

Issue No. : 1
Issue Date : December 2010
Project No. : 912

**PROVISION OF CREMATORS AT
WO HOP SHEK CREMATORIUM**

**QUARTERLY ENVIRONMENTAL
MONITORING & AUDIT REPORT
(AUGUST 2010 – OCTOBER 2010)**

Prepared By:

ALLIED ENVIRONMENTAL CONSULTANTS LTD.

COMMERCIAL-IN-CONFIDENCE

Allied Environmental Consultants Limited
Acousticians & Environmental Engineers

19/F., Kwan Chart Tower, 6 Tonnochy Road, Wan Chai, Hong Kong
Tel: (852) 2815 7028 Fax: (852) 2815 5399 Email: info@aechk.com





3D Visualisation
Environment & Energy
Information Technology



ISO 9001 : 2008
Certificate No.: CC 3988

Architectural Services Department
Architectural Branch
41/F, Queensway Government Offices
66 Queensway
Hong Kong

Your reference:

Our reference: HKASD101/50/100603

Date: 3 December 2010

Attn.: Mr Andrew NAM / Ms Salina LEE

BY FAX ONLY
(Fax no.: 2524 7981)

Dear Sirs

Quotation Contract No. 9/2009/AB1
Provision of Cremators at Wo Hop Shek Crematorium - Independent Environmental Checker Service
Quarterly EM&A Report (August 2010 – October 2010)

We refer to your e-mail from your Environmental Team attaching a copy of the quarterly EM&A report (August 2010 – October 2010) on 2 December 2010. We have no comment and, hereby, endorse the report.

Should you have any queries, please do not hesitate to contact our Mr James Choi on 2869 6018.

Yours faithfully
EDMS CONSULTING LTD

Andy W L Chung
Independent Environmental Checker

AC/lyl

cc AEC – Ms Grace Kwok (Fax: 2815 5399)

Issue No. : 1
Issue Date : December 2010
Project No. : 912

**PROVISION OF CREMATORS AT
WO HOP SHEK CREMATORIUM**

**QUARTERLY ENVIRONMENTAL
MONITORING & AUDIT REPORT
(AUGUST 2010 – OCTOBER 2010)**

Prepared By:

ALLIED ENVIRONMENTAL CONSULTANTS LTD.

COMMERCIAL-IN-CONFIDENCE

Certified by:



Grace M. H. Kwok
Environmental Team Leader

Issue No. : 1
Issue Date : December 2010
Project No. : 912


PROVISION OF CREMATORS AT WO HOP SHEK CREMATORIUM


QUARTERLY ENVIRONMENTAL MONITORING & AUDIT REPORT (AUGUST 2010 – OCTOBER 2010)

Prepared By:

ALLIED ENVIRONMENTAL CONSULTANTS LTD.

COMMERCIAL-IN-CONFIDENCE

Author: 
Nic H. H. Lam
BSc (Hons) AMHKIOA

Checked: 
Winnie M. W. Ma
BEnvMgmt(Hons) MSc AMHKIOA

Approved: 
Grace Kwok
BEng(Hons) MHKIEL MHKIOA
MISWA MINA MRAPA LEED AP

This report has been prepared by Allied Environmental Consultants Limited with all reasonable skill, care and diligence within the terms of the Agreement with the client, incorporating our General Terms and Conditions of Business and taking account of the resources devoted to it by agreement with the client.

We disclaim any responsibility to the client and others in respect of any matters outside the scope of the above.

This report is confidential to the client and we accept no responsibility of whatsoever nature to third parties to whom this report, or any part thereof, is made known. Any such party relies upon the report at their own risk.

Table of Contents

Table of Contents	i
List of Tables	ii
List of Figures	ii
List of Appendices	ii
EXECUTIVE SUMMARY	1
1. PROJECT BACKGROUND	2
1.1 Project Organization and Contact Personnel	3
2. CONSTRUCTION WORKS & PROGRAMME	3
3. SUMMARY OF EM&A REQUIREMENT	5
4. AIR QUALITY MONITORING	7
4.1 Air Quality Monitoring Methodology	7
4.2 Monitoring Equipment	7
4.3 Air Quality Monitoring Location	7
5. RESULTS	8
5.1. Air Quality	8
5.2. Weather Conditions	8
6. SITE INSPECTION & AUDIT	8
7. LANDSCAPE AND VISUAL IMPACTS	11
8. NON-COMPLIANCE, COMPLAINTS, NOTIFICATIONS OF SUMMONS AND SUCCESSFUL PROSECUTIONS	11
9. WASTE MANAGEMENT	11
10. RECOMMENDATIONS AND CONCLUSIONS	11
10.1. Recommendations	11
10.2. Conclusions	12

List of Tables

Table 1	Contact Details of Key Personnel
Table 2	Interrelationship between Construction Activities and Mitigation Measures
Table 3	Action and Limit Level for Air Quality Impact Monitoring
Table 4	Event Action Plan
Table 5	Descriptions of Air Quality Monitoring Locations
Table 6	Summary of Weather Conditions during the Monitoring Period
Table 7	Summary of Site Inspections

List of Figures

Figure 1	Site Location Plan
Figure 2	Location of Air Quality Monitoring Station
Figure 3	Photos of Air Quality Monitoring Station

List of Appendices

Appendix A	Calibration Record of High-Volume TSP Sampler
Appendix B	Summary and Graphical Plot of 1-Hour TSP Monitoring Record
Appendix C	Summary and Graphical Plot of 24-Hour TSP Monitoring Record
Appendix D	Wind Record

EXECUTIVE SUMMARY

Allied Environmental Consultants Limited (AEC) has been appointed to conduct an environmental monitoring and audit (EM&A) program for the Provision of Cremators at Wo Hop Shek Crematorium (the “Project”). The construction works of the Project commenced on 1st November 2009. This report is the fourth quarterly EM&A report, which summarizes the environmental monitoring and audit results recorded during the period from 1st August 2010 to 31st October 2010.

Based on the monitoring results, the air quality and construction noise levels during the reporting period complied with the environmental requirements in EM&A Manual. There were no environmental complaints received in this reporting quarter. No notification of summons or prosecution was received.

Construction activities to be undertaken in November 2010 include construction of retaining wall; site drainage works and backfilling; construction works for Area 2; construction of the cremator plant room and pipe piling at retaining wall of Area 4. Potential environmental impacts include dust generation from drilling, material transfer, demolition works, vehicular movement, stockpile of excavated materials and piling process; noise from demolition and construction of RC structure; wastewater generated from spraying water and piling process; and generation of various wastes including C&D and chemical wastes. The Contractor should properly implement environmental mitigation measures as per the implementation schedule in the EM&A manual to ensure no adverse environmental impacts to be arisen from the construction works. The Contractor is also reminded to maintain good housekeeping at the site.

1. PROJECT BACKGROUND

The existing Wo Hop Shek Crematorium is a coffin crematorium with two twin cremators. A skeletal cremator building with a single cremator operates nearby for the cremation of skeletal remains from burial. The skeletal cremator and the coffin cremators were commissioned in the 1960's and 1991 respectively.

As the five existing cremators had approached the end of their serviceable life, the Food and Environmental Hygiene Department (FEHD) proposed to demolish the existing coffin crematorium and the skeletal cremator building and to construct in-situ a new crematorium in the same site.

An Environmental Impact Assessment (EIA) was carried out for the Provision of Cremators at Wo Hop Shek Crematorium (hereafter referred to as the "Project") and the EIA Report was approved by Environmental Protection Department (EPD) in June 2008. The Environmental Permit (EP-329/2009) for the Project was issued by EPD in February 2009.

The locations of project site and air sensitive receivers are shown in **Figure 1**. The construction phase is divided in the three phases as outlined below:

Phase I (Year 2009 to Year 2011)

Construction works include the demolition of the existing coffin crematorium building, transformer room and pump room and provision of five new coffin cremators, one dual-purpose cremator, one new skeletal cremator, one cremation plant room with sufficient space for housing nine single cremators and other ancillary facilities such as service halls. The new crematorium will provide seven cremators upon completion of Phase I.

Phase II (Year 2012)

The existing skeletal cremator building will be demolished upon completion of Phase I (i.e. there will be no overlapping between Phases I and II).

Phase III: Future Expansion Phase (for completion by around 2014)

Two additional cremators and one additional service hall will be provided upon completion of Phase II to allow future expansion.

In July 2009, Architectural Services Department (ArchSD) as the works agent has awarded the construction contract of the Project to Wan Chung Construction Co. Ltd. ("the Contractor"). The Contractor has appointed Allied Environmental Consultants Limited (AEC) as the Environmental Team (ET) to undertake Environmental Monitoring and Audit (EM&A) programme in accordance with the EM&A Manual under the approved EIA report, which details the EM&A requirements for the construction and operation of the Project, and the EP-329/2009.

The Construction Programme of the Project is shown in Appendix A. The construction works commenced on 1st November 2009. This report is the fourth quarterly EM&A report, which details the EM&A results recorded during the period from 1st August 2010 to 31st October 2010.

1.1 Project Organization and Contact Personnel

Key personnel and contact particulars are summarized in *Table 1*.

Role	Department / Company	Names	Contact Number	Fax Number
Environmental Permit Holder	Food and Environmental Hygiene Department	Ms. Karen Sin	3141 1226	3101 0450
Architect	Architecture Services Department	Mr. Andrew Nam	2867 3662	2290 2170
Main Contractor	Wan Chung Construction Co., Limited	Mr. Sunny Ngan Mr. Frank So	9491 9058 9863 6587	2676 7966
Environmental Team Leader	Allied Environmental Consultants Limited	Mr. Adi Lee Ms. Grace Kwok	2815 7028	2815 5399
Independent Environmental Checker	EDMS Consulting Limited	Mr. Andy Chung	2869 6018	3007 8556

Table 1 Contact Details of Key Personnel

2. CONSTRUCTION WORKS & PROGRAMME

The major works undertaken and/or completed during the reporting period are listed below:

- Construction of retaining wall;
- Site backfilling at the stockpile area;
- Site drainage works;
- Excavation for Area 2; and
- Construction of the cremator plant room.

Figure 2 shows the works undertaken during the reporting period and *Table 2* shows the interrelationship between construction activities and environmental mitigation measures in the reporting period.

Construction Works	Major Environmental Impact	Mitigation Measures
Construction of Retaining wall	Construction dust, construction noise and Water Quality Impact.	<ol style="list-style-type: none"> 1. Watering and imperious sheeting should be provide to dusty materials from drilling, inclusive of materials transfer; 2. Water spraying should be provided to haul road and demolition works; 3. Dust emission from stockpile of excavated materials should be covered by imperious sheeting; and 4. Wastewater generated from spraying water should be well treated and recycled.
Site backfilling at the stockpile area	Construction dust, construction noise and waste management.	Provide water spraying and imperious sheet to handling of debris material. Well-maintained and quiet plants were used. Trip record should maintain properly.
Site drainage works	Construction dust and construction noise.	Water spraying to loading /unloading process and stockpile. Well-maintained and quiet plants were used.
Construction works for Area 2	Construction dust, construction noise and waste management.	Provide water spraying and imperious sheet to handling of debris material. Well-maintained and quiet plants were used. Trip record should maintain properly.
Construction of the cremator plant room	Construction dust and construction noise.	Water spraying to loading /unloading process and stockpile. Well-maintained and quiet plants were used.

Table 2 Interrelationship between Construction Activities and Mitigation Measures

3. SUMMARY OF EM&A REQUIREMENT

For regular impact monitoring, the sampling frequency of at least once in every six-days, was strictly observed at the monitoring station for 24-hr TSP monitoring. For 1-hr TSP monitoring, the sampling frequency of at least three times in every six-days was undertaken when the highest dust impact occurs.

From baseline monitoring results, the Action and Limit Levels for air quality are summarized in *Table 3*.

Parameters	Monitoring Location	Baseline Level ($\mu\text{g}/\text{m}^3$)	Action Level ($\mu\text{g}/\text{m}^3$)	Limit Level ($\mu\text{g}/\text{m}^3$)
24-Hour TSP Level	A22a	42.0	157.3	260
	A22b	41.6	157.0	260
1-Hour TSP Level	A22a	48.8	281.7	500
	A22b	46.8	280.4	500

Table 3 Action and Limit Level for Air Quality Impact Monitoring

Should non-compliance of the above Action and Limit levels occurs, actions in accordance with the Event and Action Plan in *Table 4*.

Event	Action			
	ET	IEC	AR	Contractor
Action Level				
Exceedance for one sample	1. Identify source, investigate the causes of complaint and propose remedial measures; 2. Inform IEC and AR; 3. Repeat measurement to confirm finding; 4. Increase monitoring frequency to daily.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method.	1. Notify Contractor.	1. Rectify any unacceptable practice; 2. Amend working methods if appropriate.
Exceedance for two or more consecutive samples	1. Identify source; 2. Inform IEC and AR; 3. Advise the AR 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	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	1. Confirm receipt of notification of exceedance in writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented.	1. Submit proposals for remedial to AR within three working days of notification; 2. Implement the agreed proposals; 3. Amend proposal if appropriate.

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

Table 4 Event and Action Plan

4. AIR QUALITY MONITORING

4.1 Air Quality Monitoring Methodology

TSP levels in 1-hour and 24-hour were measured to indicate the impacts of construction dust on air quality. TSP levels were measured by following the standard high volume sampling (HVS) method as set out in the Title 40 of the Code of Federal Regulations, Chapter 1 (Part 50). 1-hour TSP samples were taken three times a day between 0700-1900 hours. 24-hour TSP samples were taken every six days.

4.2 Monitoring Equipment

High Volume Sampler (HVS) in compliance with the specifications of section 2.2.1 of the EM&A Manual was used for carrying out the 1-hour and 24-hour TSP monitoring at the designated location. The model number of the HVSs is Anderson GMWS-2310 ACCU-VOL.

The HVSs are equipped with an electronic mass flow controller and be calibrated against a traceable standard at regular intervals. The flow rate of each HVS with mass flow controller is calibrated using an orifice calibrator. Initial calibration of dust monitoring equipment is conducted upon installation and prior to commissioning. Five point calibration is carried out every six months. The Calibration Certificates of the High-Volume TSP Sampler are given in *Appendix A*. The weighing of the filter paper was undertaken by SGS Hong Kong Limited.

Wind data monitoring equipment was set up on 30 November 2009 and set up at conspicuous locations for logging wind speed and wind direction near to the dust monitoring locations. Installation and operation of wind data monitoring equipment followed the followings:

- Wind sensors were installed on masts at an elevated level 10m above ground so that they are clear of obstructions of turbulence caused by the buildings;
- The wind data were captured by a data logger and to be downloaded for processing at least once a month;
- The wind data monitoring equipment shall be re-calibrated at least once every six months; and
- Wind direction is divided into 16 sectors of 22.5 degrees each.

Weather data were obtained from the on-site wind stations in the reporting period.

4.3 Air Quality Monitoring Location

1-hour and 24-hour TSP monitoring were conducted to monitor the air quality. Air quality monitoring were conducted at two designated air quality monitoring locations during construction phase: (i) 83 Wo Ka Lau Road (A22a) and (ii) 51D Wo Hop Shek San Tsuen (A22b) as shown in *Figure 2*. Details of the two air quality monitoring stations are shown in *Table 5*.

ID	Monitoring Location	Description of Monitoring Location
A22a	83 Wo Ka Lau Road	G/F at the front gate of 83 Wo Ka Lau Road
A22b	51D Wo Hop Shek San Tsuen	G/F boundary wall of house 51D of Wo Hop Shek San Tsuen

Table 5 Descriptions of Air Quality Monitoring Locations

5. RESULTS

5.1. Air Quality

No exceedance was recorded in this quarter. Summary and graphical plots of air quality monitoring record of 1-hour TSP levels and 24-hour TSP levels are given in *Appendix B and Appendix C*.

5.2. Weather Conditions

Weather data were obtained from the on-site wind stations in the reporting period. *Table 6* summarizes the wind data during the monitoring dates. Wind data records from the on-site wind stations are shown in *Appendix D*.

Date	Weather	Prevailing Wind Direction	Daily Average Wind Speed (m/s)
6 August 2010	Fine	NE	0.16
12 August 2010	Fine	SE	0.10
18 August 2010	Fine	E	0.13
24 August 2010	Cloudy	SE	0.17
30 August 2010	Sunny	E	0.16
4 September 2010	Cloudy	E	0.1
10 September 2010	Fine	N	0.8
16 September 2010	Sunny	NE	0.1
22 September 2010	Cloudy	SW	0.2
28 September 2010	Sunny	S	0.3
4 October 2010	Cloudy	NE	0.14
10 October 2010	Fine	NE	0.2
16 October 2010	Sunny	NE	0.1
22 October 2010	Cloudy	N	2.78
28 October 2010	Sunny	NE	0.16

Table 6 Summary of Weather Conditions during the Monitoring Period

6. SITE INSPECTION & AUDIT

Weekly site inspections were carried out by representatives of the ET. A total of thirteen site inspections were conducted by the ET in this reporting period. Observations by the ET, actions by the Contractor and outcome are summarized in the *Table 7*.

Date	Observations	Action taken by Contractor	Outcome
5 August 2010	No observations during inspection.	Contractor was required to keep up with the mitigation	Nil.

Date	Observations	Action taken by Contractor	Outcome
		measures.	
13 August 2010	Exposed slope surface near the construction of cremator was not properly covered.	Tarpaulin sheet was provided to cover the exposed slope surface.	The situation was rectified as observed on 25 August 2010 (Closed).
	The unpaved site area appeared dry.	The unpaved site area was properly watered.	The situation was rectified as observed on 20 August 2010 (Closed).
20 August 2010	Exposed slope surface near the construction of cremator was not properly covered and some tarpaulin sheets were not in a good condition.	New tarpaulin sheets were provided.	The situation was rectified as observed on 25 August 2010 (Closed).
25 August 2010	Water was accumulated at the western portion of site outside the retaining wall of the proposed building development.	Provide additional drainage provisions.	The situation was rectified as observed on 3 September 2010 (Closed).
3 September 2010	No observations during inspection.	Contractor was required to keep up with the mitigation measures.	Nil.
10 September 2010	Rain water was accumulated on the tarpaulin sheet surface and unpaved area.	Dewatering was provided.	The situation was rectified as observed on 17 September 2010 (Closed).
	Some aluminium cans and plastic bottles area not separately on-site.	The general refuse was recycled as applicable.	The situation was rectified as observed on 17 September 2010 (Closed).
	Wrong naming was given to waste storage area.	The naming of waste storage area was amended.	The situation was rectified as observed on 17 September 2010 (Closed).
	Oil stain was observed on-site.	The oil stain was properly removed	The situation was rectified as observed on 17 September 2010 (Closed).
17 September 2010	Exposed slope surface near the construction of cremator was not properly covered and	New tarpaulin sheets were provided.	The situation was rectified as observed on 24 September 2010 (Closed).

Date	Observations	Action taken by Contractor	Outcome
	some tarpaulin sheets.		
24 September 2010	Construction waste was not segregated from the construction materials.	A proper storage area was provided for collection of construction waste.	The situation was rectified as observed on 30 September 2010 (Closed).
30 September 2010	Muddy water was accumulated at the basement.	Muddy water was cleaned up through dewatering.	The situation was rectified as observed on 8 October 2010 (Closed).
8 October 2010	Stockpile of cement was left uncovered on-site.	The dusty stockpile of cement was covered.	The situation was rectified as observed on 15 October 2010 (Closed).
	General refuse was accumulated at the waste storage area.	The general refuse was disposed of properly.	The situation was rectified as observed on 15 October 2010 (Closed).
	Muddy water was accumulated in the u-channel.	Provisions were given to divert the excess water.	The situation was rectified as observed on 15 October 2010 (Closed).
	Unused concrete was found near the site entrance.	The unused concrete was removed.	The situation was rectified as observed on 15 October 2010 (Closed).
15 October 2010	The waste storage area was blocked by the construction materials.	The construction materials were relocated.	The situation was rectified as observed on 21 October 2010 (Closed).
21 October 2010	The sedimentation tank was fully occupied.	The accumulated water in the sedimentation tank was discharged.	The situation was rectified as observed on 29 October 2010 (Closed).
	Ponds were observed on-site.	Provisions were given to divert the excess water.	The situation was rectified as observed on 5 November 2010 (Closed).
29 October 2010	Unpaved road appeared dry.	Regular watering was provided.	The situation was rectified as observed on 5 November 2010 (Closed). The situation was rectified as observed on 5 November 2010 (Closed).
	General refuse was accumulated at the waste storage area.	The general refuse was disposed of properly.	

Table 7 Summary of Site Inspections

During site inspections in the reporting quarter, no non-conformance of implementation of environmental mitigation measures was identified. All environmental mitigation measures for construction stages as stated in approved EIA Report, EM&A Manual and EP-329/2009 were carried out properly in the reporting quarter.

7. LANDSCAPE AND VISUAL IMPACTS

A total of six landscape and visual impact inspections were carried out on 13th and 25th August 2010, 10th and 24th September 2010 and 8th and 21st October 2010. In August 2010, the transplanted trees *Aquilaria sinensis* showed deterioration in health condition at transplanting receptor site “T1”. Daily watering and closely monitoring is recommended. The ecological monitoring was completed in August 2010.

8. NON-COMPLIANCE, COMPLAINTS, NOTIFICATIONS OF SUMMONS AND SUCCESSFUL PROSECUTIONS

In the site inspection by the EPD on 31st October 2010, it was observed that excavator, clawler crane, crane truck and submersible pumps had been used for carrying out construction work other than percussive piling in respect of which not included in the construction noise permit GW-RN0145-10. The contractor immediately ceased the operation of equipments and committed to follow all conditions of the construction noise permit. In this reporting month, no other complaint, inspection notice, notification of summons or prosecution was received. No non-compliance was recorded.

9. WASTE MANAGEMENT

A total of 3,802.5 m³ of inert C&D material was disposed to Tuen Mun Area 38 Fill Bank. 3 tonnes of metal wastes and 0.351 m³ of general refuse were disposed of to NENT Landfill. No chemical waste was generated in this reporting quarter.

10. RECOMMENDATIONS AND CONCLUSIONS

10.1. Recommendations

In accordance with the environmental site audits undertaken during the reporting quarter, the following recommendations are made:

- Excess water should be removed from the unpaved area / excavation area / sump pit;
- Muddy water and surface runoff should be cleaned up;
- Regular watering should be given to unpaved haul road and stockpile of dusty materials;
- Enclosure should be given for dusty operation and exposed slope surface;
- Proper drainage provisions should be given for ground at lower level;

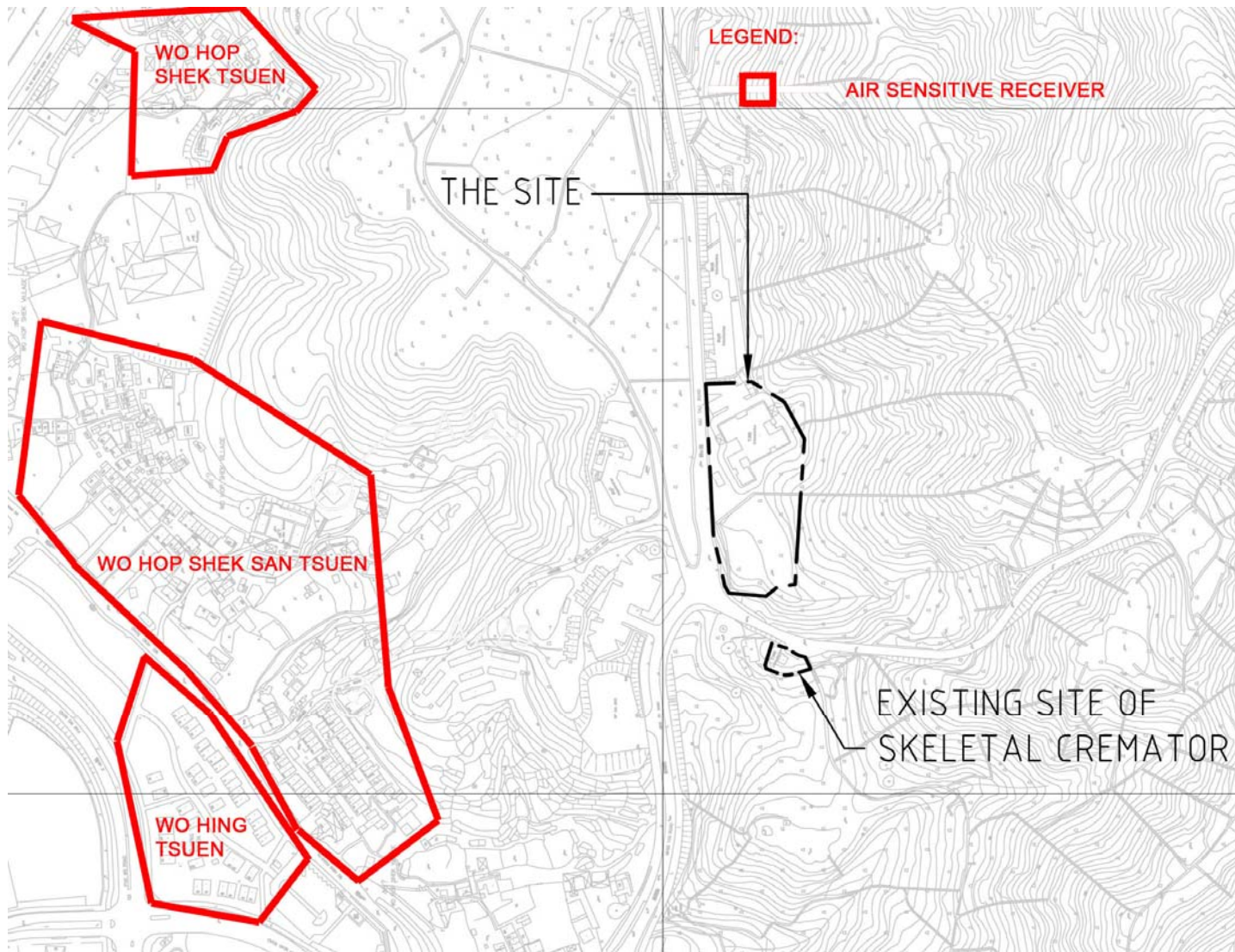
- The general refuse should be recycled as applicable;
- The waste storage area should be setup according to EPD;
- Oil stain should be removed;
- Excess waste should be removed regularly to prevent from accumulation; and
- Provide dewatering after rains.

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

10.2. Conclusions

Environmental monitoring was carried out for the Provision of Cremators at Wo Hop Shek Crematorium in the reporting period. 1-hour and 24-hour TSP air quality monitoring were conducted at (i) 83 Wo Ka Lau Road (A22a) and (ii) 51D Wo Hop Shek San Tsuen (A22b) during the period from 1st August 2010 to 31st October 2010.

All monitoring results complied with the relevant action and limit levels. No environmental complaints and notification of summons or prosecution were received during the reporting period.



PROVISION OF CREMATORS AT WO HOP SHEK CREMATORIUM AT KIU TAU ROAD
SITE LOCATION PLAN

Figure No.

1

Rev.:

0

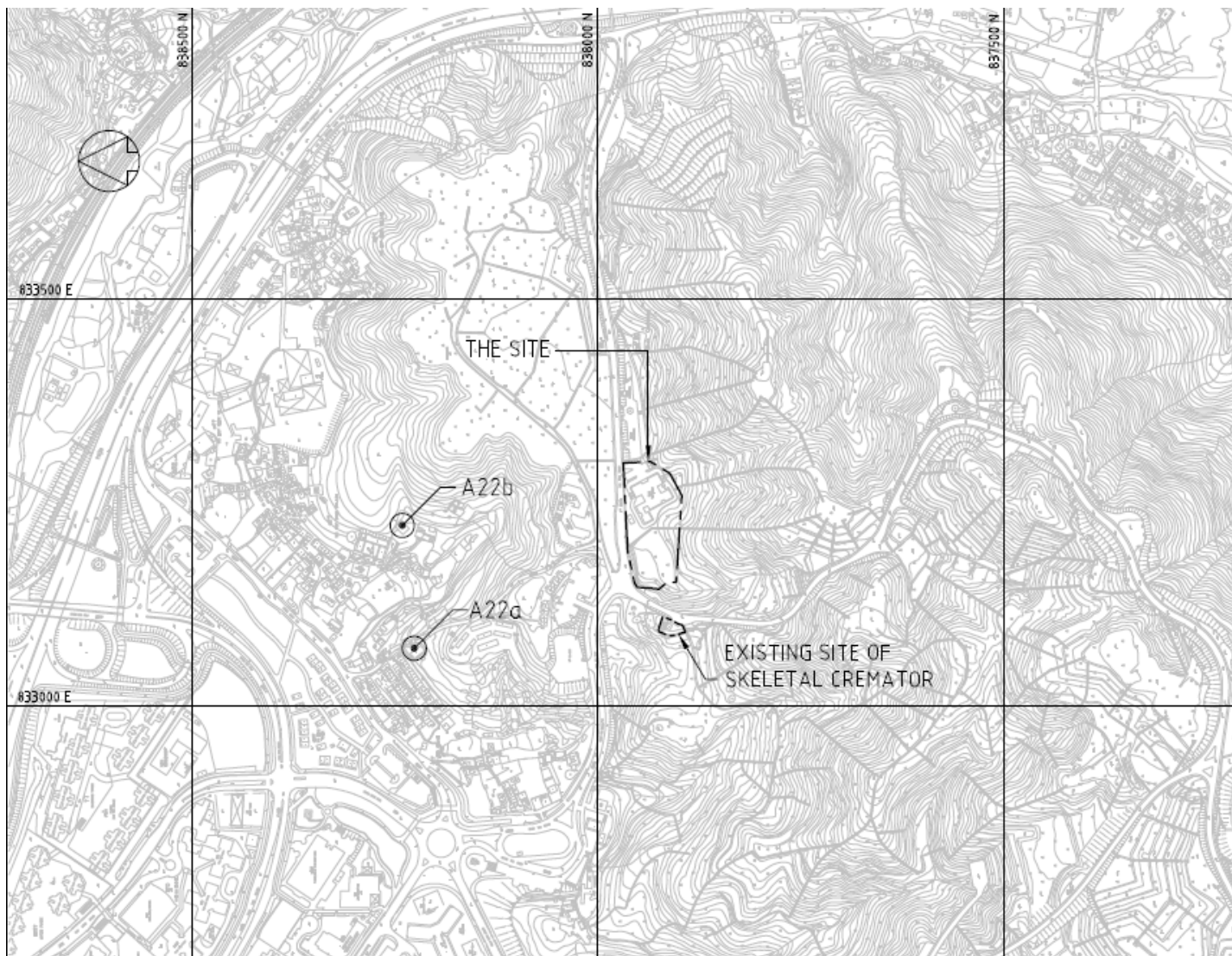
Scale

NTS

Date

2/10





PROVISION OF CREMATORS AT WO HOP SHEK CREMATORIUM AT KIU TAU ROAD
LOCATION OF AIR QUALITY MONITORING STATION

Figure No.

2

Rev.:

0

Scale

NTS

Date

2/10





Ground floor within the front gate of 83 Wo Ka Lau Road



Ground floor boundary wall of house 51D of Wo Hop Shek San Tsuen

PROVISION OF CREMATORS AT WO HOP SHEK CREMATORIUM AT KIU TAU ROAD
PHOTOS OF AIR QUALITY MONITORING STATION

Figure No.

3

Rev.:

0

Scale

NTS

Date

2/10



Appendix A

Calibration Record of High-Volume TSP Sampler

High-Volume TSP Sampler
5-Point Calibration Record

Location : A1 (Fanling)
Calibrated by : P.F.Yeung
Date : 7/7/2010

Sampler

Model : GMWS-2310 ACCU-VOL
Serial Number : S/N 0143

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) : 1006
Ta(K) : 302

Zero Error of Sampler Flow Rate Indication

IO : 0.0

Resistance Plate		dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC	Y
1	18 holes	10.4	3.190	1.594	62	61.3
2	13 holes	8.3	2.850	1.425	54	53.4
3	10 holes	6.3	2.483	1.243	46	45.5
4	7 holes	3.6	1.877	0.942	32	31.7
5	5 holes	2.4	1.533	0.772	24	23.7

Sampler Calibration Relationship

Slope(m): 45.590 Intercept(b): -11.352 Correlation Coefficient(r): 0.9999

Checked by: Magnum Fan

Date: 10/7/2010

High-Volume TSP Sampler
5-Point Calibration Record

Location : A1 (Fanling)
Calibrated by : P.F.Yeung
Date : 3/9/2010

Sampler

Model : GMWS-2310 ACCU-VOL
Serial Number : S/N 0143

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) : 302

Zero Error of Sampler Flow Rate Indication

IO : 0.0

Resistance Plate	dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC	Y
1 18 holes	10.8	3.256	1.626	63	62.4
2 13 holes	8.7	2.923	1.461	56	55.5
3 10 holes	6.7	2.565	1.284	48	47.6
4 7 holes	4.1	2.006	1.007	36	35.7
5 5 holes	2.5	1.503	0.789	26	25.8

Sampler Calibration Relationship

Slope(m): 43.736 Intercept(b): -8.553 Correlation Coefficient(r): 0.9999

Checked by: Magnum Fan

Date: 10/9/2010

High-Volume TSP Sampler
5-Point Calibration Record

Location : A2, Fanling
Calibrated by : P.F.Yeung
Date : 7/7/2010

Sampler

Model : GMWS-2310 ACCU-VOL
Serial Number : S/N 1068

Calibration Orifice and Standard Calibration Relationship

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

Standard Condition

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

Calibration Condition

Pa (hpa) : 1006
Ta(K) : 302

Zero Error of Sampler Flow Rate Indication

IO : 0.0

Resistance Plate		dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC (indicated flow)	Y
1	18 holes	7.0	2.617	1.310	42	41.6
2	13 holes	5.5	2.320	1.162	36	35.6
3	10 holes	4.4	2.075	1.041	30	29.7
4	7 holes	2.3	1.500	0.756	18	17.8
5	5 holes	1.5	1.212	0.612	12	11.9

Sampler Calibration Relationship

Slope(m): 42.785 Intercept(b): -14.455 Correlation Coefficient(r): 0.9998

Checked by: Magnum Fan

Date: 10/07/2010

High-Volume TSP Sampler
5-Point Calibration Record

Location : A2, Fanling
Calibrated by : P.F.Yeung
Date : 3/09/2010

Sampler

Model : GMWS-2310 ACCU-VOL
Serial Number : S/N 1068

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) : 302

Zero Error of Sampler Flow Rate Indication

IO : 0.0

Resistance Plate		dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC (indicated flow)	Y
1	18 holes	7.4	2.696	1.348	47	46.6
2	13 holes	5.5	2.324	1.164	37	36.7
3	10 holes	4.8	2.171	1.088	34	33.7
4	7 holes	2.7	1.628	0.819	20	19.8
5	5 holes	1.7	1.292	0.652	12	11.9

Sampler Calibration Relationship

Slope(m): 49.733 Intercept(b): -20.718 Correlation Coefficient(r): 0.9997

Checked by: Magnum Fan

Date: 10/09/2010

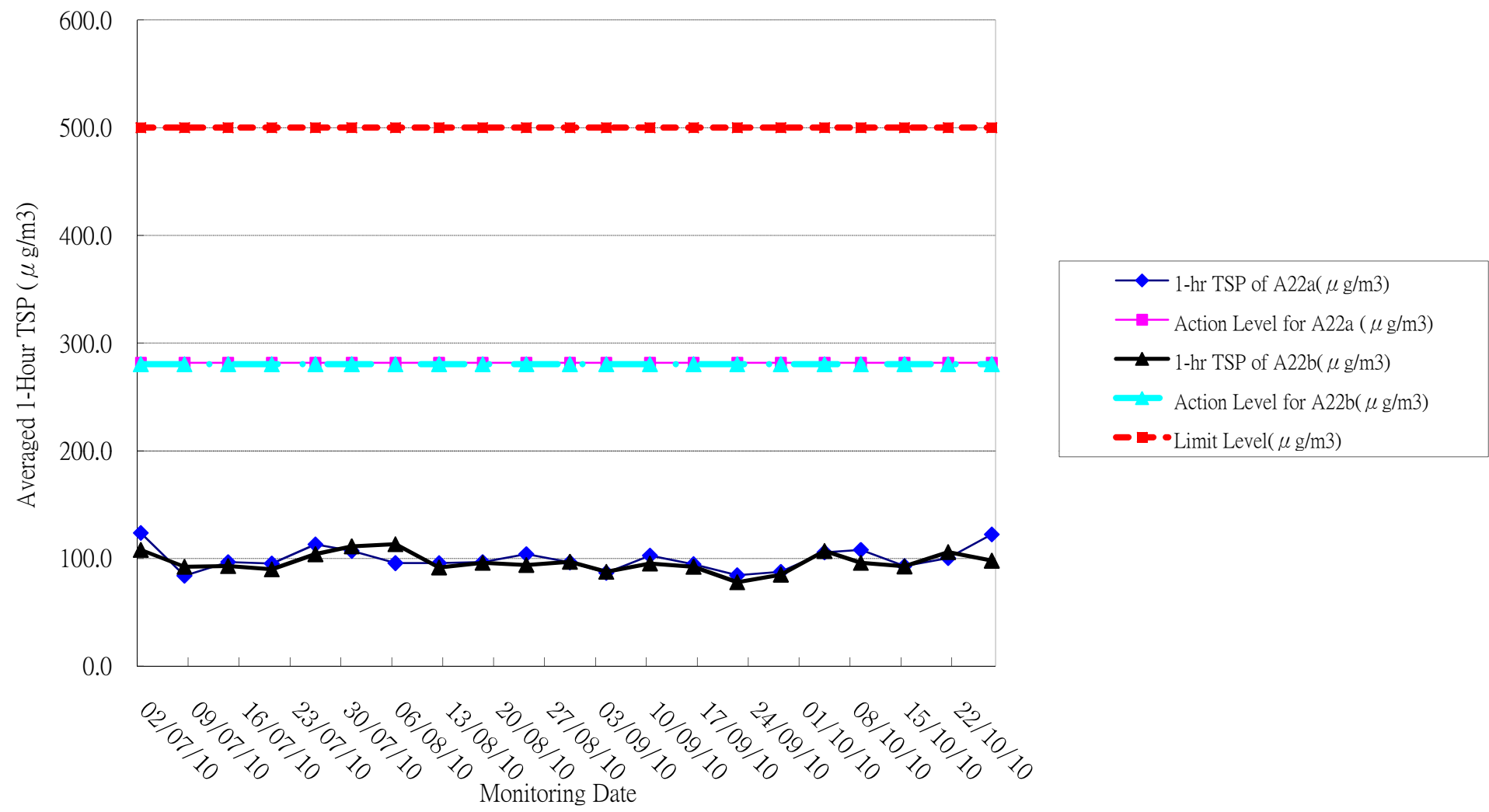
Appendix B

*Summary and Graphical Plot of 1-Hour TSP
Monitoring Record*

Impact Monitoring for reprovisioning of cremators in Wo Hop Shek Crematorium**Air Quality Monitoring: 1-hour TSP****Month: August - October 2010**

Date	1-hr TSP of A22a($\mu\text{g}/\text{m}^3$)	Action Level for A22a ($\mu\text{g}/\text{m}^3$)	1-hr TSP of A22b($\mu\text{g}/\text{m}^3$)	Action Level for A22b($\mu\text{g}/\text{m}^3$)	Limit Level($\mu\text{g}/\text{m}^3$)
06/08/10	95.7	281.7	113.3	280.4	500.0
12/08/10	95.7	281.7	91.7	280.4	500.0
18/08/10	96.7	281.7	96.0	280.4	500.0
24/08/10	104.0	281.7	94.0	280.4	500.0
30/08/10	96.3	281.7	97.0	280.4	500.0
04/09/10	86.7	281.7	87.7	280.4	500.0
10/09/10	102.7	281.7	95.3	280.4	500.0
16/09/10	94.7	281.7	92.3	280.4	500.0
22/09/10	84.3	281.7	78.0	280.4	500.0
28/09/10	87.7	281.7	85.0	280.4	500.0
04/10/10	105.7	281.7	107.0	280.4	500.0
09/10/10	108.0	281.7	96.0	280.4	500.0
15/10/10	93.0	281.7	92.7	280.4	500.0
21/10/10	100.3	281.7	106.0	280.4	500.0
27/10/10	122.3	281.7	98.0	280.4	500.0

1-Hour TSP air quality monitoring data plot recorded at the designated monitoring points



Appendix C

*Summary and Graphical Plot of 24-Hour TSP
Monitoring Record*

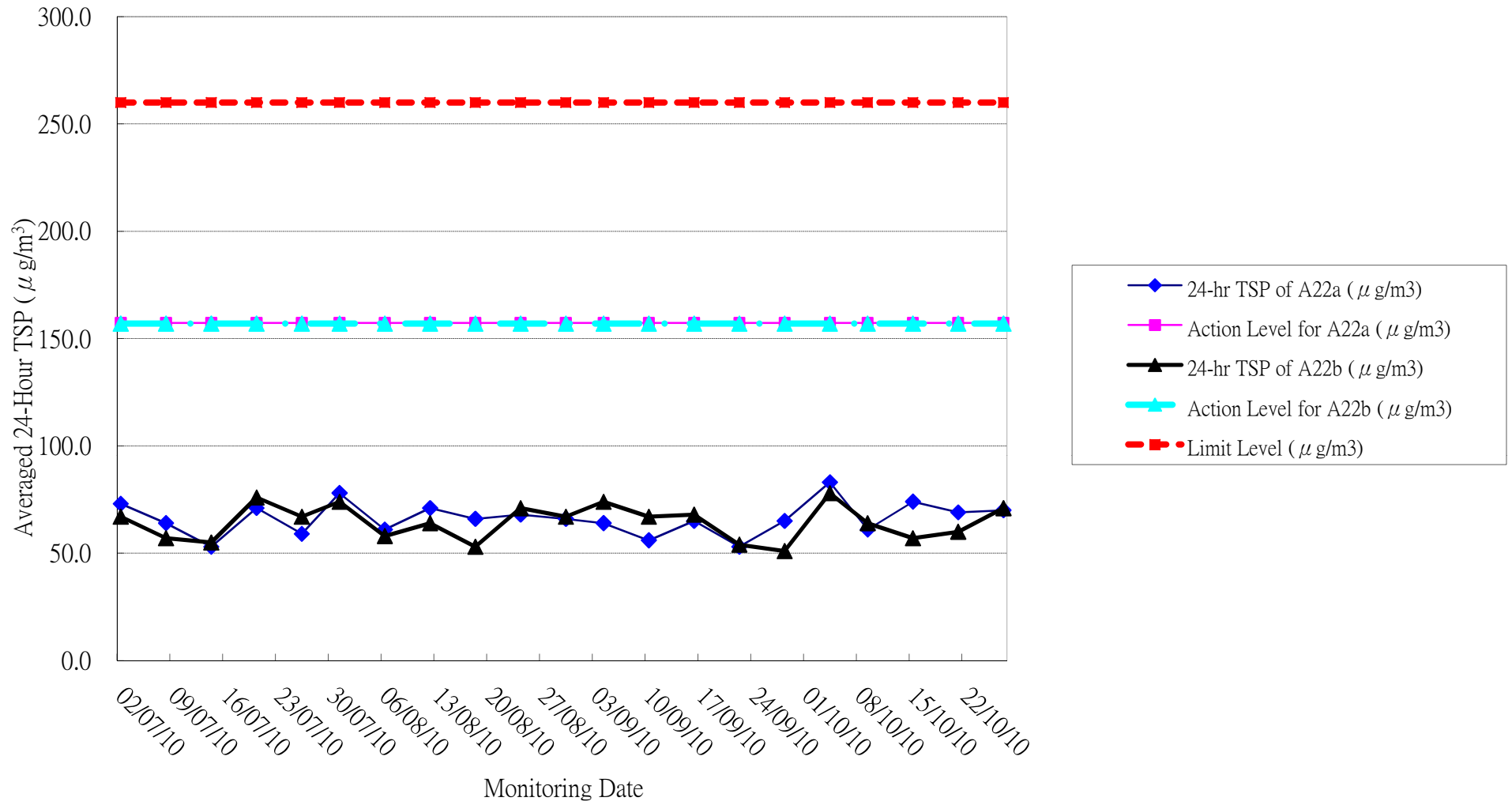
Impact Monitoring for reprovisioning of cremators in Wo Hop Shek Crematorium

Air Quality Monitoring: 24-hour TSP

Month: August - October 2010

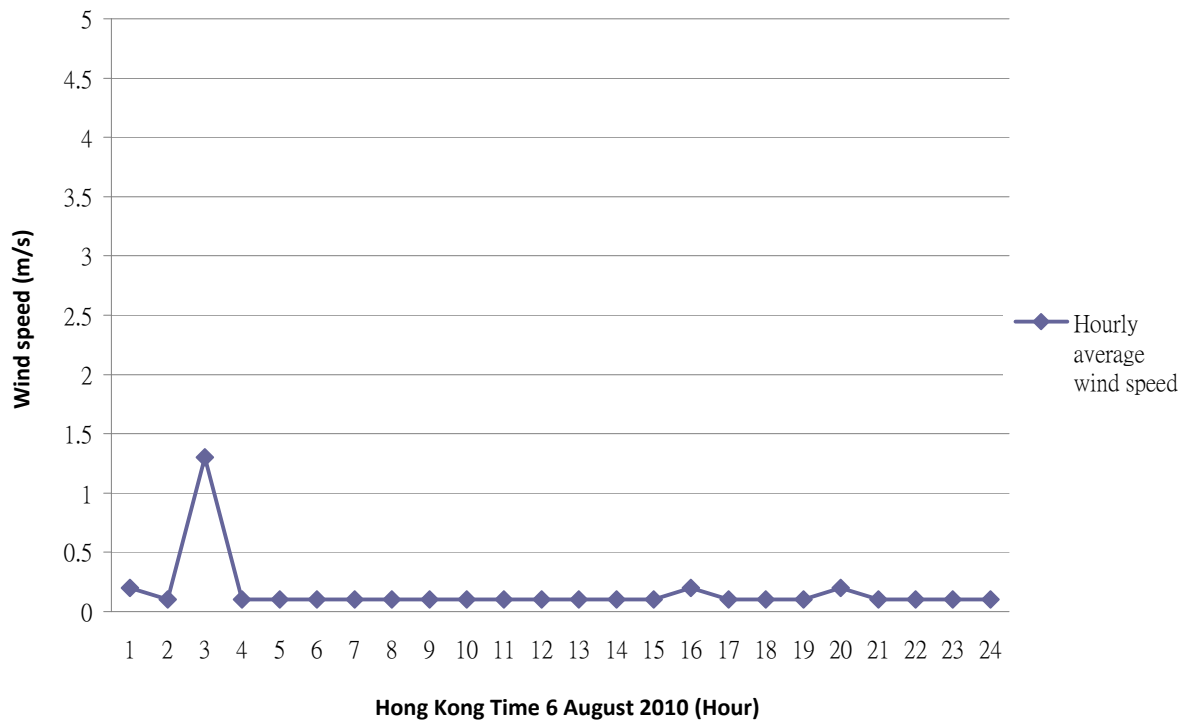
Date	24-hr TSP of A22a (µg/m3)	Action Level for A22a (µg/m3)	24-hr TSP of A22b (µg/m3)	Action Level for A22b (µg/m3)	Limit Level (µg/m3)
06/08/10	61.0	157.3	58.0	157.0	260.0
12/08/10	71.0	157.3	64.0	157.0	260.0
18/08/10	66.0	157.3	53.0	157.0	260.0
24/08/10	68.0	157.3	71.0	157.0	260.0
30/08/10	66.0	157.3	67.0	157.0	260.0
04/09/10	64.0	157.3	74.0	157.0	260.0
10/09/10	56.0	157.3	67.0	157.0	260.0
16/09/10	65.0	157.3	68.0	157.0	260.0
22/09/10	53.0	157.3	54.0	157.0	260.0
28/09/10	65.0	157.3	51.0	157.0	260.0
04/10/10	83.0	157.3	78.0	157.0	260.0
09/10/10	61.0	157.3	64.0	157.0	260.0
15/10/10	74.0	157.3	57.0	157.0	260.0
21/10/10	69.0	157.3	60.0	157.0	260.0
27/10/10	70.0	157.3	71.0	157.0	260.0

24-Hour TSP air quality monitoring data plot recorded at the designated monitoring points

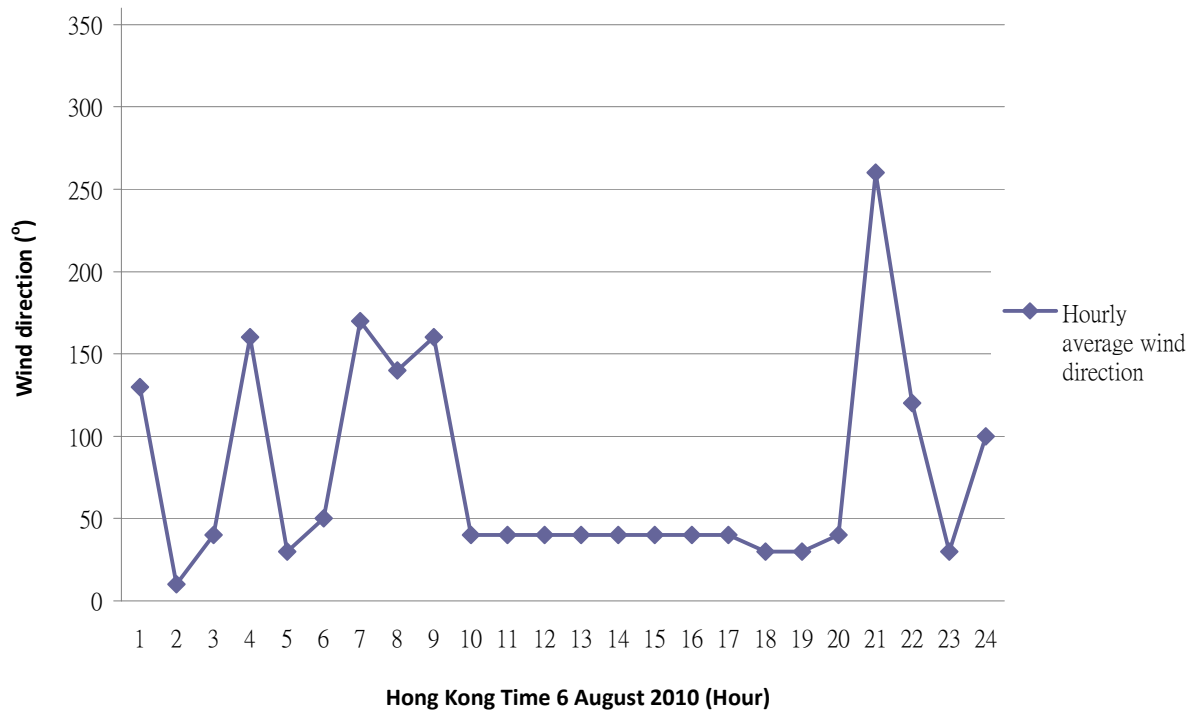


Appendix D
Wind Record

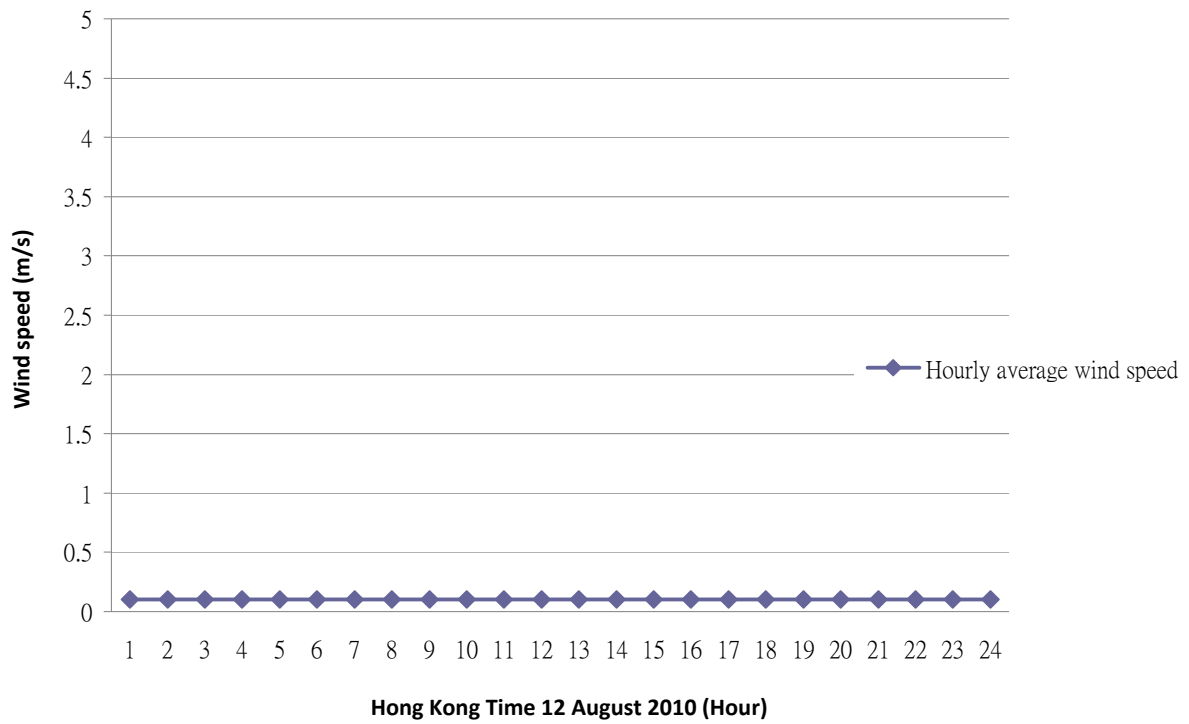
Wind speed profile at on-site wind station



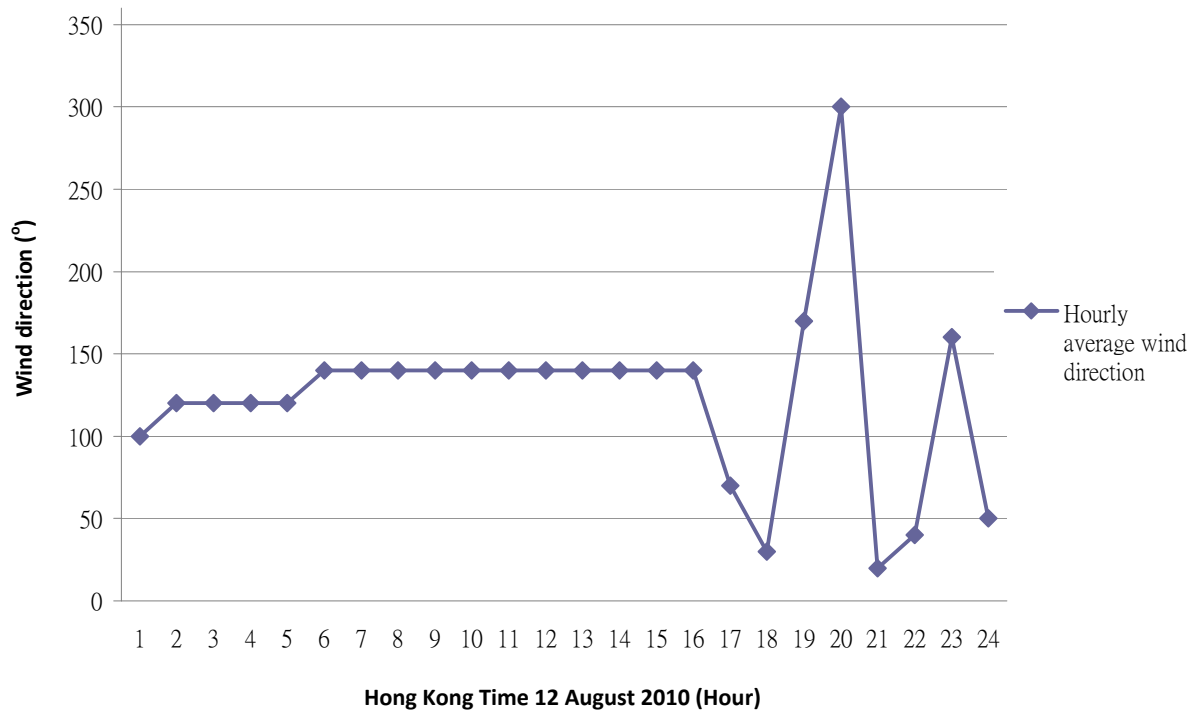
Wind direction profile at on-site wind station



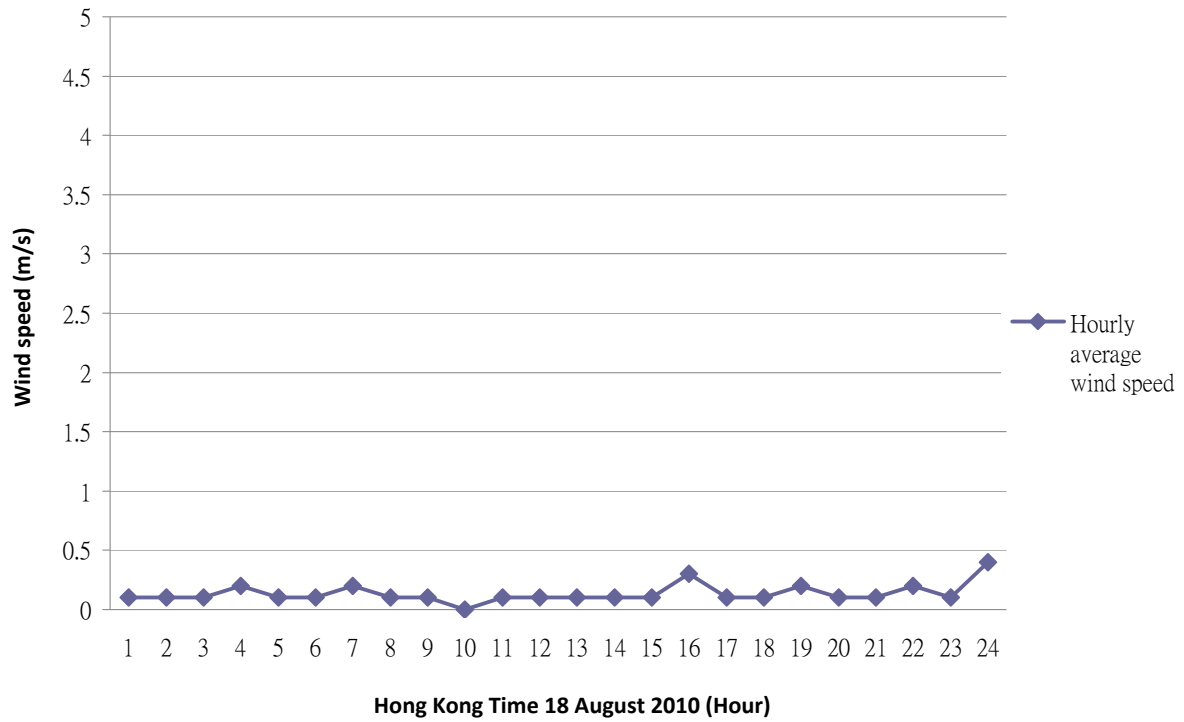
Wind speed profile at on-site wind station



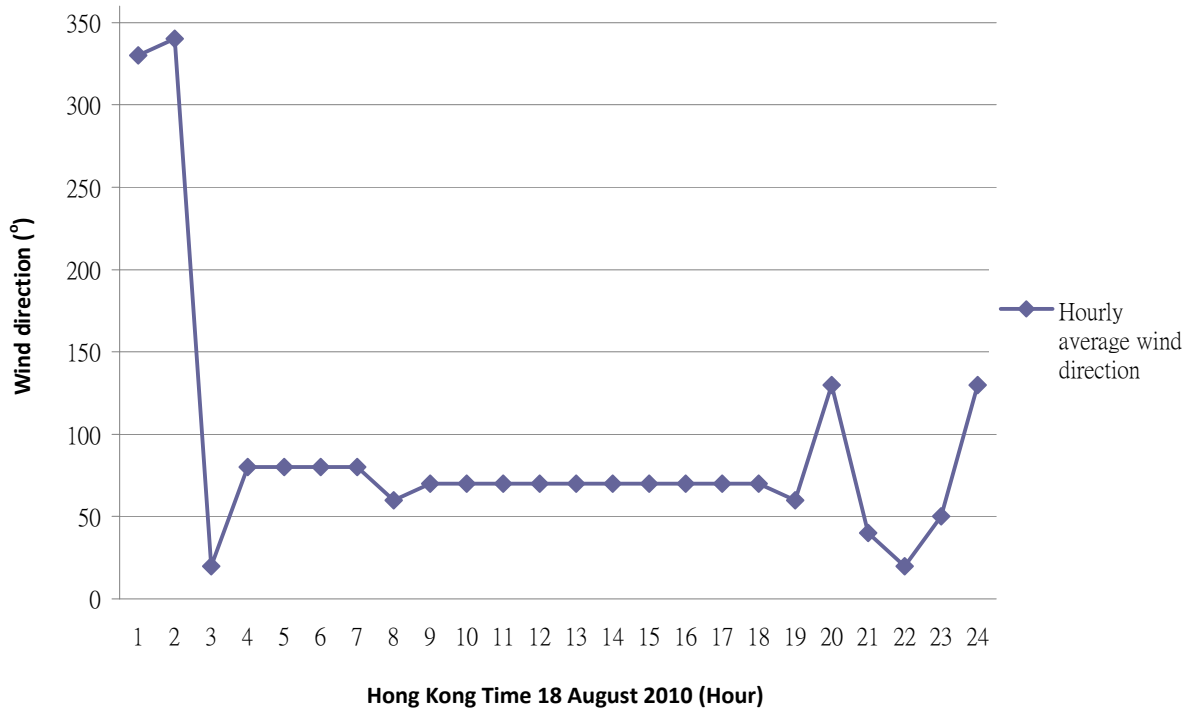
Wind direction profile at on-site wind station



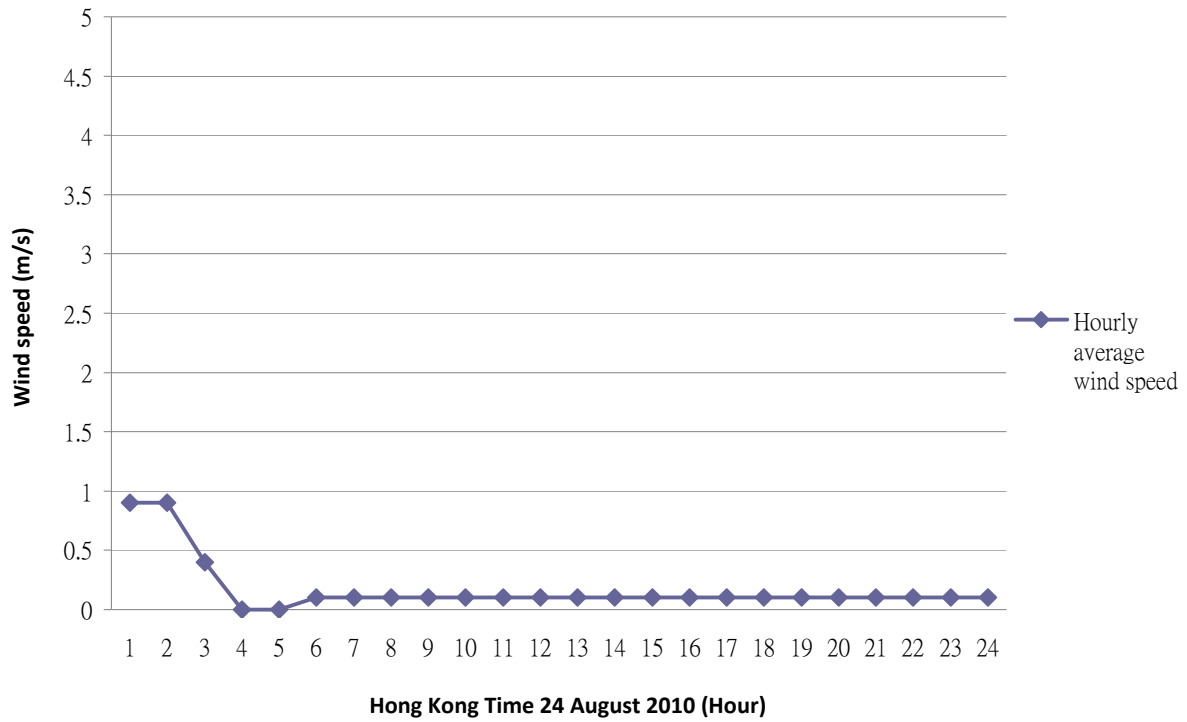
Wind speed profile at on-site wind station



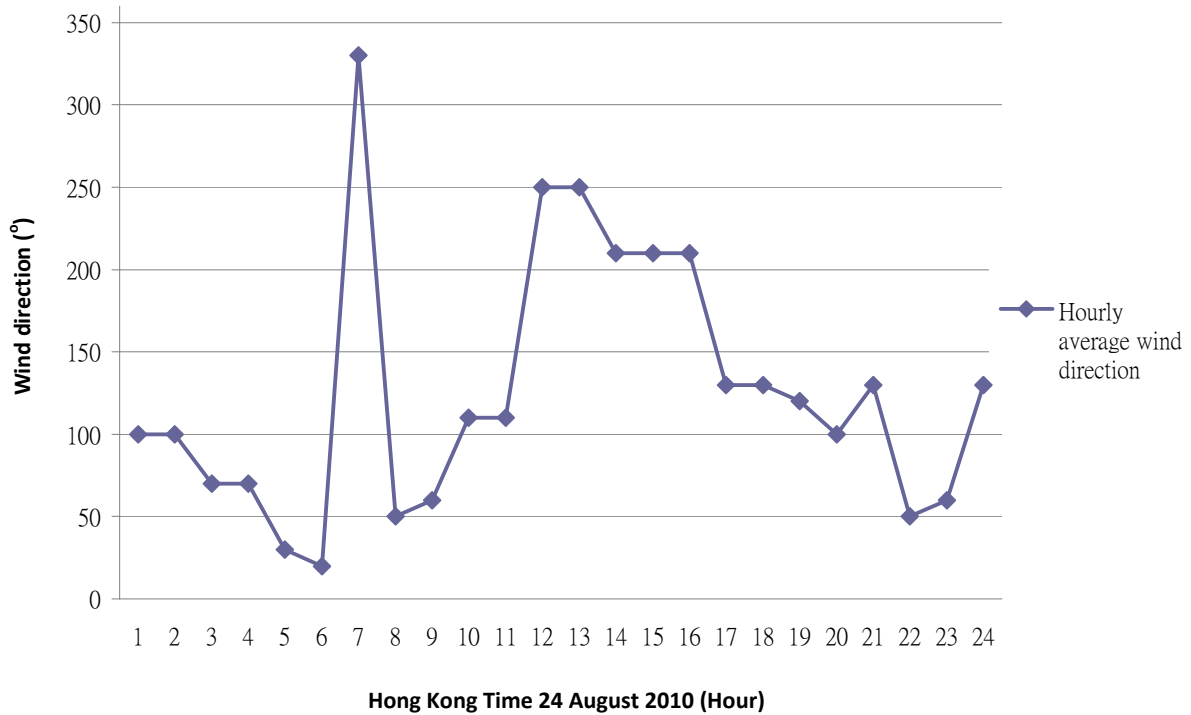
Wind direction profile at on-site wind station



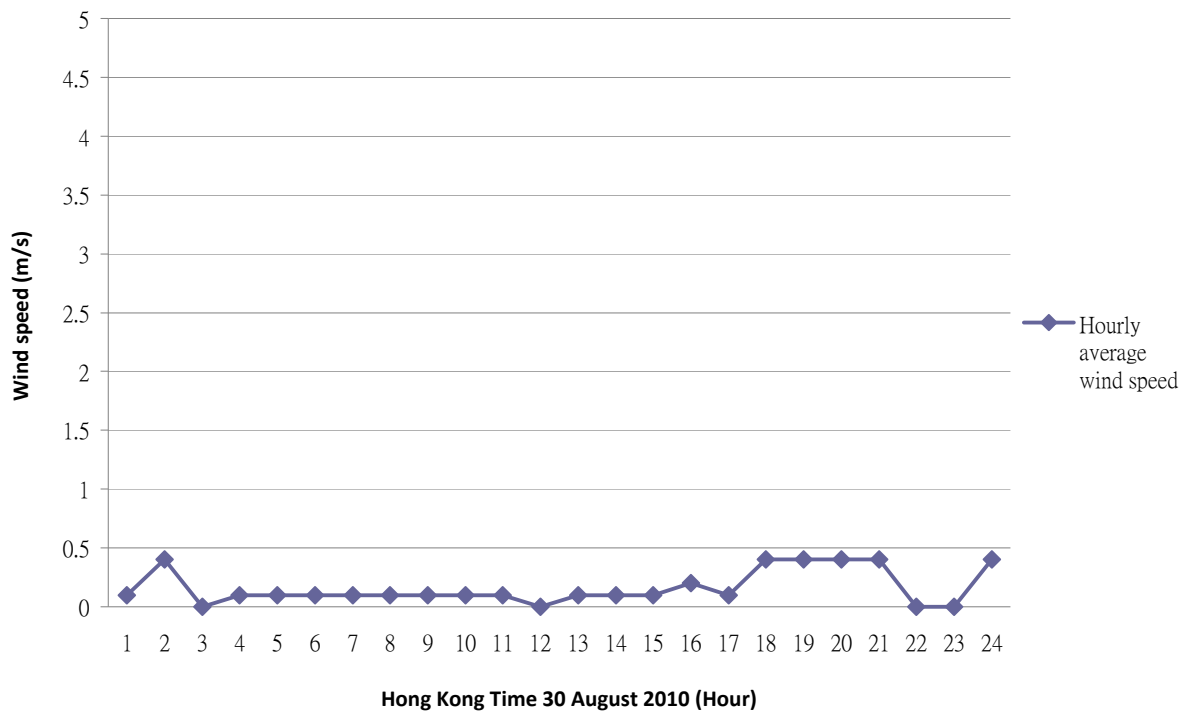
Wind speed profile at on-site wind station



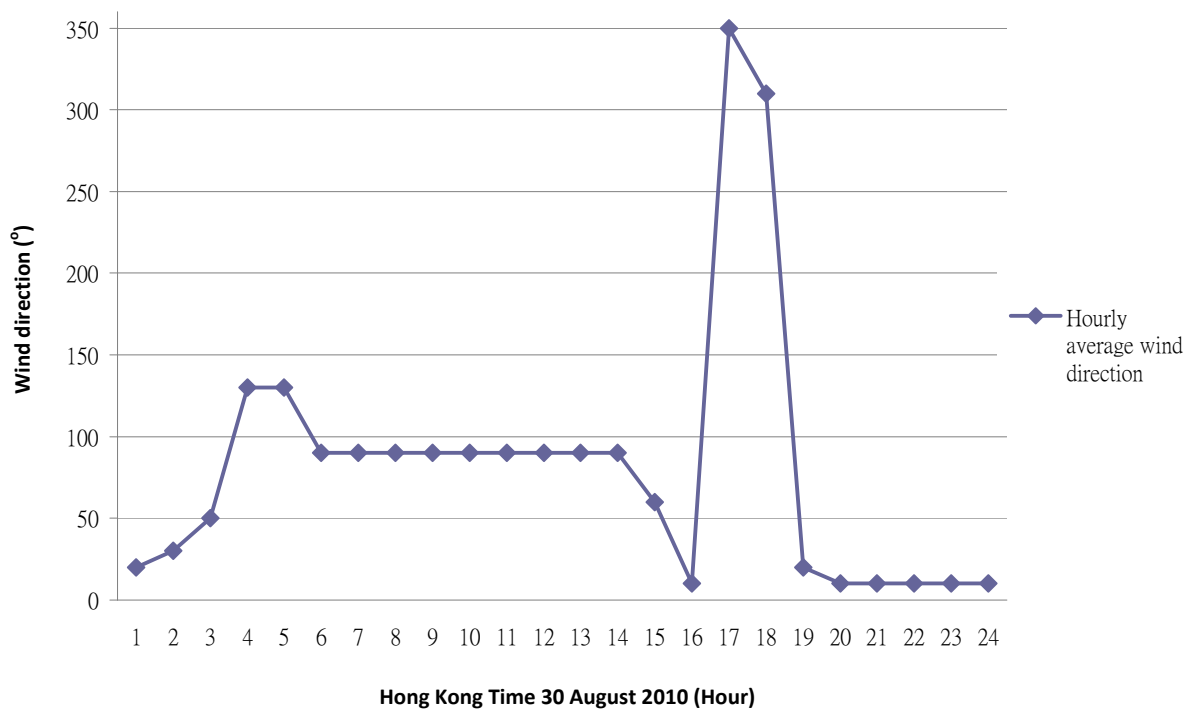
Wind direction profile at on-site wind station



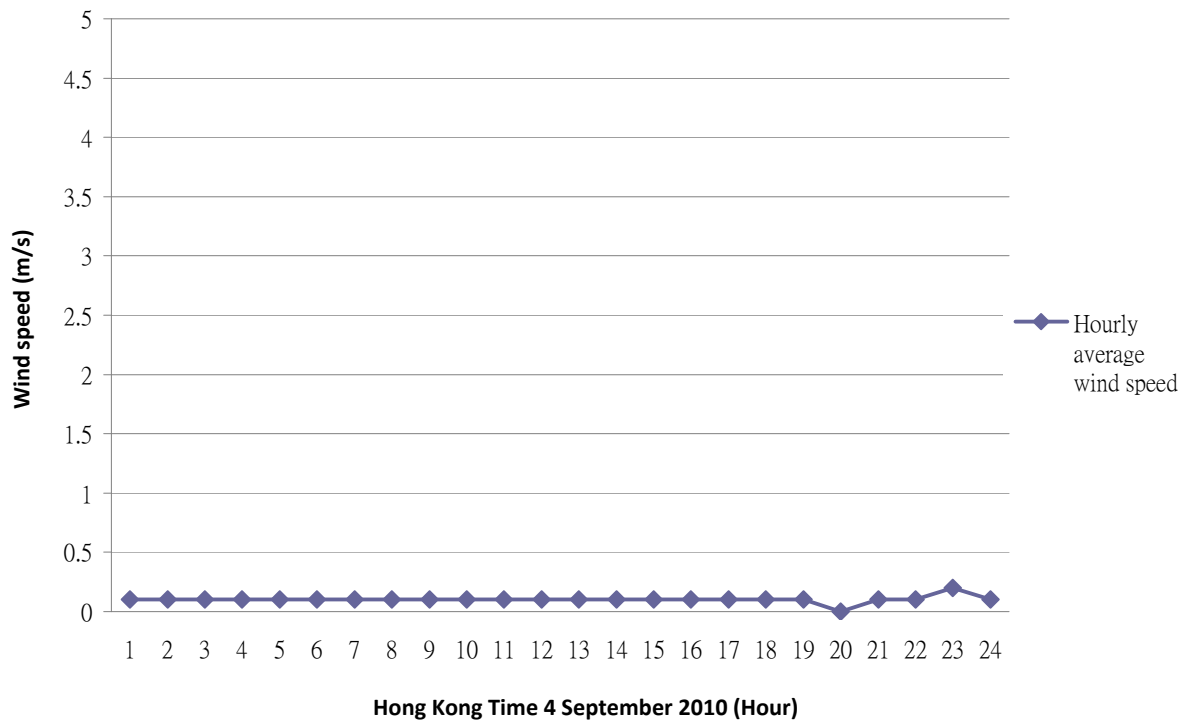
Wind speed profile at on-site wind station



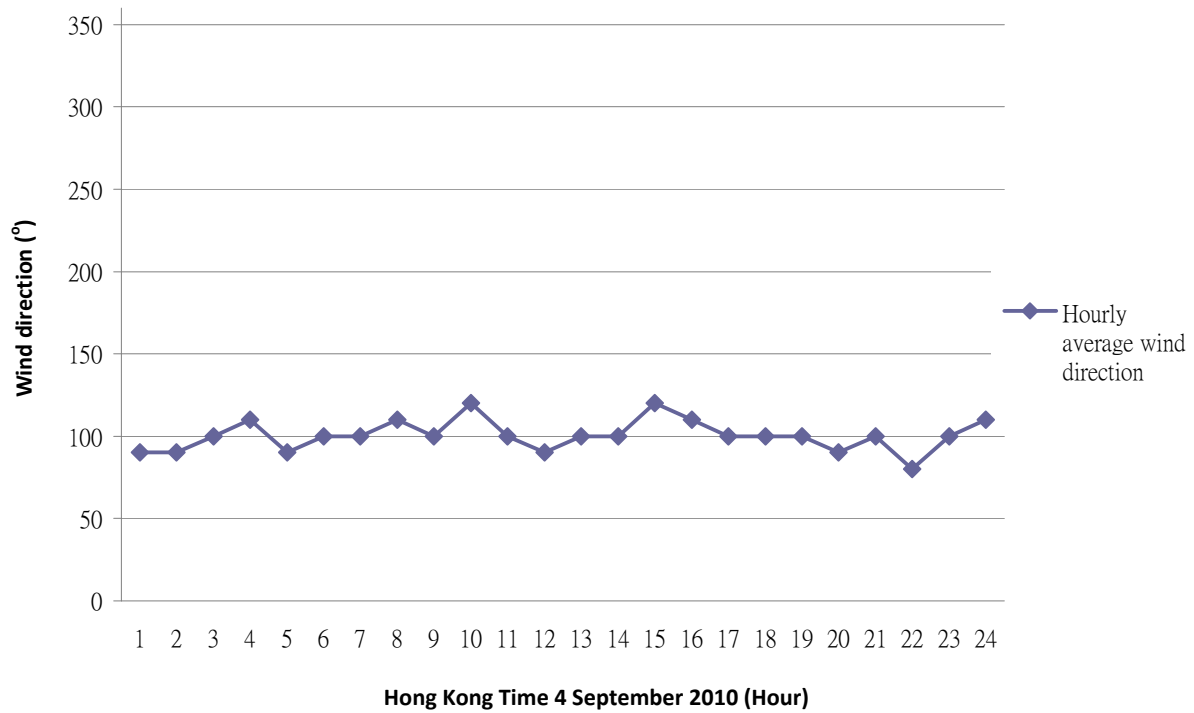
Wind direction profile at on-site wind station



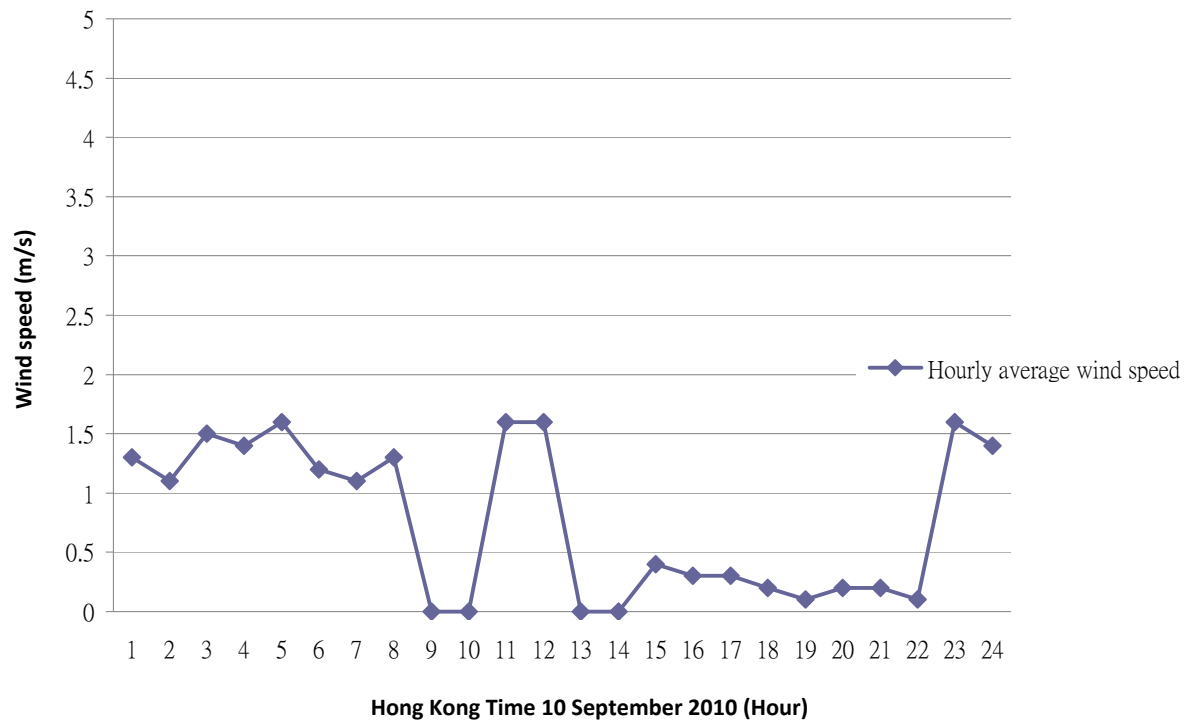
Wind speed profile at on-site wind station



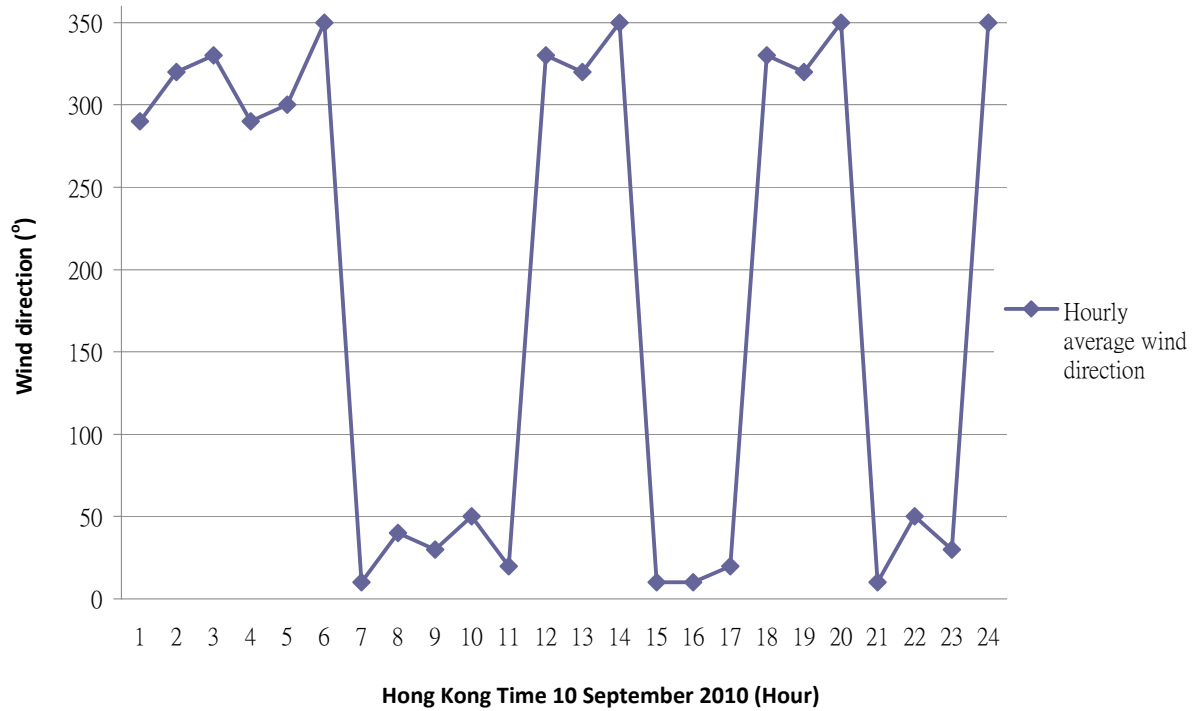
Wind direction profile at on-site wind station



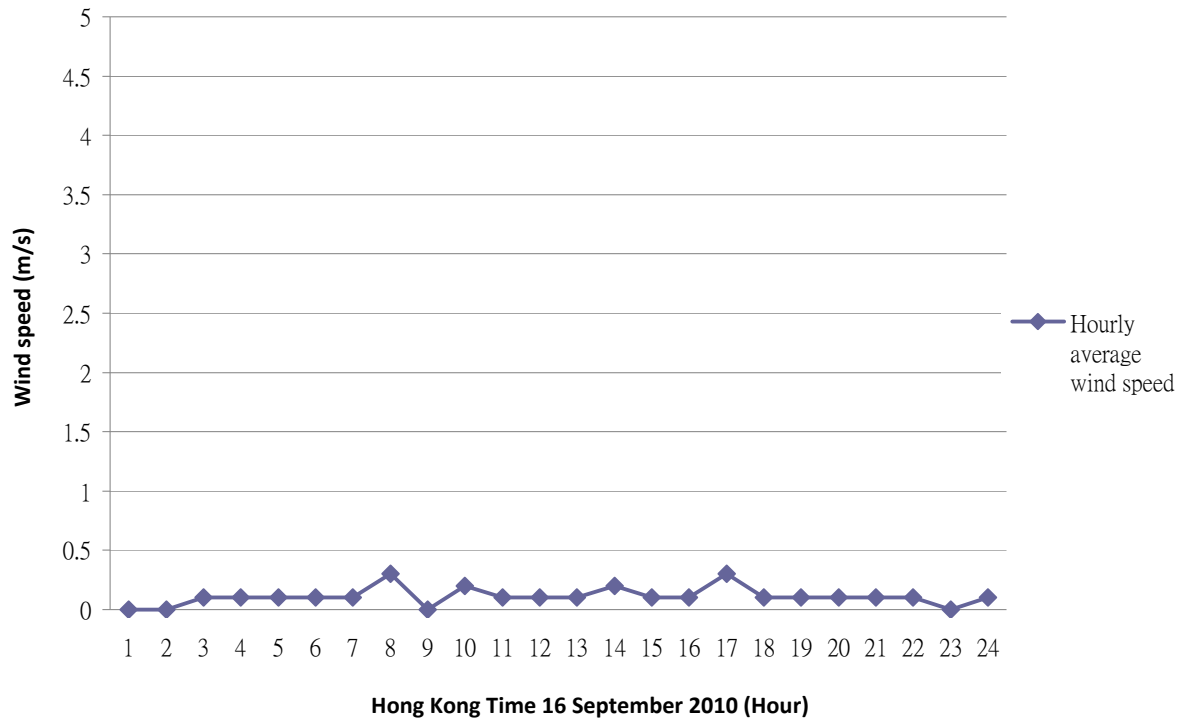
Wind speed profile at on-site wind station



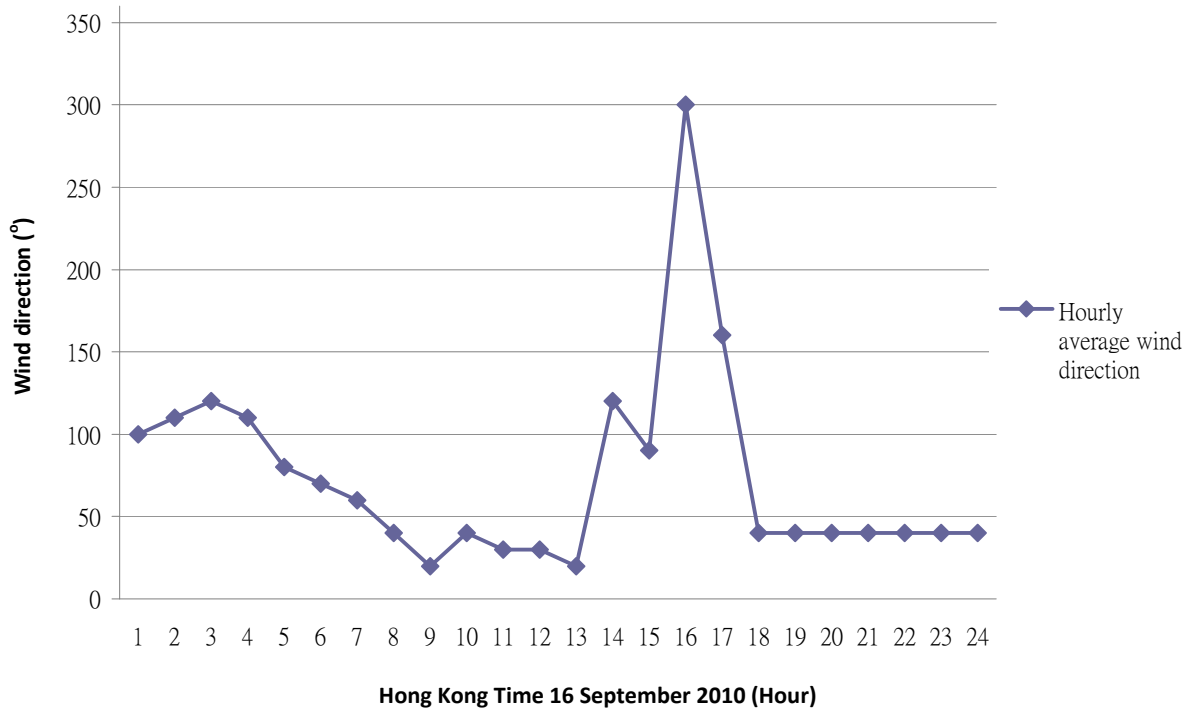
Wind direction profile at on-site wind station



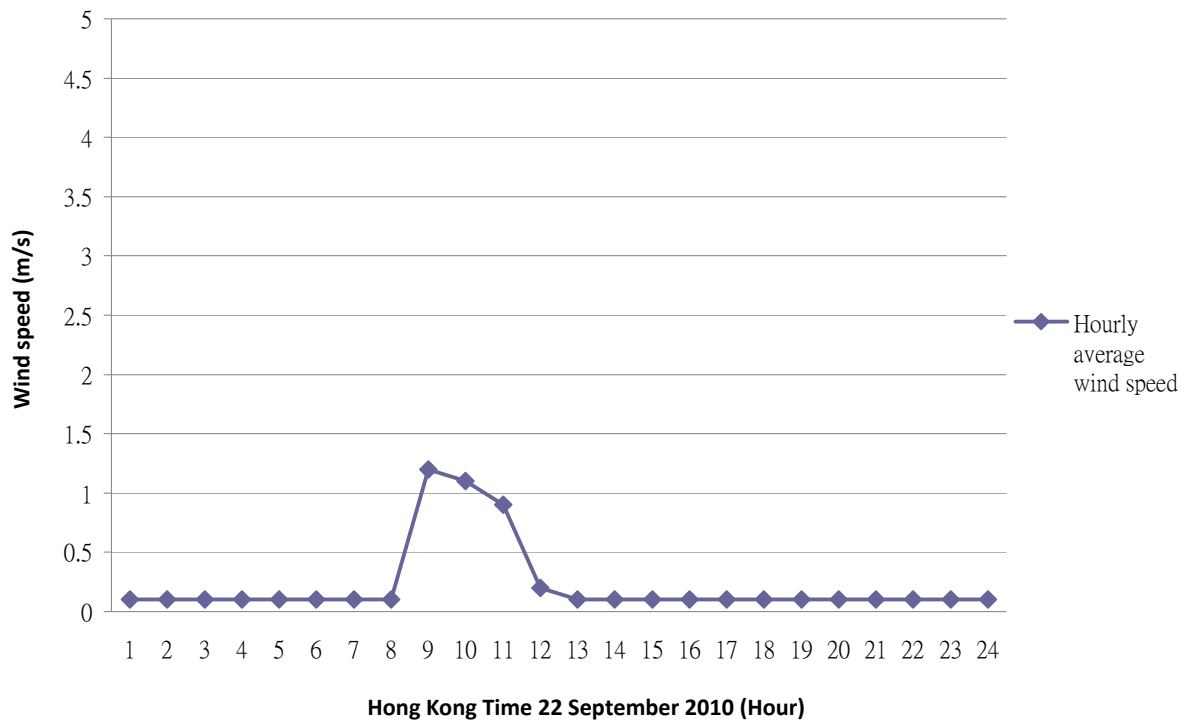
Wind speed profile at on-site wind station



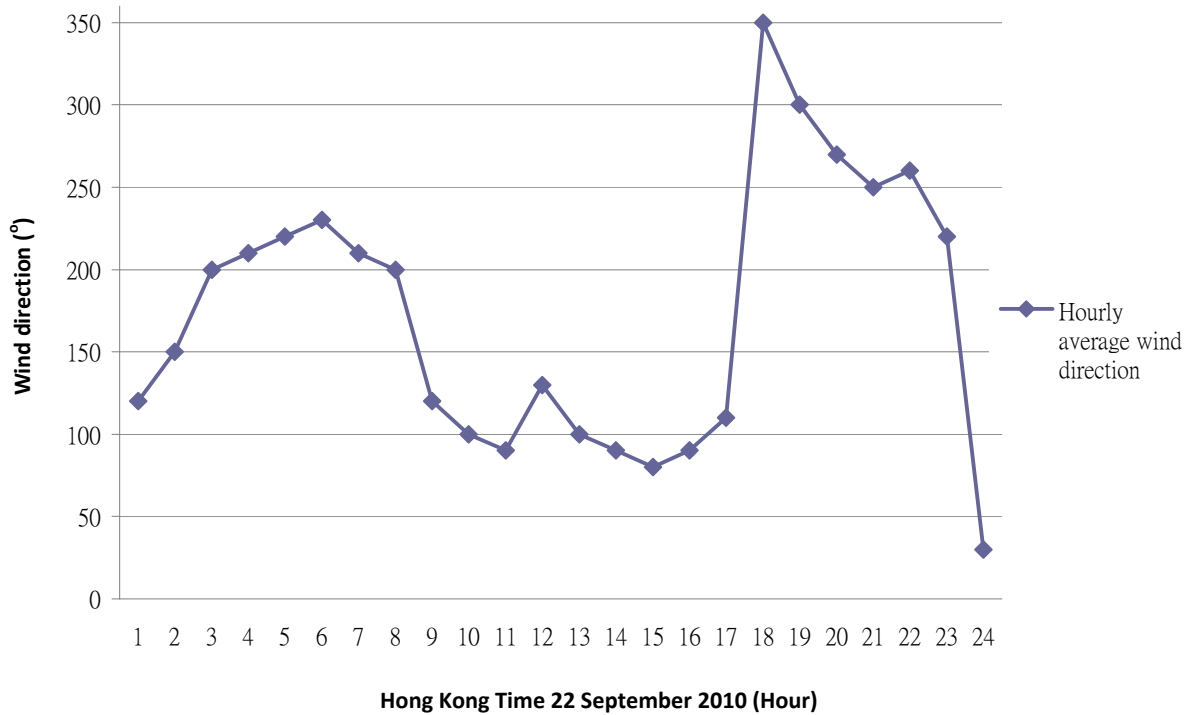
Wind direction profile at on-site wind station



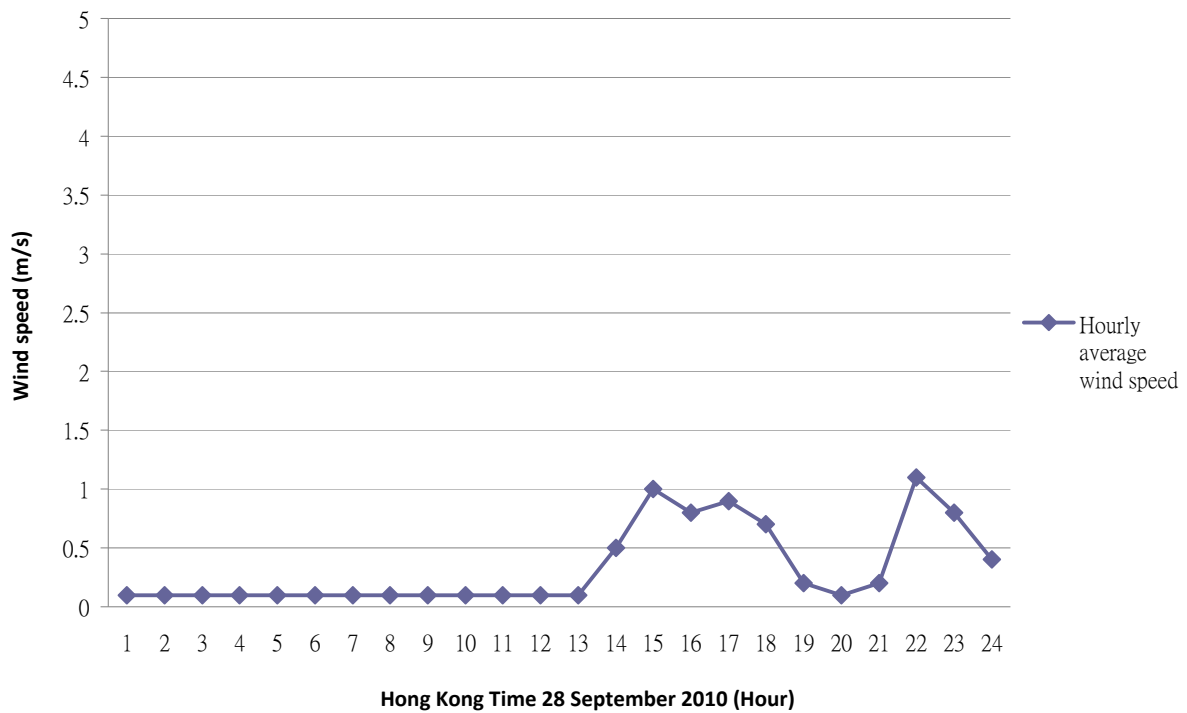
Wind speed profile at on-site wind station



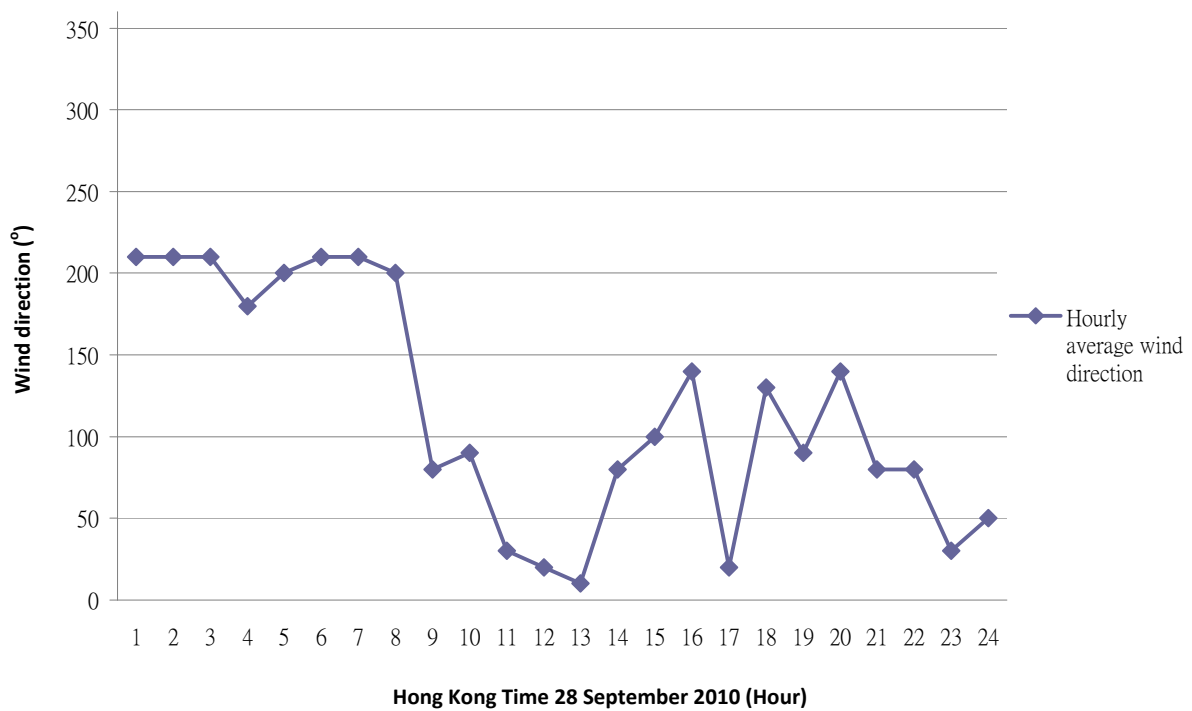
Wind direction profile at on-site wind station



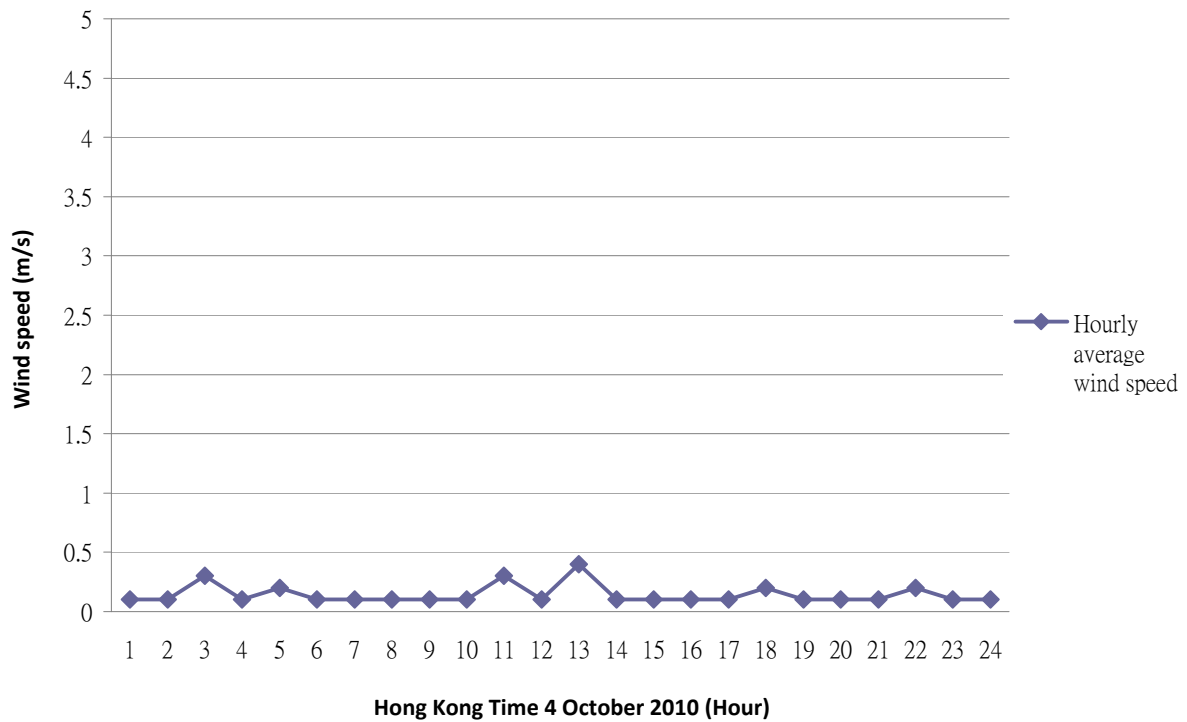
Wind speed profile at on-site wind station



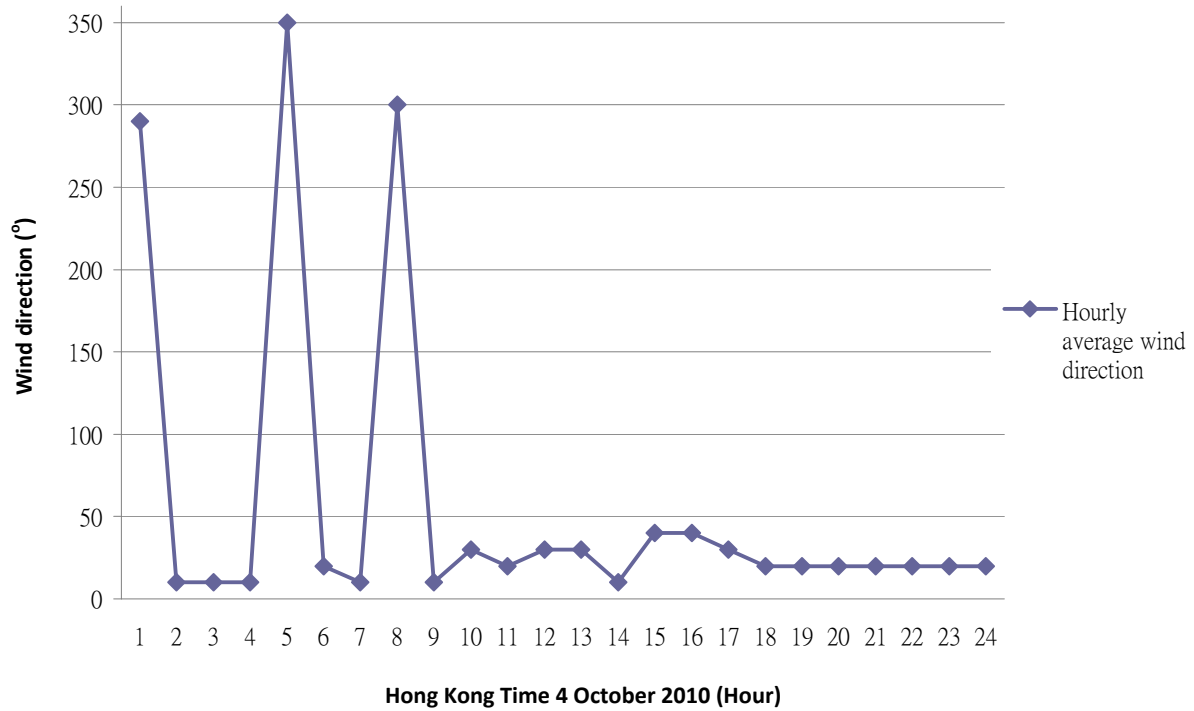
Wind direction profile at on-site wind station



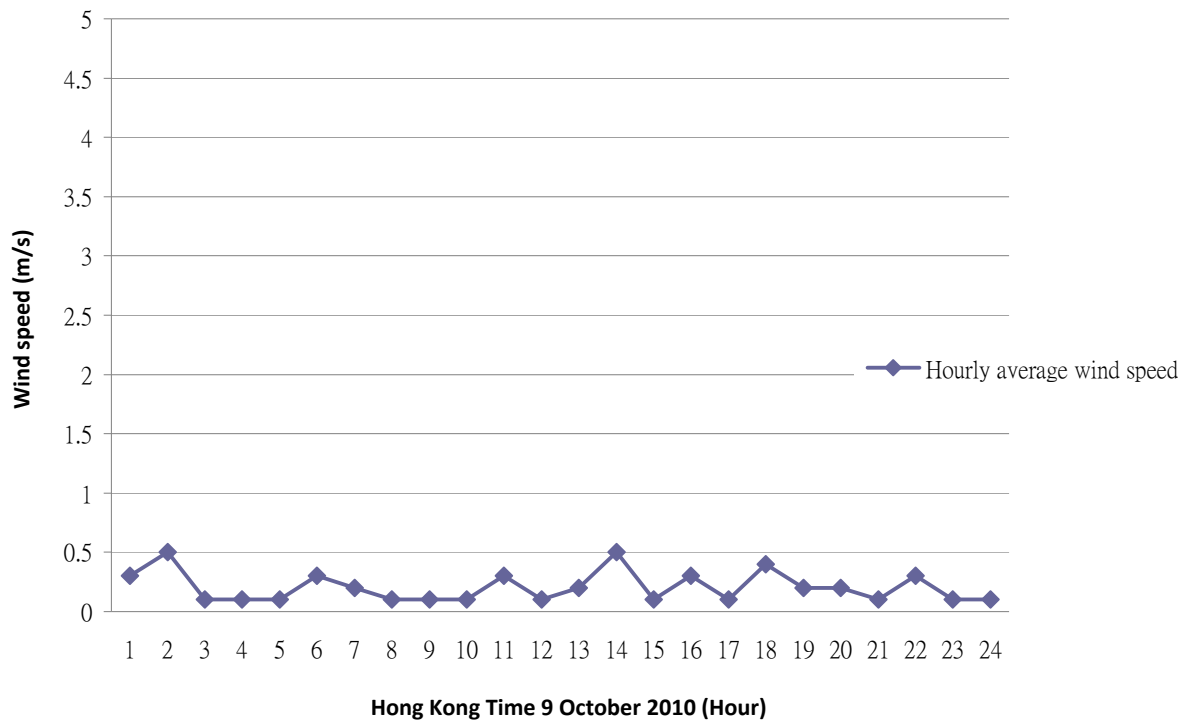
Wind speed profile at on-site wind station



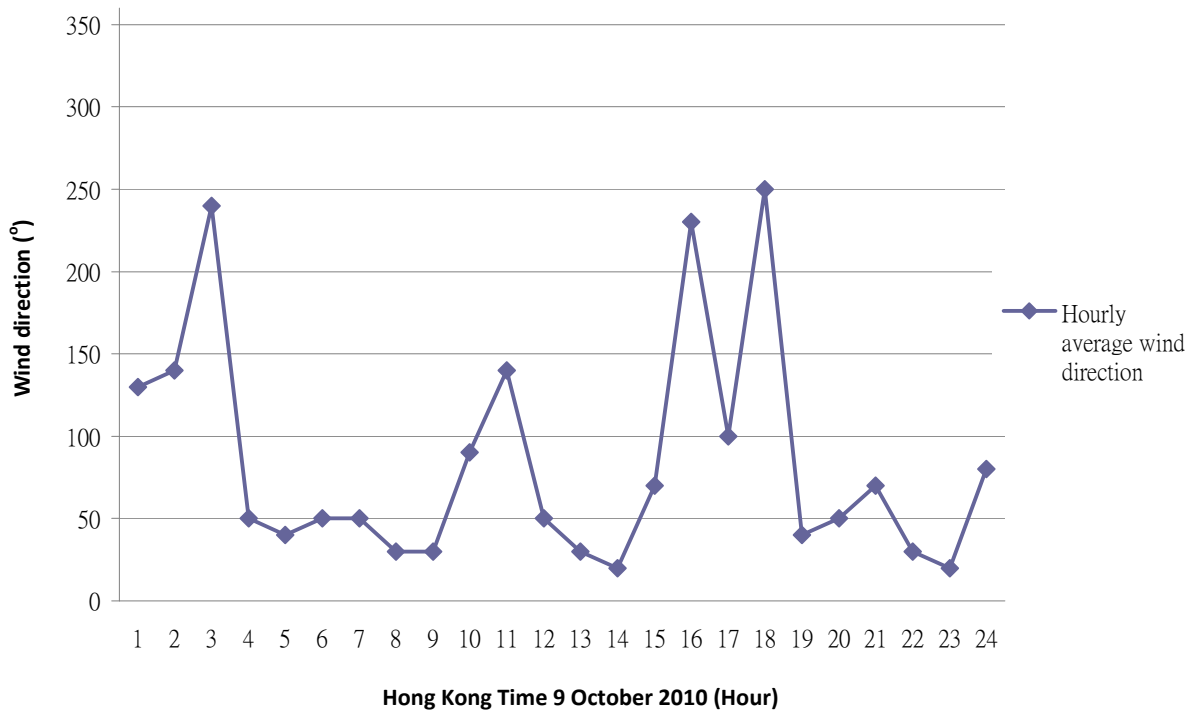
Wind direction profile at on-site wind station



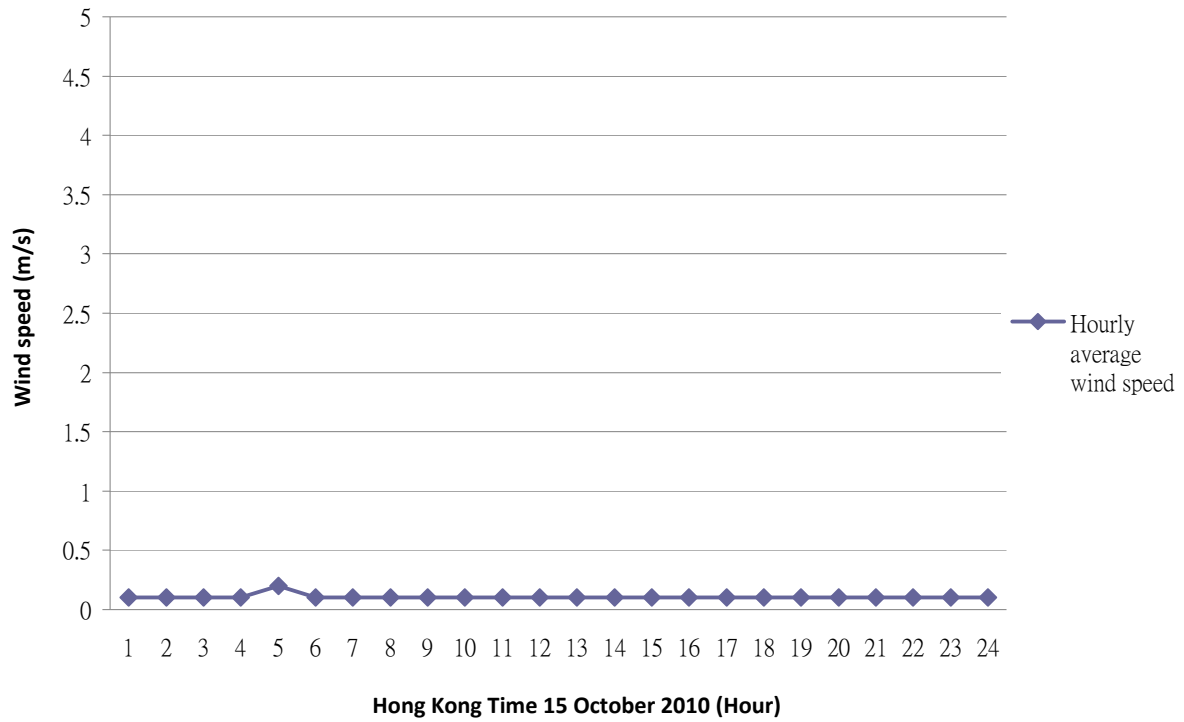
Wind speed profile at on-site wind station



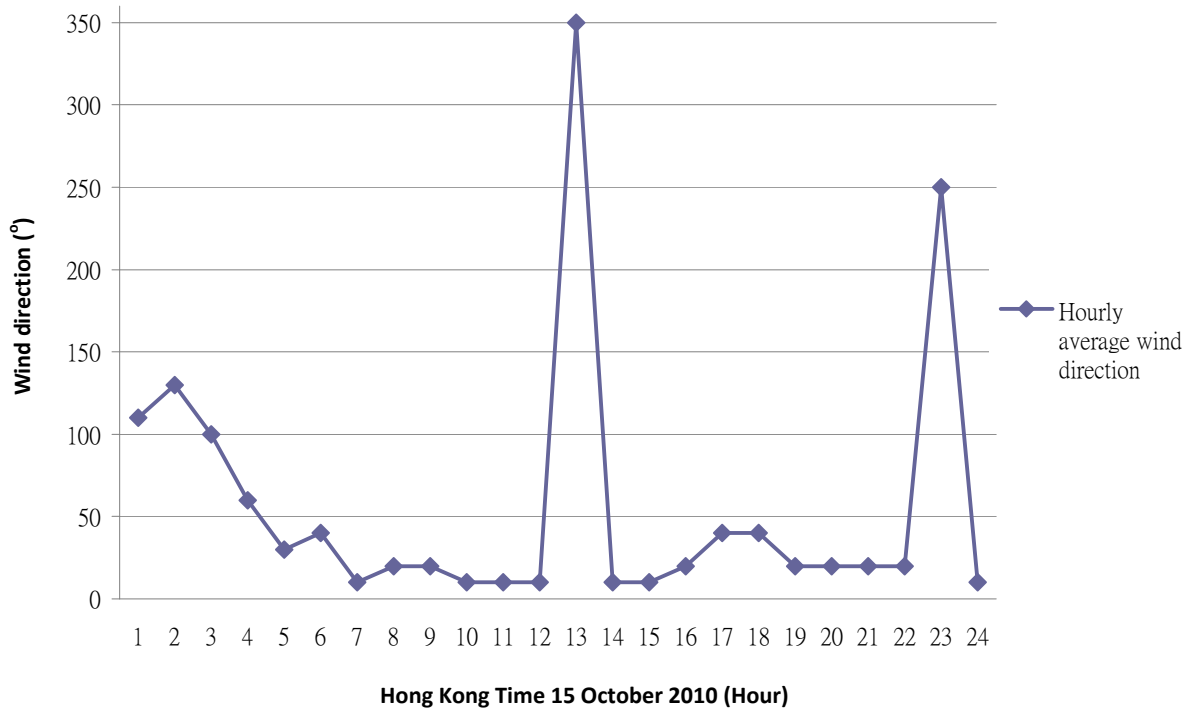
Wind direction profile at on-site wind station



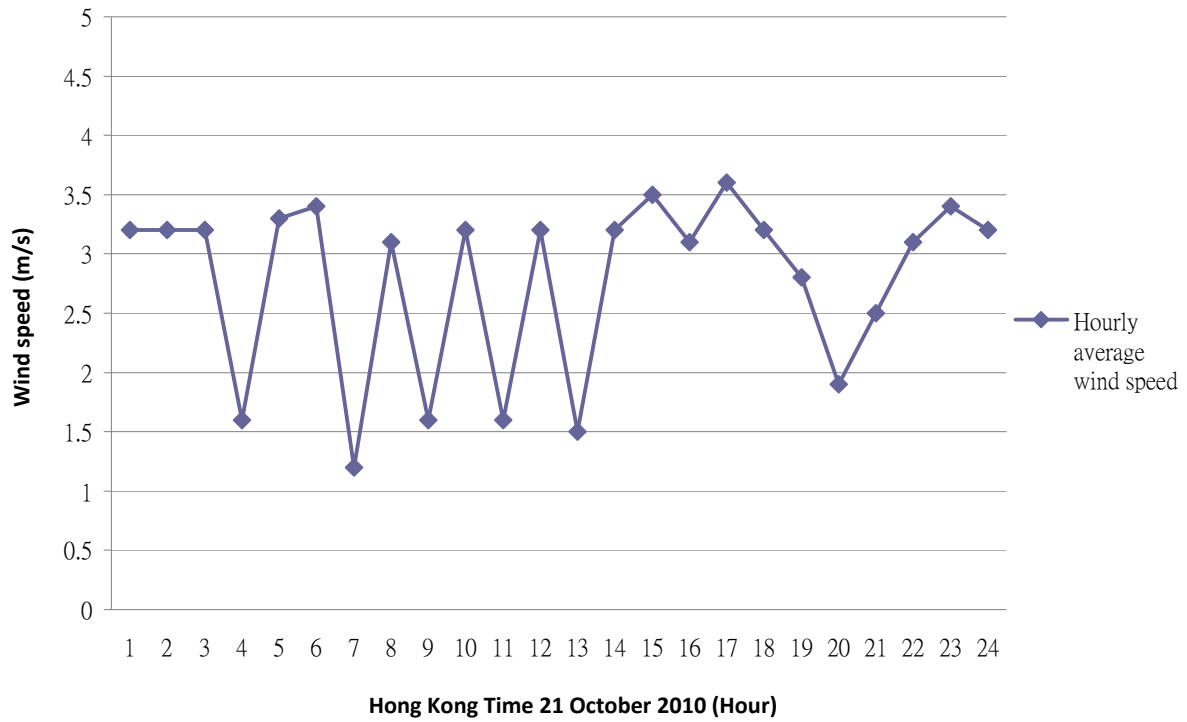
Wind speed profile at on-site wind station



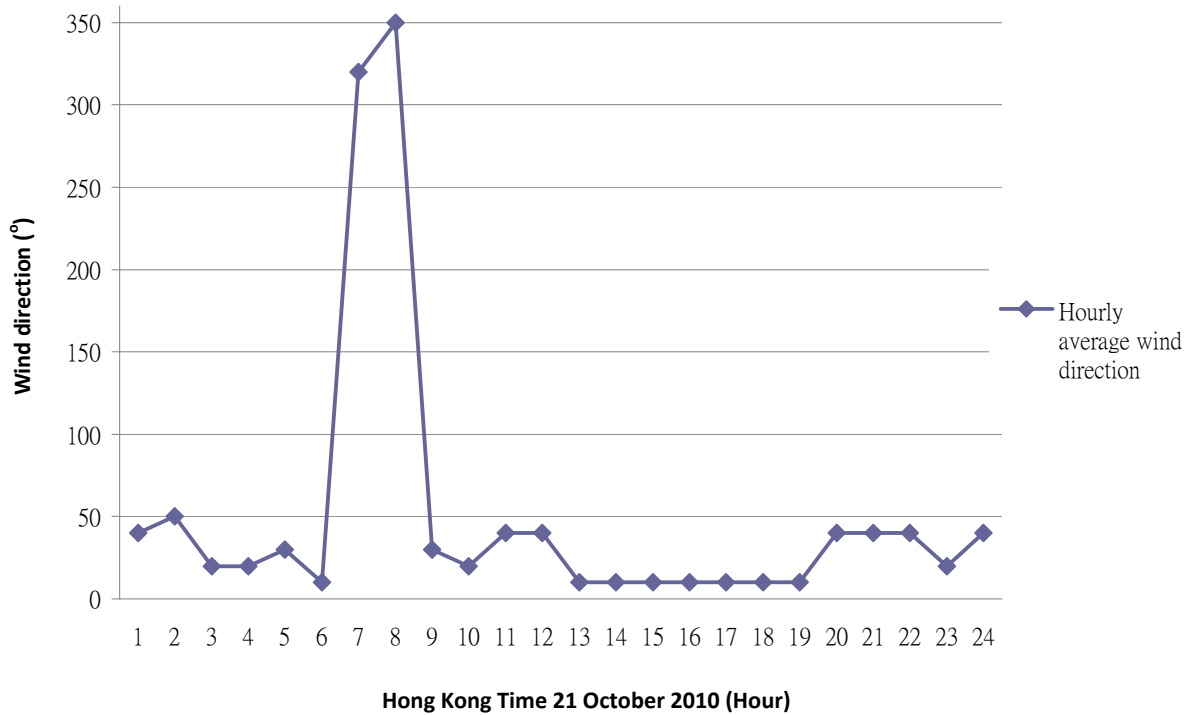
Wind direction profile at on-site wind station



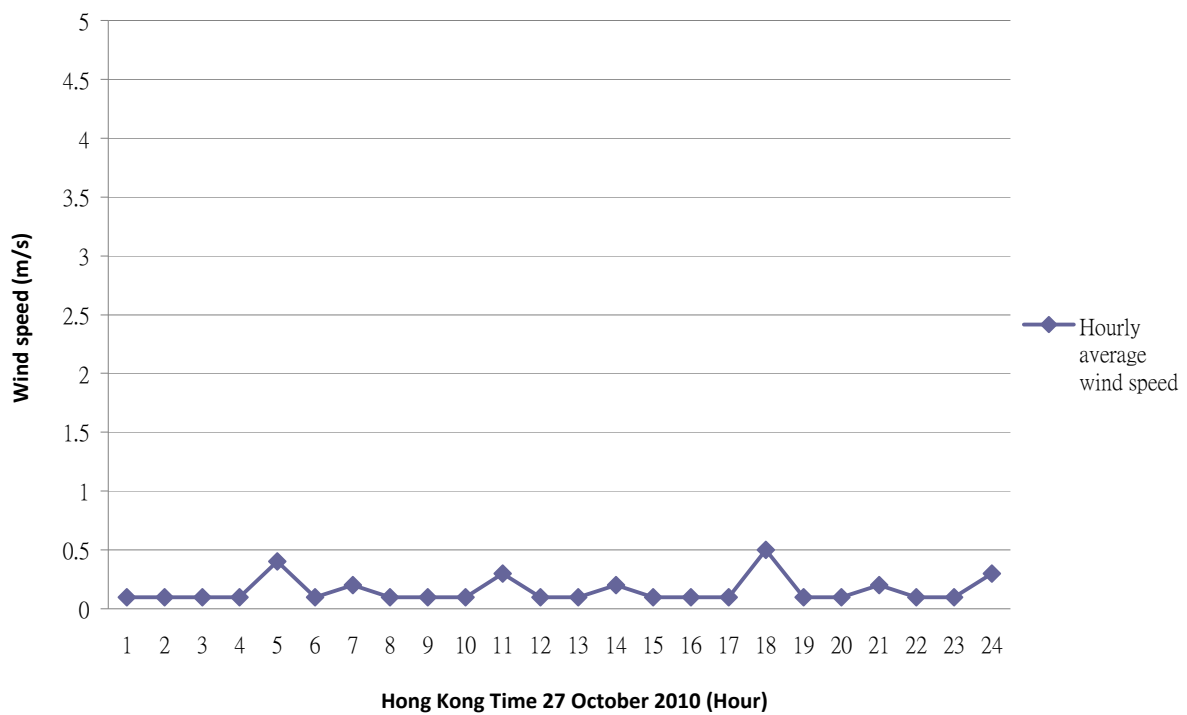
Wind speed profile at on-site wind station



Wind direction profile at on-site wind station



Wind speed profile at on-site wind station



Wind direction profile at on-site wind station

