



Environmental Team Services for Contract No. CV/2012/02  
Construction of Sewage Pumping Station near Tsz Tin Road  
and Associated Sewerage Works in Area 54, Tuen Mun

Monthly EM&A Report for February 2016 (Rev. A)

March 2016

Civil Engineering and Development Department





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CV/2012/02 Construction of Sewage Pumping  
Station near Tsz Tin Road and Associated  
Sewerage Works in Area 54, Tuen Mun

Monthly EM&A Report for February 2016 (Rev. A)

March 2016

Civil Engineering and Development Department

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Homantin, Kowloon



**Pursuant to Condition 3.6 of Environmental Permit No. EP-381/2009, this Monthly EM&A Report has been reviewed and certified by the Environmental Team Leader (ETL) and verified by the Independent Environmental Checker (IEC).**

**Certified by:**



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Brandon Wong  
Environmental Team Leader (ETL)  
Mott MacDonald Hong Kong Limited

**Date** 9 March 2016

**Verified by:**

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F N Wong  
Independent Environmental Checker (IEC)  
Arcadis

**Date** \_\_\_\_\_



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# Executive Summary

On 26 October 2012, Mott MacDonald Hong Kong Limited (MMHK) was commissioned by the Civil Engineering and Development Department (CEDD) under Agreement No. LW 02/2012 to undertake the Environmental Team (ET) services (including environmental monitoring and audit (EM&A)) for the Construction of Sewage Pumping Station near Tsz Tin Road and Associated Sewerage Works in Area 54, Tuen Mun (The Project).

The Environmental Permit (Environmental Permit (EP) No. EP-381/2009) for the “Tuen Mun Area 54 Sewage Pumping Station” was granted by the Environmental Protection Department (EPD) on 4 January 2010. The construction works commenced on 22 February 2013. This is the February 2016 Monthly EM&A Report submitted under Condition 3.6 of the EP which summarises the findings on EM&A during the period from 1 to 29 February 2016.

## **Exceedance of Action and Limit Levels**

There was no breach of Action or Limit levels for Air Quality (1-hr TSP and 24-hr TSP) and Noise level (as  $L_{eq}$ , 30 minutes) in this reporting month.

## **Implementation of Mitigation Measures**

Site inspection was carried out on 3, 11, 17 and 24 February 2016 to confirm the implementation measures undertaken by the Contractor in the reporting month. The outcomes are presented in Section 4 and the status of implementation of mitigation measures in the site is shown in [Appendix J](#).

## **Record of Complaints**

No environmental complaint was recorded in the reporting month.

## **Record of Notification of Summons and Successful Prosecutions**

No notification of summons and successful prosecution were recorded in the reporting month.

## **Reporting Changes**

There are no reporting changes.

## **Future Key Issues**

The major site works scheduled to be commissioned in the coming month include:

### Portion A

- Excavation
- Construction of DN500 twin rising main
- Installation of sheet pile
- Temporary Support
- Pipe laying

- Pipe jacking
- Construction of manhole and valve pit
- Formwork
- Backfilling
- Road construction
- Steel fixing
- Concreting

#### Portion B

- Construction of retaining wall
- Formwork
- Steel Fixing
- Concreting
- Backfilling

Potential environmental impacts due to the construction activities, including air quality, noise, water quality and waste will be monitored or reviewed. The recommended environmental mitigation measures shall be implemented on site and weekly site inspections will be carried out to ensure that the environmental conditions are acceptable.

# 1 Introduction

## 1.1 Background

On 26 October 2012, Mott MacDonald Hong Kong Limited (MMHK) was commissioned by the Civil Engineering and Development Department (CEDD) under Agreement No. LW 02/2012 to undertake the Environmental Team (ET) services (including environmental monitoring and audit (EM&A)) for the Construction of Sewage Pumping Station near Tsz Tin Road and Associated Sewerage Works in Area 54, Tuen Mun (The Project). The construction works commenced on 22 February 2013.

The Monthly EM&A Report is required under the approved EM&A Manual and is submitted to fulfil Condition 3.6 of the Environmental Permit (EP) No. EP-381/2009 for the “Tuen Mun Area 54 Sewage Pumping Station”. The EP was granted by the Environmental Protection Department (EPD) on 4 January 2010.

This is the February 2016 Monthly EM&A Report presenting the monitoring works conducted from 1 to 29 February 2016. The purpose of this report is to summarise the findings in the EM&A of the project over the reporting period.

## 1.2 Project Organisation

The organisation chart and lines of communication with respect to the on-site environmental management structure together with the contact information of the key personnel are shown in [Appendix A](#).

## 1.3 Environmental Status in the Reporting Period

During the reporting period, construction works of the Project undertaken include:

### Portion A

- Excavation
- Construction of DN500 twin rising main
- Installation of sheet pile
- Temporary Support
- Pipe laying
- Pipe jacking
- Construction of manhole and valve pit
- Formwork
- Steel fixing
- Concreting

### Portion B

- Construction of retaining wall
- Formwork
- Steel Fixing
- Concreting
- Backfilling

The Construction Works Programme of the Project is provided in [Appendix B](#). A layout plan of the Project is provided in [Figure 1.1](#). Please refer to **Table 4-2** on the status of the environmental licenses.

#### 1.4 Summary of EM&A Requirements

The EM&A programme requires environmental monitoring of air quality, noise, landscape and visual as specified in the approved EM&A Manual.

A summary of impact EM&A requirements is presented in **Table 1-1**.

**Table 1-1: Summary of Impact EM&A Requirements**

Parameters	Descriptions	Locations	Frequencies
Air Quality	24-Hour TSP	A5	At least once every 6 days
	1-Hour TSP	A5	At least 3 times every 6 days
Noise	L <sub>eq</sub> , 30 minutes	N1, N2	Weekly
Landscape and Visual	Monitoring includes auditing the design, implementation and maintenance of L&V mitigation measures	Project site of Tuen Mun Area 54 Sewage Pumping Station (TM54SPS) and the associated sewerage works in Area 54.	Once per month

The Environmental Quality Performance Limits for air quality and noise are shown in [Appendix C](#).

The Event and Action Plan for air quality, construction noise, landscape and visual impact are shown in [Appendix D](#).

## 2 Impact Monitoring Methodology

### 2.1 Introduction

For air quality and construction noise, the monitoring methodology, including the monitoring locations, monitoring equipments used, monitoring parameters, and frequency and duration etc., are explained in this Section. The environmental monitoring schedules for the reporting period and the tentative monitoring Schedule for the coming month are provided in [Appendix E](#).

### 2.2 Air Quality

#### 2.2.1 Monitoring Parameters, Frequency and Duration

**Table 2-1** summarizes the monitoring parameters, frequency and duration of the TSP monitoring.

Table 2-1: Air Quality Monitoring Parameters, Frequency and Duration

Monitoring Station	Parameter	Frequency	Duration
Project Site Office (A5)	24-hour TSP	At least once in every six-days	24 hours
	1-hour TSP	At least 3 times every six-days	60 minutes

#### 2.2.2 Monitoring Locations

Due to rejection of station set up at Unicorn Garden, alternative location was proposed and agreed by IEC and ER. EPD had no objection to the proposal in their reply on 4 January 2013. Location of the monitoring station is given in **Table 2.2** and shown in [Figure 2.1](#).

Table 2.2: Air Quality Monitoring Station

Monitoring Station	Location
A5	Project Site Office

#### 2.2.3 Monitoring Equipments

Continuous 24-hour TSP air quality monitoring was conducted using High Volume Sampler (HVS) (Model: GMWS-2310 Accu-vol) located at the designated monitoring station. The HVS meets all the requirements stated in Section 3.2 of the EM&A Manual. Portable direct reading dust meter was used to carry out the 1-hour TSP monitoring. **Table 2-3** summarizes the equipment used in the impact air quality monitoring. Copies of the calibration certificates for the HVS and portable dust meters are attached in [Appendix F](#).

Table 2-3: TSP Monitoring Equipment

Equipment	Model
<b>24-hr TSP monitoring</b>	
High Volume Sampler	GMWS 2310 Accu-vol (Serial no. 0764)
Calibrator	TE-5025A (Serial no. 2454)
<b>1-hr TSP monitoring</b>	
Portable direct reading dust meter	Sibata LD-3B (Serial no. 336338) (Detection Limit : $1 \mu\text{g}/\text{m}^3 \pm 0.1 \mu\text{g}/\text{m}^3$ )

## 2.2.4 Monitoring Methodology

### 24-hour TSP Monitoring

#### Installation

The HVS was installed at the site boundary. The following criteria were considered in the installation of the HVS.

- A horizontal platform with appropriate support to secure the sampler against gusty wind was provided.
- The distance between the HVS and any obstacles, such as buildings, was at least twice the height that the obstacle protrudes above the HVS.
- A minimum of 2 metres separation from walls, parapets and penthouse was required for rooftop sampler.
- A minimum of 2 metres separation from any supporting structure, measured horizontally was required.
- No furnace or incinerator flues or building vent were nearby.
- Airflow around the sampler was unrestricted.
- The sampler has been more than 20 metres from any drip line.
- Permission was obtained to set up the sampler and to obtain access to the monitoring station.
- A secured supply of electricity is needed to operate the sampler.

#### Preparation of Filter Papers

- Glass fibre filters were labelled and sufficient filters that were clean and without pinholes were selected.
- The filters used are specified to have a minimum collection efficiency of 99 percent for  $0.3 \mu\text{m}$  (DOP) particles.
- All filters were equilibrated in the conditioning environment for 24 hours before weighing. The conditioning environment temperature was around  $25 \text{ }^\circ\text{C}$  and not variable by more than  $\pm 3 \text{ }^\circ\text{C}$  with relative humidity (RH)  $< 50\%$  and was not variable by more than  $\pm 5\%$ . A convenient working RH was  $40\%$ . All preparation of filters was done by Hong Kong Laboratory Accreditation Scheme (HOKLAS) accredited laboratory.

### Field Monitoring Procedures

- The power supply was checked to ensure the HVS works properly.
- The filter holder and the area surrounding the filter were cleaned.
- The filter holder was removed by loosening the four bolts and a new filter, with stamped number upward, on a supporting screen was aligned carefully.
- The filter was properly aligned on the screen so that the gasket formed an airtight seal on the outer edges of the filter.
- The swing bolts were fastened to hold the filter holder down to the frame. The pressure applied should be sufficient to avoid air leakage at the edges.
- The shelter lid was closed and was secured with the aluminium strip.
- The HVS was warmed-up for about 5 minutes to establish run-temperature conditions.
- A new flow rate record sheet was set into the flow recorder.
- The flow rate of the HVS was checked and adjusted at around 1.3 m<sup>3</sup>/min. The range specified in the EM&A Manual was between 0.6-1.7 m<sup>3</sup>/min.
- The programmable timer was set for a sampling period of 24 hrs, and the starting time, weather condition and the filter number were recorded.
- The initial elapsed time was recorded.
- At the end of sampling, the sampled filter was removed carefully and folded in half length so that only surfaces with collected particulate matter were in contact.
- It was then placed in a clean plastic envelope and sealed.
- All monitoring information was recorded on a standard data sheet.
- Filters were sent to a Hong Kong Laboratory Accreditation Scheme (HOKLAS) accredited laboratory for analysis.

### Maintenance and Calibration

- The HVS and its accessories are maintained in good working condition, such as replacing motor brushes routinely and checking electrical wiring to ensure a continuous power supply.
- HVSs were calibrated prior to monitoring.
- Calibration records for HVS are shown in [Appendix F](#).

### 1-hour TSP Monitoring

#### Field Monitoring

The measuring procedures of the 1-hour dust meter are in accordance with the Manufacturer's Instruction Manual as follows:

- Turn the power on.
- Close the air collecting opening cover.
- Push the "TIME SETTING" switch to [BG].
- Push "START/STOP" switch to perform background measurement for 6 seconds.
- Turn the knob at SENSI ADJ position to insert the light scattering plate.
- Leave the equipment for 1 minute upon "SPAN CHECK" is indicated in the display.
- Push "START/STOP" switch to perform automatic sensitivity adjustment. This measurement takes 1 minute.

- Pull out the knob and return it to MEASURE position.
- Setting time period of 1 hour for the 1-hour TSP measurement.
- Push “START/STOP” to start the 1-hour TSP measurement.
- Regular checking of the time period setting to ensure monitoring time of 1 hour.

### Maintenance and Calibration

- The 1-hour dust meter would be checked at 3-month intervals and calibrated at 1-year intervals throughout all stages of the air quality monitoring.
- Calibration records for direct dust meters are shown in [Appendix F](#).

### Weather Condition

- The wind data during the monitoring period were recorded and provided in [Appendix H](#).

## 2.3 Construction Noise

### 2.3.1 Monitoring Parameters, Frequency and Duration

**Table 2.4** summarizes the monitoring parameters, frequency and duration of noise monitoring. The noise in A-weighted levels  $L_{eq}$ ,  $L_{10}$  and  $L_{90}$  are recorded in a 30-minute interval between 0700 and 1900 hrs at the designated monitoring stations shown in [Figure 2.1](#).

Table 2.4: Noise Monitoring Parameters, Period and Frequency

Time Period	Parameters	Frequency
Daytime on normal weekdays (0700-1900 hrs)	$L_{eq}$ (30 min), $L_{90}$ (30 min) & $L_{10}$ (30 min)	Once every week

### 2.3.2 Monitoring Equipment

Integrating Sound Level Meter was used for noise monitoring. It was a Type 1 sound level meter capable of giving a continuous readout of the noise level readings including equivalent continuous sound pressure level ( $LA_{eq}$ ) and percentile sound pressure level ( $L_x$ ). They comply with International Electrotechnical Commission Publications 651:1979 (Type 1) and 804:1985 (Type 1). **Table 2.5** summarizes the noise monitoring equipment model being used.

Table 2.5: Noise Monitoring Equipments

Monitoring Station	Equipment Model	
	Integrating Sound Level Meter	Calibrator
N1	Rion NL-18 (Serial no. 00360030)	Rion NC-73
N2	(Detection limit: 20dB ± 0.1 dB) and Rion NL-31 (Serial no. 00320533) (Detection limit: 20dB ± 0.1 dB)	(Serial no. 10997142) (Detection limit: 94dB ± 0.1 dB)



### 2.3.3 Monitoring Locations

Two monitoring stations (N1 and N2) were proposed in the EM&A Manual. Due to access problems and rejection from premises owners, alternative locations were proposed and agreed by IEC and ER. EPD had no objection to the proposal in their reply on 4 January 2013. The locations of the monitoring stations are described in **Table 2-6** and shown in [Figure 2.1](#).

Table 2-6: Locations of Noise Monitoring Stations

Monitoring Station	Locations	Type of measurement
N1	G/F of Block 6 of Unicorn Garden	Free Field
N2	No. 140 of Kei Lun Wai	Free Field

### 2.3.4 Monitoring Methodology

#### Field Monitoring

- The microphone of the Sound Level Meter was set at least 1.2 m above the ground.
- Free Field measurement was made at the monitoring locations.
- The battery condition was checked to ensure the correct functioning of the meter.
- Parameters such as frequency weighting, the time weighting and the measurement time were set as follows:
  - frequency weighting: A
  - time weighting: Fast
  - time measurement: 30 minutes intervals (between 0700-1900 on normal weekdays)
- Prior to and after each noise measurement, the meter was calibrated using a Calibrator for 94 dB at 1 kHz. If the difference in the calibration level before and after measurement was more than 1 dB, the measurement would be considered invalid and has to be repeated after re-calibration or repair of the equipment.
- During the monitoring period, the  $L_{eq}$ ,  $L_{10}$  and  $L_{90}$  were recorded. In addition, any site observations and noise sources were recorded on a standard record sheet.
- A correction of +3dB(A) was made to the free field measurements.
- Noise measurements were not made in presence of fog, rain, wind with a steady speed exceeding  $5\text{ms}^{-1}$  or wind with gusts exceeding  $10\text{ms}^{-1}$ .

#### Maintenance and Calibration

- The microphone head of the sound level meter and calibrator is cleaned with soft cloth at quarterly intervals.
- The sound level meter and calibrator are sent to the supplier or HOKLAS laboratory to check and calibrate at yearly intervals.
- Calibration records are shown in [Appendix F](#).

#### Weather Condition

- The wind data during the monitoring period were recorded and provided in [Appendix H](#).

## 3 Monitoring Results

### 3.1 Impact Monitoring

Construction impact monitoring for air quality, noise and landscape and visual impact was undertaken in compliance with the EM&A Manual during the reporting month.

### 3.2 Air Quality Monitoring

#### 3.2.1 1-hr TSP

Results of 1-hour TSP at the monitoring location are summarised in **Table 3-1**. Graphical plots of the monitoring results are shown in [Appendix G](#).

Table 3-1: Summary of 1-hour TSP monitoring results

Monitoring Date	Start Time	1-hr TSP ( $\mu\text{g}/\text{m}^3$ )			Range ( $\mu\text{g}/\text{m}^3$ )	Action Level ( $\mu\text{g}/\text{m}^3$ )	Limit Level ( $\mu\text{g}/\text{m}^3$ )
		1st Result	2nd Result	3rd Result			
01-Feb-16	12:35	55	64	65	55-112	375	500
06-Feb-16	13:12	66	55	59			
12-Feb-16	13:00	63	55	70			
18-Feb-16	12:30	112	109	86			
24-Feb-16	12:52	95	101	110			

#### 3.2.2 24-hr TSP

Results of 24-hour TSP at the monitoring location are summarised in **Table 3-2**. Graphical plots of the monitoring results are shown in [Appendix G](#).

Table 3-2: Summary of 24-hour TSP monitoring results

Monitoring Date	Start Time	Monitoring Results ( $\mu\text{g}/\text{m}^3$ )	Range ( $\mu\text{g}/\text{m}^3$ )	Action Level ( $\mu\text{g}/\text{m}^3$ )	Limit Level ( $\mu\text{g}/\text{m}^3$ )
01-Feb-16	12:30	51	46-73	188	260
06-Feb-16	13:10	46			
12-Feb-16	13:02	52			
18-Feb-16	12:32	54			
24-Feb-16	12:50	73			

No exceedance of 1-hour and 24-hour TSP (Action or Limit Level) was recorded in the reporting period.

### 3.3 Construction Noise

The construction noise monitoring results are summarized in **Table 3-3**. Graphical plots of the monitoring data are shown in [Appendix G](#).

Table 3-3: Summary of Construction noise monitoring results

Monitoring Date	Start Time	End Time	Mean & Range of Noise Levels, dB(A)			Construction Noise, dB(A)	Wind Speed, (m/s)	Limit Level for Leq (dB(A))
			Leq	L <sub>10</sub>	L <sub>90</sub>			
<b>N1</b>								
01-Feb-16	13:00	13:30	52	54	47	55	0.5	75
12-Feb-16	13:07	13:37	51	54	47	54	0.5	
18-Feb-16	13:00	13:30	54	56	47	57	0.5	
24-Feb-16	13:00	13:30	51	53	47	54	0.5	
<b>N2</b>								
01-Feb-16	13:35	14:05	50	52	46	53	0.5	75
12-Feb-16	13:41	14:11	50	51	46	53	0.5	
18-Feb-16	13:35	14:05	50	52	46	53	0.5	
24-Feb-16	13:35	14:05	50	52	46	53	0.5	

No exceedance (Action/Limit Level) of construction noise was recorded in the reporting period as no noise related environmental complaint was received during the reporting period and noise levels recorded during the monitoring period were below 75 dB(A).

### 3.4 Landscape and Visual

The landscape and visual impact inspection was conducted on 3 February 2016 to check the design, implementation and maintenance of L&V mitigation measures at Project site of Tuen Mun Area 54 Sewage Pumping Station (TM54SPS) and the associated sewerage works in Area 54. No major deficiency was observed. Details of inspection can be referred to **Appendix L**.

## 4 Environmental Site Inspection

### 4.1 Site Inspection

Construction phase weekly site inspection was carried out on 3, 11, 17 and 24 February 2016. All observations have been recorded in the site inspection checklist and passed to the Contractor together with the appropriate recommended mitigation measures where necessary. The key observation from site inspection and associated recommendations are summarized in **Table 4-1**.

Table 4-1: Summary of Site Inspections and Recommendations

Inspection Date	Observation / Recommendation	Contractor's Responses / Action(s) Undertaken	Close-out (Date)
29 January 2016	The Environmental Permit is missing.	The contractor was reminded to provide the Environmental Permit at site entrance/exit.	3 February 2016
29 January 2016	Site runoff should be diverted to silt removal facilities before discharge.	The contractor was reminded to provide silt removal facilities and settle runoff prior to disposal.	3 February 2016

### 4.2 Advice on the Solid and Liquid Waste Management Status

The Contractor has been registered as a chemical waste producer for the Project. Construction and demolition (C&D) material sorting will be carried out on site. A sufficient number of receptacles were available for general refuse collection.

The waste flow table is present in [Appendix I](#).

### 4.3 Status of Environmental Licenses and Permits

The environmental permits, licenses, and/or notifications on environmental protection for this Project which were valid during the period are summarised in **Table 4-2**.

Table 4-2: Status of Environmental Submissions, Licenses and Permits

Statutory Reference	Description	Permit /Reference No.	Status
EIAO	Environmental Permit	EP-381/2009	Valid
APCO	Notification of Construction Work under APCO	356594	Valid
WPCO	Discharge License	WT00015603-2013	Valid
WDO	Registration as Chemical Waste Producer	5213-423-S3567-02	Valid
WDO	Bill Account for disposal	7016271	Valid

Legend: EIAO – Environmental Impact Assessment Ordinance  
 APCO – Air Pollution Control Ordinance  
 WPCO – Water Pollution Control Ordinance  
 WDO – Waste Disposal Ordinance

The Air Pollution Control (Non-road Mobile Machinery) (Emission) Regulation requires all non-road mobile machinery to bear a unique label with a reference number issued by EPD as specified in the Regulation.

Compliance to this regulation was examined during site inspection and any deficiencies would be recorded in the site inspection checklist.

#### **4.4 Recommended Mitigation Measures**

The EM&A programme followed the recommended mitigation measures in the EM&A Manual. The EM&A requirements as well as the summary of implementation status of the environmental mitigation measures are provided in [Appendix J](#). In particular, the following mitigation measures were brought to attention during the site inspections:

##### **Water quality**

- Channels, earth bunds or sand bag barriers should be provided on site to direct storm water to silt removal facilities.
- Water pumped out from foundation excavations should be discharged into storm drains via silt removal facilities.

##### **Others**

- A copy of the valid Environmental Permit shall be displayed conspicuously on the Project site(s) at all vehicular site entrances/exits or at a convenient location for public information at all times. The most updated information about the Permit, including any amended Permit, shall be displayed at such locations. If the Permit Holder surrenders a part or whole of the Permit, the notice he send to the Director shall also be displayed at the same locations as the original Permit. The suspended, varied or cancelled Permit shall be removed from display at the Project site(s).

## 5 Report on Non-compliance, Complaints, Notification of Summons and Successful Prosecutions

### 5.1 Record on Non-compliance of Action and Limit Levels

There was no breach of Action or Limit Levels for Air Quality and Noise monitoring in the reporting month.

All landscape and visual mitigation measures have been implemented in full in accordance with the recommendations of the approved EIA report (EIA-150/2008).

### 5.2 Record on Environmental Complaints Received

No environmental complaint was received this month. The cumulative statistics on complaints were provided in [Appendix K](#).

### 5.3 Record on Notifications of Summons and Successful Prosecution

No notifications of summons or successful prosecution were received this month. The cumulative statistics on notifications of summons and successful prosecutions were provided in [Appendix K](#).

### 5.4 Review of Reasons for and Implications of Non-compliance, Complaints, Summons and Prosecutions

As no notifications of summons or successful prosecution were received, the associated review was not required.

### 5.5 Follow-up Actions Taken

As no notifications of summons or successful prosecution were received, the associated follow-up actions were not required.

## 6 Future Key Issues

### 6.1 Construction Works for the Coming Month(s)

The major site works scheduled to be commissioned in the coming month include:

#### Portion A

- Excavation
- Construction of DN500 twin rising main
- Installation of sheet pile
- Temporary Support
- Pipe laying
- Pipe jacking
- Construction of manhole and valve pit
- Formwork
- Backfilling
- Road construction
- Steel fixing
- Concreting

#### Portion B

- Construction of retaining wall
- Formwork
- Steel Fixing
- Concreting
- Backfilling

### 6.2 Key Issues for the Coming Month

Key issues to be considered in the coming month include:

- Generation of dust from construction works;
- Noise impact from operating equipment and machinery on-site;
- Generation of site surface runoffs and wastewater from activities on-site;
- Management of stockpiles and slopes, particularly on rainy days;
- Sorting, recycling, storage and disposal of general refuse and construction waste; and
- Management of chemicals and avoidance of oil spillage on-site.

### 6.3 Monitoring Schedule for the Coming Month

The environmental site inspection and environmental monitoring will be continued in the coming month. Impact monitoring for air quality and noise in accordance with the approved EM&A Manual has commenced since 22 February 2013. The tentative monitoring schedule for the coming month is shown in the [Appendix E](#).

# 7 Conclusions and Recommendations

## 7.1 Conclusions

The EM&A programme as recommended in the EM&A Manual has been undertaken since the construction works commenced on 22 February 2013.

Monitoring of air quality and noise with respect to the Project is underway. In particular, the 1-hr TSP, 24-hr TSP, noise level (as  $L_{eq}$ , 30 minute) under monitoring have been checked against established Action and Limit levels. There was no breach of Action and Limit Levels for 1-hr TSP, 24-hr TSP and noise in the reporting month.

The February 2016 monthly landscape and visual site audit was undertaken on 3 February 2016 and all L&V mitigation measures have been implemented in full.

## 7.2 Recommendations

Potential environmental impacts due to the construction activities, including air quality, noise, water quality and waste will be monitored or reviewed. The recommended environmental mitigation measures shall be implemented on site and weekly site inspections will be carried out to ensure that the environmental conditions are acceptable.



## Appendix A. Project Organisation

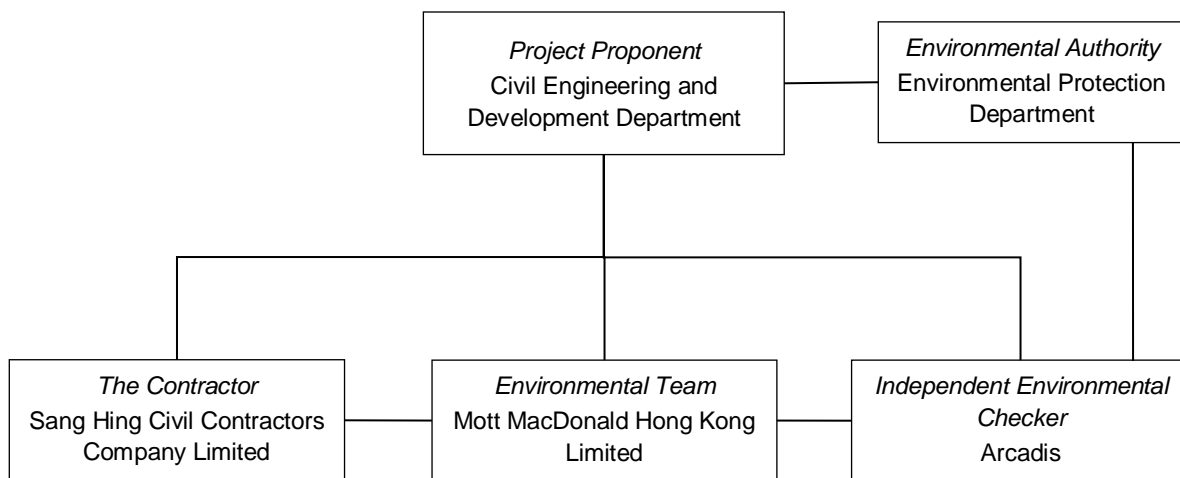


Table A.1: Contact information

Company / Department	Position	Name	Telephone / Mobile
Civil Engineering and Development Department	Engineer's Representative	Mr Henry Tsang	2760 5781
Arcadis	Independent Environmental Checker	Mr. F N Wong	2911 2744
Mott MacDonald Hong Kong Ltd.	Environmental Team Leader	Mr. Brandon Wong	2828 5875
Sang Hing Civil Contractors Company Limited	Project Director	Mr. P Y Cheng	9023 4821
Sang Hing Civil Contractors Company Limited	Site Agent	Mr. K H Lai	9187 7116
Sang Hing Civil Contractors Company Limited	Environmental Officer	Mr Y M Leung	9844 7741

# Appendix B. Tentative Construction Programme

## Appendix C. Action and Limit Levels for Construction Phase

### Air Quality

The Action and Limit Levels for 1-hour and 24-hour TSP for the monitoring station are presented in following tables:

Table C.1: Action and Limit Levels for 1-hour TSP

Monitoring Station	Action Level ( $\mu\text{g}/\text{m}^3$ )	Limit Level ( $\mu\text{g}/\text{m}^3$ )
A5	375	500

Table C.2: Action and Limit Levels for 24-hour TSP

Monitoring Station	Action Level ( $\mu\text{g}/\text{m}^3$ )	Limit Level ( $\mu\text{g}/\text{m}^3$ )
A5	188	260

### Noise

The Action and Limit Levels for Noise for the monitoring stations are presented in following table:

Table C.3: Action and Limit Levels for Construction Noise

Time Period & Monitoring Locations	Action Level	Limit Level
N1 & N2		
0700-1900 hours on normal weekdays	When one documented complaint is received from any one of the sensitive receivers	75 dB(A)

# Appendix D. Event and Action Plan for Air Quality, Noise, Landscape and Visual Impact

## Air Quality

In case the Action and Limit Levels are not complied during construction stage, the following Event and Action Plan should be followed:

Table D1: Event and Action Plan for Air Quality

Event	Action			
	ET Leader	IEC	ER (Engineer's Representative)	Contractor
<b>Action Level</b>				
Exceedance for one sample	<ol style="list-style-type: none"> <li>1. Identify source and investigate the causes of exceedance.</li> <li>2. Inform Contractor, IEC and ER.</li> <li>3. Repeat measurement to confirm finding.</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> </ol>	<ol style="list-style-type: none"> <li>1. Notify Contractor.</li> </ol>	<ol style="list-style-type: none"> <li>1. Rectify any unacceptable practice.</li> <li>2. Amend working methods if appropriate.</li> </ol>
Exceedance for two or more consecutive samples	<ol style="list-style-type: none"> <li>1. Identify the source and investigate the causes of exceedance.</li> <li>2. Inform Contractor, IEC and ER.</li> <li>3. Increase monitoring frequency to daily.</li> <li>4. Discuss with IEC and the Contractor on remedial actions required.</li> <li>5. Assess the effectiveness of Contractor's remedial actions.</li> <li>6. If exceedance continues, arrange meeting with IEC and ER.</li> <li>7. 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 the Contractor's working method.</li> <li>3. Discuss with ET and the Contractor on possible remedial measures.</li> <li>4. Advise ER on the effectiveness of the proposed remedial measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Confirm receipt of notification of exceedance in writing.</li> <li>2. Notify the Contractor.</li> <li>3. In consolidation with the IEC, agree with the Contractor on the remedial measures to be implemented.</li> <li>4. Supervise implementation of remedial measures.</li> <li>5. Conduct meeting with ET and IEC if exceedance continues.</li> </ol>	<ol style="list-style-type: none"> <li>1. Discuss with ET and IEC on proper remedial actions.</li> <li>2. Submit proposals for remedial actions to ER and IEC within 3 working days of notification.</li> <li>3. Implement the agreed proposals.</li> <li>4. Amend proposal if appropriate.</li> </ol>
<b>Limit Level</b>				
Exceedance for one sample	<ol style="list-style-type: none"> <li>1. Identify source and investigate the causes of exceedance.</li> <li>2. Inform Contractor, IEC, ER and EPD.</li> <li>3. Repeat measurement to confirm finding.</li> <li>4. Assess effectiveness of Contractor's remedial actions and keep EPD,</li> </ol>	<ol style="list-style-type: none"> <li>1. Check monitoring data submitted by ET.</li> <li>2. Check the Contractor's working method.</li> <li>3. Discuss with ET Leader and the Contractor on possible remedial measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Confirm receipt of notification of exceedance in writing.</li> <li>2. Notify the Contractor.</li> <li>3. In consolidation with the IEC, agree with the Contractor on</li> </ol>	<ol style="list-style-type: none"> <li>1. Take immediate action to avoid further exceedance.</li> <li>2. Discuss with ET and IEC on proper remedial actions.</li> <li>3. Submit proposals for remedial actions to IEC within 3 working days of</li> </ol>

Event	Action			
	ET Leader	IEC	ER (Engineer's Representative)	Contractor
	IEC and ER informed of the results.	4. Advise ER on the effectiveness of the proposed remedial measures.	the remedial measures to be implemented. 4. Supervise implementation of remedial measures. 5. Conduct meeting with ET and IEC if exceedance continues.	notification. 4. Implement the agreed proposals.
Exceedance for two or more consecutive samples	<ol style="list-style-type: none"> <li>1. Notify IEC, ER, Contractor and EPD.</li> <li>2. Repeat measurements to confirm findings.</li> <li>3. Carry out analysis of the Contractor's working procedures to identify source and investigate the causes of exceedance.</li> <li>4. Increase monitoring frequency to daily.</li> <li>5. Arrange meeting IEC, ER and Contractor to discuss the remedial actions to be taken.</li> <li>6. Assess effectiveness of the Contractor's remedial actions and keep IEC, EPD and ER informed of the results.</li> <li>7. 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 the Contractor's working method.</li> <li>3. Discuss amongst ER, ET and Contractor on the potential remedial actions.</li> <li>4. Review the Contractor's remedial actions whenever necessary to assure their effectiveness and advise ER accordingly.</li> </ol>	<ol style="list-style-type: none"> <li>1. Confirm receipt of notification of exceedance in writing.</li> <li>2. Notify Contractor.</li> <li>3. In consultation with IEC, agree with the Contractor on the remedial measures to be implemented.</li> <li>4. Supervise 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. Discuss with ET and IEC on proper remedial actions.</li> <li>3. Submit proposals for remedial actions to IEC within 3 working days of notification.</li> <li>4. Implement the agreed proposals.</li> <li>5. Submit further remedial actions if problem still not under control.</li> <li>6. Stop the relevant portion of works as instructed by ER until the exceedance is abated.</li> </ol>

## **Construction Noise**

In case the Action and Limit Levels are not complied during construction stage, the following Event and Action Plan should be followed:

Table D2: Event and Action Plan for Construction Noise

Event	Action			
	ET Leader	IEC	ER	Contractor
Action Level	<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 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 measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Review the investigation results submitted by ET.</li> <li>2. Review the proposed remedial measures by the Contractor and advise 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 ET and ER.</li> <li>2. Implement noise mitigation proposals.</li> </ol>
Limit Level	<ol style="list-style-type: none"> <li>1. Inform IEC, ER, Contractor and EPD.</li> <li>2. Repeat measurement 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 the 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 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 ET 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>

### **Landscape and Visual Impact**

In case the Action and Limit Levels are not complied during construction stage, the following Event and Action Plan should be followed:

Table D3: Event and Action Plan for Landscape and Visual Impact – Construction Phase

Event	Action			
	ET Leader	IEC	ER	Contractor
Non-conformity on one occasion	<ol style="list-style-type: none"> <li>1. Identify source</li> <li>2. Inform the IEC and ER.</li> <li>3. Discuss remedial actions with the IEC, the ER and Contractor.</li> <li>4. Monitor remedial action until rectification has been completed.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check report.</li> <li>2. Check the Contractor's working method.</li> <li>3. Discuss with the ER and the Contractor on possible remedial measures.</li> <li>4. Advise the ER on effectiveness of proposed remedial measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Notify the Contractor.</li> <li>2. Ensure remedial measures are properly implemented.</li> </ol>	<ol style="list-style-type: none"> <li>1. Amend working methods.</li> <li>2. Rectify damage and undertake remedial measures or any necessary replacement.</li> </ol>
Repeated non-conformity	<ol style="list-style-type: none"> <li>1. Identify source.</li> <li>2. Notify IEC and the ER.</li> <li>3. Increase monitoring (site audit) frequency.</li> <li>4. Discuss remedial actions with the IEC, the ER and the Contractor.</li> <li>5. Monitor remedial actions until rectification has been completed.</li> <li>6. If exceedance stops, cease additional monitoring (site audit).</li> </ol>	<ol style="list-style-type: none"> <li>1. Check report.</li> <li>2. Check the Contractor's working method.</li> <li>3. Discuss with the ER and the Contractor on possible remedial measures.</li> <li>4. Advise the ER on effectiveness of proposed remedial measures.</li> <li>5. Supervise implementation of remedial measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Notify the Contractor.</li> <li>2. Ensure remedial measures are properly implemented.</li> </ol>	<ol style="list-style-type: none"> <li>1. Amend working methods.</li> <li>2. Rectify damage and undertake remedial measures or any necessary replacement.</li> </ol>

# Appendix E. Monitoring Schedule

Table E.1: Monitoring Schedule for the reporting month

**Air Quality & Noise Monitoring Schedule for February 2016**

Feb-16						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
	1 24-hr TSP 1-hr TSP x 3 Noise	2	3 Weekly Audit	4	5	6 24-hr TSP 1-hr TSP x 3
7	8 Lunar New Year's Day	9 The second day of Lunar New Year	10 The third day of Lunar New Year	11 Weekly Audit	12 24-hr TSP 1-hr TSP x 3 Noise	13
14	15	16	17 Weekly Audit	18 24-hr TSP 1-hr TSP x 3 Noise	19	20
21	22	23	24 Weekly Audit 24-hr TSP 1-hr TSP x 3 Noise	25	26	27
28	29					

- Air Quality Monitoring (24-hr Total Suspended Particulates)
- Air Quality Monitoring (1-hr Total Suspended Particulates) x 3 times
- Noise Monitoring (30-min)
- Weekly Audit



Table E.2: Tentative Monitoring Schedule for the coming month

Tentative Air Quality & Noise Monitoring Schedule for March 2016

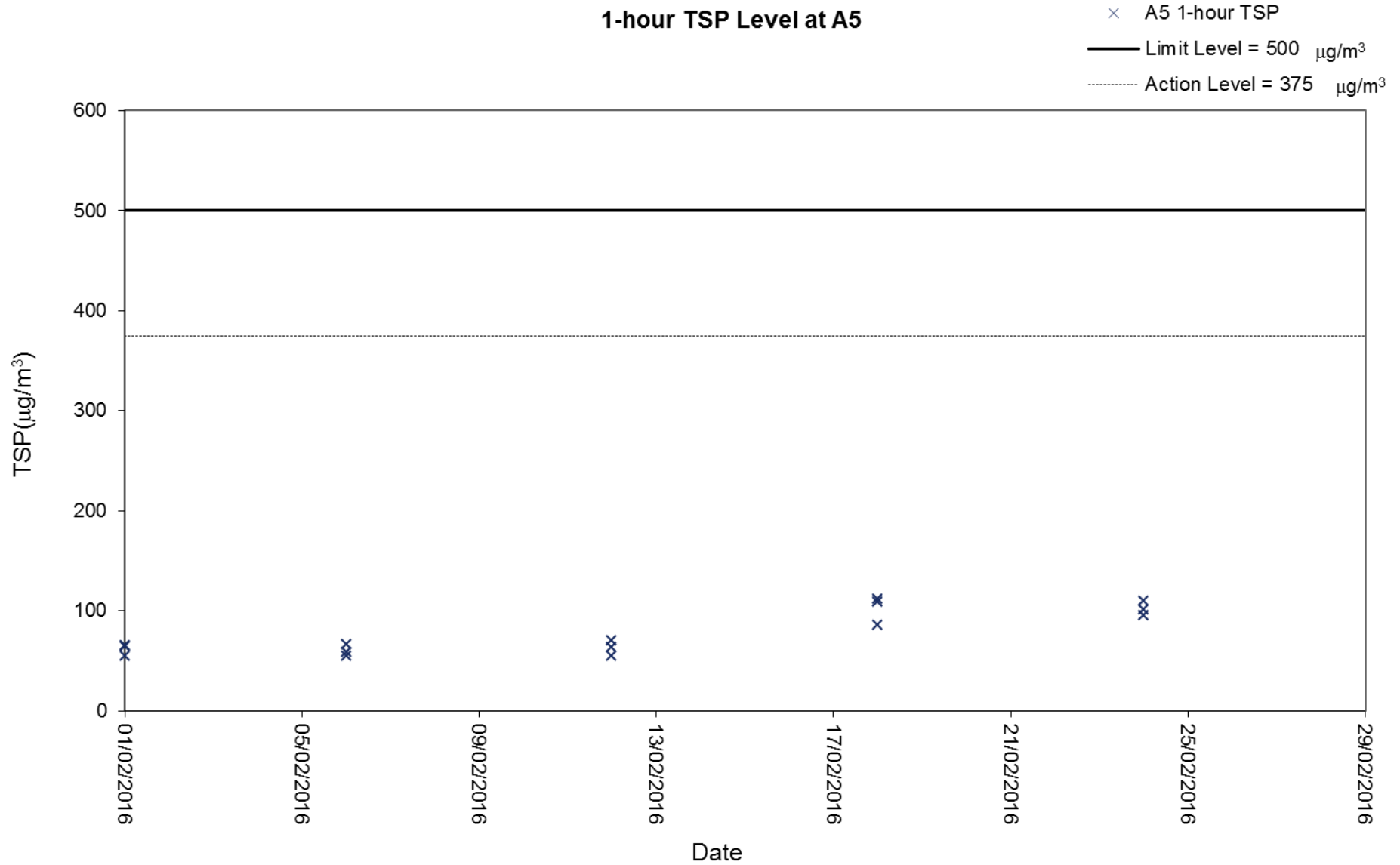
Mar-16						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
		1 24-hr TSP 1-hr TSP x 3 Noise	2 Weekly Audit	3	4	5
6	7 24-hr TSP 1-hr TSP x 3 Noise	8	9 Weekly Audit	10	11	12 24-hr TSP 1-hr TSP x 3
13	14	15	16 Weekly Audit	17	18 24-hr TSP 1-hr TSP x 3 Noise	19
20	21	22	23 Weekly Audit	24 24-hr TSP 1-hr TSP x 3 Noise	25 Good Friday	26 The day following Good Friday
27	28 Easter Monday	29	30 Weekly Audit 24-hr TSP 1-hr TSP x 3 Noise	31		
1						

- Air Quality Monitoring (24-hr Total Suspended Particulates)
- Air Quality Monitoring (1-hr Total Suspended Particulates) x 3 times
- Noise Monitoring (30-min)
- Weekly Audit

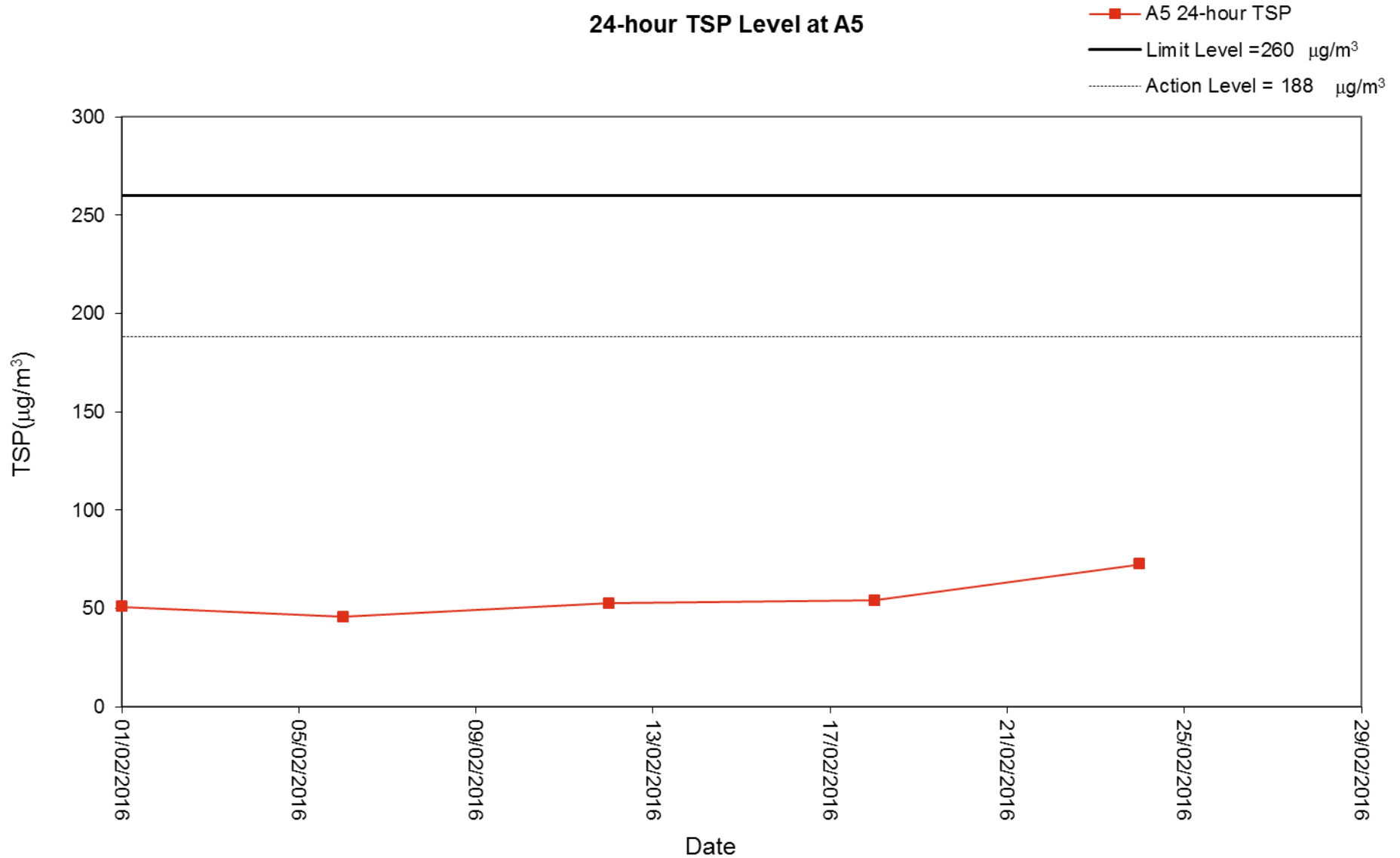
## Appendix F. Calibration Certificates

## Appendix G. Graphical plots of the monitoring results

Air quality monitoring at Station A5 (1-hour TSP)



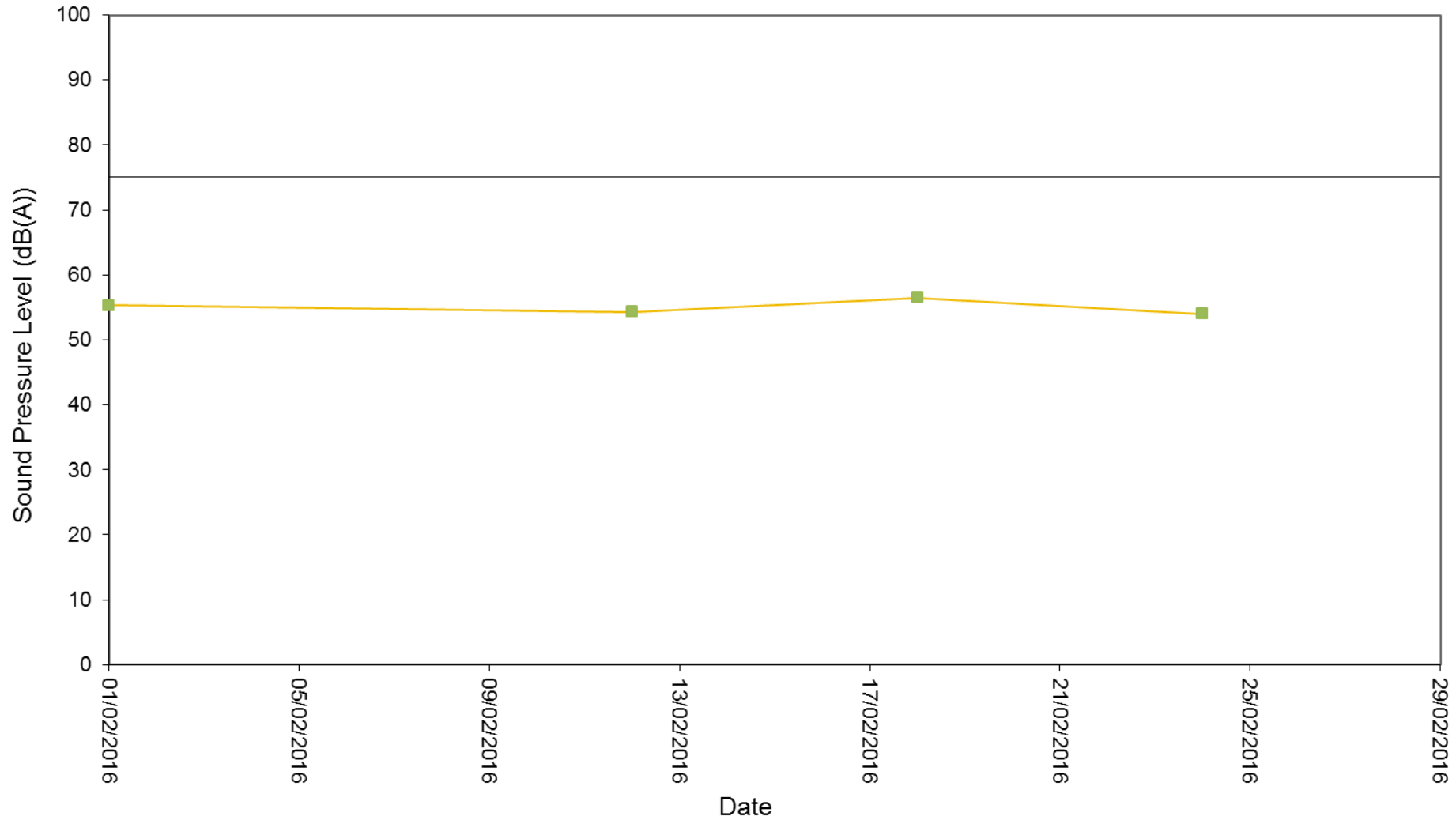
**Air quality monitoring at Station A5 (24-hour TSP)**



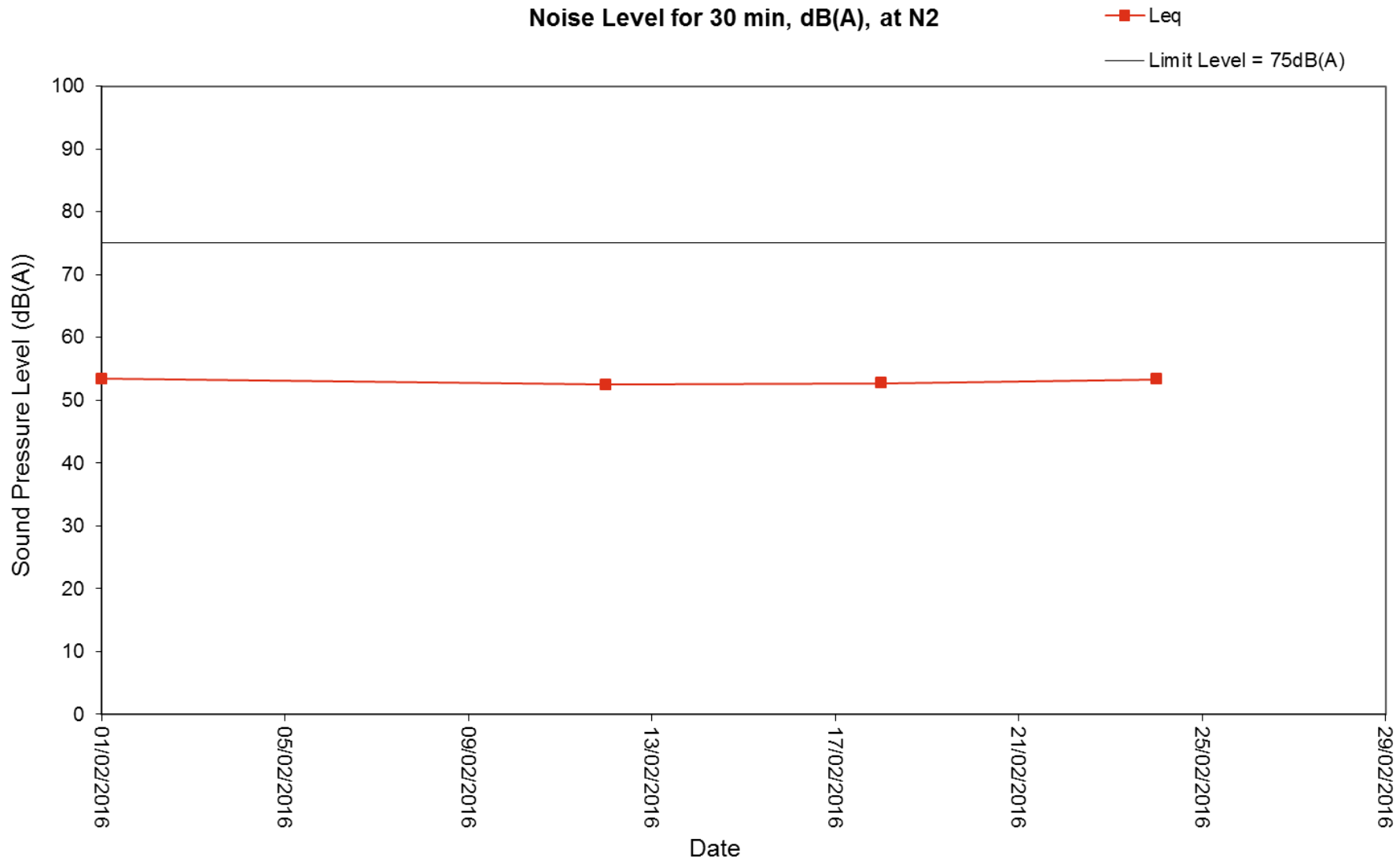
**Construction noise monitoring at Station N1**

**Noise Level for 30 min, dB(A), at N1**

—■— Leq    — Limit Level = 75dB(A)

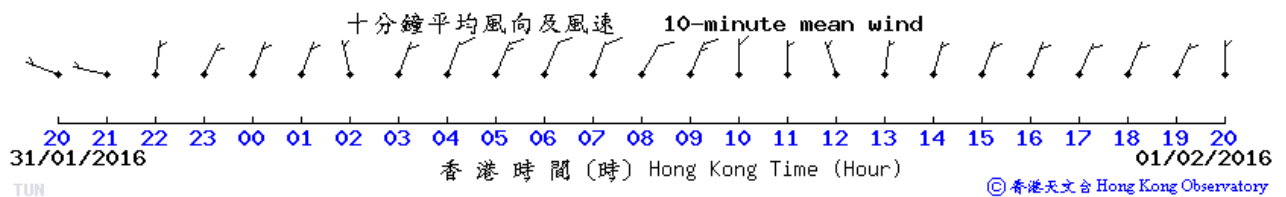
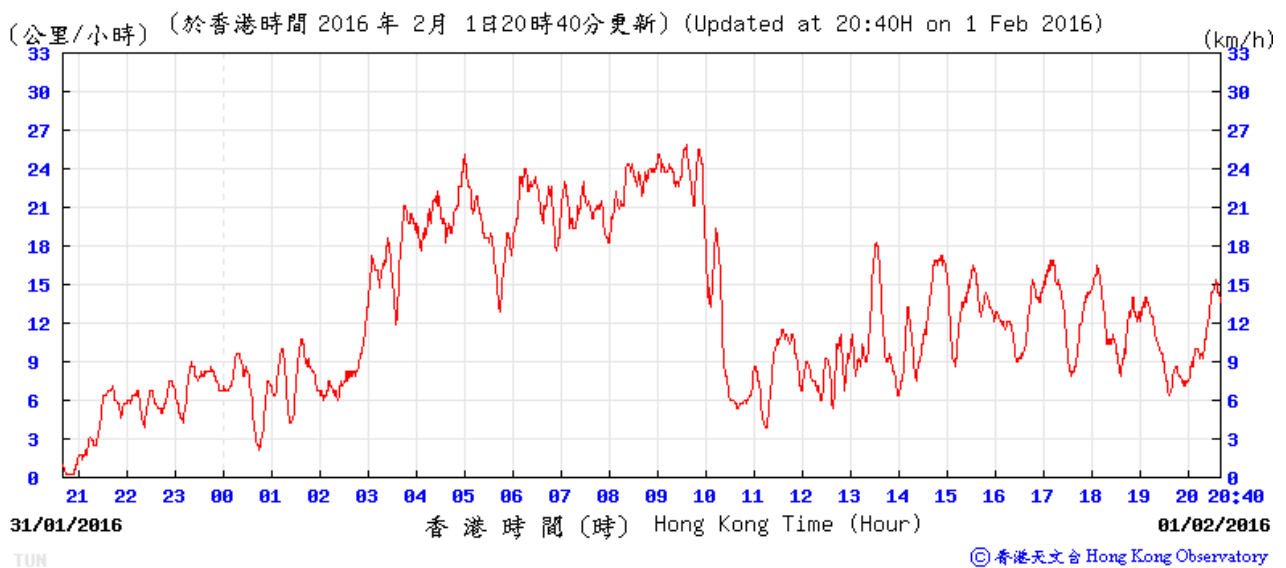
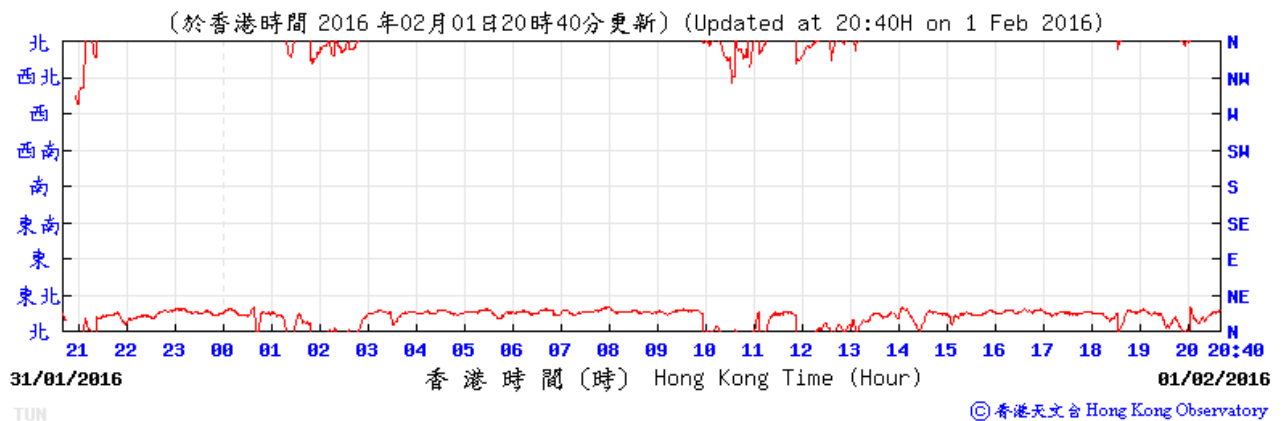


**Construction noise monitoring at Station N2**



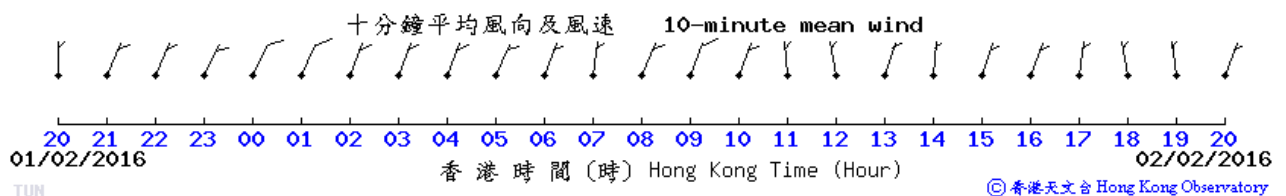
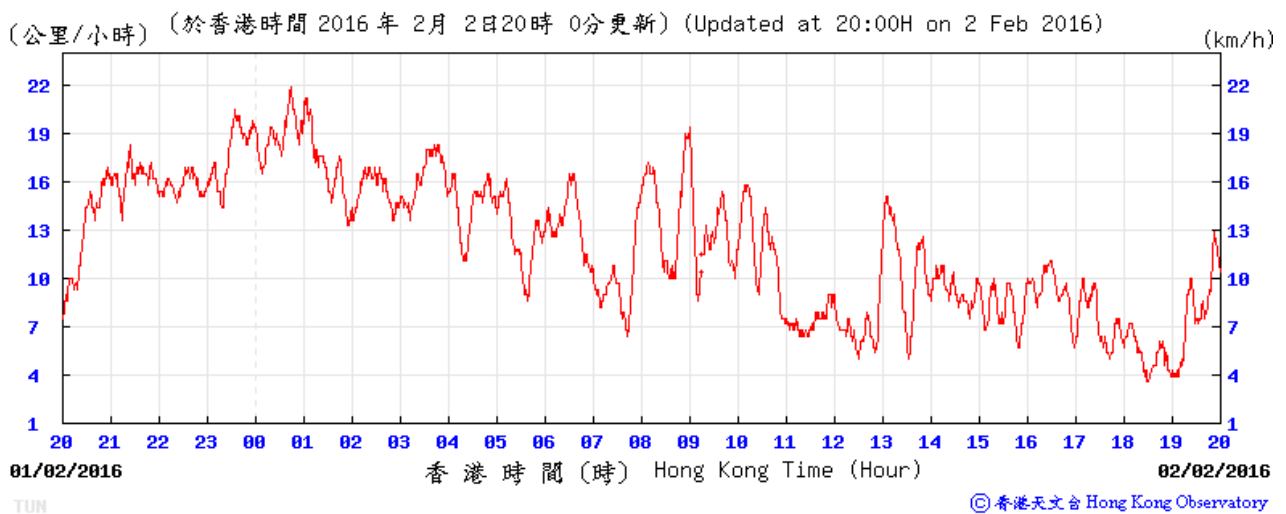
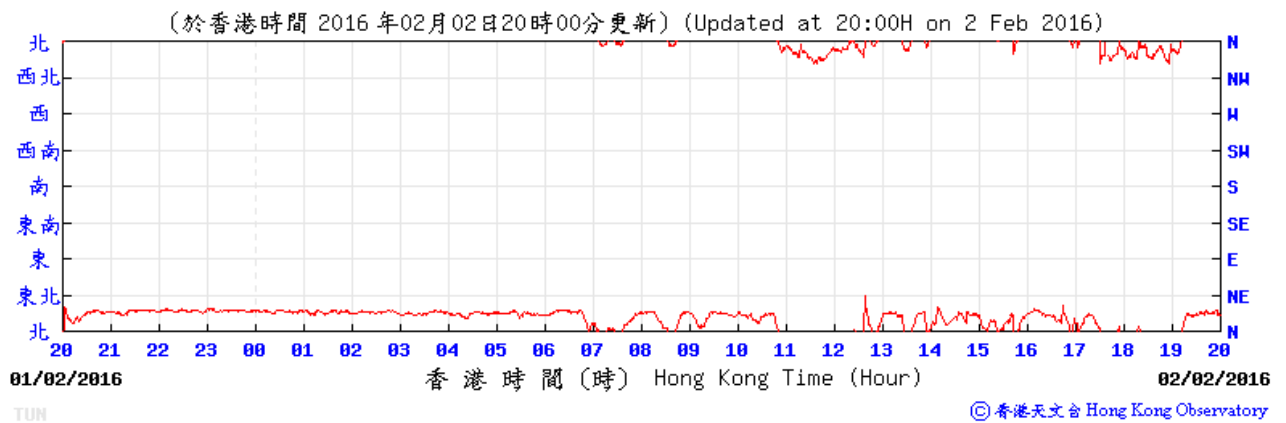
# Appendix H. Wind data from Hong Kong Observatory Weather Station

Tuen Mun – 1 February 2016

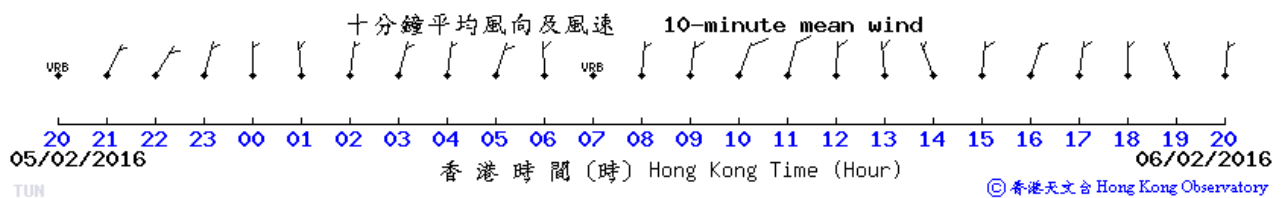
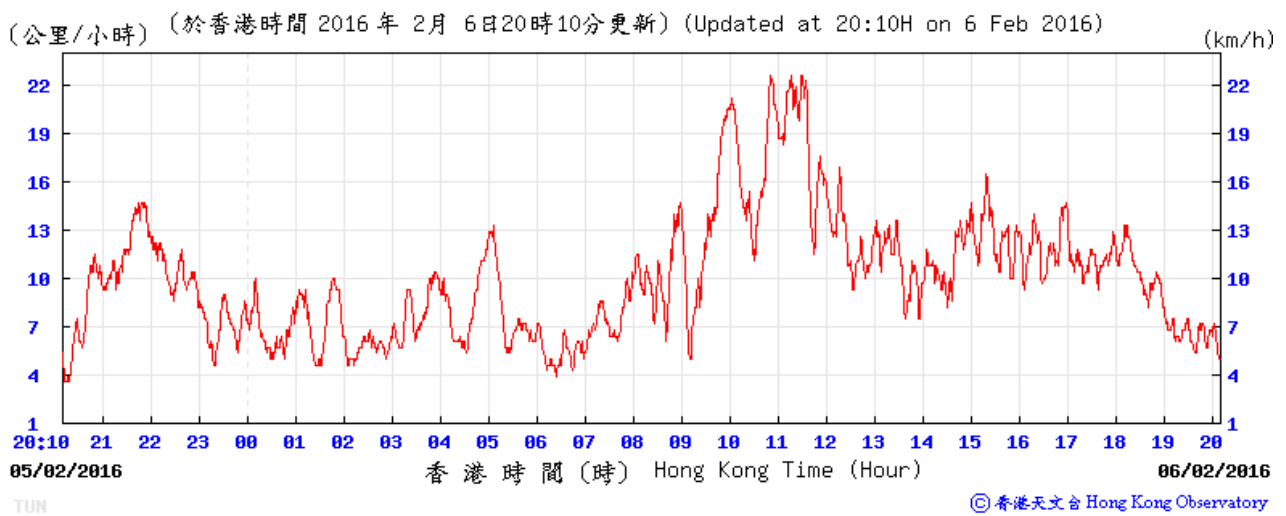
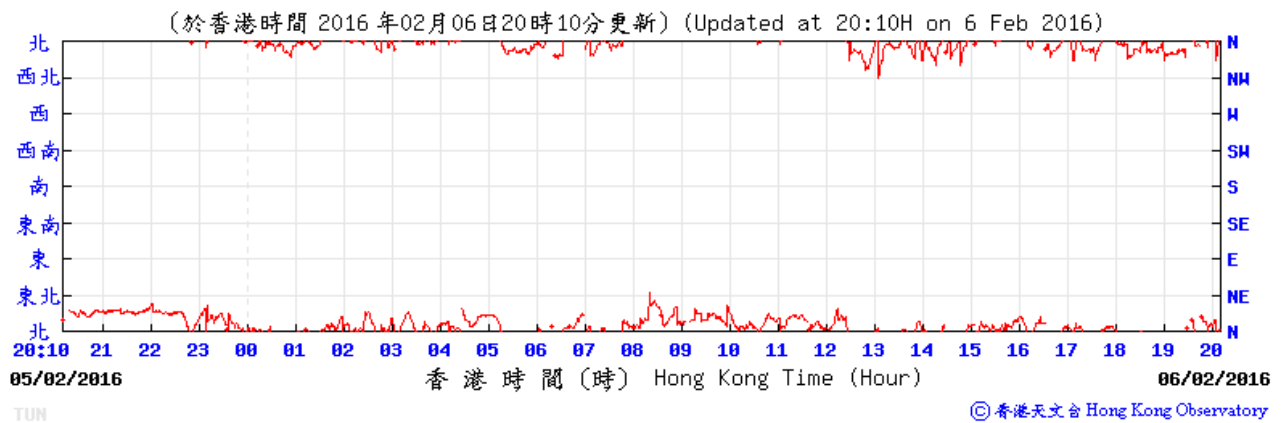




**Tuen Mun – 2 February 2016**

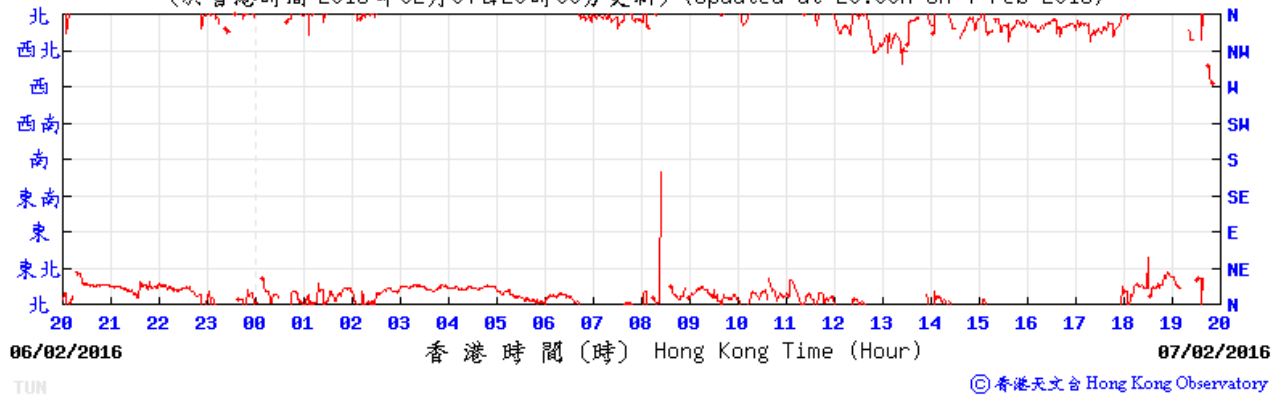


**Tuen Mun – 6 February 2016**

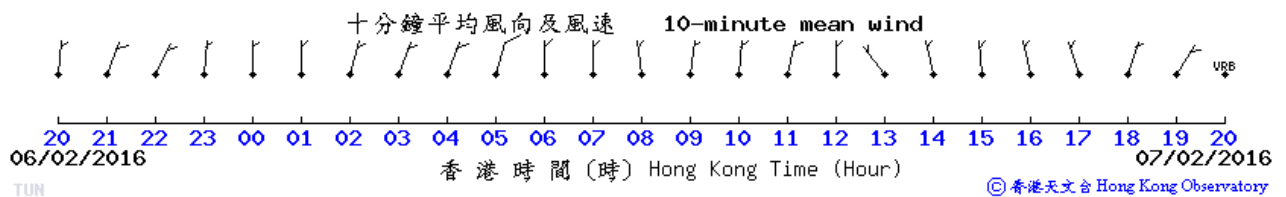
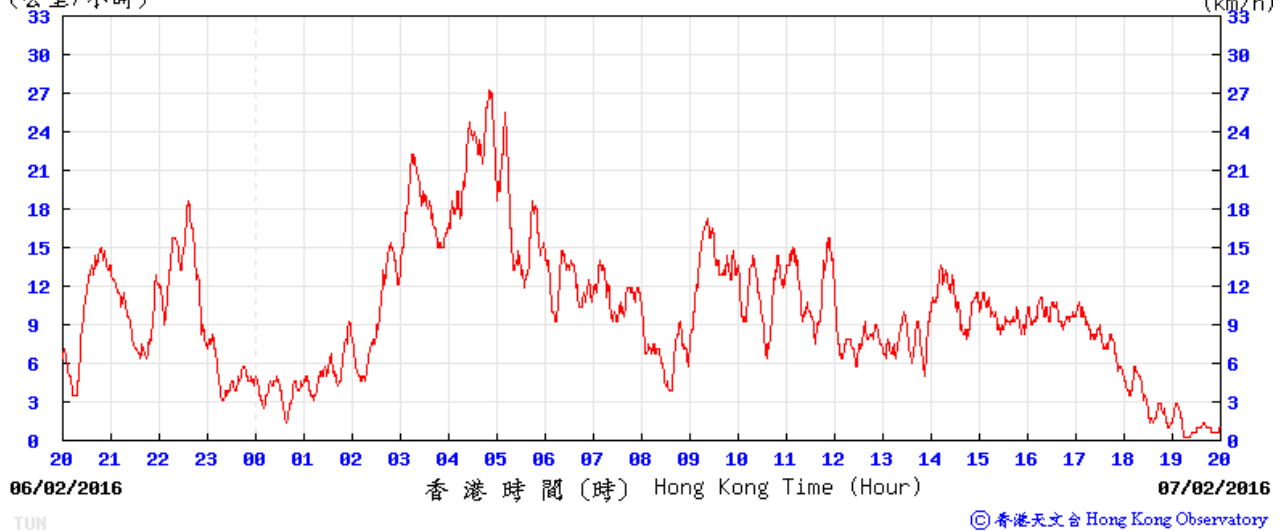


**Tuen Mun – 7 February 2016**

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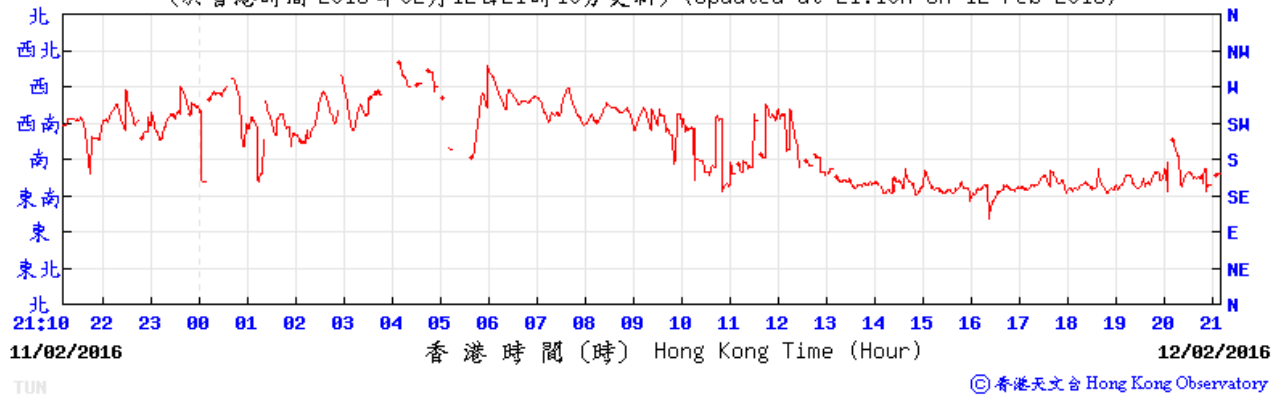


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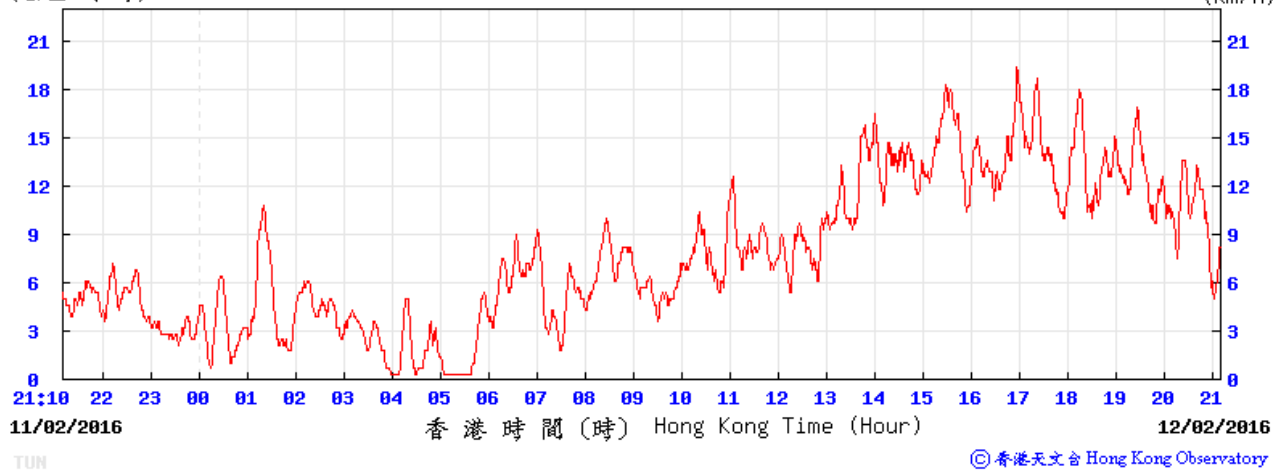


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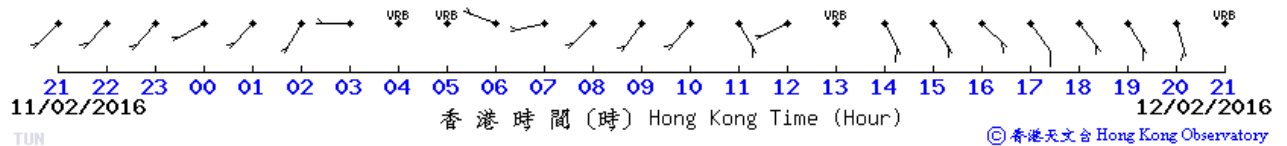
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(公里/小時) (於香港時間 2016 年 2月12日21時10分更新) (Updated at 21:10H on 12 Feb 2016) (km/h)

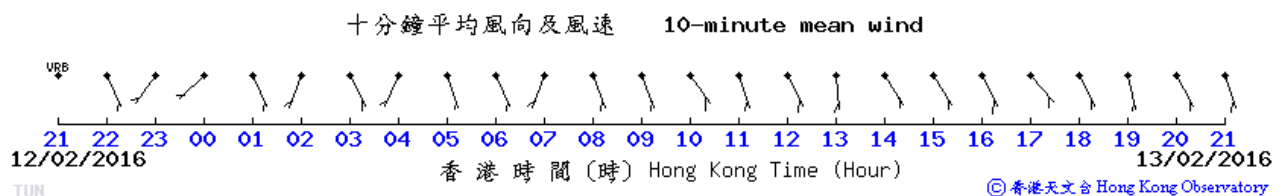
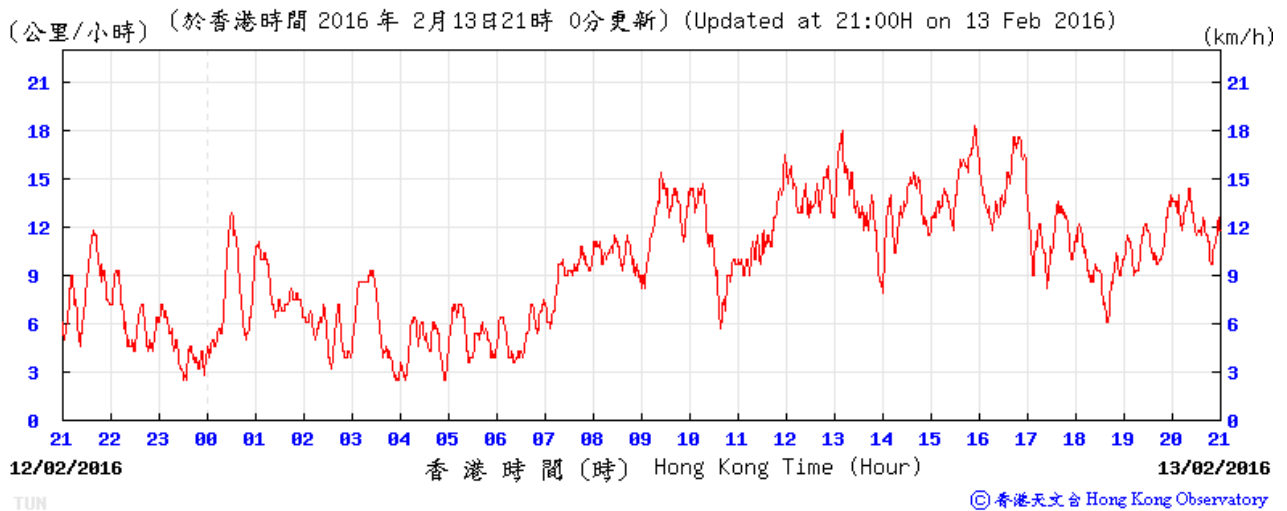
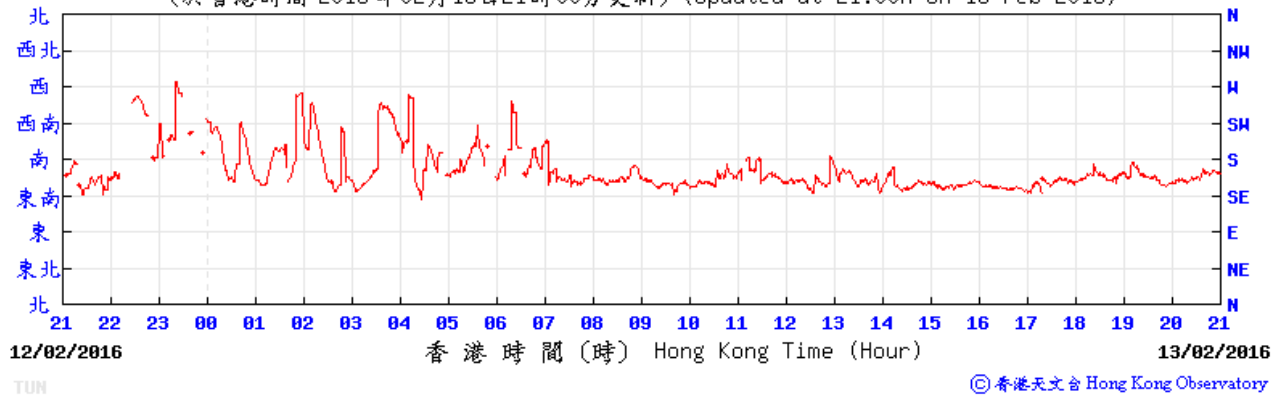


十分鐘平均風向及風速 10-minute mean wind



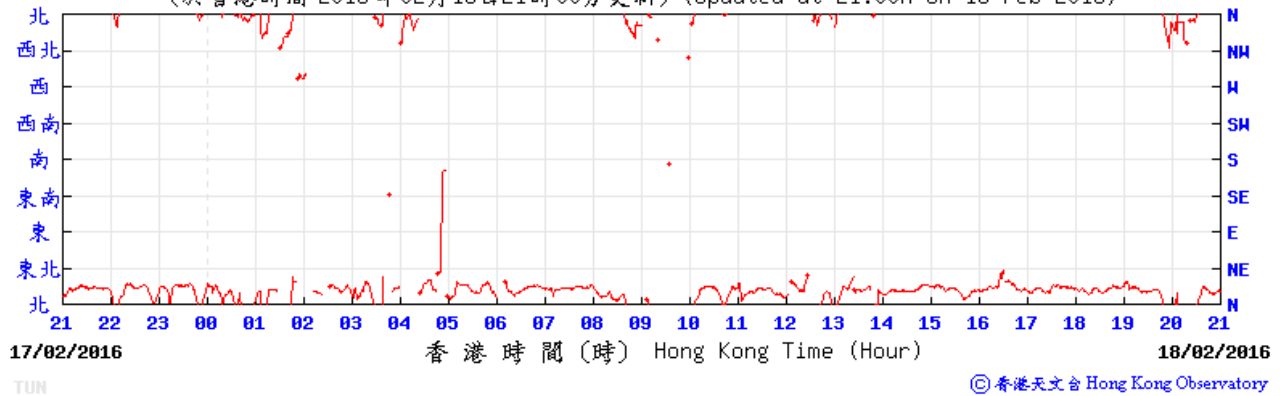
**Tuen Mun – 13 February 2016**

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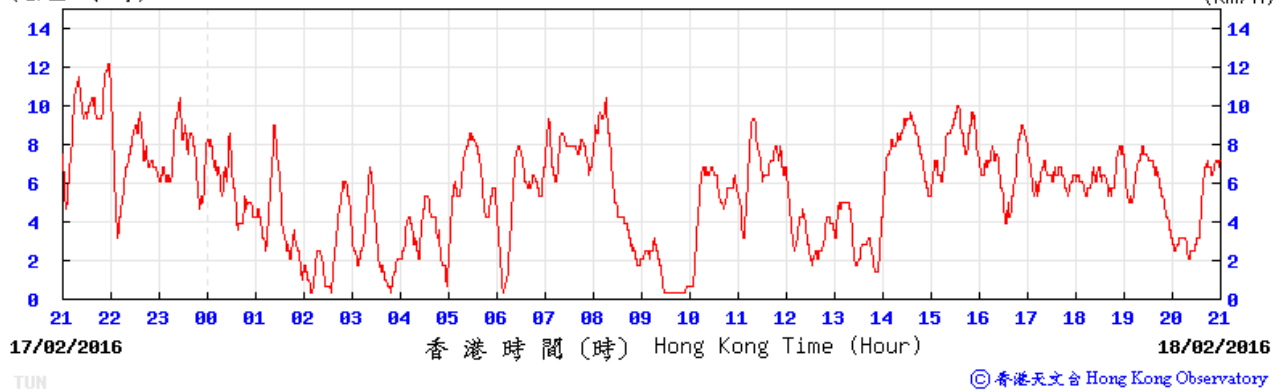


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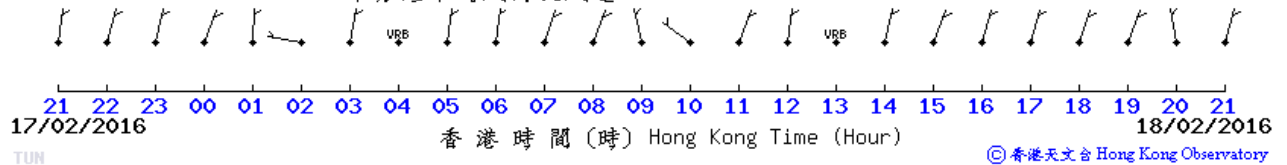
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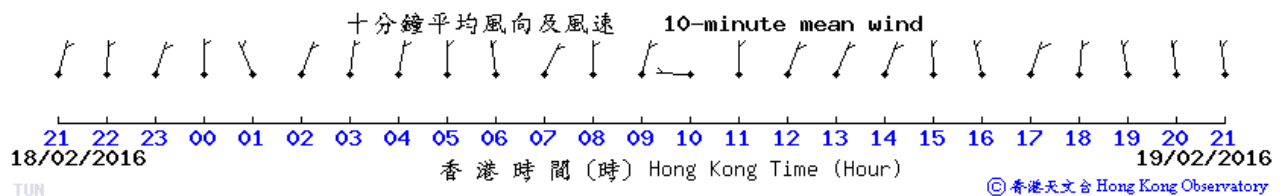
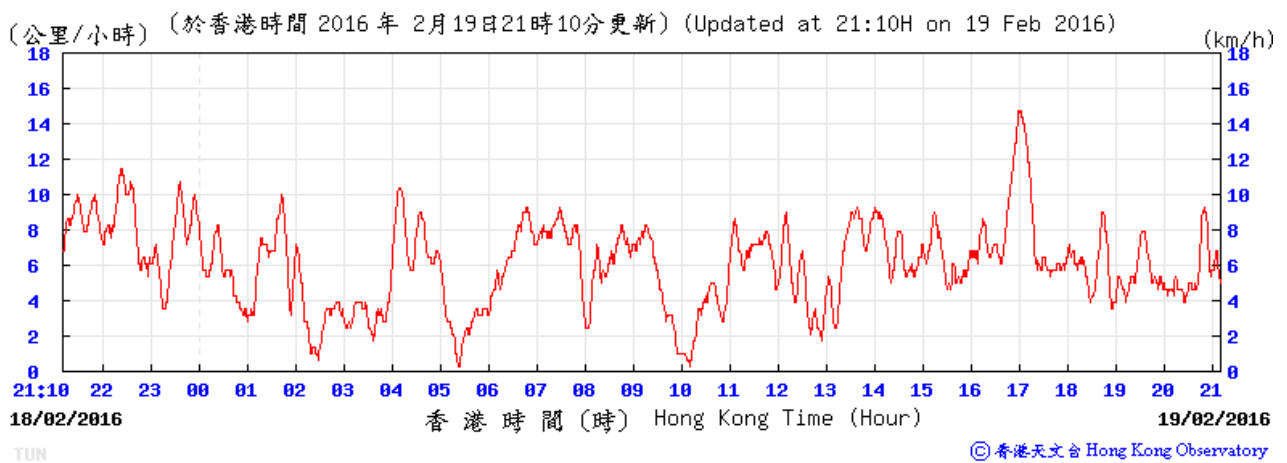
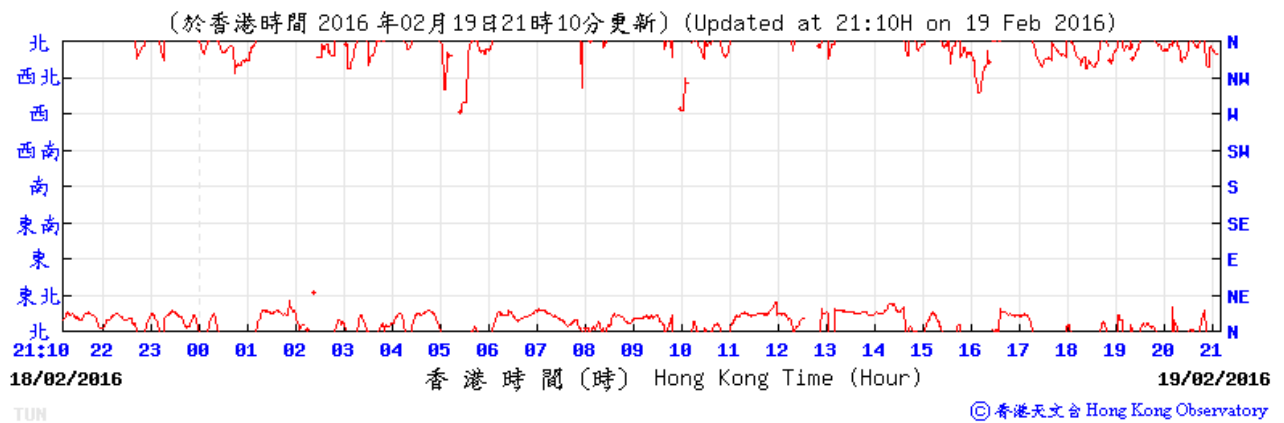
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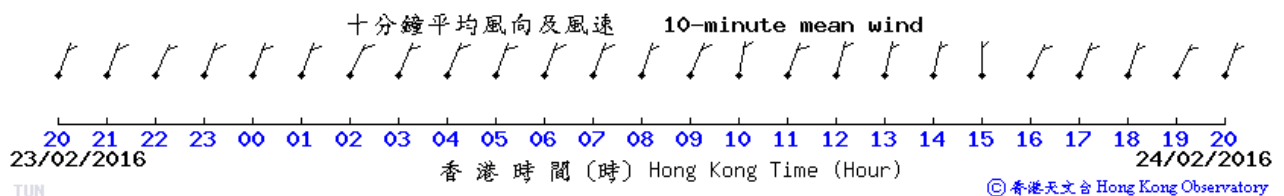
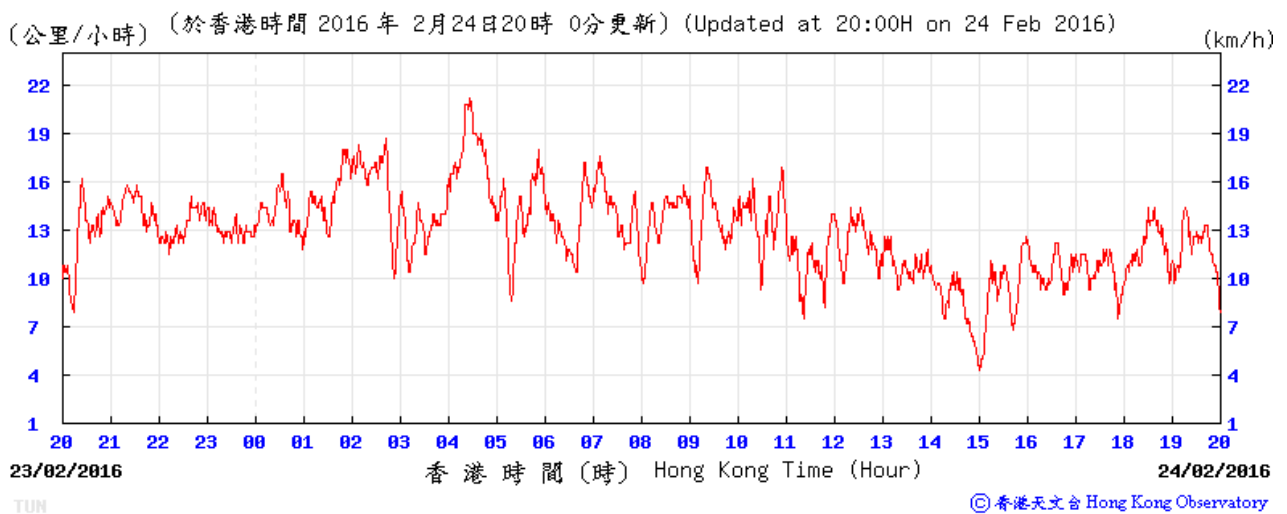
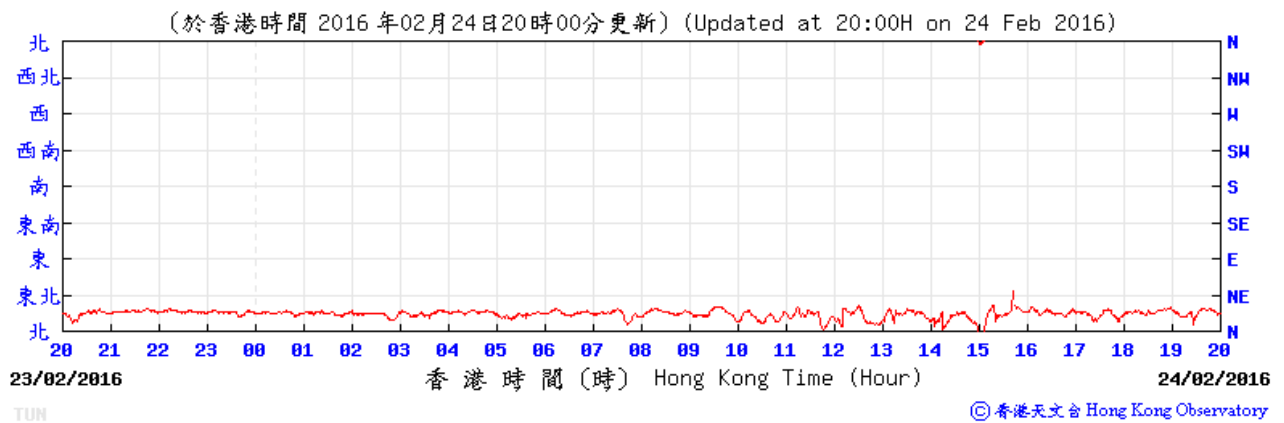
十分鐘平均風向及風速 10-minute mean wind



**Tuen Mun – 19 February 2016**

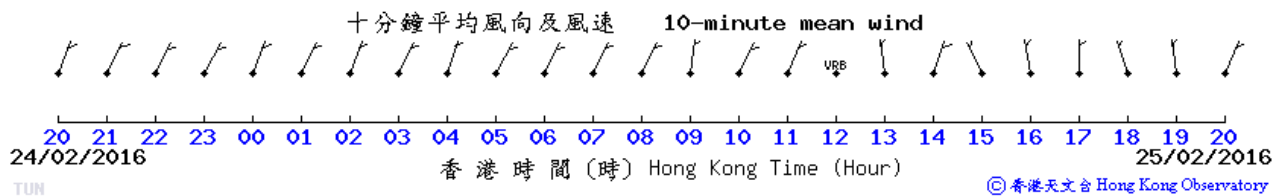
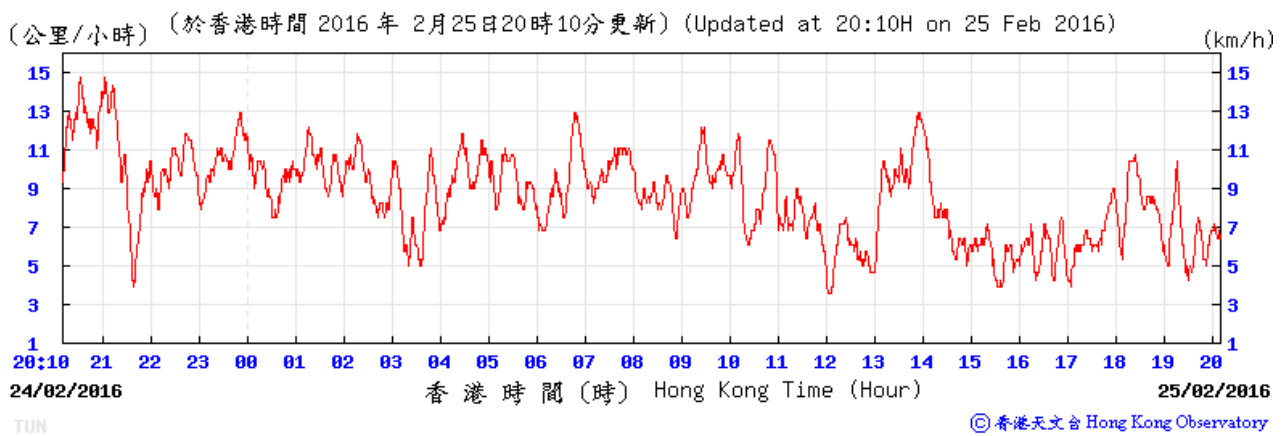
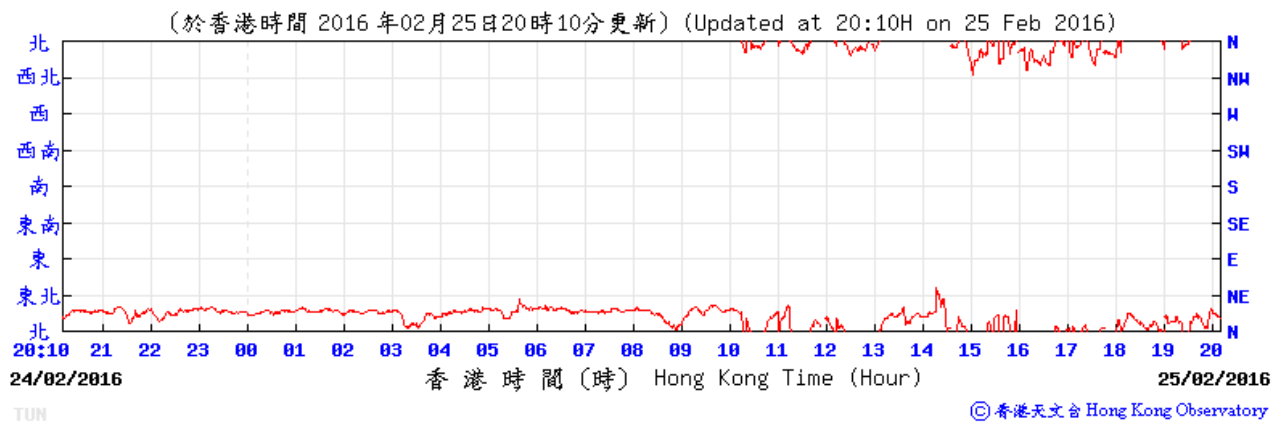


**Tuen Mun – 24 February 2016**





**Tuen Mun – 25 February 2016**





# Appendix I. Waste Flow Table

Environmental Team Services for Contract No. CV/2012/02 Construction of Sewage Pumping Station near Tsz Tin Road and Associated Sewerage Works in Area 54, Tuen Mun



Name of Department: CEDD

Contract No.: CV/2012/02

Monthly Summary Waste Flow Table for 2015

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper/ cardboard packaging	Plastics (see Note 3)	Chemical Waste	Others, e.g. general refuse
	(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 '000 kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m <sup>3</sup> )
2012	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2013	12.768	0.000	0.000	0.000	12.768	0.000	0.000	0.016	0.000	0.000	0.024
2014	1.380	0.000	1.400	0.000	1.380	0.000	8.570	0.030	0.000	0.175	0.120
2015	6.516	0.000	0.850	0.000	6.516	0.000	0.000	0.000	0.000	0.000	0.276
Jan-16	0.648	0.000	0.050	0.000	0.648	0.000	0.000	0.000	0.000	0.000	0.036
Feb-16	1.098	0.000	0.100	0.000	1.098	0.000	0.000	0.000	0.000	0.000	0.018
Mar-16											
Apr-16											
May-16											
Jun-16											
Jul-16											
Aug-16											
Sep-16											
Oct-16											
Nov-16											
Dec-16											
Total	22.410	0.000	2.400	0.000	22.410	0.000	8.570	0.046	0.000	0.175	0.474

Forecast of Total Quantities of C&D Materials to be Generated from the Contract*										
Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper/ cardboard packaging	Plastics (see Note 3)	Chemical Waste	Others, e.g. general refuse
(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 '000 kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m <sup>3</sup> )
19.300	0.000	2.400	0.000	16.400	0.500	11.000	1.500	0.000	0.200	0.700

Notes :

- (1) The performance targets are given in PS Clause 1.84(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 Sites.
- (3) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging materials.
- (4) Estimate 6m<sup>3</sup> capacity per dump truck

Updated on 4 March 2016

# Appendix J. Environmental Mitigation Measures – Implementation Status

Table J.1: Air Quality – Recommended Mitigation Measures

* EM&A / ^ EP ref:	Recommended measures	Implementation Status
*2.57, Table A1	Implementation of the dust suppression measures stipulated in the Air Pollution Control (Construction Dust) Regulation.	✓
*2.57, Table A1	Skip hoist for material transport should be totally enclosed by impervious sheeting;	✓
	Vehicle washing facilities should be provided at every vehicle exit point;	✓
	The area where vehicle washing takes place and the section of the road between the washing facilities and the exit point should be paved with concrete, bituminous materials or hardcore;	✓
	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;	✓
	Use of regular watering, with complete coverage, to reduce dust emissions from exposed site surfaces and unpaved roads, particularly during dry weather	✓
	Side enclosure and covering of any aggregate or dusty material storage piles to reduce emissions. Where this is not practicable owing to frequent usage, watering shall be applied to aggregate fines;	✓
	Open stockpiles shall be avoided or covered. Where possible, prevent placing dusty material storage piles near ASRs	✓
	Tarpaulin covering of all dusty vehicle loads transported to, from and between site locations	✓
	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;	✓
	Every vehicle should be washed to remove any dusty materials from its body and wheels before leaving the construction sites	✓
	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.	✓

Table J.2: Noise – Recommended Mitigation Measures

* EM&A / ^ EP ref:	Recommended measures	Implementation Status
*3.16, Table A2	Adoption of quiet plant for following construction activities/scenarios: Site clearance Bulk excavation for sub-structure and site formation Steel fixing concreting of sub-structure Steel fixing and concreting of roof and columns Brick Works & Finishing, M&E Installation & Pipeworks, Landscape Works & Roadworks	✓
	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 should be utilised and should be properly maintained during the construction program	✓
	Mobile plant should be sited as far away from NSRs as possible.	✓

* EM&A / ^ EP ref:	Recommended measures	Implementation Status
	Machines and plant that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum.	✓
	Plant known to emit noise strongly in one direction, should, where possible, be orientated to direct noise away from nearby NSRs.	✓
	Material stockpiles and other structures should be effectively utilised, where practicable, to screen noise from on-site construction activities.	✓

Table J.3: Water Quality – Recommended Mitigation Measures

* EM&A / ^ EP ref:	Recommended measures	Implementation Status
*4.3, Table A3	At the start of site establishment, perimeter cut-off drains to direct off-site water around the site should be constructed with internal drainage works and erosion and sedimentation control facilities implemented. Channels, earth bunds or sand bag barriers should be provided on site to direct storm water to silt removal facilities.	✓
	Sand/silt removal facilities such as sand/silt traps and sediment basins should be provided to remove sand/silt particles from runoff.	✓
	All drainage facilities and erosion and sediment control structures should be regularly inspected and maintained to ensure proper and efficient operation at all times and particularly during rainstorms.	✓
	Measures should be taken to minimize the ingress of site drainage into excavations. Water pumped out from foundation excavations should be discharged into storm drains via silt removal facilities.	✓
	Temporarily exposed slope/soil surfaces should be covered by a tarpaulin or other means and temporary access roads should be protected by crushed stone or gravel, as excavation proceeds. Interception channels should be provided to prevent storm runoff from washing across exposed soil surfaces.	✓
	All vehicles and plant should be cleaned before leaving a construction site to ensure no earth, mud, debris and the like is deposited by them on roads. Wash-water should have sand and silt settled out and removed at least on a weekly basis to ensure the continued efficiency of the process. The section of access road leading to, and exiting from, the wheel-wash bay to the public road should be paved with sufficient backfall toward the wheel-wash bay to prevent vehicle tracking of soil and silty water to public roads and drains.	✓
	Open stockpiles of construction materials or construction wastes on-site of more than 50m <sup>3</sup> should be covered with tarpaulin or similar fabric during rainstorms	✓
^4.4-4.5, Table A3	Construction waste, debris and refuse generated on-site shall be collected, handled and disposed of properly to avoid entering any nearby storm water drain. Stockpiles of cement and other construction materials shall be kept covered when not being used.	✓
	Oils and fuels shall only be used and stored in designated areas which have pollution prevention facilities. All fuel tanks and storage areas shall be provided with locks and be sited on sealed areas, within bunds of a capacity equal to 110% of the storage capacity of the largest tank. The bund shall be drained of rainwater after a rain event.	✓
*4.6, Table A3	Construction work force sewage shall be handled by temporary facilities, such as portable chemical toilets should be employed on-site. A licensed contractor shall be responsible for appropriate disposal and maintenance of these facilities	✓

Table J.4: Waste Management – Recommended Mitigation Measures

* EM&A / ^ EP ref:	Recommended measures	Implementation Status
*5.5, Table A4	Nomination of an approved person, such as a site manager, to be responsible for good site practices, arrangements for collection and effective disposal to an appropriate facility, of all wastes generated at the site	✓
	Training of site personnel in proper waste management and chemical handling procedures	✓
	Provision of sufficient waste disposal points and regular collection of waste	✓
	Appropriate measures to minimise windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers	✓
	Regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors.	✓
	Separation of chemical wastes for special handling and appropriate treatment at the Chemical Waste Treatment Facility.	✓
*5.6, Table A4	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 by providing separate labelled bins to enable this waste to be segregated from other general refuse generated by the work force	✓
	Proper storage and site practices to minimise the potential for damage or contamination of construction materials.	✓
	Plan and stock construction materials carefully to minimise amount of waste generated and avoid unnecessary generation of waste.	✓
	A recording system for the amount of wastes generated, recycled and disposed (including disposal sites) shall be proposed.	✓
	Training shall be provided to workers about the concepts of site cleanliness and appropriate waste management procedures, including waste reduction, reuse and recycle.	✓
*5.8, Table A4	General refuse should be stored in enclosed bins or compaction units separate from C&D material.	✓
*5.9, Table A4	The excavated C&D material should be reused on-site as fill material as far as possible for general filling. The surplus excavated material should be disposed of at the designated public fill reception facility, as agreed with the Secretary of the Public Fill Committee, for other beneficial uses.	✓
	A trip-ticket system should be included to monitor the disposal of C&D material at the public fill reception facility and landfill.	✓
*5.10, Table A4	The Contractor should 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.	✓
	Appropriate labels should be securely attached on each chemical waste container.	✓
	Chemical waste should be disposed of in accordance with the Waste Disposal (Chemical Waste) (General) Regulation.	✓

Table J.5: Landscape and Visual Impact – Recommended Mitigation Measures

* EM&A / ^ EP ref:	Recommended measures	Implementation Status
*Table 7.2, Table A5	“No-intrusion Zone” should be set up and maintained around the existing trees, woodland, plantation areas and ground vegetation. No activities or storage should be performed inside the “No-intrusion Zone”.	N/A
*Table 7.2, Table A 5	Hoarding or boundary fencing for construction should fit into the existing environment when looking from outside.	✓
*Table 7.2, Table A 5	Workers should be properly and cleanly dressed.	✓
	The construction contract should require the main contractor to issue guideline to the construction works to minimize disturbance to existing village, rustic dwellings and workshops. .	✓
*Table 7.2, Table A	Excavation works and demolition of existing squatters / workshops which will be highly visible from surrounding areas should be well planned and with precautions to suppress dust.	✓
	Exposed soil shall be covered or ‘camouflaged’ and watered often. Areas that are expected to be left with bare soil for a long period of time after excavation shall be properly covered with suitable protective fabric. Silt and erosion shall be controlled by ground barriers around the slope cutting area.	✓
*Table 7.2, Table A	All security floodlights for construction sites shall be equipped with adjustable shield, frosted diffusers and reflective covers, and be carefully controlled to minimize light pollution and night-time glare to nearby village.	✓
	The Contractor shall consider other security measures which shall minimize the visual impacts.	✓
*Table 7.2, Table A	Existing topsoil shall be re-used where possible for new planting areas within the project.	N/A

Table J.6: Others

* EM&A / ^ EP ref:	Recommended measures	Implementation Status
^1.5	A copy of the valid Environmental Permit shall be displayed conspicuously on the Project site(s) at all vehicular site entrances/exits or at a convenient location for public information at all times. The most updated information about the Permit, including any amended Permit, shall be displayed at such locations. If the Permit Holder surrenders a part or whole of the Permit, the notice he send to the Director shall also be displayed at the same locations as the original Permit. The suspended, varied or cancelled Permit shall be removed from display at the Project site(s).	✓
n/a	The required licenses should be obtained by the Contractor (including CNP (if any), WPCO license, etc.)	✓

Legend:

✓	Implemented
x	Not implemented
P	Partially implemented
N/A	Not applicable
N/O	Not observed

## Appendix K. Cumulative statistics on complaints, notifications of summons and successful prosecutions

Cumulative statistics for complaints, notifications of summons and successful prosecutions for the Project account for period starting from the date of commencement of construction works (i.e. 22 Feb 2013) to the end of the reporting month and are summarized in the **Table K1** below.

Table K1: Statistics for complaints, notifications of summons and successful prosecutions

Reporting Period	Cumulative Statistics		
	Complaints	Notifications of summons	Successful prosecutions
This reporting month	0	0	0
From 22 Feb 2013 to end of the reporting month	0	0	0



# Appendix L. Landscape and Visual Impact Monitoring