

Gammon Construction Limited

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

July 2010

**Environmental Resources Management**



21/F Lincoln House  
979 King's Road  
Taikoo Place  
Island East, Hong Kong  
Telephone: (852) 2271 3000  
Facsimile: (852) 2723 5660  
E-mail: [post.hk@erm.com](mailto:post.hk@erm.com)  
<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: *Second  
Quarterly EM&A Report*

July 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:	_____ 6 July 2010 _____

Our ref KMY/PEJ/AFK/JOC/fy/T261332/22.01/L-0079  
T 2828 5757  
E Anne.Kerr@mottmac.com.hk  
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

8 July 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/2007/23  
Construction of Sewage Conveyance System from North Point to Stonecutters Island  
Submission of 2<sup>nd</sup> Quarterly EM&A Report for March to May 2010**

We refer to the revised 2<sup>nd</sup> Quarterly EM&A Report for March to May 2010 received on 6 July 2010 via email, We confirm we have no comment on the said report.

Yours faithfully  
for MOTT MACDONALD HONG KONG LIMITED



Dr. Anne F Kerr  
Independent Environmental Checker

c.c. AECOM  
Gammon  
ERM

Mr. Y H Fung  
Mr. Max Ko  
Ms. Winnie Ko

By email  
By email  
By email

## CONTENTS

1	INTRODUCTION	1
1.1	PURPOSE OF THE REPORT	1
1.2	STRUCTURE OF THE REPORT	1
2	PROJECT INFORMATION	5
2.1	BACKGROUND AND GENERAL SITE DESCRIPTION	5
2.2	STATUS OF ENVIRONMENTAL APPROVAL DOCUMENTS AND REQUIRED SUBMISSIONS	6
2.3	PROJECT ORGANISATION	7
3	NORTH POINT PRODUCTION AND DROP SHAFTS	8
3.1	CONSTRUCTION ACTIVITIES DURING THE REPORTING PERIOD	8
3.2	STATUS OF ENVIRONMENTAL APPROVAL DOCUMENTS	8
3.3	ENVIRONMENTAL MONITORING REQUIREMENTS	9
3.3.1	<i>Air Quality Monitoring</i>	9
3.3.2	<i>Noise Monitoring</i>	12
3.3.3	<i>Cultural Heritage</i>	14
3.3.4	<i>Landscape and Visual Monitoring</i>	14
3.4	IMPLEMENTATION STATUS ON ENVIRONMENTAL PROTECTION REQUIREMENTS	14
3.5	MONITORING RESULTS	14
3.5.1	<i>Air Quality</i>	14
3.5.2	<i>Noise</i>	15
3.5.3	<i>Landscape and Visual</i>	15
3.5.4	<i>Cultural Heritage</i>	15
3.5.5	<i>Waste Management</i>	15
3.6	ENVIRONMENTAL SITE INSPECTION	16
3.7	ENVIRONMENTAL NON-CONFORMANCE	17
3.7.1	<i>Summary of Monitoring Exceedance</i>	17
3.7.2	<i>Summary of Environmental Non-Compliance</i>	19
3.7.3	<i>Summary of Environmental Complaint</i>	19
3.7.4	<i>Summary of Environmental Summon and Successful Prosecution</i>	19
4	WAN CHAI EAST PRODUCTION AND DROP SHAFTS	20
	CONSTRUCTION ACTIVITIES	20
4.1	DURING THE REPORTING PERIOD	20
4.2	STATUS OF ENVIRONMENTAL APPROVAL DOCUMENTS	20
4.3	ENVIRONMENTAL MONITORING REQUIREMENTS	21
4.3.1	<i>Air Quality Monitoring</i>	21
4.3.2	<i>Noise Monitoring</i>	24
4.3.3	<i>Cultural Heritage</i>	26
4.3.4	<i>Landscape and Visual Monitoring</i>	26
4.4	IMPLEMENTATION STATUS ON ENVIRONMENTAL PROTECTION REQUIREMENTS	26
4.5	MONITORING RESULTS	26
4.5.1	<i>Air Quality</i>	26
4.5.2	<i>Noise</i>	27

4.5.3	<i>Landscape and Visual</i>	27
4.5.4	<i>Cultural Heritage</i>	27
4.5.5	<i>Waste Management</i>	27
4.6	ENVIRONMENTAL SITE INSPECTION	28
4.7	ENVIRONMENTAL NON-CONFORMANCE	30
4.7.1	<i>Summary of Monitoring Exceedance</i>	30
4.7.2	<i>Summary of Environmental Non-Compliance</i>	30
4.7.3	<i>Summary of Environmental Complaint</i>	30
4.7.4	<i>Summary of Environmental Summon and Successful Prosecution</i>	30
5	CENTRAL DROP SHAFT	31
5.1	CONSTRUCTION ACTIVITIES DURING THE REPORTING PERIOD	31
5.2	STATUS OF ENVIRONMENTAL APPROVAL DOCUMENTS	31
5.3	ENVIRONMENTAL MONITORING REQUIREMENTS	31
5.3.1	<i>Air Quality Monitoring</i>	31
5.3.2	<i>Noise Monitoring</i>	35
5.3.3	<i>Cultural Heritage</i>	36
5.3.4	<i>Landscape and Visual Monitoring</i>	36
5.4	IMPLEMENTATION STATUS ON ENVIRONMENTAL PROTECTION REQUIREMENTS	37
5.5	MONITORING RESULTS	37
5.5.1	<i>Air Quality</i>	37
5.5.2	<i>Noise</i>	37
5.5.3	<i>Landscape and Visual</i>	37
5.5.4	<i>Cultural Heritage</i>	38
5.5.5	<i>Waste Management</i>	38
5.6	ENVIRONMENTAL SITE INSPECTION	39
5.7	ENVIRONMENTAL NON-CONFORMANCE	40
5.7.1	<i>Summary of Monitoring Exceedance</i>	40
5.7.2	<i>Summary of Environmental Non-Compliance</i>	40
5.7.3	<i>Summary of Environmental Complaint</i>	40
5.7.4	<i>Summary of Environmental Summon and Successful Prosecution</i>	40
6	SAI YING PUN JUNCTION SHAFT	41
6.1	CONSTRUCTION ACTIVITIES DURING THE REPORTING PERIOD	41
6.2	STATUS OF ENVIRONMENTAL APPROVAL DOCUMENTS	41
6.3	ENVIRONMENTAL MONITORING REQUIREMENTS	41
6.3.1	<i>Air Quality Monitoring</i>	41
6.3.2	<i>Noise Monitoring</i>	43
6.3.3	<i>Cultural Heritage</i>	44
6.3.4	<i>Landscape and Visual Monitoring</i>	44
6.4	IMPLEMENTATION STATUS ON ENVIRONMENTAL PROTECTION REQUIREMENTS	45
6.5	MONITORING RESULTS	45
6.5.1	<i>Air Quality</i>	45
6.5.2	<i>Noise</i>	45
6.5.3	<i>Landscape and Visual</i>	46
6.5.4	<i>Cultural Heritage</i>	46
6.5.5	<i>Waste Management</i>	46
6.6	ENVIRONMENTAL SITE INSPECTION	47
6.7	ENVIRONMENTAL NON-CONFORMANCE	48
6.7.1	<i>Summary of Monitoring Exceedance</i>	48

6.7.2	<i>Summary of Environmental Non-Compliance</i>	50
6.7.3	<i>Summary of Environmental Complaint</i>	50
6.7.4	<i>Summary of Environmental Summon and Successful Prosecution</i>	53
7	<b>STONECUTTERS ISLAND PRODUCTION AND RISER SHAFTS</b>	54
7.1	<b>CONSTRUCTION ACTIVITIES DURING THE REPORTING PERIOD</b>	54
7.2	<b>STATUS OF ENVIRONMENTAL APPROVAL DOCUMENTS</b>	54
7.3	<b>ENVIRONMENTAL MONITORING REQUIREMENTS</b>	54
7.3.1	<i>Air Quality Monitoring</i>	54
7.3.2	<i>Noise Monitoring</i>	58
7.3.3	<i>Cultural Heritage</i>	60
7.3.4	<i>Landscape and Visual Monitoring</i>	60
7.4	<b>IMPLEMENTATION STATUS ON ENVIRONMENTAL PROTECTION REQUIREMENTS</b>	61
7.5	<b>MONITORING RESULTS</b>	61
7.5.1	<i>Air Quality</i>	61
7.5.2	<i>Noise</i>	61
7.5.3	<i>Landscape and Visual</i>	61
7.5.4	<i>Cultural Heritage</i>	62
7.5.5	<i>Waste Management</i>	62
7.6	<b>ENVIRONMENTAL SITE INSPECTION</b>	63
7.7	<b>ENVIRONMENTAL NON-CONFORMANCE</b>	65
7.7.1	<i>Summary of Monitoring Exceedance</i>	65
7.7.2	<i>Summary of Environmental Non-Compliance</i>	65
7.7.3	<i>Summary of Environmental Complaint</i>	65
7.7.4	<i>Summary of Environmental Summon and Successful Prosecution</i>	65
8	<b>CONCLUSIONS</b>	66
8.1	<b>NORTH POINT PRODUCTION AND DROP SHAFT</b>	66
8.2	<b>WAN CHAI EAST PRODUCTION AND DROP SHAFTS</b>	66
8.3	<b>CENTRAL DROP SHAFT</b>	66
8.4	<b>SAI YING PUN JUNCTION SHAFT</b>	67
8.5	<b>STONECUTTERS ISLAND PRODUCTION AND RISER SHAFTS</b>	67

## LIST OF TABLES

Table 2.1	<i>Summary of Environmental Licensing, Notification and Permit Status for the Contract (a)</i>
Table 2.2	<i>Status of Required Submission for all Sites</i>
Table 3.1	<i>Summary of Construction Activities Undertaken from 1 March 2010 to 31 May 2010 at North Point Production and Drop Shafts</i>
Table 3.2	<i>Summary of Environmental Licensing, Notification and Permit Status at North Point Production and Drop Shafts</i>
Table 3.3	<i>Construction Phase Air Monitoring Location at North Point Production and Drop Shafts</i>
Table 3.4	<i>TSP Monitoring Parameter and Frequency</i>
Table 3.5	<i>TSP Monitoring Equipment for North Point Production and Drop Shafts Sites</i>
Table 3.6	<i>Action and Limit Levels for Air Quality at North Point Production and Drop Shafts</i>
Table 3.7	<i>Construction Phase Noise Monitoring Station at North Point Production and Drop Shafts</i>
Table 3.8	<i>Noise Monitoring Equipment at North Point Production and Drop Shafts</i>
Table 3.9	<i>Action and Limit Levels for Noise Monitoring at North Point Production and Drop Shafts</i>
Table 3.10	<i>Quantities of Waste Generated from the Project for all Sites</i>
Table 3.11	<i>Summary of Record of Exceedance at North Point Production and Drop Shafts</i>
Table 4.1	<i>Summary of Construction Activities Undertaken from 1 March 2010 to 31 May 2010 at Wan Chai East Production and Drop Shafts</i>
Table 4.2	<i>Summary of Environmental Licensing, Notification and Permit Status at Wan Chai East Production and Drop Shafts</i>
Table 4.3	<i>Construction Phase Air Monitoring Location at Wan Chai East Production and Drop Shafts</i>
Table 4.4	<i>TSP Monitoring Parameter and Frequency at Wan Chai East Production and Drop Shafts</i>
Table 4.5	<i>TSP Monitoring Equipment at Wan Chai East Production and Drop Shafts</i>
Table 4.6	<i>Action and Limit Levels for Air Quality at Wan Chai East Production and Drop Shafts</i>
Table 4.8	<i>Noise Monitoring Equipment at Wan Chai East Production and Drop Shafts</i>
Table 4.9	<i>Action and Limit Levels for Noise Monitoring at Wan Chai East Production and Drop Shafts</i>
Table 4.10	<i>Quantities of Waste Generated from the Project for all Sites</i>
Table 5.1	<i>Summary of Construction Activities Undertaken from 1 March 2010 to 31 May 2010 at Central Drop Shaft</i>
Table 5.2	<i>Summary of Environmental Licensing, Notification and Permit Status at Central Drop Shaft</i>
Table 5.3	<i>Construction Phase Air Monitoring Location at Central Drop Shaft</i>
Table 5.4	<i>TSP Monitoring Parameter and Frequency at Central Drop Shaft</i>
Table 5.5	<i>TSP Monitoring Equipment at Central Drop Shaft</i>
Table 5.6	<i>Action and Limit Levels for Air Quality at Central Drop Shaft</i>
Table 5.7	<i>Construction Phase Noise Monitoring Station at Central Drop Shaft</i>
Table 5.8	<i>Noise Monitoring Equipment at Central Drop Shaft</i>
Table 5.9	<i>Action and Limit Levels for Noise Monitoring at Central Drop Shaft</i>
Table 5.10	<i>Quantities of Waste Generated from the Project for all Sites</i>
Table 6.1	<i>Summary of Construction Activities Undertaken from 1 March 2010 to 31 May 2010 at Sai Ying Pun Junction Shaft</i>

Table 6.2	<i>Summary of Environmental Licensing, Notification and Permit Status at Sai Ying Pun Junction Shaft</i>
Table 6.3	<i>Construction Phase Air Monitoring Location at Sai Ying Pun Junction Shaft</i>
Table 6.4	<i>TSP Monitoring Parameter and Frequency at Sai Ying Pun Junction Shaft</i>
Table 6.5	<i>Action and Limit Levels for Air Quality at Sai Ying Pun Junction Shaft</i>
Table 6.6	<i>Construction Phase Noise Monitoring Station at Sai Ying Pun Junction Shaft</i>
Table 6.7	<i>Noise Monitoring Equipment at Sai Ying Pun Junction Shaft</i>
Table 6.8	<i>Action and Limit Levels for Noise Monitoring at Sai Ying Pun Junction Shaft</i>
Table 6.9	<i>Quantities of Waste Generated from the Project for all Sites</i>
Table 6.10	<i>Summary of Record of Exceedance at Sai Ying Pun Junction Shaft</i>
Table 6.11	<i>Summary of Complaint Received</i>
Table 7.1	<i>Summary of Construction Activities Undertaken from 1 March 2010 to 31 May 2010 at Stonecutters Island Production and Riser Shafts</i>
Table 7.2	<i>Summary of Environmental Licensing, Notification and Permit Status at Stonecutters Island Production and Riser Shafts</i>
Table 7.3	<i>Construction Phase Air Monitoring Location at Stonecutters Island Production and Riser Shafts</i>
Table 7.4	<i>TSP Monitoring Parameter and Frequency at Stonecutters Island Production and Riser Shafts</i>
Table 7.5	<i>TSP Monitoring Equipment at Stonecutters Island Production and Riser Shafts</i>
Table 7.6	<i>Action and Limit Levels for Air Quality at Stonecutters Island Production and Riser Shafts</i>
Table 7.7	<i>Construction Phase Noise Monitoring Station at Stonecutters Island Production and Riser Shafts</i>
Table 7.8	<i>Noise Monitoring Equipment at Stonecutters Island Production and Riser Shafts</i>
Table 7.9	<i>Action and Limit Levels for Noise Monitoring at Stonecutters Island Production and Riser Shaft</i>
Table 7.10	<i>Quantities of Waste Generated from the Project for all Sites</i>



## LIST OF ANNEXES

Annex A	Location of Works Areas
Annex B	Project Organization Chart and Contact Detail
Annex C	North Point Production and Drop Shaft
Annex C1	<i>Locations of Construction Activities during the Reporting period</i>
Annex C2	<i>Locations of Air Quality and Noise Monitoring Stations</i>
Annex C3	<i>Summary of Implementation Status</i>
Annex C4	<i>24-hour and 1-hour TSP Monitoring Results</i>
Annex C5	<i>Noise Monitoring Results</i>
Annex C6	<i>Cumulative Complaints and Summons/Prosecutions Log</i>
Annex D	Wan Chai East Production and Drop Shaft
Annex D1	<i>Locations of Construction Activities during the Reporting period</i>
Annex D2	<i>Locations of Air Quality and Noise Monitoring Stations</i>
Annex D3	<i>Summary of Implementation Status</i>
Annex D4	<i>24-hour and 1-hour TSP Monitoring Results</i>
Annex D5	<i>Noise Monitoring Results</i>
Annex D6	<i>Cumulative Complaints and Summons/Prosecutions Log</i>
Annex E	Central Drop Shaft
Annex E1	<i>Locations of Construction Activities during the Reporting period</i>
Annex E2	<i>Locations of Air Quality and Noise Monitoring Stations</i>
Annex E3	<i>Summary of Implementation Status</i>
Annex E4	<i>24-hour and 1-hour TSP Monitoring Results</i>
Annex E5	<i>Noise Monitoring Results</i>
Annex E6	<i>Cumulative Complaints and Summons/Prosecutions Log</i>
Annex F	Sai Ying Pun Junction Shaft
Annex F1	<i>Locations of Construction Activities during the Reporting period</i>
Annex F2	<i>Locations of Air Quality and Noise Monitoring Stations</i>
Annex F3	<i>Summary of Implementation Status</i>
Annex F4	<i>24-hour and 1-hour TSP Monitoring Results</i>
Annex F5	<i>Noise Monitoring Results</i>
Annex F6	<i>Cumulative Complaints and Summons/Prosecutions Log</i>
Annex G	Stonecutters Island Production and Riser Shaft
Annex G1	<i>Locations of Construction Activities during the Reporting period</i>
Annex G2	<i>Locations of Air Quality and Noise Monitoring Stations</i>
Annex G3	<i>Summary of Implementation Status</i>
Annex G4	<i>24-hour and 1-hour TSP Monitoring Results</i>
Annex G5	<i>Noise Monitoring Results</i>
Annex G6	<i>Cumulative Complaints and Summons/Prosecutions Log</i>

- Annex H Calibration Reports for HVSs and Sound Level Meters for All Sites
- Annex I Event /Action Plans for Air Quality, Noise and Landscape and Visual Monitoring
- Annex J Waste Flow Table for All Sites

## **EXECUTIVE SUMMARY**

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

## *North Point Production and Drop Shafts*

### Summary of Construction Works undertaken during Reporting Period

The major construction works undertaken included:

- Construction of diaphragm wall
- Installation of substation
- Transportation and temporary storage of excavated marine sediment to the derrick lighter berthed at Sai Ying Pun Junction Shaft
- Toe grouting and fissure grouting below diaphragm wall
- Construction of pipe pile wall
- Construction of colcrete pile
- Grouting
- Installation of Monitoring Instrumentation

### Environmental Monitoring and Audit Progress

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

- |   |          |
|---|----------|
| • 24-hour TSP Monitoring at each monitoring station (AM1 and AM2) | 16 sets  |
| • 1-hour TSP Monitoring at each monitoring station (AM1 and AM2)  | 48 sets  |
| • Construction Noise Monitoring during Normal Weekdays at NM1     | 13 sets  |
| • Joint Environmental Site Inspection                             | 12 times |
| • Landscape & Visual Monitoring                                   | 3 times  |

### Air Quality

Sixteen sets of 24-hour TSP and forty-eight sets of 1-hr TSP measurements were carried out at each of the designated monitoring stations during the reporting period. No exceedance was recorded during the reporting period.

### Noise

Thirteen sets of 30-minute construction noise measurements were carried out at the monitoring station NM1 during normal weekdays of the reporting period. Three exceedances were recorded at NM1 on 12, 18 and 24 March 2010.

### Landscape & Visual

Landscape and visual monitoring commenced in December 2009. Details of the audit findings and implementation status are presented in *Section 3.5.3*.

### 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 25,114.08 tonnes of inert C&D materials, 115.71 tonnes of non-inert C&D materials, 850 m<sup>3</sup> of type 1 marine deposit, 1,081 m<sup>3</sup> of type 2 marine deposit and 44 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 3.6*.

## Environmental Exceedance/Non-conformance/Complaint/Summons and Prosecution

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.

Three exceedances of limit level were reported at NM1 on 12, 18 and 24 March 2010. Investigations into the incidents were made and concluded that the noise exceedance was not only solely caused by the Contractor's construction activities but also caused by Architectural Services Department's (ArchSD) construction activities, traffic noise and noise from the users at football court nearby. 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 recommended or specified in the EIA, EM&A Manual, EMP, Method Statements, General and Particular Specifications of this Project to avoid exceedance of noise limit levels or causing noise nuisance.

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

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

## *Wan Chai East Production and Drop Shaft*

### Summary of Construction Works undertaken during Reporting period

The major construction works undertaken included:

- Toe grouting and fissure grouting
- Installation of monitoring instrumentation
- Conduction of pumping test
- Construction of footing of noise enclosure
- Construction of guide wall
- Construction of diaphragm wall
- Transportation and Temporary Storage of excavated marine sediment from Wan Chai East Drop Shaft to the derrick lighter berthed at Sai Ying Pun Junction Shaft

### Environmental Monitoring and Audit Progress

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

- |   |          |
|---|----------|
| • 24-hour TSP Monitoring at AM3                               | 16 sets  |
| • 1-hour TSP Monitoring at AM3                                | 48 sets  |
| • Construction Noise Monitoring during Normal Weekdays at NM2 | 13 sets  |
| • Joint Environmental Site Inspection                         | 13 times |
| • Landscape & Visual Monitoring                               | 3 times  |

### Air Quality

Sixteen sets of 24-hour TSP and forty-eight 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

Thirteen sets of 30-minute construction noise measurements were carried out at the monitoring station NM2 during normal weekdays of the reporting period. 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 4.5.3*.

### 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 25,114.08 tonnes of inert C&D materials, 115.71 tonnes of non-inert C&D materials, 850 m<sup>3</sup> of type 1 marine deposit, 1,081 m<sup>3</sup> of type 2 marine deposit and 44 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 4.6*.

## Environmental Exceedance/Non-conformance/Complaint/Summons and Prosecution

No exceedance was recorded during this reporting period.

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

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

## Central Drop Shaft

### Summary of Construction Works undertaken during Reporting period

The major construction works undertaken included:

- Construction of guide wall
- Construction of diaphragm wall
- Installation of monitoring instrumentation
- Transportation and temporary storage of excavated marine sediment to the derrick lighter berthed at Sai Ying Pun Junction Shaft

### Environmental Monitoring and Audit Progress

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

- |   |          |
|---|----------|
| • 24-hour TSP Monitoring at AM4                               | 16 sets  |
| • 1-hour TSP Monitoring at AM4                                | 48 sets  |
| • Construction Noise Monitoring during Normal Weekdays at NM3 | 13 sets  |
| • Joint Environmental Site Inspection                         | 12 times |
| • Landscape & Visual Monitoring                               | 3 times  |

### Air Quality

Sixteen sets of 24-hour TSP and forty-eight 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

Thirteen sets of 30-minute construction noise measurements were carried out at the monitoring station NM3 during normal weekdays of the reporting period. 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 5.5.3*.

### 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 25,114.08 tonnes of inert C&D materials, 115.71 tonnes of non-inert C&D materials, 850 m<sup>3</sup> of type 1 marine deposit, 1,081 m<sup>3</sup> of type 2 marine deposit and 44 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

Twelve 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 5.6*.

#### 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 prosecutions was received in this reporting period.

## Sai Ying Pun Junction Shaft

### Summary of Construction Works undertaken during Reporting Month

The major construction works undertaken included:

- Construction of diaphragm wall
- Disposal of type 3 marine sediment from Sai Ying Pun Junction Shaft to SENT
- Transportation and temporary storage of excavated marine sediment to the derrick lighter berthed at Sai Ying Pun Junction Shaft Installation of monitoring instrumentation
- Installation of monitoring instrumentation

### Environmental Monitoring and Audit Progress

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

• 24-hour TSP Monitoring at AM5	17 sets
• 1-hour TSP Monitoring at AM5	51 sets
• Construction Noise Monitoring during Normal Weekdays at NM4	13 sets
• Construction Noise Monitoring during Restricted Hours at NM4	13 sets
• Joint Environmental Site Inspection	12 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. Exceedances of the action level for 1-hr TSP and 24-hr TSP were recorded on 17 March and on 23 March at AM5, respectively.

### Noise

Thirteen sets of 30-minute construction noise measurements were carried out at the monitoring station NM4 during normal weekdays of the reporting period. Thirteen sets of 3 x 5-minute construction noise measurements were carried out during restricted hours (between 0700 and 2300 hours on Sundays and public holidays) on 7, 14, 21 and 28 March 2010, 4, 11, 18 and 25 April 2010 and 2, 9, 15, 23 and 30 May 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 6.5.3*.

### 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 25,114.08 tonnes of inert C&D materials, 115.71 tonnes of non-inert C&D materials, 850 m<sup>3</sup> of type 1 marine deposit, 1,081 m<sup>3</sup> of type 2 marine deposit and 44 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

Twelve 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 6.6*.

## Environmental Exceedance/Non-conformance/Complaint/Summons and Prosecution

Exceedances of the action level for 1-hr TSP and 24-hr TSP were recorded on 17 March and on 23 March at AM5, respectively. Investigations into the incidents were made and concluded that the exceedance was not due to the Contractor's construction activities. However, the Contractor of this Project was reminded to implement all relevant dust mitigation measures recommended or specified in the EIA, EM&A Manual, EMP, Method Statements, General and Particular Specifications of this Project to avoid exceedance of action levels.

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 blockage of gully chambers was received in the reporting month. Investigations into the complaint were conducted on the same day of complaint. As the complaint is considered not caused by the Contractor's construction activities, no further follow-up actions will be required.

Two complaints regarding the night time general construction noise were received in the reporting month. Investigations into the complaint were conducted on 15 May 2010. As the complaint is considered not caused by the Contractor's construction activities, no further follow-up actions will be required.

No summon or prosecution was received in this reporting period.

## *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
- Installation of monitoring instrumentation
- Transportation and temporary storage of excavated marine sediment to the derrick lighter berthed at Sai Ying Pun Junction 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	16 sets
• 1-hour TSP Monitoring at AM6	48 sets
• Construction Noise Monitoring during Normal Weekdays at NM5	13 times
• Construction Noise Monitoring during Restricted Hours at NM5	13 times
• Joint Environmental Site Inspection	13 times
• Landscape & Visual Monitoring	3 times

### Air Quality

Sixteen sets of 24-hour TSP and forty-eight 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

Thirteen sets of 30-minute construction noise measurements were carried out at the monitoring station NM5 during normal weekdays of the reporting period. Thirteen 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 7, 14, 21 and 28 March 2010 and 4, 11, 18 and 25 April and 2, 9, 16, 23 and 30 May 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 25,114.08 tonnes of inert C&D materials, 115.71 tonnes of non-inert C&D materials, 850 m<sup>3</sup> of type 1 marine deposit, 1,081 m<sup>3</sup> of type 2 marine deposit and 44 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 second quarterly EM&A report which summarizes the impact monitoring results and audit findings for the EM&A programme during the reporting period from 1 March 2010 to 31 May 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/B) for the works was granted on 2 November 2009. Under the requirements of Condition 4.1 of Environmental Permit EP-322/2008/B,

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

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

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

## 2.2 STATUS OF 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 by EP-322/2008/A 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 by EP-322/2008/B 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 by EP-322/2008/C on 14 May 2010.</li> </ul>
	EP-322/2008/C	Throughout the Contract	<ul style="list-style-type: none"> <li>Permit granted on 14 May 2010</li> </ul>
Notification of Construction Works under Air Pollution Control (Construction Dust) Regulation	--	--	<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/11-001	28 April 2010 – 27 May 2010	Superseded by EP/MD/11-019
Type 2 Marine Deposit	EP/MD/11-019	14 June 2010 – 13 July 2010	--
Type 3 Marine Deposit	8477	18 February 2010 – 17 August 2010	--

**Note:**

(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*

<b>EP Condition</b>	<b>Submission</b>	<b>Submission Date</b>
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 Fourth Monthly EM&A Report	14 April 2010
	Submission of Fifth Monthly EM&A Report	14 May 2010
	Submission of Sixth Monthly EM&A Report	11 June 2010

### 2.3      *PROJECT ORGANISATION*

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

### 3.1 CONSTRUCTION ACTIVITIES DURING THE REPORTING PERIOD

A summary of the major construction activities undertaken in this reporting period is shown in *Table 3.1*. The locations of the construction activities are shown in *Annex C1*.

**Table 3.1** *Summary of Construction Activities Undertaken from 1 March 2010 to 31 May 2010 at North Point Production and Drop Shafts*

Worksite	Construction Activities Undertaken
Production Shaft	<ul style="list-style-type: none"> <li>• Construction of diaphragm wall</li> <li>• Installation of substation</li> <li>• Transportation and temporary storage of excavated marine sediment to the derrick lighter berthed at Sai Ying Pun Junction Shaft</li> <li>• Toe grouting and fissure grouting below diaphragm wall</li> <li>• Installation of Monitoring Instrumentation</li> </ul>
Drop Shaft at North Point PTW	<ul style="list-style-type: none"> <li>• Construction of pipe pile wall</li> <li>• Transportation and temporary storage of excavated marine sediment to the derrick lighter berthed at Sai Ying Pun Junction Shaft</li> <li>• Grouting</li> <li>• Installation of Monitoring Instrumentation</li> <li>• Construction of colcrete pile</li> </ul>

### 3.2 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 3.2*.

**Table 3.2** *Summary of Environmental Licensing, Notification and Permit Status at North Point Production and Drop Shafts*

Permit/ Licences/ Notification	Reference	Validity Period	Remarks
Wastewater Discharge License	North Point PTW Drop Shaft WT00005153-2009	12 October 2009 - 31 October 2014	--
	North Point Production Shaft WT00005154-2009	12 October 2009 - 31 October 2014	--
Chemical Waste Producer Registration	North Point Production Shaft 5213-153-G2484-01	--	--
	North Point PTW Drop Shaft 5213-153-G2483-01	--	--
Construction Noise Permit	North Point Production Shaft	30 September 2009 - 29 March 2010	--

Permit/ Licences/ Notification	Reference	Validity Period	Remarks
	GW-RW0728-09		
	North Point Production Shaft	8 March 2010 – 4 September 2010	--
	GW-RS0163-10		
	North Point PTW Drop Shaft	16 September 2009 - 15 March 2010	Superseded by GW- RS0057-10 on 1 February 2010
	GW-RS0697-09		
	North Point PTW Drop Shaft	1 February 2010 - 31 July 2010	--
	GW-RS0057-10		

### 3.3 ENVIRONMENTAL MONITORING REQUIREMENTS

#### 3.3.1 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 stations for this Contract are listed in *Table 3.3* and shown in *Annex C2*.

**Table 3.3 Construction Phase Air Monitoring Location at North Point Production and Drop Shafts**

Worksite	Construction Air Quality Monitoring Stations			
	ID in EM&A Manual	ID	Location	Remark
North Point	-	AM1	Chan's Creative School (formerly known as Madam Chan Wai Chow Memorial School)	• Access for station setup to K.Wah Centre (CM_NP1) and Tin Chiu Street Children's Playground (CM_NP3) was rejected.
	CM_NP2	AM2	Rooftop of Hong Kong & Islands Regional Office, WSD	

##### Monitoring Parameters, Frequency and Programme

Air quality monitoring was conducted in accordance with the requirements stipulated in the EM&A Manual (*Table 3.4*).

**Table 3.4 TSP Monitoring Parameter and Frequency**

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 three 1-hour TSP monitoring were performed using High Volume Samplers (HVS) with appropriate sampling inlets installed and 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 3.5 summarizes the equipment that were deployed for the 24-hour and 1-hour TSP monitoring respectively.

Table 3.5 TSP Monitoring Equipment for North Point Production and Drop Shafts Sites

Monitoring Station	Monitoring Equipment (HVS and Calibrator)
24-hr and 1-hr TSP	
AM1	GMW GS-2310 (S/N 1808), CM-AIR-43 (S/N 9833620)
AM2	GMW GS-2310 (S/N 0145), CM-AIR-43 (S/N 9833620)

### Monitoring Methodology

#### Installation

The setup locations of the HVSs at monitoring stations were listed in Table 3.3. All HVSs were 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 AM1 and AM2;
- 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 four 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 records for the HVSs are given in *Annex H*.

### Wind Data Monitoring

The nearest weather station to North Point Production and Drop Shafts is Kai Tak Station. Average wind data (wind speed and wind direction) during the monitoring period were obtained from the meteorological station at Kai Tak of the Hong Kong Observatory (HKO) and are presented in *Annex C4*.

### *Action and Limit Levels*

The Action and Limit levels have been established and presented in *Table 3.6*.

**Table 3.6** *Action and Limit Levels for Air Quality at North Point Production and Drop Shafts*

Parameter	Air Monitoring Station	Action Level, $\mu\text{gm}^{-3}$	Limit Level, $\mu\text{gm}^{-3}$
24-hour TSP	AM1	185	260
	AM2	182	260
1-hour TSP	AM1	340	500
	AM2	352	500

### *Event and Action Plan*

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

### 3.3.2 *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 3.7* and is shown in *Annex C2*.

**Table 3.7** *Construction Phase Noise Monitoring Station at North Point Production and Drop Shafts*

Worksite	Proposed Construction Noise Monitoring Station				
	ID in EM&A Manual	ID	Location	Type of Measurement	Remark
North Point	M1	NM1	Rooftop of Chan's Creative School (formerly known as Madam Chan Wai Chow Memorial School)	Façade	-

### *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 3.8*, 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 3.8** *Noise Monitoring Equipment at North Point Production and Drop Shafts*

Monitoring Station	Monitoring Equipment (Sound Level Metre and Calibrator)
NM1	<ul style="list-style-type: none"><li>• Calibrator: Rion NC-73 (S/N 10786708)</li><li>• Sound Level Meters: 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)</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.

### *Action and Limit Levels*

The action and limit levels for noise monitoring during different monitoring periods are summarized in *Table 3.9*.

**Table 3.9** *Action and Limit Levels for Noise Monitoring at North Point Production and Drop Shafts*

Noise Monitoring Location	Noise Criteria, Leq(30mins), dB(A)	Remark
NMI	70	During normal teaching period
	69	During the school examination period
	75	During school holidays

*Event and Action Plan*

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

**3.3.3** *Cultural Heritage*

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

**3.3.4** *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*.

**3.4** *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 C3*.

**3.5** *MONITORING RESULTS*

**3.5.1** *Air Quality*

A total of sixteen sets of 24-hour and forty-eight sets of 1-hour TSP measurements were carried out at each of AM1 and AM2 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 C4*.

The weather condition during the monitoring period varied from sunny to rainy. The local impacts near the monitoring stations of AM1 to AM2 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.

### 3.5.2 *Noise*

A total of thirteen sets of 30-minute construction noise measurements were carried out at the monitoring station NM1 during normal weekdays of the reporting period. The monitoring results together with graphical presentations are presented in *Annex C5*. The local impacts observed near the monitoring stations of NM1 included traffic noise from King's Road, Java Road and nearby roads; school bell rings; student noise and the construction works by other parties undertaken in the vicinity.

Exceedances of the limit level were recorded on 12, 18 and 24 March at NM1. Investigations were conducted to review the potential causes for the noise level recorded. A summary of the investigation results is presented in *Section 3.7.1*.

### 3.5.3 *Landscape and Visual*

Implementation and maintenance of landscape and visual mitigation measures are fully achieved and no major findings were observed during the reporting period.

### 3.5.4 *Cultural Heritage*

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

### 3.5.5 *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 3.10*. 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. 0.288 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 3.10 Quantities of Waste Generated from the Project for all Sites

Month / Year	Quantity					
	C&D Materials (inert) (a)	C&D Materials (non-inert) (b)	Chemical Waste	Marine Deposit (c)		
				Type 1	Type 2	Type 3
May 2010	25,114.08 tonnes	115.71 tonnes	300 L	850 m <sup>3</sup>	1081 m <sup>3</sup>	44 m <sup>3</sup>

Notes:

- (a) Inert C&D materials include bricks, concrete, building debris, rubble and excavated soil. No inert C&D material was reused in this Project during the reporting period. Non-reused inert C&D materials were disposed of at the Tuen Mun Area 38/Tseung Kwan O Area 137 Fill Bank/ Chai Wan Barging Point.
- (b) Non-inert C&D materials include steel, paper / cardboard packaging waste, plastics and other wastes such as general refuse. Steel materials generated from the project are grouped into non-inert C&D materials as the materials were not disposed of with other inert C&D materials. The non-inert C&D materials other than steel and paper/cardboard packaging were disposed of at SENT Landfill. No steel material and 0.288 tonnes of paper/cardboard packaging were sent to recyclers for recycling during the reporting period.
- (c) 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.

3.6

*ENVIRONMENTAL SITE INSPECTION*

Weekly site inspections were carried out by the representatives of the Contractor, Engineer and the ET. Twelve site inspections were conducted on 4, 11, 18 and 25 March 2010, 1, 8, 15, 22 and 29 April 2010 and 6, 13 and 20 May 2010. There was no non-compliance recorded during this reporting period.

Major findings and recommendations are summarized as follows:

*North Point Production Shaft*

- On 25 March, 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 to avoid mosquito breeding on-site.
- On 6 May, an unlabelled oil drum was observed adjacent to the air compressor near the Contractor's office. The Contractor was recommended to provide proper labelling for chemicals on-site.
- On 13 May, an empty tin of chemical was placed on the ground near the pipe pile working area. The Contractor was recommended to store the chemical waste in the chemical store area and dispose of via licensed chemical waste collector.
- On 20 May, no chemical label was observed on an oil container in a drip tray near the grouting area. The Contractor was recommended to implement proper labelling for chemicals and chemical wastes on site for proper identification and easy classification for storage.

*North Point Drop Shaft*

- On 4 March, tyre tracks with soil and grit were observed on the ground near the site vehicular entrance. The Contractor was recommended to strictly enforce wheel washing on vehicles leaving the construction site to

avoid carryover of soil and grit into public areas outside the work site boundary.

- On 11 March, 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 to avoid mosquito breeding on-site.
- On 8 April, oil stains were observed on the ground near the grouting area. The Contractor has immediately removed the oil stains. The Contractor was recommended to dispose of the collected wastes as chemical wastes. The Contractor was also recommended to provide drip trays as a containment measure to avoid potential spillages and therefore potential soil contamination and surface runoffs.
- On 20 May, oil sheen was observed on the ground next to a generator. The Contractor was recommended to arrange clean-up of oil sheen immediately, especially on rainy days, to avoid contamination of soil and runoff into drainages. The Contractor was also recommended to dispose of the collected chemical wastes via licensed collectors.

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

### 3.7 ENVIRONMENTAL NON-CONFORMANCE

#### 3.7.1 *Summary of Monitoring Exceedance*

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

Exceedances of limit level were reported at NM1 on 12, 18 and 24 March 2010. Details of the incidents and investigations are presented in *Table 3.11*.

With reference to the investigation results at NM1, it was concluded that the noise exceedance was not solely caused by the Contractor's construction activities but also caused by ArchSD's construction activities, traffic noise and noise from the users at football court nearby. 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 recommended or specified in the EIA, EM&A Manual, EMP, Method Statements, General and Particular Specifications of this Project to avoid exceedance of noise limit levels or causing noise nuisance.

**Table 3.11 Summary of Record of Exceedance at North Point Production and Drop Shafts**

Station	Record of Exceedance	Result of Investigation
NM1	Exceedance of Limit Level on 12 Mar 2010 (09:50 – 10:20)	<p>Observations during the noise monitoring indicated that construction activities including concrete breaking in the building and operating plants deployed at the ASD worksite outside the school were the dominant noise sources during the monitoring period. Meanwhile, with reference to the works summary provided by the Contractor, works conducted at the North Point Production Shaft in the morning of 12 March 2010 including installation of diaphragm wall and mobile crane movement. Two mobile cranes, a soil grab and a hand-held concrete breaker were operated on site during the monitoring period.</p> <p>Therefore, it is believed that the noise exceedance is considered not solely caused by the Contractor's construction activities.</p>
NM1	Exceedance of Limit Level on 18 Mar 2010 (11:15 – 11:45)	<p>Observations during the noise monitoring indicated that concrete breaking in the building and operating plants deployed at the ASD worksite outside the school were carried out. It should be noted that the ArchSD's site is located in between NM1 and our worksites. Meanwhile, with reference to the works summary provided by the Contractor, works conducted at the North Point Production Shaft during the monitoring period including installation of diaphragm wall and mobile crane movement. One mobile crane and a soil grab were operated on site during the monitoring period. Besides, only grouting works were conducted at the North Point Drop Shaft including operations of grout mixers, agitator and grout pumps.</p> <p>Some other noise sources, such as traffic noise and noise from the users at football court nearby were also noticed during the monitoring period, which may have also contributed to the measured noise level.</p> <p>Therefore, it is believed that the slightly noise exceedance is considered not solely caused by the Contractor's construction activities.</p>



Station	Record of Exceedance	Result of Investigation
NM1	Exceedance of Limit Level on 24 Mar 2010 (10:30 - 11:00)	<p>Observations during the noise monitoring indicated that construction activities including cutting and drilling and operating plants deployed at the ArchSD worksite outside the school were carried out. It should be noted that the ArchSD's site is located in between NM1 and our worksites. Meanwhile, with reference to the works summary provided by the Contractor, works conducted at the North Point Production Shaft during the monitoring period including installation of diaphragm wall and mobile crane movement. One mobile crane, a soil grab and a welding set were operated on site during the monitoring period. Besides, only drilling hole of colcrete pile was conducted at the North Point Drop Shaft including operations of a mini backhoe and drill rig.</p> <p>With reviewing the noise monitoring record on 17<sup>th</sup> February 2010, noise level was relatively low which was 66.3 dB(A). At that time, there was limited construction activities conducted in ArchSD site whilst the similar construction activities including installation of diaphragm wall and mobile crane movement were conducted at the project site. Hence, the noise level contribution from the project site is considered to be low. Some other noise sources, such as traffic noise and noise from the users at football court nearby were also noticed during the monitoring period, which may have also contributed to the measured noise level.</p> <p>Therefore, it is believed that the noise exceedance is considered not only solely caused by the Contractor's construction activities but also caused by ArchSD's construction activities, traffic noise and noise from the users at football court nearby.</p>

### 3.7.2 *Summary of Environmental Non-Compliance*

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

### 3.7.3 *Summary of Environmental Complaint*

No complaint was received during the reporting period. The cumulative complaints log is shown in *Annex C6*.

### 3.7.4 *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 C6*.

#### 4.1 CONSTRUCTION ACTIVITIES DURING THE REPORTING PERIOD

A summary of the major construction activities undertaken in this reporting period is shown in *Table 4.1*. The locations of the construction activities are shown in *Annex D1*.

**Table 4.1** *Summary of Construction Activities Undertaken from 1 March 2010 to 31 May 2010 at Wan Chai East Production and Drop Shafts*

Worksite	Construction Activities Undertaken
Production Shaft	<ul style="list-style-type: none"> <li>• Toe grouting and fissure grouting</li> <li>• Installation of monitoring instrumentation</li> <li>• Conduction of pumping test</li> <li>• Construction of footing of noise enclosure</li> </ul>
Drop Shaft	<ul style="list-style-type: none"> <li>• Construction of guide wall</li> <li>• Construction of diaphragm wall</li> <li>• Installation of monitoring instrumentation</li> <li>• Transportation and Temporary Storage of excavated marine sediment from Wan Chai East Drop Shaft to the derrick lighter berthed at Sai Ying Pun Junction Shaft</li> </ul>

#### 4.2 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 4.2*.

**Table 4.2** *Summary of Environmental Licensing, Notification and Permit Status at Wan Chai East Production and Drop Shafts*

Permit/ Licences/ Notification	Reference	Validity Period	Remarks
Wastewater Discharge License	Wan Chai East Production Shaft and Drop Shaft WT00005060-2009	06 October 2009 - 31 October 2014	--
Chemical Waste Producer Registration	Wan Chai East Production Shaft and Drop Shaft 5213-135-G2308-03	--	--
Construction Noise Permit	Wan Chai East Drop Shaft GW-RS0899-09	26 November 2009 - 21 May 2010	Superseded by GW-RS0041-10 on 20 January 2010
	Wan Chai East Drop Shaft GW-RS0041-10	20 January 2010 - 19 July 2010	--
	Wan Chai East Production Shaft GW-RS0275-10	26 March 2010 - 25 September 2010	--

### 4.3 ENVIRONMENTAL MONITORING REQUIREMENTS

#### 4.3.1 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 4.3* and shown in *Annex D2*.

**Table 4.3 Construction Phase Air Monitoring Location at Wan Chai East Production and Drop Shafts**

Worksite	Construction Air Quality Monitoring Station			Remark
	ID in EM&A Manual	ID	Location	
Wan Chai East	-	AM3	Rooftop of Wan Chai East PTW	<ul style="list-style-type: none"> <li>The rooftop of Society for the Prevention of Cruelty to Animals building (CM_WC1) was crowded with existing facilities (eg water tanks) that setup of HVSs for baseline monitoring is not feasible.</li> </ul>

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

Air quality monitoring was conducted in accordance with the requirements stipulated in the EM&A Manual (*Table 4.4*).

**Table 4.4 TSP Monitoring Parameter and Frequency at Wan Chai East Production and Drop 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 4.5* summarizes the equipment that was deployed for the 24-hour and 1-hour TSP monitoring.

**Table 4.5 TSP Monitoring Equipment at Wan Chai East Production and Drop Shafts**

Monitoring Station	Monitoring Equipment (HVS and Calibrator)
<i>24-hr and 1-hr TSP</i>	
AM3	GMW GS-2310 (S/N 0481), CM-AIR-43 (S/N 9833620)

*Monitoring Methodology*

Installation

The setup location of the HVS at monitoring stations was listed in *Table 4.3*. The HVS was free-standing with no obstruction.

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

- appropriate support to secure the sampler against gusty wind was provided at AM3;
- 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 folder in half length so that only surfaces with collected particulate matter were in contact;
- it was then placed in a clean plastic envelope and sealed;
- all monitoring information was recorded on a standard data sheet; and
- filters were sent to SGS Hong Kong Ltd for analysis.

#### Maintenance and Calibration

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

#### Wind Data Monitoring

The nearest weather station to Wan Chai East Production and Drop Shafts is King's Park Station. Average wind data (wind speed and wind direction) during the monitoring period were obtained from the meteorological station

at King's Park of the Hong Kong Observatory (HKO) and are presented in *Annex D4*.

#### *Action and Limit Levels*

The Action and Limit levels have been established and presented in *Table 4.6*.

**Table 4.6** *Action and Limit Levels for Air Quality at Wan Chai East Production and Drop Shafts*

Parameter	Air Monitoring Station	Action Level, $\mu\text{gm}^{-3}$	Limit Level, $\mu\text{gm}^{-3}$
24-hour TSP	AM3	181	260
1-hour TSP	AM3	355	500

#### *Event and Action Plan*

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

### 4.3.2 *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 4.7* and is shown in *Annex D2*.

**Table 4.7** *Construction Phase Noise Monitoring Station at Wan Chai East Production and Drop Shafts*

Worksite	Construction Noise Monitoring Station				
	ID in EM&A Manual	ID	Location	Type of Measurement	Remark
Wan Chai East	-	NM2	Rooftop of Hyde Building	Façade	<ul style="list-style-type: none"> <li>No guaranteed access for equipment set-up due to no caretaker of Kei Wah Building (M2)</li> <li>Alternative location, NM2, is located next to Kei Wah Building and is also the background noise monitoring station in the HATS2A EIA study.</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 4.8*, 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 4.8** *Noise Monitoring Equipment at Wan Chai East Production and Drop Shafts*

Monitoring Station	Monitoring Equipment (Sound Level Metre and Calibrator)
NM2	<ul style="list-style-type: none"><li>• Calibrator: Rion NC-73 (S/N 10786708)</li><li>• Sound Level Meters: 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)</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.

### *Action and Limit Levels*

The action and limit levels for noise monitoring during different monitoring periods are summarized in *Table 4.9*.

**Table 4.9** *Action and Limit Levels for Noise Monitoring at Wan Chai East Production and Drop Shafts*

Noise Monitoring Location	Measurement Parameter	Noise Criteria (dB(A))	Remark
NM2	L <sub>eq(30mins)</sub>	75	Normal working hours during weekdays
	L <sub>eq(5mins)</sub>	70	Evening (1900-2300); and Sundays and public holidays (0700-2300)
	L <sub>eq(5mins)</sub>	55	Night-time (2300-0700)

*Event and Action Plan*

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

**4.3.3** *Cultural Heritage*

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

**4.3.4** *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*.

**4.4** *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 D3*.

**4.5** *MONITORING RESULTS*

**4.5.1** *Air Quality*

A total of sixteen sets of 24-hour and forty-eight sets of 1-hour TSP measurements were carried out at AM3 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 D4*.



The weather condition during the monitoring period varied from sunny to rainy. The local impacts near the monitoring stations of AM3 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.

#### 4.5.2 *Noise*

A total of thirteen sets of 30-minute construction noise measurements were carried out at the monitoring station NM2 during normal working hours of weekdays of the reporting period. The monitoring results together with graphical presentations are presented in *Annex D5*. The local impacts observed near the monitoring stations of NM2 were traffic noise from Gloucester Road and Hung Hing Road and occasional helicopter landing on the helipad at Hung Hing Road.

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

#### 4.5.3 *Landscape and Visual*

Implementation and maintenance of landscape and visual mitigation measures are fully achieved. Major findings and recommendations are summarized as follows:

- On 29 April, wooden boards were placed against a tree at the northwest corner of the site. The Contractor was recommended to remove the boards from the tree as soon as possible to avoid any damages to the plants on site. The Contractor was also recommended to strictly implement relevant tree protection measures and keep materials and equipment clear from trees on site to avoid any damages to the trees.

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

#### 4.5.4 *Cultural Heritage*

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

#### 4.5.5 *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 4.10*. 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. 0.288 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 4.10** 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
May 2010	25,114.08 tonnes	115.71 tonnes	300 L	850 m <sup>3</sup>	1081 m <sup>3</sup>	44 m <sup>3</sup>

**Notes:**

- (a) Inert C&D materials include bricks, concrete, building debris, rubble and excavated soil. No inert C&D material was reused in this Project during the reporting period. Non-reused inert C&D materials were disposed of at the Tuen Mun Area 38/Tseung Kwan O Area 137 Fill Bank/ Chai Wan Barging Point.
- (b) Non-inert C&D materials include steel, paper / cardboard packaging waste, plastics and other wastes such as general refuse. Steel materials generated from the project are grouped into non-inert C&D materials as the materials were not disposed of with other inert C&D materials. The non-inert C&D materials other than steel and paper/cardboard packaging were disposed of at SENT Landfill. No steel material and 0.288 tonnes of paper/cardboard packaging were sent to recyclers for recycling during the reporting period.
- (c) 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.

#### 4.6 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 4, 11, 18 and 25 March 2010, 1, 8, 15, 22 and 29 April 2010 and 6, 13, 20 and 27 May 2010. There was no non-compliance recorded during the site inspections.

Major findings and recommendations are summarized as follows:

##### *Wan Chan East Production Shaft*

- On 18 March, stagnant water was observed in the drip tray underneath the chemical drums near the grouting area. The Contractor has immediately cleared the stagnant water. The Contractor was also recommended to inspect and clear stagnant water inside containers, trays and depressed areas on-site regularly as part of good housekeeping practices to avoid mosquito breeding on-site.

- On 25 March, an unlabelled empty drum was observed near the generator. The Contractor was recommended to provide proper labelling for chemicals on-site. The Contractor was also recommended to store the chemical waste in the designated chemical waste storage on site and dispose via licensed chemical waste collector.
- On 25 March, chemical drums without drip trays were observed underneath the wetsep. The Contractor was recommended to provide secondary spillage containments for all chemicals on site.
- On 15 April, the gap between site offices (ie containers) was observed to be full of leaves and rubbish. However, access for housekeeping and mosquito breeding preventive measures was not allowed due to the limited separation distances between the site offices. The Contractor confirmed that the site offices will be removed soon, meanwhile it was recommended to clean the miscellaneous items and to provide mosquito breeding preventive measures immediately. The Contractor was also recommended to include sufficient spaces for housekeeping purpose when planning to locate new site offices.
- On 22 April, small pools of bentonite slurries were observed on the ground below a slurry pump near the bentonite slurry tank. The Contractor was recommended to check and ensure all slurry pumps deployed on site are in good working conditions without leakage. The bentonite slurries observed on the ground should also be cleared and disposed of by proper means by the Contractor.
- On 22 April, stagnant water was observed in the container for storage of type 1 sediments. The Contractor was recommended to clear the stagnant water as soon as possible or apply larvicides regularly to avoid mosquito breeding on site as part of good housekeeping practices.

#### *Wan Chai East Drop Shaft*

- On 4 March, oil drums without chemical labels were observed near the grouting working site. The Contractor was recommended to provide proper labelling for chemical containers on-site.
- On 15 April, oil stains were observed on the ground near the water pump. The Contractor was recommended to clear the oil stains immediately and dispose of the collected wastes as chemical wastes. The Contractor was also recommended to provide drip trays for the water pump or equipment with potential of oil spillage as a containment measure to avoid potential spillages and therefore potential soil contamination and surface runoffs.
- On 6 May, stagnant water was observed in the tank near the wastewater treatment facility. The Contractor was recommended to clear the stagnant water immediately as part of good housekeeping practices to avoid mosquito breeding.
- On 13 May, Stagnant water was observed on the tarpaulin sheet on top of the site office. The Contractor was recommended to clear the stagnant water immediately as part of good housekeeping practices to avoid mosquito breeding.

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

#### **4.7 ENVIRONMENTAL NON-CONFORMANCE**

##### **4.7.1 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 station during the reporting period.

##### **4.7.2 Summary of Environmental Non-Compliance**

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

##### **4.7.3 Summary of Environmental Complaint**

No complaint was received during the reporting period. The cumulative complaints log is shown in *Annex D6*.

##### **4.7.4 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 D6*.

### 5.1 CONSTRUCTION ACTIVITIES DURING THE REPORTING PERIOD

A summary of the major construction activities undertaken in this reporting period is shown in *Table 5.1*. The location of the construction activities is shown in *Annex E1*.

**Table 5.1** *Summary of Construction Activities Undertaken from 1 March 2010 to 31 May 2010 at Central Drop Shaft*

Construction Activities Undertaken
• Construction of guide wall
• Construction of diaphragm wall
• Installation of monitoring instrumentation
• Transportation and temporary storage of excavated marine sediment to the derrick lighter berthed at Sai Ying Pun Junction Shaft

### 5.2 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 5.2*.

**Table 5.2** *Summary of Environmental Licensing, Notification and Permit Status at Central Drop Shaft*

Permit/ Licences/ Notification	Reference	Validity Period	Remarks
Wastewater Discharge License	Central PTW Drop Shaft WT0005131-2009	09 October 2009 -31 October 2014	--
Chemical Waste Producer Registration	Central PTW Drop Shaft 5213-115-G2347-06	--	--

### 5.3 ENVIRONMENTAL MONITORING REQUIREMENTS

#### 5.3.1 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 5.3* and shown in *Annex E2*.

**Table 5.3 Construction Phase Air Monitoring Location at Central Drop Shaft**

Worksite	Construction Air Quality Monitoring Station			Remark
	ID in EM&A Manual	ID	Location	
Central	-	AM4	A Location within the DSD Central PTW	<ul style="list-style-type: none"> <li>• Access to Sheung Wan Fire Station (CM_C1) was rejected.</li> <li>• All possible locations along Connaught Road West and Connaught Road East have been exhausted and no suitable location is identified due to rejection by the premise owner, security reason, without guaranteed access or inaccessible. AM4 is the alternative location.</li> </ul>

*Monitoring Parameters, Frequency and Programme*

Air quality monitoring was conducted in accordance with the requirements stipulated in the EM&A Manual (Table 5.4).

**Table 5.4 TSP Monitoring Parameter and Frequency at Central Drop Shaft**

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 5.5 summarizes the equipment that was deployed for the 24-hour and 1-hour TSP monitoring.

**Table 5.5 TSP Monitoring Equipment at Central Drop Shaft**

Monitoring Station	Monitoring Equipment (HVS and Calibrator)
24-hr and 1-hr TSP	
AM4	GMW GS-2310 (S/N 9315), CM-AIR-43 (S/N 9833620)

*Monitoring Methodology*

Installation

The setup location of the HVS at monitoring stations was listed in Table 5.3. 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 AM4;
- 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 stations to at Central Drop Shaft are King's Park Station and Green Island Station. Average wind data (wind speed and wind direction) during the monitoring period were obtained from the meteorological stations at Green Island and King's Park of the Hong Kong Observatory (HKO) and are presented in *Annex E4*.

#### *Action and Limit Levels*

The Action and Limit levels have been established and presented in *Table 5.6*.

**Table 5.6** *Action and Limit Levels for Air Quality at Central Drop Shaft*

Parameter	Air Monitoring Station	Action Level, µgm <sup>-3</sup>	Limit Level, µgm <sup>-3</sup>
24-hour TSP	AM4	211	260
1-hour TSP	AM4	393	500



## *Event and Action Plan*

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

### 5.3.2 *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 locations for this Contract are listed in *Table 5.7* and are shown in *Annex E2*.

**Table 5.7** *Construction Phase Noise Monitoring Station at Central Drop Shaft*

Worksite	Construction Noise Monitoring Station				
	ID in EM&A Manual	ID	Location	Type of Measurement	Remark
Central	-	NM3	Rooftop of Goldfield Building	Façade	• Chi Cheung Building (M4) is not accessible.

#### *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 5.8*, 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 5.8** *Noise Monitoring Equipment at Central Drop Shaft*

Monitoring Station	Monitoring Equipment (Sound Level Metre and Calibrator)
NM3	<ul style="list-style-type: none"> <li>• Calibrator: Rion NC-73 (S/N 10786708)</li> <li>• Sound Level Meters: 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)</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.

*Action and Limit Levels*

The action and limit levels for the noise monitoring during different monitoring periods are summarized in *Table 5.9*.

**Table 5.9** *Action and Limit Levels for Noise Monitoring at Central Drop Shaft*

Noise Monitoring Location	Measurement Parameter	Noise Criteria (dB(A))	Remark
NM3	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*.

**5.3.3** *Cultural Heritage*

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

**5.3.4** *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*.

### 5.4 *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 E3*.

### 5.5 *MONITORING RESULTS*

#### 5.5.1 *Air Quality*

A total of sixteen sets of 24-hour and forty-eight sets of 1-hour TSP measurements were carried out at AM4 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 E4*.

The weather condition during the monitoring period varied from sunny to fine. The local impacts near the monitoring stations of AM4 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.

#### 5.5.2 *Noise*

A total of thirteen sets of 30-minute construction noise measurements were carried out at the monitoring station NM3 during normal weekdays of the reporting period. The monitoring results together with graphical presentations are presented in *Annex E5*. The local impacts observed near the monitoring stations of NM3 were traffic noise from Connaught Road Central.

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

#### 5.5.3 *Landscape and Visual*

Implementation and maintenance of landscape and visual mitigation measures are fully achieved and no major findings were observed during the reporting period.

#### 5.5.4 *Cultural Heritage*

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

#### 5.5.5 *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 5.10*. 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. 0.288 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 5.10 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
May 2010	25,114.08 tonnes	115.71 tonnes	300 L	850 m <sup>3</sup>	1081 m <sup>3</sup>	44 m <sup>3</sup>

Notes:

- (a) Inert C&D materials include bricks, concrete, building debris, rubble and excavated soil. No inert C&D material was reused in this Project during the reporting period. Non-reused inert C&D materials were disposed of at the Tuen Mun Area 38/Tseung Kwan O Area 137 Fill Bank/ Chai Wan Barging Point.
- (b) Non-inert C&D materials include steel, paper / cardboard packaging waste, plastics and other wastes such as general refuse. Steel materials generated from the project are grouped into non-inert C&D materials as the materials were not disposed of with other inert C&D materials. The non-inert C&D materials other than steel and paper/cardboard packaging were disposed of at SENT Landfill. No steel material and 0.288 tonnes of paper/cardboard packaging were sent to recyclers for recycling during the reporting period.
- (c) 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.

5.6

ENVIRONMENTAL SITE INSPECTION

Weekly site inspections were carried out by the representatives of the Contractor, Engineer and the ET. Twelve site inspections were conducted on 4, 11, 18 and 25 March 2010, 1, 8, 15, 22 and 29 April 2010 and 6, 13 and 20 May 2010.

Major findings and recommendations are summarized as follows:

- On 18 March, oil stains were observed on the ground near the tracked crane. The Contractor immediately cleared the oil stains and stored the collected soil in a plastic bag for further disposal as chemical waste.
- On 18 March, unlabelled plastic bottles were observed in the chemical waste storage. The Contractor was recommended to check whether the bottles are chemical wastes. If the bottles are chemical wastes, the bottles should be labelled properly according to waste properties. Otherwise, plastics should be disposed in the plastics recycling box provided on site.
- On 8 April, the chemical waste label on the chemical waste storage was observed to be damaged. The Contractor was recommended to replace the damaged label.
- On 6 May, the impervious sheet on the right side cover board of a dump truck for transporting C&D materials was observed to be damaged. The Contractor was recommended to repair the cover board as soon as possible so that dust from C&D materials on the truck is properly suppressed at all times during transportation.
- On 13 May, tyre tracks and footprints of soil and mud were observed on the public road outside the vehicular entrance of the work site. The Contractor was recommended to clear the soil and mud from the road as soon as possible. The Contractor was also recommended to strictly implement wheel wash on all exiting vehicles and to provide boot cleaning

basins for workers in order to avoid carryover of soil and mud from the work site into public areas.

- On 20 May, oil sheens were observed on the ground, including the access road and works area, at multiple spots of the sites. The Contractor has immediately arranged clearance of the oil sheens with spillage kit at the Stonecutters site. The Contractor was recommended to arrange clean up of oil sheen immediately, especially on rainy days, to avoid contamination of soil and runoff into drainages. The Contractor was also recommended to dispose of the collected chemical wastes via licensed collectors.
- On 20 May, stagnant water was observed on the ground and drip trays in the inspected sites after heavy 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.

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

## 5.7 ENVIRONMENTAL NON-CONFORMANCE

### 5.7.1 *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 noise was recorded at monitoring stations during the reporting period.

### 5.7.2 *Summary of Environmental Non-Compliance*

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

### 5.7.3 *Summary of Environmental Complaint*

No complaint was received during the reporting period. The cumulative complaints log is shown in *Annex E6*.

### 5.7.4 *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 E6*.

### 6.1 CONSTRUCTION ACTIVITIES DURING THE REPORTING PERIOD

A summary of the major construction activities undertaken in this reporting period is shown in *Table 6.1*. The location of the construction activities is shown in *Annex F1*.

**Table 6.1** *Summary of Construction Activities Undertaken from 1 March 2010 to 31 May 2010 at Sai Ying Pun Junction Shaft*

Construction Activities Undertaken
<ul style="list-style-type: none"> <li>• Construction of diaphragm wall</li> <li>• Disposal of type 3 marine sediment from Sai Ying Pun Junction Shaft to SENT</li> <li>• Installation of monitoring instrumentation</li> <li>• Transportation and temporary storage of excavated marine sediment to the derrick lighter berthed at Sai Ying Pun Junction Shaft</li> </ul>

### 6.2 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 6.2*.

**Table 6.2** *Summary of Environmental Licensing, Notification and Permit Status at Sai Ying Pun Junction Shaft*

Permit/ Licences/ Notification	Reference	Validity Period	Remarks
Wastewater Discharge License	Sai Ying Pun Junction Shaft WT00005133-2009	09 October 2009 - 31 October 2014	--
Chemical Waste Producer Registration	Sai Ying Pun Junction Shaft 5213-112-G2347-05	--	--
Construction Noise Permit	Sai Ying Pun Junction Shaft GW-RS0656-09	28 August 2009 - 28 February 2010	Superseded by GW-RS0028-10 on 14 January 2010
	Sai Ying Pun Junction Shaft GW-RS0028-10	14 January 2010 - 13 July 2010	--

### 6.3 ENVIRONMENTAL MONITORING REQUIREMENTS

#### 6.3.1 Air Quality Monitoring

Due to contractual arrangements, air quality monitoring was implemented by the Environmental Team of Contract No. DC/2007/24 of Harbour Area Treatment Scheme Stage 2A (HATS2A) - Construction of Sewage Conveyance System from Aberdeen to Stonecutters Island (Contract 24) starting from 28 December 2009.

Air monitoring data at AM5 after 28 December 2009 was collected and provided by the ET of Contract 24.

The following information regarding air monitoring therefore only covers the arrangements covered under this Contract from 1 - 27 December 2009.

#### *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 6.3* and shown in *Annex F2*.

**Table 6.3** *Construction Phase Air Monitoring Location at Sai Ying Pun Junction Shaft*

Worksite	Construction Air Quality Monitoring Station			Remark
	ID in EM&A Manual	ID	Location	
Fung Mat Street	CM_FM1	AM5	Western Wholesale Food Market	-

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

Air quality monitoring was conducted in accordance with the requirements stipulated in the EM&A Manual (*Table 6.4*).

**Table 6.4** *TSP Monitoring Parameter and Frequency at Sai Ying Pun Junction Shaft*

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

#### *Wind Data Monitoring*

The nearest weather stations to Sai Ying Pun Junction Shaft are King's Park Station and Green Island Station. Average wind data (wind speed and wind direction) during the monitoring period were obtained from the meteorological stations at King's Park and Green Island of the Hong Kong Observatory (HKO) and are presented in *Annex F4*.

#### *Action and Limit Levels*

The Action and Limit levels have been established and presented in *Table 6.5*.

**Table 6.5** *Action and Limit Levels for Air Quality at Sai Ying Pun Junction Shaft*

Parameter	Air Monitoring Station	Action Level, $\mu\text{gm}^{-3}$	Limit Level, $\mu\text{gm}^{-3}$
24-hour TSP	AM5	188	260
1-hour TSP	AM5	332	500



## *Event and Action Plan*

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

### 6.3.2 *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 6.6* and is shown in *Annex F2*.

**Table 6.6** *Construction Phase Noise Monitoring Station at Sai Ying Pun Junction Shaft*

Worksite	Construction Noise Monitoring Station				
	ID in EM&A Manual	ID	Location	Type of Measurement	Remark
Fung Mat Road	M3	NM4	Rooftop of Block A, Kwan Yick Building Phase III	Façade	-

#### *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 6.7*, 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 6.7** *Noise Monitoring Equipment at Sai Ying Pun Junction Shaft*

Monitoring Station	Monitoring Equipment (Sound Level Metre and Calibrator)
NM4	<ul style="list-style-type: none"> <li>• Calibrator: Rion NC-73 (S/N 10786708)</li> <li>• Sound Level Meters: 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)</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.

#### *Action and Limit Levels*

The action and limit levels for the noise monitoring during different monitoring periods are summarized in *Table 6.8*.

**Table 6.8** *Action and Limit Levels for Noise Monitoring at Sai Ying Pun Junction Shaft*

Noise Monitoring Location	Measurement Parameter	Noise Criteria (dB(A))	Remark
NM4	$L_{eq(30mins)}$	75	Normal working hours during weekdays
	$L_{eq(5mins)}$	70	Evening (1900-2300); and Sundays and public holidays (0700-2300)
	$L_{eq(5mins)}$	55	Night-time (2300-0700)

#### *Event and Action Plan*

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

### 6.3.3 *Cultural Heritage*

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

### 6.3.4 *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*.

### 6.4 *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 F3*.

### 6.5 *MONITORING RESULTS*

#### 6.5.1 *Air Quality*

A total of seventeen sets of 24-hour and fifty-one sets of 1-hour TSP measurements were carried out at AM5 during the reporting period. The 24-hr TSP monitoring date of 20 May proposed in the fifth EM&A report was rescheduled to 24 May 2010 due to HVS failure. One set monitoring data of 1-hour TSP conducted on 20 May 2010 was not provided due to HVS failure. The monitoring data for 24-hour TSP and 1-hour TSP together with wind data and graphical presentations are presented in *Annex F4*.

The weather condition during the monitoring period varied from sunny to fine. The local impacts near the monitoring stations of AM5 were mainly associated with vehicle emissions.

Exceedances of the action level for 1-hr TSP and 24-hr TSP were recorded on 17 March and 23 March at AM5, respectively. Investigations were conducted to review the potential causes for the noise level recorded. A summary of the investigation results is presented in *Section 6.7.1*.

#### 6.5.2 *Noise*

A total of thirteen sets of 30-minute construction noise measurements were carried out at the monitoring station NM4 during normal weekdays of the reporting period. Construction works were also conducted on public holidays and Sundays at Sai Ying Pun Junction Shaft in this reporting period. Hence, thirteen sets of 3 x 5-minute construction noise measurements were carried out at the monitoring station NM4 during restricted hours (between 0700 and 2300 hours on Sundays and public holidays) on 7, 14, 21 and 28 March, 4, 11, 18 and 25 April and 2, 9, 15, 23 and 30 May 2010. The monitoring date of 16 May proposed in the fifth EM&A report was rescheduled to 15 May due to the complaint investigation. The monitoring results together with graphical presentations are presented in *Annex F5*. The

local impacts observed near the monitoring stations of NM4 were mainly traffic noise from Connaught Road West.

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

#### 6.5.3 *Landscape and Visual*

Implementation and maintenance of landscape and visual mitigation measures are fully achieved and no major findings were observed during the reporting period.

#### 6.5.4 *Cultural Heritage*

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

#### 6.5.5 *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 6.9*. 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. 0.288 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 6.9 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
May 2010	25,114.08 tonnes	115.71 tonnes	300 L	850 m <sup>3</sup>	1081 m <sup>3</sup>	44 m <sup>3</sup>

Notes:

- (a) Inert C&D materials include bricks, concrete, building debris, rubble and excavated soil. No inert C&D material was reused in this Project during the reporting period. Non-reused inert C&D materials were disposed of at the Tuen Mun Area 38/Tseung Kwan O Area 137 Fill Bank/ Chai Wan Barging Point.
- (b) Non-inert C&D materials include steel, paper / cardboard packaging waste, plastics and other wastes such as general refuse. Steel materials generated from the project are grouped into non-inert C&D materials as the materials were not disposed of with other inert C&D materials. The non-inert C&D materials other than steel and paper/cardboard packaging were disposed of at SENT Landfill. No steel material and 0.288 tonnes of paper/cardboard packaging were sent to recyclers for recycling during the reporting period.
- (c) 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.

## 6.6 ENVIRONMENTAL SITE INSPECTION

Weekly site inspections were carried out by the representatives of the Contractor, Engineer and the ET. Twelve site inspections were conducted on 4, 11, 18 and 25 March 2010, 1, 8, 15, 22 and 29 April 2010 and 6, 13 and 20 May 2010.

There was no non-compliance recorded during the site inspections.

Major findings and recommendations are summarized as follows:

- On 11 March, oil stains were observed on the ground near the hydromill and tracked cranes on site. The Contractor was recommended to remove the oil stains as soon as possible and dispose of the collected wastes as chemical wastes. The Contractor was also recommended to provide drip trays as a containment measure to avoid potential spillages and therefore potential soil contamination and surface runoffs.
- On 18 March, muddy stagnant water was observed in the temporary drainage behind the bentonite silos near the site boundary. The Contractor was recommended to improve the design of the temporary drainage as soon as possible to avoid mosquito breeding as part of a good housekeeping practice.
- On 1 April, bentonite slurry with stagnant water was observed near the bentonite filtering plants. The Contractor was recommended to clear the water as soon as possible. The Contractor was also recommended to check if the bentonite filtering plants is in good condition to avoid bentonite slurry spillage.
- On 15 April, oil stains were observed on the ground near the hydro mill. The Contractor was recommended to clear the oil stains immediately and dispose of the collected wastes as chemical wastes. The Contractor was

also recommended to provide drip trays as a containment measure to avoid potential spillages.

- On 22 April, stagnant water was observed on top of the site office. The Contractor was recommended to clear the stagnant water immediately as part of good housekeeping practices to avoid mosquito breeding.
- On 6 and 13 May, a water pump adjacent to the bentonite silos was observed to be leaking water. The Contractor was recommended to arrange maintenance on the water pump as soon as possible to avoid further water leakage and therefore unnecessary wastage.
- On 20 May, oil sheens were observed on the ground, including the access road and works area, at multiple spots of the sites. The Contractor has immediately arranged clearance of the oil sheens with spillage kit at the Stonecutters site. The Contractor was recommended to arrange clean up of oil sheen immediately, especially on rainy days, to avoid contamination of soil and runoff into drainages. The Contractor was also recommended to dispose of the collected chemical wastes via licensed collectors.
- On 20 May, stagnant water was observed on the ground and drip trays in the inspected sites after heavy 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.

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

## 6.7 ENVIRONMENTAL NON-CONFORMANCE

### 6.7.1 *Summary of Monitoring Exceedance*

Exceedances of the action level for 1-hr TSP and 24-hr TSP were recorded on 17 and 23 March 2010 at AM5, respectively. Details of the incidents and investigations are presented in *Table 6.10*.

**Table 6.10** *Summary of Record of Exceedance at Sai Ying Pun Junction Shaft*

Station	Record of Exceedance	Result of Investigation
AM5	Exceedance of Action Level for 1-hr TSP on 17 Mar 2010 (08:00 – 09:00)	<p>Observations during the air monitoring indicated that there were no dusty construction activities. Key works carried out by the project site during the monitoring period included the following:</p> <ul style="list-style-type: none"> <li>• Installing steel cage, stop ends and tremie pipes for D-wall construction P15</li> <li>• Excavating and chiselling for D-wall construction P03</li> <li>• Disposal of C&amp;D to public fill</li> </ul> <p>While key works carried out by Contractor of DC/2007/24 (its worksite located between AM5 and DC/2007/23's work site) during the monitoring period included the following:</p> <ul style="list-style-type: none"> <li>• Hydrofraise excavation on P18</li> <li>• Grab excavation on P14 – excavated soil is directly loaded to a truck and dump to the muckpit nearby.</li> <li>• Hauling of excavated material from site to designated dumping area.</li> </ul> <p>Regular watering has been provided for the project site area. It was noted that the dominant wind direction between 16:00 hours on 17 March and 09:00 hours on 18 March (i.e. during part of the air monitoring section) recorded at the King's Park Station and the Green Island Station of HKO was westerly and northwesterly, whilst the average wind speed was 1.67 ms<sup>-1</sup> and 3.43 ms<sup>-1</sup>. In view of the wind speed and direction during the air monitoring section, it is anticipated that any emissions resulted from the project site would unlikely reach AM5 as the project site is located to the west of the project site. Besides, no exceedance of 24-hr TSP was indentified at the next scheduled monitoring section (i.e. 23 March 2010) when the similar major construction activities were also carried out at the project site.</p> <p>Based on the above, no direct evidence showing the exceedance observed is attributable to the project site.</p>

Station	Record of Exceedance	Result of Investigation
AM5	Exceedance of Action Level for 24-hr TSP on 23 Mar 2010 (16:00 – 16:00 next day)	<p>Observations during the air monitoring indicated that there were no dusty construction activities. Key works carried out by the project site during the monitoring period included the following:</p> <ul style="list-style-type: none"> <li>• Chiselling and excavate for D-wall construction P03 from 85.6m-87.3m depth from 07:30-19:30</li> <li>• Desanding after collection of rockhead and founding material</li> <li>• Adjusting the verticality for D-wall construction P11</li> <li>• Disposal of C&amp;D to public fill</li> </ul> <p>While key works carried out by Contractor of DC/2007/24 (its worksite located between AM5 and DC/2007/23's work site) during the monitoring period included the following:</p> <ul style="list-style-type: none"> <li>• Excavation of P14 through hydrofraise</li> <li>• Excavation of P11 through grab</li> <li>• Hauling of excavated material from site to designated dumping area</li> </ul> <p>Regular watering has been provided for the project site area. It was noted that the hourly RSP level recorded by EPD's monitoring station at Central/Western (closest to the project site) at 08:00 and 09:00 on 23 March 2010 was 400.9 <math>\mu\text{gm}^{-3}</math> and 273.4 <math>\mu\text{gm}^{-3}</math> respectively, which was contributed by the sandstorm from northern China from 20 to 24 March 2010. The dominant wind direction between 08:00 and 09:00 hours (ie during air monitoring section) on 23 March 2010 at the King's Park Station and the Green Island Station of HKO was southeasterly and northeasterly, respectively, whilst the average wind speed was 1.25 <math>\text{ms}^{-1}</math> and 5.56 <math>\text{ms}^{-1}</math>. In view of the wind speed and direction during the air monitoring section, it is likely that the exceedance was due to general background.</p>

With reference to the investigation results at AM5, it was concluded that the exceedance was not due to the Contractor's construction activities. However, the Contractor of this Project was reminded to implement all relevant dust mitigation measures recommended or specified in the EIA, EM&A Manual, EMP, Method Statements, General and Particular Specifications of this Project to avoid exceedance of action levels.

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

#### 6.7.2 *Summary of Environmental Non-Compliance*

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

#### 6.7.3 *Summary of Environmental Complaint*

Three complaints have been received in this reporting period. A summary of the environmental complaint received is summarized as follow:



**Table 6.11** *Summary of Complaint Received*

Date	Means by which complaint was received	Nature of complaint
9 April 2010	Complaint is filed by EPD	Gully blockage at Fung Mat Road near J/O Water Street
12 May 2010	Two complaints are filed by EPD	Night time general construction noise at Sai Ying Pun

On 9 April 2010, a complaint regarding the blockage of gully chambers has been received by the EPD, indicating that the blockage is causing ponding on road surface at Fung Mat Road near J/O Water Street.

As reported by the Contractor, the drainage channel and gully has been blocked prior to the commencement of the project. Conditional survey was conducted by the Contractor in September 2009 which indicated the gullies identified in the complaint were all blocked by the soil fill and the gully pipes except the one near the Site boundary were not observed. Hence, the Contractor reported to DSD in September 2009 to look for their further actions.

With reference to the Contractor's works summary for 9 April 2010, works conducted at Sai Ying Pun Junction Shaft included installation of diaphragm wall and bentonite testing. Wastewater was mainly generated from surface runoff and from wheel washing facilities and they would be mainly re-used on-site such as in diaphragm wall construction. Only limited wastewater would be discharged into the approved discharge point in compliance with the conditions stated in the effluent discharge license (WT00005133-2009).

Based on the above, the complaint was considered not caused by the Contractor's construction activities and no follow-up action was required.

On 12 May 2010, two complaints regarding the night-time construction noise near the seafront at Fung Mat Road were received by the EPD, indicating that the construction activities at night was causing noise nuisance to the residence nearby.

The working hours in the evening restricted period at the Sai Ying Pun junction shaft for Contract No. DC/2007/23 (Contract 23) on 12 May 2010 were from 1900 to 2030 hours. Investigations revealed that major works conducted at Sai Ying Pin Junction Shaft for Contract 23 included excavation and chiseling for D-wall construction and disposal of C&D materials to public fill. Construction Noise Permit (CNP) (GW-RS0656-09) is available for the construction works undertaken and the use of equipment during restricted hours.

It is noted that noise monitoring for evening restricted hours (1900 - 2300 hours) were conducted by ET of Contract 24 for 15 minutes (1900 - 1915 hours) at NM4 on 12 May 2010 (date of complaint received). The average  $L_{eq(5min)}$  recorded was 69dB(A), complying with the evening criterion of 70 dB(A). No construction works were observed on both sites of Contracts 23 & 24 at the

time of monitoring. Traffic noise from Connaught Road West was also observed to be dominant in the background.

After receiving the complaints from EPD, restricted hours noise monitoring (for 15 minutes during 1900 – 2300 hours) were conducted at NM4 by ET of Contract 24 on 14 May 2010 and ET of Contract 23 on 15 May 2010. The average  $L_{eq(5min)}$  levels were 68.5dB (A) and 68.0 dB(A) on 14 and 15 May 2010, respectively which complied with the noise criterion of 70dB(A). During the monitoring on 14 May 2010, maintenance of construction equipment was observed at the project site for Contract 24 and concreting of D-wall was observed at the project site for Contract 23. During the monitoring on 15 May 2010, no construction activities were observed at both project sites of Contract 23 and Contract 24. In addition, some other noise sources, such as traffic on Connaught Road West and ferries in the Victoria Harbour were also noticed during the monitoring period on both days of monitoring.

It is understood that all works conducted in the evening restricted period of 12-15 May 2010 in Contract 23 only utilized equipments approved under the CNP (GW-RS0656-09). Further noise monitoring during the restricted period on 14 May 2010 also suggested there was no exceedance of evening noise criterion at the designated noise monitoring station due to the project works. On 20 May 2010, EPD also inspected the work site of Contract 23 from 1925 to 1935 hours and confirmed that all works were conducted under approved CNP conditions.

Further to the concern of the complainant that noise from works had been heard since one month ago, noise monitoring during the evening restricted hours by Contract 24 from 2 April to 12 May 2010 was also reviewed. The range of average  $L_{eq(5min)}$  measured in that period of time spans was 67.0 - 69.7 dB(A), all complied with the evening noise criterion of 70dB(A). Construction works observed from both work sites included construction of D-wall and the loading of construction materials, similar to the work types conducted in the current period. The evidences suggested all works at the Sai Ying Pun work sites complied with the legislative requirements for evening time work.

The Contractor has adhered strictly to the Construction Noise Mitigation Plan and the relevant Construction Noise Permit (CNP) for all works in the evening restricted hours of 12 May 2010. Available information and the further noise measurement on 12, 14 and 15 May 2010 also suggested evening noise criterion was complied when the complaints were received. It could therefore be concluded that works by the Contract 23 did not violate regulatory limits and the Contractor has implemented all necessary measures to avoid nuisances to nearby sensitive receivers.

While the above suggested the Contractor has complied with all relevant requirements for noise control, no further action is required. However, the Contractor will continue to ensure all requirements in the CNP are strictly complied with to avoid nuisance to nearby sensitive receivers.

The cumulative complaints log is shown in *Annex F6*.

#### 6.7.4

#### *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 F6*.

### 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 March 2010 to 31 May 2010 at Stonecutters Island Production and Riser Shafts*

Construction Activities Undertaken	
•	Construction of diaphragm wall at Stonecutters Island Production Shaft and Riser Shaft
•	Transportation and temporary storage of excavated marine sediment to the derrick lighter berthed at Sai Ying Pun Junction Shaft
•	Installation of monitoring instrumentation

### 7.2 STATUS OF ENVIRONMENTAL APPROVAL DOCUMENTS

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

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

Permit/ Licences/ Notification	Reference	Validity Period	Remarks
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-RW0397-09	17 September 2009 - 15 March 2010	superseded by GW-RW0066-10 on 8 February 2010
	Stonecutters Island Production Shaft and Riser Shaft GW-RW0066-10	8 February 2010 - 7 August 2010	--

### 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			Remark
	ID in EM&A Manual	ID	Location	
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)
24-hr and 1-hr TSP	
AM6	GMW GS-2310 (S/N 1254), CM-AIR-43 (S/N 9833620)

### Monitoring Methodology

#### Installation

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

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

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

#### Preparation of Filter Papers

- glass fibre filters were labelled and sufficient filters that were clean and without pinholes were selected;
- all filters were equilibrated in the conditioning environment for 24 hours before weighing. The conditioning environment temperature was around 25 °C and not variable by more than  $\pm 3$  °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 four 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)</li> <li>• Sound Level Meters: 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)</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(30mins)</sub>	75	Normal working hours during weekdays
	L <sub>eq(5mins)</sub>	70	Evening (1900-2300); and Sundays and public holidays (0700-2300)
	L <sub>eq(5mins)</sub>	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 sixteen sets of 24-hour and forty-eight 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 thirteen 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. Thirteen 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 7, 14, 21 and 28 March, 4, 11, 18 and 25 April and 2, 9, 16, 23 and 30 May 2010. 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**

Implementation and maintenance of landscape and visual mitigation measures are fully achieved and no major findings were observed during 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. 0.288 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
May 2010	25,114.08 tonnes	115.71 tonnes	300 L	850 m <sup>3</sup>	1081 m <sup>3</sup>	44 m <sup>3</sup>

**Notes:**

- (a) Inert C&D materials include bricks, concrete, building debris, rubble and excavated soil. No inert C&D material was reused in this Project during the reporting period. Non-reused inert C&D materials were disposed of at the Tuen Mun Area 38/Tseung Kwan O Area 137 Fill Bank/ Chai Wan Barging Point.
- (b) Non-inert C&D materials include steel, paper / cardboard packaging waste, plastics and other wastes such as general refuse. Steel materials generated from the project are grouped into non-inert C&D materials as the materials were not disposed of with other inert C&D materials. The non-inert C&D materials other than steel and paper / cardboard packaging were disposed of at SENT Landfill. No steel material and 0.288 tonnes of paper/cardboard packaging were sent to recyclers for recycling during the reporting period.
- (c) 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.

Weekly site inspections were carried out by the representatives of the Contractor, Engineer and the ET. Thirteen site inspections were conducted on 4, 11, 18 and 25 March 2010, 1, 8, 15, 22 and 29 April 2010 and 6, 13, 20 and 27 May 2010. There was no non-compliance recorded during the site inspections.

Major findings and recommendations are summarized as follows:

#### Riser Shaft

- On 13 May, flies were observed in the general waste skip near the entrance of the drop shaft work site. The Contractor was recommended to implement proper control measures, such as covers for skips and frequent clearance of general wastes, to minimize potential attraction of flies in the works area as far as practicable.
- On 20 May, oil sheens were observed on the ground, including the access road and works area, at multiple spots of the sites. The Contractor has immediately arranged clearance of the oil sheens with spillage kit at the Stonecutters site. The Contractor was recommended to arrange clean up of oil sheen immediately, especially on rainy days, to avoid contamination of soil and runoff into drainages. The Contractor was also recommended to dispose of the collected chemical wastes via licensed collectors.
- On 20 May, stagnant water was observed on the ground and drip trays in the inspected sites after heavy 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

#### Production Shaft

- On 4 March, small pools of bentonite slurry were observed on soil surface behind the bentonite slurry silos adjacent to the work site. The Contractor was recommended to clear the bentonite slurry from the soil surface immediately. Slurry pipes should be regularly checked and works areas should also be properly bunded to ensure bentonite slurries were contained in proximity to working areas.
- On 4 March, stagnant water was observed in a tank behind the bentonite slurries silos. Larvae were also observed on the surface of the stagnant water. The Contractor was recommended to dispose of unused stagnant water as soon as possible. Larvicide should be added to the stagnant water tank should it be reserved for future usage.
- On 4 March, equipments and materials were stored over the u-channels surrounding the production shaft site. The Contractor was recommended to remove the equipments and materials as soon as possible to avoid soil

and grit from dropping into the drains and potentially contaminate the stormwater discharged, especially during the wet season.

- On 18 March, small pools of stagnant water were observed on the ground and in an empty container behind the bentonite silos near the site boundary. The Contractor was recommended to clear the stagnant water or apply larvicide as soon as possible to avoid mosquito breeding as part of a good housekeeping practice.
- On 25 March, unlabelled empty drums were observed near the generator. The Contractor was recommended to check whether the bottles are chemical wastes. If the empty drums are chemical wastes, they should be labelled properly according to waste properties. Otherwise, they should be disposed in the designated general waste area provided on site.
- On 1 April, an unlabelled oil drum was observed near the generator in the Contractor's office. The Contractor was recommended to provide proper labelling for chemicals on-site.
- On 13 May, Stagnant water were observed behind the container office adjacent to the production shaft and in one drip tray adjacent to the shaft works area. The Contractor was recommended to clear the stagnant water as soon as possible, as part of a good housekeeping practice, to avoid mosquito breeding.
- On 20 May, oil sheens were observed on the ground, including the access road and works area, at multiple spots of the sites. The Contractor has immediately arranged clearance of the oil sheens with spillage kit at the Stonecutters site. The Contractor was recommended to arrange clean up of oil sheen immediately, especially on rainy days, to avoid contamination of soil and runoff into drainages. The Contractor was also recommended to dispose of the collected chemical wastes via licensed collectors.
- On 20 May, stagnant water was observed on the ground and drip trays in the inspected sites after heavy 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 27 May, oil sheen was observed on the ground near the production shaft works area. The Contractor was recommended to arrange clean up of oil sheen immediately to avoid contamination of soil and runoff into drainages. The Contractor was also recommended to dispose of the collected chemical wastes via licensed collectors.

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

7.7 *ENVIRONMENTAL NON-CONFORMANCE*

7.7.1 *Summary of Monitoring Exceedance*

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

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 March 2010 to 31 May 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 exceedance of Action and Limit Levels of 24-hour TSP and 1-hour TSP were recorded at the air quality monitoring stations during the reporting period.

Three exceedances of limit level were reported at NM1 on 12, 18 and 24 March 2010. Investigations into the incidents were made and concluded that the noise exceedance was not only solely caused by the Contractor's construction activities but also caused by ArchSD's construction activities, traffic noise and noise from the users at football court nearby. 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 recommended or specified in the EIA, EM&A Manual, EMP, Method Statements, General and Particular Specifications of this Project to avoid exceedance of noise limit levels or causing noise nuisance.

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

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

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

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

No exceedance of the Action and Limit Levels of construction noise was recorded at 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.

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

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



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

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

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

#### 8.4 *SAI YING PUN JUNCTION SHAFT*

Exceedances of the Action Level for 1-hr TSP and 24-hr TSP were recorded on 17 March and on 23 March at AM5, respectively. Investigations into the incidents were made and concluded that the exceedance was not due to the Contractor's construction activities. However, the Contractor of this Project was reminded to implement all relevant dust mitigation measures recommended or specified in the EIA, EM&A Manual, EMP, Method Statements, General and Particular Specifications of this Project to avoid exceedance of Action Level.

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.

Three complaints were received during the report period. One complaint regarding glare from spotlights at the project site was received in the reporting period. Investigations into the complaint were conducted on the following day of complaint, and all necessary mitigation measures were implemented by the Contractor immediately. Two complaints regarding the night-time general construction noise were received in the reporting month. Investigations into the complaint were conducted on 15 May 2010. As the complaints are considered not caused by the Contractor's construction activities, no further action is required. However, the Contractor will continue to ensure all requirements in the CNP are strictly complied with to avoid nuisance to nearby sensitive receivers. All complaints are closed.

There was no summon or 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

---



**Key**

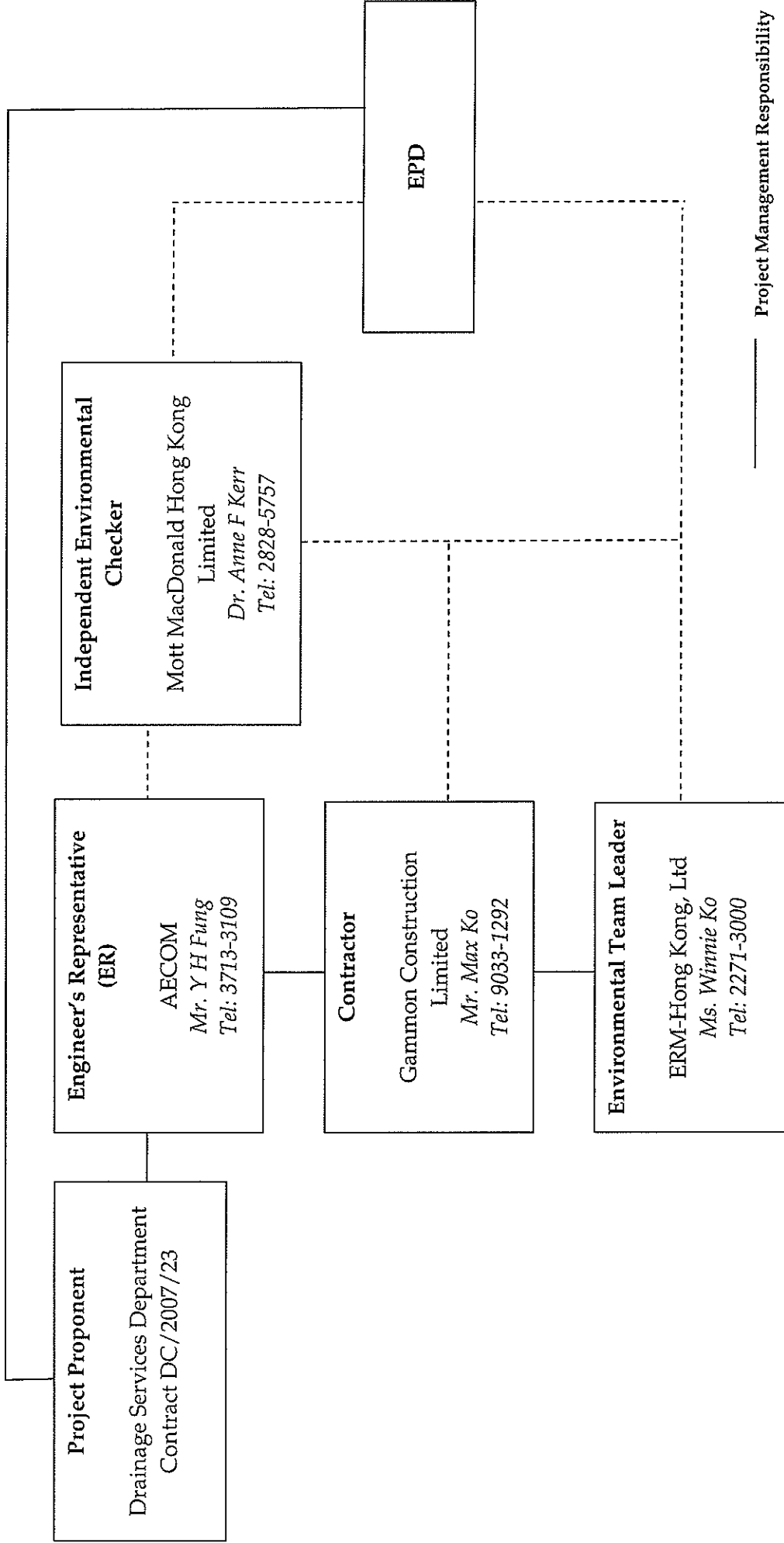
- Proposed SCS Alignments
- 8 Existing PTWs
- Existing SCISTW

General Layout Plan of HATS Stage 2A

Annex B

## Project Organization Chart and Contact Detail

Project Organization





————— Project Management Responsibility

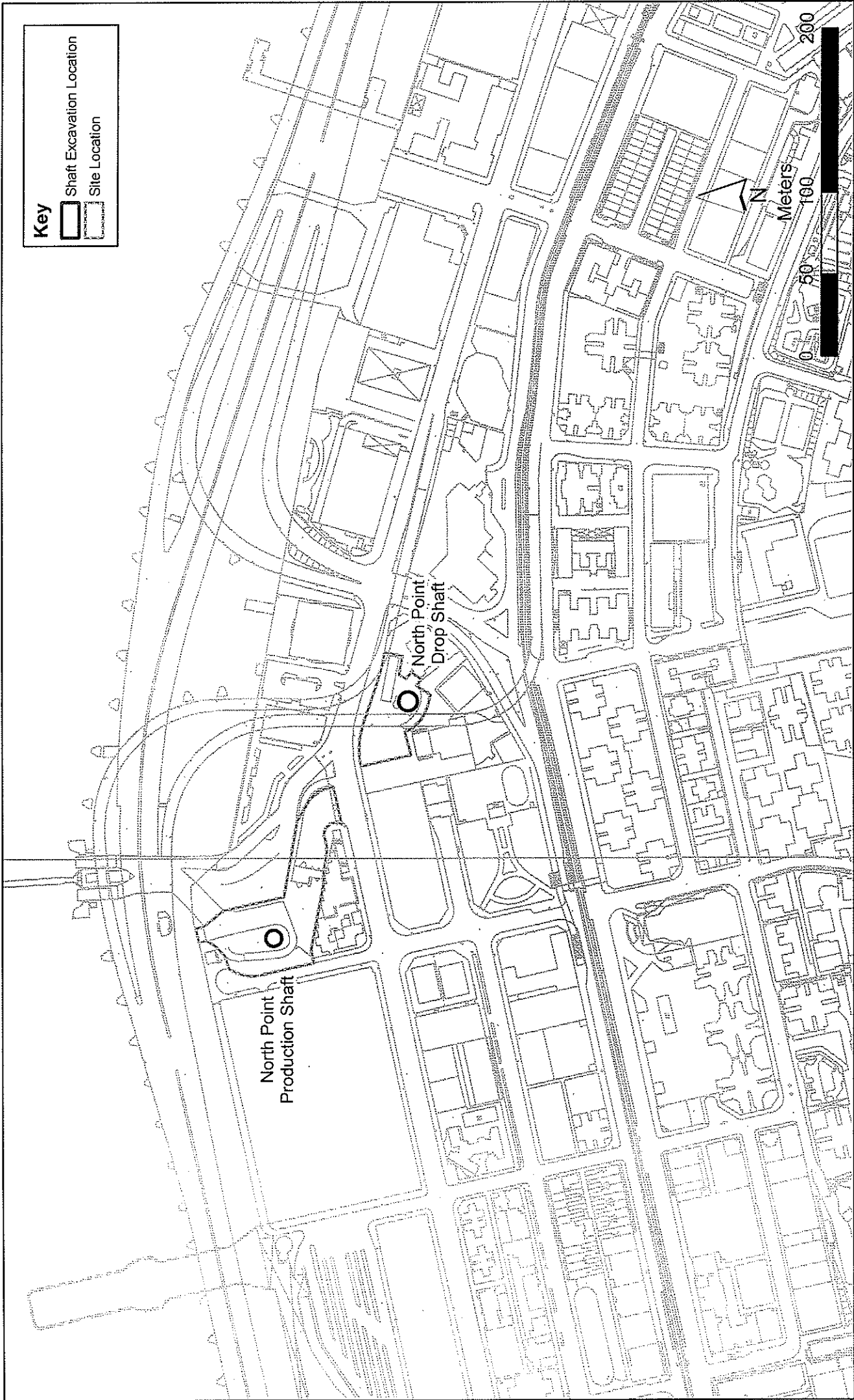
- - - - - Informal Communication Channel

Annex C

## North Point Production and Drop Shafts

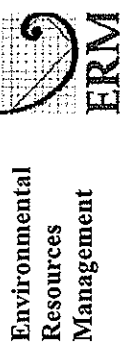
**Key**

-  Shaft Excavation Location
-  Site Location

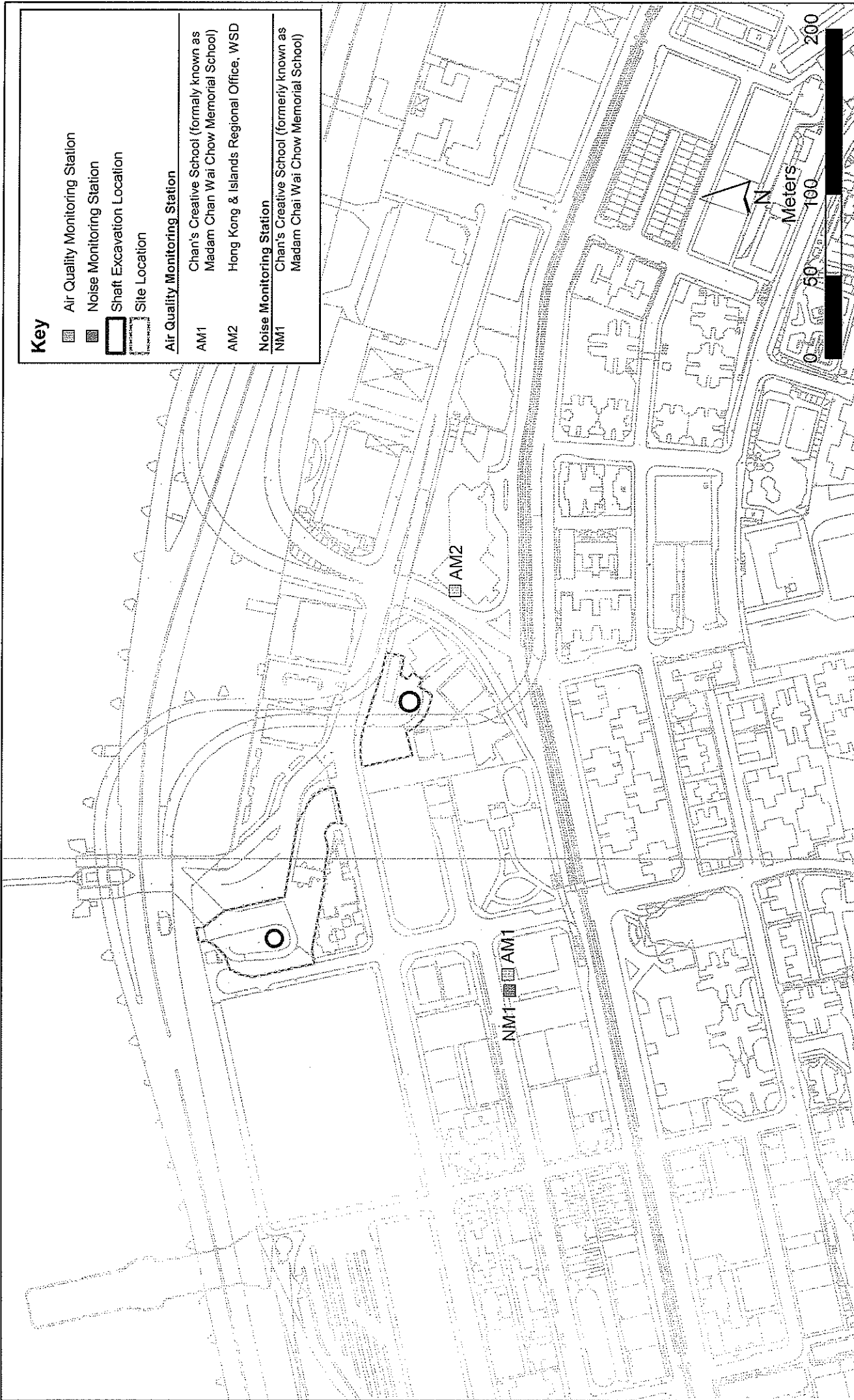


Annex C1

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 North Point







**Key**

- Air Quality Monitoring Station
- Noise Monitoring Station
- Shaft Excavation Location
- Site Location

**Air Quality Monitoring Station**

- AM1 Chan's Creative School (formerly known as Madam Chan Wai Chow Memorial School)
- AM2 Hong Kong & Islands Regional Office, WSD

**Noise Monitoring Station**

- NM1 Chan's Creative School (formerly known as Madam Chan Wai Chow Memorial School)

ANNEX C3 - 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 hardcore;</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>	Δ	

ANNEX C3 - 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>watering twice per day within the worksites at North Point PTW; and</li> <li>watering 8 times per day within worksites at the SCS works area at North Point.</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	Commissioning tests for all deodorization system should be included in the Design and Construction Contract Document.	All PTW and SCISTW / during operational phase	
<i>Construction Phase</i>			
Noise	Use of quiet PME, movable barriers and acoustic mats	All work sites / during construction	√

ANNEX C3 - SUMMARY OF MITIGATION MEASURES IMPLEMENTATION SCHEDULE

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
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	Δ
<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</p> <p>Construction Site Drainage should be adopted where applicable.</p>	All work sites / during construction	√

ANNEX C3 - 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	✓
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 C3 - 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	√

ANNEX C3 - SUMMARY OF MITIGATION MEASURES IMPLEMENTATION SCHEDULE

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Water Quality	Construction Works in Close Proximity of Storm Drains or Seafront	All work sites / during construction	√
<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>			

ANNEX C3 - SUMMARY OF MITIGATION MEASURES IMPLEMENTATION SCHEDULE

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
<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	Standby unit(s) and dual (backup) power supply would be provided at all the Stage 2 PTWs to reduce the risk of equipment breakdown at the PTWs.	Stage 2 PTWs / Operation Stage	NA. Measures not required until commencement of operational phase
<i>Construction Phase</i>			
Waste	Reusable steel or concrete panel shutters, fencing and hoarding and signboard should be used as a preferred alternative to items made of wood, to minimise wastage of wood. Attention should be paid to WBTC No. 19/2001 - Metallic Site Hoardings and Signboards to reduce the amount of timber used on construction sites. Metallic alternatives to timber are readily available and should be used rather than new timber. Precast concrete units should be adopted wherever feasible to minimize the use of timber formwork.	All work sites / during the construction period	✓
Waste	All waste materials should be segregated into categories covering: <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	✓



ANNEX C3 - SUMMARY OF MITIGATION MEASURES IMPLEMENTATION SCHEDULE

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
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	√
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	Δ
Waste	<p>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".</p>	All work sites / during the construction period	√

ANNEX C3 - SUMMARY OF MITIGATION MEASURES IMPLEMENTATION SCHEDULE

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
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	Δ
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	✓
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	✓

ANNEX C3 - SUMMARY OF MITIGATION MEASURES IMPLEMENTATION SCHEDULE

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Waste	Prior to excavation of the marine deposit layer, the deposit should be tested in accordance with the ETWB TC(W) No. 34/2002 and the results should be presented in a Preliminary Sediment Quality Report. The marine deposit should be disposed of at the disposal site designated by the Marine Fill Committee (MFC) or Director of Environmental Protection (DEP) depending on the test results.	All work sites / during the construction period	Δ
<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 C3 - 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 15.8 and 15.9. 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.
	Monitoring of vibration limits shall be conducted and reported as a requirement of EM&A programme	Identified historical buildings/structures as mentioned in Tables 15.8 and 15.9. 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 C4 24-hour and 1-hour TSP Monitoring Results

### 24-hour TSP Monitoring Results

#### Station AM1

Start Date	Start Time	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		Initial	Final	Initial	Final		Initial	Final	Average						
1-Mar-10	15:50	2-Mar-10	15:50	Cloudy	2.8594	3.0091	10399.03	10423.03	24.00	1.19	1.19	1.19	87	185	260	Construction work in progress	1808	5674
6-Mar-10	12:15	7-Mar-10	12:15	Fine	2.8009	2.9971	10426.03	10450.03	24.00	1.19	1.19	1.19	79	185	260	Construction work in progress	1808	2667
12-Mar-10	12:38	13-Mar-10	12:38	Cloudy	2.8405	2.9827	10453.03	10477.03	24.00	1.19	1.19	1.19	83	185	260	Construction work in progress	1808	5775
18-Mar-10	13:05	19-Mar-10	13:05	Sunny	2.8404	2.9834	10480.03	10504.03	24.00	1.19	1.19	1.19	83	185	260	Construction work in progress	1808	5778
24-Mar-10	13:15	24-Mar-10	13:15	Sunny	2.8491	2.9937	10507.03	10531.03	24.00	1.19	1.19	1.19	84	185	260	Construction work in progress	1808	5791
30-Mar-10	13:05	31-Mar-10	13:05	Cloudy	2.8715	2.9820	10534.03	10568.03	24.00	1.19	1.19	1.19	64	185	260	Construction work in progress	1808	5888

Min.	64
Max.	87
Average	80

### 24-hour TSP Monitoring Results

#### Station AM2

Start Date	Start Time	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		Initial	Final	Initial	Final		Initial	Final	Average						
1-Mar-10	14:40	2-Mar-10	14:40	Fine	2.8641	3.0011	11173.93	11197.93	24.00	1.18	1.18	1.18	81	182	260	Construction work in progress	0145	5672
6-Mar-10	12:35	7-Mar-10	12:35	Fine	2.8341	3.0112	11200.93	11224.93	24.00	1.18	1.18	1.18	104	182	260	Construction work in progress	0145	5664
12-Mar-10	11:45	13-Mar-10	11:45	Cloudy	2.8909	3.0297	11227.93	11251.93	24.00	1.18	1.18	1.18	88	182	260	Construction work in progress	0145	5779
18-Mar-10	13:20	18-Mar-10	13:20	Sunny	2.8391	2.9971	11254.93	11278.93	24.00	1.18	1.18	1.18	93	182	260	Construction work in progress	0145	5787
24-Mar-10	12:30	25-Mar-10	12:30	Sunny	2.8797	3.0258	11281.93	11305.93	24.00	1.14	1.14	1.14	89	182	260	Construction work in progress	0145	5884
30-Mar-10	13:20	31-Mar-10	13:20	Cloudy	2.8806	2.9971	11308.93	11332.93	24.00	1.14	1.14	1.14	71	182	260	Construction work in progress	0145	5893

Min.	71
Max.	104
Average	88

## Annex C4 24-hour and 1-hour TSP Monitoring Results

### 1-hour TSP Monitoring Results

#### Station AM1

Date	Start Time	Finish Time	Weather	TSP Concentration ( $\mu\text{g}/\text{m}^3$ )	Action Level ( $\mu\text{g}/\text{m}^3$ )	Limit Level ( $\mu\text{g}/\text{m}^3$ )	Site Conditions / Observations / Remarks	Temperature ( $^{\circ}\text{C}$ )	Wind Speed* (m/s)	Sampler ID	Filter ID
1-Mar-10	10:45	11:45	Fine	141	340	500	Construction work in progress	22		1808	5679
1-Mar-10	11:48	12:48	Fine	147	340	500	Construction work in progress	22		1808	5676
1-Mar-10	13:45	14:45	Fine	172	340	500	Construction work in progress	22		1808	5675
6-Mar-10	9:00	10:00	Fine	129	340	500	Construction work in progress	24		1808	5670
6-Mar-10	10:05	11:05	Fine	176	340	500	Construction work in progress	24		1808	5669
6-Mar-10	11:10	12:10	Fine	153	340	500	Construction work in progress	24		1808	5668
12-Mar-10	8:40	9:40	Cloudy	122	340	500	Construction work in progress	18		1808	5772
12-Mar-10	10:30	11:30	Cloudy	130	340	500	Construction work in progress	18		1808	5773
12-Mar-10	11:34	12:34	Cloudy	150	340	500	Construction work in progress	18		1808	5774
18-Mar-10	9:00	10:00	Sunny	171	340	500	Construction work in progress	22		1808	5781
18-Mar-10	9:05	10:05	Sunny	168	340	500	Construction work in progress	22		1808	5782
18-Mar-10	12:00	13:00	Sunny	174	340	500	Construction work in progress	22		1808	5783
24-Mar-10	9:20	10:20	Sunny	140	340	500	Construction work in progress	26		1808	5784
24-Mar-10	11:05	12:05	Sunny	134	340	500	Construction work in progress	26		1808	5790
24-Mar-10	12:10	13:10	Sunny	143	340	500	Construction work in progress	26		1808	5792
30-Mar-10	9:50	10:50	Cloudy	120	340	500	Construction work in progress	17		1808	5886
30-Mar-10	10:56	11:56	Cloudy	141	340	500	Construction work in progress	17		1808	5887
30-Mar-10	12:00	13:00	Cloudy	147	340	500	Construction work in progress	17		1808	5889
				<b>Min.</b>							
				<b>Max.</b>							
				<b>Average</b>							

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

## Annex C4 24-hour and 1-hour TSP Monitoring Results

### 1-hour TSP Monitoring Results

#### Station AM2

Date	Start Time	Finish Time	Weather	TSP Concentration ( $\mu\text{g}/\text{m}^3$ )	Action Level ( $\mu\text{g}/\text{m}^3$ )	Limit Level ( $\mu\text{g}/\text{m}^3$ )	Site Conditions / Observations / Remarks	Temperature ( $^{\circ}\text{C}$ )	Wind Speed * (m/s)	Sampler ID	Filter ID
1-Mar-10	10:30	11:30	Fine	124	352	500	Construction work in progress	22		0145	5678
1-Mar-10	11:35	12:35	Fine	141	352	500	Construction work in progress	22		0145	5677
1-Mar-10	13:30	14:30	Fine	145	352	500	Construction work in progress	22		0145	5673
6-Mar-10	9:15	10:15	Fine	162	352	500	Construction work in progress	24		0145	5671
6-Mar-10	10:18	11:18	Fine	164	352	500	Construction work in progress	24		0145	5666
6-Mar-10	11:25	12:25	Fine	191	352	500	Construction work in progress	24		0145	5665
12-Mar-10	8:30	9:30	Cloudy	126	352	500	Construction work in progress	18		0145	5776
12-Mar-10	9:35	10:35	Cloudy	148	352	500	Construction work in progress	18		0145	5777
12-Mar-10	10:42	11:42	Cloudy	140	352	500	Construction work in progress	18		0145	5778
18-Mar-10	8:45	9:45	Sunny	162	352	500	Construction work in progress	22		0145	5780
18-Mar-10	9:48	10:48	Sunny	178	352	500	Construction work in progress	22		0145	5785
18-Mar-10	12:15	13:15	Sunny	189	352	500	Construction work in progress	22		0145	5786
24-Mar-10	9:00	10:00	Sunny	159	352	500	Construction work in progress	26		0145	5789
24-Mar-10	10:05	11:05	Sunny	164	352	500	Construction work in progress	26		0145	5794
24-Mar-10	11:25	12:25	Sunny	164	352	500	Construction work in progress	26		0145	5795
30-Mar-10	9:00	10:00	Cloudy	133	352	500	Construction work in progress	17		0145	5885
30-Mar-10	11:10	12:10	Cloudy	148	352	500	Construction work in progress	17		0145	5891
30-Mar-10	12:15	13:15	Cloudy	154	352	500	Construction work in progress	17		0145	5892

<b>Min.</b>	124
<b>Max.</b>	191
<b>Average</b>	155

Wind Speed data is presented in the Meteorological Data table

## Annex C4 24-hour and 1-hour TSP Monitoring Results

### 24-hour TSP Monitoring Results

#### Station AM1

Start Date	Time	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		Initial	Final	Initial	Final		Initial	Final	Average							
7-Apr-10	13:10	8-Apr-10	13:10	Rainy	2.8324	2.9707	10571.03	10595.03	24.00	1.19	1.19	1.19	81	185	260	Construction work in progress	1808	5890	
12-Apr-10	13:32	13-Apr-10	13:32	Fine	2.8599	3.0098	10598.03	10622.03	24.00	1.19	1.19	1.19	87	185	260	Construction work in progress	1808	6035	
17-Apr-10	12:15	18-Apr-10	12:15	Fine	2.8822	3.0241	10625.03	10649.03	24.00	1.19	1.19	1.19	83	185	260	Construction work in progress	1808	6039	
23-Apr-10	12:35	24-Apr-10	12:35	Sunny	2.8842	2.9984	10652.03	10676.03	24.00	1.19	1.19	1.19	67	185	260	Construction work in progress	1808	6043	
29-Apr-10	12:54	30-Apr-10	12:54	Cloudy	2.8159	2.9601	10679.03	10703.03	24.00	1.19	1.19	1.19	84	185	260	Construction work in progress	1808	6129	
										Min.									
										Max.									
										Average									

### 24-hour TSP Monitoring Results

#### Station AM2

Start Date	Time	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		Initial	Final	Initial	Final		Initial	Final	Average							
7-Apr-10	13:30	8-Apr-10	13:30	Rainy	2.8391	3.0008	11335.93	11359.93	24.00	1.14	1.14	1.14	99	182	260	Construction work in progress	0145	5900	
12-Apr-10	12:48	13-Apr-10	12:48	Fine	2.8229	2.9878	11362.93	11386.93	24.00	1.14	1.14	1.14	100	182	260	Operation of mobile crane	8162	5890	
17-Apr-10	12:28	18-Apr-10	12:28	Fine	2.8607	2.9888	11389.93	11413.93	24.00	1.14	1.14	1.14	78	182	260	Construction work in progress	0145	6050	
23-Apr-10	12:50	24-Apr-10	12:50	Sunny	2.8001	2.9446	11416.93	11440.93	24.00	1.14	1.14	1.14	88	182	260	Construction work in progress	0145	6054	
29-Apr-10	13:15	30-Apr-10	13:15	Cloudy	2.8210	2.9928	11443.93	11467.93	24.00	1.14	1.14	1.14	108	182	260	Construction work in progress	0145	6045	
										Min.									
										Max.									
										Average									



## Annex C4 24-hour and 1-hour TSP Monitoring Results

### 1-hour TSP Monitoring Results

#### Station AM1

Date	Start Time	Finish Time	Weather	TSP Concentration ( $\mu\text{g}/\text{m}^3$ )	Action Level ( $\mu\text{g}/\text{m}^3$ )	Limit Level ( $\mu\text{g}/\text{m}^3$ )	Site Conditions / Observations / Remarks	Temperature ( $^{\circ}\text{C}$ )	Wind Speed* (m/s)	Sampler ID	Filter ID
7-Apr-10	10:00	11:00	Rainy	120	340	500	Construction work in progress	20		1808	5793
7-Apr-10	11:03	12:03	Rainy	120	340	500	Construction work in progress	20		1808	5897
7-Apr-10	12:08	13:08	Rainy	118	340	500	Construction work in progress	20		1808	5899
12-Apr-10	10:20	11:20	Fine	146	340	500	Construction work in progress	26		1808	6046
12-Apr-10	11:23	12:23	Fine	151	340	500	Construction work in progress	26		1808	6033
12-Apr-10	12:28	13:28	Fine	158	340	500	Construction work in progress	26		1808	6034
17-Apr-10	9:00	10:00	Fine	134	340	500	Construction work in progress	18		1808	6036
17-Apr-10	10:03	11:03	Fine	129	340	500	Construction work in progress	18		1808	6037
17-Apr-10	11:08	12:08	Fine	136	340	500	Construction work in progress	18		1808	6038
23-Apr-10	8:50	9:50	Sunny	111	340	500	Construction work in progress	21		1808	6040
23-Apr-10	10:30	11:30	Sunny	144	340	500	Construction work in progress	21		1808	6041
23-Apr-10	11:33	12:33	Sunny	139	340	500	Construction work in progress	21		1808	6042
29-Apr-10	9:10	10:10	Cloudy	146	340	500	Construction work in progress	24		1808	6178
29-Apr-10	10:48	11:48	Cloudy	141	340	500	Construction work in progress	24		1808	6179
29-Apr-10	11:51	12:51	Cloudy	148	340	500	Construction work in progress	24		1808	6180
<b>Min.</b>				<b>111</b>							
<b>Max.</b>				<b>158</b>							
<b>Average</b>				<b>136</b>							

Wind Speed data is presented in the Meteorological Data table

## Annex C4 24-hour and 1-hour TSP Monitoring Results

### 1-hour TSP Monitoring Results

Station AM2

Date	Start Time	Finish Time	Weather	TSP Concentration ( $\mu\text{g}/\text{m}^3$ )	Action Level ( $\mu\text{g}/\text{m}^3$ )	Limit Level ( $\mu\text{g}/\text{m}^3$ )	Site Conditions / Observations / Remarks	Temperature ( $^{\circ}\text{C}$ )	Wind Speed * (m/s)	Sampler ID	Filter ID
7-Apr-10	9:10	10:10	Rainy	159	352	500	Construction work in progress	20		0145	5894
7-Apr-10	10:20	11:20	Rainy	148	352	500	Construction work in progress	20		0145	5895
7-Apr-10	11:25	12:25	Rainy	156	352	500	Construction work in progress	20		0145	5896
12-Apr-10	9:15	10:15	Fine	148	352	500	Construction work in progress	26		0145	5902
12-Apr-10	10:40	11:40	Fine	151	352	500	Construction work in progress	26		0145	5903
12-Apr-10	11:43	12:43	Fine	181	352	500	Construction work in progress	26		0145	5901
17-Apr-10	9:15	10:15	Fine	152	352	500	Construction work in progress	18		0145	6047
17-Apr-10	10:18	11:18	Fine	165	352	500	Construction work in progress	18		0145	6048
17-Apr-10	11:23	12:23	Fine	155	352	500	Construction work in progress	18		0145	6049
23-Apr-10	9:15	10:15	Sunny	143	352	500	Construction work in progress	21		0145	6051
23-Apr-10	10:45	11:45	Sunny	159	352	500	Construction work in progress	21		0145	6052
23-Apr-10	11:48	12:48	Sunny	154	352	500	Construction work in progress	21		0145	6053
29-Apr-10	8:50	9:50	Cloudy	183	352	500	Construction work in progress	24		0145	6055
29-Apr-10	11:05	12:05	Cloudy	193	352	500	Construction work in progress	24		0145	6056
29-Apr-10	12:10	13:10	Cloudy	215	352	500	Construction work in progress	24		0145	6128
				<b>Min.</b>							
				<b>Max.</b>							
				<b>Average</b>							

Wind Speed data is presented in the Meteorological Data table

## Annex C4 24-hour and 1-hour TSP Monitoring Results

### 24-hour TSP Monitoring Results

#### Station AM1

Start Date	Start Time	Finish Date	Finish Time	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
					Initial	Final	Initial	Final		Initial	Final	Average						
5-May-10	12:50	6-May-10	12:50	Fine	2.8246	2.9868	10706.03	10730.04	24.00	1.19	1.19	1.19	95	185	260	Construction work in progress	1808	6142
11-May-10	15:50	12-May-10	15:50	Fine	2.8117	2.9881	10733.03	10757.03	24.00	1.19	1.19	1.19	103	185	260	Construction work in progress	1808	6146
17-May-10	14:50	18-May-10	14:50	Sunny	2.7873	2.9501	10760.03	10784.03	24.00	1.19	1.19	1.19	95	185	260	Construction work in progress	1808	6150
22-May-10	12:25	23-May-10	12:25	Fine	2.7951	2.9820	10787.03	10811.03	24.00	1.19	1.19	1.19	97	185	260	Construction work in progress	1808	6264
28-May-10	12:50	29-May-10	12:50	Sunny	2.7994	2.9675	10814.03	10838.03	24.00	1.12	1.12	1.12	104	185	260	Construction work in progress	1808	6267
										Min.	95							
										Max.	104							
										Average	99							

### 24-hour TSP Monitoring Results

#### Station AM2

Start Date	Start Time	Finish Date	Finish Time	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
					Initial	Final	Initial	Final		Initial	Final	Average						
5-May-10	12:10	6-May-10	12:10	Fine	2.8014	2.9809	11470.93	11494.93	24.00	1.14	1.14	1.14	109	182	260	Construction work in progress	0145	6133
11-May-10	14:45	12-May-10	14:45	Fine	2.7925	2.9715	11497.93	11521.93	24.00	1.14	1.14	1.14	109	182	260	Operation of mobile crane	8162	6137
17-May-10	13:15	18-May-10	13:15	Sunny	2.7846	2.9661	11524.93	11548.93	24.00	1.14	1.14	1.14	111	182	260	Construction work in progress	0145	6151
22-May-10	12:13	23-May-10	12:13	Fine	2.8765	3.0149	11551.93	11575.93	24.00	1.14	1.14	1.14	84	182	260	Construction work in progress	0145	6252
28-May-10	13:10	29-May-10	13:10	Sunny	2.8703	3.0248	11578.93	11602.93	24.00	1.17	1.17	1.17	92	182	260	Construction work in progress	0145	6259
										Min.	84							
										Max.	111							
										Average	101							

## Annex C4 24-hour and 1-hour TSP Monitoring Results

### 1-hour TSP Monitoring Results

#### Station AM1

Date	Start Time	Finish Time	Weather	TSP Concentration ( $\mu\text{g}/\text{m}^3$ )	Action Level ( $\mu\text{g}/\text{m}^3$ )	Limit Level ( $\mu\text{g}/\text{m}^3$ )	Site Conditions / Observations / Remarks	Temperature ( $^{\circ}\text{C}$ )	Wind Speed* (m/s)	Sampler ID	Filter ID	
5-May-10	9:05	10:05	Fine	161	340	500	Construction work in progress	28		1808	6044	
5-May-10	10:43	11:43	Fine	141	340	500	Construction work in progress	28		1808	6140	
5-May-10	11:46	12:46	Fine	176	340	500	Construction work in progress	28		1808	6141	
11-May-10	11:50	12:50	Fine	158	340	500	Construction work in progress	23		1808	6143	
11-May-10	12:55	13:55	Fine	150	340	500	Construction work in progress	23		1808	6144	
11-May-10	14:00	15:00	Fine	165	340	500	Construction work in progress	23		1808	6145	
17-May-10	10:30	11:30	Sunny	196	340	500	Construction work in progress	28		1808	6147	
17-May-10	11:35	12:35	Sunny	171	340	500	Construction work in progress	28		1808	6148	
17-May-10	12:40	13:40	Sunny	179	340	500	Construction work in progress	28		1808	6149	
22-May-10	9:15	10:15	Fine	127	340	500	Construction work in progress	28		1808	6261	
22-May-10	10:18	11:18	Fine	157	340	500	Construction work in progress	28		1808	6262	
22-May-10	11:22	12:22	Fine	154	340	500	Construction work in progress	28		1808	6263	
28-May-10	9:40	10:40	Sunny	150	340	500	Construction work in progress	29		1808	6254	
28-May-10	10:44	11:44	Sunny	165	340	500	Construction work in progress	29		1808	6265	
28-May-10	11:46	12:46	Sunny	182	340	500	Construction work in progress	29		1808	6266	
				<b>Min.</b>								
				<b>Max.</b>								
				<b>Average</b>								

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

## Annex C4 24-hour and 1-hour TSP Monitoring Results

### 1-hour TSP Monitoring Results

#### Station AM2

Date	Start Time	Finish Time	Weather	TSP Concentration ( $\mu\text{g}/\text{m}^3$ )	Action Level ( $\mu\text{g}/\text{m}^3$ )	Limit Level ( $\mu\text{g}/\text{m}^3$ )	Site Conditions / Observations / Remarks	Temperature ( $^{\circ}\text{C}$ )	Wind Speed * (m/s)	Sampler ID	Filter ID
5-May-10	8:50	9:50	Fine	166	352	500	Construction work in progress	28		0145	6130
5-May-10	9:53	10:53	Fine	156	352	500	Construction work in progress	28		0145	6131
5-May-10	11:00	12:00	Fine	154	352	500	Construction work in progress	28		0145	6132
11-May-10	11:30	12:30	Fine	132	352	500	Construction work in progress	23		0145	6134
11-May-10	12:35	13:35	Fine	151	352	500	Construction work in progress	23		0145	6135
11-May-10	13:40	14:40	Fine	155	352	500	Construction work in progress	23		0145	6136
17-May-10	10:00	11:00	Sunny	203	352	500	Construction work in progress	28		0145	6138
17-May-10	11:05	12:05	Sunny	170	352	500	Construction work in progress	28		0145	6139
17-May-10	12:08	13:08	Sunny	181	352	500	Construction work in progress	28		0145	0476
22-May-10	9:00	10:00	Fine	127	352	500	Construction work in progress	28		0145	6249
22-May-10	10:03	11:03	Fine	152	352	500	Construction work in progress	28		0145	6250
22-May-10	11:08	12:08	Fine	148	352	500	Construction work in progress	28		0145	6251
28-May-10	9:55	10:55	Sunny	170	352	500	Construction work in progress	29		0145	6253
28-May-10	10:58	11:58	Sunny	182	352	500	Construction work in progress	29		0145	6255
28-May-10	12:00	13:00	Sunny	172	352	500	Construction work in progress	29		0145	6260
				<b>Min.</b>							
				<b>Max.</b>							
				<b>Average</b>							

Wind Speed data is presented in the Meteorological Data table

Meteorological Data Extracted from the Hong Kong Observatory

King's Park Station						
Date	Weather	Average Air Temperature (°C) *	Average Relative Humidity (%) *	Total Rainfall (mm) *	Average Wind Speed (km/h)	Wind Direction
1/3/10	Sunny	22.0	89-97	0.0	0-18	E
2/3/10	Sunny	24.0	80-94	0.0	0-14	SW
5/3/10	Rainy	26.0	75-89	Trace	0-22	S
6/3/10	Rainy	26.0	78-90	Trace	0-16	SW
8/3/10	Rainy	15.0	91-98	0.5	0-22	SE
11/3/10	Rainy	16.0	51-80	0.0	0-17	SE
12/3/10	Rainy	17.0	77-95	0.4	0-13	SE
13/3/10	Rainy	18.0	90-96	Trace	0-19	SE
17/3/10	Sunny	18.0	69-84	0.0	0-23	E
18/3/10	Sunny	21.0	68-87	0.0	0-19	SE
23/3/10	Sunny	23.0	78-94	0.0	0-15	SE
24/3/10	Rainy	25.0	70-96	Trace	0-18	E
25/3/10	Rainy	17.0	53-96	8.9	0-23	N
29/3/10	Sunny	18.0	51-80	0.0	2-30	E
30/3/10	Rainy	19.0	76-87	Trace	5-22	E
31/3/10	Rainy	22.0	75-93	Trace	0-21	E

Tsing Yi Station						
Date	Weather	Average Air Temperature (°C) *	Average Relative Humidity (%) *	Total Rainfall (mm) *	Average Wind Speed (km/h)	Wind Direction
1/3/10	Sunny	22.0	89-97	0.0	1-15	SE
2/3/10	Sunny	24.0	80-94	0.0	2-21	SE
5/3/10	Rainy	26.0	75-89	Trace	2-30	SE
6/3/10	Rainy	26.0	78-90	Trace	0-26	SE
8/3/10	Rainy	15.0	91-98	0.5	1-16	NE
11/3/10	Rainy	16.0	51-80	0.0	1-15	SE
12/3/10	Rainy	17.0	77-95	0.4	0-8	SE
13/3/10	Rainy	18.0	90-96	Trace	0-24	E
17/3/10	Sunny	18.0	69-84	0.0	2-23	SE
18/3/10	Sunny	21.0	68-87	0.0	0-8	SW
23/3/10	Sunny	23.0	78-94	0.0	0-19	SE
24/3/10	Rainy	25.0	70-96	Trace	0-21	SE
25/3/10	Rainy	17.0	53-96	8.9	6-30	NW
29/3/10	Sunny	18.0	51-80	0.0	6-20	E
30/3/10	Rainy	19.0	76-87	Trace	6-18	E
31/3/10	Rainy	22.0	75-93	Trace	3-21	E

Kai Tak Station						
Date	Weather	Average Air Temperature (°C) *	Average Relative Humidity (%) *	Total Rainfall (mm) *	Average Wind Speed (km/h)	Wind Direction
1/3/10	Sunny	22.0	89-97	0.0	8-18	SE
2/3/10	Sunny	24.0	80-94	0.0	0-16	SE
5/3/10	Rainy	26.0	75-89	Trace	6-24	SE
6/3/10	Rainy	26.0	78-90	Trace	1-15	SE
8/3/10	Rainy	15.0	91-98	0.5	2-18	SE
11/3/10	Rainy	16.0	51-80	0.0	0-23	SE
12/3/10	Rainy	17.0	77-95	0.4	4-18	SE
13/3/10	Rainy	18.0	90-96	Trace	6-21	SE
17/3/10	Sunny	18.0	69-84	0.0	0-25	E
18/3/10	Sunny	21.0	68-87	0.0	0-12	SE
23/3/10	Sunny	23.0	78-94	0.0	4-19	SE
24/3/10	Rainy	25.0	70-96	Trace	6-22	SE
25/3/10	Rainy	17.0	53-96	8.9	3-27	NW
29/3/10	Sunny	18.0	51-80	0.0	8-34	E
30/3/10	Rainy	19.0	76-87	Trace	10-34	E
31/3/10	Rainy	22.0	75-93	Trace	0-24	E

Green Island Station						
Date	Weather	Average Air Temperature (°C) *	Average Relative Humidity (%) *	Total Rainfall (mm) *	Average Wind Speed (km/h)	Wind Direction
1/3/10	Sunny	22.0	89-97	0.0	2-35	NE
2/3/10	Sunny	24.0	80-94	0.0	2-38	S
5/3/10	Rainy	26.0	75-89	Trace	24-51	S
6/3/10	Rainy	26.0	78-90	Trace	20-40	SE
8/3/10	Rainy	15.0	91-98	0.5	20-50	NE
11/3/10	Rainy	16.0	51-80	0.0	3-27	NE
12/3/10	Rainy	17.0	77-95	0.4	11-30	NE
13/3/10	Rainy	18.0	90-96	Trace	4-41	NE
17/3/10	Sunny	18.0	69-84	0.0	1-42	NE
18/3/10	Sunny	21.0	68-87	0.0	0-28	NW
23/3/10	Sunny	23.0	78-94	0.0	0-30	NE
24/3/10	Rainy	25.0	70-96	Trace	0-35	NE
25/3/10	Rainy	17.0	53-96	8.9	10-60	NE
29/3/10	Sunny	18.0	51-80	0.0	25-58	NE
30/3/10	Rainy	19.0	76-87	Trace	22-58	NE
31/3/10	Rainy	22.0	75-93	Trace	22-45	NE

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

Meteorological Data Extracted from the Hong Kong Observatory

King's Park Station						
Date	Weather	Average Air Temperature (°C)	Average Relative Humidity (%)	Total Rainfall (mm)	Average Wind Speed (km/h)	Wind Direction
1/4/2010	Rainy	23.7	77-95	TRACE	0-18	E
7/4/2010	Rainy	20.0	80-96	1.8	6-30	E
12/4/2010	Sunny	26.4	79-94	0.0	0-16	SE
13/4/2010	Rainy	25.0	77-98	0.9	0-25	E
16/4/2010	Rainy	16.3	80-90	TRACE	0-17	E
19/4/2010	Rainy	22.9	78-96	TRACE	5-20	SE
22/4/2010	Rainy	25.0	77-95	6.8	0-27	SW
23/4/2010	Sunny	21.0	59-78	0.0	0-21	NE
24/4/2010	Rainy	22.2	45-81	TRACE	6-28	E
28/4/2010	Rainy	23.5	70-89	TRACE	0-10	E
29/4/2010	Rainy	21.0	80-99	40.6	0-27	W
30/4/2010	Rainy	22.1	66-97	0.6	2-28	E

Tsing Yi Station						
Date	Weather	Average Air Temperature (°C)	Average Relative Humidity (%)	Total Rainfall (mm)	Average Wind Speed (km/h)	Wind Direction
1/4/2010	Rainy	23.7	77-95	TRACE	0-20	E
7/4/2010	Rainy	20.0	80-96	1.8	1-28	E
12/4/2010	Sunny	26.4	79-94	0.0	0-20	SE
13/4/2010	Rainy	25.0	77-98	0.9	0-30	SE
16/4/2010	Rainy	16.3	80-90	TRACE	1-14	NW
19/4/2010	Rainy	22.9	78-96	TRACE	2-15	E
22/4/2010	Rainy	25.0	77-95	6.8	0-30	SE
23/4/2010	Sunny	21.0	59-78	0.0	3-34	NW
24/4/2010	Rainy	22.2	45-81	TRACE	1-24	E
28/4/2010	Rainy	23.5	70-89	TRACE	0-12	E
29/4/2010	Rainy	21.0	80-99	40.6	0-24	E
30/4/2010	Rainy	22.1	66-97	0.6	3-21	SE

Kai Tak Station						
Date	Weather	Average Air Temperature (°C)	Average Relative Humidity (%)	Total Rainfall (mm)	Average Wind Speed (km/h)	Wind Direction
1/4/2010	Rainy	23.7	77-95	TRACE	2-21	SE
7/4/2010	Rainy	20.0	80-96	1.8	9-31	SE
12/4/2010	Sunny	26.4	79-94	0.0	1-14	SE
13/4/2010	Rainy	25.0	77-98	0.9	5-33	SE
16/4/2010	Rainy	16.3	80-90	TRACE	1-18	E
19/4/2010	Rainy	22.9	78-96	TRACE	9-20	SE
22/4/2010	Rainy	25.0	77-95	6.8	1-36	SW
23/4/2010	Sunny	21.0	59-78	0.0	3-21	SE
24/4/2010	Rainy	22.2	45-81	TRACE	5-31	E
28/4/2010	Rainy	23.5	70-89	TRACE	1-17	SE
29/4/2010	Rainy	21.0	80-99	40.6	0-35	E
30/4/2010	Rainy	22.1	66-97	0.6	5-30	E

Green Island Station						
Date	Weather	Average Air Temperature (°C)	Average Relative Humidity (%)	Total Rainfall (mm)	Average Wind Speed (km/h)	Wind Direction
1/4/2010	Rainy	23.7	77-95	TRACE	1-30	NE
7/4/2010	Rainy	20.0	80-96	1.8	1-80	NE
12/4/2010	Sunny	26.4	79-94	0.0	13-35	S
13/4/2010	Rainy	25.0	77-98	0.9	3-75	S, NE
16/4/2010	Rainy	16.3	80-90	TRACE	8-37	NE
19/4/2010	Rainy	22.9	78-96	TRACE	2-32	NE
22/4/2010	Rainy	25.0	77-95	6.8	1-47	S
23/4/2010	Sunny	21.0	59-78	0.0	4-43	NW
24/4/2010	Rainy	22.2	45-81	TRACE	15-55	NE
28/4/2010	Rainy	23.5	70-89	TRACE	0-20	NE
29/4/2010	Rainy	21.0	80-99	40.6	1-75	NE
30/4/2010	Rainy	22.1	66-97	0.6	3-60	NE

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

Meteorological Data Extracted from the Hong Kong Observatory

King's Park Station						
Date	Weather	Average Air Temperature (°C)	Average Relative Humidity (%)	Total Rainfall (mm)	Average Wind Speed (km/h)	Wind Direction
4/5/2010	Rainy	24.9	80-92	Trace	4-22	E
5/5/2010	Rainy	25.7	78-94	Trace	2-16	E
6/5/2010	Rainy	27.4	80-93	0.2	0-19	SW
10/5/2010	Rainy	24.2	86-98	27.6	0-15	SE
11/5/2010	Rainy	24.5	81-96	0.3	8-19	E
12/5/2010	Rainy	24.9	78-93	Trace	8-21	E
14/5/2010	Rainy	24.7	90-98	Trace	5-15	E
17/5/2010	Rainy	25.7	82-95	Trace	9-16	E
18/5/2010	Rainy	27.0	76-96	Trace	0-14	E
20/5/2010	Rainy	26.0	69-99	6.1	0-15	SE
22/5/2010	Rainy	28.5	79-88	Trace	3-29	SW
24/5/2010	Sunny	26.0	44-84	0.0	0-17	NE
26/5/2010	Sunny	27.0	67-83	0.0	2-22	E
28/5/2010	Sunny	28.0	75-90	0.0	2-21	E
29/5/2010	Rainy	26.0	77-98	22.6	0-25	E

Tsing Yi Station						
Date	Weather	Average Air Temperature (°C)	Average Relative Humidity (%)	Total Rainfall (mm)	Average Wind Speed (km/h)	Wind Direction
4/5/2010	Rainy	24.9	80-92	Trace	3-20	E
5/5/2010	Rainy	25.7	78-94	Trace	6-22	E
6/5/2010	Rainy	27.4	80-93	0.2	-	-
10/5/2010	Rainy	24.2	86-98	27.6	-	-
11/5/2010	Rainy	24.5	81-96	0.3	-	-
12/5/2010	Rainy	24.9	78-93	Trace	-	-
14/5/2010	Rainy	24.7	90-98	Trace	9-23	E
17/5/2010	Rainy	25.7	82-95	Trace	9-21	E
18/5/2010	Rainy	27.0	76-96	Trace	-	-
20/5/2010	Rainy	26.0	69-99	6.1	-	-
22/5/2010	Rainy	28.5	79-88	Trace	-	-
24/5/2010	Sunny	26.0	44-84	0.0	-	-
26/5/2010	Sunny	27.0	67-83	0.0	-	-
28/5/2010	Sunny	28.0	75-90	0.0	-	-
29/5/2010	Rainy	26.0	77-98	22.6	0-15	S

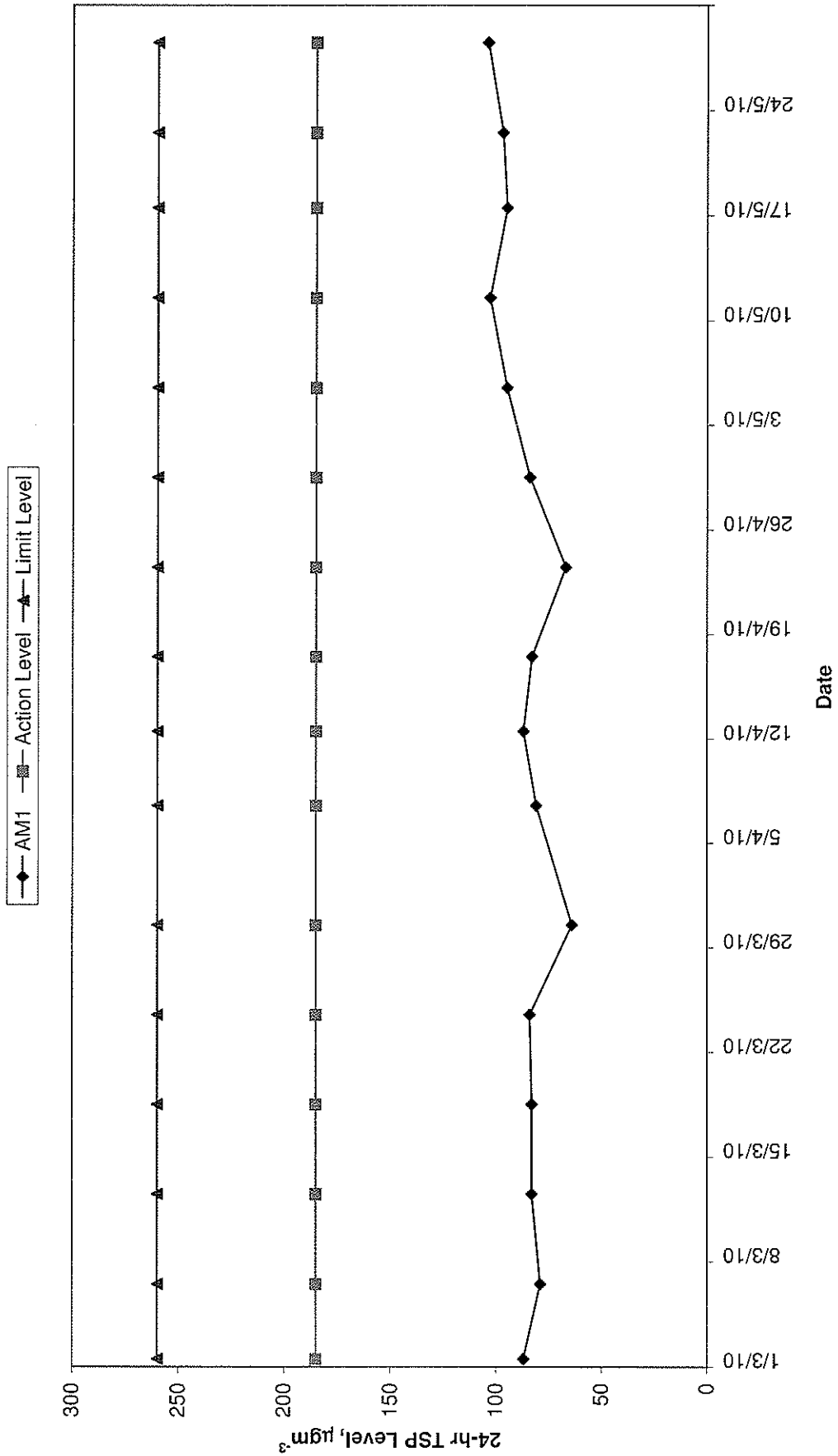
Kai Tak Station						
Date	Weather	Average Air Temperature (°C)	Average Relative Humidity (%)	Total Rainfall (mm)	Average Wind Speed (km/h)	Wind Direction
4/5/2010	Rainy	24.9	80-92	Trace	3-23	E
5/5/2010	Rainy	25.7	78-94	Trace	3-15	SE
6/5/2010	Rainy	27.4	80-93	0.2	0-15	SE
10/5/2010	Rainy	24.2	86-98	27.6	0-24	SE
11/5/2010	Rainy	24.5	81-96	0.3	9-24	E
12/5/2010	Rainy	24.9	78-93	Trace	9-25	E
14/5/2010	Rainy	24.7	90-96	Trace	5-19	E
17/5/2010	Rainy	25.7	82-95	Trace	8-22	E
18/5/2010	Rainy	27.0	76-96	Trace	0-14	SE
20/5/2010	Rainy	26.0	69-99	6.1	0-21	SE
22/5/2010	Rainy	28.5	79-88	Trace	5-25	S
24/5/2010	Sunny	26.0	44-84	0.0	0-24	NE
26/5/2010	Sunny	27.0	67-83	0.0	5-30	E
28/5/2010	Sunny	28.0	75-90	0.0	7-22	SE
29/5/2010	Rainy	26.0	77-98	22.6	2-41	SE

Green Island Station						
Date	Weather	Average Air Temperature (°C)	Average Relative Humidity (%)	Total Rainfall (mm)	Average Wind Speed (km/h)	Wind Direction
4/5/2010	Rainy	24.9	80-92	Trace	6-40	NE
5/5/2010	Rainy	25.7	78-94	Trace	5-35	NE
6/5/2010	Rainy	27.4	80-93	0.2	0-36	S
10/5/2010	Rainy	24.2	86-98	27.6	4-30	NW
11/5/2010	Rainy	24.5	81-96	0.3	6-42	NE
12/5/2010	Rainy	24.9	78-93	Trace	16-47	NE
14/5/2010	Rainy	24.7	90-96	Trace	13-39	NE
17/5/2010	Rainy	25.7	82-95	Trace	4-43	NE
18/5/2010	Rainy	27.0	76-96	Trace	0-34	S
20/5/2010	Rainy	26.0	69-99	6.1	3-48	S
22/5/2010	Rainy	28.5	79-88	Trace	23-45	S
24/5/2010	Sunny	26.0	44-84	0.0	11-36	NE
26/5/2010	Sunny	27.0	67-83	0.0	5-53	NE
28/5/2010	Sunny	28.0	75-90	0.0	0-36	S
29/5/2010	Rainy	26.0	77-98	22.6	0-38	S

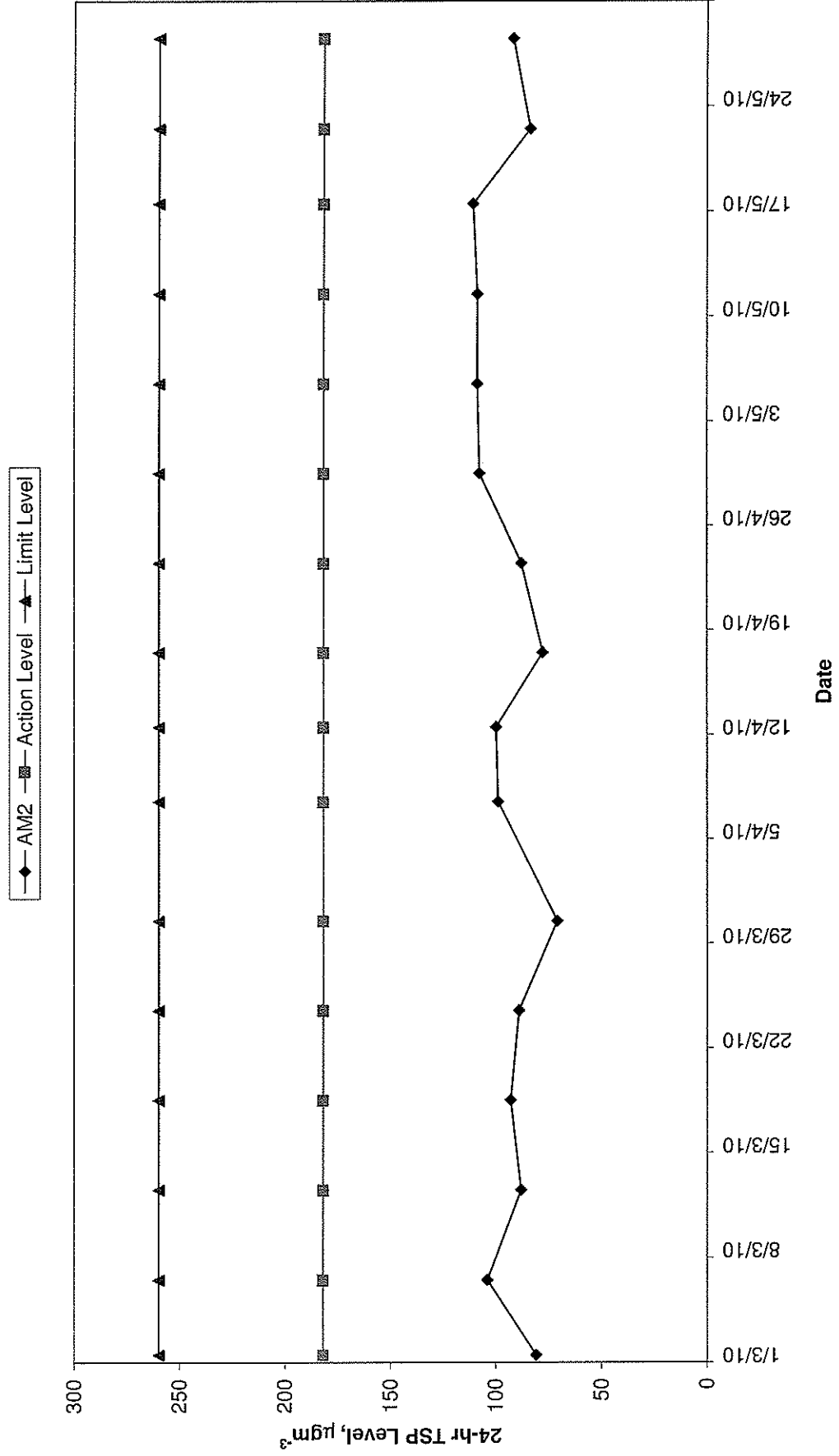
\* king's park data  
 - data were not available  
 # less than 24 hourly observations per day



24-hr TSP Levels  
AM1 (Chan's Creative School)

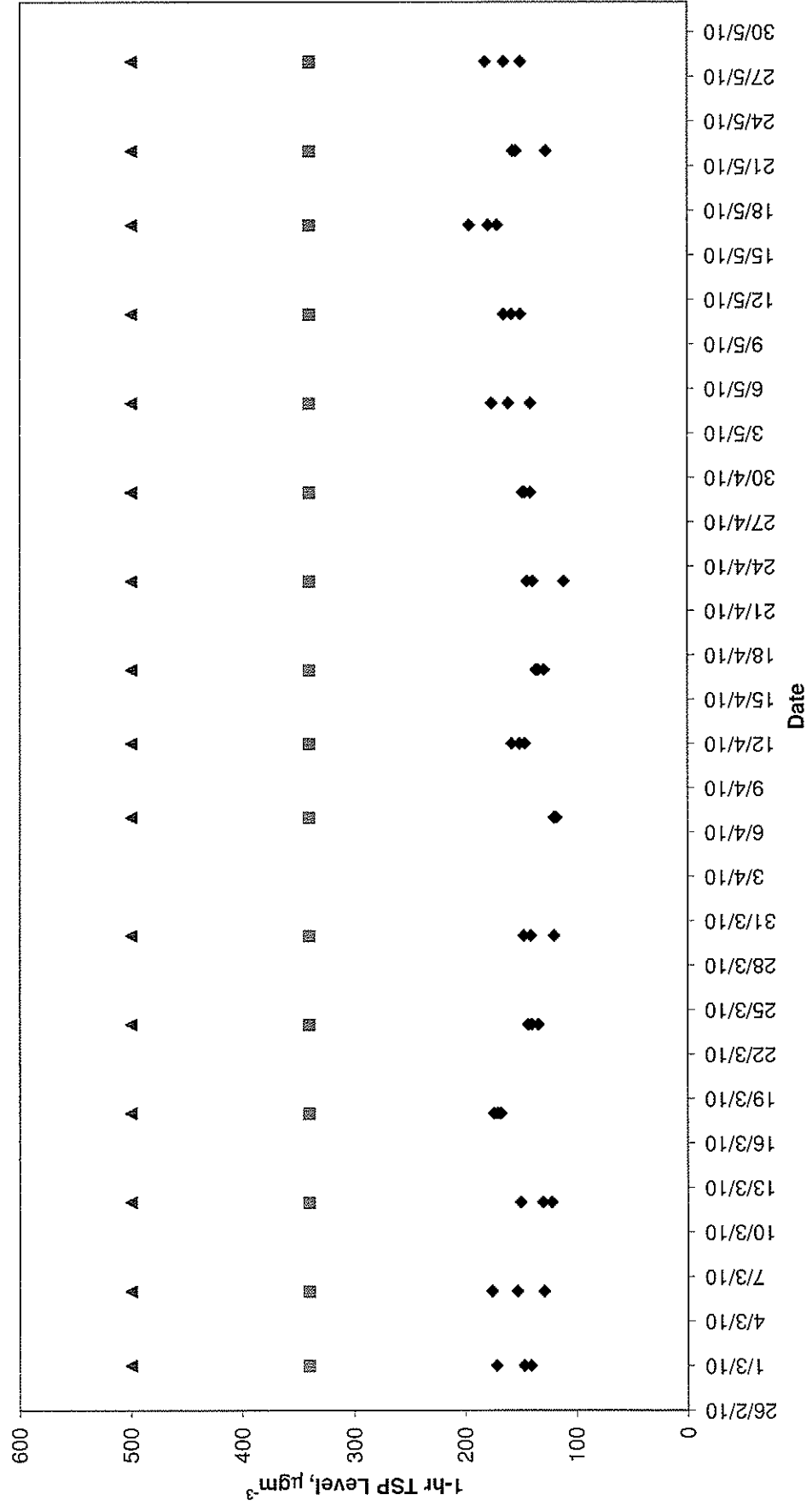


24-hr TSP Levels  
 AM2 (Hong Kong & Island Regional Office, WSD)

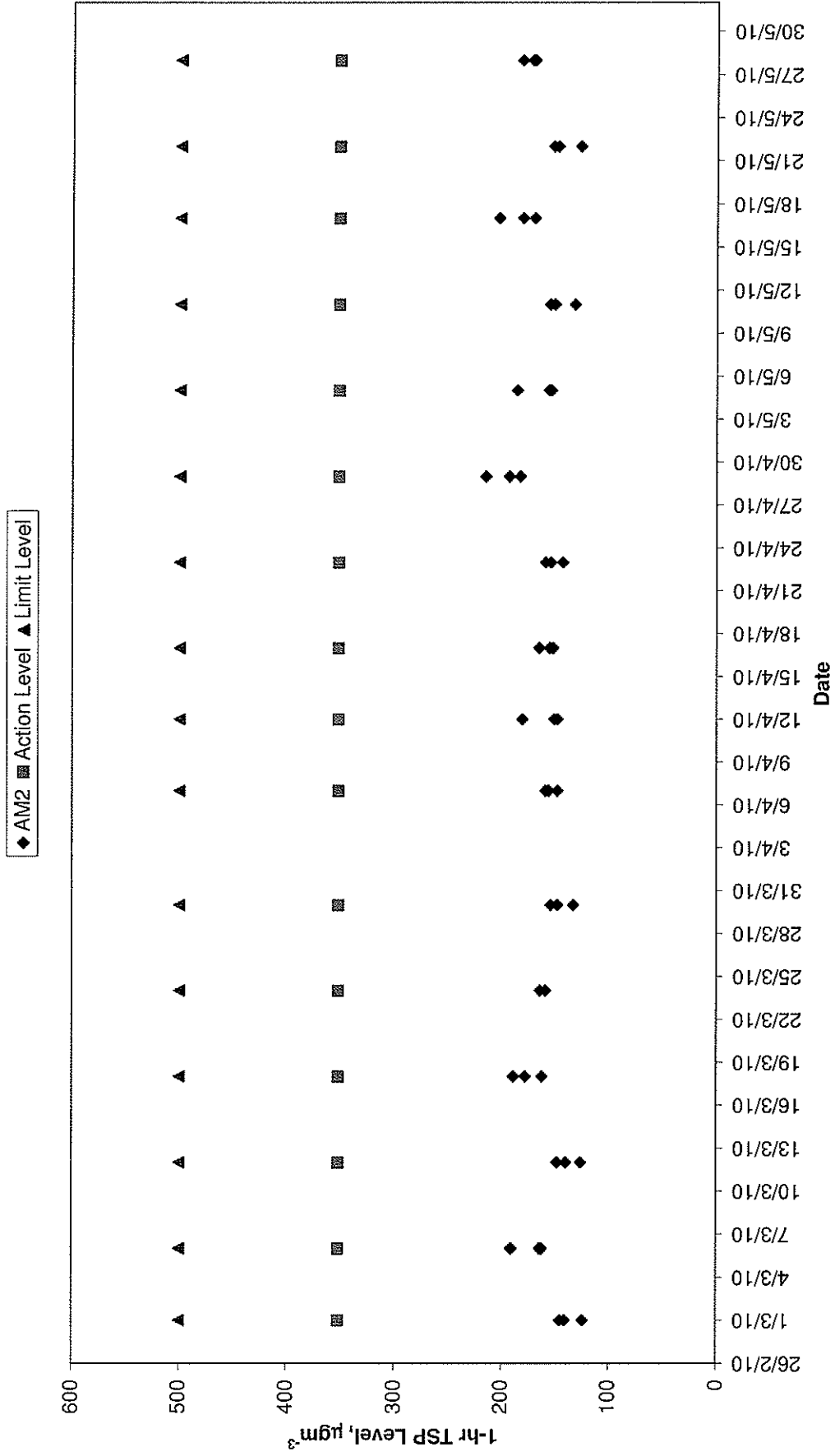


1-hr TSP Levels  
 AM1 (Chan's Creative School)

◆ AM1    ■ Action Level    ▲ Limit Level



# 1-hr TSP Levels AM2 (Hong Kong & Island Regional Office, WSD)



## Annex C5 Noise Monitoring Results

### Daytime Noise Monitoring Results

Station NIM1

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	Callibrator Model / ID
				Leq	L10	L90							
1-Mar-10	15:05	15:35	Fine	70.0	71.9	67.8	Cutting and Breaker from ASD Site, Mobile crane in HATS Site	Traffic Noise	-	22	0.3	RION- NA27 (S/N 00201194)	RION - NC73 (S/N 10786708)
12-Mar-10	9:50	10:20	Cloudy	72.5	74.8	69.6	Noise mainly come from ASD site (cutting and breaker inside) Two cranes were working in HATS Site	Traffic Noise	-	12	0.5	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10786708)
18-Mar-10	11:15	11:45	Sunny	70.1	72.3	68.5	Noise from ASD site (cutting, breaker noise), minor noise from HATS DAD site (two cranes were working)	Traffic Noise, noise from nearby football court	-	21	0.2	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10786708)
24-Mar-10	10:30	11:00	Sunny	69.9	71.9	67.4	Noise from ASD site (cutting, drilling noise), two cranes were working from HATS DAD site	Traffic Noise, noise from nearby football court	-	25	0.3	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10786708)
30-Mar-10	9:15	9:45	Sunny	68.8	76.6	66.1	Drilling noise from ASD site, two cranes were working at the HATS site	Traffic Noise	-	19	0.5	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10786708)
				<b>Min.</b>									
				<b>Max.</b>									
				68.8									
				72.5									

## Annex C5 Noise Monitoring Results

### Daytime Noise Monitoring Results

Station NM1

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							
7-Apr-10	9:28	9:58	Cloudy	70.0	71.3	67.8	Drilling noise from ASD site, mobile cranes working at HATS site	Traffic Noise	-	20	0.3	RION-NL31 (S/N 00320533)	RION - NC73 (S/N 10997142)
12-Apr-10	9:45	10:15	Fine	69.5	70.9	69.5	Hammering noise from ASD site and two mobile cranes working at HATS site	Traffic Noise	-	26	0.5	RION-NL31 (S/N 00410224)	RION - NC73 (S/N 10786708)
23-Apr-10	9:55	10:25	Sunny	69.3	70.9	67.3	Noise from ASD site.	Traffic Noise	-	21	0.3	RION-NL31 (S/N 00410224)	RION - NC73 (S/N 10786708)
29-Apr-10	10:15	10:45	Cloudy	69.7	71.2	67.7	Cutting noise from ASD site. No apparent noise from HATS site.	Traffic Noise	-	21	0.5	RION-NL31 (S/N 00410224)	RION - NC73 (S/N 10786708)
				<b>Min.</b>	<b>69.3</b>								
				<b>Max.</b>	<b>70.0</b>								

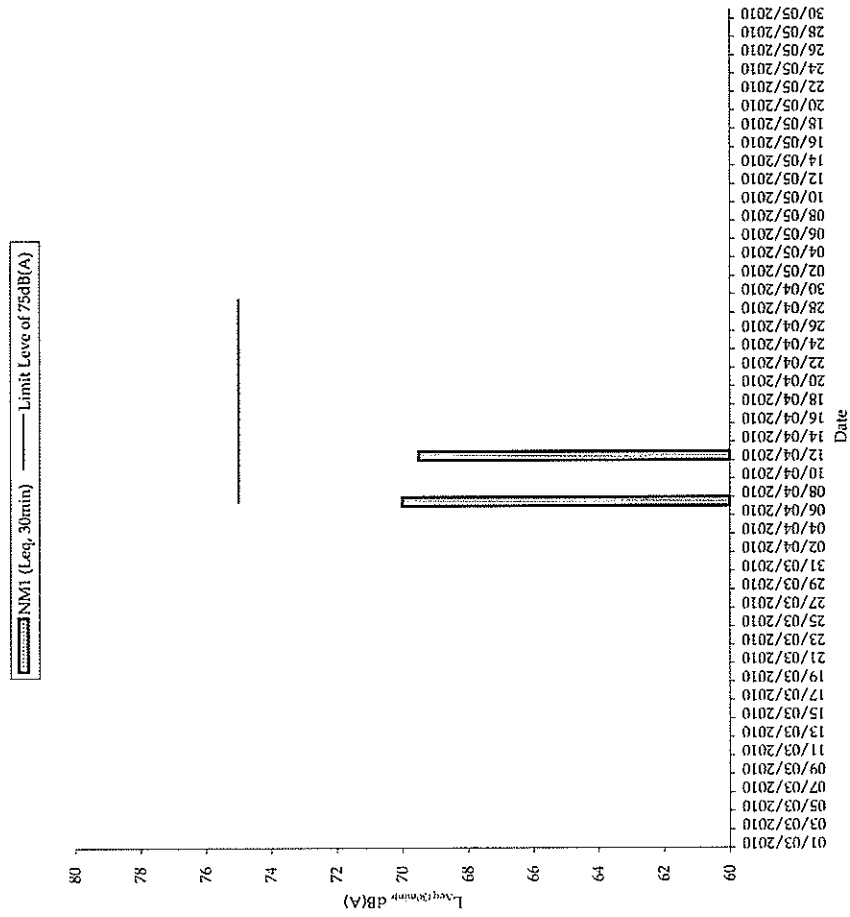
## Annex C5 Noise Monitoring Results

### Daytime Noise Monitoring Results

Station NM1

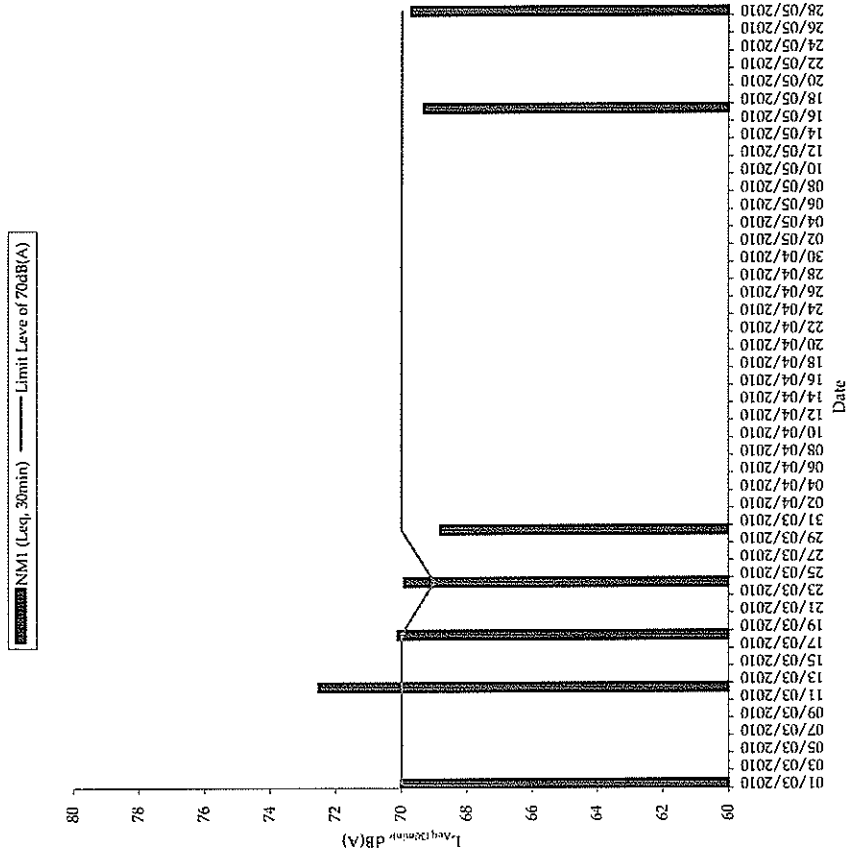
Date	Start Time	End Time	Weather	Noise level (dB(A)), 30 min			Major Construction Noise Source(s) Observed	Other Noise Source(s) Observed	Remarks	Temp. (°C)	Wind Speed (m/s)	Noise Meter Model / ID	Calibrator Model / ID
				Leq	L10	L90							
5-May-10	10:10	10:40	Fine	69.6	71.2	67.8	Cutting noise from ASD site	Traffic Noise	-	22	0.3	RION-NL31 (S/N 00410224)	RION - NC73 (S/N 10997142)
11-May-10	15:10	15:40	Fine	68.8	70.4	66.7	Cutting noise from ASD site	Traffic Noise	-	25	0.3	RION-NL31 (S/N 00983400)	RION - NC73 (S/N 10786708)
17-May-10	14:15	14:45	Fine	69.2	71.0	66.7	Noise from ASD site, road work.	Traffic Noise	-	28	0.2	RION-NL31 (S/N 00983400)	RION - NC73 (S/N 10786708)
28-May-10	9:05	9:35	Fine	69.9	71.2	68.2	Cutting and hammering noise from ASD site.	Traffic Noise	-	28	0.2	RION-NL31 (S/N 00983400)	RION - NC73 (S/N 10786708)
				<b>Min.</b>	<b>68.8</b>								
				<b>Max.</b>	<b>69.9</b>								

Normal Weekdays Noise Monitoring Results at NM1 ( $L_{eq, 30min}$ )



Remark:  
- 75dB(A) was adopted as the Limit Level during school holiday in the reporting period

Restricted Hours Noise Monitoring Results at NM1 ( $L_{eq, 30min}$ )



Remark:  
- 70dB(A) was adopted as the Limit Level during school normal teaching period in the reporting period



*Annex C6 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
Overall Total	0	0

Annex D

## Wan Chai East Production and Drop Shafts

**Key**

- Shaft Excavation Location
- Site Location

Wan Chai East  
Drop Shaft

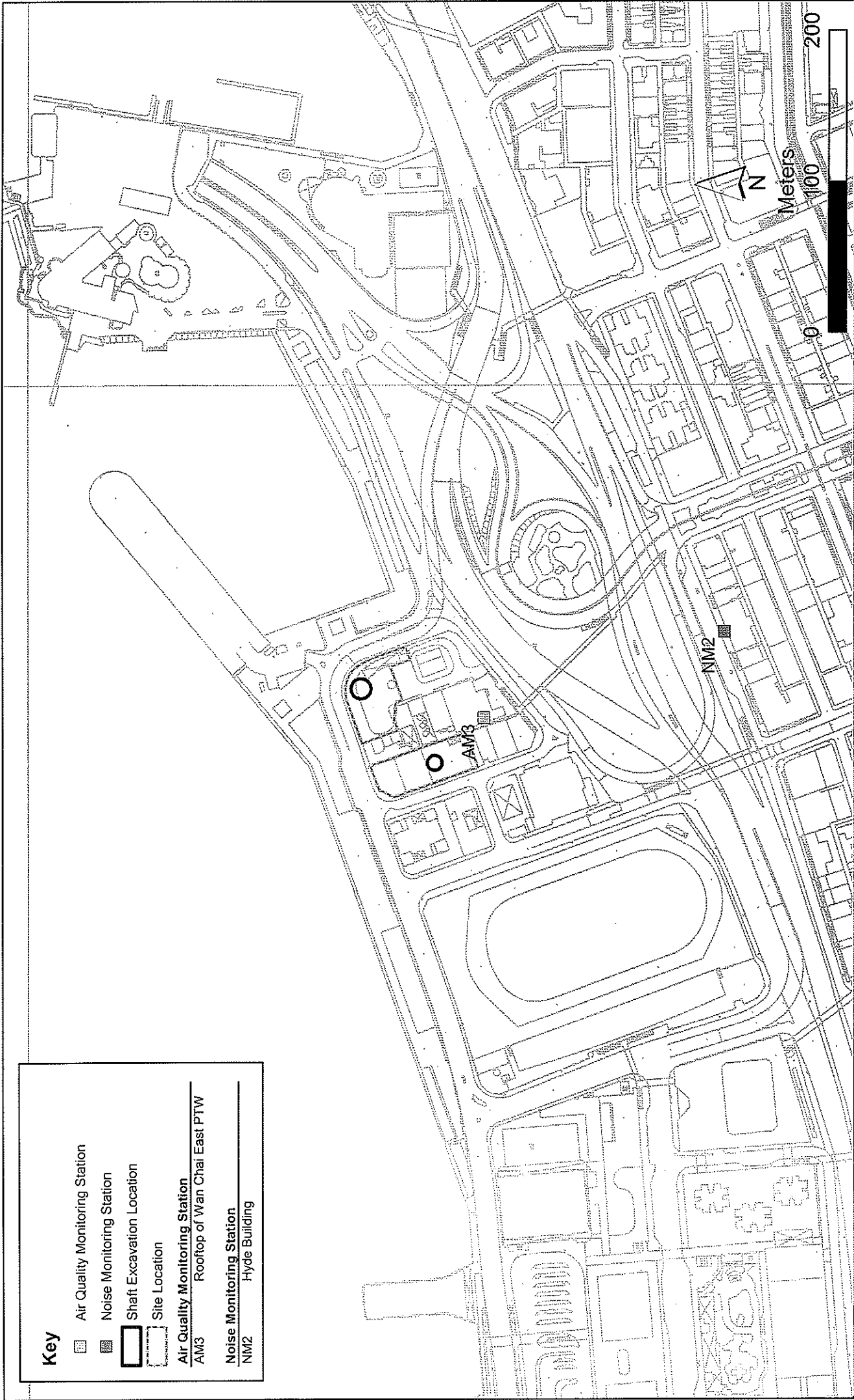
Wan Chai East  
Production Shaft



Meters

100

200



Key	
	Air Quality Monitoring Station
	Noise Monitoring Station
	Shaft Excavation Location
	Site Location
	Air Quality Monitoring Station
	Rooftop of Wan Chai East PTW
AMS3	
	Noise Monitoring Station
NIM2	Hyde Building

## ANNEX D3 - SUMMARY OF MITIGATION MEASURES IMPLEMENTATION SCHEDULE

Type of Impact <i>Construction Phase</i>	Environmental Protection Measures	Location/ Timing	Status
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 hardcore;</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 D3 - 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>watering twice per day within the worksites at Wan Chai East PTW;</li> <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 Wan Chai East.</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> <p>Commissioning tests for all deodorization system should be included in the Design and Construction Contract Document.</p>	All work sites / during construction	NA. Measures not required until commencement of operational phase
Air Quality		All PTW and SCISTW / during operational phase	
<i>Construction Phase</i>			
Noise	Use of quiet PME, movable barriers and acoustic mats	All work sites / during construction	√

ANNEX D3 - SUMMARY OF MITIGATION MEASURES IMPLEMENTATION SCHEDULE

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
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 D3 - 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 D3 - 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 D3 - SUMMARY OF MITIGATION MEASURES IMPLEMENTATION SCHEDULE

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Water Quality	Construction Works in Close Proximity of Storm Drains or Seafront	All work sites / during construction	√
	<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>		

ANNEX D3 - SUMMARY OF MITIGATION MEASURES IMPLEMENTATION SCHEDULE

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
<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	Standby unit(s) and dual (backup) power supply would be provided at all the Stage 2 PTWs to reduce the risk of equipment breakdown at the PTWs.	Stage 2 PTWs / Operation Stage	NA. Measures not required until commencement of operational phase
<i>Construction Phase</i>			
Waste	Reusable steel or concrete panel shutters, fencing and hoarding and signboard should be used as a preferred alternative to items made of wood, to minimise wastage of wood. Attention should be paid to WBTC No. 19/2001 - Metallic Site Hoardings and Signboards to reduce the amount of timber used on construction sites. Metallic alternatives to timber are readily available and should be used rather than new timber. Precast concrete units should be adopted wherever feasible to minimize the use of timber formwork.	All work sites / during the construction period	√
Waste	All waste materials should be segregated into categories covering: <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	Δ

ANNEX D3 - SUMMARY OF MITIGATION MEASURES IMPLEMENTATION SCHEDULE

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
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	Δ
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	<p>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".</p>	All work sites / during the construction period	✓

ANNEX D3 - SUMMARY OF MITIGATION MEASURES IMPLEMENTATION SCHEDULE

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
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	✓
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

ANNEX D3 - SUMMARY OF MITIGATION MEASURES IMPLEMENTATION SCHEDULE

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Waste	Prior to excavation of the marine deposit layer, the deposit should be tested in accordance with the ETWB TC(W) No. 34/2002 and the results should be presented in a Preliminary Sediment Quality Report. The marine deposit should be disposed of at the disposal site designated by the Marine Fill Committee (MFC) or Director of Environmental Protection (DEP) depending on the test results.	All work sites / during the construction period	Δ
<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 D3 - 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 15.8 and 15.9. 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.
	Monitoring of vibration limits shall be conducted and reported as a requirement of EM&A programme	Identified historical buildings/structures as mentioned in Tables 15.8 and 15.9. 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 D4 24-hour and 1-hour TSP Monitoring Results

### 24-hour TSP Monitoring Results

#### Station AM3

Start Date	Time	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		Initial	Final	Initial	Final		Initial	Final	Average						
2-Mar-10	11:45	3-Mar-10	11:45	Fine	2.8464	2.9536	2792.32	2816.32	24.00	1.20	1.20	1.20	62	181	260	Construction work in progress	0481	0371
8-Mar-10	11:52	9-Mar-10	11:52	Cloudy	2.8099	2.9567	2819.32	2843.32	24.00	1.20	1.20	1.20	85	181	260	Construction work in progress	0481	379
13-Mar-10	14:40	14-Mar-10	14:40	Sunny	2.8625	2.9972	2846.32	2870.32	24.00	1.20	1.20	1.20	78	181	260	Construction work in progress	0481	384
19-Mar-10	12:10	20-Mar-10	12:10	Sunny	2.8523	2.9912	2873.32	2897.32	24.00	1.20	1.20	1.20	80	181	260	Construction work in progress	0481	391
25-Mar-10	12:15	26-Mar-10	12:15	Fine	2.8350	3.0028	2900.32	2924.32	24.00	1.16	1.16	1.16	100	181	260	Construction work in progress	0481	402
31-Mar-10	13:00	1-Apr-10	13:00	Sunny	2.8420	3.0057	2927.32	2951.32	24.00	1.16	1.16	1.16	98	181	260	Construction work in progress	0481	412
													Min.	62				
													Max.	100				
													Average	84				



## Annex D4 24-hour and 1-hour TSP Monitoring Results

### 1-hour TSP Monitoring Results

#### Station AM3

Date	Start Time	Finish Time	Weather	TSP Concentration ( $\mu\text{g}/\text{m}^3$ )	Action Level ( $\mu\text{g}/\text{m}^3$ )	Limit Level ( $\mu\text{g}/\text{m}^3$ )	Site Conditions / Observations / Remarks	Temperature ( $^{\circ}\text{C}$ )	Wind Speed * (m/s)	Sampler ID	Filter ID
2-Mar-10	8:30	9:30	Fine	115	355	500	Construction work in progress.	25		0481	0370
2-Mar-10	9:35	10:35	Fine	125	355	500	Construction work in progress.	25		0481	0375
2-Mar-10	10:40	11:40	Fine	132	355	500	Construction work in progress.	25		0481	0377
8-Mar-10	8:45	9:45	Cloudy	165	355	500	Construction work in progress.	17		0481	378
8-Mar-10	9:48	10:48	Cloudy	163	355	500	Construction work in progress.	17		0481	379
8-Mar-10	10:50	11:50	Cloudy	147	355	500	Construction work in progress.	17		0481	380
13-Mar-10	11:20	12:20	Sunny	111	355	500	Construction work in progress.	18		0481	382
13-Mar-10	12:20	13:20	Sunny	186	355	500	Construction work in progress.	18		0481	385
13-Mar-10	13:34	14:34	Sunny	139	355	500	Construction work in progress.	18		0481	387
19-Mar-10	9:00	10:00	Sunny	167	355	500	Construction work in progress.	24		0481	388
19-Mar-10	10:05	11:05	Sunny	190	355	500	Construction work in progress.	24		0481	395
19-Mar-10	11:07	12:07	Sunny	150	355	500	Construction work in progress.	24		0481	397
25-Mar-10	9:00	10:00	Fine	172	355	500	Construction work in progress.	15		0481	398
25-Mar-10	10:05	11:05	Fine	138	355	500	Construction work in progress.	15		0481	399
25-Mar-10	11:10	12:10	Fine	182	355	500	Construction work in progress.	15		0481	404
31-Mar-10	9:40	10:40	Sunny	161	355	500	Construction work in progress.	22		0481	407
31-Mar-10	10:45	11:45	Sunny	124	355	500	Construction work in progress.	22		0481	408
31-Mar-10	11:50	12:50	Sunny	224	355	500	Construction work in progress.	22		0481	410
				<b>Min.</b>							
				<b>Max.</b>							
				<b>Average</b>							

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

## Annex D4 24-hour and 1-hour TSP Monitoring Results

### 24-hour TSP Monitoring Results

#### Station AM3

Start Date	Start Time	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		Initial	Final	Initial	Final		Initial	Final	Average						
7-Apr-10	13:44	8-Apr-10	13:44	Rainy	2.8629	3.0362	2954.32	2978.32	24.00	1.16	1.16	1.16	104	181	260	Construction work in progress	0481	0416
13-Apr-10	15:20	19-Apr-10	15:20	Fine	2.8435	2.9955	2981.32	3005.32	24.00	1.16	1.16	1.16	91	181	260	Construction work in progress	0481	0426
19-Apr-10	11:20	20-Apr-10	11:20	Fine	2.8592	2.9894	3008.32	3032.32	24.00	1.16	1.16	1.16	78	181	260	Construction work in progress	0481	0441
24-Apr-10	14:35	25-Apr-10	14:35	Sunny	2.8124	2.9707	3035.32	3059.32	24.00	1.16	1.16	1.16	95	181	260	Construction work in progress	0481	6003
30-Apr-10	14:05	1-May-10	14:05	Sunny	2.8157	2.9545	3062.32	3086.32	24.00	1.16	1.16	1.16	83	181	260	Construction work in progress	481	0447
										<b>Min.</b>			<b>78</b>					
										<b>Max.</b>			<b>104</b>					
										<b>Average</b>			<b>90</b>					

# Annex D4 24-hour and 1-hour TSP Monitoring Results

## 1-hour TSP Monitoring Results

### Station AM3

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
7-Apr-10	10:30	11:30	Rainy	330	355	500	Construction work in progress.	20		0481	0415
7-Apr-10	11:35	12:35	Rainy	234	355	500	Construction work in progress.	20		0481	0419
7-Apr-10	12:40	13:40	Rainy	263	355	500	Construction work in progress.	20		0481	0422
13-Apr-10	12:00	13:00	Fine	138	393	500	Construction work in progress.	25		9315	0427
13-Apr-10	13:04	14:04	Fine	200	393	500	Construction work in progress.	25		9315	0428
13-Apr-10	14:08	15:08	Fine	195	393	500	Construction work in progress.	25		9315	0431
19-Apr-10	8:05	9:05	Fine	128	355	500	Construction work in progress.	23		0481	0432
19-Apr-10	9:08	10:08	Fine	119	355	500	Construction work in progress.	23		0481	0434
19-Apr-10	10:15	11:15	Fine	141	355	500	Construction work in progress.	23		0481	0435
24-Apr-10	11:25	12:25	Sunny	185	355	500	Construction work in progress.	23		0481	0439
24-Apr-10	12:28	13:28	Sunny	154	355	500	Construction work in progress.	23		0481	6002
24-Apr-10	13:32	14:32	Sunny	125	355	500	Construction work in progress.	23		0481	0445
30-Apr-10	10:50	11:50	Sunny	135	355	500	Construction work in progress.	22		0481	0450
30-Apr-10	11:55	12:55	Sunny	158	355	500	Construction work in progress.	22		0481	0451
30-Apr-10	13:00	14:00	Sunny	184	355	500	Construction work in progress.	22		0481	0455
<b>Min.</b>				<b>119</b>							
<b>Max.</b>				<b>330</b>							
<b>Average</b>				<b>179</b>							

Wind Speed data is presented in the Meteorological Data table

## Annex D4 24-hour and 1-hour TSP Monitoring Results

### 24-hour TSP Monitoring Results

#### Station AM3

Start Date	Time	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		Initial	Final	Initial	Final		Initial	Final	Average						
6-May-10	15:50	7-May-10	15:50	Cloudy	2.7943	2.9505	3089.32	3113.32	24.00	1.16	1.16	1.16	94	181	260	Construction work in progress	0481	0457
12-May-10	11:17	13-May-10	11:17	Sunny	2.8623	2.9986	3116.32	3140.32	24.00	1.16	1.16	1.16	82	181	260	Construction work in progress	0481	0465
18-May-10	15:00	19-May-10	15:00	Sunny	2.8124	2.9614	3143.32	3157.32	24.00	1.16	1.16	1.16	89	181	260	Construction work in progress	0481	0468
24-May-10	13:55	25-May-10	13:55	Sunny	2.8158	2.9645	3170.32	3194.32	24.00	1.17	1.17	1.17	88	181	260	Construction work in progress	0481	0483
29-May-10	13:50	30-May-10	13:50	Sunny	2.8284	2.9623	3197.32	3221.32	24.00	1.17	1.17	1.17	79	181	260	Construction work in progress	0481	0490
										<b>Min.</b>			79					
										<b>Max.</b>			94					
										<b>Average</b>			86					

## Annex D4 24-hour and 1-hour TSP Monitoring Results

### 1-hour TSP Monitoring Results

#### Station AM3

Date	Start Time	Finish Time	Weather	TSP Concentration ( $\mu\text{g}/\text{m}^3$ )	Action Level ( $\mu\text{g}/\text{m}^3$ )	Limit Level ( $\mu\text{g}/\text{m}^3$ )	Site Conditions / Observations / Remarks	Temperature ( $^{\circ}\text{C}$ )	Wind Speed * (m/s)	Sampler ID	Filter ID
6-May-10	12:00	13:00	Cloudy	119	355	500	Construction work in progress.	27		0481	0456
6-May-10	13:03	14:03	Cloudy	148	355	500	Construction work in progress.	27		0481	0459
6-May-10	14:08	15:08	Cloudy	144	355	500	Construction work in progress.	27		0481	0460
12-May-10	8:10	9:10	Sunny	191	393	500	Construction work in progress.	25		9315	0461
12-May-10	9:12	10:12	Sunny	172	393	500	Construction work in progress.	25		9315	0464
12-May-10	10:15	11:15	Sunny	171	393	500	Construction work in progress.	25		9315	0467
18-May-10	11:50	12:50	Sunny	226	355	500	Construction work in progress.	28		0481	0472
18-May-10	12:52	13:52	Sunny	136	355	500	Construction work in progress.	28		0481	0478
18-May-10	13:55	14:55	Sunny	218	355	500	Construction work in progress.	28		0481	0479
24-May-10	10:45	11:45	Sunny	170	355	500	Construction work in progress.	27		0481	0480
24-May-10	11:50	12:50	Sunny	191	355	500	Construction work in progress.	27		0481	0482
24-May-10	12:53	13:53	Sunny	151	355	500	Construction work in progress.	27		0481	0486
29-May-10	10:40	11:40	Sunny	184	355	500	Construction work in progress.	29		0481	0487
29-May-10	11:44	12:44	Sunny	150	355	500	Construction work in progress.	29		0481	0488
29-May-10	12:46	13:46	Sunny	197	355	500	Construction work in progress.	29		0481	0489
			<b>Min.</b>	<b>119</b>							
			<b>Max.</b>	<b>226</b>							
			<b>Average</b>	<b>171</b>							

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

Meteorological Data Extracted from the Hong Kong Observatory

King's Park Station						
Date	Weather	Average Air Temperature (°C)	Average Relative Humidity (%)	Total Rainfall (mm)	Average Wind Speed (km/h)	Wind Direction
1/3/10	Sunny	22.0	89-97	0.0	0-18	E
2/3/10	Sunny	24.0	80-94	0.0	0-14	SW
5/3/10	Rainy	26.0	75-89	Trace	0-22	S
6/3/10	Rainy	26.0	78-90	Trace	0-16	SW
8/3/10	Rainy	15.0	91-98	0.5	0-22	SE
11/3/10	Rainy	16.0	51-80	0.0	0-17	SE
12/3/10	Rainy	17.0	77-95	0.4	0-13	SE
13/3/10	Rainy	18.0	90-96	Trace	0-19	SE
17/3/10	Sunny	18.0	69-84	0.0	0-23	E
18/3/10	Sunny	21.0	68-87	0.0	0-19	SE
23/3/10	Sunny	23.0	78-94	0.0	0-15	SE
24/3/10	Rainy	25.0	70-96	Trace	0-18	E
25/3/10	Rainy	17.0	53-96	8.9	0-23	N
29/3/10	Sunny	18.0	51-80	0.0	2-30	E
30/3/10	Rainy	19.0	76-87	Trace	5-22	E
31/3/10	Rainy	22.0	75-93	Trace	0-21	E

Tsing Yi Station						
Date	Weather	Average Air Temperature (°C)	Average Relative Humidity (%)	Total Rainfall (mm)	Average Wind Speed (km/h)	Wind Direction
1/3/10	Sunny	22.0	89-97	0.0	1-15	SE
2/3/10	Sunny	24.0	80-94	0.0	2-21	SE
5/3/10	Rainy	26.0	75-89	Trace	2-30	SE
6/3/10	Rainy	26.0	78-90	Trace	0-26	SE
8/3/10	Rainy	15.0	91-98	0.5	1-16	NE
11/3/10	Rainy	16.0	51-80	0.0	1-15	SE
12/3/10	Rainy	17.0	77-95	0.4	0-8	SE
13/3/10	Rainy	18.0	90-96	Trace	0-24	E
17/3/10	Sunny	18.0	69-84	0.0	2-23	SE
18/3/10	Sunny	21.0	68-87	0.0	0-8	SW
23/3/10	Sunny	23.0	78-94	0.0	0-19	SE
24/3/10	Rainy	25.0	70-96	Trace	0-21	SE
25/3/10	Rainy	17.0	53-96	8.9	6-30	NW
29/3/10	Sunny	18.0	51-80	0.0	6-20	E
30/3/10	Rainy	19.0	76-87	Trace	6-18	E
31/3/10	Rainy	22.0	75-93	Trace	3-21	E

Kai Tak Station						
Date	Weather	Average Air Temperature (°C)	Average Relative Humidity (%)	Total Rainfall (mm)	Average Wind Speed (km/h)	Wind Direction
1/3/10	Sunny	22.0	89-97	0.0	8-18	SE
2/3/10	Sunny	24.0	80-94	0.0	0-16	SE
5/3/10	Rainy	26.0	75-89	Trace	6-24	SE
6/3/10	Rainy	26.0	78-90	Trace	1-15	SE
8/3/10	Rainy	15.0	91-98	0.5	2-18	SE
11/3/10	Rainy	16.0	51-80	0.0	0-23	SE
12/3/10	Rainy	17.0	77-95	0.4	4-18	SE
13/3/10	Rainy	18.0	90-96	Trace	6-21	SE
17/3/10	Sunny	18.0	69-84	0.0	0-25	E
18/3/10	Sunny	21.0	68-87	0.0	0-12	SE
23/3/10	Sunny	23.0	78-94	0.0	4-19	SE
24/3/10	Rainy	25.0	70-96	Trace	6-22	SE
25/3/10	Rainy	17.0	53-96	8.9	3-27	NW
29/3/10	Sunny	18.0	51-80	0.0	6-34	E
30/3/10	Rainy	19.0	76-87	Trace	10-34	E
31/3/10	Rainy	22.0	75-93	Trace	0-24	E

Green Island Station						
Date	Weather	Average Air Temperature (°C)	Average Relative Humidity (%)	Total Rainfall (mm)	Average Wind Speed (km/h)	Wind Direction
1/3/10	Sunny	22.0	89-97	0.0	2-35	NE
2/3/10	Sunny	24.0	80-94	0.0	2-38	S
5/3/10	Rainy	26.0	75-89	Trace	24-51	S
6/3/10	Rainy	26.0	78-90	Trace	20-40	SE
8/3/10	Rainy	15.0	91-98	0.5	20-50	NE
11/3/10	Rainy	16.0	51-80	0.0	3-27	NE
12/3/10	Rainy	17.0	77-95	0.4	11-30	NE
13/3/10	Rainy	18.0	90-96	Trace	4-41	NE
17/3/10	Sunny	18.0	69-84	0.0	1-42	NE
18/3/10	Sunny	21.0	68-87	0.0	0-28	NW
23/3/10	Sunny	23.0	78-94	0.0	0-30	NE
24/3/10	Rainy	25.0	70-96	Trace	0-35	NE
25/3/10	Rainy	17.0	53-96	8.9	10-60	NE
29/3/10	Sunny	18.0	51-80	0.0	25-58	NE
30/3/10	Rainy	19.0	76-87	Trace	22-58	NE
31/3/10	Rainy	22.0	75-93	Trace	22-45	NE

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

Meteorological Data Extracted from the Hong Kong Observatory

King's Park Station						
Date	Weather	Average Air Temperature (°C)	Average Relative Humidity (%)	Total Rainfall (mm)	Average Wind Speed (km/h)	Wind Direction
1/4/2010	Rainy	23.7	77-95	TRACE	0-18	E
7/4/2010	Rainy	20.0	80-96	1.8	6-30	E
12/4/2010	Sunny	26.4	79-94	0.0	0-16	SE
13/4/2010	Rainy	25.0	77-98	0.9	0-25	E
16/4/2010	Rainy	26.3	80-90	TRACE	0-17	E
19/4/2010	Rainy	22.9	78-96	TRACE	5-20	SE
22/4/2010	Rainy	25.0	77-95	6.8	0-27	SW
23/4/2010	Sunny	21.0	59-78	0.0	0-21	NE
24/4/2010	Rainy	22.2	45-81	TRACE	6-29	E
28/4/2010	Rainy	23.5	70-89	TRACE	0-10	E
29/4/2010	Rainy	21.0	80-99	40.6	0-27	W
30/4/2010	Rainy	22.1	66-97	0.6	2-28	E

Tsing Yi Station						
Date	Weather	Average Air Temperature (°C)	Average Relative Humidity (%)	Total Rainfall (mm)	Average Wind Speed (km/h)	Wind Direction
1/4/2010	Rainy	23.7	77-95	TRACE	0-20	E
7/4/2010	Rainy	20.0	80-96	1.8	1-28	E
12/4/2010	Sunny	26.4	79-94	0.0	0-20	SE
13/4/2010	Rainy	25.0	77-98	0.9	0-30	SE
16/4/2010	Rainy	16.3	80-90	TRACE	1-14	NW
19/4/2010	Rainy	22.9	78-96	TRACE	2-15	E
22/4/2010	Rainy	25.0	77-95	6.8	0-30	SE
23/4/2010	Sunny	21.0	59-78	0.0	3-34	NW
24/4/2010	Rainy	22.2	45-81	TRACE	1-24	E
28/4/2010	Rainy	23.5	70-89	TRACE	0-12	E
29/4/2010	Rainy	21.0	80-99	40.6	0-24	E
30/4/2010	Rainy	22.1	66-97	0.6	3-21	SE

Kai Tak Station						
Date	Weather	Average Air Temperature (°C)	Average Relative Humidity (%)	Total Rainfall (mm)	Average Wind Speed (km/h)	Wind Direction
1/4/2010	Rainy	23.7	77-95	TRACE	2-21	SE
7/4/2010	Rainy	20.0	80-96	1.8	9-31	SE
12/4/2010	Sunny	26.4	79-94	0.0	1-14	SE
13/4/2010	Rainy	25.0	77-98	0.9	5-33	SE
16/4/2010	Rainy	16.3	80-90	TRACE	1-18	E
19/4/2010	Rainy	22.9	78-96	TRACE	9-20	SE
22/4/2010	Rainy	25.0	77-95	6.8	1-36	SW
23/4/2010	Sunny	21.0	59-78	0.0	3-21	SE
24/4/2010	Rainy	22.2	45-81	TRACE	5-31	E
28/4/2010	Rainy	23.5	70-89	TRACE	1-17	SE
29/4/2010	Rainy	21.0	80-99	40.6	0-35	E
30/4/2010	Rainy	22.1	66-97	0.6	5-30	E

Green Island Station						
Date	Weather	Average Air Temperature (°C)	Average Relative Humidity (%)	Total Rainfall (mm)	Average Wind Speed (km/h)	Wind Direction
1/4/2010	Rainy	23.7	77-95	TRACE	1-30	NE
7/4/2010	Rainy	20.0	80-96	1.8	1-80	NE
12/4/2010	Sunny	26.4	79-94	0.0	13-35	S
13/4/2010	Rainy	25.0	77-98	0.9	3-75	S, NE
16/4/2010	Rainy	16.3	80-90	TRACE	8-37	NE
19/4/2010	Rainy	22.9	78-96	TRACE	2-32	NE
22/4/2010	Rainy	25.0	77-95	6.8	1-47	S
23/4/2010	Sunny	21.0	59-78	0.0	4-43	NW
24/4/2010	Rainy	22.2	45-81	TRACE	15-55	NE
28/4/2010	Rainy	23.5	70-89	TRACE	0-20	NE
29/4/2010	Rainy	21.0	80-99	40.6	1-75	NE
30/4/2010	Rainy	22.1	66-97	0.6	3-60	NE

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

Meteorological Data Extracted from the Hong Kong Observatory

King's Park Station						
Date	Weather	Average Air Temperature (°C) *	Average Relative Humidity (%) *	Total Rainfall (mm) *	Average Wind Speed (km/h)	Wind Direction
4/5/2010	Rainy	24.9	80-92	Trace	4-22	E
5/5/2010	Rainy	25.7	78-94	Trace	2-16	E
6/5/2010	Rainy	27.4	80-93	0.2	0-19	SW
10/5/2010	Rainy	24.2	86-98	27.6	0-15	SE
11/5/2010	Rainy	24.5	81-96	0.3	8-19	E
12/5/2010	Rainy	24.9	78-93	Trace	8-21	E
14/5/2010	Rainy	24.7	90-96	Trace	5-15	E
17/5/2010	Rainy	25.7	82-95	Trace	9-16	E
18/5/2010	Rainy	27.0	76-96	Trace	0-14	E
20/5/2010	Rainy	26.0	69-99	6.1	0-15	SE
22/5/2010	Rainy	28.5	79-88	Trace	3-29	SW
24/5/2010	Sunny	26.0	44-84	0.0	0-17	NE
26/5/2010	Sunny	27.0	67-83	0.0	2-22	E
28/5/2010	Sunny	26.0	75-90	0.0	2-21	E
29/5/2010	Rainy	26.0	77-98	22.6	0-25	E

Kai Tak Station						
Date	Weather	Average Air Temperature (°C) *	Average Relative Humidity (%) *	Total Rainfall (mm) *	Average Wind Speed (km/h)	Wind Direction
4/5/2010	Rainy	24.9	80-92	Trace	3-23	E
5/5/2010	Rainy	25.7	78-94	Trace	3-15	SE
6/5/2010	Rainy	27.4	80-93	0.2	0-15	SE
10/5/2010	Rainy	24.2	86-98	27.6	0-24	SE
11/5/2010	Rainy	24.5	81-96	0.3	9-24	E
12/5/2010	Rainy	24.9	78-93	Trace	9-25	E
14/5/2010	Rainy	24.7	90-96	Trace	5-19	E
17/5/2010	Rainy	25.7	82-95	Trace	8-22	E
18/5/2010	Rainy	27.0	76-96	Trace	0-14	SE
20/5/2010	Rainy	26.0	69-99	6.1	0-21	SE
22/5/2010	Rainy	28.5	79-88	Trace	5-25	S
24/5/2010	Sunny	26.0	44-84	0.0	0-24	NE
26/5/2010	Sunny	27.0	67-83	0.0	5-30	E
28/5/2010	Sunny	28.0	75-90	0.0	7-22	SE
29/5/2010	Rainy	26.0	77-98	22.6	2-41	SE

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

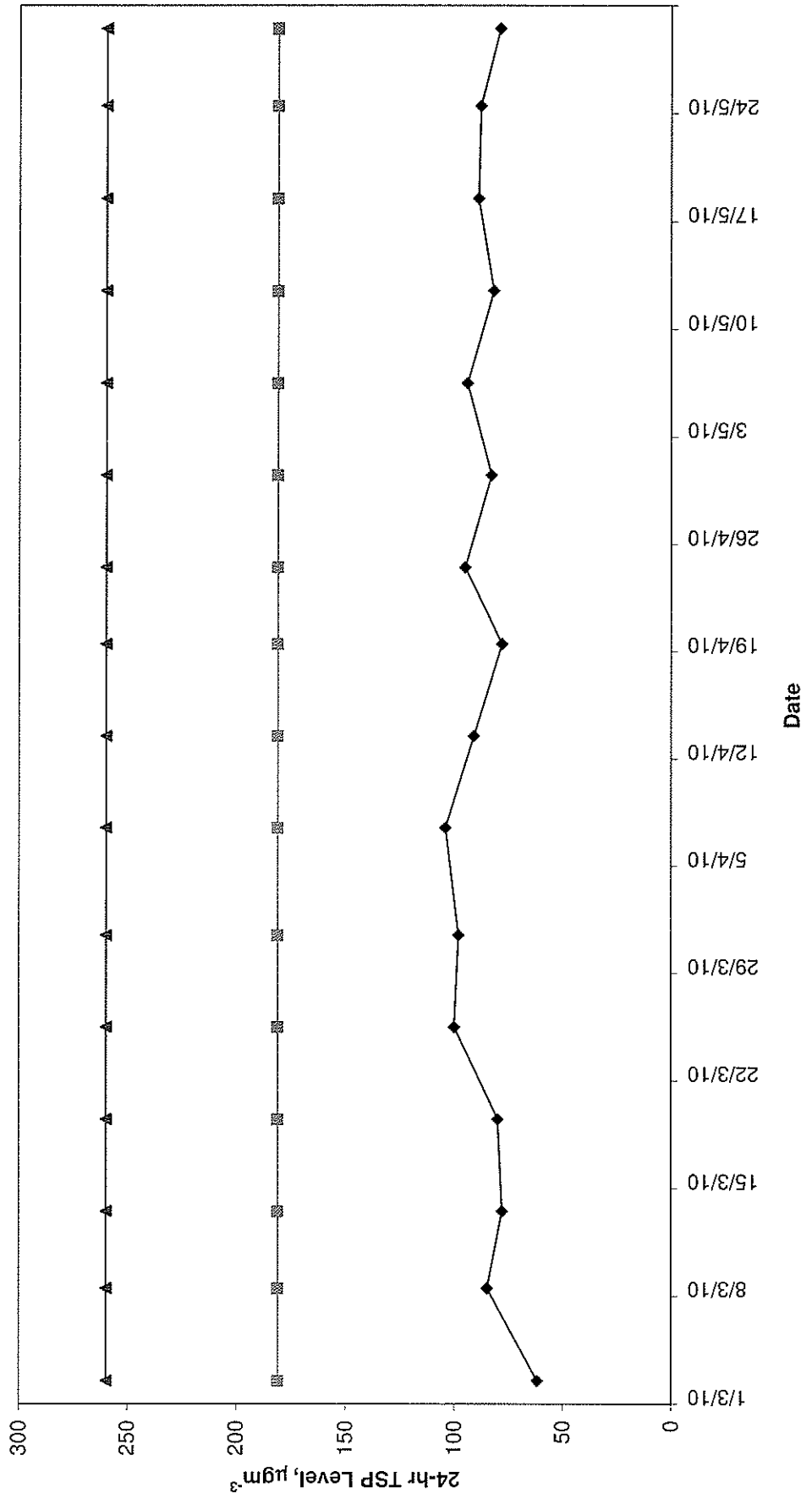
Tsing Yi Station						
Date	Weather	Average Air Temperature (°C) *	Average Relative Humidity (%) *	Total Rainfall (mm) *	Average Wind Speed (km/h)	Wind Direction
4/5/2010	Rainy	24.9	80-92	Trace	3-20	E
5/5/2010	Rainy	25.7	78-94	Trace	6-22	E
6/5/2010	Rainy	27.4	80-93	0.2	-	-
10/5/2010	Rainy	24.2	86-98	27.6	-	-
11/5/2010	Rainy	24.5	81-96	0.3	-	-
12/5/2010	Rainy	24.9	78-93	Trace	-	-
14/5/2010	Rainy	24.7	90-96	Trace	9-23	E
17/5/2010	Rainy	25.7	82-95	Trace	9-21	E
18/5/2010	Rainy	27.0	76-96	Trace	-	-
20/5/2010	Rainy	26.0	69-99	6.1	-	-
22/5/2010	Rainy	28.5	79-88	Trace	-	-
24/5/2010	Sunny	26.0	44-84	0.0	-	-
26/5/2010	Sunny	27.0	67-83	0.0	-	-
28/5/2010	Sunny	26.0	75-90	0.0	-	-
29/5/2010	Rainy	26.0	77-98	22.6	0-15	S

Green Island Station						
Date	Weather	Average Air Temperature (°C) *	Average Relative Humidity (%) *	Total Rainfall (mm) *	Average Wind Speed (km/h)	Wind Direction
4/5/2010	Rainy	24.9	80-92	Trace	6-40	NE
5/5/2010	Rainy	25.7	78-94	Trace	5-35	NE
6/5/2010	Rainy	27.4	80-93	0.2	0-36	S
10/5/2010	Rainy	24.2	86-98	27.6	4-30	NW
11/5/2010	Rainy	24.5	81-96	0.3	6-42	NE
12/5/2010	Rainy	24.9	78-93	Trace	16-47	NE
14/5/2010	Rainy	24.7	90-96	Trace	13-39	NE
17/5/2010	Rainy	25.7	82-95	Trace	4-43	NE
18/5/2010	Rainy	27.0	76-96	Trace	0-34	S
20/5/2010	Rainy	26.0	69-99	6.1	3-48	S
22/5/2010	Rainy	28.5	79-88	Trace	23-45	S
24/5/2010	Sunny	26.0	44-84	0.0	11-36	NE
26/5/2010	Sunny	27.0	67-83	0.0	5-53	NE
28/5/2010	Sunny	28.0	75-90	0.0	0-36	S
29/5/2010	Rainy	26.0	77-98	22.6	0-38	S



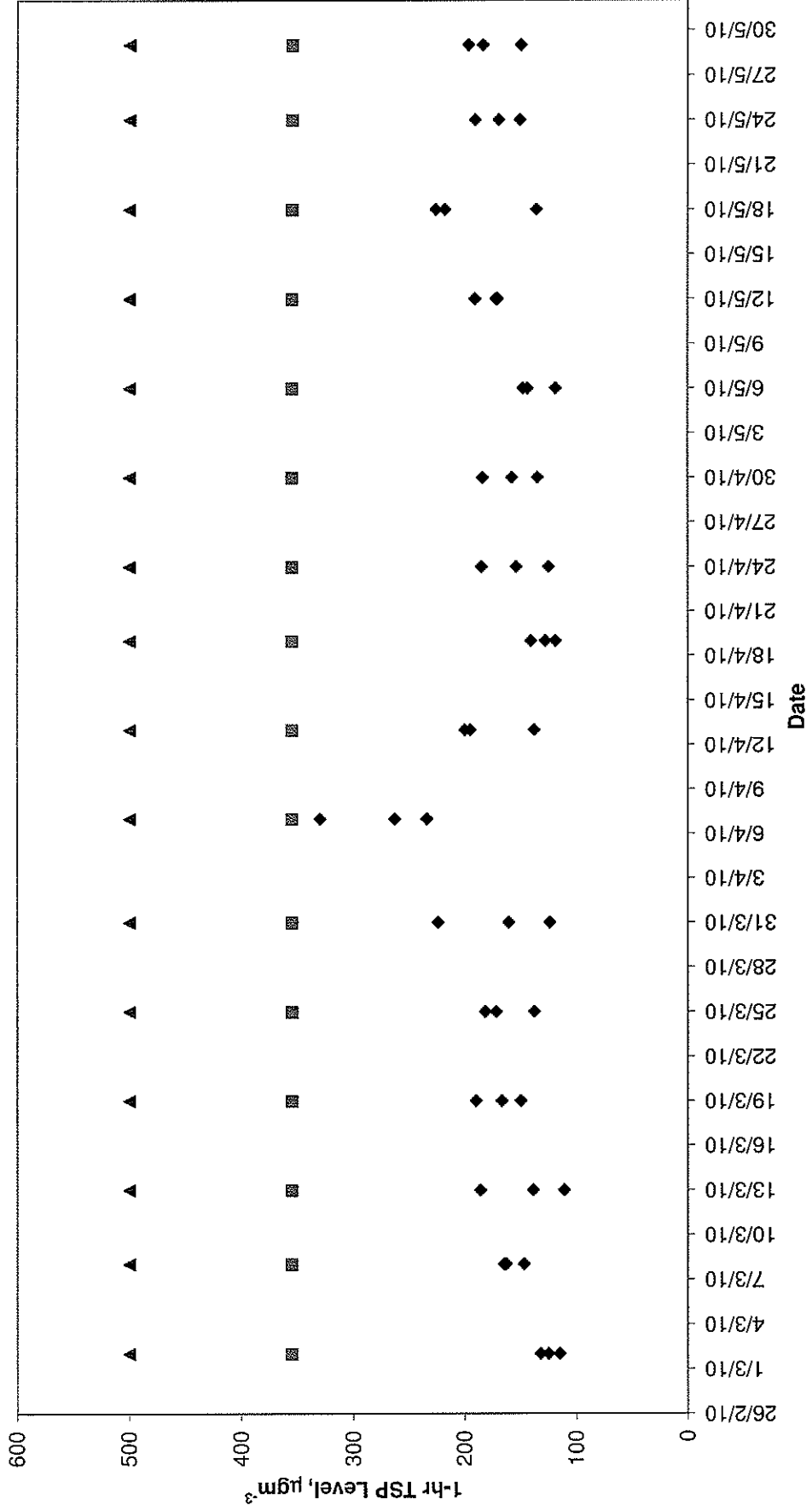
24-hr TSP Level  
AM3 (Wan Chai East PTW)

AM3 Action Level Limit Level



1-hr TSP Level  
AM3 (Wan Chai East PTW)

◆ AM3    ■ Action Level    ▲ Limit Level



## Annex D5 Noise Monitoring Results

### Daytime Noise Monitoring Results

Station NMM2

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-Mar-10	10:57	11:27	Fine	72.3	73.8	72.1	Excavator work, piling	Traffic Noise	-	24	1.0	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10786708)
8-Mar-10	9:00	9:30	Cloudy	73.8	74.6	72.8	Hand-held breakers, welding	Traffic Noise	-	15	1.0	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10786708)
19-Mar-10	11:23	11:53	Sunny	73.4	74.1	72.6	Excavator work	Traffic Noise	-	21	0.8	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10786708)
25-Mar-10	10:20	10:50	Sunny	73.1	74.3	71.9	Excavator work, breaker	Traffic Noise	-	17	1.5	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10786708)
31-Mar-10	11:00	11:30	Sunny	73.5	74.3	72.7	Excavator Work	Traffic Noise	-	22	1.0	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10786708)
				<b>Min.</b>	<b>72.3</b>								
				<b>Max.</b>	<b>73.8</b>								

## Annex D5 Noise Monitoring Results

### Daytime Noise Monitoring Results

Station NM2

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							
7-Apr-10	10:45	11:15	Trace Rain	74.3	75.9	73.0	No construction noise heard	Breaker noise (near site), Traffic noise	-	19	1.2	RION - NL31 (S/N 00410224)	RION - NC73 (S/N 10786708)
13-Apr-10	14:23	14:53	Fine	74.1	75.4	72.6	Breaker, mobile crane were working.	Traffic noise	-	26	0.5	RION - NL31 (S/N 00410224)	RION - NC73 (S/N 10786708)
19-Apr-10	9:22	9:52	Fine	72.9	73.8	72.1	Excavator work, mobile cranes were working	Traffic noise	-	23	0.5	RION - NL31 (S/N 00410224)	RION - NC73 (S/N 10786708)
30-Apr-10	11:08	11:38	Sunny	73.5	74.4	72.6	Excavator work, mobile cranes were working and breaker noise	Traffic noise	-	22	0.8	RION - NL31 (S/N 00410224)	RION - NC73 (S/N 10786708)
				<b>Min.</b>	<b>72.9</b>								
				<b>Max.</b>	<b>74.3</b>								



## Annex D5 Noise Monitoring Results

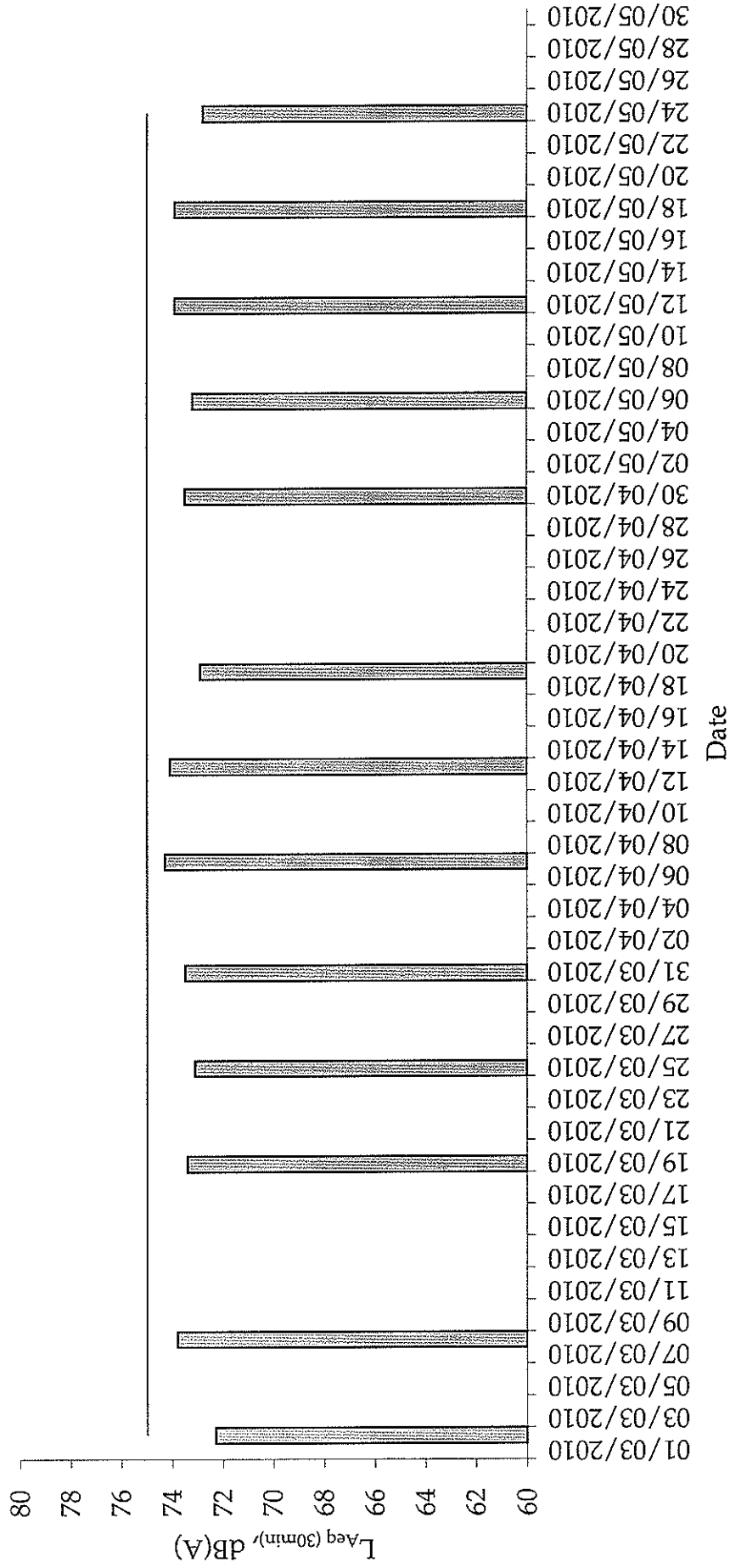
### Daytime Noise Monitoring Results

Station NM2

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							
6-May-10	15:00	15:30	Cloudy	73.2	74.0	72.2	Excavator work, mobile cranes were working and concreting work	Breaker noise (near site), Traffic noise	-	26	1.2	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10786708)
12-May-10	10:30	11:00	Cloudy	73.9	74.9	72.9	Breaker, mobile crane and excavator were working. Concreting work.	Traffic noise	-	25	0.8	RION- NL31 (S/N 00983400)	RION - NC73 (S/N 10786708)
18-May-10	13:10	13:40	Fine	73.9	75.8	72.9	Excavator work, mobile cranes were working	Traffic noise	-	28	0.8	RION- NL31 (S/N 00983400)	RION - NC73 (S/N 10786708)
24-May-10	11:02	11:32	Sunny	72.8	73.8	72.0	Excavator work, mobile cranes were working	Traffic noise	-	25	0.5	RION- NL31 (S/N 00983400)	RION - NC73 (S/N 10786708)
				<b>Min.</b>	<b>72.8</b>								
				<b>Max.</b>	<b>73.9</b>								

### Normal Weekdays Noise Monitoring Results at NM2 ( $L_{eq, 30min}$ )

 NM2 ( $L_{eq, 30min}$ )   
  Limit Leve of 75dB(A)



*Annex D6 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
Overall Total	0	0

Annex E

## Central Drop Shaft

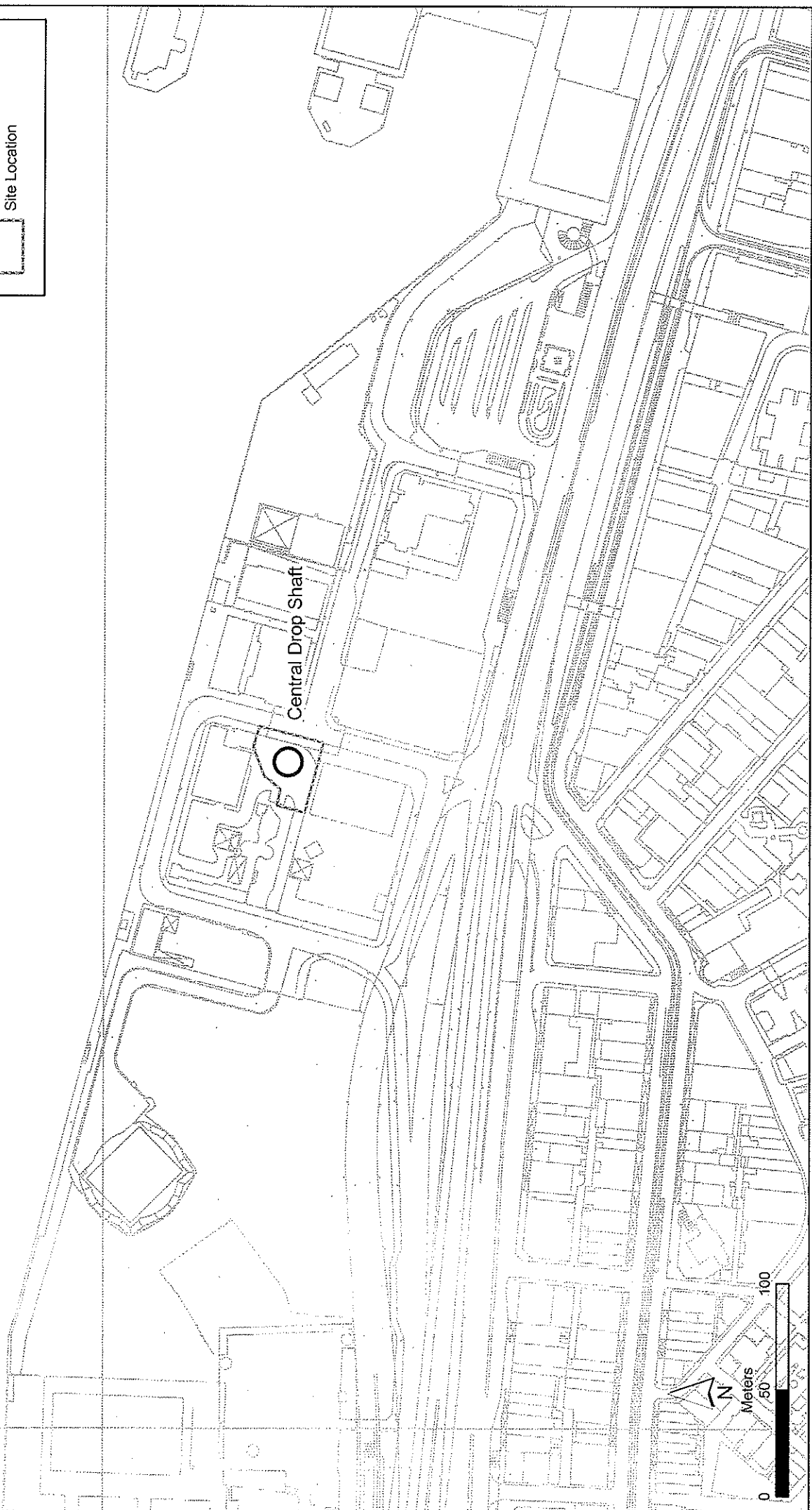


**Key**



Shaft Excavation Location

Site Location



Annex E1

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 Central

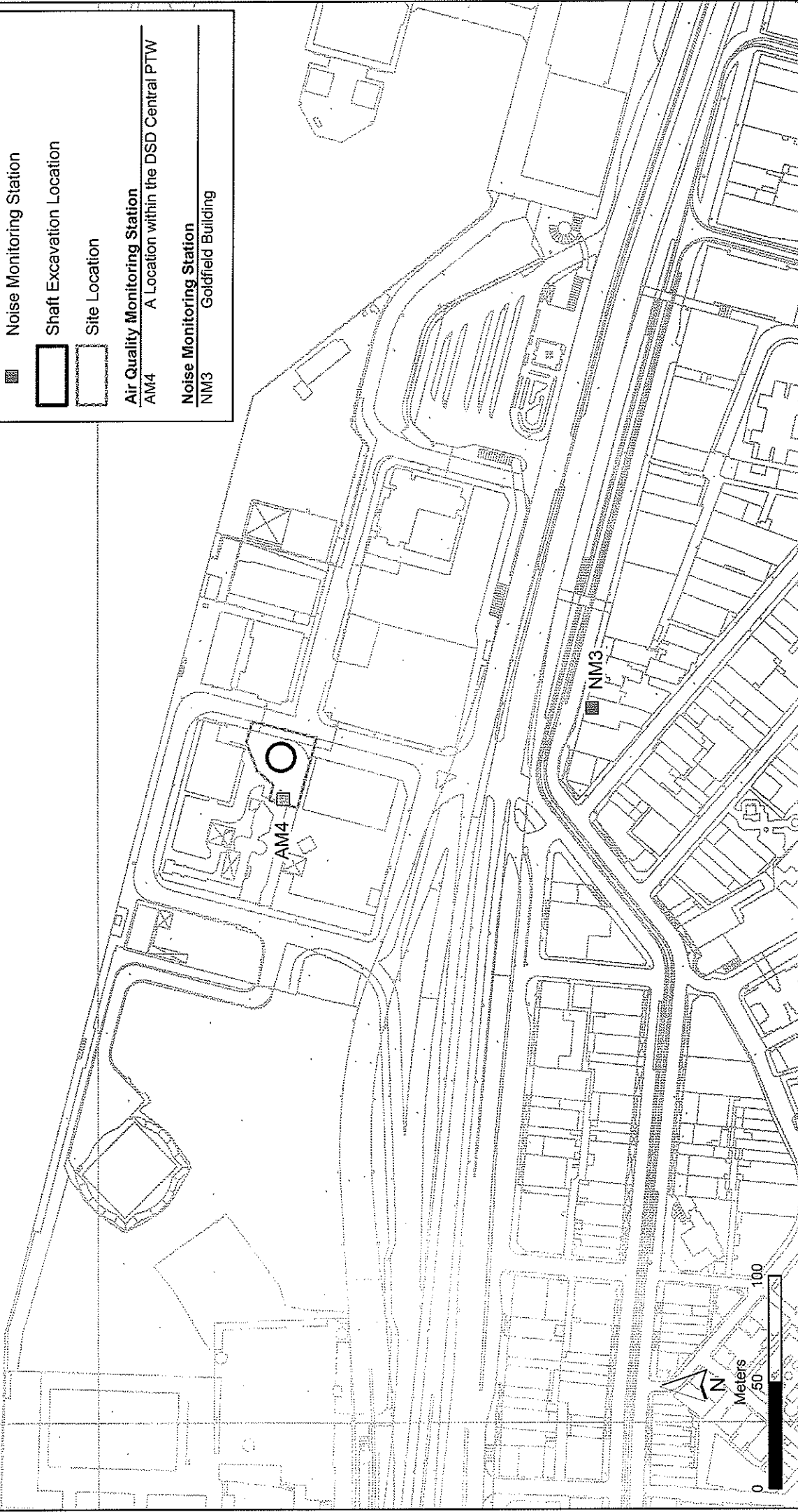


**Key**

-  Air Quality Monitoring Station
-  Noise Monitoring Station
-  Shaft Excavation Location
-  Site Location

**Air Quality Monitoring Station**  
 AM4 A Location within the DSD Central PTW

**Noise Monitoring Station**  
 NM3 Goldfield Building



**ANNEX E3 - SUMMARY OF MITIGATION MEASURES IMPLEMENTATION SCHEDULE**

Type of Impact Construction Phase	Environmental Protection Measures	Location/ Timing	Status
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 hardcore;</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	√
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>• watering four times per day within worksites at the Central PTW.</li> </ul>	All work sites / during construction	√
<i>Operational Phase</i>			

ANNEX E3 - SUMMARY OF MITIGATION MEASURES IMPLEMENTATION SCHEDULE

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
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	Commissioning tests for all deodorization system should be included in the Design and Construction Contract Document.	All PTW and SCISTW / during operational phase	
Construction Phase			
Noise	Use of quiet PME, movable barriers and acoustic mats	All work sites / during construction	√

ANNEX E3 - SUMMARY OF MITIGATION MEASURES IMPLEMENTATION SCHEDULE

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
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</p> <p>Construction Site Drainage should be adopted where applicable.</p>	All work sites / during construction	√

ANNEX E3 - 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 E3 - 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	√

ANNEX E3 - 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 E3 - SUMMARY OF MITIGATION MEASURES IMPLEMENTATION SCHEDULE

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
<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	Standby unit(s) and dual (backup) power supply would be provided at all the Stage 2 PTWs to reduce the risk of equipment breakdown at the PTWs.	Stage 2 PTWs / Operation Stage	NA. Measures not required until commencement of operational phase
<i>Construction Phase</i>			
Waste	Reusable steel or concrete panel shutters, fencing and hoarding and signboard should be used as a preferred alternative to items made of wood, to minimise wastage of wood. Attention should be paid to WBTC No. 19/2001 - Metallic Site Hoardings and Signboards to reduce the amount of timber used on construction sites. Metallic alternatives to timber are readily available and should be used rather than new timber. Precast concrete units should be adopted wherever feasible to minimize the use of timber formwork.	All work sites / during the construction period	✓
Waste	All waste materials should be segregated into categories covering: <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	✓

ANNEX E3 - SUMMARY OF MITIGATION MEASURES IMPLEMENTATION SCHEDULE

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
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	✓
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	<p>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".</p>	All work sites / during the construction period	✓

ANNEX E3 - SUMMARY OF MITIGATION MEASURES IMPLEMENTATION SCHEDULE

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
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	✓
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

ANNEX E3 - SUMMARY OF MITIGATION MEASURES IMPLEMENTATION SCHEDULE

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
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>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	✓
<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 E3 - 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 15.8 and 15.9. 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.
	Monitoring of vibration limits shall be conducted and reported as a requirement of EM&A programme	Identified historical buildings/structures as mentioned in Tables 15.8 and 15.9. 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 E4 24-hour and 1-hour TSP Monitoring Results

### 24-hour TSP Monitoring Results

#### Station AM4

Start Date	Start Time	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		Initial	Final	Initial	Final		Initial	Final	Average						
2-Mar-10	16:00	3-Mar-10	16:00	Fine	2.8442	2.9537	17046.85	17070.85	24.00	1.19	1.19	1.19	64	211	260	Construction work in progress	9315	0373
8-Mar-10	16:00	9-Mar-10	16:00	Cloudy	2.8267	2.9897	17073.85	17097.85	24.00	1.19	1.19	1.19	95	211	260	Construction work in progress	9315	383
13-Mar-10	15:20	13-Mar-10	15:20	Sunny	2.8494	3.0331	17100.85	17124.85	24.00	1.19	1.19	1.19	107	211	260	Construction work in progress	9315	393
19-Mar-10	14:55	20-Mar-10	15:55	Sunny	2.8698	3.0394	17127.95	17151.85	24.00	1.19	1.19	1.19	87	211	260	Construction work in progress	9315	396
25-Mar-10	15:25	26-Mar-10	15:25	Fine	2.8474	3.1041	17154.85	17178.85	24.00	1.18	1.18	1.18	151	211	260	Construction work in progress	9315	406
31-Mar-10	16:10	1-Apr-10	16:10	Sunny	2.8625	3.0585	17181.85	17205.85	24.00	1.18	1.18	1.18	115	211	260	Construction work in progress	9315	413
													<b>Min.</b>	<b>64</b>				
													<b>Max.</b>	<b>151</b>				
													<b>Average</b>	<b>103</b>				

## Annex E4 24-hour and 1-hour TSP Monitoring Results

### 1-hour TSP Monitoring Results

#### Station AM4

Date	Start Time	Finish Time	Weather	TSP Concentration ( $\mu\text{g}/\text{m}^3$ )	Action Level ( $\mu\text{g}/\text{m}^3$ )	Limit Level ( $\mu\text{g}/\text{m}^3$ )	Site Conditions / Observations / Remarks	Temperature ( $^{\circ}\text{C}$ )	Wind Speed * (m/s)	Sampler ID	Filter ID
2-Mar-10	12:30	13:30	Fine	102	393	500	Construction work in progress.	25		9315	0362
2-Mar-10	13:34	14:34	Fine	190	393	500	Construction work in progress.	25		9315	0367
2-Mar-10	14:40	15:40	Fine	216	393	500	Construction work in progress.	25		9315	0369
8-Mar-10	12:30	13:30	Cloudy	359	393	500	Construction work in progress.	17		9315	372
8-Mar-10	13:35	14:35	Cloudy	228	393	500	Construction work in progress.	17		9315	374
8-Mar-10	14:38	15:38	Cloudy	252	393	500	Construction work in progress.	17		9315	381
13-Mar-10	8:30	9:30	Sunny	294	393	500	Construction work in progress.	18		9315	386
13-Mar-10	9:33	10:33	Sunny	292	393	500	Construction work in progress.	18		9315	389
13-Mar-10	10:39	11:39	Sunny	249	393	500	Construction work in progress.	18		9315	390
19-Mar-10	8:20	9:20	Sunny	211	393	500	Construction work in progress.	24		9315	392
19-Mar-10	12:40	13:40	Sunny	259	393	500	Construction work in progress.	24		9315	394
19-Mar-10	13:44	14:44	Sunny	203	393	500	Construction work in progress.	24		9315	400
25-Mar-10	8:20	9:20	Fine	251	393	500	Construction work in progress.	15		9315	401
25-Mar-10	13:00	14:00	Fine	268	393	500	Construction work in progress.	15		9315	403
25-Mar-10	14:08	15:08	Fine	357	393	500	Construction work in progress.	15		9315	405
31-Mar-10	8:00	9:00	Sunny	226	393	500	Construction work in progress.	22		9315	409
31-Mar-10	9:05	10:05	Sunny	304	393	500	Construction work in progress.	22		9315	411
31-Mar-10	13:40	14:40	Sunny	356	393	500	Construction work in progress.	22		9315	414
				<b>Min.</b>							
				<b>Max.</b>							
				<b>Average</b>							

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

## Annex E4 24-hour and 1-hour TSP Monitoring Results

### 24-hour TSP Monitoring Results

#### Station AM4

Start Date	Time	Finish		Weather	Filter Weight (g)		Elapsed Time Reading		Sampling Time (hrs)	Flow Rate (m <sup>3</sup> /min)			TSP Conc. (ug/m <sup>3</sup> )	Action Level (ug/m <sup>3</sup> )	Limit Level (ug/m <sup>3</sup> )	Observations / Remarks	Sampler ID	Filter ID	
		Date	Time		Initial	Final	Initial	Final		Initial	Final	Average							
7-Apr-10	15:30	8-Apr-10	15:30	Rainy	2.8961	2.9872	17208.85	17232.85	24.00	1.18	1.18	1.18	89	211	260	Construction work in progress	9315	0417	
13-Apr-10	11:20	14-Apr-10	11:20	Fine	2.8127	2.9676	17235.85	17259.85	24.00	1.18	1.18	1.18	91	211	260	Construction work in progress	9315	0424	
19-Apr-10	17:20	20-Apr-10	17:20	Fine	2.8233	2.9749	17262.85	17286.85	24.00	1.18	1.18	1.18	89	211	260	Construction work in progress	9315	0433	
24-Apr-10	15:20	25-Apr-10	15:20	Sunny	2.8429	2.9943	17288.85	17312.85	24.00	1.18	1.18	1.18	89	211	260	Construction work in progress	9315	0440	
30-Apr-10	14:40	1-May-10	14:40	Cloudy	2.8555	3.0438	17315.85	17339.85	24.00	1.18	1.18	1.18	111	211	260	Construction work in progress	9315	0446	
											Min.	89							
											Max.	111							
											Average	94							



## Annex E4 24-hour and 1-hour TSP Monitoring Results

### 1-hour TSP Monitoring Results

#### Station AM4

Date	Start Time	Finish Time	Weather	TSP Concentration ( $\mu\text{g}/\text{m}^3$ )	Action Level ( $\mu\text{g}/\text{m}^3$ )	Limit Level ( $\mu\text{g}/\text{m}^3$ )	Site Conditions / Observations / Remarks	Temperature ( $^{\circ}\text{C}$ )	Wind Speed * (m/s)	Sampler ID	Filter ID	
7-Apr-10	7:50	8:50	Rainy	311	393	500	Construction work in progress.	20		9315	0418	
7-Apr-10	8:52	9:52	Rainy	164	393	500	Construction work in progress.	20		9315	0420	
7-Apr-10	9:55	10:55	Rainy	175	393	500	Construction work in progress.	20		9315	0421	
13-Apr-10	7:50	8:50	Fine	160	393	500	Construction work in progress.	25		9315	0423	
13-Apr-10	8:54	9:54	Fine	175	393	500	Construction work in progress.	25		9315	0425	
13-Apr-10	9:58	10:58	Fine	199	393	500	Construction work in progress.	25		9315	0429	
19-Apr-10	14:00	15:00	Fine	213	393	500	Construction work in progress.	23		9315	0430	
19-Apr-10	15:15	16:15	Fine	212	393	500	Construction work in progress.	23		9315	0436	
19-Apr-10	16:18	17:18	Fine	218	393	500	Construction work in progress.	23		9315	0437	
24-Apr-10	7:50	8:50	Sunny	162	393	500	Construction work in progress.	23		9315	0438	
24-Apr-10	8:53	9:53	Sunny	278	393	500	Construction work in progress.	23		9315	0442	
24-Apr-10	9:55	10:55	Sunny	191	393	500	Construction work in progress.	23		9315	0443	
30-Apr-10	8:00	9:00	Sunny	266	393	500	Construction work in progress.	22		9315	0444	
30-Apr-10	9:08	10:08	Sunny	305	393	500	Construction work in progress.	22		9315	0446	
30-Apr-10	10:10	11:10	Sunny	253	393	500	Construction work in progress.	22		9315	0449	
				<b>Min.</b>								
				<b>Max.</b>								
				<b>Average</b>								

Wind Speed data is presented in the Meteorological Data table

## Annex E4 24-hour and 1-hour TSP Monitoring Results

### 1-hour TSP Monitoring Results

#### Station AM/4

Date	Start Time	Finish Time	Weather	TSP Concentration ( $\mu\text{g}/\text{m}^3$ )	Action Level ( $\mu\text{g}/\text{m}^3$ )	Limit Level ( $\mu\text{g}/\text{m}^3$ )	Site Conditions / Observations / Remarks	Temperature ( $^{\circ}\text{C}$ )	Wind Speed* (m/s)	Sampler ID	Filter ID
6-May-10	8:00	9:00	Cloudy	237	393	500	Construction work in progress.	27		9315	0452
6-May-10	9:10	10:10	Cloudy	369	393	500	Construction work in progress.	27		9315	0454
6-May-10	10:15	11:15	Cloudy	371	393	500	Construction work in progress.	27		9315	0453
12-May-10	12:00	13:00	Sunny	232	393	500	Construction work in progress.	25		9315	0462
12-May-10	13:02	14:02	Sunny	278	393	500	Construction work in progress.	25		9315	0466
12-May-10	14:05	15:05	Sunny	232	393	500	Construction work in progress.	25		9315	0469
18-May-10	8:00	9:00	Sunny	326	393	500	Construction work in progress.	28		9315	0470
18-May-10	9:08	10:08	Sunny	281	393	500	Construction work in progress.	28		9315	0473
18-May-10	10:10	11:11	Sunny	227	393	500	Construction work in progress.	28		9315	0475
24-May-10	8:00	9:00	Sunny	190	393	500	Construction work in progress.	27		9315	0477
24-May-10	9:03	10:03	Sunny	151	393	500	Construction work in progress.	27		9315	0481
24-May-10	10:15	11:15	Sunny	193	393	500	Construction work in progress.	27		9315	0484
29-May-10	8:00	9:00	Sunny	173	393	500	Construction work in progress.	29		9315	0491
29-May-10	9:02	10:02	Sunny	148	393	500	Construction work in progress.	29		9315	0492
29-May-10	10:05	11:05	Sunny	152	393	500	Construction work in progress.	29		9315	0493
				<b>Min.</b>							
				<b>Max.</b>							
				<b>Average</b>							

Wind Speed data is presented in the Meteorological Data table

## Annex E4 24-hour and 1-hour TSP Monitoring Results

### 24-hour TSP Monitoring Results

#### Station AM4

Start Date	Time	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		Initial	Final	Initial	Final		Initial	Final	Average						
6-May-10	11:18	7-May-10	11:18	Cloudy	2.8311	2.9916	17342.85	17366.85	24.00	1.18	1.18	1.18	94	211	260	Construction work in progress	9315	0458
12-May-10	15:10	13-May-10	15:10	Sunny	2.8146	2.9828	17369.85	17393.85	24.00	1.18	1.18	1.18	99	211	260	Construction work in progress	9315	0463
18-May-10	15:40	19-May-10	15:40	Sunny	2.8383	3.0509	17396.85	17420.85	24.00	1.18	1.18	1.18	125	211	260	Construction work in progress	9315	0471
24-May-10	14:35	25-May-10	14:35	Sunny	2.8468	2.9936	17423.85	17447.85	24.00	1.14	1.14	1.14	89	211	260	Construction work in progress	9315	0474
29-May-10	14:30	30-May-10	14:30	Sunny	2.8074	2.9630	17450.85	17474.85	24.00	1.14	1.14	1.11	95	211	260	Construction work in progress	9315	0485
										Min.				89				
										Max.				125				
										Average				100				

Meteorological Data Extracted from the Hong Kong Observatory

King's Park Station						
Date	Weather	Average Air Temperature (°C)	Average Relative Humidity (%) *	Total Rainfall (mm)	Average Wind Speed (km/h)	Wind Direction
1/3/10	Sunny	22.0	89-97	0.0	0-18	E
2/3/10	Sunny	24.0	80-94	0.0	0-14	SW
5/3/10	Rainy	26.0	75-89	Trace	0-22	S
6/3/10	Rainy	26.0	78-90	Trace	0-16	SW
8/3/10	Rainy	15.0	91-98	0.5	0-22	SE
11/3/10	Rainy	16.0	51-80	0.0	0-17	SE
12/3/10	Rainy	17.0	77-95	0.4	0-13	SE
13/3/10	Rainy	18.0	90-96	Trace	0-19	SE
17/3/10	Sunny	18.0	69-84	0.0	0-23	E
18/3/10	Sunny	21.0	68-87	0.0	0-19	SE
23/3/10	Sunny	23.0	78-94	0.0	0-15	SE
24/3/10	Rainy	25.0	70-96	Trace	0-18	E
25/3/10	Rainy	17.0	53-96	8.9	0-23	N
29/3/10	Sunny	18.0	51-80	0.0	2-30	E
30/3/10	Rainy	19.0	76-87	Trace	5-22	E
31/3/10	Rainy	22.0	75-93	Trace	0-21	E

Kai Tak Station						
Date	Weather	Average Air Temperature (°C) *	Average Relative Humidity (%) *	Total Rainfall (mm) *	Average Wind Speed (km/h)	Wind Direction
1/3/10	Sunny	22.0	89-97	0.0	8-18	SE
2/3/10	Sunny	24.0	80-94	0.0	0-16	SE
5/3/10	Rainy	26.0	75-89	Trace	6-24	SE
6/3/10	Rainy	26.0	78-90	Trace	1-15	SE
8/3/10	Rainy	15.0	91-98	0.5	2-18	SE
11/3/10	Rainy	16.0	51-80	0.0	0-23	SE
12/3/10	Rainy	17.0	77-95	0.4	4-18	SE
13/3/10	Rainy	18.0	90-96	Trace	6-21	SE
17/3/10	Sunny	18.0	69-84	0.0	0-25	E
18/3/10	Sunny	21.0	68-87	0.0	0-12	SE
23/3/10	Sunny	23.0	78-94	0.0	4-19	SE
24/3/10	Rainy	25.0	70-96	Trace	6-22	SE
25/3/10	Rainy	17.0	53-96	8.9	3-27	NW
29/3/10	Sunny	18.0	51-80	0.0	6-34	E
30/3/10	Rainy	19.0	76-87	Trace	10-34	E
31/3/10	Rainy	22.0	75-93	Trace	0-24	E

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

Tsing Yi Station						
Date	Weather	Average Air Temperature (°C)	Average Relative Humidity (%) *	Total Rainfall (mm) *	Average Wind Speed (km/h)	Wind Direction
1/3/10	Sunny	22.0	89-97	0.0	1-15	SE
2/3/10	Sunny	24.0	80-94	0.0	2-21	SE
5/3/10	Rainy	26.0	75-89	Trace	2-30	SE
6/3/10	Rainy	26.0	78-90	Trace	0-26	SE
8/3/10	Rainy	15.0	91-98	0.5	1-16	NE
11/3/10	Rainy	16.0	51-80	0.0	1-15	SE
12/3/10	Rainy	17.0	77-95	0.4	0-8	SE
13/3/10	Rainy	18.0	90-96	Trace	0-24	E
17/3/10	Sunny	18.0	69-84	0.0	2-23	SE
18/3/10	Sunny	21.0	68-87	0.0	0-8	SW
23/3/10	Sunny	23.0	78-94	0.0	0-19	SE
24/3/10	Rainy	25.0	70-96	Trace	0-21	SE
25/3/10	Rainy	17.0	53-96	8.9	6-30	NW
29/3/10	Sunny	18.0	51-80	0.0	6-20	E
30/3/10	Rainy	19.0	76-87	Trace	6-18	E
31/3/10	Rainy	22.0	75-93	Trace	3-21	E

Green Island Station						
Date	Weather	Average Air Temperature (°C) *	Average Relative Humidity (%) *	Total Rainfall (mm) *	Average Wind Speed (km/h)	Wind Direction
1/3/10	Sunny	22.0	89-97	0.0	2-35	NE
2/3/10	Sunny	24.0	80-94	0.0	2-38	S
5/3/10	Rainy	26.0	75-89	Trace	24-51	S
6/3/10	Rainy	26.0	78-90	Trace	20-40	SE
8/3/10	Rainy	15.0	91-98	0.5	20-50	NE
11/3/10	Rainy	16.0	51-80	0.0	3-27	NE
12/3/10	Rainy	17.0	77-95	0.4	11-30	NE
13/3/10	Rainy	18.0	90-96	Trace	4-41	NE
17/3/10	Sunny	18.0	69-84	0.0	1-42	NE
18/3/10	Sunny	21.0	68-87	0.0	0-28	NW
23/3/10	Sunny	23.0	78-94	0.0	0-30	NE
24/3/10	Rainy	25.0	70-96	Trace	0-35	NE
25/3/10	Rainy	17.0	53-96	8.9	10-60	NE
29/3/10	Sunny	18.0	51-80	0.0	25-58	NE
30/3/10	Rainy	19.0	76-87	Trace	22-58	NE
31/3/10	Rainy	22.0	75-93	Trace	22-45	NE

Meteorological Data Extracted from the Hong Kong Observatory

King's Park Station						
Date	Weather	Average Air Temperature (°C)	Average Relative Humidity (%)	Total Rainfall (mm)	Average Wind Speed (km/h)	Wind Direction
1/4/2010	Rainy	23.7	77-95	TRACE	0-18	E
7/4/2010	Rainy	20.0	80-96	1.8	6-30	E
12/4/2010	Sunny	26.4	79-94	0.0	0-16	SE
13/4/2010	Rainy	25.0	77-98	0.9	0-25	E
16/4/2010	Rainy	16.3	80-90	TRACE	0-17	E
19/4/2010	Rainy	22.9	78-96	TRACE	5-20	SE
22/4/2010	Rainy	25.0	77-95	6.8	0-27	SW
23/4/2010	Sunny	21.0	59-78	0.0	0-21	NE
24/4/2010	Rainy	22.2	45-81	TRACE	6-29	E
28/4/2010	Rainy	23.5	70-89	TRACE	0-10	E
29/4/2010	Rainy	21.0	80-99	40.6	0-27	W
30/4/2010	Rainy	22.1	66-97	0.6	2-28	E

Kai Tak Station						
Date	Weather	Average Air Temperature (°C)	Average Relative Humidity (%)	Total Rainfall (mm)	Average Wind Speed (km/h)	Wind Direction
1/4/2010	Rainy	23.7	77-95	TRACE	2-21	SE
7/4/2010	Rainy	20.0	80-96	1.8	9-31	SE
12/4/2010	Sunny	26.4	79-94	0.0	1-14	SE
13/4/2010	Rainy	25.0	77-98	0.9	5-33	SE
16/4/2010	Rainy	16.3	80-90	TRACE	1-18	E
19/4/2010	Rainy	22.9	76-96	TRACE	9-20	SE
22/4/2010	Rainy	25.0	77-95	6.8	1-36	SW
23/4/2010	Sunny	21.0	59-78	0.0	3-21	SE
24/4/2010	Rainy	22.2	45-81	TRACE	5-31	E
28/4/2010	Rainy	23.5	70-89	TRACE	1-17	SE
29/4/2010	Rainy	21.0	80-99	40.6	0-35	E
30/4/2010	Rainy	22.1	66-97	0.6	5-30	E

\* king's park data

- data were not available

# less than 24 hourly observations per day

Tsing Yi Station						
Date	Weather	Average Air Temperature (°C)	Average Relative Humidity (%)	Total Rainfall (mm)	Average Wind Speed (km/h)	Wind Direction
1/4/2010	Rainy	23.7	77-95	TRACE	0-20	E
7/4/2010	Rainy	20.0	80-96	1.8	1-28	E
12/4/2010	Sunny	26.4	79-94	0.0	0-20	SE
13/4/2010	Rainy	25.0	77-98	0.9	0-30	SE
16/4/2010	Rainy	16.3	80-90	TRACE	1-14	NW
19/4/2010	Rainy	22.9	78-96	TRACE	2-15	E
22/4/2010	Rainy	25.0	77-95	6.8	0-30	SE
23/4/2010	Sunny	21.0	59-78	0.0	3-34	NW
24/4/2010	Rainy	22.2	45-81	TRACE	1-24	E
28/4/2010	Rainy	23.5	70-89	TRACE	0-12	E
29/4/2010	Rainy	21.0	80-99	40.6	0-24	E
30/4/2010	Rainy	22.1	66-97	0.6	3-21	SE

Green Island Station						
Date	Weather	Average Air Temperature (°C)	Average Relative Humidity (%)	Total Rainfall (mm)	Average Wind Speed (km/h)	Wind Direction
1/4/2010	Rainy	23.7	77-95	TRACE	1-30	NE
7/4/2010	Rainy	20.0	80-96	1.8	1-80	NE
12/4/2010	Sunny	26.4	79-94	0.0	13-35	S
13/4/2010	Rainy	25.0	77-98	0.9	3-75	S,NE
16/4/2010	Rainy	16.3	80-90	TRACE	8-37	NE
19/4/2010	Rainy	22.9	78-96	TRACE	2-32	NE
22/4/2010	Rainy	25.0	77-95	6.8	1-47	S
23/4/2010	Sunny	21.0	59-78	0.0	4-43	NW
24/4/2010	Rainy	22.2	45-81	TRACE	15-55	NE
28/4/2010	Rainy	23.5	70-89	TRACE	0-20	NE
29/4/2010	Rainy	21.0	80-99	40.6	1-75	NE
30/4/2010	Rainy	22.1	66-97	0.6	3-60	NE

Meteorological Data Extracted from the Hong Kong Observatory

King's Park Station						
Date	Weather	Average Air Temperature (°C) *	Average Relative Humidity (%) *	Total Rainfall (mm) *	Average Wind Speed (km/h)	Wind Direction
4/5/2010	Rainy	24.9	80-92	Trace	4-22	E
5/5/2010	Rainy	25.7	78-94	Trace	2-16	E
6/5/2010	Rainy	27.4	80-93	0.2	0-19	SW
10/5/2010	Rainy	24.2	86-98	27.6	0-15	SE
11/5/2010	Rainy	24.5	81-96	0.3	8-19	E
12/5/2010	Rainy	24.9	78-93	Trace	8-21	E
14/5/2010	Rainy	24.7	90-96	Trace	5-15	E
17/5/2010	Rainy	25.7	82-95	Trace	9-16	E
18/5/2010	Rainy	27.0	76-96	Trace	0-14	E
20/5/2010	Rainy	26.0	69-99	6.1	0-15	SE
22/5/2010	Rainy	28.5	79-88	Trace	3-29	SW
24/5/2010	Sunny	26.0	44-84	0.0	0-17	NE
26/5/2010	Sunny	27.0	67-83	0.0	2-22	E
28/5/2010	Sunny	28.0	75-90	0.0	2-21	E
29/5/2010	Rainy	26.0	77-98	22.6	0-25	E

Kai Tak Station						
Date	Weather	Average Air Temperature (°C) *	Average Relative Humidity (%) *	Total Rainfall (mm) *	Average Wind Speed (km/h)	Wind Direction
4/5/2010	Rainy	24.9	80-92	Trace	3-23	E
5/5/2010	Rainy	25.7	78-94	Trace	3-15	SE
6/5/2010	Rainy	27.4	80-93	0.2	0-15	SE
10/5/2010	Rainy	24.2	86-98	27.6	0-24	SE
11/5/2010	Rainy	24.5	81-96	0.3	9-24	E
12/5/2010	Rainy	24.9	78-93	Trace	9-25	E
14/5/2010	Rainy	24.7	90-96	Trace	5-19	E
17/5/2010	Rainy	25.7	82-95	Trace	8-22	E
18/5/2010	Rainy	27.0	76-96	Trace	0-14	SE
20/5/2010	Rainy	26.0	69-99	6.1	0-21	SE
22/5/2010	Rainy	28.5	79-88	Trace	5-25	S
24/5/2010	Sunny	26.0	44-84	0.0	0-24	NE
26/5/2010	Sunny	27.0	67-83	0.0	5-30	E
28/5/2010	Sunny	28.0	75-90	0.0	7-22	SE
29/5/2010	Rainy	26.0	77-98	22.6	2-41	SE

\* King's park data

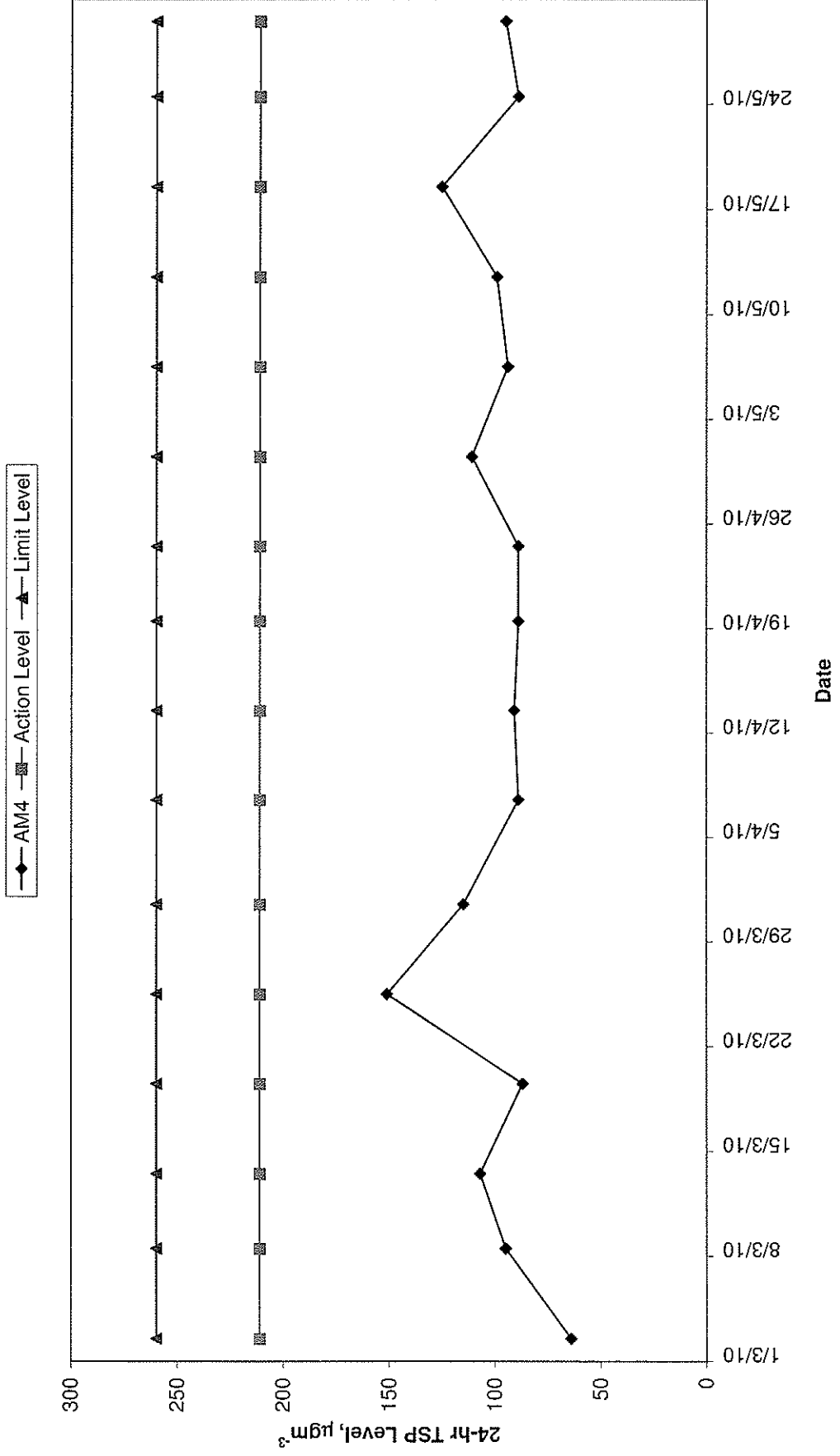
- data were not available

# less than 24 hourly observations per day

Tsing Yi Station						
Date	Weather	Average Air Temperature (°C) *	Average Relative Humidity (%) *	Total Rainfall (mm) *	Average Wind Speed (km/h)	Wind Direction
4/5/2010	Rainy	24.9	80-92	Trace	3-20	E
5/5/2010	Rainy	25.7	78-94	Trace	6-22	E
6/5/2010	Rainy	27.4	80-93	0.2	-	-
10/5/2010	Rainy	24.2	86-98	27.6	-	-
11/5/2010	Rainy	24.5	81-96	0.3	-	-
12/5/2010	Rainy	24.9	78-93	Trace	-	-
14/5/2010	Rainy	24.7	90-96	Trace	9-23	E
17/5/2010	Rainy	25.7	82-95	Trace	9-21	E
18/5/2010	Rainy	27.0	76-96	Trace	-	-
20/5/2010	Rainy	26.0	69-99	6.1	-	-
22/5/2010	Rainy	28.5	79-88	Trace	-	-
24/5/2010	Sunny	26.0	44-84	0.0	-	-
26/5/2010	Sunny	27.0	67-83	0.0	-	-
28/5/2010	Sunny	28.0	75-90	0.0	-	-
29/5/2010	Rainy	26.0	77-98	22.6	0-15	S

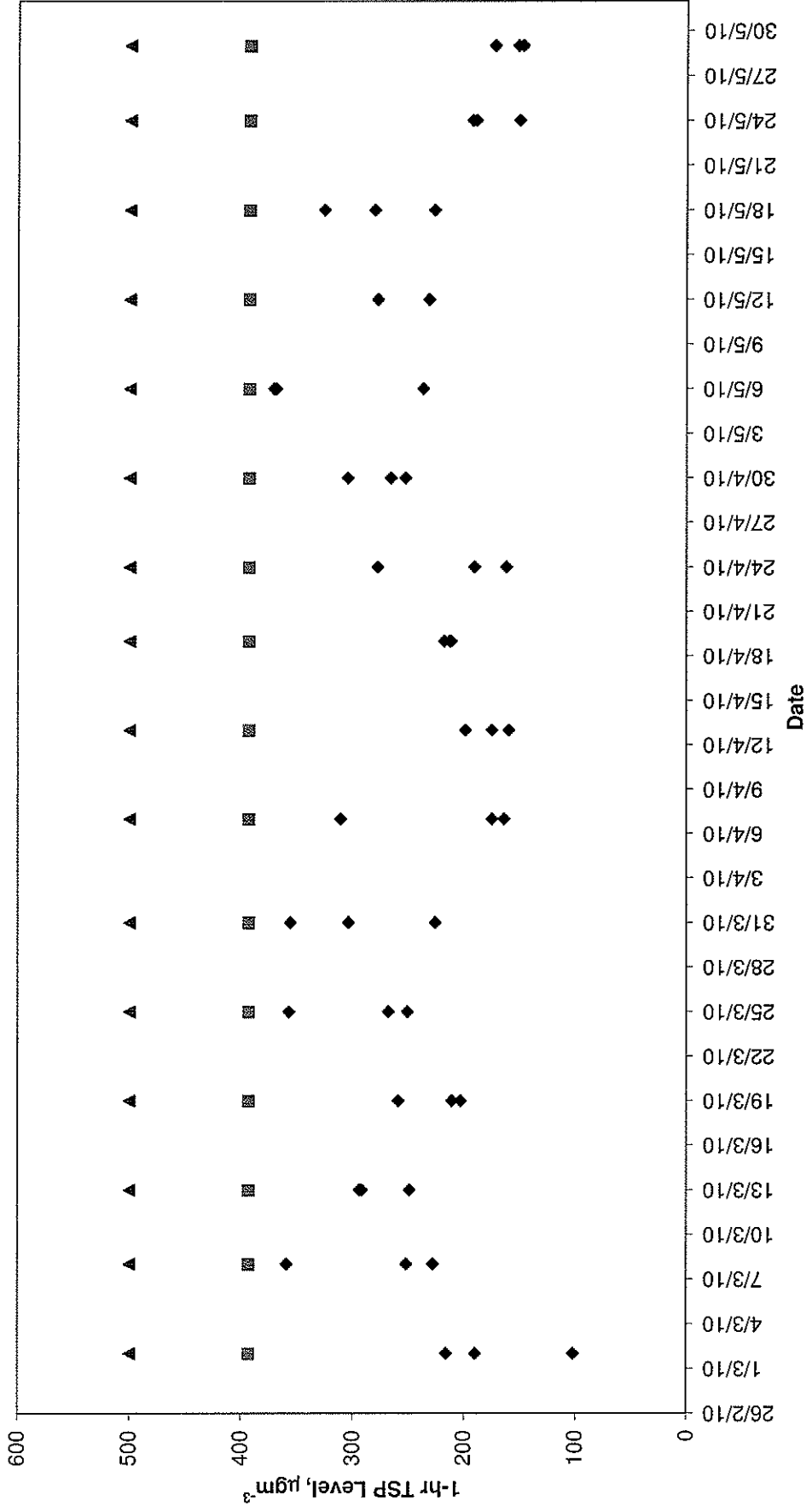
Green Island Station						
Date	Weather	Average Air Temperature (°C) *	Average Relative Humidity (%) *	Total Rainfall (mm) *	Average Wind Speed (km/h)	Wind Direction
4/5/2010	Rainy	24.9	80-92	Trace	6-40	NE
5/5/2010	Rainy	25.7	78-94	Trace	5-35	NE
6/5/2010	Rainy	27.4	80-93	0.2	0-36	S
10/5/2010	Rainy	24.2	86-98	27.6	4-30	NW
11/5/2010	Rainy	24.5	81-96	0.3	6-42	NE
12/5/2010	Rainy	24.9	78-93	Trace	18-47	NE
14/5/2010	Rainy	24.7	90-96	Trace	13-39	NE
17/5/2010	Rainy	25.7	82-95	Trace	4-43	NE
18/5/2010	Rainy	27.0	76-96	Trace	0-34	S
20/5/2010	Rainy	26.0	69-99	6.1	3-48	S
22/5/2010	Rainy	28.5	79-88	Trace	23-45	S
24/5/2010	Sunny	26.0	44-84	0.0	11-36	NE
26/5/2010	Sunny	27.0	67-83	0.0	5-53	NE
28/5/2010	Sunny	28.0	75-90	0.0	0-36	S
29/5/2010	Rainy	26.0	77-98	22.6	0-38	S

24-hr TSP Level  
AM4 (A Location within DSD Central PTW )



1-hr TSP Level  
 AM4 (A Location within DSD Central PTW)

◆ AM4    ■ Action Level    ▲ Limit Level





## Annex E5 Noise Monitoring Results

### Daytime Noise Monitoring Results

Station NM3

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-Mar-10	13:48	14:18	Fine	74.8	76.5	73.2	Mobile cranes and excavators	Traffic noise	-	24	1.0	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10786708)
8-Mar-10	13:45	14:15	Cloudy	74.6	76.1	72.9	Mobile cranes and excavators	Traffic Noise	-	15	1.0	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10786708)
19-Mar-10	14:07	14:37	Sunny	74.9	76.1	73.4	Mobile cranes movement, welding and excavators	Traffic Noise	-	21	1.2	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10786708)
25-Mar-10	13:18	13:48	Sunny	74.9	76.2	72.9	Mobile cranes and excavators	Traffic Noise, Aircraft Noise	-	17	1.2	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10786708)
31-Mar-10	14:00	14:30	Sunny	74.8	76.2	72.8	Mobile cranes and excavators	Traffic Noise	-	22	0.5	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10786708)
				<b>Min.</b>	<b>74.6</b>								
				<b>Max.</b>	<b>74.9</b>								

## Annex E5 Noise Monitoring Results

### Daytime Noise Monitoring Results

Station NM3

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							
7-Apr-10	9:10	9:40	Trace Rain	74.7	76.3	73.0	Excavator work, mobile cranes were working	Traffic noise	-	19	1.5	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10786708)
13-Apr-10	9:10	9:40	Fine	74.9	76.3	73.0	Excavator work, two mobile cranes were working	Traffic noise	-	26	0.5	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10786708)
19-Apr-10	13:15	13:45	Fine	74.9	76.2	73.2	Excavator work, mobile cranes were working	Traffic noise	-	23	0.5	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10786708)
30-Apr-10	9:20	9:50	Sunny	74.9	76.4	72.9	Excavator work, mobile cranes were working	Traffic noise	-	22	0.7	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10786708)
				<b>Min.</b>	<b>74.7</b>								
				<b>Max.</b>	<b>74.9</b>								

## Annex E5 Noise Monitoring Results

### Daytime Noise Monitoring Results

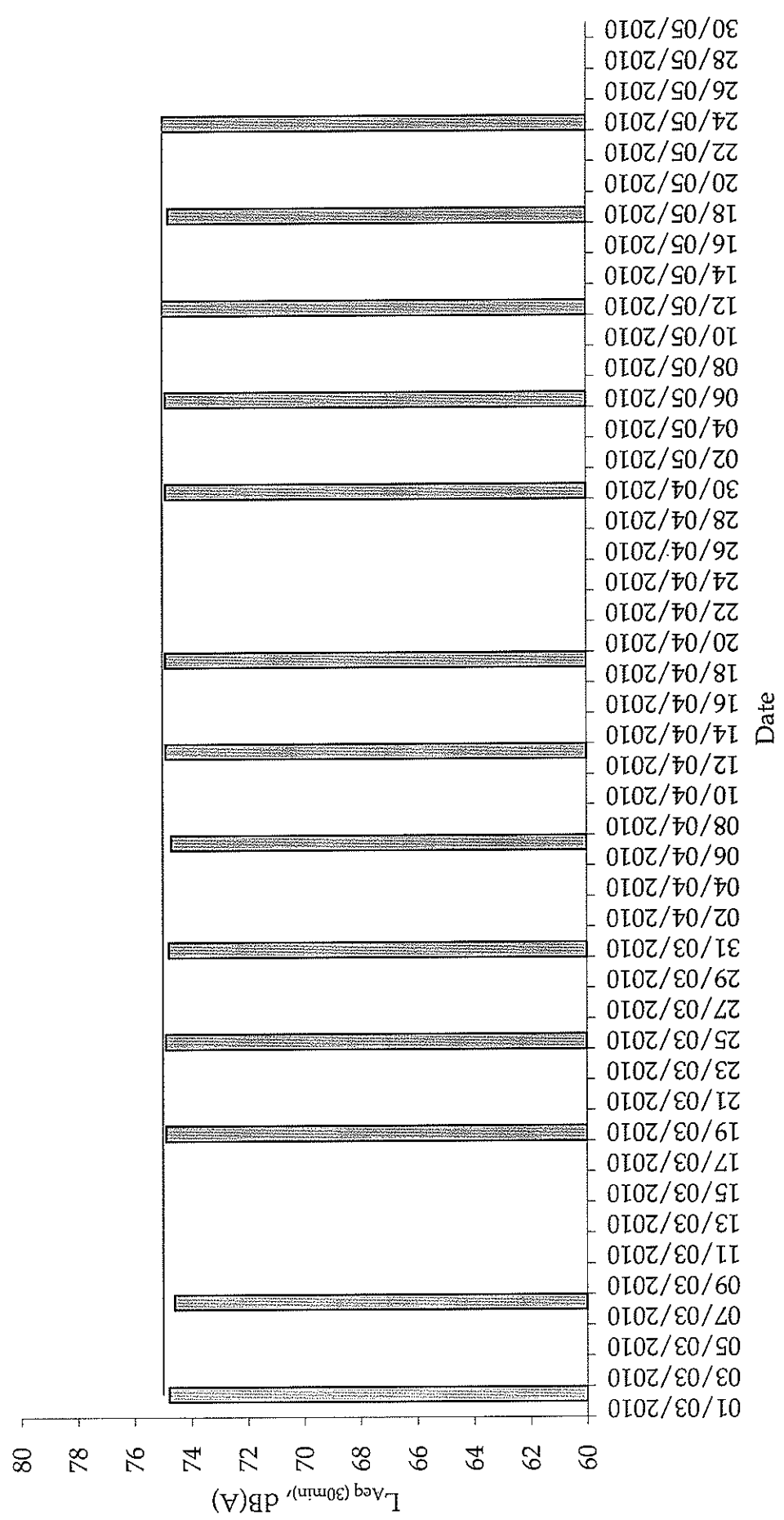
Station NMS3

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							
6-May-10	9:25	9:55	Cloudy	74.9	76.8	72.6	Excavator work, mobile cranes were working	Traffic noise	-	26	0.7	RION-NL31 (S/N 00410224)	RION - NC73 (S/N 10786708)
12-May-10	13:17	13:47	Fine	75.0	76.8	72.9	Excavator work, mobile cranes were working	Traffic noise	-	25	0.9	RION-NL31 (S/N 00983400)	RION - NC73 (S/N 10786708)
18-May-10	9:25	9:55	Fine	74.8	76.2	73.2	Excavator work, mobile cranes were working	Traffic noise	-	28	0.5	RION-NL31 (S/N 00983400)	RION - NC73 (S/N 10786708)
24-May-10	8:20	8:50	Sunny	75.0	76.3	73.0	No construction works observed.	Traffic noise	-	25	0.5	RION-NL31 (S/N 00983400)	RION - NC73 (S/N 10786708)

<b>Min.</b>	<b>74.8</b>
<b>Max.</b>	<b>75.0</b>

Noise Monitoring Results at NM3 ( $L_{eq, 30min}$ )

▨ NM3 — Limit Level



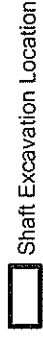
*Annex E6 Cumulative Complaint and Summons/Prosecutions Log*

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
Overall Total	0	0

Annex F

## Sai Ying Pun Junction Shaft

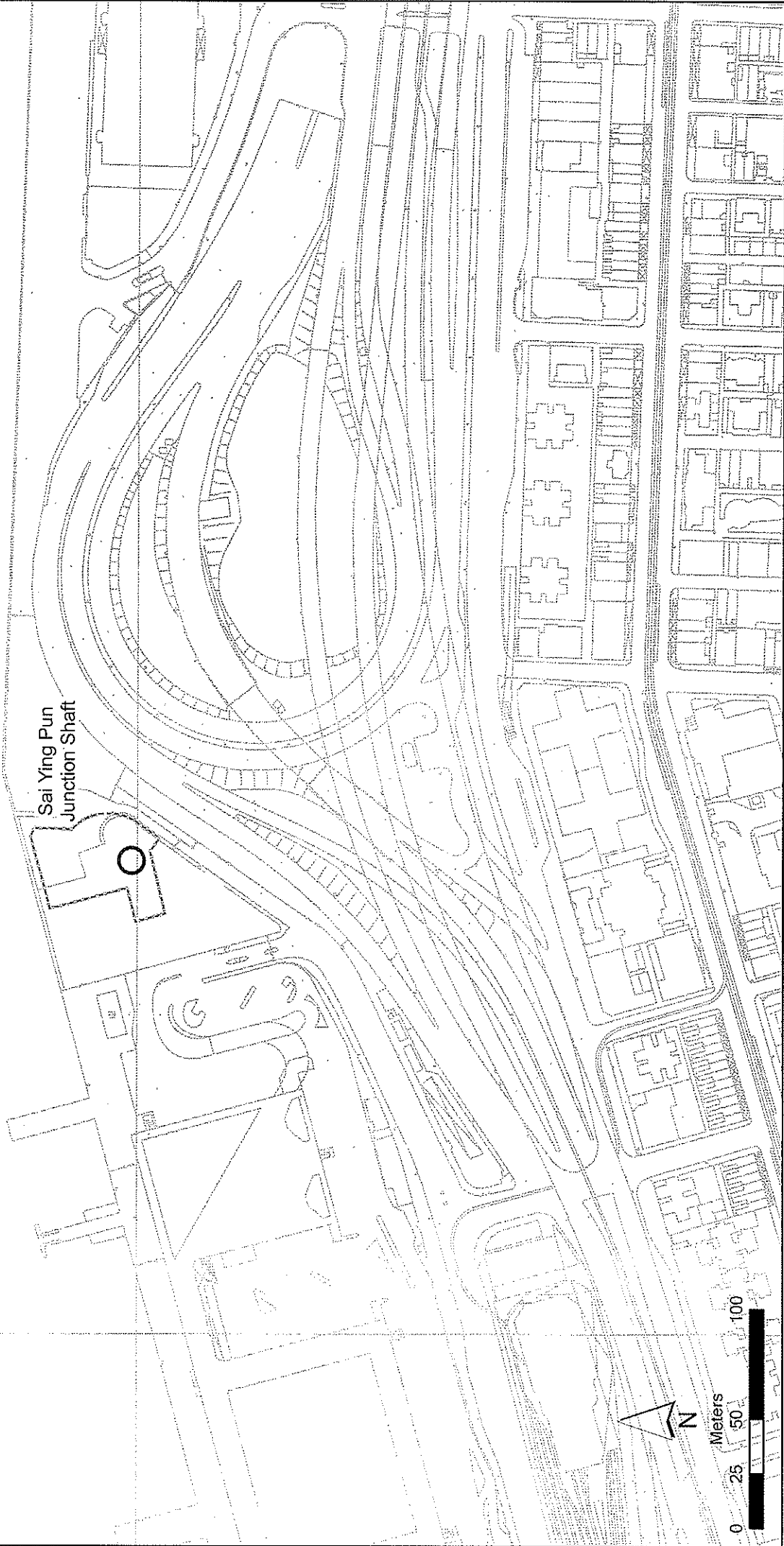
Key



Shaft Excavation Location



Site Location



Sai Ying Pun  
Junction Shaft



Meters

0 25 50 100



Annex F1

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 Sai Ying Pun

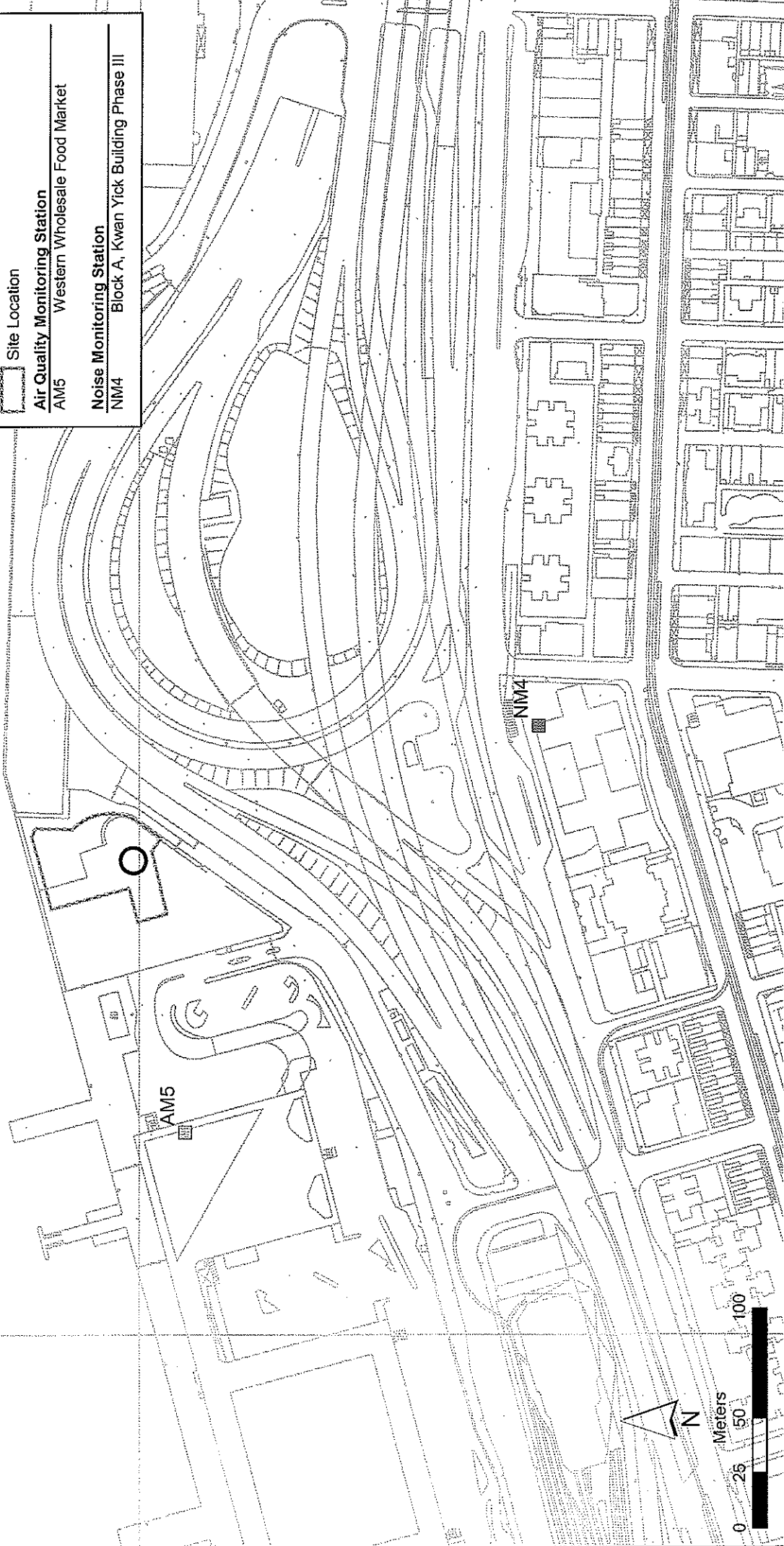


**Key**

-  Air Quality Monitoring Station
-  Noise Monitoring Station
-  Shaft Excavation Location
-  Site Location

**Air Quality Monitoring Station**  
AM5 Western Wholesale Food Market

**Noise Monitoring Station**  
NM4 Block A, Kwan Yick Building Phase III





ANNEX F3 - SUMMARY OF MITIGATION MEASURES IMPLEMENTATION SCHEDULE

Type of Impact Construction Phase	Environmental Protection Measures	Location/ Timing	Status
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 F3 - 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>• watering twice per day within the worksites at Fung Mat Road Site;</li> <li>• the barging points should be continuous watering throughout the whole unloading process.</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	Commissioning tests for all deodorization system should be included in the Design and Construction Contract Document.	All PTW and SCISTW / during operational phase	
<i>Construction Phase</i>			
Noise	Use of quiet PME, movable barriers and acoustic mats	All work sites / during construction	√

ANNEX F3 - SUMMARY OF MITIGATION MEASURES IMPLEMENTATION SCHEDULE

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
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 F3 - 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 F3 - 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	√

### ANNEX F3 - SUMMARY OF MITIGATION MEASURES IMPLEMENTATION SCHEDULE

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Water Quality	Construction Works in Close Proximity of Storm Drains or Seafront	All work sites / during construction	√
<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>			

ANNEX F3 - SUMMARY OF MITIGATION MEASURES IMPLEMENTATION SCHEDULE

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
<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	Standby unit(s) and dual (backup) power supply would be provided at all the Stage 2 PTWs to reduce the risk of equipment breakdown at the PTWs.	Stage 2 PTWs / Operation Stage	NA. Measures not required until commencement of operational phase
<i>Construction Phase</i>			
Waste	Reusable steel or concrete panel shutters, fencing and hoarding and signboard should be used as a preferred alternative to items made of wood, to minimise wastage of wood. Attention should be paid to WBTC No. 19/2001 - Metallic Site Hoardings and Signboards to reduce the amount of timber used on construction sites. Metallic alternatives to timber are readily available and should be used rather than new timber. Precast concrete units should be adopted wherever feasible to minimize the use of timber formwork.	All work sites / during the construction period	✓
Waste	All waste materials should be segregated into categories covering: <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	✓

**ANNEX F3 - SUMMARY OF MITIGATION MEASURES IMPLEMENTATION SCHEDULE**

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
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	✓
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	<p>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".</p>	All work sites / during the construction period	✓



ANNEX F3 - SUMMARY OF MITIGATION MEASURES IMPLEMENTATION SCHEDULE

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
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	✓
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

ANNEX F3 - SUMMARY OF MITIGATION MEASURES IMPLEMENTATION SCHEDULE

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
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>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	✓
<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 F3 - 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 15.8 and 15.9. 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.
	Monitoring of vibration limits shall be conducted and reported as a requirement of EM&A programme	Identified historical buildings/structures as mentioned in Tables 15.8 and 15.9. 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 F4 24-hour and 1-hour TSP Monitoring Results

### 24-hour TSP Monitoring Results

#### Station AM5

Start Date	Start Time	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		Initial	Final	Initial	Final		Initial	Final	Average						
1-Mar-10	9:00	2-Mar-10	9:00	Cloudy	2.9226	3.0358	108.30	132.30	24.00	1.33	1.33	1.33	59	188	260	Operation of mobile crane	8162	54
5-Mar-10	9:00	6-Mar-10	9:00	Cloudy	2.8145	2.9921	135.30	159.30	24.00	1.32	1.32	1.32	62	188	260	Operation of mobile crane	8162	25
11-Mar-10	11:45	12-Mar-10	11:45	Cloudy	2.9349	3.1640	162.30	186.30	24.00	1.50	1.50	1.50	106	188	260	Operation of mobile crane	8162	25
17-Mar-10	16:00	18-Mar-10	16:00	Cloudy	2.9253	3.3825	197.32	221.32	24.00	1.50	1.50	1.50	212	188	260	Operation of mobile crane	8162	57
23-Mar-10	11:55	24-Mar-10	11:55	Cloudy	2.9214	3.2370	224.32	248.32	24.00	1.50	1.50	1.50	146	188	260	Operation of mobile crane	8162	72
29-Mar-10	12:45	30-Mar-10	12:45	Cloudy	2.9586	3.1943	251.32	275.32	24.00	1.50	1.50	1.50	109	188	260	Operation of mobile crane	8162	79
													Min.	59				
													Max.	212				
													Average	116				

## Annex F4 24-hour and 1-hour TSP Monitoring Results

### 1-hour TSP Monitoring Results

#### Station AM5

Date	Start Time	Finish Time	Weather	TSP Concentration ( $\mu\text{g}/\text{m}^3$ )	Action Level ( $\mu\text{g}/\text{m}^3$ )	Limit Level ( $\mu\text{g}/\text{m}^3$ )	Site Conditions / Observations / Remarks	Temperature ( $^{\circ}\text{C}$ )	Wind Speed * (m/s)	Sampler ID	Filter ID
1-Mar-10	8:00	9:00	Cloudy	84	332	500	No construction activities observed.	22.1		8162	51
1-Mar-10	9:15	10:15	Cloudy	49	332	500	No construction activities observed.	22.1		8162	52
1-Mar-10	10:40	11:40	Cloudy	145	332	500	No construction activities observed.	22.1		8162	53
5-Mar-10	8:00	9:00	Cloudy	103	332	500	No construction activities observed.	25.8		8162	45
5-Mar-10	9:20	10:20	Cloudy	55	332	500	No construction activities observed.	25.8		8162	44
5-Mar-10	10:45	11:45	Cloudy	53	332	500	No construction activities observed.	25.8		8162	43
11-Mar-10	8:00	9:00	Cloudy	222	332	500	No construction activities observed.	20		8162	67
11-Mar-10	9:15	10:15	Cloudy	168	332	500	No construction activities observed.	20		8162	66
11-Mar-10	10:30	11:30	Cloudy	181	332	500	No construction activities observed.	20		8162	65
17-Mar-10	8:00	9:00	Cloudy	109	332	500	No construction activities observed.	19		8162	61
17-Mar-10	9:15	10:15	Cloudy	139	332	500	No construction activities observed.	19		8162	55
17-Mar-10	10:30	11:30	Cloudy	147	332	500	No construction activities observed.	19		8162	56
23-Mar-10	8:00	9:00	Cloudy	354	332	500	No construction activities observed.	20.7		8162	60
23-Mar-10	9:15	10:15	Cloudy	241	332	500	No construction activities observed.	20.7		8162	70
23-Mar-10	10:30	11:30	Cloudy	294	332	500	No construction activities observed.	20.7		8162	71
29-Mar-10	9:17	10:17	Cloudy	160	332	500	No construction activities observed.	20.7		8162	76
29-Mar-10	10:20	11:20	Cloudy	97	332	500	No construction activities observed.	20.7		8162	77
29-Mar-10	11:30	12:30	Cloudy	100	332	500	No construction activities observed.	20.7		8162	78

<b>Min.</b>	<b>49</b>
<b>Max.</b>	<b>354</b>
<b>Average</b>	<b>150</b>

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

# Annex F4 24-hour and 1-hour TSP Monitoring Results

## 24-hour TSP Monitoring Results

### Station AM5

Start Date	Start Time	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		Initial	Final	Initial	Final		Initial	Final	Average						
1-Apr-10	12:50	2-Apr-10	12:50	Cloudy	2.9311	3.2200	278.32	302.32	24.00	1.41	1.41	1.41	143	188	260	Operation of mobile crane	8162	82
8-Apr-10	12:07	9-Apr-10	12:07	Cloudy	2.9178	3.0792	337.22	361.22	24.00	1.45	1.45	1.45	77	188	260	Operation of mobile crane	8162	89
12-Apr-10	12:12	13-Apr-10	12:12	Cloudy	2.9031	3.0300	364.22	388.22	24.00	1.42	1.42	1.42	62	188	260	Loading activities	8162	99
16-Apr-10	12:00	17-Apr-10	12:00	Cloudy	2.9189	3.0482	391.22	415.22	24.00	1.45	1.45	1.45	62	188	260	Concreting	8162	107
22-Apr-10	12:00	23-Apr-10	12:00	Cloudy	2.8978	3.0820	418.22	442.22	24.00	1.20	1.20	1.20	107	188	260	Operation of mobile crane	8162	114
28-Apr-10	19:33	29-Apr-10	19:33	Cloudy	2.9361	3.2958	445.22	469.22	24.00	1.40	1.40	1.40	179	188	260	No construction works observation.	8162	121

Min.	62
Max.	179
Average	105

## Annex F4 24-hour and 1-hour TSP Monitoring Results

### 1-hour TSP Monitoring Results

#### Station AM5

Date	Start Time	Finish Time	Weather	TSP Concentration ( $\mu\text{g}/\text{m}^3$ )	Action Level ( $\mu\text{g}/\text{m}^3$ )	Limit Level ( $\mu\text{g}/\text{m}^3$ )	Site Conditions / Observations / Remarks	Temperature ( $^{\circ}\text{C}$ )	Wind Speed * (m/s)	Sampler ID	Filter ID
1-Apr-10	9:30	10:30	Cloudy	151	332	500	No construction activities observed.	21	<5	8162	80
1-Apr-10	10:40	11:40	Cloudy	192	332	500	No construction activities observed.	21	<5	8162	81
1-Apr-10	11:45	12:45	Cloudy	178	332	500	No construction activities observed.	21	<5	8162	84
8-Apr-10							HVS failure				
8-Apr-10	9:20	10:20	Cloudy	86	332	500	No construction activities observed.	17.3	<5	8162	87
8-Apr-10	10:34	11:34	Cloudy	76	332	500	No construction activities observed.	17.3	<5	8162	88
12-Apr-10	9:00	10:00	Cloudy	96	332	500	No construction activities observed.	26.1	<5	8162	96
12-Apr-10	10:03	11:03	Cloudy	71	332	500	No construction activities observed.	26.1	<5	8162	97
12-Apr-10	11:07	12:07	Cloudy	70	332	500	No construction activities observed.	26.1	<5	8162	98
16-Apr-10	8:00	9:00	Cloudy	145	332	500	Concreting	16.5	<5	8162	103
16-Apr-10	9:10	10:10	Cloudy	50	332	500	Concreting	16.5	<5	8162	105
16-Apr-10	10:30	11:30	Cloudy	50	332	500	Concreting	16.5	<5	8162	106
22-Apr-10	8:00	9:00	Cloudy	56.2	332	500	No construction activities observed.	24.4	<5	8162	111
22-Apr-10	9:15	10:15	Cloudy	52.7	332	500	No construction activities observed.	24.4	<5	8162	112
22-Apr-10	10:30	11:30	Cloudy	79.0	332	500	No construction activities observed.	24.4	<5	8162	113
28-Apr-10	16:15	17:15	Cloudy	169.9	332	500	Operation of hydraulic extractor	22.8	<5	8162	118
28-Apr-10	17:25	18:25	Cloudy	137.4	332	500	Operation of hydraulic extractor	22.8	<5	8162	119
28-Apr-10	18:30	19:30	Cloudy	217.7	332	500	Operation of hydraulic extractor	22.8	<5	8162	120
			Min.	50							
			Max.	218							
			Average	110							

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

## Annex F4 24-hour and 1-hour TSP Monitoring Results

### 24-hour TSP Monitoring Results

#### Station AM5

Start Date	Start Time	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		Initial	Final	Initial	Final		Initial	Final	Average									
4-May-10	13:00	5-May-10	13:00	Sunny	2.9213	3.0900	472.22	496.22	24.00	1.43	1.43	1.43	82	188	260	Operation of hydraulic extractor	8162	128			
10-May-10	14:30	11-May-10	14:30	Rainy	2.9470	3.0865	499.22	523.22	24.00	1.42	1.42	1.42	68	188	260	Some loading activities	8162	135			
14-May-10	17:00	15-May-10	17:00	Sunny	2.9374	3.1262	526.22	550.22	24.00	1.39	1.39	1.39	94	188	260	No construction works observation.	8162	142			
24-May-10	12:17	25-May-10	12:17	Sunny	2.9109	3.0731	570.22	594.22	24.00	-	-	-	HVS failure	188	260	No construction works observation.	8162	149			
26-May-10	19:50	27-May-10	19:50	Cloudy	2.8081	2.9222	597.99	621.99	24.00	1.42	1.42	1.42	56	188	260	No construction works observation.	8162	156			
													56								
													94								
													75								



## Annex F4 24-hour and 1-hour TSP Monitoring Results

### 1-hour TSP Monitoring Results

#### Station AM5

Date	Start Time	Finish Time	Weather	TSP Concentration ( $\mu\text{g}/\text{m}^3$ )	Action Level ( $\mu\text{g}/\text{m}^3$ )	Limit Level ( $\mu\text{g}/\text{m}^3$ )	Site Conditions / Observations / Remarks	Temperature ( $^{\circ}\text{C}$ )	Wind Speed * (m/s)	Sampler ID	Filter ID
4-May-10	9:10	10:10	Cloudy	116	332	500	Loading activities	24	<5	8162	125
4-May-10	17:25	18:25	Cloudy	142	332	500	Loading activities	24.1	<5	8162	126
4-May-10	18:30	19:30	Cloudy	146	332	500	Loading activities	24.1	<5	8162	127
10-May-10	8:00	9:00	Rainy	330	332	500	No construction activities observed.	23.9	<5	8162	131
10-May-10	11:15	12:15	Rainy	50	332	500	No construction activities observed.	23.9	<5	8162	133
10-May-10	13:20	14:20	Rainy	87	332	500	No construction activities observed.	23.9	<5	8162	134
14-May-10	8:00	9:00	Rainy	75	332	500	Operation of hydraulic extractor	24.5	<5	8162	139
14-May-10	14:45	15:45	Rainy	163	332	500	Operation of hydraulic extractor	24.5	<5	8162	140
14-May-10	15:55	16:55	Rainy	180	332	500	Operation of hydraulic extractor	24.5	<5	8162	141
20-May-10	9:07	10:07	Cloudy	90	332	500	Loading activities	25.9	<5	8162	146
20-May-10	10:10	11:10	Cloudy	38	332	500	Loading activities	25.9	<5	8162	147
20-May-10	11:15	12:15	Cloudy	<i>HVS failure</i>	332	500	Loading activities	25.9	<5	8162	148
26-May-10	16:30	17:30	Rainy	107	332	500	Operation of mobile crane, hydraulic excavator and bentonite filtering plant	26.6	<5	8162	153
26-May-10	17:40	18:40	Rainy	199	332	500	Operation of mobile crane, hydraulic excavator and bentonite filtering plant	26.6	<5	8162	154
26-May-10	18:45	19:45	Rainy	113	332	500	Operation of mobile crane, hydraulic excavator and bentonite filtering plant	26.6	<5	8162	155
				<b>Min.</b>							
				<b>Max.</b>							
				<b>Average</b>							

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

Meteorological Data Extracted from the Hong Kong Observatory

King's Park Station						
Date	Weather	Average Air Temperature (°C) *	Average Relative Humidity (%) *	Total Rainfall (mm) *	Average Wind Speed (km/h)	Wind Direction
1/3/10	Sunny	22.0	89-97	0.0	0-18	E
2/3/10	Sunny	24.0	80-94	0.0	0-14	SW
5/3/10	Rainy	26.0	75-89	Trace	0-22	S
6/3/10	Rainy	26.0	78-90	Trace	0-16	SW
8/3/10	Rainy	15.0	91-98	0.5	0-22	SE
11/3/10	Rainy	16.0	51-80	0.0	0-17	SE
12/3/10	Rainy	17.0	77-95	0.4	0-13	SE
13/3/10	Rainy	18.0	90-96	Trace	0-19	SE
17/3/10	Sunny	18.0	69-84	0.0	0-23	E
18/3/10	Sunny	21.0	68-87	0.0	0-19	SE
23/3/10	Sunny	23.0	78-94	0.0	0-15	SE
24/3/10	Rainy	25.0	70-96	Trace	0-18	E
25/3/10	Rainy	17.0	53-96	8.9	0-23	N
29/3/10	Sunny	18.0	51-80	0.0	2-30	E
30/3/10	Rainy	19.0	76-87	Trace	5-22	E
31/3/10	Rainy	22.0	75-93	Trace	0-21	E

Tsing Yi Station						
Date	Weather	Average Air Temperature (°C) *	Average Relative Humidity (%) *	Total Rainfall (mm) *	Average Wind Speed (km/h)	Wind Direction
1/3/10	Sunny	22.0	89-97	0.0	1-15	SE
2/3/10	Sunny	24.0	80-94	0.0	2-21	SE
5/3/10	Rainy	26.0	75-89	Trace	2-30	SE
6/3/10	Rainy	26.0	78-90	Trace	0-26	SE
8/3/10	Rainy	15.0	91-98	0.5	1-16	NE
11/3/10	Rainy	16.0	51-80	0.0	1-15	SE
12/3/10	Rainy	17.0	77-95	0.4	0-8	SE
13/3/10	Rainy	18.0	90-96	Trace	0-24	E
17/3/10	Sunny	18.0	69-84	0.0	2-23	SE
18/3/10	Sunny	21.0	68-87	0.0	0-8	SW
23/3/10	Sunny	23.0	78-94	0.0	0-19	SE
24/3/10	Rainy	25.0	70-96	Trace	0-21	SE
25/3/10	Rainy	17.0	53-96	8.9	6-30	NW
29/3/10	Sunny	18.0	51-80	0.0	6-20	E
30/3/10	Rainy	19.0	76-87	Trace	6-18	E
31/3/10	Rainy	22.0	75-93	Trace	3-21	E

Kai Tak Station						
Date	Weather	Average Air Temperature (°C) *	Average Relative Humidity (%) *	Total Rainfall (mm) *	Average Wind Speed (km/h)	Wind Direction
1/3/10	Sunny	22.0	89-97	0.0	8-18	SE
2/3/10	Sunny	24.0	80-94	0.0	0-16	SE
5/3/10	Rainy	26.0	75-89	Trace	6-24	SE
6/3/10	Rainy	26.0	78-90	Trace	1-15	SE
8/3/10	Rainy	15.0	91-98	0.5	2-18	SE
11/3/10	Rainy	16.0	51-80	0.0	0-23	SE
12/3/10	Rainy	17.0	77-95	0.4	4-18	SE
13/3/10	Rainy	18.0	90-96	Trace	6-21	SE
17/3/10	Sunny	18.0	69-84	0.0	0-25	E
18/3/10	Sunny	21.0	68-87	0.0	0-12	SE
23/3/10	Sunny	23.0	78-94	0.0	4-19	SE
24/3/10	Rainy	25.0	70-96	Trace	6-22	SE
25/3/10	Rainy	17.0	53-96	8.9	3-27	NW
29/3/10	Sunny	18.0	51-80	0.0	8-34	E
30/3/10	Rainy	19.0	76-87	Trace	10-34	E
31/3/10	Rainy	22.0	75-93	Trace	0-24	E

Green Island Station						
Date	Weather	Average Air Temperature (°C) *	Average Relative Humidity (%) *	Total Rainfall (mm) *	Average Wind Speed (km/h)	Wind Direction
1/3/10	Sunny	22.0	89-97	0.0	2-35	NE
2/3/10	Sunny	24.0	80-94	0.0	2-38	S
5/3/10	Rainy	26.0	75-89	Trace	24-51	S
6/3/10	Rainy	26.0	78-90	Trace	20-40	SE
8/3/10	Rainy	15.0	91-98	0.5	20-50	NE
11/3/10	Rainy	16.0	51-80	0.0	3-27	NE
12/3/10	Rainy	17.0	77-95	0.4	11-30	NE
13/3/10	Rainy	18.0	90-96	Trace	4-41	NE
17/3/10	Sunny	18.0	69-84	0.0	1-42	NE
18/3/10	Sunny	21.0	68-87	0.0	0-28	NW
23/3/10	Sunny	23.0	78-94	0.0	0-30	NE
24/3/10	Rainy	25.0	70-96	Trace	0-35	NE
25/3/10	Rainy	17.0	53-96	8.9	10-60	NE
29/3/10	Sunny	18.0	51-80	0.0	25-58	NE
30/3/10	Rainy	19.0	76-87	Trace	22-58	NE
31/3/10	Rainy	22.0	75-93	Trace	22-45	NE

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

Meteorological Data Extracted from the Hong Kong Observatory

King's Park Station						
Date	Weather	Average Air Temperature (°C)	Average Relative Humidity (%)	Total Rainfall (mm)	Average Wind Speed (km/h)	Wind Direction
1/4/2010	Rainy	23.7	77-95	TRACE	0-18	E
7/4/2010	Rainy	20.0	80-96	1.8	6-30	E
12/4/2010	Sunny	26.4	79-94	0.0	0-16	SE
13/4/2010	Rainy	25.0	77-98	0.9	0-25	E
16/4/2010	Rainy	16.3	80-90	TRACE	0-17	E
19/4/2010	Rainy	22.9	78-96	TRACE	5-20	SE
22/4/2010	Rainy	25.0	77-95	6.8	0-27	SW
23/4/2010	Sunny	21.0	59-78	0.0	0-21	NE
24/4/2010	Rainy	22.2	45-81	TRACE	6-29	E
28/4/2010	Rainy	23.5	70-89	TRACE	0-10	E
29/4/2010	Rainy	21.0	80-99	40.6	0-27	W
30/4/2010	Rainy	22.1	66-97	0.6	2-28	E

Tsing Yi Station						
Date	Weather	Average Air Temperature (°C)	Average Relative Humidity (%)	Total Rainfall (mm)	Average Wind Speed (km/h)	Wind Direction
1/4/2010	Rainy	23.7	77-95	TRACE	0-20	E
7/4/2010	Rainy	20.0	80-96	1.8	1-28	E
12/4/2010	Sunny	26.4	79-94	0.0	0-20	SE
13/4/2010	Rainy	25.0	77-98	0.9	0-30	SE
16/4/2010	Rainy	16.3	80-90	TRACE	1-14	NW
19/4/2010	Rainy	22.9	78-96	TRACE	2-15	E
22/4/2010	Rainy	25.0	77-95	6.8	0-30	SE
23/4/2010	Sunny	21.0	59-78	0.0	3-34	NW
24/4/2010	Rainy	22.2	45-81	TRACE	1-24	E
28/4/2010	Rainy	23.5	70-89	TRACE	0-12	E
29/4/2010	Rainy	21.0	80-99	40.6	0-24	E
30/4/2010	Rainy	22.1	66-97	0.6	3-21	SE

Kai Tak Station						
Date	Weather	Average Air Temperature (°C)	Average Relative Humidity (%)	Total Rainfall (mm)	Average Wind Speed (km/h)	Wind Direction
1/4/2010	Rainy	23.7	77-95	TRACE	2-21	SE
7/4/2010	Rainy	20.0	80-96	1.8	9-31	SE
12/4/2010	Sunny	26.4	79-94	0.0	1-14	SE
13/4/2010	Rainy	25.0	77-98	0.9	5-33	SE
16/4/2010	Rainy	16.3	80-90	TRACE	1-18	E
19/4/2010	Rainy	22.9	78-96	TRACE	9-20	SE
22/4/2010	Rainy	25.0	77-95	6.8	1-36	SW
23/4/2010	Sunny	21.0	59-78	0.0	3-21	SE
24/4/2010	Rainy	22.2	45-81	TRACE	5-31	E
28/4/2010	Rainy	23.5	70-89	TRACE	1-17	SE
29/4/2010	Rainy	21.0	80-99	40.6	0-35	E
30/4/2010	Rainy	22.1	66-97	0.6	5-30	E

Green Island Station						
Date	Weather	Average Air Temperature (°C)	Average Relative Humidity (%)	Total Rainfall (mm)	Average Wind Speed (km/h)	Wind Direction
1/4/2010	Rainy	23.7	77-95	TRACE	1-30	NE
7/4/2010	Rainy	20.0	80-96	1.8	1-80	NE
12/4/2010	Sunny	26.4	79-94	0.0	13-35	S
13/4/2010	Rainy	25.0	77-98	0.9	3-75	S, NE
16/4/2010	Rainy	16.3	80-90	TRACE	8-37	NE
19/4/2010	Rainy	22.9	78-96	TRACE	2-32	NE
22/4/2010	Rainy	25.0	77-95	6.8	1-47	S
23/4/2010	Sunny	21.0	59-78	0.0	4-43	NW
24/4/2010	Rainy	22.2	45-81	TRACE	15-55	NE
28/4/2010	Rainy	23.5	70-89	TRACE	0-20	NE
29/4/2010	Rainy	21.0	80-99	40.6	1-75	NE
30/4/2010	Rainy	22.1	66-97	0.6	3-60	NE

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

Metereological Data Extracted from the Hong Kong Observatory

King's Park Station						
Date	Weather	Average Air Temperature (°C) *	Average Relative Humidity (%) *	Total Rainfall (mm) *	Average Wind Speed (km/h)	Wind Direction
4/5/2010	Rainy	24.9	80-92	Trace	4-22	E
5/5/2010	Rainy	25.7	78-94	Trace	2-16	E
6/5/2010	Rainy	27.4	80-93	0.2	0-19	SW
10/5/2010	Rainy	24.2	86-98	27.6	0-15	SE
11/5/2010	Rainy	24.5	81-96	0.3	8-19	E
12/5/2010	Rainy	24.9	78-93	Trace	8-21	E
14/5/2010	Rainy	24.7	90-96	Trace	5-15	E
17/5/2010	Rainy	25.7	82-95	Trace	9-16	E
18/5/2010	Rainy	27.0	76-96	Trace	0-14	E
20/5/2010	Rainy	26.0	69-99	6.1	0-15	SE
22/5/2010	Rainy	28.5	79-88	Trace	3-29	SW
24/5/2010	Sunny	26.0	44-84	0.0	0-17	NE
26/5/2010	Sunny	27.0	67-83	0.0	2-22	E
28/5/2010	Sunny	28.0	75-90	0.0	2-21	E
29/5/2010	Rainy	26.0	77-98	22.6	0-25	E

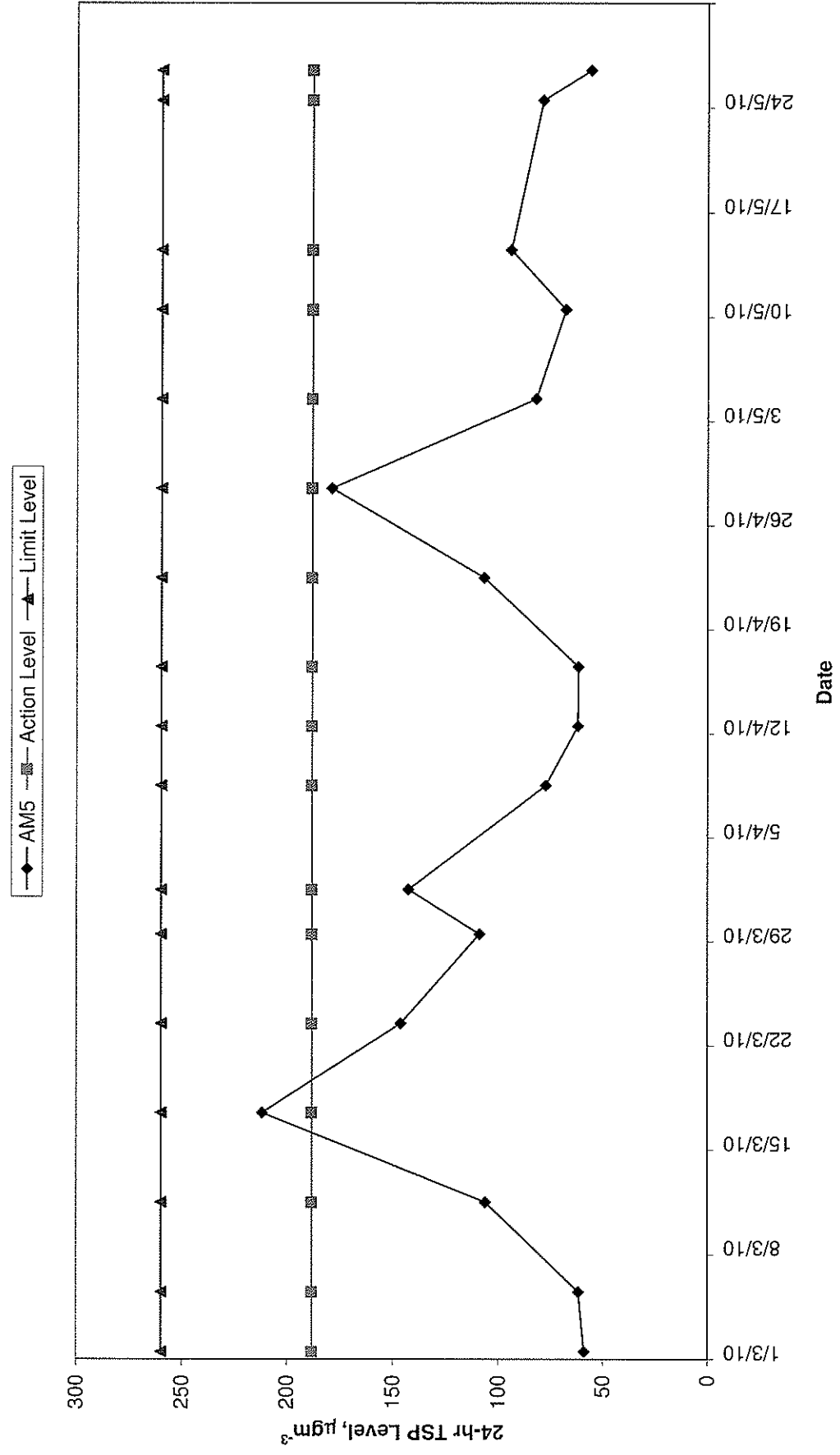
Kai Tak Station						
Date	Weather	Average Air Temperature (°C) *	Average Relative Humidity (%) *	Total Rainfall (mm) *	Average Wind Speed (km/h)	Wind Direction
4/5/2010	Rainy	24.9	80-92	Trace	3-23	E
5/5/2010	Rainy	25.7	78-94	Trace	3-15	SE
6/5/2010	Rainy	27.4	80-93	0.2	0-15	SE
10/5/2010	Rainy	24.2	86-98	27.6	0-24	SE
11/5/2010	Rainy	24.5	81-96	0.3	9-24	E
12/5/2010	Rainy	24.9	78-93	Trace	9-25	E
14/5/2010	Rainy	24.7	90-96	Trace	5-19	E
17/5/2010	Rainy	25.7	82-95	Trace	8-22	E
18/5/2010	Rainy	27.0	76-96	Trace	0-14	SE
20/5/2010	Rainy	26.0	69-99	6.1	0-21	SE
22/5/2010	Rainy	28.5	79-88	Trace	5-25	S
24/5/2010	Sunny	26.0	44-84	0.0	0-24	NE
26/5/2010	Sunny	27.0	67-83	0.0	5-30	E
28/5/2010	Sunny	28.0	75-90	0.0	7-22	SE
29/5/2010	Rainy	26.0	77-98	22.6	2-41	SE

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

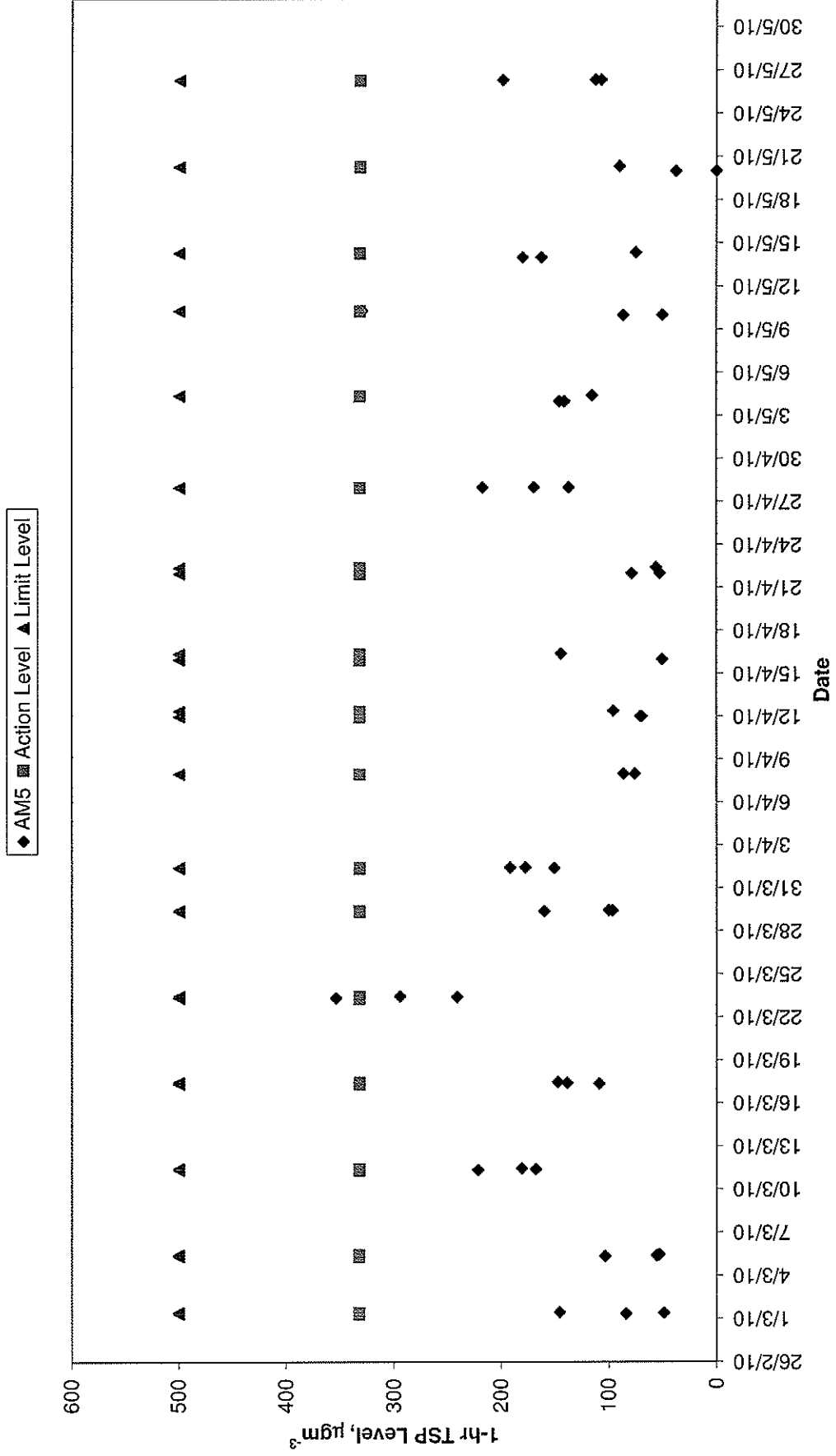
Tsing Yi Station						
Date	Weather	Average Air Temperature (°C) *	Average Relative Humidity (%) *	Total Rainfall (mm) *	Average Wind Speed (km/h)	Wind Direction
4/5/2010	Rainy	24.9	80-92	Trace	3-20	E
5/5/2010	Rainy	25.7	78-94	Trace	6-22	E
6/5/2010	Rainy	27.4	80-93	0.2	-	-
10/5/2010	Rainy	24.2	86-98	27.6	-	-
11/5/2010	Rainy	24.5	81-96	0.3	-	-
12/5/2010	Rainy	24.9	78-93	Trace	-	-
14/5/2010	Rainy	24.7	90-96	Trace	9-23	E
17/5/2010	Rainy	25.7	82-95	Trace	9-21	E
18/5/2010	Rainy	27.0	76-96	Trace	-	-
20/5/2010	Rainy	26.0	69-99	6.1	-	-
22/5/2010	Rainy	28.5	79-88	Trace	-	-
24/5/2010	Sunny	26.0	44-84	0.0	-	-
26/5/2010	Sunny	27.0	67-83	0.0	-	-
28/5/2010	Sunny	28.0	75-90	0.0	-	-
29/5/2010	Rainy	26.0	77-98	22.6	0-15	S

Green Island Station						
Date	Weather	Average Air Temperature (°C) *	Average Relative Humidity (%) *	Total Rainfall (mm) *	Average Wind Speed (km/h)	Wind Direction
4/5/2010	Rainy	24.9	80-92	Trace	6-40	NE
5/5/2010	Rainy	25.7	78-94	Trace	5-35	NE
6/5/2010	Rainy	27.4	80-93	0.2	0-36	S
10/5/2010	Rainy	24.2	86-98	27.6	4-30	NW
11/5/2010	Rainy	24.5	81-96	0.3	6-42	NE
12/5/2010	Rainy	24.9	78-93	Trace	16-47	NE
14/5/2010	Rainy	24.7	90-96	Trace	13-39	NE
17/5/2010	Rainy	25.7	82-95	Trace	4-43	NE
18/5/2010	Rainy	27.0	76-96	Trace	0-34	S
20/5/2010	Rainy	26.0	69-99	6.1	3-48	S
22/5/2010	Rainy	28.5	79-88	Trace	23-45	S
24/5/2010	Sunny	26.0	44-84	0.0	11-36	NE
26/5/2010	Sunny	27.0	67-83	0.0	5-53	NE
28/5/2010	Sunny	28.0	75-90	0.0	0-36	S
29/5/2010	Rainy	26.0	77-98	22.6	0-38	S

24-hr TSP Level  
 AM5 (AFCD Western Wholesale Food Market)



**1-hr TSP Level**  
**AM5 (AFCD Western Wholesale Food Market)**



## Annex F5 Noise Monitoring Results

### Daytime Noise Monitoring Results

Station NM4

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	Callibrator Model / ID
				Leg	L10	L90							
2-Mar-10	15:05	15:35	Fine	68.8	69.9	67.5	Mobile cranes	Traffic noise	-	24	0.8	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10786708)
8-Mar-10	15:00	15:30	Cloudy	68.8	70.1	67.3	Mobile cranes	Traffic Noise	-	15	0.8	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10786708)
19-Mar-10	15:30	16:00	Sunny	69.2	70.5	67.8	Mobile cranes	Traffic Noise	-	21	1.0	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10786708)
25-Mar-10	14:30	15:00	Sunny	69.2	70.5	67.5	Mobile cranes	Traffic noise	-	17	1.5	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10786708)
31-Mar-10	15:15	15:45	Sunny	69.1	70.5	66.9	Mobile cranes, excavators	Traffic noise	-	22	0.5	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10786708)
				<b>Min.</b>	<b>68.8</b>								
				<b>Max.</b>	<b>69.2</b>								





## Annex F5 Noise Monitoring Results

### Daytime Noise Monitoring Results

Station NM4

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							
7-Apr-10	14:30	15:00	Trace Rain	68.9	70.5	66.9	Mobile cranes, excavator work	Traffic Noise	-	19	1.2	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10786708)
13-Apr-10	10:20	10:50	Fine	68.5	69.9	66.7	Mobile cranes	Traffic Noise	-	26	0.5	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10786708)
19-Apr-10	14:22	14:52	Fine	68.7	69.9	66.4	Mobile cranes, excavator work	Traffic Noise	-	23	0.8	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10786708)
30-Apr-10	8:20	8:50	Sunny	69.2	70.3	67.8	Mobile cranes, excavator work	Traffic Noise	-	22	0.8	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10786708)

Min.	68.5
Max.	69.2

# Annex F5 Noise Monitoring Results

## Restricted Hours Noise Monitoring Results

Station NM4

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-Apr-10	10:04	10:09	Fine	64.4	66.7	61.4	Nil	Occasional ship vessels passby	Average results during 15 min monitoring	18	0.8	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10786708)
	10:09	10:14	Fine	64.5	66.5	62.4							
	10:14	10:19	Fine	65.3	68.2	62.4							
11-Apr-10	10:04	10:19	Fine	64.8	67.2	62.2	Nil	Occasional ship vessels passby	Average results during 15 min monitoring	23	0.8	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10786708)
	10:07	10:12	Fine	65.0	66.8	62.9							
	10:12	10:17	Fine	65.3	67.3	62.5							
18-Apr-10	10:07	10:22	Fine	64.7	66.4	62.5	Nil	Traffic noise	Average results during 15 min monitoring	20	0.5	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10786708)
	10:10	10:15	Fine	64.3	65.8	62.3							
	10:15	10:20	Fine	64.2	65.7	62.0							
25-Apr-10	10:20	10:25	Fine	65.0	66.7	62.9	Nil	Traffic noise	Average results during 15 min monitoring	21	0.5	RION- NL31 (S/N 0041224)	RION - NC73 (S/N 10786708)
	10:10	10:25	Fine	64.5	66.1	62.4							
	9:54	9:59	Fine	65.2	66.7	63.2							
25-Apr-10	9:59	10:04	Fine	64.5	66.0	62.6	Nil	Traffic noise	Average results during 15 min monitoring	21	0.5	RION- NL31 (S/N 0041224)	RION - NC73 (S/N 10786708)
	10:04	10:09	Fine	66.7	68.9	64.1							
	9:54	10:09	Fine	65.6	67.4	63.3							
				<b>Min.</b>	<b>64.2</b>								
				<b>Max.</b>	<b>66.7</b>								

## Annex F5 Noise Monitoring Results

### Daytime Noise Monitoring Results

Station NM4

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	Callibrator Model / ID	
				Leq	L10	L90								
6-May-10	8:20	8:50	Cloudy	69.3	70.6	67.9	Mobile cranes, excavator work	Traffic Noise, helicopter passby at 10:26	-	27	1.0	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10786708)	
12-May-10	14:25	14:55	Sunny	68.5	70.1	66.7	Mobile cranes, excavator work	Traffic Noise	-	25	1.0	RION- NL31 (S/N 009883400)	RION - NC73 (S/N 10786708)	
18-May-10	8:20	8:50	Fine	69.1	70.4	67.4	Mobile cranes	Traffic Noise	-	28	0.5	RION- NL31 (S/N 009883400)	RION - NC73 (S/N 10786708)	
24-May-10	9:25	9:55	Sunny	68.7	70.4	67.1	Mobile cranes, excavator work	Traffic Noise	-	25	0.5	RION- NL31 (S/N 009883400)	RION - NC73 (S/N 10786708)	
				<b>Min.</b>									68.5	
				<b>Max.</b>									69.3	

Annex F6 Noise Monitoring Results

Restricted Hours Noise Monitoring Results

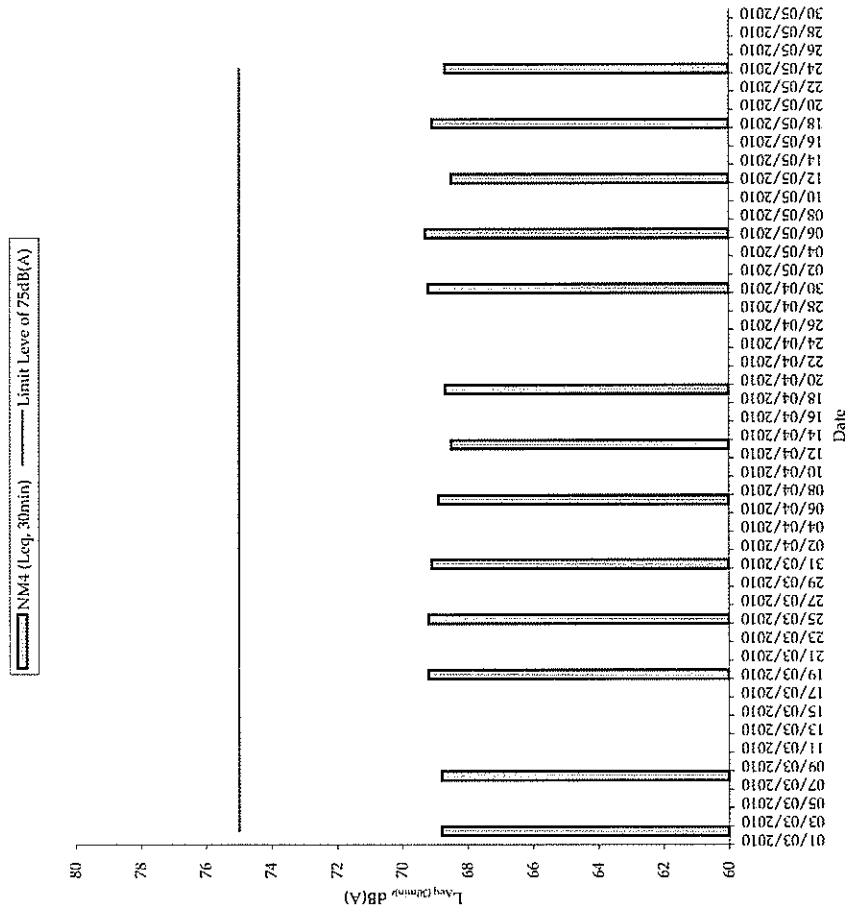
Station N14

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							
2-May-10	10:19	10:24	Sunny	64.2	65.9	63.0	Filling and desanding bentonite in D-wall	Traffic Noise, helicopter passby at 10:26	Average results during 15 min monitoring	26	0.3	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10786708)
	10:24	10:29	Sunny	64.7	65.8	63.2							
	10:29	10:34	Sunny	64.8	66.3	62.9							
9-May-10	10:19	10:34	Sunny	64.6	66.0	63.0	Repair Trench Cutter and Desanding System	Traffic noise	Average results during 15 min monitoring	28	0.5	RION- NL31 (S/N 00983400)	RION - NC73 (S/N 10786708)
	10:06	10:11	Sunny	64.3	65.6	62.8							
	10:11	10:16	Sunny	64.1	65.5	62.6							
	10:16	10:21	Sunny	64.5	65.8	63.0							
	10:06	10:21	Sunny	64.3	65.6	62.8							
14-May-10	19:36	19:41	Fine	69.0	70.5	66.5	Equipment maintenance	Loading activities and concreting	Average results during 15 min monitoring by monitoring by ET of Contract 24	24.5	<5	B&K 2238 S/N : 2684502	B&K 4231 S/N: 2385180
	19:41	19:46	Fine	68.9	70.0	67.5							
	19:46	19:51	Fine	67.5	68.5	66.0							
15-May-10	19:36	19:51	Fine	66.5	69.7	66.7	Equipment maintenance and arrangement	Loading activities	Average results during 15 min monitoring	25	1.5	RION- NA27 (S/N 00201194)	RION - NC73 (S/N 10786708)
	19:10	19:15	Fine	66.5	69.8	66.8							
	19:15	19:20	Fine	66.1	69.7	66.2							
	19:20	19:25	Fine	67.4	68.8	65.9							
	19:10	19:25	Fine	66.0	69.4	66.3							
23-May-10	8:12	8:17	Sunny	64.3	66.5	61.6	Repair Trench Cutter and Desanding System	Traffic noise	Average results during 15 min monitoring	25	0.5	RION- NL31 (S/N 00983400)	RION - NC73 (S/N 10786708)
	8:17	8:22	Sunny	64.4	64.7	60.9							
	8:22	8:27	Sunny	63.8	65.8	60.5							
	8:12	8:27	Sunny	64.2	65.7	61.0							
30-May-10	11:12	11:17	Fine	66.0	67.4	64.4	Trench bentonite slurry monitoring	Traffic noise	Average results during 15 min monitoring	25	0.5	RION- NL31 (S/N 00983400)	RION - NC73 (S/N 10786708)
	11:17	11:22	Fine	65.1	66.7	63.7							
	11:22	11:27	Fine	64.0	66.0	63.1							
	11:12	11:27	Fine	65.3	66.7	63.8							

Min.	63.8
Max.	69.0

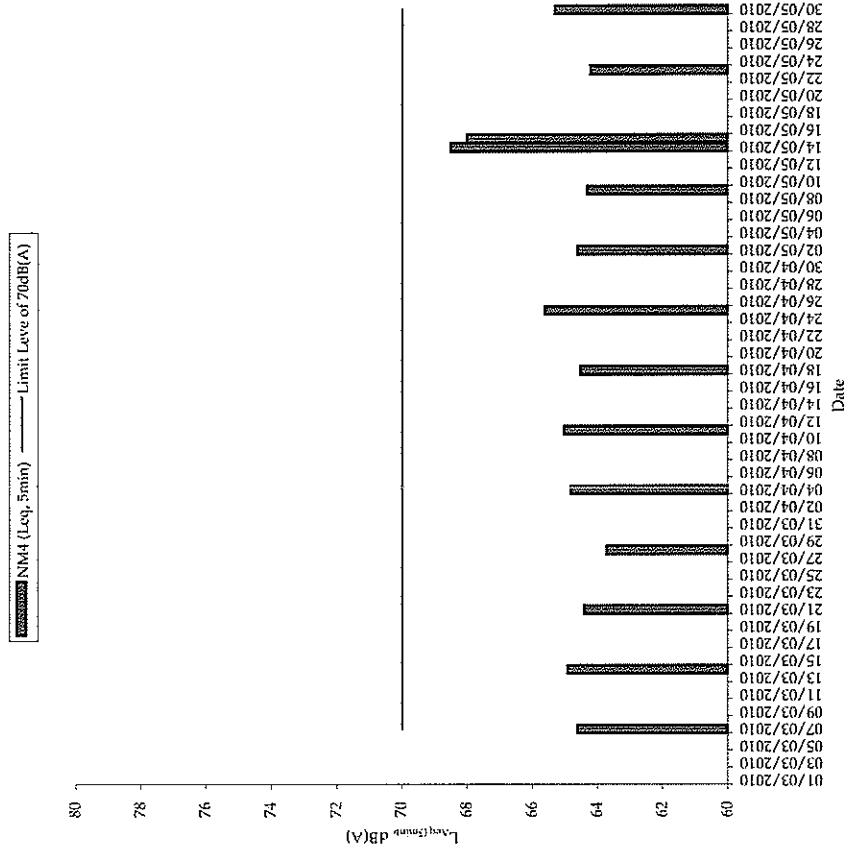
\* Prepared by Contract No. DC/2007/24 Harbour Area Treatment Scheme Stage 2A (HATS 2A) Construction of Sewage Conveyance System from Aberdeen to Sai Ying Pun

Normal Weekdays Noise Monitoring Results at NM4 ( $L_{eq, 30min}$ )



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

Restricted Hours Noise Monitoring Results at NM4 ( $L_{eq, 5min}$ )



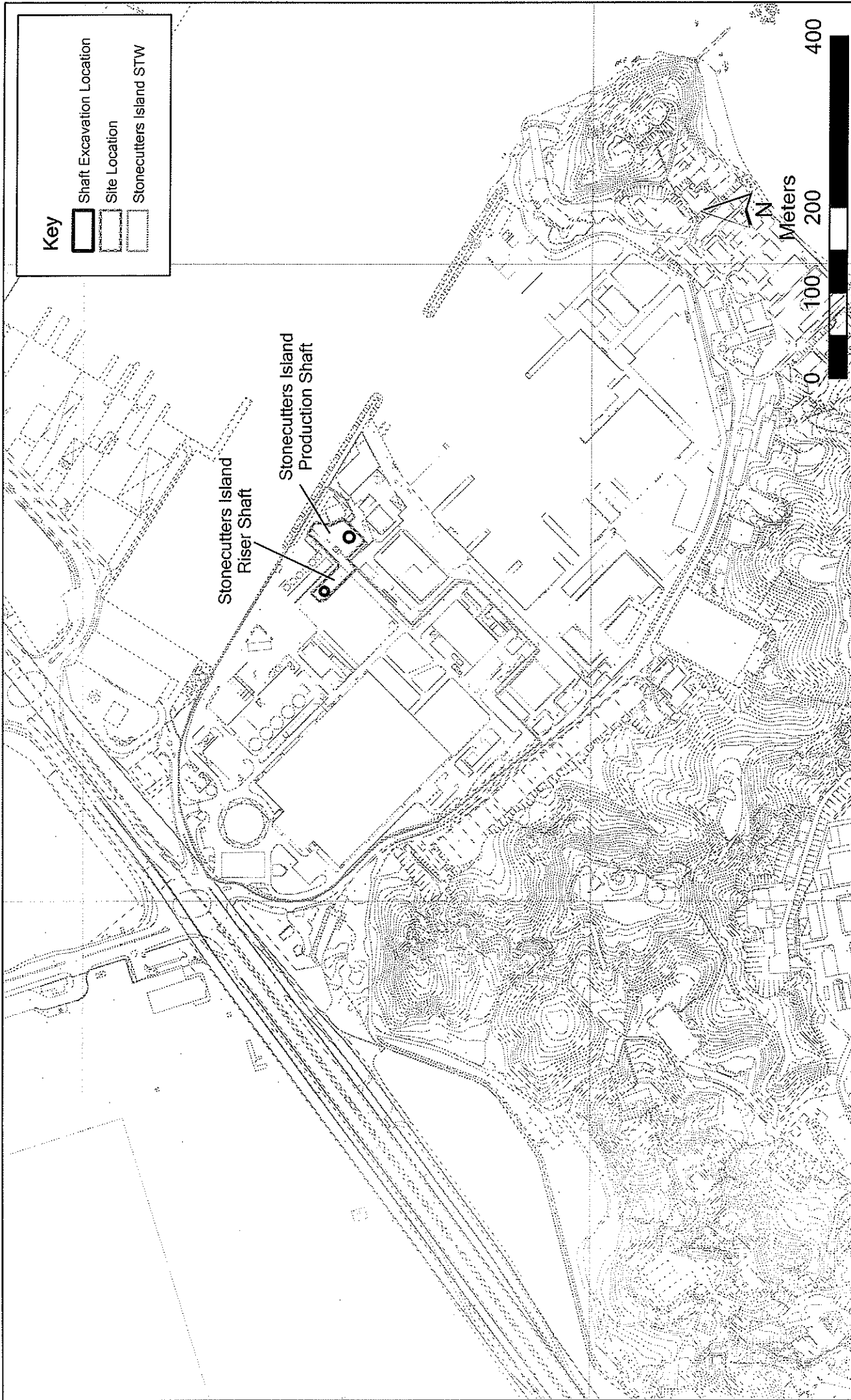
Remark:  
- 70dB(A) was adopted as the Limit Level during restricted hours in the reporting period

*Annex F6 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	1	0
March 2010	0	0
April 2010	1	0
May 2010	2	0
Overall Total	4	0

Annex G

## Stonecutters Island Production and Riser Shafts



**Key**

-  Shaft Excavation Location
-  Site Location
-  Stonecutters Island STW

Stonecutters Island  
Riser Shaft

Stonecutters Island  
Production Shaft

Meters  
0 100 200 400

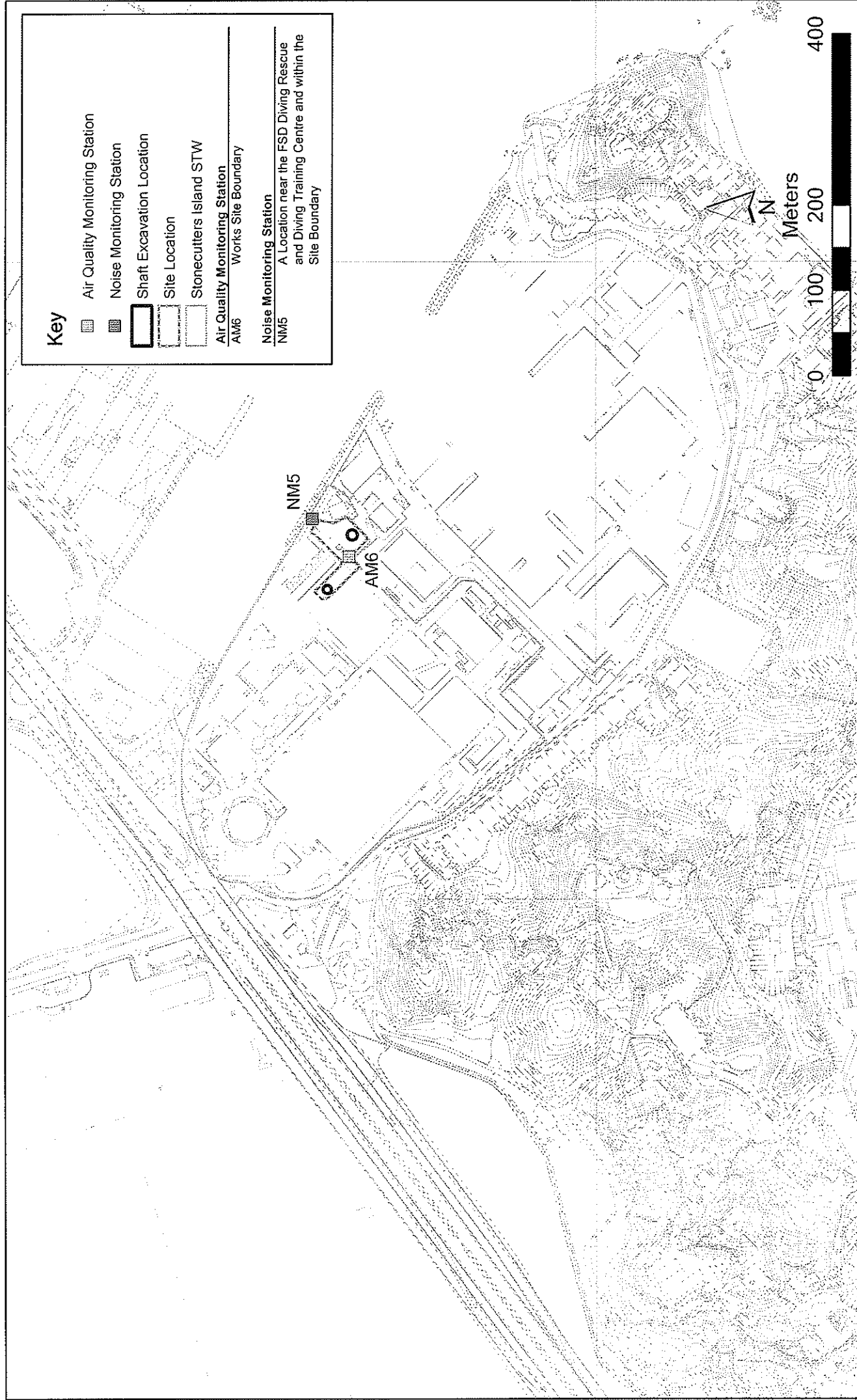
Annex G1

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/  
 0704887\_Stonecutters Island.mxd  
 Date: 03/03/2010







**Key**

- Air Quality Monitoring Station
- Noise Monitoring Station
- Shaft Excavation Location
- Site Location
- Stonecutters Island STW
- Air Quality Monitoring Station AM6 Works Site Boundary
- Noise Monitoring Station NIM5
- A Location near the FSD Diving Rescue and Diving Training Centre and within the Site Boundary

ANNEX G3 - SUMMARY OF MITIGATION MEASURES IMPLEMENTATION SCHEDULE

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
<i>Construction Phase</i>	<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	<p>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.</p>	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	
<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	✓
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	√

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

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Water Quality	Construction Works in Close Proximity of Storm Drains or Seafront	All work sites / during construction	√
<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>			

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	<p>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.</p>	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	Δ

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	Δ
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 PNI 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	Δ
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	<p>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.</p>	All work sites / during the construction period	Δ
Waste	<p>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.</p>	All work sites / during the construction period	✓
<i>Operation Phase</i>			
Waste	<p>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.</p>	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	<p>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.</p>	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	✓
<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 Date	Time	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		Initial	Final	Initial	Final		Initial	Final	Average						
1-Mar-10	16:18	2-Mar-10	16:18	Cloudy	2.8295	2.9975	5952.03	5976.03	24.00	1.10	1.10	1.10	106	196	260	Construction work in progress	1254	5703
5-Mar-10	13:42	6-Mar-10	13:42	Fine	2.8400	2.9987	5979.03	6003.03	24.00	1.10	1.10	1.10	100	196	260	Construction work in progress	1254	5711
11-Mar-10	12:06	12-Mar-10	12:06	Fine	2.8229	2.9971	6006.03	6030.03	24.00	1.10	1.10	1.10	110	196	260	Construction work in progress	1254	5719
17-Mar-10	17:16	18-Mar-10	17:16	Fine	2.8494	2.9975	6033.03	6057.03	24.00	1.10	1.10	1.10	93	196	260	Construction work in progress	1254	5723
23-Mar-10	12:06	24-Mar-10	12:06	Fine	2.8081	2.9601	6060.03	6084.03	24.00	1.10	1.10	1.10	96	196	260	Construction work in progress	1254	5820
29-Mar-10	16:16	30-Mar-10	16:16	Fine	2.8024	2.9871	6087.03	6111.03	24.00	1.12	1.12	1.12	115	196	260	Construction work in progress	1254	5828

Min.	93
Max.	115
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 ( $\mu\text{g}/\text{m}^3$ )	Action Level ( $\mu\text{g}/\text{m}^3$ )	Limit Level ( $\mu\text{g}/\text{m}^3$ )	Site Conditions / Observations / Remarks	Temperature ( $^{\circ}\text{C}$ )	Wind Speed * (m/s)	Sampler ID	Filter ID
1-Mar-10	13:12	14:12	Cloudy	109	346	500	Construction work in progress	23		1254	5566
1-Mar-10	14:14	15:14	Cloudy	103	346	500	Construction work in progress	23		1254	5567
1-Mar-10	15:16	16:16	Cloudy	203	346	500	Construction work in progress	23		1254	5702
5-Mar-10	10:10	11:10	Fine	189	346	500	Construction work in progress	24		1254	5708
5-Mar-10	11:12	12:12	Fine	218	346	500	Construction work in progress	24		1254	5709
5-Mar-10	12:40	13:40	Fine	192	346	500	Construction work in progress	24		1254	5710
11-Mar-10	9:00	10:00	Fine	159	346	500	Construction work in progress	20		1254	5712
11-Mar-10	10:02	11:02	Fine	192	346	500	Construction work in progress	20		1254	5717
11-Mar-10	11:04	12:04	Fine	205	346	500	Construction work in progress	20		1254	5718
17-Mar-10	14:10	15:10	Fine	180	346	500	Construction work in progress	19		1254	5720
17-Mar-10	15:12	16:12	Fine	171	346	500	Construction work in progress	19		1254	5721
17-Mar-10	16:14	17:14	Fine	185	346	500	Construction work in progress	19		1254	5722
23-Mar-10	9:00	10:00	Fine	188	346	500	Construction work in progress	22		1254	5817
23-Mar-10	11:04	12:04	Fine	177	346	500	Construction work in progress	22		1254	5819
23-Mar-10	10:02	11:02	Fine	226	346	500	Construction work in progress	22		1254	5818
29-Mar-10	13:10	14:10	Fine	189	346	500	Construction work in progress	20		1254	2825
29-Mar-10	14:12	15:12	Fine	187	346	500	Construction work in progress	20		1254	5826
29-Mar-10	15:14	16:14	Fine	198	346	500	Construction work in progress	20		1254	5827
				<b>Min.</b>							
				<b>Max.</b>							
				<b>Average</b>							

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



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

### 24-hour TSP Monitoring Results

#### Station AM6

Start Date	Start Time	Finish Date	Finish Time	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		
					Initial	Final	Initial	Final		Initial	Final	Average								
7-Apr-10	13:16	8-Apr-10	13:16	Rainy	2.8271	2.9954	6114.03	6138.03	24.00	1.12	1.12	1.12	164	196	260	Construction work in progress	1254	5957		
13-Apr-10	16:11	14-Apr-10	16:11	Fine	2.8861	3.0512	6141.03	6165.03	24.00	1.12	1.12	1.12	115	196	260	Construction work in progress	1254	5965		
19-Apr-10	16:06	20-Apr-10	16:06	Fine	2.8175	2.9809	6168.03	6192.03	24.00	1.12	1.12	1.12	101	196	260	Construction work in progress	1254	5973		
23-Apr-10	17:08	23-Apr-10	17:08	Fine	2.7998	2.9846	6195.03	6219.03	24.00	1.12	1.12	1.12	115	196	260	Construction work in progress	1254	6103		
29-Apr-10	12:10	30-Apr-10	12:10	Cloudy	2.7856	3.0058	6222.03	6246.03	24.00	1.12	1.12	1.12	137	196	260	Construction work in progress	1254	6111		
													Min.	101						
													Max.	164						
													Average	126						

## 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 ( $\mu\text{g}/\text{m}^3$ )	Action Level ( $\mu\text{g}/\text{m}^3$ )	Limit Level ( $\mu\text{g}/\text{m}^3$ )	Site Conditions / Observations / Remarks	Temperature ( $^{\circ}\text{C}$ )	Wind Speed* (m/s)	Sampler ID	Filter ID
7-Apr-10	10:10	11:10	Rainy	272	346	500	Construction work in progress	18		1254	5829
7-Apr-10	11:12	12:12	Rainy	335	346	500	Construction work in progress	18		1254	5834
7-Apr-10	12:14	13:14	Rainy	312	346	500	Construction work in progress	18		1254	5956
13-Apr-10	13:05	14:05	Fine	289	346	500	Construction work in progress	26		1254	5962
13-Apr-10	14:07	15:07	Fine	304	346	500	Construction work in progress	26		1254	5963
19-Apr-10	15:09	16:09	Fine	283	346	500	Construction work in progress	26		1254	5964
19-Apr-10	13:00	14:00	Fine	158	346	500	Construction work in progress	23		1254	5970
19-Apr-10	14:02	15:02	Fine	266	346	500	Construction work in progress	23		1254	5971
19-Apr-10	15:04	16:04	Fine	280	346	500	Construction work in progress	23		1254	5972
23-Apr-10	14:02	15:02	Fine	311	346	500	Construction work in progress	21		1254	5978
23-Apr-10	15:04	16:04	Fine	254	346	500	Construction work in progress	21		1254	5979
23-Apr-10	16:06	17:06	Fine	193	346	500	Construction work in progress	21		1254	6102
29-Apr-10	9:02	10:02	Cloudy	179	346	500	Construction work in progress	21		1254	6108
29-Apr-10	10:04	11:04	Rainy	192	346	500	Construction work in progress	21		1254	6109
29-Apr-10	11:06	12:06	Rainy	205	346	500	Construction work in progress	21		1254	6110
<b>Min.</b>				<b>158</b>							
<b>Max.</b>				<b>335</b>							
<b>Average</b>				<b>256</b>							

Wind Speed data is presented in the Meteorological Data table

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

### 24-hour TSP Monitoring Results

#### Station AM6

Start Date	Time	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		Initial	Final	Initial	Final		Initial	Final	Average								
5-May-10	12:14	6-May-10	12:14	Fine	2.7959	2.9617	6249.03	6273.03	24.00	1.12	1.12	1.12	103	196	260	Construction work in progress	1254	6115		
11-May-10	16:16	12-May-10	16:16	Fine	2.8009	2.9989	6276.03	6300.03	24.00	1.12	1.12	1.12	123	196	260	Construction work in progress	1254	6123		
17-May-10	12:14	18-May-10	12:14	Sunny	2.8157	2.9977	6303.03	6327.03	24.00	1.12	1.12	1.12	113	196	260	Construction work in progress	1254	6286		
20-May-10	12:08	21-May-10	12:08	Cloudy	2.8112	2.9975	6330.03	6354.03	24.00	1.12	1.12	1.12	116	196	260	Construction work in progress	1254	6296		
26-May-10	11:11	27-May-10	11:11	Sunny	2.8256	3.0049	6357.03	6381.03	24.00	1.13	1.13	1.13	110	196	260	Construction work in progress	1254	6388		
													<b>Min.</b>	<b>103</b>						
													<b>Max.</b>	<b>123</b>						
													<b>Average</b>	<b>113</b>						

## 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 ( $\mu\text{g}/\text{m}^3$ )	Action Level ( $\mu\text{g}/\text{m}^3$ )	Limit Level ( $\mu\text{g}/\text{m}^3$ )	Site Conditions / Observations / Remarks	Temperature ( $^{\circ}\text{C}$ )	Wind Speed * (m/s)	Sampler ID	Filter ID
5-May-10	9:10	10:10	Fine	167	346	500	Construction work in progress	22		1254	6112
5-May-10	10:12	11:12	Fine	196	346	500	Construction work in progress	22		1254	6113
5-May-10	11:12	12:12	Fine	228	346	500	Construction work in progress	22		1254	6114
11-May-10	13:10	14:10	Fine	320	346	500	Construction work in progress	25		1254	6116
11-May-10	14:12	15:12	Fine	290	346	500	Construction work in progress	25		1254	6119
11-May-10	15:14	16:14	Fine	310	346	500	Construction work in progress	25		1254	6122
17-May-10	9:10	10:10	Sunny	284	346	500	Construction work in progress	28		1254	6283
17-May-10	10:12	11:12	Sunny	311	346	500	Construction work in progress	28		1254	6284
17-May-10	11:12	12:12	Sunny	301	346	500	Construction work in progress	28		1254	6285
20-May-10	9:02	10:02	Cloudy	201	346	500	Construction work in progress	28		1254	6293
20-May-10	10:04	11:04	Cloudy	210	346	500	Construction work in progress	28		1254	6294
20-May-10	11:06	12:06	Cloudy	192	346	500	Construction work in progress	28		1254	6295
26-May-10	8:05	9:05	Sunny	235	346	500	Construction work in progress	29		1254	6385
26-May-10	9:07	10:07	Sunny	294	346	500	Construction work in progress	29		1254	6386
26-May-10	10:09	11:09	Sunny	252	346	500	Construction work in progress	29		1254	6387
				<b>Min.</b>	<b>167</b>						
				<b>Max.</b>	<b>320</b>						
				<b>Average</b>	<b>253</b>						

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

Meteorological Data Extracted from the Hong Kong Observatory

King's Park Station						
Date	Weather	Average Air Temperature (°C) *	Average Relative Humidity (%) *	Total Rainfall (mm) *	Average Wind Speed (km/h)	Wind Direction
1/3/10	Sunny	22.0	89-97	0.0	0-18	E
2/3/10	Sunny	24.0	80-94	0.0	0-14	SW
5/3/10	Rainy	26.0	75-89	Trace	0-22	S
6/3/10	Rainy	26.0	78-90	Trace	0-16	SW
8/3/10	Rainy	15.0	91-98	0.5	0-22	SE
11/3/10	Rainy	16.0	51-80	0.0	0-17	SE
12/3/10	Rainy	17.0	77-95	0.4	0-13	SE
13/3/10	Rainy	18.0	90-96	Trace	0-19	SE
17/3/10	Sunny	18.0	69-84	0.0	0-23	E
18/3/10	Sunny	21.0	68-87	0.0	0-19	SE
23/3/10	Sunny	23.0	78-94	0.0	0-15	SE
24/3/10	Rainy	25.0	70-96	Trace	0-18	E
25/3/10	Rainy	17.0	53-96	8.9	0-23	N
29/3/10	Sunny	18.0	51-80	0.0	2-30	E
30/3/10	Rainy	19.0	76-87	Trace	5-22	E
31/3/10	Rainy	22.0	75-93	Trace	0-21	E

Kai Tak Station						
Date	Weather	Average Air Temperature (°C) *	Average Relative Humidity (%) *	Total Rainfall (mm) *	Average Wind Speed (km/h)	Wind Direction
1/3/10	Sunny	22.0	89-97	0.0	8-18	SE
2/3/10	Sunny	24.0	80-94	0.0	0-16	SE
5/3/10	Rainy	26.0	75-89	Trace	6-24	SE
6/3/10	Rainy	26.0	78-90	Trace	1-15	SE
8/3/10	Rainy	15.0	91-98	0.5	2-18	SE
11/3/10	Rainy	16.0	51-80	0.0	0-23	SE
12/3/10	Rainy	17.0	77-95	0.4	4-18	SE
13/3/10	Rainy	18.0	90-96	Trace	6-21	SE
17/3/10	Sunny	18.0	69-84	0.0	0-25	E
18/3/10	Sunny	21.0	68-87	0.0	0-12	SE
23/3/10	Sunny	23.0	78-94	0.0	4-19	SE
24/3/10	Rainy	25.0	70-96	Trace	6-22	SE
25/3/10	Rainy	17.0	53-96	8.9	3-27	NW
29/3/10	Sunny	18.0	51-80	0.0	8-34	E
30/3/10	Rainy	19.0	76-87	Trace	10-34	E
31/3/10	Rainy	22.0	75-93	Trace	0-24	E

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

Tsing Yi Station						
Date	Weather	Average Air Temperature (°C) *	Average Relative Humidity (%) *	Total Rainfall (mm) *	Average Wind Speed (km/h)	Wind Direction
1/3/10	Sunny	22.0	89-97	0.0	1-15	SE
2/3/10	Sunny	24.0	80-94	0.0	2-21	SE
5/3/10	Rainy	26.0	75-89	Trace	2-30	SE
6/3/10	Rainy	26.0	78-90	Trace	0-26	SE
8/3/10	Rainy	15.0	91-98	0.5	1-16	NE
11/3/10	Rainy	16.0	51-80	0.0	1-15	SE
12/3/10	Rainy	17.0	77-95	0.4	0-8	SE
13/3/10	Rainy	18.0	90-96	Trace	0-24	E
17/3/10	Sunny	18.0	69-84	0.0	2-23	SE
18/3/10	Sunny	21.0	68-87	0.0	0-8	SW
23/3/10	Sunny	23.0	78-94	0.0	0-19	SE
24/3/10	Rainy	25.0	70-96	Trace	0-21	SE
25/3/10	Rainy	17.0	53-96	8.9	6-30	NW
29/3/10	Sunny	18.0	51-80	0.0	6-20	E
30/3/10	Rainy	19.0	76-87	Trace	6-18	E
31/3/10	Rainy	22.0	75-93	Trace	3-21	E

Green Island Station						
Date	Weather	Average Air Temperature (°C) *	Average Relative Humidity (%) *	Total Rainfall (mm) *	Average Wind Speed (km/h)	Wind Direction
1/3/10	Sunny	22.0	89-97	0.0	2-35	NE
2/3/10	Sunny	24.0	80-94	0.0	2-38	S
5/3/10	Rainy	26.0	75-89	Trace	24-51	S
6/3/10	Rainy	26.0	78-90	Trace	20-40	SE
8/3/10	Rainy	15.0	91-98	0.5	20-50	NE
11/3/10	Rainy	16.0	51-80	0.0	3-27	NE
12/3/10	Rainy	17.0	77-95	0.4	11-30	NE
13/3/10	Rainy	18.0	90-96	Trace	4-41	NE
17/3/10	Sunny	18.0	69-84	0.0	1-42	NE
18/3/10	Sunny	21.0	68-87	0.0	0-28	NW
23/3/10	Sunny	23.0	78-94	0.0	0-30	NE
24/3/10	Rainy	25.0	70-96	Trace	0-35	NE
25/3/10	Rainy	17.0	53-96	8.9	10-60	NE
29/3/10	Sunny	18.0	51-80	0.0	25-58	NE
30/3/10	Rainy	19.0	76-87	Trace	22-58	NE
31/3/10	Rainy	22.0	75-93	Trace	22-45	NE

Meteorological Data Extracted from the Hong Kong Observatory

King's Park Station						
Date	Weather	Average Air Temperature (°C)	Average Relative Humidity (%)	Total Rainfall (mm)	Average Wind Speed (km/h)	Wind Direction
1/4/2010	Rainy	23.7	77-95	TRACE	0-18	E
7/4/2010	Rainy	20.0	80-96	1.8	6-30	E
12/4/2010	Sunny	26.4	79-94	0.0	0-16	SE
13/4/2010	Rainy	25.0	77-98	0.9	0-25	E
16/4/2010	Rainy	16.3	80-90	TRACE	0-17	E
19/4/2010	Rainy	22.9	78-96	TRACE	5-20	SE
22/4/2010	Rainy	25.0	77-95	6.8	0-27	SW
23/4/2010	Sunny	21.0	59-78	0.0	0-21	NE
24/4/2010	Rainy	22.2	45-81	TRACE	6-29	E
28/4/2010	Rainy	23.5	70-89	TRACE	0-10	E
29/4/2010	Rainy	21.0	80-99	40.6	0-27	W
30/4/2010	Rainy	22.1	66-97	0.6	2-28	E

Tsing Yi Station						
Date	Weather	Average Air Temperature (°C)	Average Relative Humidity (%)	Total Rainfall (mm)	Average Wind Speed (km/h)	Wind Direction
1/4/2010	Rainy	23.7	77-95	TRACE	0-20	E
7/4/2010	Rainy	20.0	80-96	1.8	1-28	E
12/4/2010	Sunny	26.4	79-94	0.0	0-20	SE
13/4/2010	Rainy	25.0	77-98	0.9	0-30	SE
16/4/2010	Rainy	16.3	80-90	TRACE	1-14	NW
19/4/2010	Rainy	22.9	78-96	TRACE	2-15	E
22/4/2010	Rainy	25.0	77-95	6.8	0-30	SE
23/4/2010	Sunny	21.0	59-78	0.0	3-34	NW
24/4/2010	Rainy	22.2	45-81	TRACE	1-24	E
28/4/2010	Rainy	23.5	70-89	TRACE	0-12	E
29/4/2010	Rainy	21.0	80-99	40.6	0-24	E
30/4/2010	Rainy	22.1	66-97	0.6	3-21	SE

Kal Tak Station						
Date	Weather	Average Air Temperature (°C)	Average Relative Humidity (%)	Total Rainfall (mm)	Average Wind Speed (km/h)	Wind Direction
1/4/2010	Rainy	23.7	77-95	TRACE	2-21	SE
7/4/2010	Rainy	20.0	80-96	1.8	9-31	SE
12/4/2010	Sunny	26.4	79-94	0.0	1-14	SE
13/4/2010	Rainy	25.0	77-98	0.9	5-33	SE
16/4/2010	Rainy	16.3	80-90	TRACE	1-18	E
19/4/2010	Rainy	22.9	78-96	TRACE	9-20	SE
22/4/2010	Rainy	25.0	77-95	6.8	1-36	SW
23/4/2010	Sunny	21.0	59-78	0.0	3-21	SE
24/4/2010	Rainy	22.2	45-81	TRACE	5-31	E
28/4/2010	Rainy	23.5	70-89	TRACE	1-17	SE
29/4/2010	Rainy	21.0	80-99	40.6	0-35	E
30/4/2010	Rainy	22.1	66-97	0.6	5-30	E

Green Island Station						
Date	Weather	Average Air Temperature (°C)	Average Relative Humidity (%)	Total Rainfall (mm)	Average Wind Speed (km/h)	Wind Direction
1/4/2010	Rainy	23.7	77-95	TRACE	1-30	NE
7/4/2010	Rainy	20.0	80-96	1.8	1-80	NE
12/4/2010	Sunny	26.4	79-94	0.0	13-35	S
13/4/2010	Rainy	25.0	77-98	0.9	3-75	S, NE
16/4/2010	Rainy	16.3	80-90	TRACE	8-37	NE
19/4/2010	Rainy	22.9	78-96	TRACE	2-32	NE
22/4/2010	Rainy	25.0	77-95	6.8	1-47	S
23/4/2010	Sunny	21.0	59-78	0.0	4-43	NW
24/4/2010	Rainy	22.2	45-81	TRACE	15-55	NE
28/4/2010	Rainy	23.5	70-89	TRACE	0-20	NE
29/4/2010	Rainy	21.0	80-99	40.6	1-75	NE
30/4/2010	Rainy	22.1	66-97	0.6	3-60	NE

\* king's park data

- data were not available

# less than 24 hourly observations per day

Metereological Data Extracted from the Hong Kong Observatory

King's Park Station						
Date	Weather	Average Air Temperature (°C) *	Average Relative Humidity (%) *	Total Rainfall (mm) *	Average Wind Speed (km/h)	Wind Direction
4/5/2010	Rainy	24.9	80-92	Trace	4-22	E
5/5/2010	Rainy	25.7	78-94	Trace	2-16	E
6/5/2010	Rainy	27.4	80-93	0.2	0-19	SW
10/5/2010	Rainy	24.2	86-98	27.6	0-15	SE
11/5/2010	Rainy	24.5	81-96	0.3	8-19	E
12/5/2010	Rainy	24.9	78-93	Trace	8-21	E
14/5/2010	Rainy	24.7	90-96	Trace	5-15	E
17/5/2010	Rainy	25.7	82-95	Trace	9-16	E
18/5/2010	Rainy	27.0	76-96	Trace	0-14	E
20/5/2010	Rainy	26.0	69-99	6.1	0-15	SE
22/5/2010	Rainy	28.5	79-88	Trace	3-29	SW
24/5/2010	Sunny	26.0	44-84	0.0	0-17	NE
26/5/2010	Sunny	27.0	67-83	0.0	2-22	E
28/5/2010	Sunny	28.0	75-90	0.0	2-21	E
29/5/2010	Rainy	26.0	77-98	22.6	0-25	E

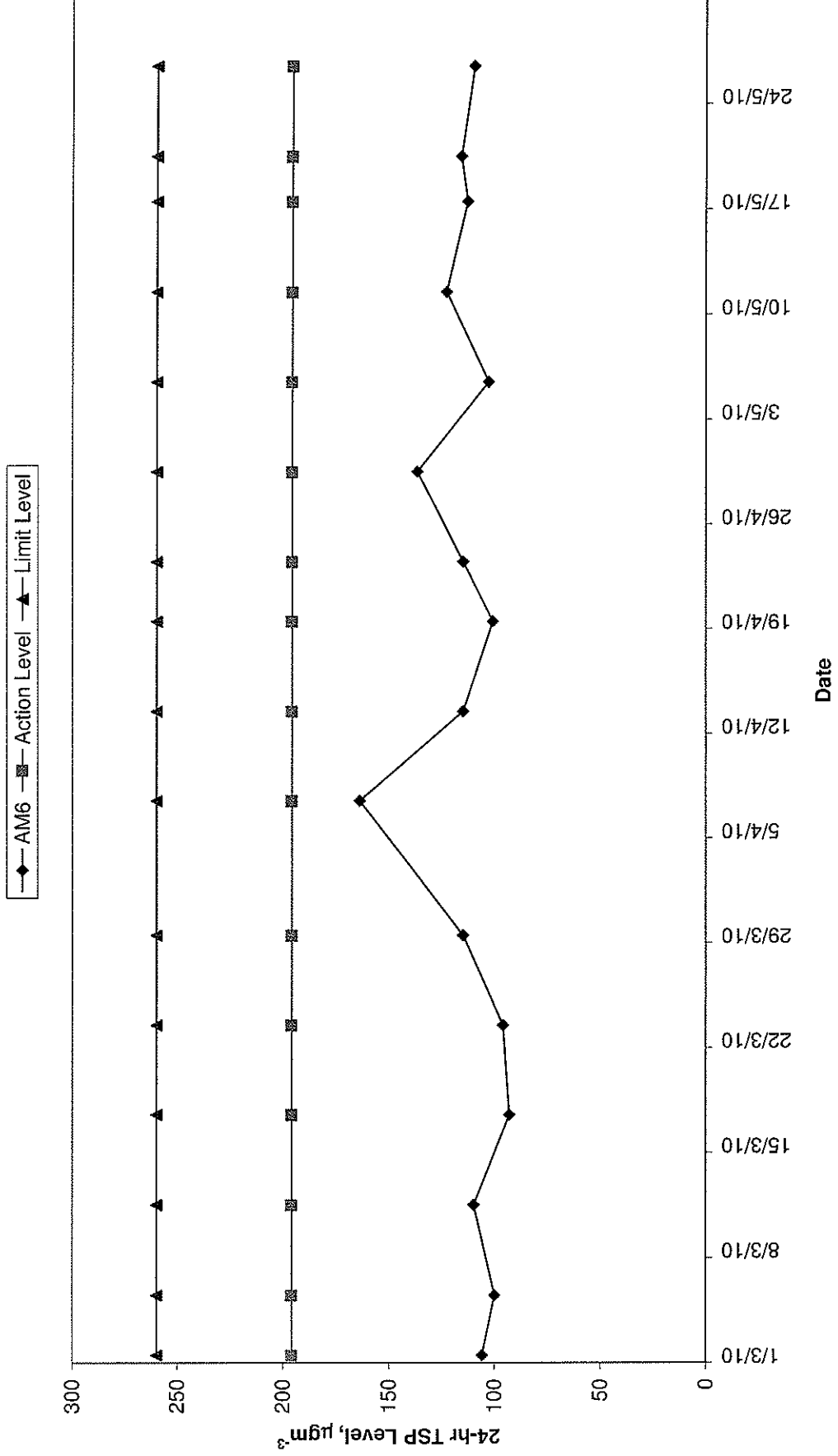
Kai Tak Station						
Date	Weather	Average Air Temperature (°C) *	Average Relative Humidity (%) *	Total Rainfall (mm) *	Average Wind Speed (km/h)	Wind Direction
4/5/2010	Rainy	24.9	80-92	Trace	3-23	E
5/5/2010	Rainy	25.7	78-94	Trace	3-15	SE
6/5/2010	Rainy	27.4	80-93	0.2	0-15	SE
10/5/2010	Rainy	24.2	86-98	27.6	0-24	SE
11/5/2010	Rainy	24.5	81-96	0.3	9-24	E
12/5/2010	Rainy	24.9	78-93	Trace	9-25	E
14/5/2010	Rainy	24.7	90-96	Trace	5-19	E
17/5/2010	Rainy	25.7	82-95	Trace	8-22	E
18/5/2010	Rainy	27.0	76-96	Trace	0-14	SE
20/5/2010	Rainy	26.0	69-99	6.1	0-21	SE
22/5/2010	Rainy	28.5	79-88	Trace	5-25	S
24/5/2010	Sunny	26.0	44-84	0.0	0-24	NE
26/5/2010	Sunny	27.0	67-83	0.0	5-30	E
28/5/2010	Sunny	28.0	75-90	0.0	7-22	SE
29/5/2010	Rainy	26.0	77-98	22.6	2-41	SE

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

Tsing Yi Station						
Date	Weather	Average Air Temperature (°C) *	Average Relative Humidity (%) *	Total Rainfall (mm) *	Average Wind Speed (km/h)	Wind Direction
4/5/2010	Rainy	24.9	80-92	Trace	3-20	E
5/5/2010	Rainy	25.7	78-94	Trace	6-22	E
6/5/2010	Rainy	27.4	80-93	0.2	-	-
10/5/2010	Rainy	24.2	86-98	27.6	-	-
11/5/2010	Rainy	24.5	81-96	0.3	-	-
12/5/2010	Rainy	24.9	78-93	Trace	-	-
14/5/2010	Rainy	24.7	90-96	Trace	9-23	E
17/5/2010	Rainy	25.7	82-95	Trace	9-21	E
18/5/2010	Rainy	27.0	76-96	Trace	-	-
20/5/2010	Rainy	26.0	69-99	6.1	-	-
22/5/2010	Rainy	28.5	79-88	Trace	-	-
24/5/2010	Sunny	26.0	44-84	0.0	-	-
26/5/2010	Sunny	27.0	67-83	0.0	-	-
28/5/2010	Sunny	28.0	75-90	0.0	-	-
29/5/2010	Rainy	26.0	77-98	22.6	0-15	S

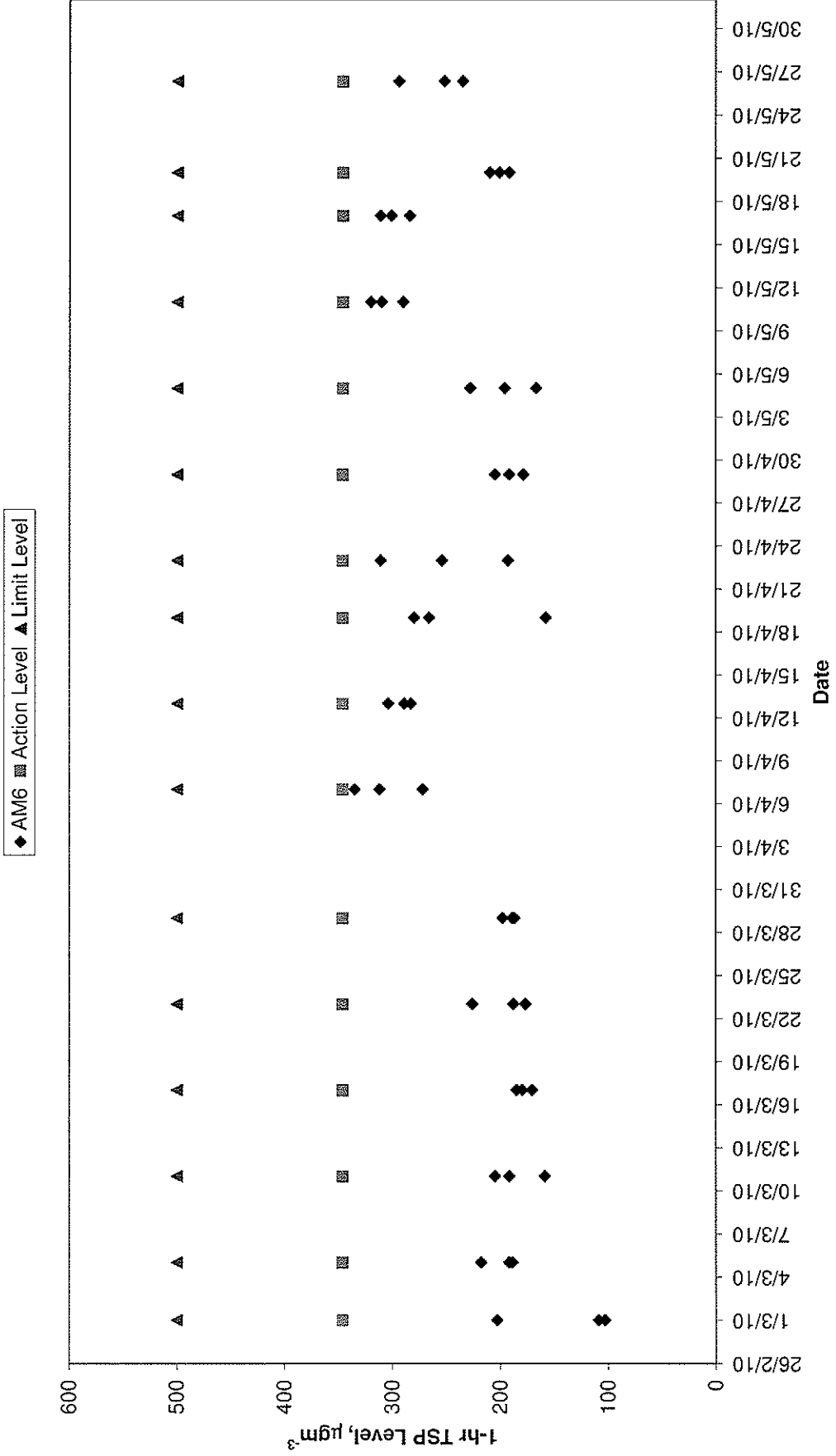
Green Island Station						
Date	Weather	Average Air Temperature (°C) *	Average Relative Humidity (%) *	Total Rainfall (mm) *	Average Wind Speed (km/h)	Wind Direction
4/5/2010	Rainy	24.9	80-92	Trace	6-40	NE
5/5/2010	Rainy	25.7	78-94	Trace	5-35	NE
6/5/2010	Rainy	27.4	80-93	0.2	0-36	S
10/5/2010	Rainy	24.2	86-98	27.6	4-30	NW
11/5/2010	Rainy	24.5	81-96	0.3	6-42	NE
12/5/2010	Rainy	24.9	78-93	Trace	16-47	NE
14/5/2010	Rainy	24.7	90-96	Trace	13-39	NE
17/5/2010	Rainy	25.7	82-95	Trace	4-43	NE
18/5/2010	Rainy	27.0	76-96	Trace	0-34	S
20/5/2010	Rainy	26.0	69-99	6.1	3-48	S
22/5/2010	Rainy	28.5	79-88	Trace	23-45	S
24/5/2010	Sunny	26.0	44-84	0.0	11-36	NE
26/5/2010	Sunny	27.0	67-83	0.0	5-53	NE
28/5/2010	Sunny	28.0	75-90	0.0	0-36	S
29/5/2010	Rainy	26.0	77-98	22.6	0-38	S

# 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
				Leg	L10	L90							
1-Mar-10	14:20	14:50	Cloudy	68.9	69.6	67.9	Mobile cranes movement, generator and excavator	Traffic Noise	-	22	0.8	RION-NA27 (S/N 00201194)	RION-NC73 (S/N 10786708)
11-Mar-10	9:20	9:50	Fine	66.3	67.0	65.5	Mobile cranes movement, generator and desander	Traffic Noise	-	20	0.5	RION-NA27 (S/N 00201194)	RION-NC73 (S/N 10786708)
17-Mar-10	16:05	16:35	Fine	63.8	65.0	62.5	Mobile cranes movement, generator, excavator	Traffic Noise	-	19	0.3	RION-NA27 (S/N 00201194)	RION-NC73 (S/N 10786708)
23-Mar-10	11:10	11:40	Fine	65.2	65.8	64.4	Mobile cranes movement, generator, dump truck	Traffic Noise, Aircraft Noise	-	23	0.5	RION-NA27 (S/N 00201194)	RION-NC73 (S/N 10786708)
29-Mar-10	14:20	14:50	Fine	70.3	70.9	69.6	Mobile cranes movement, generator	Traffic Noise, Aircraft Noise	-	23	0.5	RION-NA27 (S/N 00201194)	RION-NC73 (S/N 10786708)
				<b>Min.</b>	<b>63.8</b>								
				<b>Max.</b>	<b>70.3</b>								



# Annex G5 Noise Monitoring Results

## Daytime Noise Monitoring Results

Station NM5

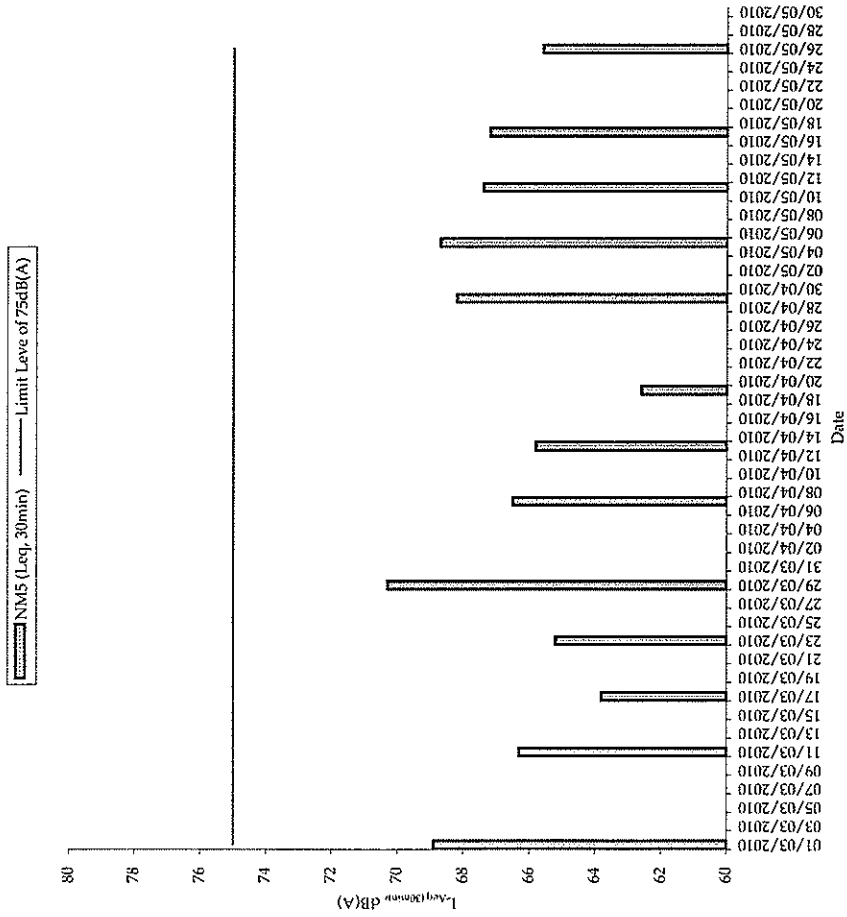
Date	Start Time	End Time	Weather	Noise level (dB(A), 30 min)			Major Construction Noise Source(s) Observed	Other Noise Source(s) Observed	Remarks	Temp. (°C)	Wind Speed (m/s)	Noise Meter Model / ID	Calibrator Model / ID
				Leq	L10	L90							
7-Apr-10	11:00	11:30	Rainy	66.5	67.1	65.8	Mobile cranes movement, generator	Traffic Noise	-	19	1.5	RION-NA27 (S/N 00201194)	RION-NC73 (S/N 10786708)
13-Apr-10	13:10	13:40	Fine	65.8	66.4	65.1	Mobile cranes movement, generator	Traffic Noise, Aircraft Noise	-	26	0.8	RION-NA27 (S/N 00201194)	RION-NC73 (S/N 10786708)
19-Apr-10	13:05	13:35	Fine	62.6	63.9	61.1	Mobile cranes movement, generator, excavator	Traffic Noise	-	23	0.7	RION-NA27 (S/N 00201194)	RION-NC73 (S/N 10786708)
29-Apr-10	11:07	11:37	Cloudy	68.2	69.2	67.4	Mobile cranes movement, generator, excavator	Traffic Noise	-	21	0.5	RION-NA27 (S/N 00201194)	RION-NC73 (S/N 10786708)
				<b>Min.</b>	<b>62.6</b>								
				<b>Max.</b>	<b>68.2</b>								





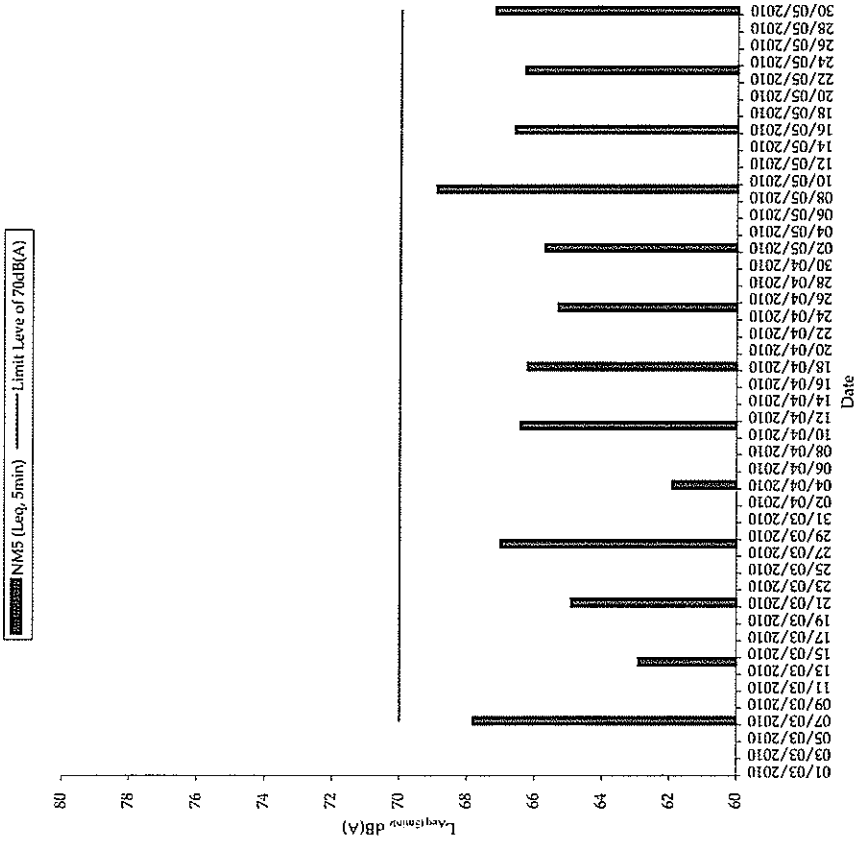


Normal Weekdays Noise Monitoring Results at NIM5 ( $L_{eq, 30min}$ )



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

Restricted Hours Noise Monitoring Results at NIM5 ( $L_{eq, 5min}$ )



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
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		
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) 25 March 2010	25 May 2010
AM2	Rooftop of Hong Kong & Islands Regional Office, WSD	GMW GS-2310 (S/N 0145)	CM-AIR-43 (S/N 9833620) 25 March 2010	25 May 2010
AM3	Rooftop of Wan Chai East PTW	GMW GS-2310 (S/N 0481)	CM-AIR-43 (S/N 9833620) 25 March 2010	25 May 2010
AM4	A Location within the DSD Central PTW	GMW GS-2310 (S/N 9315)	CM-AIR-43 (S/N 9833620) 25 March 2010	25 May 2010
AM5	Western Wholesale Food Market	GMW GS-2310 (S/N 8162)	CM-AIR-43 (S/N 9833620) 1 April 2010	1 June 2010
AM6	Works Site Boundary	GMW GS-2310 (S/N 1254)	CM-AIR-43 (S/N 9833620) 25 March 2010	25 May 2010

### TSP Monitoring Equipment

Monitoring Station ID	Location	Monitoring Equipment	Last Calibration Date	Next Calibration Date
<i>24-hr and 1-hr TSP</i>				
AM1	Chan's Creative School (formerly known as Madam Chan Wai Chow Memorial School)	HVS GMW GS-2310 (S/N 1808)	CM-AIR-43 (S/N 9833620) 25 May 2010	25 July 2010
AM2	Rooftop of Hong Kong & Islands Regional Office, WSD	GMW GS-2310 (S/N 0145)	CM-AIR-43 (S/N 9833620) 25 May 2010	25 July 2010
AM3	Rooftop of Wan Chai East PTW	GMW GS-2310 (S/N 0481)	CM-AIR-43 (S/N 9833620) 25 May 2010	25 July 2010
AM4	A Location within the DSD Central PTW	GMW GS-2310 (S/N 9315)	CM-AIR-43 (S/N 9833620) 25 May 2010	25 July 2010
AM5	Western Wholesale Food Market	GMW GS-2310 (S/N 8162)	CM-AIR-43 (S/N 9833620) 1 April 2010	1 June 2010
AM6	Works Site Boundary	GMW GS-2310 (S/N 1254)	CM-AIR-43 (S/N 9833620) 25 May 2010	25 July 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 NL-18 (S/N 00360030)	6 July 2009	6 July 2010
		Rion NL-31 (S/N 00320533)	16 July 2009	16 July 2010
	Sound Level Meter	Rion NL-31 (S/N 00410224)	8 May 2009	8 May 2010
		Rion NA-27 (S/N 00201194)	10 July 2009	10 July 2010
		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)) 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 : AM1  
Calibrated by : K.T.Ho  
Date : 22/03/2010

Sampler

Model : GMWS-2310 ACCU-VOL  
Serial Number : S/N 1808

Calibration Orifice and Standard Calibration Relationship

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

Standard Condition

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

Calibration Condition

Pa (hpa) : 1018  
Ta(K) : 290

Resistance Plate	dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC	Y
1   18 holes	13	3.643	1.843	65	65.7
2   13 holes	10.2	3.226	1.632	57	57.6
3   10 holes	7.8	2.821	1.427	49	49.5
4   7 holes	5.6	2.391	1.210	40	40.4
5   5 holes	3	1.750	0.885	28	28.3

Sampler Calibration Relationship

Slope(m):40.735 Intercept(b): -8.553 Correlation Coefficient(r): 0.9998

Checked by: Magnum Fan

Date: 25/03/2010

High-Volume TSP Sampler  
5-Point Calibration Record

Location : AM2  
Calibrated by : K.T.Ho  
Date : 22/03/2010

Sampler

Model : GMWS-2310 ACCU-VOL  
Serial Number : S/N 0145

Calibration Office and Standard Calibration Relationship

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

Standard Condition

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

Calibration Condition

Pa (hpa) : 1018  
Ta(K) : 290

Resistance Plate	dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC	Y
1   18 holes	12.2	3.529	1.785	65	65.7
2   13 holes	9.6	3.130	1.584	57	57.6
3   10 holes	7.7	2.803	1.418	50	50.5
4   7 holes	5	2.259	1.143	40	40.4
5   5 holes	2.7	1.660	0.840	28	28.3

Sampler Calibration Relationship

Slope(m): 39.372 Intercept(b): -4.818 Correlation Coefficient(r): 0.9998

Checked by: Magnum Fan

Date: 25/03/2010

High-Volume TSP Sampler  
5-Point Calibration Record

Location : AM3  
 Calibrated by : K.T.Ho  
 Date : 22/03/2010

Sampler

Model : GMWS-2310 ACCU-VOL  
 Serial Number : S/N 0481

Calibration Office and Standard Calibration Relationship

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

Standard Condition

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

Calibration Condition

Pa (hpa) : 1018  
 Ta(K) : 290

Resistance Plate	dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC	Y
1   18 holes	12.1	3.514	1.778	62	62.6
2   13 holes	9.5	3.114	1.575	55	55.6
3   10 holes	7.4	2.748	1.390	48	48.5
4   7 holes	4.7	2.190	1.108	38	38.4
5   5 holes	2.9	1.720	0.871	29	29.3

Sampler Calibration Relationship

Slope(m):36.752 Intercept(b): -2.536 Correlation Coefficient(r): 0.9999

Checked by: Magnum Fan

Date: 25/03/2010



High-Volume TSP Sampler  
5-Point Calibration Record

Location : AM4  
Calibrated by : K.T.Ho  
Date : 22/03/2010

Sampler

Model : GMWS-2310 ACCU-VOL  
Serial Number : S/N 9315

Calibration Office and Standard Calibration Relationship

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

Standard Condition

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

Calibration Condition

Pa (hpa) : 1018  
Ta(K) : 290

Resistance Plate	dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC	Y
1   18 holes	11.8	3.470	1.756	60	60.6
2   13 holes	9.3	3.081	1.559	53	53.5
3   10 holes	7.4	2.748	1.390	47	47.5
4   7 holes	4.6	2.167	1.096	37	37.4
5   5 holes	2.9	1.720	0.871	28	28.3

Sampler Calibration Relationship

Slope(m):36.201 Intercept(b): -2.843 Correlation Coefficient(r): 0.9997

Checked by: Magnum Fan

Date: 25/03/2010

High-Volume TSP Sampler  
5-Point Calibration Record\*

Location : AM5  
Calibrated by : K.T.Ho  
Date : 31/03/2010

Sampler

Model : GMWS-2310 ACCU-VOL  
Serial Number : S/N 2146

Calibration Office and Standard Calibration Relationship

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

Standard Condition

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

Calibration Condition

Pa (hpa) : 1016  
Ta(K) : 295

Resistance Plate	dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC	Y
1   18 holes	12.5	3.559	1.800	57	57.4
2   13 holes	9.4	3.086	1.561	50	50.3
3   10 holes	7.3	2.720	1.376	44	44.3
4   7 holes	4.9	2.228	1.127	37	37.2
5   5 holes	2.8	1.684	0.852	28	28.2

Sampler Calibration Relationship

Slope(m): 30.679 Intercept(b): 2.268 Correlation Coefficient(r): 0.9997

Checked by: Magnum Fan

Date: 01/04/2010

\* Provided by Contract No. DC/2007/24 Harbour Area Treatment Scheme Stage 2A (HATS 2A) Construction of Sewage Conveyance System from Aberdeen to Sai Ying Pun

High-Volume TSP Sampler  
5-Point Calibration Record

Location : AM6  
Calibrated by : P.F.Yeung  
Date : 22/03/2010

Sampler

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

Calibration Office and Standard Calibration Relationship

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

Standard Condition

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

Calibration Condition

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

Resistance Plate	dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC	Y
1   18 holes	9.0	3.031	1.533	59	59.6
2   13 holes	7.2	2.711	1.372	53	53.5
3   10 holes	5.7	2.412	1.220	47	47.5
4   7 holes	3.6	1.917	0.967	38	38.4
5   5 holes	2.2	1.498	0.758	30	30.3

Sampler Calibration Relationship

Slope(m): 37.748 Intercept(b): 1.674 Correlation Coefficient(r): 0.9999

Checked by: Magnum Fan

Date: 25/03/2010

High-Volume TSP Sampler  
5-Point Calibration Record

Location : AM1  
Calibrated by : K.T.Ho  
Date : 22/05/2010

Sampler

Model : GMWS-2310 ACCU-VOL  
Serial Number : S/N 1808

Calibration Office 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) : 1008  
Ta(K) : 299

Resistance Plate	dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC	Y
1   18 holes	12.0	3.452	1.724	66	65.8
2   13 holes	9.6	3.088	1.543	59	58.8
3   10 holes	7.0	2.637	1.320	49	48.8
4   7 holes	4.8	2.183	1.094	39	38.9
5   5 holes	2.8	1.668	0.838	28	27.9

Sampler Calibration Relationship

Slope(m):43.158 Intercept(b): -8.229 Correlation Coefficient(r): 0.9998

Checked by: Magnum Fan

Date: 25/05/2010

High-Volume TSP Sampler  
5-Point Calibration Record

Location : AM2  
 Calibrated by : K.T.Ho  
 Date : 22/05/2010

Sampler

Model : GMWS-2310 ACCU-VOL  
 Serial Number : S/N 0145

Calibration Office 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) : 1008  
 Ta(K) : 299

Resistance Plate	dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC	Y
1   18 holes	11.0	3.305	1.651	63	62.8
2   13 holes	9.3	3.039	1.519	56	55.8
3   10 holes	7.3	2.693	1.347	48	47.8
4   7 holes	4.7	2.160	1.083	36	35.9
5   5 holes	2.8	1.668	0.838	25	24.9

Sampler Calibration Relationship

Slope(m):46.286 Intercept(b): -14.152 Correlation Coefficient(r): 0.9997

Checked by: Magnum Fan

Date: 25/05/2010

High-Volume TSP Sampler  
5-Point Calibration Record

Location : AM3  
Calibrated by : K.T.Ho  
Date : 22/05/2010

Sampler

Model : GMWS-2310 ACCU-VOL  
Serial Number : S/N 0481

Calibration Office 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) : 1008  
Ta(K) : 299

Resistance Plate	dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC	Y
1   18 holes	11.7	3.409	1.702	65	64.8
2   13 holes	9.3	3.040	1.519	57	56.8
3   10 holes	7.2	2.674	1.338	48	47.8
4   7 holes	4.6	2.137	1.072	36	35.9
5   5 holes	2.7	1.637	0.824	24	23.9

Sampler Calibration Relationship

Slope(m):46.581 Intercept(b): -14.280 Correlation Coefficient(r): 0.9998

Checked by: Magnum Fan

Date: 25/05/2010

High-Volume TSP Sampler  
5-Point Calibration Record

Location : AM4  
Calibrated by : K.T.Ho  
Date : 22/05/2010

Sampler

Model : GMWS-2310 ACCU-VOL  
Serial Number : S/N 9315

Calibration Office 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) : 1008  
Ta(K) : 299

Resistance Plate	dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC	Y
1   18 holes	6.2	2.481	1.242	44	43.8
2   13 holes	4.8	2.183	1.094	38	37.9
3   10 holes	3.6	1.891	0.949	33	32.9
4   7 holes	2.2	1.478	0.745	24	23.9
5   5 holes	1.5	1.221	0.617	19	18.9

Sampler Calibration Relationship

Slope(m):39.916 Intercept(b):-5.606 Correlation Coefficient(r):0.9995

Checked by: Magnum Fan

Date: 25/05/2010

High-Volume TSP Sampler  
5-Point Calibration Record\*

Location : AM5  
Calibrated by : K.T.Ho  
Date : 31/03/2010

Sampler

Model : GMWS-2310 ACCU-VOL  
Serial Number : S/N 2146

Calibration Office and Standard Calibration Relationship

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

Standard Condition

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

Calibration Condition

Pa (hpa) : 1016  
Ta(K) : 295

Resistance Plate	dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC	Y
1   18 holes	12.5	3.559	1.800	57	57.4
2   13 holes	9.4	3.086	1.561	50	50.3
3   10 holes	7.3	2.720	1.376	44	44.3
4   7 holes	4.9	2.228	1.127	37	37.2
5   5 holes	2.8	1.684	0.852	28	28.2

Sampler Calibration Relationship

Slope(m):30.679 Intercept(b): 2.268 Correlation Coefficient(r): 0.9997

Checked by: Magnum Fan

Date: 01/04/2010

\* Provided by Contract No. DC/2007/24 Harbour Area Treatment Scheme Stage 2A (HATS 2A) Construction of Sewage Conveyance System from Aberdeen to Sai Ying Pun



High-Volume TSP Sampler  
5-Point Calibration Record

Location : AM6  
Calibrated by : P.F.Yeung  
Date : 22/05/2010

Sampler

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

Calibration Office 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) : 1008  
Ta(K) : 299

Resistance Plate	dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC	Y
1   18 holes	9.4	3.055	1.527	59	58.8
2   13 holes	7.6	2.747	1.374	54	53.8
3   10 holes	5.6	2.358	1.181	48	47.8
4   7 holes	3.8	1.943	0.975	41	40.9
5   5 holes	2.2	1.478	0.745	34	33.9

Sampler Calibration Relationship

Slope(m): 31.961 Intercept(b): 9.954 Correlation Coefficient(r): 0.9998

Checked by: Magnum Fan

Date: 25/05/2010



輝創工程有限公司

Sun Creation Engineering Limited Calibration and Testing Laboratory

Certificate No. : C093598

## Certificate of Calibration

*This is to certify that the equipment*

*Description : Sound Level Calibrator*

*Manufacturer : Rion*

*Model No. : NC-73*

*Serial No. : 10786708*

*has been calibrated for the specific items and ranges.*

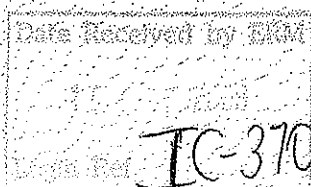
*The results are shown in the Calibration Report No. C093598.*

*The equipment is supplied by*

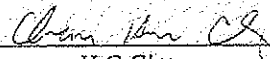
*Co. Name : Envirotech Services Co.*

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

Winnie KO		
Received by	Date	



Date of Issue : 10 July 2009

Certified by :   
H.C. Chan

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

Calibration and Testing Laboratory of Sun Creation Engineering Limited

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

Tel: 2927 2606

Fax: 2744 8986

E-mail: callab@suncreation.com

Website: www.suncreation.com



輝創工程有限公司

Sun Creation Engineering Limited Calibration and Testing Laboratory

Report No. : C093598

## Calibration Report

### ITEM TESTED

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

### TEST CONDITIONS

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

### TEST SPECIFICATIONS

Calibration check

DATE OF TEST : 9 July 2009

JOB NO. : IC09-1664

### TEST RESULTS

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

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

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

Tested by :

  
K.C. Lee

Date : 10 July 2009

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

Calibration and Testing Laboratory of Sun Creation Engineering Limited

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

Tel: 2927 2606

Fax: 2744 8986

E-mail: callab@suncreation.com

Website: www.suncreation.com

Page 1 of 2



# 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	C080751
CL129	Universal Counter	C093121
CL281	Multifunction Acoustic Calibrator	DC090052

4. Test procedure : MA100N.

5. Results :

### 5.1 Sound Level Accuracy

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

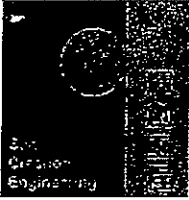
### 5.2 Frequency Accuracy

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

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

Note :

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



輝創工程有限公司

Sun Creation Engineering Limited Calibration and Testing Laboratory

Certificate No. : C093473

## Certificate of Calibration

*This is to certify that the equipment*

*Description : Precision Integrating Sound Level Meter*

*Manufacturer : Rion*

*Model No. : NL-18*

*Serial No. : 00360030*

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

*The equipment is supplied by*

*Co. Name : Envirotech Services Co.*

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

*Date of Issue : 6 July 2009*

Certified by :   
H C Chan

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

Calibration and Testing Laboratory of Sun Creation Engineering Limited

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

Tel: 2927 2606

Fax: 2744 8986

E-mail: 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. : C093473

## Calibration Report

### ITEM TESTED

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

### TEST CONDITIONS

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

### TEST SPECIFICATIONS

Calibration check

DATE OF TEST : 3 July 2009

JOB NO. : IC09-1664

### TEST RESULTS

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

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

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

Tested by :

  
K/C Lee

Date : 6 July 2009

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

Calibration and Testing Laboratory of Sun Creation Engineering Limited

c/o 4/F, Tsing Shan Wan Exchange Building, J Hing On Lane, Tuen Mun, New Territories, Hong Kong  
Tel: 2927 2606 Fax: 2744 8986 E-mail: callab@suncreation.com Website: www.suncreation.com

Page 1 of 4



# Calibration Report

1. The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 24 hours, and switched on to warm up for over 10 minutes before the commencement of the test.
2. Self-calibration using the internal standard (After Adjustment) was performed before the test 6.1.2 - 6.4.
3. The results presented are the mean of 3 measurements at each calibration point.
4. Test equipment :

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

5. Test procedure : MA101N.

6. Results :

6.1 Sound Pressure Level

6.1.1 Reference Sound Pressure Level

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

6.1.2 Linearity

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

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

6.2 Time Weighting

6.2.1 Continuous Signal

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

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



# Calibration Report

## 6.2.2 Tone Burst Signal (2 kHz)

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

## 6.3 Frequency Weighting

### 6.3.1 A-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 651 Type 1 Spec. (dB)
Range (dB)	Mode	Weight	Response	Level (dB)	Freq.		
40 - 100	LA	A	Fast	94.00	31.5 Hz	54.7	-39.4 ± 1.5
					63 Hz	68.0	-26.2 ± 1.5
					125 Hz	78.0	-16.1 ± 1.0
					250 Hz	85.4	-8.6 ± 1.0
					500 Hz	90.8	-3.2 ± 1.0
					1 kHz	94.1	Ref.
					2 kHz	95.3	+1.2 ± 1.0
					4 kHz	94.9	+1.0 ± 1.0
8 kHz	91.7	-1.1 (+1.5 ; -3.0)					

### 6.3.2 C-Weighting

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

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





# Calibration Report

## 6.4 Time Averaging

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

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

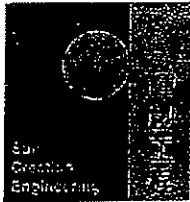
- Uncertainties of Applied Value : 94 dB : 31.5Hz - 125 Hz : ± 0.35 dB  
 250 Hz - 500 Hz : ± 0.30 dB  
 1 kHz : ± 0.20 dB  
 2 kHz - 4 kHz : ± 0.35 dB  
 8 kHz : ± 0.45 dB  
 104 dB : 1 kHz : ± 0.10 dB (Ref. 94 dB)  
 114 dB : 1 kHz : ± 0.10 dB (Ref. 94 dB)  
 Burst equivalent level : ± 0.2 dB (Ref.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

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

### Note :

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

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



輝創工程有限公司

Sun Creation Engineering Limited Calibration and Testing Laboratory

Certificate No. : C093733

## Certificate of Calibration

*This is to certify that the equipment*

*Description : Sound Level Meter*

*Manufacturer : Rion*

*Model No. : NL-31*

*Serial No. : 00320533*

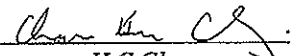
*has been calibrated for the specific items and ranges.  
The results are shown in the Calibration Report No. C093733.*

*The equipment is supplied by*

*Co. Name : Envirotech Services Co.*

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

*Date of Issue : 16 July 2009*

*Certified by :   
H C Chan*

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

Calibration and Testing Laboratory of Sun Creation Engineering Limited

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



輝創工程有限公司

Sun Creation Engineering Limited Calibration and Testing Laboratory

Report No. : C093733

## Calibration Report

### ITEM TESTED

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

### TEST CONDITIONS

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

### TEST SPECIFICATIONS

Calibration check

DATE OF TEST : 15 July 2009

JOB NO. : IC09-1740

### TEST RESULTS

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

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

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

Tested by :

  
K. L. Lee

Date : 16 July 2009

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

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

Page 1 of 4

# 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 :

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

5. Test procedure : MA101N.

6. Results :

6.1 Sound Pressure Level

6.1.1 Reference Sound Pressure Level

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

6.1.2 Linearity

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

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

6.2 Time Weighting

6.2.1 Continuous Signal

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

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



# Calibration Report

## 6.2.2 Tone Burst Signal (2 kHz)

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Burst Duration		
20 - 110	L <sub>A</sub>	A	Fast	106.00	Continuous	106.0	Ref.
	L <sub>AMAX</sub>				200 ms	105.0	-1.0 ± 1.0
	L <sub>A</sub>		Slow		Continuous	106.0	Ref.
	L <sub>AMAX</sub>				500 ms	102.0	-4.1 ± 1.0

## 6.3 Frequency Weighting

### 6.3.1 A-Weighting

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

### 6.3.2 C-Weighting

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

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

# Calibration Report

## 6.4 Time Averaging

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

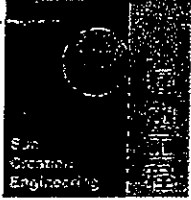
Remarks : - Mfr's Spec. : IEC 60651 & IEC 60804 Type I

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

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

Note :

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



輝創工程有限公司

Sun Creation Engineering Limited Calibration and Testing Laboratory

Certificate No. : C092284

## Certificate of Calibration

*This is to certify that the equipment*

*Description : Sound Level Meter*

*Manufacturer : Rion*

*Model No. : NL-31*

*Serial No. : 00410224*

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

*The equipment is supplied by*

*Co. Name : Envirotech Services Co.*

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

*Date of Issue : 8 May 2009*

*Certified by :*

*K. Lee*

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

Calibration and Testing Laboratory of Sun Creation Engineering Limited

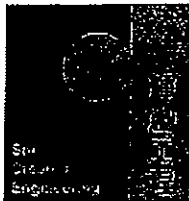
c/o 4/F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong

Tel: 2927 2606

Fax: 2744 8986

E-mail: callab@suncreation.com

Website: www.suncreation.com



輝創工程有限公司

Sun Creation Engineering Limited Calibration and Testing Laboratory

Report No. : C092284

## Calibration Report

### ITEM TESTED

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

### TEST CONDITIONS

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

### TEST SPECIFICATIONS

Calibration

DATE OF TEST : 7 May 2009

JOB NO. : IC09-1058

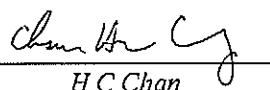
### TEST RESULTS

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

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

- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory

Tested by :

  
H C Chan

Date : 8 May 2009

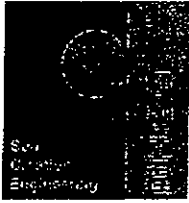
The test equipment used for calibration are traceable to the National Standards as specified in this report.  
This report shall not be reproduced except in full and with prior written approval from this laboratory.

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

Page 1 of 4





# 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 using the internal standard (after adjustment) was performed before the test 6.1.2 - 6.4.
- The results presented are the mean of 3 measurements at each calibration point.
- Test equipment :

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

5. Test procedure : MA101N.

6. Results :

6.1 Sound Pressure Level

6.1.1 Reference Sound Pressure Level

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

\* Out of Mfr's Spec.

6.1.2 Linearity

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

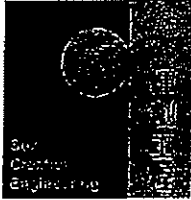
IEC 651 Type I Spec. : ± 0.4 dB per 10 dB step and ± 0.7 dB for overall different.

6.2 Time Weighting

6.2.1 Continuous Signal

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

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



# Calibration Report

## 6.2.2 Tone Burst Signal (2 kHz)

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

## 6.3 Frequency Weighting

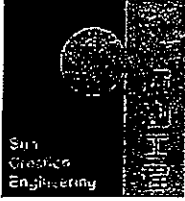
### 6.3.1 A-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 651 Type 1 Spec. (dB)
Range (dB)	Mode	Weight	Response	Level (dB)	Freq.		
20 - 100	L <sub>A</sub>	A	Fast	94.00	31.5 Hz	54.9	-39.4 ± 1.5
					63 Hz	68.1	-26.2 ± 1.5
					125 Hz	78.0	-16.1 ± 1.0
					500 Hz	90.8	-3.2 ± 1.0
					1 kHz	94.0	Ref.
					2 kHz	95.2	+1.2 ± 1.0
					4 kHz	94.7	+1.0 ± 1.0
					8 kHz	90.2	-1.1 (+1.5 ; -3.0)

### 6.3.2 C-Weighting

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

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



# Calibration Report

## 6.4 Time Averaging

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

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

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

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

Note :

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

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



輝創工程有限公司

Sun Creation Engineering Limited Calibration and Testing Laboratory

Certificate No. : C093599

## Certificate of Calibration

*This is to certify that the equipment*

*Description : Precision Sound Level Meter*

*Manufacturer : Rion*

*Model No. : NA-27*

*Serial No. : 00201194*

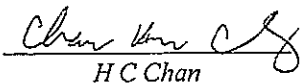
*has been calibrated for the specific items and ranges.  
The results are shown in the Calibration Report No. C093599.*

*The equipment is supplied by*

*Co. Name : Envirotech Services Co.*

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

*Date of Issue : 10 July 2009*

*Certified by :   
H C Chan*

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

Calibration and Testing Laboratory of Sun Creation Engineering Limited

c/o 4/F. Tsing Shan Wan Exchange Building, I Hing On Lane, Tuen Mun, New Territories, Hong Kong  
Tel: 2927 2606 Fax: 2744 8986 E-mail: callab@suncreation.com Website: www.suncreation.com



輝創工程有限公司

Sun Creation Engineering Limited Calibration and Testing Laboratory

Report No. : C093599

## Calibration Report

### ITEM TESTED

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

### TEST CONDITIONS

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

### TEST SPECIFICATIONS

Calibration check

DATE OF TEST : 9 July 2009

JOB NO. : IC09-1664

### TEST RESULTS

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

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

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

Tested by :

  
K. J. Lee

Date : 10 July 2009

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

Calibration and Testing Laboratory of Sun Creation Engineering Limited

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

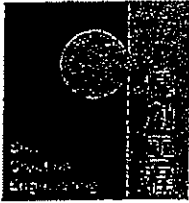
Tel: 2927 2606

Fax: 2744 8986

E-mail: callab@suncreation.com

Website: www.suncreation.com

Page 1 of 4



# Calibration Report

1. The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 24 hours, and switched on to warm up for over 10 minutes before the commencement of the test.
2. Self-calibration was performed before the test.
3. The results presented are the mean of 3 measurement at each calibration point.
4. Test equipment :

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

5. Test procedure : MA101N.

6. Results :

6.1 Sound Pressure Level

6.1.1 Reference Sound Pressure Level

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

6.1.2 Linearity

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

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

6.2 Time Weighting

6.2.1 Continuous Signal

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

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

## 6.2.2 Tone Burst Signal (2 kHz)

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

## 6.3 Frequency Weighting

### 6.3.1 A-Weighting

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

### 6.3.2 C-Weighting

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

The test equipment used for calibration are traceable to the National Standards as specified in this report. 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 I Spec. (dB)
Range (dB)	Mode	Integrating Time	Freq. (kHz)	Burst Duration (ms)	Burst Duty Factor	Burst Level (dB)	Equivalent Level (dB)		
50 - 110	LAeq	10 sec.	4	1	1/10	110.0	100	100.2	± 0.5
					1/10 <sup>2</sup>		90	90.3	± 0.5
		60 sec.			1/10 <sup>3</sup>		80	80.3	± 1.0
		5 min.			1/10 <sup>4</sup>		70	70.3	± 1.0

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

- Uncertainties of Applied Value : 94 dB : 31.5 Hz : ± 0.85 dB
- 63 Hz : ± 0.55 dB
- 125 Hz : ± 0.45 dB
- 250 Hz : ± 0.40 dB
- 500 Hz : ± 0.40 dB
- 1 kHz : ± 0.20 dB
- 2 kHz : ± 0.45 dB
- 4 kHz : ± 0.75 dB
- 8 kHz : ± 1.35 dB
- 12.5 kHz : ± 2.30 dB
- 104 dB : 1 kHz : ± 0.10 dB (Ref. 94 dB)
- 114 dB : 1 kHz : ± 0.10 dB (Ref. 94 dB)
- Burst equivalent level : ± 0.2 dB (Ref. 110 dB continuous sound level)

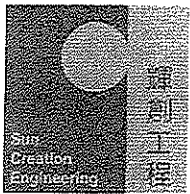
- The uncertainties are for a confidence probability of not less than 95 %.

### Note :

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

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





輝創工程有限公司

Sun Creation Engineering Limited Calibration and Testing Laboratory

Certificate No. : 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*

This certificate is valid only if used in conjunction with the Calibration Report No. C095683. This report shall be re-issued if used in conjunction with prior written approval from this laboratory.

此證書僅在與校準報告 C095683 一併使用時有效。

此校準報告如未經本實驗室書面批准而與此證書一併使用，則此證書無效。



Report No. : C095683

## Calibration Report

### ITEM TESTED

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

### TEST CONDITIONS

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

### TEST SPECIFICATIONS

Calibration check

DATE OF TEST : 22 October 2009

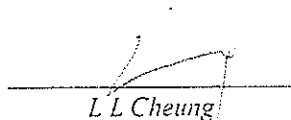
JOB NO. : IC09-2709

### 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.  
No report will be prepared if a valid calibration certificate is provided from the laboratory.

This report is the property of Sun Creation Engineering Limited.

Copyright © Sun Creation Engineering Limited. All rights reserved. No part of this report may be reproduced without the written approval from this laboratory.



# 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

5. Test procedure : MA101N.

6. Results :

6.1 Sound Pressure Level

6.1.1 Reference Sound Pressure Level

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
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 (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	
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 (dB)	IEC 61672 Class 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	94.2	Ref.
			Slow			94.2	± 0.3



# Calibration Report

## 5.3 Frequency Weighting

### 5.3.1 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)

### 5.3.2 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)

These data were measured using the equipment specified in the report and are not to be used for any other purpose without the written consent of the laboratory.

These data were measured using the equipment specified in the report and are not to be used for any other purpose without the written consent of the laboratory.

These data were measured using the equipment specified in the report and are not to be used for any other purpose without the written consent of the 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.

Annex I

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

**Table II** *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	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 (in '000kg)	Broken Concrete (see Note 3) (in '000m <sup>3</sup> )	Reused in the Contract (in '000m <sup>3</sup> )	Reused in other Projects (in '000m <sup>3</sup> )	Disposed as Public Fill (in '000kg)	Metals (see Note 1) (in '000kg)	Paper/ cardboard packaging (see Note 1) (in '000kg)	Plastics (see Note 2) (in '000kg)	Chemical Waste (in '000L)	Others, e.g. general refuse (in '000kg)	Type 1 (in '000m <sup>3</sup> )	Type 2 (in '000m <sup>3</sup> )	Type 3 (in '000m <sup>3</sup> )
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 (in '000kg)	Broken Concrete (see Note 3) (in '000m³)	Reused in the Contract (in '000m³)	Reused in other Projects (in '000m³)	Disposed as Public Fill (in '000kg)	Metals (see Note 1) (in '000kg)	Paper/ cardboard packaging (see Note 1) (in '000kg)	Plastics (see Note 2) (in '000kg)	Chemical Waste (in '000L)	Others, e.g. general refuse (in '000kg)	Type 1 (in '000m³)	Type 2 (in '000m³)	Type 3 (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	41.75	0	0	0	0		
Mar	7876.37	0	0	0	7876.37	0	0.09	0	44.58	0.46	0.42	0.027	0		
Apr	7239.31	0	0	0	7239.31	0	0.054	0	33.34	0.39	0	0.005	0		
May	9998.4	0	0	0	9998.4	0	0.144	0	37.79	0	0.661	0.012	0		
June															
<b>Sub-total</b>															
July															
Aug															
Sept															
Oct															
Nov															
Dec															
<b>Total</b>	<b>37216.4</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>37216.4</b>	<b>0</b>	<b>0.432</b>	<b>0</b>	<b>1.1</b>	<b>164.17</b>	<b>0.85</b>	<b>1.081</b>	<b>0.044</b>		

- 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.