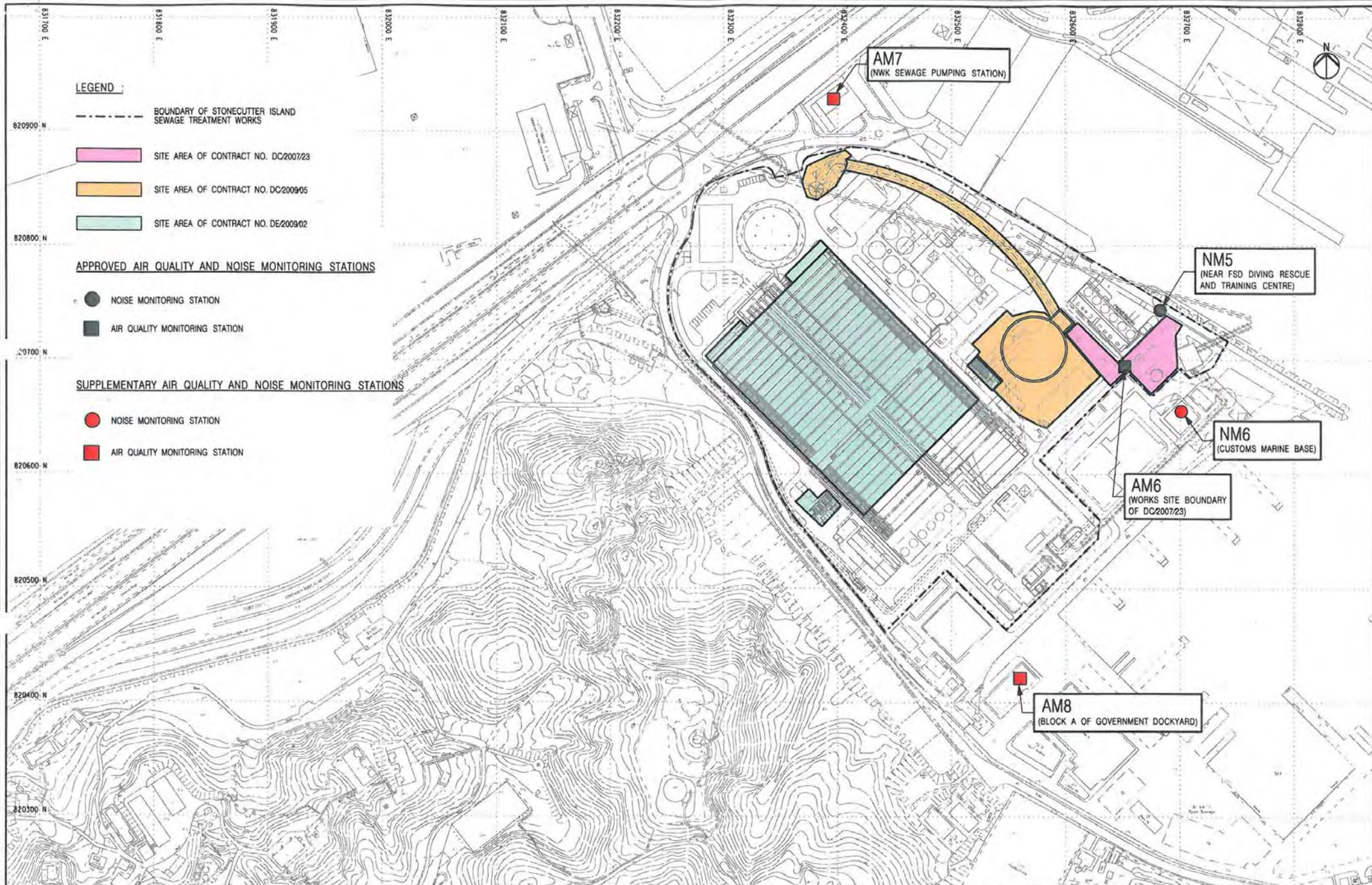
During wet season, special attention should be paid on the potential water quality impact and the quality of discharge water. As informed by the Contractor, a sedimentation tank was installed at DOU 1 portion 6 on 31 July 2010. On the other hand, water quality mitigation measures to avoid ingress of 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, the 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  
Project No.: DC0905 Contract No.: DC/2009/05  
Sketch No.: DC/2009/05/SK/0017

Sketch Title :  
LOCATIONS OF AIR AND NOISE MONITORING  
STATIONS AT STONECUTTER ISLAND SEWAGE  
TREATMENT WORKS

Scale : 1:3000 @ A3 Issue Date : 15-12-2009

Drawn: KH

Other  
Related  
Ref.:

Working Dwg. No.:  
N/A

Checked: WY

DAN No.: N/A  
Ref No.: N/A

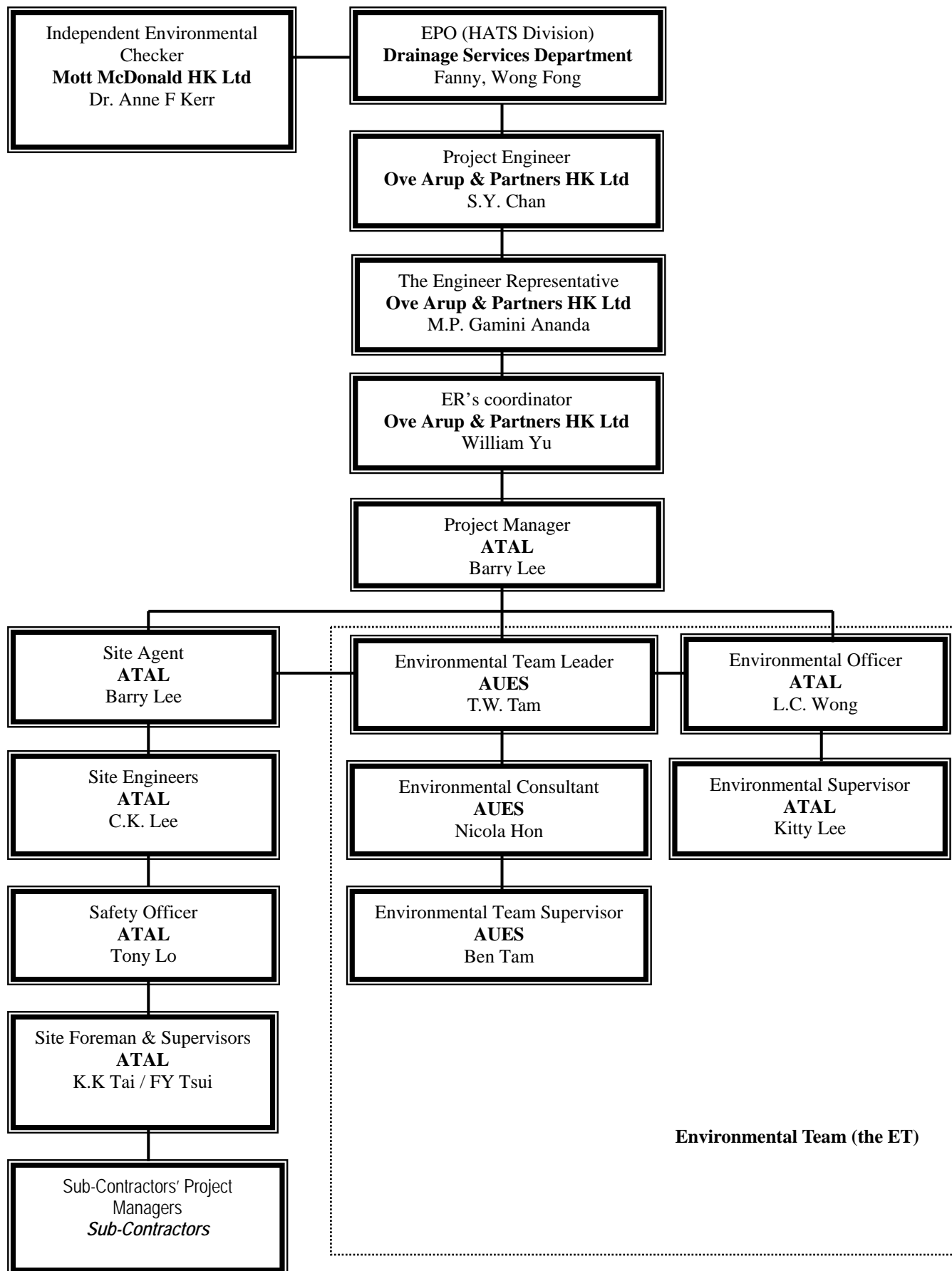
Approved: GA

In-D No.: N/A  
Other: N/A



## **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	The Engineer Representative	Mr. M.P. Gamini Ananda	2370-4311	2370-4377
OAP	ER'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/ F.Y Tsui	9367 3186	2565-7638
AUES	Environmental Team Leader	Mr. T.W. Tam	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 Hong Kong Ltd.  
ATAL (Main Contractor) – ATAL Engineering Ltd.  
AUES (ET) – Action-United Environmental Services & Consulting

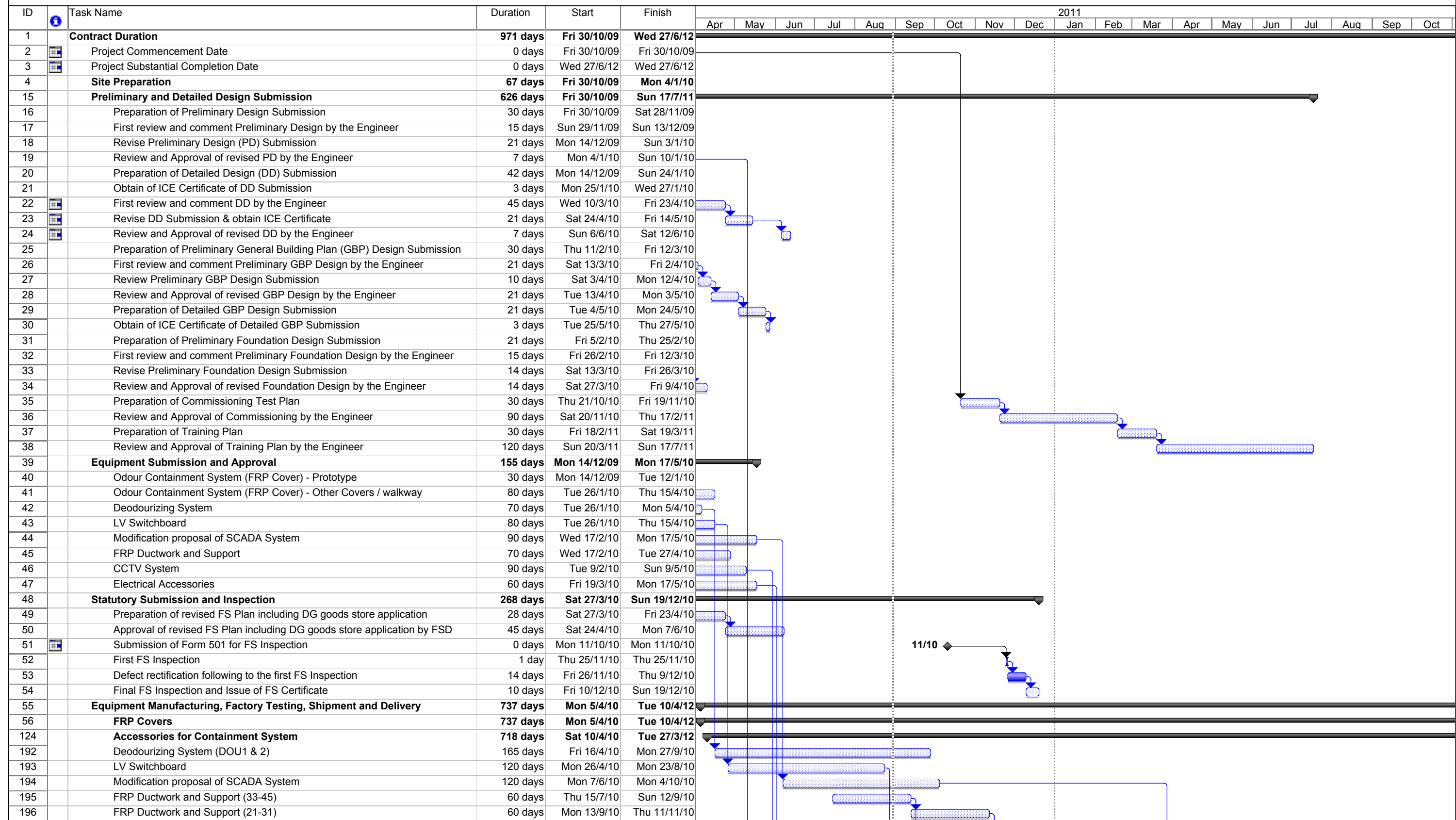
## **Annex C**

### **Master 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 (Aug10 to Oct10)

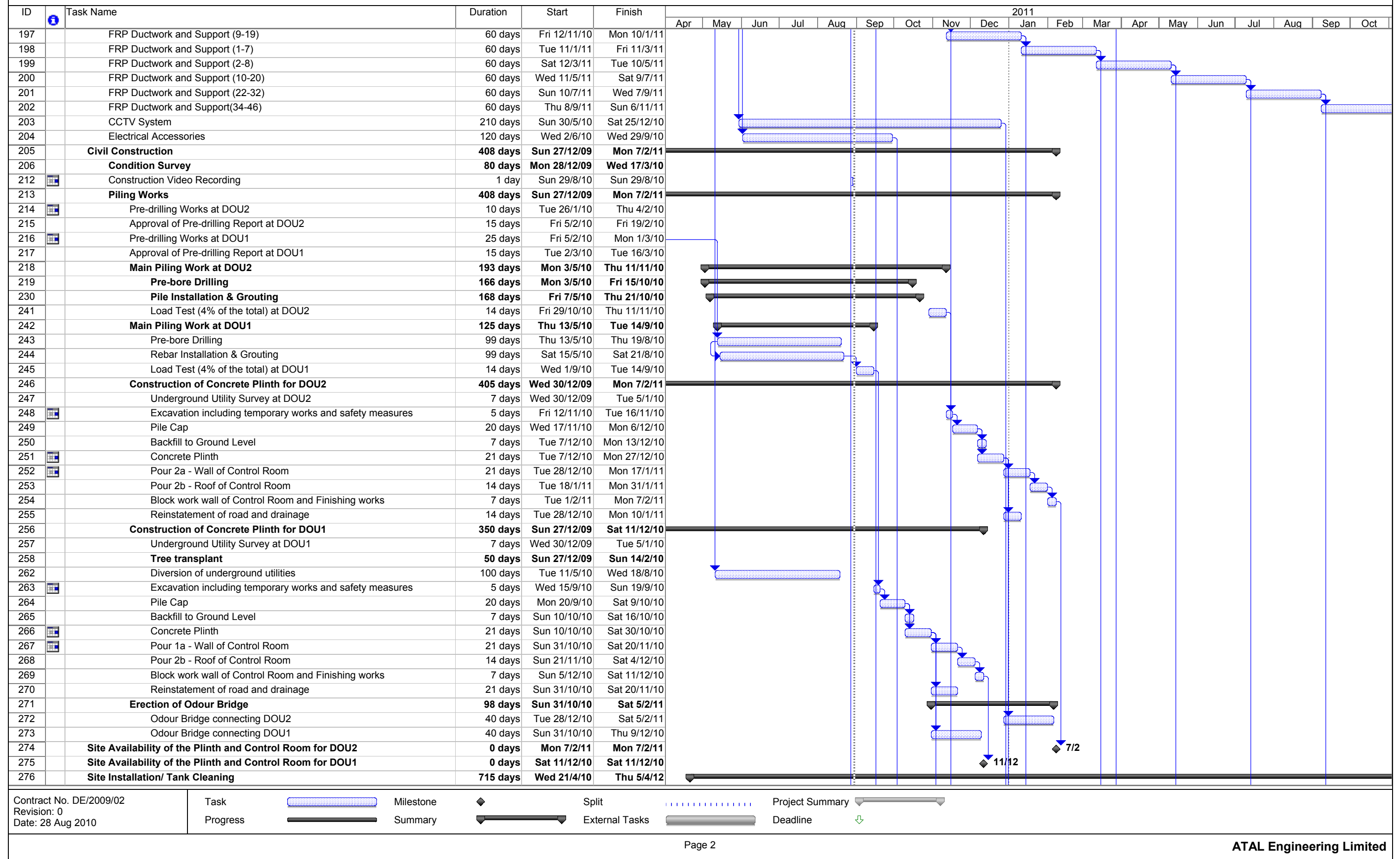
(Revision 0)



# 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 (Aug10 to Oct10)

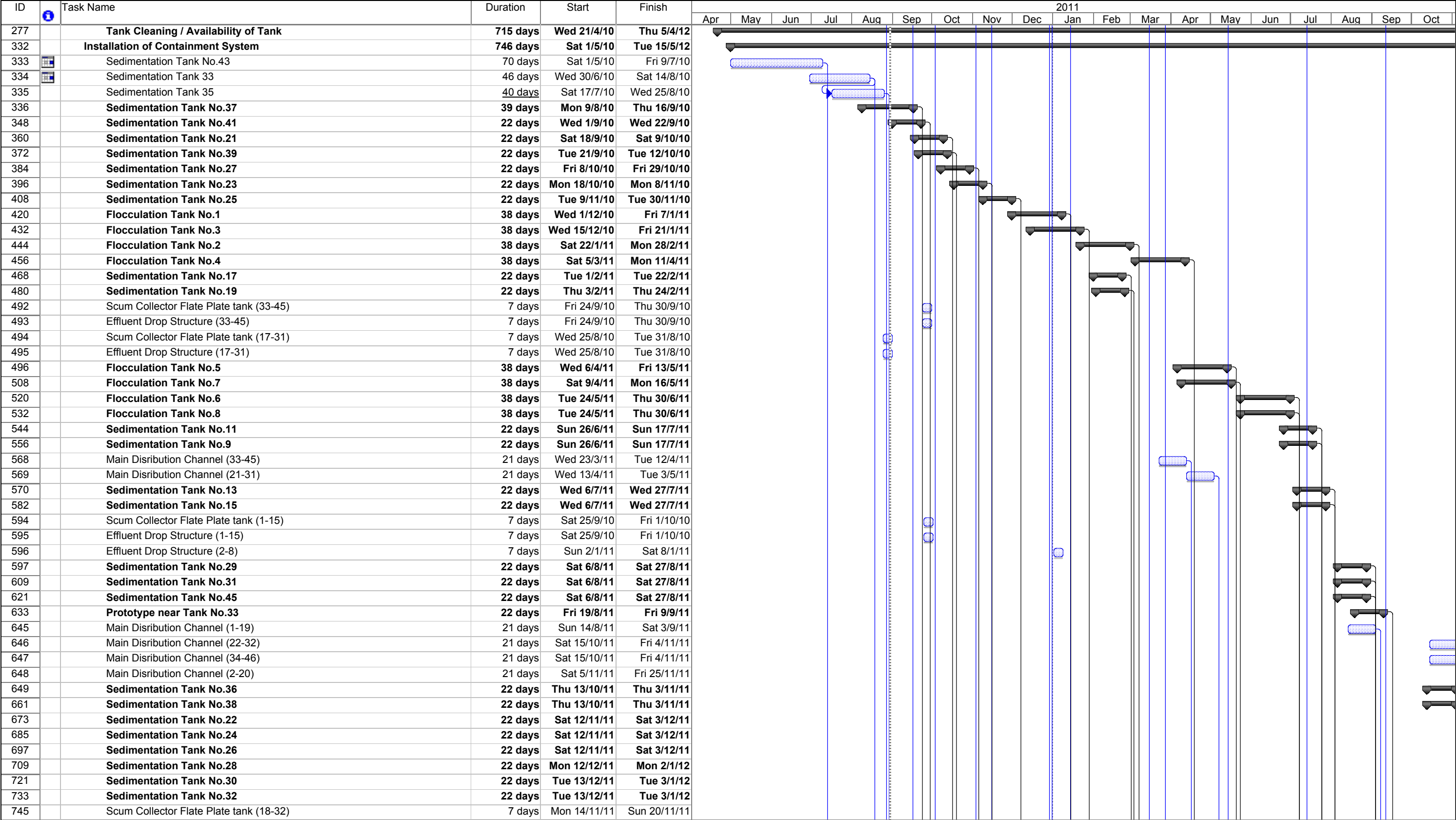
(Revision 0)



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 (Aug10 to Oct10)

(Revision 0)



Contract No. DE/2009/02  
Revision: 0  
Date: 28 Aug 2010

Task  
Progress

Milestone  
Summary

Split  
External Tasks

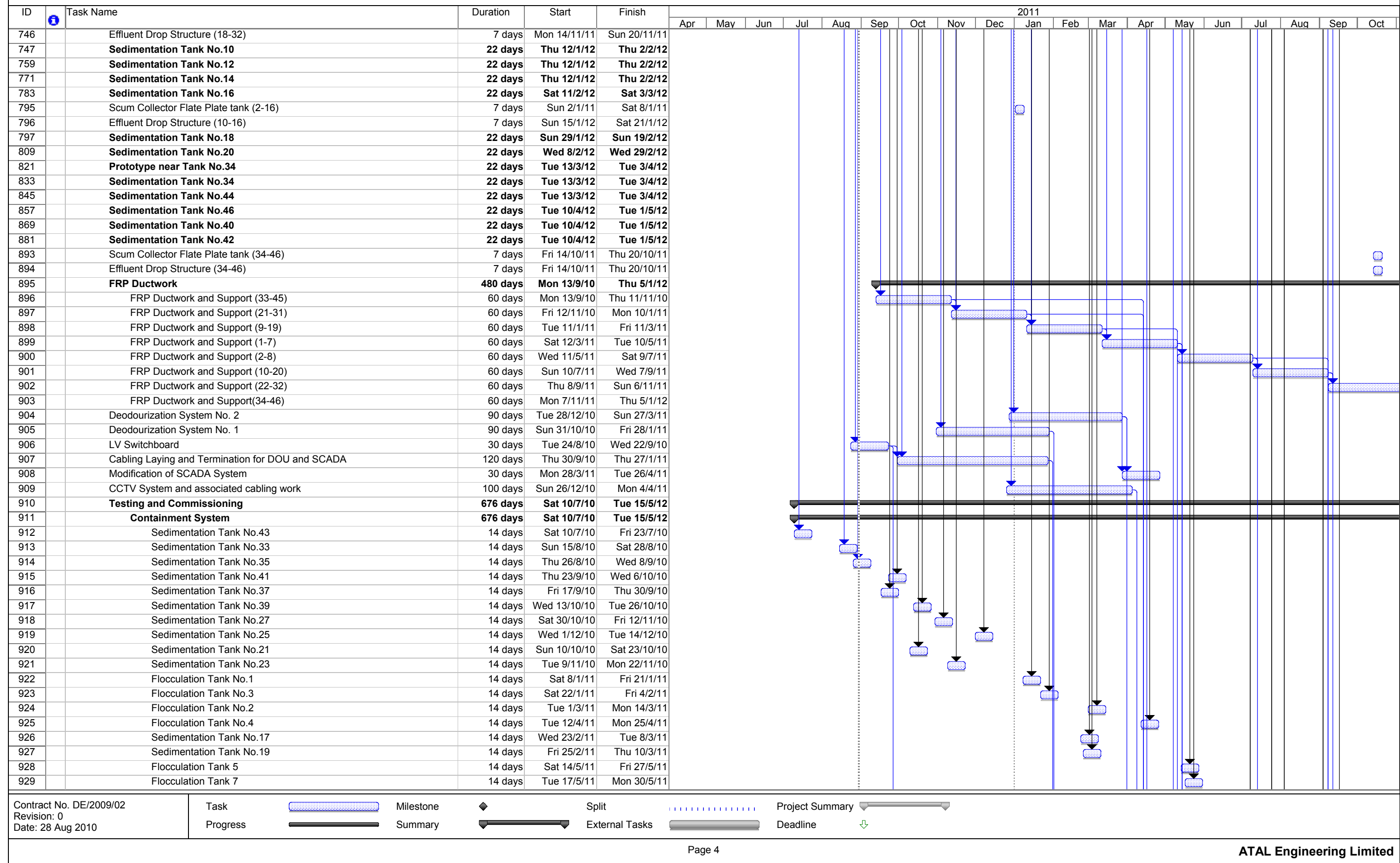
Project Summary  
Deadline



# 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 (Aug10 to Oct10)

(Revision 0)







**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 (Aug10 to Oct10)**  
(Revision 0)

ID	Task Name	Duration	Start	Finish	2011																	
					Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
930	Flocculation Tank 6	14 days	Fri 1/7/11	Thu 14/7/11																		
931	Flocculation Tank 8	14 days	Fri 1/7/11	Thu 14/7/11																		
932	Sedimentation Tank No 11	14 days	Mon 18/7/11	Sun 31/7/11																		
933	Sedimentation Tank No 9	14 days	Mon 18/7/11	Sun 31/7/11																		
934	Main Disribution Channel (33-45)	14 days	Wed 13/4/11	Tue 26/4/11																		
935	Main Disribution Channel (21-31)	14 days	Wed 4/5/11	Tue 17/5/11																		
936	Sedimentation Tank No 13	14 days	Thu 28/7/11	Wed 10/8/11																		
937	Sedimentation Tank No 15	14 days	Thu 28/7/11	Wed 10/8/11																		
938	Sedimentation Tank No 29	14 days	Sun 28/8/11	Sat 10/9/11																		
939	Sedimentation Tank No 31	14 days	Sun 28/8/11	Sat 10/9/11																		
940	Sedimentation Tank No 45	14 days	Sun 28/8/11	Sat 10/9/11																		
941	Prototype near Tank No.33	14 days	Sat 10/9/11	Fri 23/9/11																		
942	Main Disribution Channel (1-19)	14 days	Sun 4/9/11	Sat 17/9/11																		
943	Main Disribution Channel (22-32)	14 days	Sat 5/11/11	Fri 18/11/11																		
944	Main Disribution Channel (34-46)	14 days	Sat 5/11/11	Fri 18/11/11																		
945	Main Disribution Channel (2-20)	14 days	Sat 26/11/11	Fri 9/12/11																		
946	Sedimentation Tank No.36	14 days	Fri 4/11/11	Thu 17/11/11																		
947	Sedimentation Tank No.38	14 days	Fri 4/11/11	Thu 17/11/11																		
948	Sedimentation Tank No.22	14 days	Sun 4/12/11	Sat 17/12/11																		
949	Sedimentation Tank No.24	14 days	Sun 4/12/11	Sat 17/12/11																		
950	Sedimentation Tank No.26	14 days	Sun 4/12/11	Sat 17/12/11																		
951	Sedimentation Tank No.28	14 days	Tue 3/1/12	Mon 16/1/12																		
952	Sedimentation Tank No.30	14 days	Wed 4/1/12	Tue 17/1/12																		
953	Sedimentation Tank No.32	14 days	Wed 4/1/12	Tue 17/1/12																		
954	Sedimentation Tank No.10	14 days	Fri 3/2/12	Thu 16/2/12																		
955	Sedimentation Tank No.12	14 days	Fri 3/2/12	Thu 16/2/12																		
956	Sedimentation Tank No.14	14 days	Fri 3/2/12	Thu 16/2/12																		
957	Sedimentation Tank No.16	14 days	Sun 4/3/12	Sat 17/3/12																		
958	Sedimentation Tank No.18	14 days	Sun 5/2/12	Sat 18/2/12																		
959	Sedimentation Tank No.20	14 days	Thu 1/3/12	Wed 14/3/12																		
960	Prototype near Tank No.34	14 days	Wed 4/4/12	Tue 17/4/12																		
961	Sedimentation Tank No.34	14 days	Wed 4/4/12	Tue 17/4/12																		
962	Sedimentation Tank No.44	14 days	Wed 4/4/12	Tue 17/4/12																		
963	Sedimentation Tank No.46	14 days	Wed 2/5/12	Tue 15/5/12																		
964	Sedimentation Tank No.40	14 days	Wed 2/5/12	Tue 15/5/12																		
965	Sedimentation Tank No.42	14 days	Wed 2/5/12	Tue 15/5/12																		
966	LV Switchboard	14 days	Thu 23/9/10	Wed 6/10/10																		
967	Power Energization	0 days	Thu 27/1/11	Thu 27/1/11																		
968	SCADA System	21 days	Thu 14/4/11	Wed 4/5/11																		
969	Deodourization System No. 2	17 days	Mon 28/3/11	Wed 13/4/11																		
970	Deodourization System No. 1	17 days	Sat 29/1/11	Mon 14/2/11																		
971	CCTV System	14 days	Tue 5/4/11	Mon 18/4/11																		
972	System Performance Test	244 days	Thu 14/4/11	Tue 13/12/11																		
973	Deodourization System No. 2	244 days	Thu 14/4/11	Tue 13/12/11																		
974	Sedimentation Tank (33-45, Odd Number)	7 days	Thu 14/4/11	Wed 20/4/11																		
975	Sedimentation Tank (9 -31, Odd Number)	7 days	Thu 14/4/11	Wed 20/4/11																		
976	Flocculation Tank (odd number)	7 days	Wed 11/5/11	Tue 17/5/11																		
977	Inlet Works	7 days	Mon 7/11/11	Sun 13/11/11																		
978	Final DOU2 System Acceptance Test	30 days	Mon 14/11/11	Tue 13/12/11																		
979	Deodourization System No. 1	157 days	Wed 11/5/11	Fri 14/10/11																		
980	Sedimentation Tank (34 -46, Even Number)	7 days	Wed 11/5/11	Tue 17/5/11																		
981	Sedimentation Tank (10 -32, Even Number)	7 days	Sun 10/7/11	Sat 16/7/11																		

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 (Aug10 to Oct10)

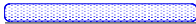
(Revision 0)


ID		Task Name	Duration	Start	Finish	2011																			
						Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	
982		Flocculation Tank (Even number)	7 days	Thu 8/9/11	Wed 14/9/11																				
983		Final DOU1 System Acceptance Test	30 days	Thu 15/9/11	Fri 14/10/11																				
984		Substantial Completion of Project	0 days	Wed 27/6/12	Wed 27/6/12																				

Contract No. DE/2009/02  
Revision: 0  
Date: 28 Aug 2010

Task


Progress






Milestone


Summary






Split


External Tasks






Project Summary

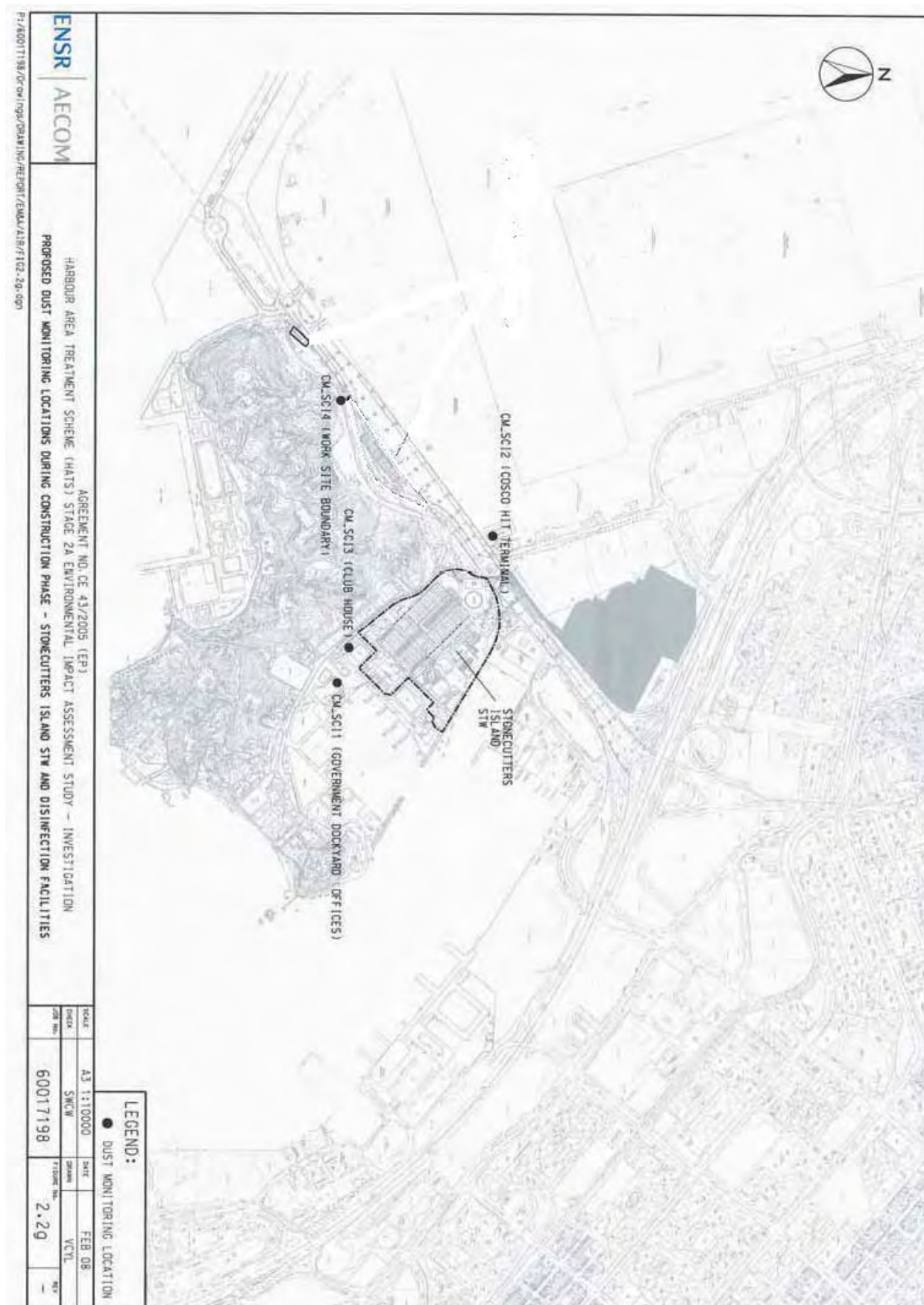
Deadline





## **Annex D**

### **Monitoring Locations Designated in the EM&A Manual**



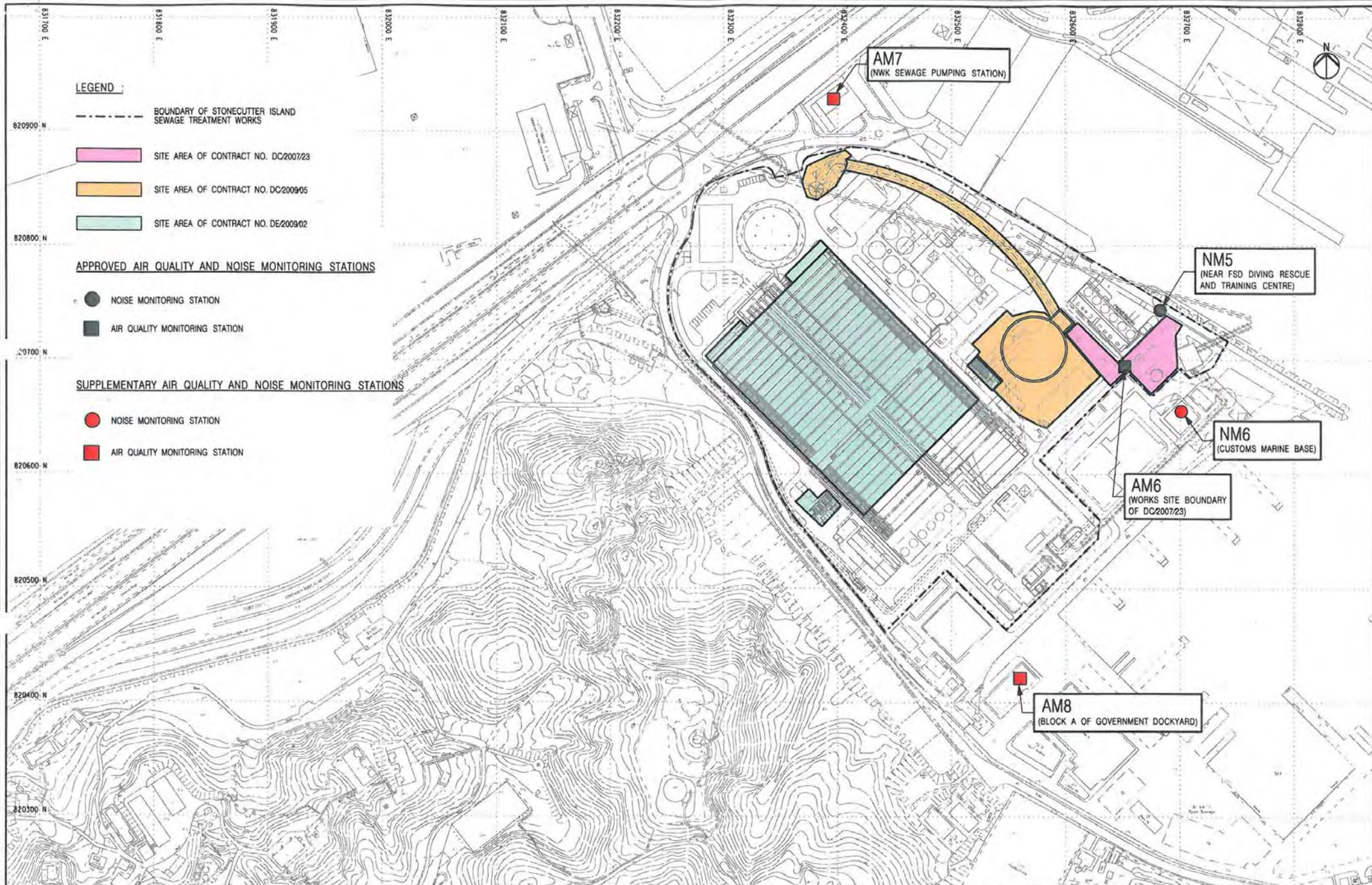




## **Annex E**

### **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  
Project No.: DC0905 Contract No.: DC/2009/05  
Sketch No.: DC/2009/05/SK/0017

Sketch Title :  
LOCATIONS OF AIR AND NOISE MONITORING  
STATIONS AT STONECUTTER ISLAND SEWAGE  
TREATMENT WORKS

Scale : 1:3000 @ A3 Issue Date : 15-12-2009

Drawn: KH

Other  
Related  
Ref.:

Working Dwg. No.:  
N/A

Checked: WY

DAN No.: N/A  
Ref No.: N/A

Approved: GA

In-D No.: N/A  
Other: N/A

## **Annex F**

### **Meteorological Data of Reporting Quarter**



### Meteorological Data – June 2010

Date		Weather	Total Rainfall (mm)	Tsing Yi Station			
				Mean Air Temp. (°C)	Wind Speed (km/h)	Mean Relative Humidity (%)	Wind Direction
1-Jun-10	Tue	Mainly cloudy with one or two light rain patches.	16.1	24.5	17	71	E/SE
2-Jun-10	Wed	Light to moderate northerly winds.	29.3	22	13.7	90	E
3-Jun-10	Thu	There will be swells.	1	23.5	7.7	77.7	N/NW
4-Jun-10	Fri	Mainly cloudy. Sunny periods in the afternoon.	Trace	25.1	5.5	80	S/SE
5-Jun-10	Sat	Sunny periods in the afternoon. Cloudy tonight.	8.2	25.7	10.5	76.5	E/SE
6-Jun-10	Sun	Mainly fine. Hot in the afternoon.	0	26.4	12	70	E/SE
7-Jun-10	Mon	Moderate easterly winds.	0	26.3	12.7	69	E/SE
8-Jun-10	Tue	Moderate southerly winds.	Trace	26.1	13.2	71.5	E/SE
9-Jun-10	Wed	Cloudy with occasional rain.	16.7	25.5	12	87.5	E
10-Jun-10	Thu	Rain will be heavy at times with a few squally thunderstorms.	58.4	25.7	8.7	92	S/SE
11-Jun-10	Fri	Cloudy with sunny intervals.	Trace	27.7	6.5	83.7	S/SE
12-Jun-10	Sat	Some rain later. Light winds.	Trace	28.3	7	79.5	S/SE
13-Jun-10	Sun	Moderate to fresh southwesterly winds.	29	27.7	11.5	91.2	SE
14-Jun-10	Mon	Mainly cloudy with a few showers.	6.4	28.2	12	88.5	S/SE
15-Jun-10	Tue	Mainly cloudy with a few showers.	0.1	27.9	14.5	90.5	S/SE
16-Jun-10	Wed	Moderate to fresh southwesterly winds.	3.8	28.4	14.7	89.5	S/SE
17-Jun-10	Thu	Cloudy periods overnight.	Trace	28.2	11	91	SE
18-Jun-10	Fri	Mainly fine and hot tomorrow.	0	28.6	12.7	86.5	S/SE
19-Jun-10	Sat	A few showers.	Trace	29.4	10.5	82.5	SE
20-Jun-10	Sun	Hot with sunny periods in the afternoon.	1.9	29.1	10.5	83.5	SE
21-Jun-10	Mon	Moderate southwesterly winds.	1.4	28.9	11.5	82.5	SE
22-Jun-10	Tue	A few showers. Hot with sunny periods.	4.6	29.2	8.5	79.5	S/SE
23-Jun-10	Wed	Cloudy with showers and a few squally thunderstorms.	41	27	12.5	86	SE
24-Jun-10	Thu	Showers will be heavy at times tomorrow.	39	27.7	14	86	S
25-Jun-10	Fri	Cloudy with showers. Showers will be heavy	2.9	28.2	12.5	84.5	E
26-Jun-10	Sat	Mainly cloudy with showers	127.6	25.9	11	90.7	E/SE
27-Jun-10	Sun	There will also be a few squally thunderstorms	44.2	25.2	11.7	93.5	E
28-Jun-10	Mon	Showers will be heavy at times at first	43.2	26.2	16	89	E
29-Jun-10	Tue	Mainly fine. Moderate south to southeasterly winds.	0.1	28.7	8.5	78	E
30-Jun-10	Wed	Fine and hot apart from one or two isolated showers.	0	29.8	6.1	75	S/SE

### Meteorological Data – July 2010

Date		Weather	Total Rainfall (mm)	Tsing Yi Station			
				Mean Air Temp. (°C)	Wind Speed (km/h)	Mean Relative Humidity (%)	Wind Direction
1-Jul-10	Thu	Fine and hot. Moderate west to southwesterly winds.	0	30.2	7.5	75	S/SE
2-Jul-10	Fri	Fine and very hot.	0	30	7.5	75	SE
3-Jul-10	Sat	Moderate southwesterly winds	0	30.2	8	76	S/SE
4-Jul-10	Sun	Occasionally fresh over offshore waters.	Trace	30.1	10.5	78.2	SE
5-Jul-10	Mon	Mainly fine and hot.	0	29.9	9	79	SE
6-Jul-10	Tue	Moderate southwesterly winds,	Trace	29.8	14.2	77.2	S
7-Jul-10	Wed	Occasionally fresh over offshore waters.	Trace	29.7	10	79.5	SE
8-Jul-10	Thu	Fine and very hot. Moderate southwesterly winds.	0.4	30	10.5	81.5	SE
9-Jul-10	Fri	It will be hot.	1.7	29.7	10.7	79.5	S/SE
10-Jul-10	Sat	Mainly fine apart from isolated showers at first.	3.9	29.6	9	77.5	SE
11-Jul-10	Sun	Light to moderate southerly winds.	1.8	29.4	9.5	77	SE
12-Jul-10	Mon	Fine and very hot.	Trace	29.9	8.2	77.5	SE
13-Jul-10	Tue	Moderate easterly winds.	Trace	30.7	9.5	69.5	S/SE
14-Jul-10	Wed	Mainly fine and very hot apart from isolated showers.	0	30.9	11.2	68.5	E/SE
15-Jul-10	Thu	Isolated showers and one or two thunderstorms.	8.4	29.5	12.5	75.5	E/SE
16-Jul-10	Fri	Sunny periods and showers. There are swells over the sea.	17.8	27.6	16	78	SE
17-Jul-10	Sat	Fine and very hot apart from a few showers.	40	27.6	12.5	79	E/SE
18-Jul-10	Sun	Moderate east to southeasterly winds.	1.1	28.7	8	69	S/SE
19-Jul-10	Mon	Fine and very hot apart from a few showers.	0	30.8	8.2	70.5	S/SE
20-Jul-10	Tue	Moderate easterly winds.	0	31.1	10.6	66	S/SE
21-Jul-10	Wed	Fresh easterly winds, occasionally strong over offshore waters. Gale on high ground.	29.6	27.8	16	78.5	E/SE
22-Jul-10	Thu	Cloudy with showers and a few squally thunderstorms.	182.4	26.7	15.5	86.5	E/SE
23-Jul-10	Fri	Cloudy with showers and a few squally thunderstorms.	14.6	28.1	13	79	E/SE
24-Jul-10	Sat	Mainly cloudy with a few showers and isolated squally thunderstorms.	1.1	29.2	8.5	74.7	SE
25-Jul-10	Sun	Moderate east to southeasterly winds.	0	30.5	8	64	S/SE
26-Jul-10	Mon	Mainly cloudy with scattered heavy showers	0	29.9	10.5	72	S/SE
27-Jul-10	Tue	Cloudy with showers. Moderate to fresh southwesterly winds.	33.6	28.2	11.5	83.5	SE
28-Jul-10	Wed	Moderate southwesterly winds, occasionally fresh over offshore waters.	122.5	26	13.7	89.7	S
29-Jul-10	Thu	Mainly cloudy with a few showers.	4.6	27.3	22	85	S/SE
30-Jul-10	Fri	Sunny periods and a few showers.	5.1	28.9	7.5	81.7	SE
31-Jul-10	Sat	A few showers. Hot with sunny periods in the afternoon.	0.8	30.4	8	75.5	SE

### Meteorological Data – August 2010

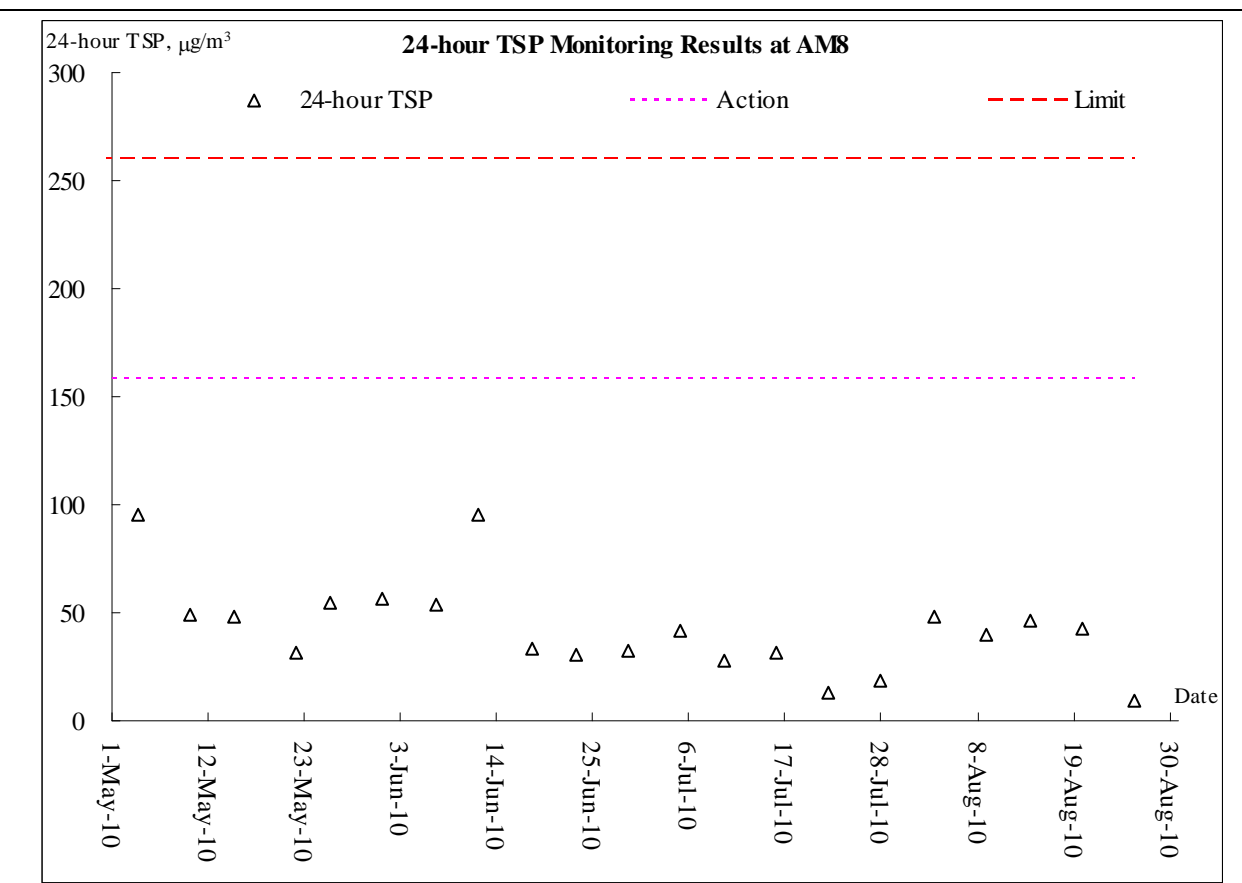
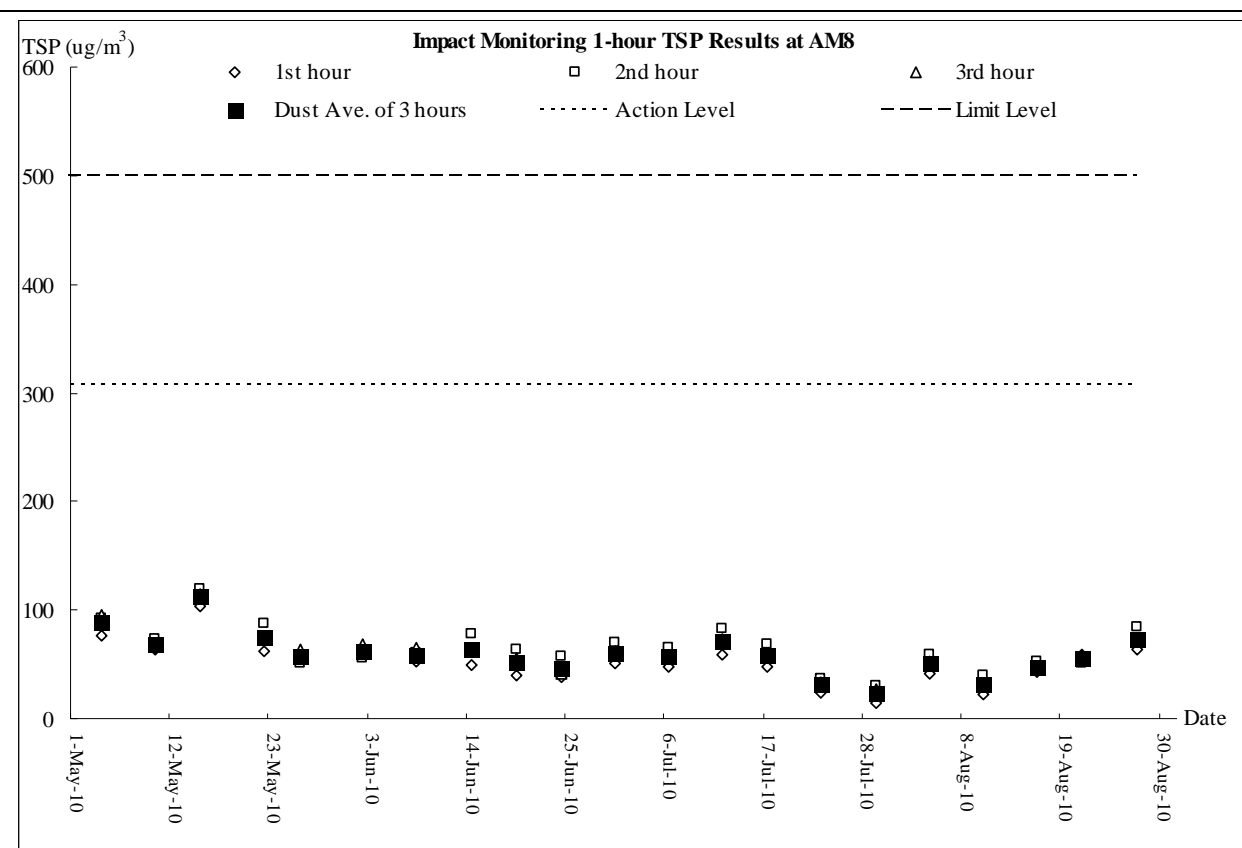
Date		Weather	Total Rainfall (mm)	Tsing Yi Station			
				Mean Air Temp. (°C)	Wind Speed (km/h)	Mean Relative Humidity (%)	Wind Direction
1-Aug-10	Sun	Fine and very hot. Moderate westerly winds.	Trace	31.2	11	65.7	SE
2-Aug-10	Mon	Showers, heavy with squally thunderstorms tonight.	1.1	29.6	12	74.7	S/SE
3-Aug-10	Tue	Occasionally fresh over offshore waters.	Trace	29.7	7.7	71.7	S
4-Aug-10	Wed	Sunny periods and a few showers.	0	30.9	9	69.5	NW
5-Aug-10	Thu	Moderate east to northeasterly winds.	14.6	29	18.7	73.7	SE
6-Aug-10	Fri	Sunny periods and a few showers.	1.6	29.3	6.5	69.5	E/SE
7-Aug-10	Sat	Isolated squally thunderstorms later.	39.1	29.6	8.5	68.7	E/SE
8-Aug-10	Sun	Very hot with sunny periods in the afternoon.	18	29.5	12.5	75.2	E/SE
9-Aug-10	Mon	Sunny periods and a few showers.	0.2	30.5	9	73.5	E/SE
10-Aug-10	Tue	It will be hot. Light to moderate southeasterly winds.	Trace	30.3	7	74.5	S/SE
11-Aug-10	Wed	Showers and a few isolated squally thunderstorms.	22.2	29	7.5	79.5	S/SE
12-Aug-10	Thu	Mainly fine and very hot during the day.	3	29.6	8.5	74	SE
13-Aug-10	Fri	Mainly fine apart from isolated showers.	3.8	30.2	8	77.5	S/SE
14-Aug-10	Sat	Mainly cloudy with showers and a few squally thunderstorms.	8.7	30.5	8.5	71	S/SE
15-Aug-10	Sun	Light to moderate southwesterly winds.	13.5	28.4	9	82.5	SE
16-Aug-10	Mon	Mainly cloudy with a few showers and isolated squally thunderstorms.	5.1	27.5	15.5	82	E/SE
17-Aug-10	Tue	Mainly cloudy with a few showers.	3.2	29.2	10.5	75	S
18-Aug-10	Wed	Light to moderate easterly winds.	0	30.1	9	71.5	E/SE
19-Aug-10	Thu	A few squally thunderstorms at first.	56.4	28.2	14.7	78	E/SE
20-Aug-10	Fri	Mainly cloudy with showers and squally thunderstorms.	22.1	29	6	68	E/SE
21-Aug-10	Sat	Moderate to fresh east to southeasterly winds	Trace	31.4	7.6	63.7	E/SE
22-Aug-10	Sun	Mainly fine and hot apart from isolated showers.	9.1	29.9	12.5	71	E/SE
23-Aug-10	Mon	Mainly fine and hot apart from isolated showers.	23.7	27.9	11.7	70.5	E/SE
24-Aug-10	Tue	Very hot in the afternoon.	42.6	27.5	14	80.5	E/SE
25-Aug-10	Wed	A few squally showers later.	5.2	28.5	7	75.7	S/SE
26-Aug-10	Thu	Very hot with sunny periods in the afternoon.	Trace	29	7.5	76	S/SE
27-Aug-10	Fri	Light winds.	0	29.4	7.5	71.5	S/SE
28-Aug-10	Sat	A few showers and isolated squally thunderstorms later.	30.1	28.4	6.5	77.5	N/NW
29-Aug-10	Sun	Moderate northerly winds.	29	30.4	9.1	66.5	N/NW
30-Aug-10	Mon	There will also be swells over the sea.	0	30.6	21	64.2	N/NW
31-Aug-10	Tue	Hazy with sunny periods.	0	31.4	8.5	67.2	N/NW

## **Annex G**

### **Graphical Plots of Impact Monitoring**

#### **1. Air Quality**

## 1. Air Quality



## **Annex H**

### **Monthly Summary Waste Flow Table**

**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<sup>st</sup> of June and December of each year)*

Month	Annual Quantities of Inert C&D Materials Generated / Imported (in '000 m <sup>3</sup> )												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 <sup>3</sup> )		in '000kg)	
	Est.	Act.	Est.	Act.	Est.	Act.	Est.	Act.	Est.	Act.	Est.	Act.	Est.	Act.	Est.	Act.	Est.	Act.	Est.	Act.	Est.	Act.	Est.	Act.
<b>2010</b>																								
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	1.00	1.00
February	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	1.80	1.80
March	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	0.10	0.10	11.95	11.95
April	0.12	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.02	0.37	0.37
May	2.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.04	4.32	4.32
June	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	3.16	3.16
<b>1st half</b>	<b>2.12</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>2.12</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.22</b>	<b>0.22</b>	<b>22.60</b>	<b>22.60</b>
July	0.50	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.02	0.46	0.46
August	0.08	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.02	1.48	1.48
September																								
October																								
November																								
December																								
<b>2nd half</b>	<b>0.58</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.58</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.04</b>	<b>0.04</b>	<b>1.94</b>	<b>1.94</b>
<b>Total</b>	<b>2.70</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>2.70</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.26</b>	<b>0.26</b>	<b>24.54</b>	<b>24.54</b>