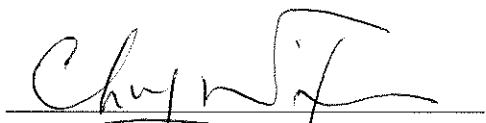


# Leader and JEC Joint Venture

**Contract No. DC/2009/23**  
**HATS Stage 2A – Upgrading of**  
**Preliminary Treatment Works at**  
**North Point, Wan Chai East and Central**

**Environmental**  
**Monitoring and Audit**  
**Final Report**

**(Version 1.0)**

Certified By   
(Environmental Team Leader)

REMARKS:

The information supplied and contained within this report is, to the best of our knowledge, correct at the time of printing.

CINOTECH accepts no responsibility for changes made to this report by third parties

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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

**Attn: Mr. Danny Tang**

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

**Our Reference**  
GCB/AFK/DC/bw/  
T261332/22.01/L-1290

**Contract No. DC/2009/23 – Upgrading of Preliminary Treatment Works at  
North Point, Wan Chai East and Central**

20/F AIA Kowloon Tower  
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Kwun Tong  
Kowloon  
Hong Kong

**Final EM&A Report on Construction Phase Activities**

20 December 2017

**By Post**

T +852 2828 5757  
F +852 2827 1823  
mottmac.hk

Dear Sir,

I refer to the captioned Final EM&A Report on construction phase activities under Contract No. DC/2009/23 as stipulated under Section 15.13 of the EM&A Manual and which was received on 20 December 2017 via email. Pursuant to Conditions 1.9 and 2.2 of Environmental Permit No. EP-322/2008/G, I hereby verify the captioned report.

Yours faithfully  
for MOTT MACDONALD HONG KONG LIMITED



Dr. Anne F Kerr  
Independent Environmental Checker  
T +852 2828 5757  
anne.kerr@mottmac.com

c.c.

Ove Arup & Partners HK Ltd.  
Leader & JEC JV  
Cinotech Consultants Ltd.

Mr. Ted Y F Tang  
Mr. Kelvin Cheung  
Dr. Priscilla Choy

Fax: 2370 4377  
By email  
By email

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## ABBREVIATION AND ACRONYM

AL Levels	Action and Limit Levels
DSD	Drainage Services Department
E / ER	Engineer/Engineer's Representative
EIA	Environmental Impact Assessment
EM&A	Environmental Monitoring and Audit
EMIS	Environmental Mitigation Implementation Schedule
EP	Environmental Permit
EPD	Environmental Protection Department
ET	Environmental Team
HATS 2A	Harbour Area Treatment Scheme Stage 2A
HVS	High Volume Sampler
IEC	Independent Environmental Checker
RE	Resident Engineer
RH	Relative Humidity
QA/QC	Quality Assurance / Quality Control
SLM	Sound Level Meter
WMP	Waste Management Plan

---

## EXECUTIVE SUMMARY

### Introduction

1. This is the Final Environmental Monitoring and Audit (EM&A) Report prepared by Cinotech Consultants Limited for DSD Contract No. DC/2009/23 “HATS Stage 2A – Upgrading of Preliminary Treatment Works at North Point, Wan Chai East and Central” (The Project). The date of commencement of construction of the Project was on 14<sup>th</sup> February 2011 while the Environmental Monitoring and Audit Programme was started on the same date. The EM&A Programme was ended on 11<sup>th</sup> August 2017 when the Proposal of Termination of EM&A Programme of the Project was approved by EPD on 11<sup>th</sup> August 2017. This report documents the detail of EM&A works conducted by Contract DC/2009/23 under the Environmental Permit (Permit No. EP-322/2008/G).
2. The construction works under this Project included the construction of fine screen and grit trap buildings, deodorization rooms, administration building and modification of existing inlet pumping stations at the preliminary treatment works at North Point, Wan Chai East and Central

### Environmental Monitoring Works

3. The environmental monitoring works of the Project was conducted by the ET for the Contract: DC/2007/23 (before October 2015) & DC/2009/23 (starting from October 2015) under HATS 2A with the Environmental Permit (Permit No. EP-322/2008/G) and in accordance with the EM&A Manual. Site audits were conducted by the ET once per week during the period covering the EM&A programme. The implementation of the environmental mitigation measures, Event Action Plans and environmental complaint handling procedures were checked.

#### *1-hour TSP and 24-hour TSP Monitoring*

4. 1-hour and 24-hour TSP air quality monitoring were conducted as scheduled at all the designated monitoring stations during the period covering the EM&A programme.

#### *Construction Noise*

5. Construction Noise monitoring was conducted as scheduled at all the designated monitoring stations during the period covering the EM&A programme.
6. According to the information from the Contractor, the construction works for this Project was completed in July 2017. After received the approval of Proposal of Termination of EM&A Programme of the Project from EPD on 11<sup>th</sup> August 2017, 1-hour and 24-hour TSP air quality monitoring were terminated from 11<sup>th</sup> August 2017 onward. Construction noise monitoring was terminated from 11<sup>th</sup> August 2017 onward.

### Environmental Licenses and Permits

7. Licenses/Permits granted to the Project include the Environmental Permit (EP) and Registered as a Chemical Waste Producer for North Point, Wan Chai East and Central PTWs sites; water discharge licenses of North Point, Wan Chai East and Central PTWs; also the Construction Noise Permits for construction works at Wan Chai East PTW and Central PTW.

---

### **Environmental Mitigation Implementation Schedule**

8. According to the EIA Report Section 3.74, 4.56, 6.384, 9.154 and 13.44, air quality, noise, water quality, waste management and landscape and visual would be the key environmental issues and mitigation measures shall be implemented during the period covering the EM&A programme. Details of the implementation of mitigation measures are provided in the **Appendix C**.

### **Summary of Complaints and Prosecutions**

9. The yellow form related to the Water Pollution Control Ordinance (Cap. 358) was received during the EPD's inspection at Central PTW on 12 September 2016. There were no environmentally related summons, prosecutions or complaints were received since the commencement of the Project. The Complaint Log is presented in **Appendix E**.

### **Future Status of the Project**

10. The construction works of this Project were substantially completed in July 2017. The EM&A Programme was ended on 11<sup>th</sup> August 2017 when the Proposal of Termination of EM&A Programme of the Project was approved by EPD on 11<sup>th</sup> August 2017.

## 1. INTRODUCTION

### Background

- 1.1 The Project is under Harbour Area Treatment Scheme (HATS) Stage 2A and is a designated project (Register No. : AEIAR-121/2008). The environmental permit: (Permit No. EP-322/2008/G) which was issued on 9<sup>th</sup> May 2014 to the Drainage Services Department (hereinafter called the DSD) as the Permit Holder. The general location plan of the Project is shown in **Figure 1A to 1C**.
- 1.2 Leader and JEC Joint Venture (hereafter called the LJJV) was commissioned by the DSD to undertake the construction of the Contract No. DC/2009/23 “Upgrading of Preliminary Treatment Works at North Point, Wan Chai East and Central”. The date of commencement of construction of the Project was on 14<sup>th</sup> February 2011 while the Environmental Monitoring and Audit was started on the same date. The EM&A Programme was ended on 11<sup>th</sup> August 2017 when the Proposal of Termination of EM&A Programme of the Project was approved by EPD on 11<sup>th</sup> August 2017.
- 1.3 Cinotech Consultants Limited was commissioned by LJJV to undertake the Environmental Monitoring and Audit (EM&A) works for the project and was appointed as the Environmental Team (ET) of the Project under Condition 2.1 of the EP.
- 1.4 This is the final EM&A report summarizing the EM&A works conducted for the Project during the period covering the EM&A programme.

### Project Organization

- 1.5 The Project organization is summarized as follow and the organization chart of the Project is shown in **Figure 2**:
- Project Proponent – Drainage Services Department (DSD)
  - Engineer’s Representative (ER) – Ove Arup & Partners Hong Kong Ltd
  - Contractor – Leader and JEC Joint Venture
  - Environmental Team (ET) – Cinotech Consultants Ltd.
  - Independent Environmental Checker (IEC) – Mott MacDonald Hong Kong Ltd
- 1.6 The contacts of key management in the Project are shown in **Table 1.1**.

**Table 1.1 Key Project Contacts**

Party	Role	Name	Position	Phone No.
Drainage Services Department	Project Proponent	Mr. Vincent Y.K. Wong	Senior Engineer 2	2159 3406
Ove Arup & Partners Hong Kong Ltd	Engineer’s Representative	Mr. Ted Tang	Principal Resident Engineer	2370-4311
	Coordinator	Ms. Natalie Kwok	Resident Engineer	6794 8844
Cinotech	Environmental	Dr. Priscilla Choy	ET Leader	2151 2089



<b>Party</b>	<b>Role</b>	<b>Name</b>	<b>Position</b>	<b>Phone No.</b>
	Team	Ms. Janet Wai	Project Coordinator & Audit Team Leader	2157 3879
Mott MacDonald	Independent Environmental Checker	Dr. Anne Kerr	Independent Environmental Checker	2828 5757
Leader and JEC Joint Venture	Contractor	Mr. Kelvin Cheung	Site Agent	9650 9410
		Mr. Sunny Sung	Environmental Officer	9650 9410

### **Summary of EM&A Requirements**

- 1.7 The EM&A programme requires works period monitoring for air quality and construction noise, landscape and visual and environmental site audit. The EM&A requirements for each parameter are described in the following sections, including:
- All monitoring parameters;
  - Action and Limit levels for all environmental parameters;
  - Event Action Plans;
  - Environmental mitigation measures, as recommended in the project EIA study final report; and
  - Environmental requirements in contract documents.
- 1.8 The advice on the implementation status of environmental protection and pollution control/mitigation measures will be summarized in the following sections of this report.

## 2. AIR QUALITY

### Baseline Condition

- 2.1 Baseline air quality monitoring was conducted at the designated monitoring stations. The baseline data was used for the Project to derive the Action and Limit Level. **Appendix A** shows the established Action and Limit Levels for the environmental monitoring works.

### Monitoring Locations

- 2.2 Four designated monitoring stations, AM1, AM2, AM3 and AM4\_2 were selected for impact dust monitoring for the Project. **Table 2.1** describes the air quality monitoring locations, which are also depicted in **Figure 1A to 1C**.

**Table 2.1 Locations for Air Quality Monitoring Stations**

Monitoring Station	Location of Measurement
AM1	Chan's Creative School
AM2	Hong Kong & Islands Regional Office, WSD
AM3	Wan Chai East PTW
AM4_2	A Location next to Sheung Wan Fire Station

Note: Since the site area where air monitoring station AM4 was located had to be returned to DSD for another Works Contract, AM4 was relocated to AM4\_2 on 24 September 2012.

- 2.3 The 1-hour TSP and 24-hour TSP impact air quality monitoring were conducted by Contract No DC/2007/23 from February 2011 to October 2015 under the same EP (Permit No. EP-322/2008/G). The monitoring programme was subsequently taken over by DC/2009/23 from October 2015 onward.

### Result and Observation

- 2.4 The detailed monitoring data and graphical presentations of 1-hour and 24-hour TSP monitoring results throughout the period covering the EM&A programme could be referred to **Appendix B** of this report.
- 2.5 No Project related Action/Limit Level exceedance was recorded. Summary of non-project exceedance is presented in **Appendix F**.
- 2.6 Major works activities carried out on site during the monitoring period is shown in **Appendix H**.
- 2.7 The monitoring works during the period covering the EM&A programme were conducted under sunny and cloudy weather condition.
- 2.8 Other factors that could affect the monitoring procedure were not observed during the monitoring period.

### 3 NOISE

#### Baseline Condition

- 3.1 Baseline noise monitoring was conducted at the designated monitoring stations. The baseline data was used for the Project to derive the Action and Limit Level. **Appendix A** shows the established Action and Limit Levels for the environmental monitoring works.

#### Monitoring Locations

- 3.2 Impact noise monitoring was conducted at three designated monitoring stations as listed in **Table 3.1**, which are also depicted in **Figure 1A** to **1C**.

**Table 3.1 Location of Noise Monitoring Stations**

Monitoring Station	Location of Measurement
NM1	Chan's Creative School
NM2	Hyde Building
NM3	Goldfield Building

- 3.3 The construction noise monitoring was conducted by Contract No DC/2007/23 from February 2011 to October 2015 under the same EP (Permit No. EP-322/2008/G). The monitoring programme was subsequently taken over by DC/2009/23 from October 2015 onward.

#### Result and Observation

- 3.4 The detailed monitoring data and graphical presentations of construction noise monitoring results throughout the period covering the EM&A programme could be referred to **Appendix B** of this report.
- 3.5 No Project related Action/Limit Level exceedance was recorded. Summary of non-project exceedance is presented in **Appendix F**.
- 3.6 Major works activities carried out on site during the monitoring period is shown in **Appendix H**.
- 3.7 The monitoring works during the period covering the EM&A programme were conducted under sunny and cloudy weather condition.
- 3.8 Other factors that could affect the monitoring procedure were not observed during the monitoring period.

## 4 REVIEW OF THE EM&A PROGRAMME

### Implementation Status of Environmental Mitigation Measures

- 4.1 Site audits were carried out on a weekly basis to monitor the implementation of proper environmental mitigation measure for the Project. The mitigation measures listed in the approved Environmental Impact Assessment (EIA) Report, EM&A Manual and Environmental Permit as well as the relevant implementation status are provided in **Appendix C**. Based on the site inspection findings, the Contractor has implemented the required mitigation measures during period covering the EM&A programme.
- 4.2 No non-compliance was recorded during the site inspections throughout the period covering the EM&A programme. Observations and recommendations recorded during the site inspections were summarized in each of the Monthly EM&A Reports.

### Review of Environmental Monitoring Procedures

- 4.3 The monitoring methodologies and procedure were regularly reviewed by the ET during each reporting month of the Project. The methodologies are considered to be effective as it has successfully monitored the environmental impact of the Project's site areas throughout the period covering the EM&A programme.
- 4.4 Event and Action Plans for noise, air quality as well as visual and landscape aspects have been developed as part of the Baseline Monitoring Report for the Project and the details are provided in **Appendix D**.

### Comparison of the EM&A data with the EIA

#### *Air Quality*

- 4.5 The EIA Report has predicted that dust nuisance at ASRs would not be expected if the recommended mitigation measures has been implemented. No air quality complaints from EPD were received by the Project and no Project related exceedance at the monitoring stations were recorded during the period covering the EM&A programme.

#### *Noise*

- 4.6 The EIA report had predicted that residual impacts of construction noise levels can be kept below the construction noise limit if the recommended mitigation measures has been implemented. No construction noise complaints from EPD were received by the Project during the period covering the EM&A programme.
- 4.7 No Project related exceedance at the monitoring stations was recorded during the period covering the EM&A programme. Detail of the non-projected related exceedances is provided in **Appendix F**.

### Status of Waste Management

- 4.8 Both general refuse and C&D waste were delivered to Public Fill and Landfill appropriately. Both the trip ticket system and chit accounting system for disposal of waste were operated by the Contractor throughout the period covering the EM&A

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programme for the Project.

- 4.9 The total waste generated during the period covering the EM&A programme is summarized in **Appendix G**.
- 4.10 No non-compliances with regard to waste management were recorded during the period covering the EM&A programme of the Project. Hence the waste management system was considered to be effective for this Project. The implementation status for waste management is provided in **Appendix C**.

#### **Implementation Status of Landscape and Visual Mitigation Measures**

- 4.11 Landscape and visual monitoring was carried out on site in accordance with the EM&A Manual to ensure that the implementation and maintenance of landscape and visual mitigation measures were achieved.
- 4.12 No non-compliance was recorded during the period covering the EM&A programme of the Project. The implementation status for Landscape and Visual's mitigation measure is provided in **Appendix C**.

#### **Summary of Complaints and Prosecutions**

- 4.13 The yellow form related to the Water Pollution Control Ordinance (Cap. 358) was received during the EPD's inspection at Central PTW on 12 September 2016. No environmental related summons, prosecutions or complaints were received by the Project during the period covering the EM&A programme. The Complaint Log is presented in **Appendix E**.

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## 5. CONCLUSIONS AND RECOMMENDATIONS

### Comments on Overall EM&A Programme

- 5.1 This Final Environmental Monitoring and Audit (EM&A) Report presented the EM&A programme undertaken during the period from 14<sup>th</sup> February 2011 to 11<sup>th</sup> August 2017 in accordance with the EM&A Manual and the requirement under EP-322/2008/G.
- 5.2 The implementation of mitigation measures for Contract No. DC/2009/23 had been carried out according to the environmental monitoring data obtained during the period covering the EM&A programme of the Project. The weekly site inspections were effective to ensure the implementation and efficiency of the mitigation measures. Therefore, the overall performance of the monitoring methodology and environmental management system for the Project was considered to be effective.
- 5.3 This EM&A programme was found to be cost effective in preventing the occurrence of monitoring impacts caused by the Project. The findings of the environmental monitoring program suggested that no major adverse impacts on the sensitive receivers were caused by the Project's works, which conformed to the findings of the EIA report.

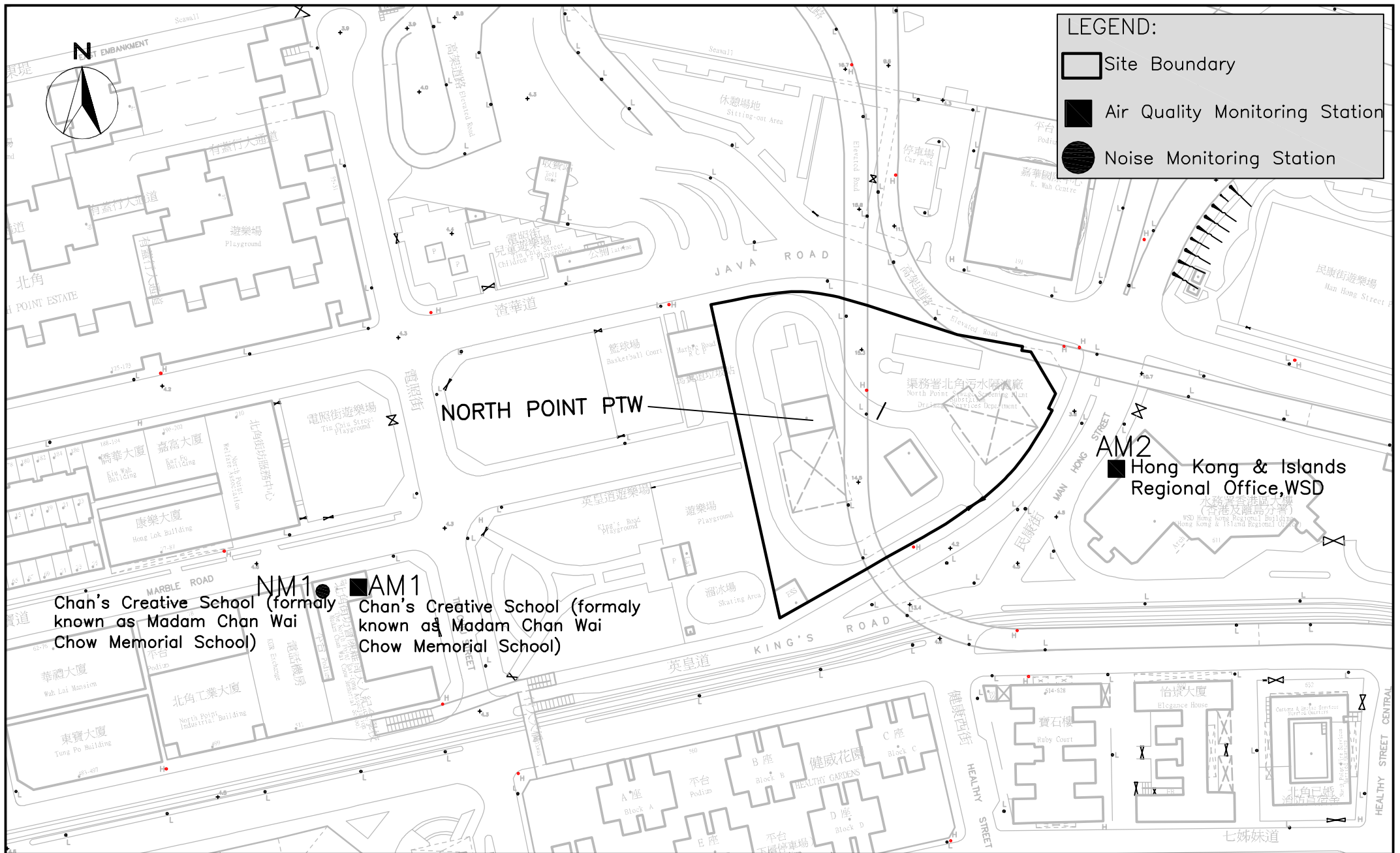
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## FIGURES

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

AM1  
 Chan's Creative School (formally known as Madam Chan Wai Chow Memorial School)

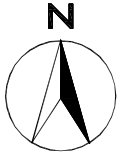
AM2  
 Hong Kong & Islands Regional Office, WSD



Contract No. DC/2009/23 – Harbour Area Treatment Stage 2A  
 – Upgrading of Preliminary Treatment Works at North Point,  
 Wan Chai East and Central  
 Impact Air Quality & Noise Monitoring Stations (North Point)

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PROJECT NO.	MA11003	FIGURE NO.	1A	REV —

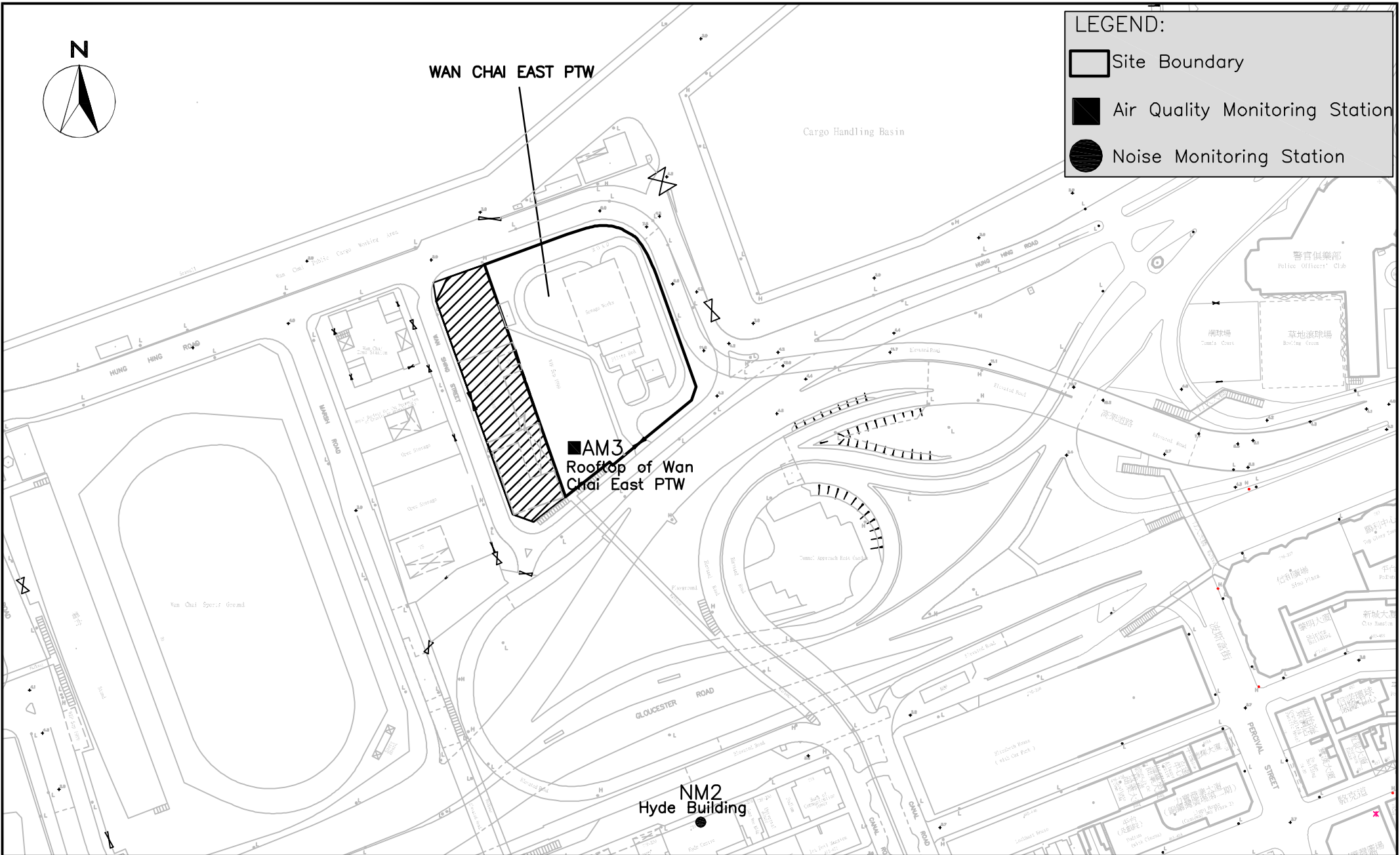




WAN CHAI EAST PTW

**LEGEND:**

- Site Boundary
- Air Quality Monitoring Station
- Noise Monitoring Station



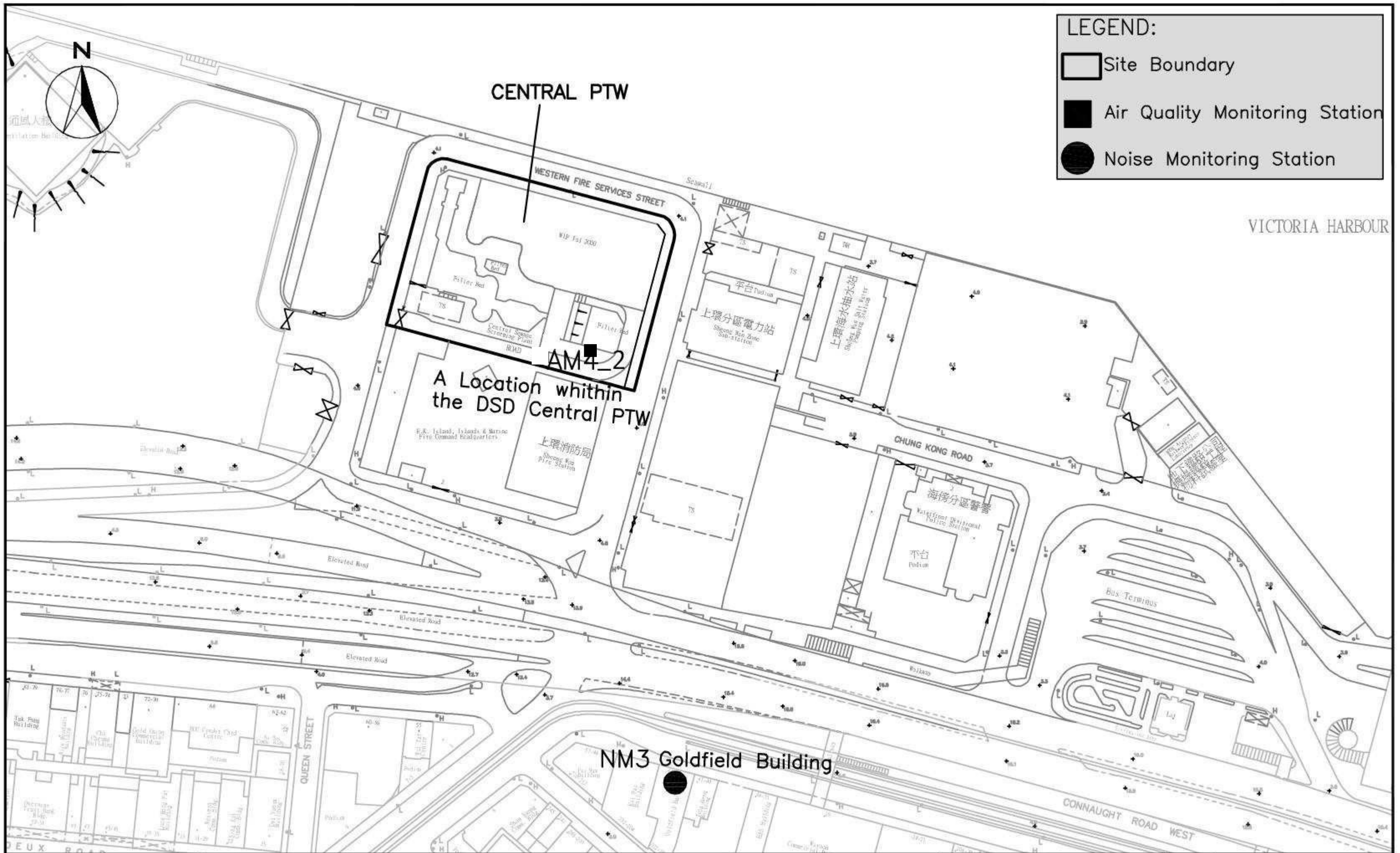
Contract No. DC/2009/23 – Harbour Area Treatment Stage 2A  
 – Upgrading of Preliminary Treatment Works at North Point,  
 Wan Chai East and Central

Impact Air Quality & Noise Monitoring Stations (Wan Chai East)

SCALE	N.T.S	DATE	11 MAR 2011
CHECK	GL	DRAWN	TW
PROJECT NO.	MA11003	FIGURE NO.	1B
		REV	—







**LEGEND:**

- Site Boundary
- Air Quality Monitoring Station
- Noise Monitoring Station

VICTORIA HARBOUR

Contract No. DC/2009/23 – Harbour Area Treatment Stage 2A  
 – Upgrading of Preliminary Treatment Works at North Point,  
 Wan Chai East and Central  
**Impact Air Quality & Noise Monitoring Stations (Central)**



SCALE	N.T.S	DATE	11 MAR 2011
CHECK	GL	DRAWN	TW
PROJECT NO.	MA11003	FIGURE NO.	1C
		REV	—

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**APPENDIX A  
ACTION AND LIMIT LEVELS FOR AIR  
QUALITY AND NOISE**

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## Appendix A Action and Limit Levels

**Table A-1 Action and Limit Levels for 1-Hour TSP and 24-Hour TSP**

Monitoring Stations	Action Level ( $\mu\text{g}/\text{m}^3$ )		Limit Level ( $\mu\text{g}/\text{m}^3$ )	
	1-hour	24-hour	1-hour	24-hour
AM1	340	185	500	260
AM2	352	182		
AM3	355	181		
AM4 2	393	211		

**Table A-2 Action and Limit Level for Construction Noise**

Monitoring Stations	Time Period	Action Level	Limit Level in dB(A)
NM1	0700-1900 hours on normal weekdays	When one documented complaint is received	70 */69**
	Restricted hours (1900-2300 on all days and 0700-2300 on general holidays and Sundays)		70 ***
NM2	0700-1900 hours on normal weekdays		75
	Restricted hours (1900-2300 on all days and 0700-2300 on general holidays and Sundays)		70 ***
NM3	0700-1900 hours on normal weekdays		75

Notes: If works are to be carried out during restricted hours, the conditions stipulated in the Construction Noise Permit (CNP) issued by the Noise Control Authority have to be followed.

\* 70 dB(A) was adopted as the Limit Level during school normal teaching period in the reporting period.

\*\* 69 dB(A) was adopted as the Limit Level during the examination period at NM1 because of the Baseline Monitoring Report, the average LAeq,30min measured at NM1 between 0700 and 1900 hours is 69.0 dB(A), exceeded the Limit Level of daytime construction noise during the examination periods (65 dB(A)).

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

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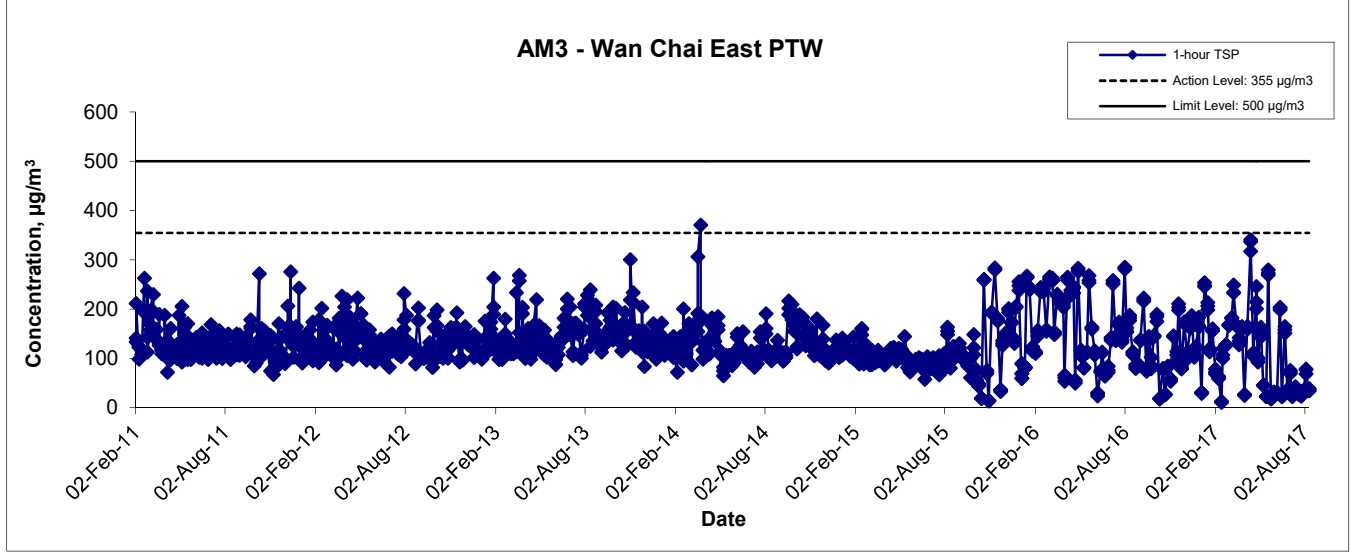
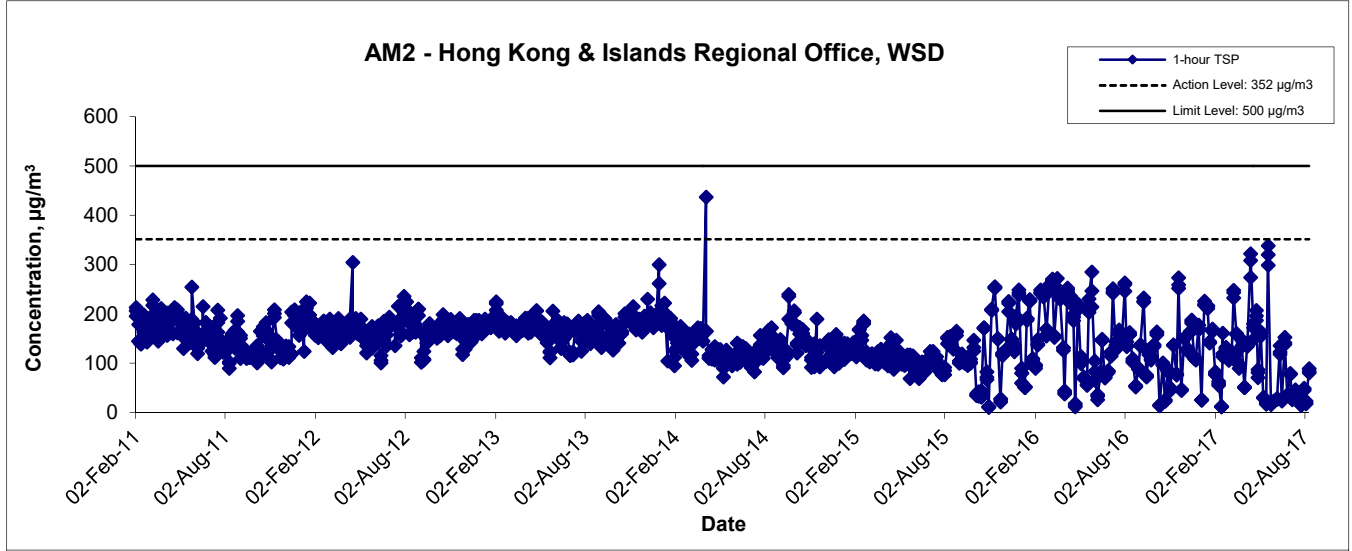
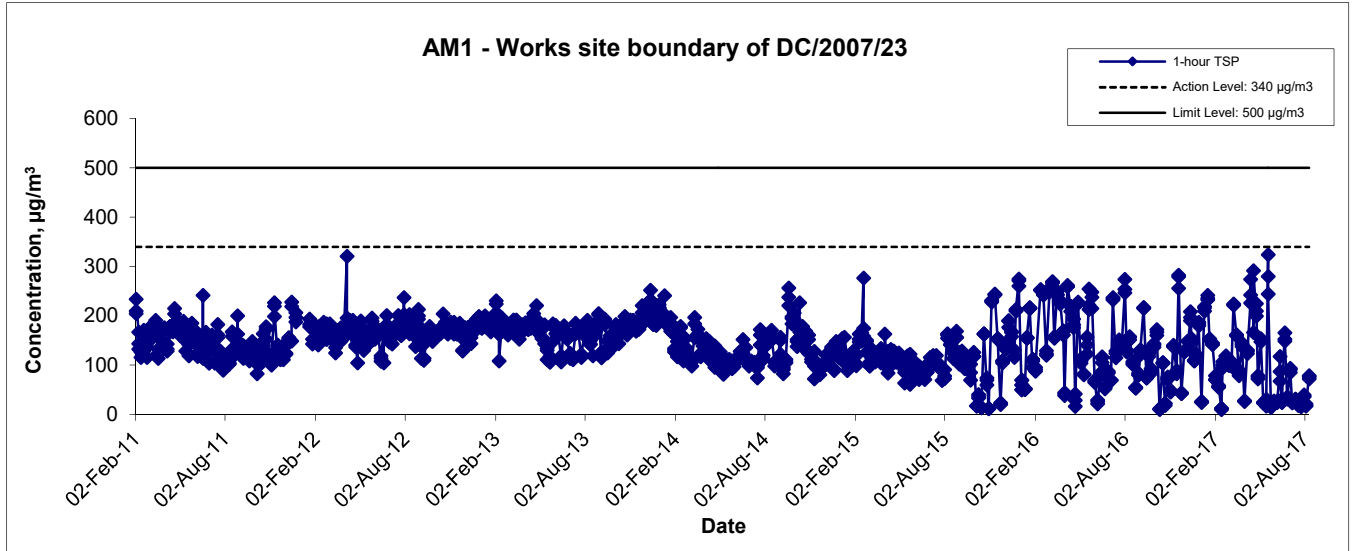
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**APPENDIX B  
GRAPHICAL PRESENTATION OF AIR  
QUALITY AND NOISE**

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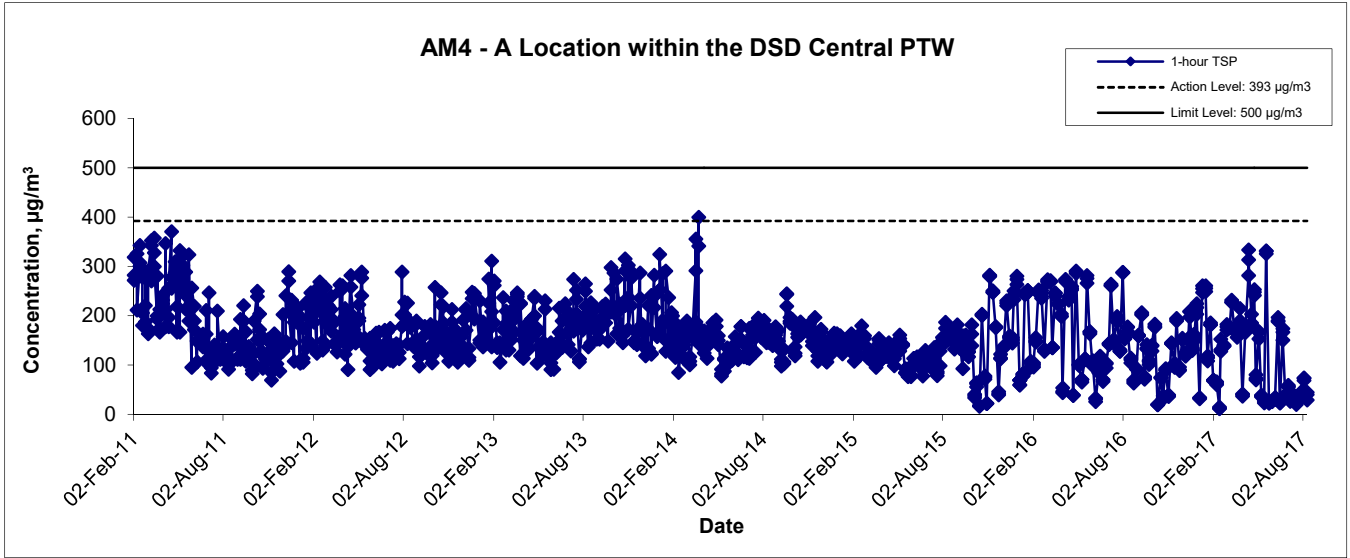
### 1-hr TSP Concentration Levels



Title Contract No. DC/2009/23 HATS 2A – Upgrading of Preliminary Treatment Works at North Point, Wan Chai East and Central  Graphical Presentation of 1-hour TSP Monitoring Results	Scale N.T.S	Project No. MA11003	CINOTECH
	Date Aug 17	Appendix B	

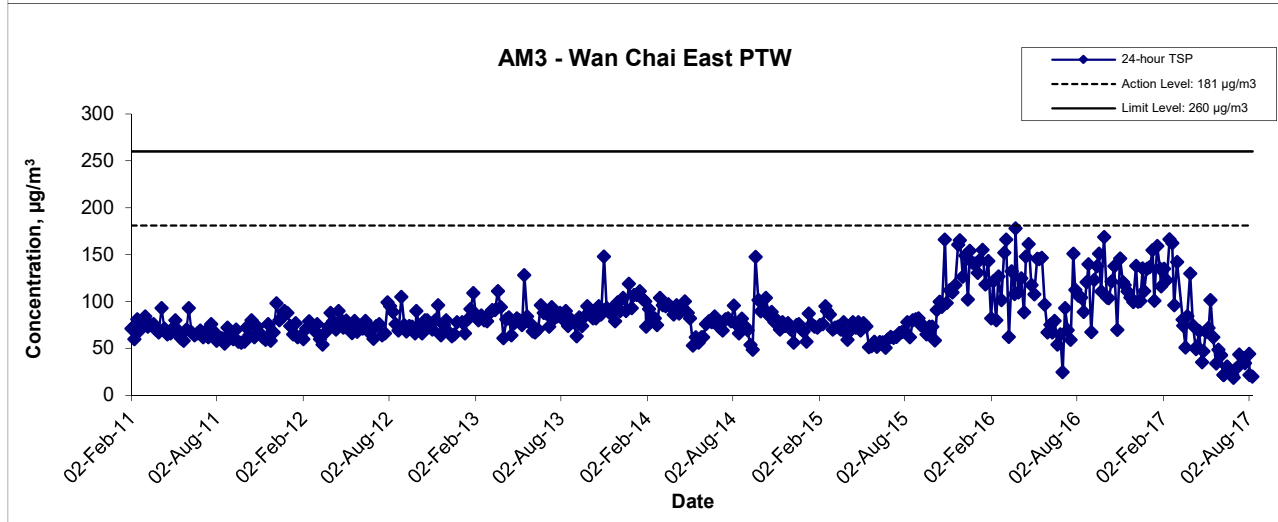
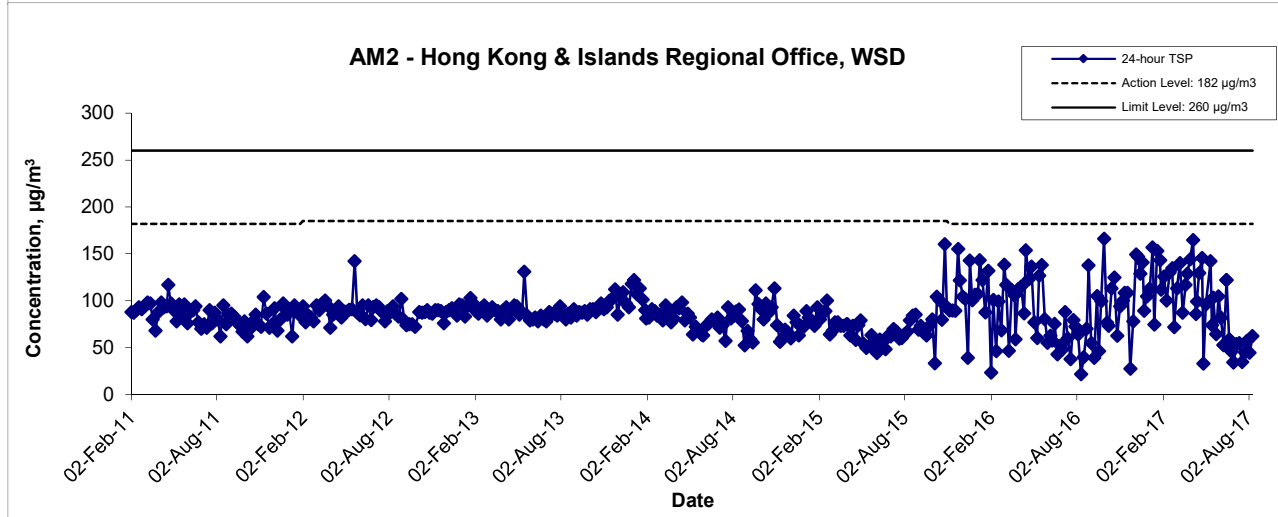
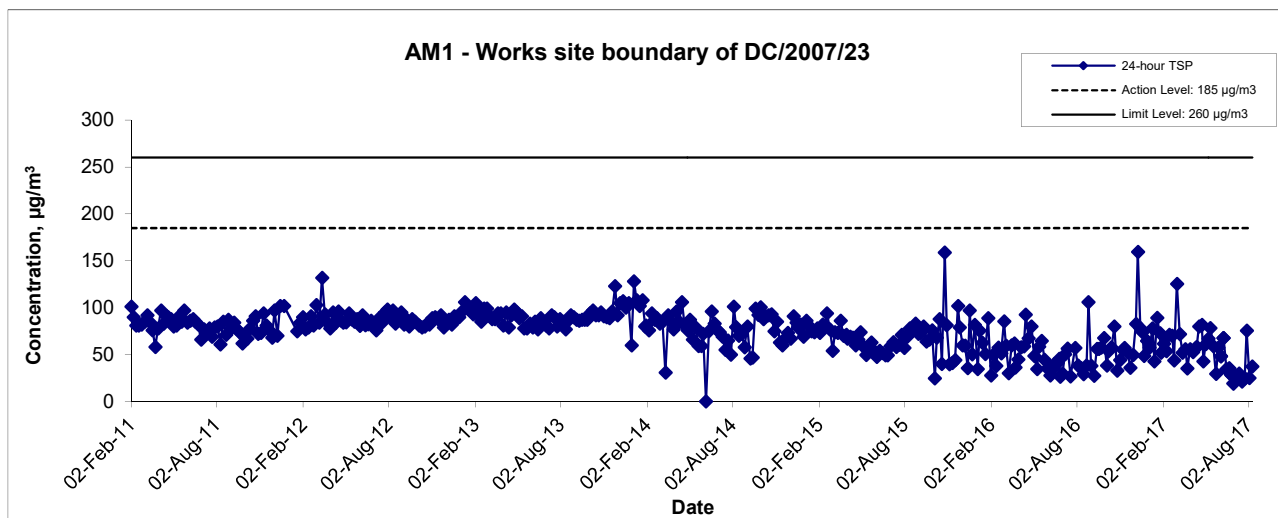


### 1-hr TSP Concentration Levels



Title Contract No. DC/2009/23 HATS 2A – Upgrading of Preliminary Treatment Works at North Point, Wan Chai East and Central  Graphical Presentation of 1-hour TSP Monitoring Results	Scale N.T.S	Project No. MA11003	
	Date Aug 17	Appendix B	

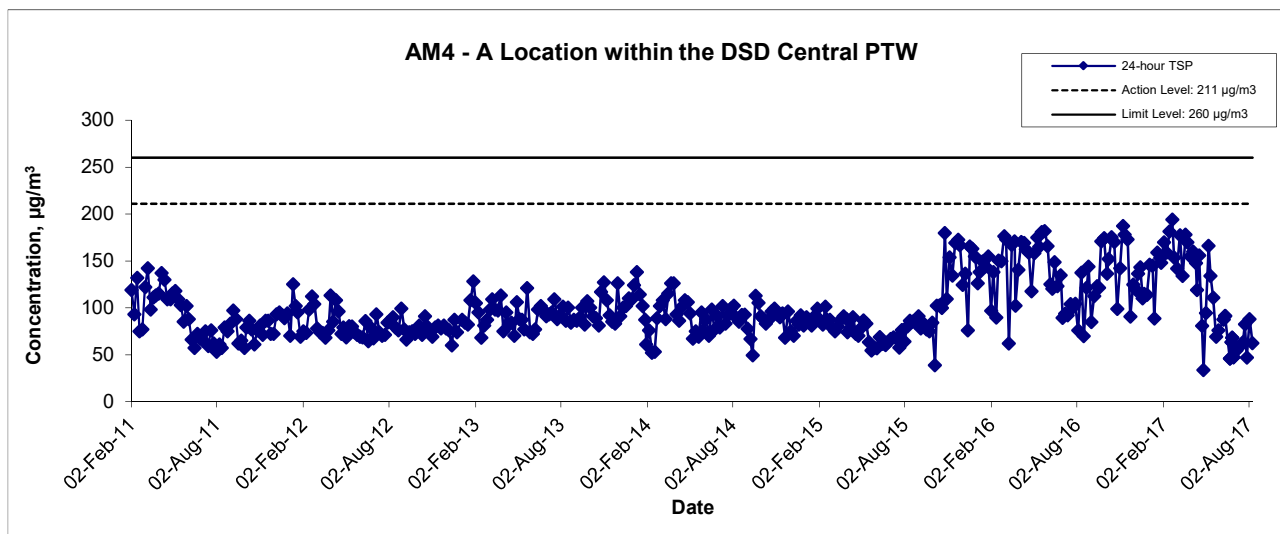
### 24-hr TSP Concentration Levels



Title	Contract No. DC/2009/23	Scale	Project No.	CINOTECH
	HATS 2A – Upgrading of Preliminary Treatment Works at North Point, Wan Chai East and Central	N.T.S	MA11003	
Graphical Presentation of 24-hour TSP Monitoring Results		Date	Appendix	
		Aug 17	B	



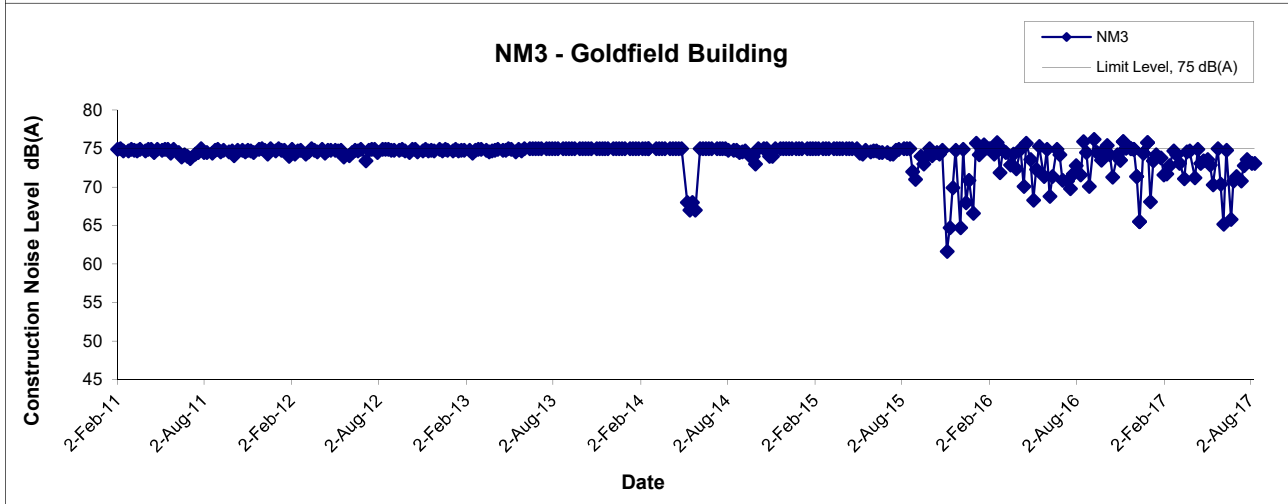
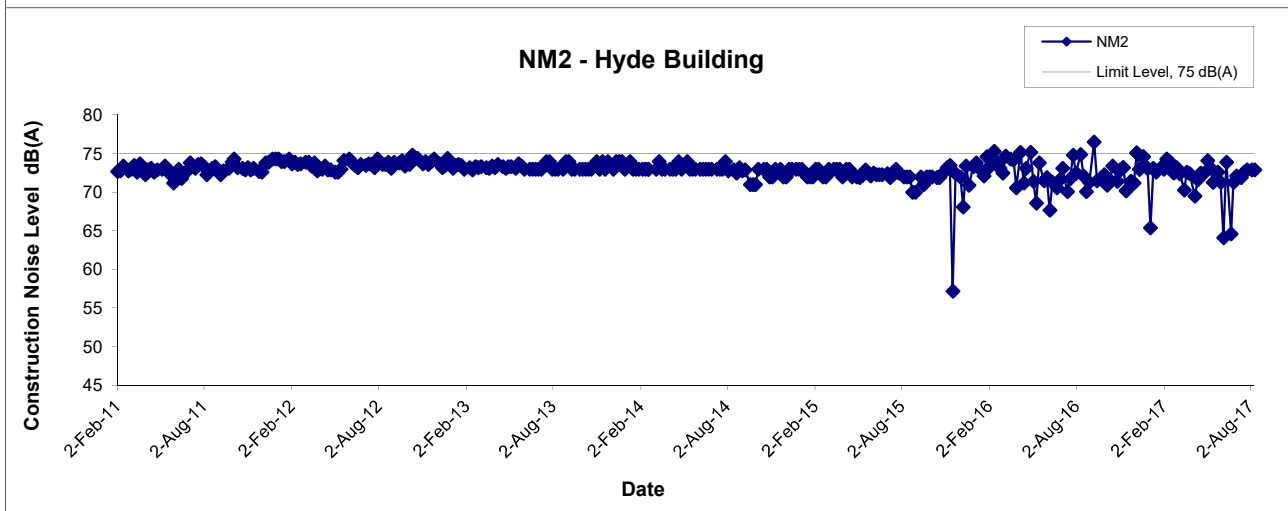
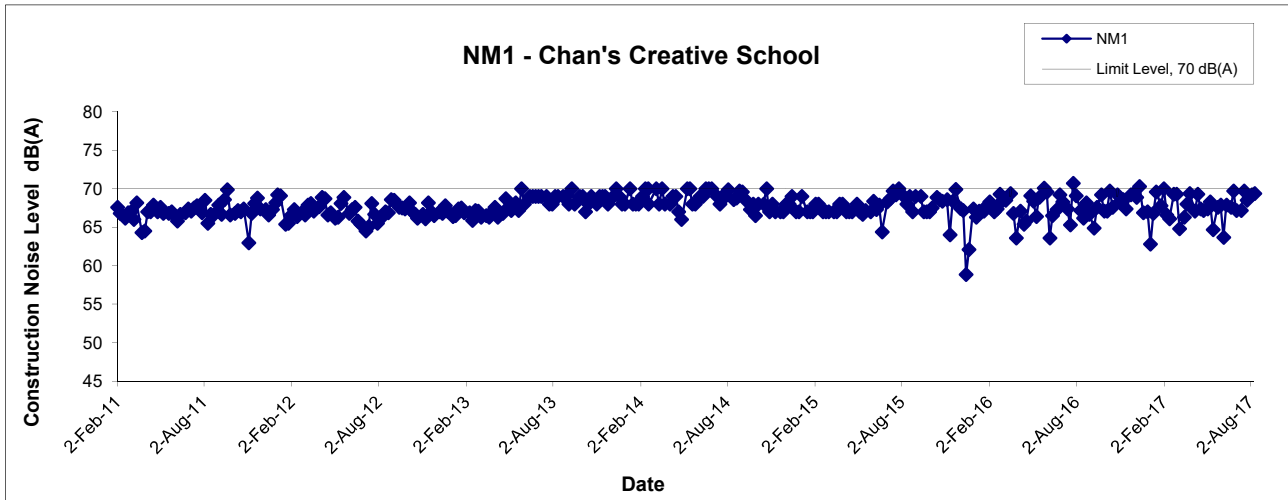
### 24-hr TSP Concentration Levels



<b>Title</b> Contract No. DC/2009/23 HATS 2A – Upgrading of Preliminary Treatment Works at North Point, Wan Chai East and Central  Graphical Presentation of 24-hour TSP Monitoring Results	<b>Scale</b> N.T.S	<b>Project No.</b> MA11003	<b>CINOTECH</b>
	<b>Date</b> Aug 17	<b>Appendix</b> B	

## Noise Levels

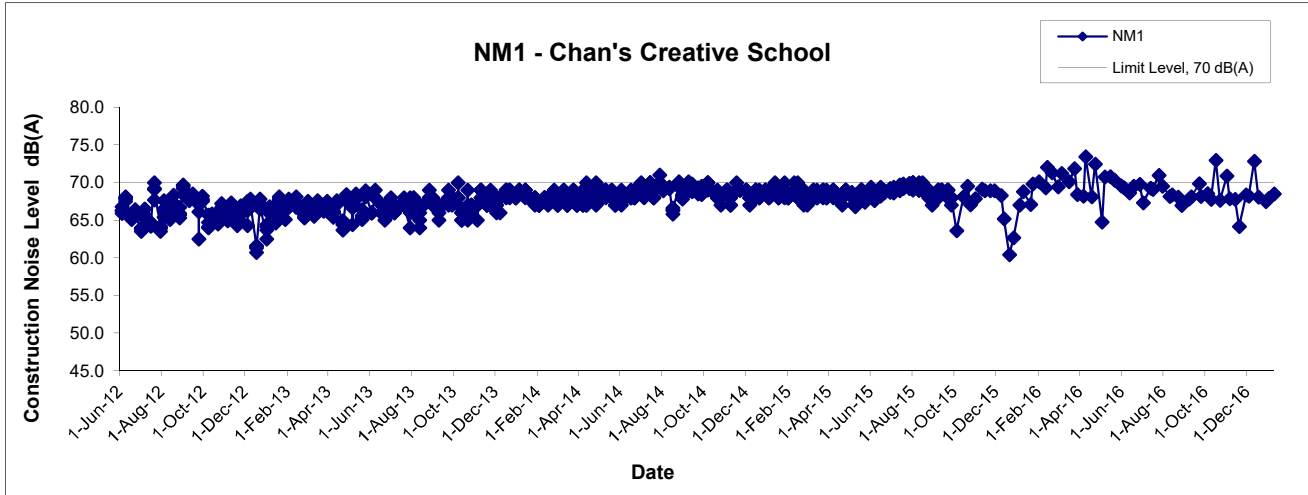
(Daytime Noise - 0700 to 1900 hrs on normal weekdays)



Title Contract No. DC/2009/23 HATS 2A – Upgrading of Preliminary Treatment Works at North Point, Wan Chai East and Central Graphical Presentation of Construction Noise Monitoring Results	Scale	N.T.S	Project No. MA11003	CINOTECH
	Date	Aug 17	Appendix B	

## Noise Levels

**(Restricted Hours - 1900 to 2300 hrs on all days  
and 0700-2300 on general holidays and Sundays)**



Title Contract No. DC/2009/23 HATS 2A – Upgrading of Preliminary Treatment Works at North Point, Wan Chai East and Central Graphical Presentation of Construction Noise Monitoring Results	Scale N.T.S	Project No. MA11003	<b>CINOTECH</b>
	Date 'Aug 17	Appendix B	

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**APPENDIX C  
SUMMARY OF ENVIRONMENTAL  
MITIGATION IMPLEMENTATION  
SCHEDULE**

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

<b>EIA Ref.</b>	<b>Recommended Mitigation Measures</b>	<b>Location of the measure</b>	<b>Implementation Status</b>
<b>A</b>	<b>Air Quality</b>		
3.74	<p>Skip hoist for material transport should be totally enclosed by impervious sheeting.</p> <p>Vehicle washing facilities should be provided at every vehicle exit point.</p> <p>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.</p> <p>Where a site boundary adjoins a road, streets or other areas accessible to the public, hoarding of not less than 2.4 m high from ground level should be provided along the entire length except for a site entrance or exit.</p> <p>Use of regular watering, with complete coverage, to reduce dust emissions from exposed site surfaces and unpaved roads, particularly during dry weather.</p> <p>Side enclosure and covering of any aggregate or dusty material storage piles to reduce emissions. Where this is not practicable owing to frequent usage, watering shall be applied to aggregate fines.</p> <p>Open stockpiles shall be avoided or covered. Where possible, prevent placing dusty material storage piles near ASRs.</p> <p>Tarpaulin covering of all dusty vehicle loads transported to, from and between site locations.</p> <p>Imposition of speed controls for vehicles on unpaved site roads. Ten kilometers per hour is the recommended limit.</p> <p>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.</p> <p>Every vehicle should be washed to remove any dusty materials from its body and wheels before leaving the construction sites.</p>	All construction sites	<p align="center">^</p> <p align="center">^</p> <p align="center">^</p> <p align="center">^</p> <p align="center">^</p> <p align="center">^</p> <p align="center">^</p> <p align="center">^</p> <p align="center">^</p> <p align="center">^</p> <p align="center">^</p> <p align="center">^</p>
3.74	Instigation of an environmental monitoring and auditing program to monitor the construction process in order to enforce controls and modify method of work if dusty conditions arise.	All construction sites	<p align="center">^</p>

EIA Ref.	Recommended Mitigation Measures	Location of the measure	Implementation Status
<b>B</b>	<b>Airborne Noise</b>		
4.56– 4.61	Use of quiet PME, movable barriers and acoustic mats.	All construction sites	^
4.67	Only well-maintained plant shall be operated on-site and plant shall be serviced regularly during the construction program.		^
	Silencers or mufflers on construction equipment shall be utilized and shall be properly maintained during the construction program.		^
	Mobile plant, if any, shall be sited as far away from NSRs as possible.		^
	Machines and plant (such as trucks) that may be in intermittent use shall be shut down between works periods or shall be throttled down to a minimum.		^
4.67	Plant known to emit noise strongly in one direction shall, wherever possible, be orientated so that the noise is directed away from the nearby NSRs.		^
	Material stockpiles and other structures shall be effectively utilized, wherever practicable, in screening noise from on-site construction activities.		^
<b>C</b>	<b>Water Quality</b>		
6.349 to 6.375	Construction Site Runoff and General Construction Activities The mitigation measures as outlined in the ProPECC PN 1/94 Construction Site Drainage should be adopted where applicable.	All construction sites	^
6.376	Effluent Discharge There is a need to apply to EPD for a discharge licence for discharge of effluent from the construction site under the WPCO. The discharge quality must meet the requirements specified in the discharge licence. If monitoring of the treated effluent quality from the works areas is required during the construction phase of the Project, the monitoring should be carried out in accordance with the WPCO license which is under the ambit of regional office (RO) of EPD. Minimum distances of 100 m should be maintained between the discharge points of construction site effluent and the existing saltwater intakes.		^
6.377	Accidental Spillage of Chemicals  Contractor must register as a chemical waste producer if chemical wastes would be produced from the construction activities. The Waste Disposal Ordinance (Cap 354) and its subsidiary regulations in particular the Waste Disposal (Chemical Waste) (General)		^

EIA Ref.	Recommended Mitigation Measures	Location of the measure	Implementation Status
	Regulation should be observed and complied with for control of chemical wastes.		
6.378	Any service shop and maintenance facilities should be located on hard standings within a bunded area, and sumps and oil interceptors should be provided. Maintenance of vehicles and equipment involving activities with potential for leakage and spillage should only be undertaken within the areas appropriately equipped to control these discharges.		^
6.379	<p>Disposal of chemical wastes should be carried out in compliance with the Waste Disposal Ordinance. The Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes published under the Waste Disposal Ordinance details the requirements to deal with chemical wastes. General requirements are given as follows:</p> <ul style="list-style-type: none"> <li>• Suitable containers should be used to hold the chemical wastes to avoid leakage or spillage during storage, handling and transport.</li> <li>• Chemical waste containers should be suitably labelled, to notify and warn the personnel who are handling the wastes, to avoid accidents.</li> <li>• Storage area should be selected at a safe location on site and adequate space should be allocated to the storage area.</li> </ul>		^
6.380	<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</li> </ul>	All construction sites	^

EIA Ref.	Recommended Mitigation Measures	Location of the measure	Implementation Status
	the storm culvert or sea.		
<b>D</b>	<b>Waste Management</b>		
9.107	Reusable steel or concrete panel shutters, fencing and hoarding and signboard should be used as a preferred alternative to items made of wood, to minimise wastage of wood. Attention should be paid to WBTC No. 19/2001 - Metallic Site Hoardings and Signboards to reduce the amount of timber used on construction sites. Metallic alternatives to timber are readily available and should be used rather than new timber. Precast concrete units should be adopted wherever feasible to minimize the use of timber formwork.	All construction sites	^
9.109	All waste materials should be segregated into categories covering: <ul style="list-style-type: none"> <li>• excavated materials suitable for reuse on-site;</li> <li>• excavated materials suitable for public filling facilities;</li> <li>• remaining C&amp;D waste for landfill;</li> <li>• chemical waste; and</li> <li>• general refuse for landfill.</li> </ul>	All construction sites	^
9.113	Sort C&D waste from demolition of existing facilities to recover recyclable portions such as metals;	All construction sites	^
	Segregation and storage of different types of waste in different containers, skips or stockpiles to enhance reuse or recycling of materials and their proper disposal.		^
	Encourage collection of aluminium cans, PET bottles and paper by providing separate labelled bins to enable these wastes to be segregated from other general refuse generated by the work force.		^
	Any unused chemicals or those with remaining functional capacity shall be recycled.		^
	Proper storage and site practices to minimise the potential for damage or contamination of construction materials.		^
9.115	Nomination of an approved person, such as a site manager, to be responsible for good site practices, arrangements for collection and effective disposal to an appropriate facility, of all wastes generated at the site.	All construction sites	^
	Training of site personnel in proper waste management and chemical waste handling procedures.		^
9.115	Develop and provide toolbox talk for on-site sorting of C&D materials to enhance worker's awareness in handling, sorting, reuse and recycling of C&D materials.	All construction sites	^



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

<b>EIA Ref.</b>	<b>Recommended Mitigation Measures</b>	<b>Location of the measure</b>	<b>Implementation Status</b>
<b>E</b>	<b>Terrestrial Ecology</b>		
10.94	To implement effective noise mitigation measures as recommended in Section 4 of EIA.	All construction sites	N/A
10.95	Dust control practices such as regular watering, complete coverage of any aggregate or dusty material storage piles, and re-schedule of dusty activities during high-wind conditions as well as other measures recommended in Section 3 of EIA, should be implemented.		^
10.96	Fences/hoardings should be erected and installed along the boundary of the works areas.		^
10.97	Standard good site practices as suggested in Section 10 of EIA should be implemented.		N/A
10.98	Provision of proper drainage system and runoff control measures such as use of sand/silt traps, oil/grease separators, sedimentation tanks, etc.		^
<b>F</b>	<b>Landscape and Visual</b>		
Table 13.7	Topsoil, where identified, should be stripped and stored for re-use in the construction of the soft landscape works, where practical.	All construction sites	^
	Existing trees to be retained on site should be carefully protected during construction.		^
	Trees unavoidably affected by the works should be transplanted where practical.		^
	Compensatory tree planting should be provided to compensate for felled trees.		^
	Control of night-time lighting.		^
Table 13.7	Erection of decorative screen hoarding compatible with the surrounding setting.	All construction sites	N/A
<b>G</b>	<b>Marine Ecology</b>		
11.137	To minimize the potential indirect impacts on water quality from construction site runoff and various construction activities, the practices outlined in ProPECC PN 1/94 Construction Site Drainage should be adopted.	All construction sites	^
<b>H</b>	<b>Hazard to Life</b>		
14A.201	Limiting use of cranes in terms of locations, lifting height, swing angle and setting up safety zone.	Exact location will be determined on construction site by the engineer	^

Remarks:	^ Compliance of mitigation measure;
	N/A Not Applicable;
	* Recommendation was made during site audit but improved/rectified by the contractor.
	# Recommendation was made during site audit and to be improved / rectified by the contractor.
	X Non-compliance of mitigation measure;
	• Non-compliance but rectified by the contractor;

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**APPENDIX D**  
**EVENT/ACTION PLANS**

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**APPENDIX D – Event / Action Plans**

**Table D-1 Event / Action Plan For Air Quality**

EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
ACTION LEVEL				
1. Exceedance for one sample	1. Identify source, investigate the causes of exceedance and propose remedial measures; 2. Inform IEC and ER; 3. Repeat measurement to confirm finding; 4. Increase monitoring frequency to daily.	1. Check monitoring data submitted by ET; 2. Check Contractor’s working method.	1. Notify Contractor.	1. Rectify any unacceptable practice; 2. Amend working methods if appropriate.
2. Exceedance for two or more consecutive samples	1. Identify source; 2. Inform IEC and ER; 3. Advise the ER on the effectiveness of the proposed remedial measures; 4. Repeat measurements to confirm findings; 5. Increase monitoring frequency to daily; 6. Discuss with IEC and Contractor on remedial actions required; 7. If exceedance continues, arrange meeting with IEC and	1. Check monitoring data submitted by ET; 2. Check Contractor’s working method; 3. Discuss with ET and Contractor on possible remedial measures; 4. Advise the ET on the effectiveness of the proposed remedial measures; 5. Supervise Implementation of remedial measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented	1. Submit proposals for remedial to ER within 3 working days of notification; 2. Implement the agreed proposals; 3. Amend proposal if appropriate

EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
	ER; 8. If exceedance stops, cease additional monitoring			
<b>LIMIT LEVEL</b>				
1. Exceedance for one sample	1. Identify source, investigate the causes of exceedance and propose remedial measures; 2. Inform ER, Contractor and EPD; 3. Repeat measurement to confirm finding; 4. Increase monitoring frequency to daily; 5. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss with ET and Contractor on possible remedial measures; 4. Advise the ER on the effectiveness of the proposed remedial measures; 5. Supervise implementation of remedial measures	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within 3 working days of notification; 3. Implement the agreed proposals; 4. Amend proposal if appropriate

EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
2. Exceedance for two or more consecutive samples	<ol style="list-style-type: none"> <li>1. Notify IEC, ER, Contractor and EPD;</li> <li>2. Identify source;</li> <li>3. Repeat measurement to confirm findings;</li> <li>4. Increase monitoring frequency to daily;</li> <li>5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented;</li> <li>6. Arrange meeting with IEC and ER to discuss the remedial actions to be taken;</li> <li>7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results;</li> <li>8. If exceedance stops, cease additional monitoring</li> </ol>	<ol style="list-style-type: none"> <li>1. Check monitoring data submitted by ET;</li> <li>2. Check Contractor's working method;</li> <li>3. Discuss amongst ER, ET, and Contractor on the potential remedial actions;</li> <li>4. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly;</li> <li>5. Supervise the implementation of remedial measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Confirm receipt of notification of failure in writing;</li> <li>2. Notify Contractor;</li> <li>3. In consolidation with the IEC, agree with the Contractor on the remedial measures to be implemented;</li> <li>4. Ensure remedial measures properly implemented;</li> <li>5. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated.</li> </ol>	<ol style="list-style-type: none"> <li>1. Take immediate action to avoid further exceedance;</li> <li>2. Submit proposals for remedial actions to IEC within 3 working days of notification;</li> <li>3. Implement the agreed proposals;</li> <li>4. Resubmit proposals if problem still not under control;</li> <li>5. Stop the relevant portion of works as determined by the ER until the exceedance is abated</li> </ol>

**Table D-2 Event / Action Plan For Construction Noise**

EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
Action Level being exceeded	<ol style="list-style-type: none"> <li>1. Notify ER, IEC and Contractor;</li> <li>2. Carry out investigation;</li> <li>3. Report the results of investigation to the IEC, ER and Contractor;</li> <li>4. Discuss with the IEC and Contractor on remedial measures required;</li> <li>5. Increase monitoring frequency to check mitigation effectiveness</li> </ol>	<ol style="list-style-type: none"> <li>1. Review the investigation results submitted by the ET;</li> <li>2. Review the proposed remedial measures by the Contractor and advise the ER accordingly;</li> <li>3. Advise the ER on the effectiveness of the proposed remedial measures</li> </ol>	<ol style="list-style-type: none"> <li>1. Confirm receipt of notification of failure in writing;</li> <li>2. Notify Contractor;</li> <li>3. In consolidation with the IEC, agree with the Contractor on the remedial measures to be implemented;</li> <li>4. Supervise the implementation of remedial measures</li> </ol>	<ol style="list-style-type: none"> <li>1. Submit noise mitigation proposals to IEC and ER;</li> <li>2. Implement noise mitigation proposals</li> </ol>
Limit Level being exceeded	<ol style="list-style-type: none"> <li>1. Inform IEC, ER, Contractor and EPD;</li> <li>2. Repeat measurements to confirm findings;</li> <li>3. Increase monitoring frequency;</li> <li>4. Identify source and investigate the cause of exceedance;</li> <li>5. Carry out analysis of Contractor's working procedures;</li> <li>6. Discuss with the IEC, Contractor and ER on remedial measures required;</li> <li>7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results;</li> <li>8. If exceedance stops, cease additional monitoring</li> </ol>	<ol style="list-style-type: none"> <li>1. Discuss amongst ER, ET, and Contractor on the potential remedial actions;</li> <li>2. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly.</li> </ol>	<ol style="list-style-type: none"> <li>1. Confirm receipt of notification of failure in writing;</li> <li>2. Notify Contractor;</li> <li>3. In consolidation with the IEC, agree with the Contractor on the remedial measures to be implemented;</li> <li>4. Supervise the implementation of remedial measures;</li> <li>5. If exceedance continues, consider stopping the Contractor to continue working on that portion of work which causes the exceedance until the exceedance is abated</li> </ol>	<ol style="list-style-type: none"> <li>1. Take immediate action to avoid further exceedance;</li> <li>2. Submit proposals for remedial actions to IEC and ER within 3 working days of notification;</li> <li>3. Implement the agreed proposals;</li> <li>4. Submit further proposal if problem still not under control;</li> <li>5. Stop the relevant portion of works as instructed by the ER until the exceedance is abated</li> </ol>



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**APPENDIX E  
COMPLAINT LOG**

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**APPENDIX E – COMPLAINT LOG**

**Cumulative complaints received:**

<b>Log Ref.</b>	<b>Location</b>	<b>Received Date</b>	<b>Details of Complaint</b>	<b>Investigation/Mitigation Action</b>	<b>Status</b>
N.A.	N.A.	N.A.	N.A.	N.A.	N.A.

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**APPENDIX F  
SUMMARY OF EXCEEDANCE  
RECORDED OVER THE PROJECT  
PERIOD**

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## **APPENDIX F – SUMMARY OF EXCEEDANCE**

- a) Exceedance Report for 1-hr TSP (NIL)**
  
- b) Exceedance Report for 24-hr TSP (NIL)**
  
- c) Exceedance Report for Construction Noise (87)**

87 non-project related exceedances on construction noise have been recorded at the noise monitoring stations during the construction phase of Contract No. DC/2009/23. All the recorded noise exceedances were reported to be caused by traffic noise and were unrelated to this Project's works.

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**APPENDIX G**  
**TOTAL WASTE FLOW TABLE**

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Name of Department : Harbour Area Treatment Scheme Stage 2A – Upgrading of Preliminary Treatment Works      Contract No DC/2009/23  
 at North Point , Wan Chai East and Central

APPENDIX J    SUMMARY OF TOTAL WASTE FLOW TABLE

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly					Special Waste			
	Total Quantity Generated	Broken Concrete (4)	Reused in the Contract	Reused in other Projects	Disposal as Public Fill	Import Fill	Metals	Paper / Cardboard Packaging	Plastics (3)	Chemical Waste	Other, e.g. general refuse	Screening (CPTW)	Grit (CPTW)	Screening (NPPTW)	Grit (NPPTW)
	[in '000m <sup>3</sup> ]	[in '000m <sup>3</sup> ]	[in '000m <sup>3</sup> ]	[in '000m <sup>3</sup> ]	[in '000m <sup>3</sup> ]	[in '000m <sup>3</sup> ]	[in '000kg]	[in '000kg]	[in '000kg]	[in '000kg]	[in '000m <sup>3</sup> ]	[in '000m <sup>3</sup> ]	[in '000m <sup>3</sup> ]	[in '000m <sup>3</sup> ]	[in '000m <sup>3</sup> ]
<b>TOTAL</b>	<b>28.687</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>28.687</b>	<b>0.000</b>	<b>72.810</b>	<b>9.205</b>	<b>1.027</b>	<b>1.030</b>	<b>2.280</b>	<b>3.909</b>	<b>2.432</b>	<b>1.916</b>	<b>1.214</b>

- Notes :
- (1) The performance targets are given in PS Clause 6(14).
  - (2) The waste flow table shall also include C&D materials that are specified in the Contract to be imported for use at the site.
  - (3) Plastics refer to plastic bottles / containers, plastic sheets / foam from packaging material.
  - \* (4) The contractor shall also submit the latest forecast of the total amount of C&D materials expected to be generated from the Works, together with a breakdown of the nature where to total amount of C&D materials expected to be generated from the Works is equal to or exceeding 50,000m<sup>3</sup>. (PS Clause 25.25S (6)(b) refers).  
 [Delete Note (4) and the table above on the forecast, where inapplicable].
  - (5) The assumed density (kg/m<sup>3</sup>) for both C&D material and general refuse.  
 C&D material 2000kg/m<sup>3</sup>  
 General refuse 500kg/m<sup>3</sup>
  - (6) Conversion factors for reporting purpose:      in-situ: rock = 2.5 tonnes/m<sup>3</sup> ; soil = 2.0 tonnes/m<sup>3</sup>      excavated: rock = 2.0 tonnes/m<sup>3</sup> ; soil = 1.8 tonnes/m<sup>3</sup>      Special Waste (Grit) = 1.2 tonnes/m<sup>3</sup>  
 broken concrete and bitumen = 2.4 tonnes/m<sup>3</sup>      C&D Waste = 0.9 tonnes/m<sup>3</sup>      bentonite slurry = 2.8 tonnes/m<sup>3</sup>      Chemical waste 1 Litres = 1 kg      Special Waste (Screening) = 0.31 tonnes/m<sup>3</sup>

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**APPENDIX H  
PROJECT'S CONSTRUCTION ACTIVITY  
PROGRAMME**

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