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 September 2013 (Rev. A)

October 2013

Civil Engineering and Development Department

CEDD

Mott MacDonald

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

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Civil Engineering and Development Department

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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:

Terence Kong
Environmental Team Leader (ETL)
Mott MacDonald Hong Kong Limited

Date 10 October 2013

Verified by:

F C Tsang
Independent Environmental Checker (IEC)
Hyder Consulting Limited

Date 15 October 2013

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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 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 September 2013 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 30 September 2013.

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 4, 11, 18 and 26 September 2013 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

There was no record of complaints received in the reporting month.

Record of Notification of Summons and Successful Prosecutions

There was no record of Notification of summons and successful prosecution 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
- Construction of chain link fencing and hoardings
- Excavation
- Construction of DN500 twin rising main using open cut method

Portion B
- Installation of ELS
- Excavation
- Stockpile & disposal of soil

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" was granted by the Environmental Protection Department (EPD) on 4 January 2010.

This is the September 2013 Monthly EM&A Report presenting the monitoring works conducted from 1 to 30 September 2013. 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
- Construction of chain link fencing and hoardings
- Excavation
- Construction of DN500 twin rising main using open cut method

Portion B
- Installation of ELS
- Excavation
- Stockpile & disposal of soil

The Construction Works Programme of the Project is provided in **Appendix B**. A layout plan of the Project is provided in **Figure 1.1**.

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	Once every 6 days
	1-Hour TSP	A5	3 times every 6 days
Noise	L_{eq}, 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 detailed 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 and Duration
Project Site Office (A5)	24-hour TSP	At least once in every six-days
	1-hour TSP	3 times every six-days

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
24-hr TSP monitoring	
High Volume Sampler	GMWS 2310 Accu-vol (Serial no. 0764)
Calibrator	TE-5025A (Serial no. 2323)

1-hr TSP monitoring	
Portable direct reading dust meter	Sibata LD-3B (Serial no. 1Y5546) (Detection Limit : 1 µg/m^3 ± 0.1 µg/ 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.
- All filters were equilibrated in the conditioning environment for 24 hours before weighing. The conditioning environment temperature was around 25 °C and not variable by more than ±3 °C with relative humidity (RH) < 50% and was not variable by more than ±5 %. A convenient working RH was 40%. All preparation of filters were 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^3/min. The range specified in the EM&A Manual was between 0.6-1.7 m^3/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.
- Push "START/STOP" to start the 1-hour TSP measurement.

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}, L_{90} & 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 (LAeq) 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) (Detection limit: 20dB ± 0.1 dB)	Rion NC-73 (Serial no. 10997142) (Detection limit: 94dB ± 0.1 dB)
N2		

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 fog, rain, wind with a steady speed exceeding 5ms^{-1} or wind with gusts exceeding 10ms^{-1}.

Maintenance and Calibration

- The microphone head of the sound level meter and calibrator is cleaned with soft cloth at quarterly intervals.
- The 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

Impact monitoring for air quality, noise and landscape and visual impact due to the construction work were 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 (μg/m^3)			Range (μg/m^3)	Action Level (μg/m^3)	Limit Level (μg/m^3)
		1st Result	2nd Result	3rd Result			
03-Sep-13	08:20	76	82	92	74 - 99	375	500
09-Sep-13	08:28	78	86	97			
13-Sep-13	08:30	78	85	94			
19-Sep-13	13:28	80	91	99			
25-Sep-13	08:27	74	82	91			
30-Sep-13	08:18	78	84	96			

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 (μg/m^3)	Range (μg/m^3)	Action Level (μg/m^3)	Limit Level (μg/m^3)
03-Sep-13	08:17	58	58 - 68	188	260
09-Sep-13	08:25	66			
13-Sep-13	08:25	64			
19-Sep-13	13:25	64			
25-Sep-13	08:25	65			
30-Sep-13	08:15	68			

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 L_{eq} (dB(A))
			L_{eq}	L_{10}	L_{90}			
	N1							
03-Sep-13	08:25	08:55	55	57	48	58	0.5	> 75
09-Sep-13	08:35	09:05	55	57	47	58	0.5	
19-Sep-13	13:35	14:05	55	57	48	58	0.8	
25-Sep-13	08:30	09:00	55	57	47	58	0.5	
30-Sep-13	08:25	08:55	55	57	49	58	0.5	
	N2							
03-Sep-13	09:00	09:30	52	54	46	55	0.5	> 75
09-Sep-13	09:12	09:42	51	54	46	54	0.5	
19-Sep-13	14:12	14:42	50	52	46	53	0.8	
25-Sep-13	09:05	09:35	52	54	46	55	0.5	
30-Sep-13	09:02	09:32	51	53	46	54	0.5	

No exceedance (Action/Limit Level) of construction noise was recorded in the reporting period.

3.4 Landscape and Visual

The landscape and visual impact inspection was conducted on 11 September 2013 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 finding 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 on 4, 11, 18 and 26 September 2013. 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	Contactor's Responses / Action(s) Undertaken	Close-out (Date)
04 September 2013	Mud was observed on vehicles leaving site area, the Contractor was asked to review and improve the wheel washing practice to ensure all vehicles leaving site are free from dusty materials.	Vehicle leaving site was observed cleaned.	11 September 2013
04 September 2013	The mechanical cover of a vehicle leaving site was observed to be incompletely closed due to high staking of materials. The Contractor was reminded to ensure the loads are flatten so that the mechanical covers on vehicles can be closed properly.	Mechanical cover on vehicle was closed properly.	11 September 2013
11 September 2013	No particular findings.	N/A	N/A
18 September 2013	No particular findings.	N/A	N/A
26 September 2013	No particular findings.	N/A	N/A

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 is 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

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:

Air

- Ensure vehicles are cleaned before leaving site to avoid dust generation.
- Mechanical covers should be closed properly to avoid dust generation.

5. Report on Non-compliance, Complaints, Notifications of Summons and Successful Prosecutions

5.1 Record on Non-compliance of Action and Limit Levels

There is 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

Not applicable.

5.5 Follow-up Actions Taken

Not applicable.

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

- Construction of chain link fencing and hoardings
- Excavation
- Construction of DN500 twin rising main using open cut method

Portion B

- Installation of ELS
- Excavation
- Stockpile & disposal of soil

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

7.1.1 Conclusions

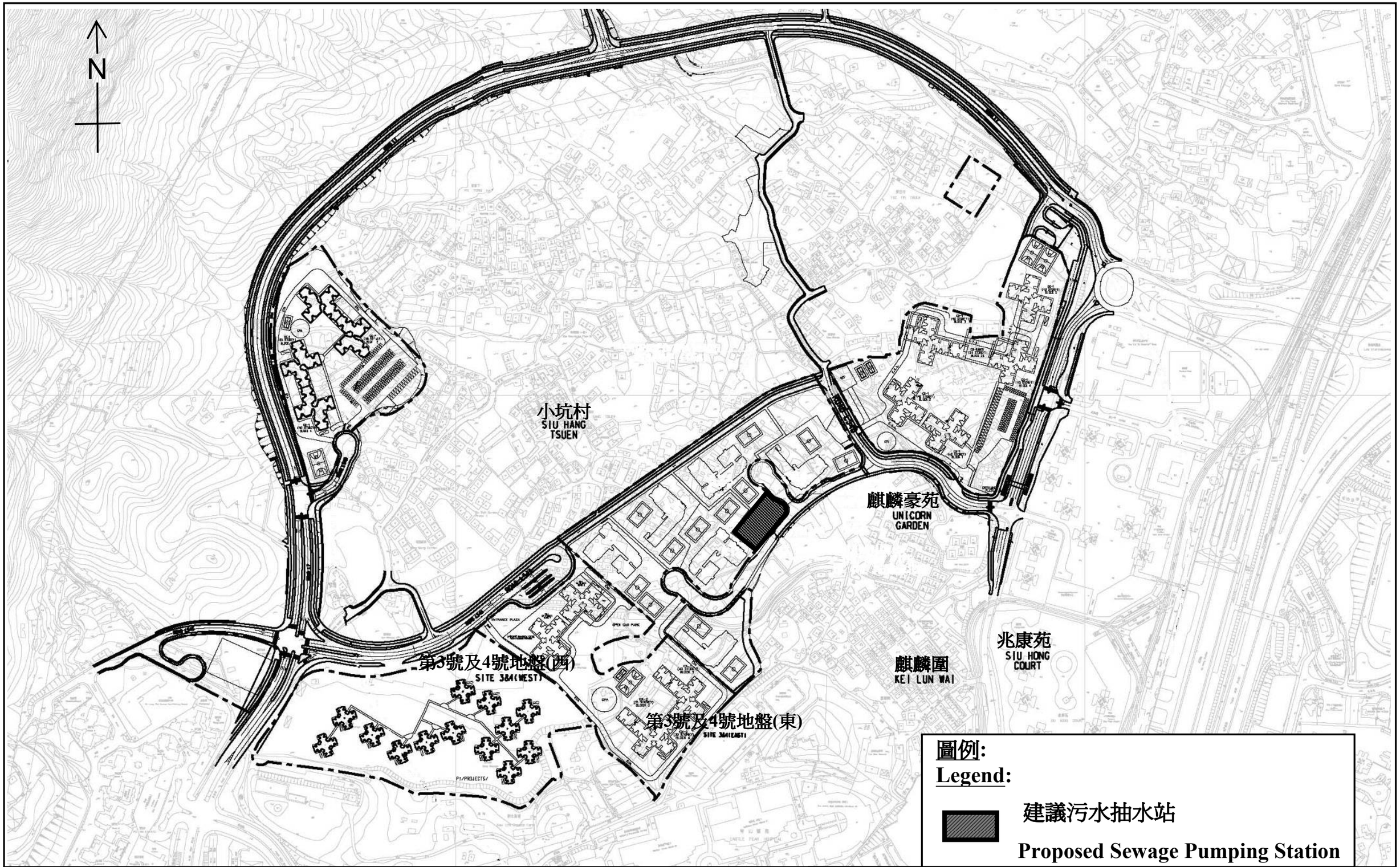
The EM&A programme as recommended in the EM&A Manual has been undertaken in the reporting month since the construction works commenced on 22 February 2013.

Monitoring of air quality and noise due 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 September 2013 monthly landscape and visual site audit was undertaken on 11 September 2013 and all L&V mitigation measures have been implemented in full.

7.1.2 Recommendations

With considerations on the construction activities and environment, recommendations on mitigation measures for impacts on air quality, noise, water quality and waste were provided during site inspections and meetings.



屯門第54區污水抽水站 –
Tuen Mun Area 54 Sewage Pumping Station –
建議污水抽水站位置
Location of Proposed Sewage Pumping Station

Figure 1.1

環境許可證： EP-381/2009
Environmental Permit: EP-381/2009

PO TONG HA

TSZ TIN TSUEN

PROJECT BOUNDARY

SIU HANG TSEUNG

SITE 4A

SITE 2
(4,998 FLATS)
R1A1

SITE 3&4(WEST)

SITE 3&4
(EAST)

A5

N1

N2

UNION GARDEN

TUEN MUN AREA 54
SEWAGE PUMPING STATION

KEI LUN WAI

ROAD L54A

ROAD L54

ENTRANCE PLAZA

OPEN CAR PARK

Legend:

- Project Site Area
- Air (TSP) Monitoring Station
- Noise Monitoring Stations

Figure 2.1 Locations of Monitoring Stations

(Not to Scale)

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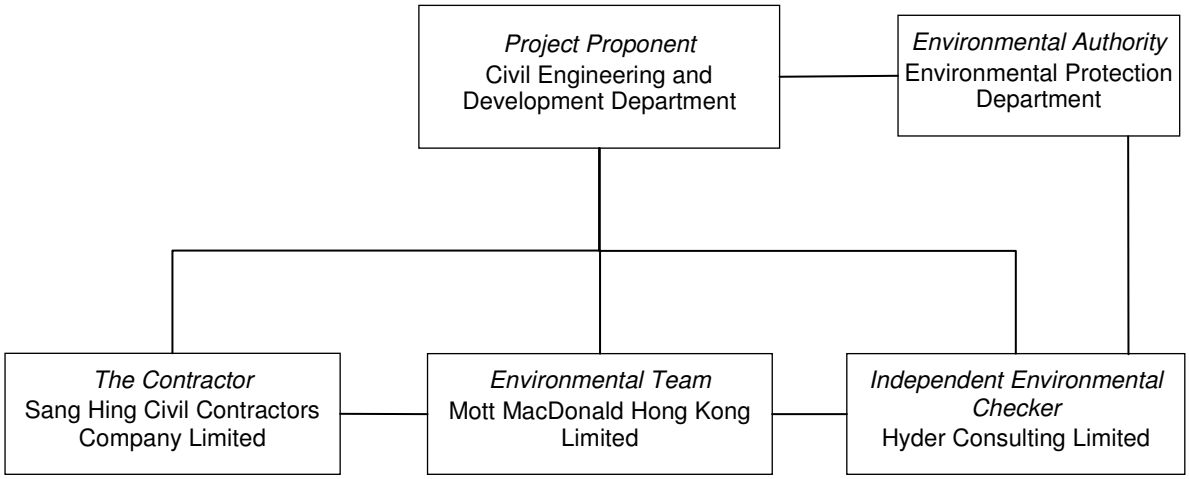
Appendix A. Project Organization



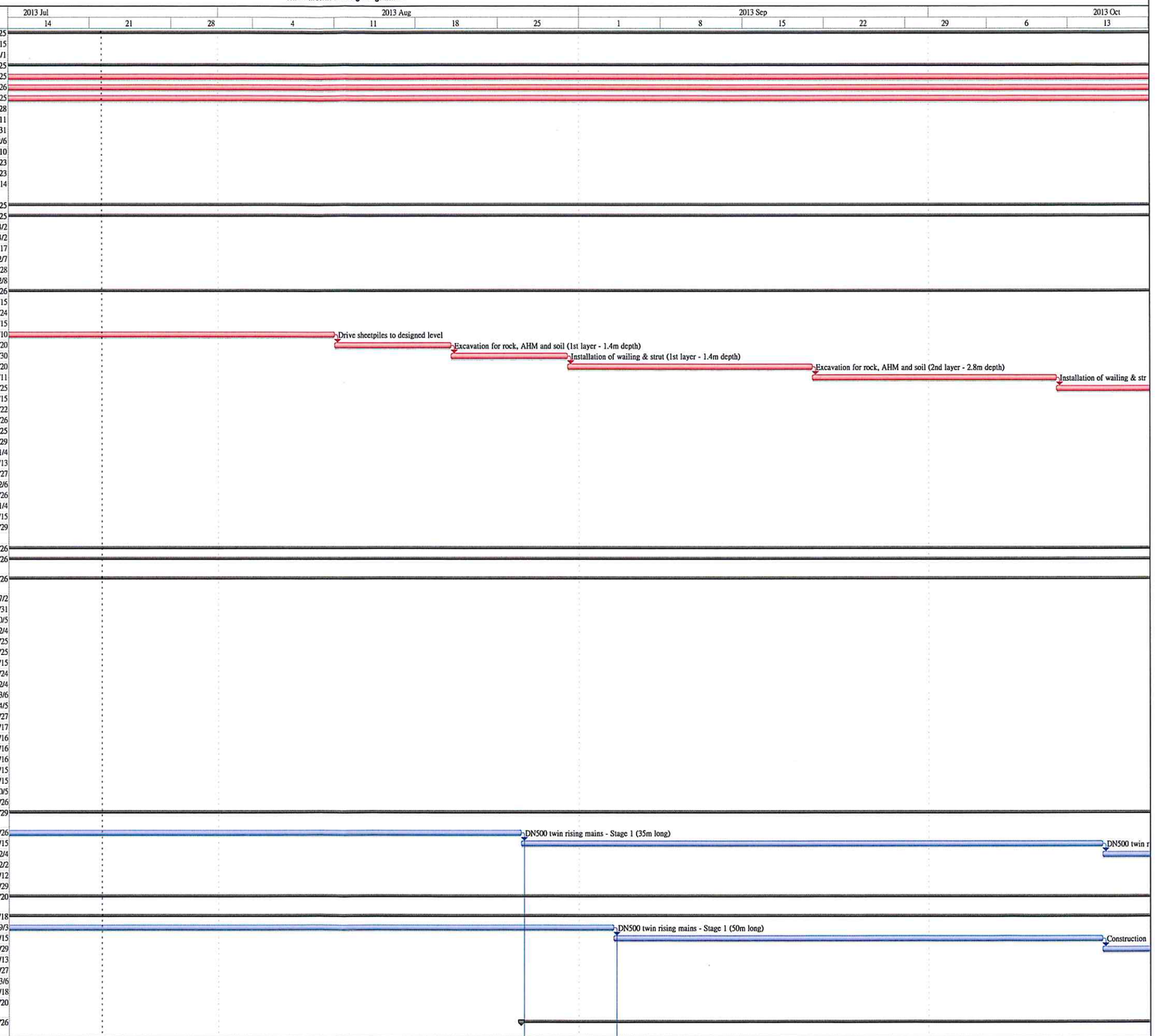
Contact information:

Company / Department	Position	Name	Telephone / Mobile
Civil Engineering and Development Department	Engineer's Representative	Mr Henry Tsang	2760 5781
Hyder Consulting Limited	Independent Environmental Checker	Mr. F C Tsang	2911 2744
Mott MacDonald Hong Kong Ltd.	Environmental Team Leader	Mr Terence Kong	2828 5919
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

Contract No. CV/2012/02
Construction of Sewerage Pumping Station Near Tsz Tin Road and Associated Sewage Works in Area 54, Tuen Mun
Three Month Rolling Programme

識別碼	Task Name	工期	開始時間	完成時間
1	Construction Period for Contract No. CV/2012/02	1472 days	2012/10/15	2016/10/25
2	A. Letter of Acceptance	0 days	2012/10/15	2012/10/15
3	B. Possession of Site	7 days	2012/10/26	2012/11/1
7	C. Section Completion Dates	1461 days	2012/10/26	2016/10/25
8	Section 1 of the works (Portion B)	608 days	2012/10/26	2014/6/25
9	Section 2 of the works (Portion A)	1096 days	2012/10/26	2015/10/26
10	Section 3 of Establishment works	1461 days	2012/10/26	2016/10/25
11	D. Safety & Environmental	45 days	2012/10/15	2012/11/28
16	E. Engineer's Site Accommodation	102 days	2012/11/2	2013/2/11
22	F. Contractor 's Site Accommodation	60 days	2012/11/2	2012/12/31
24	G. Pre-construction Condition Survey	42 days	2012/10/26	2012/12/6
27	H. Temporary Traffic Arrangement (TTA) Scheme	108 days	2012/10/26	2013/2/10
32	J. Excavation Permit (XP)	90 days	2012/10/26	2013/1/23
35	K. Tree Works	59 days	2012/10/26	2012/12/23
39	L. Set Up the Settlement Survey Instrumentation	50 days	2012/10/26	2012/12/14
40				
41	Section 1 of the Works	619 days	2012/10/15	2014/6/25
42	M. Construction of Sewage Pumping Station - 40m(L) X 28m(W)	619 days	2012/10/15	2014/6/25
43	Preparation & Submission / approval of method statement	92 days	2013/1/1	2013/4/2
44	Preparation & Submission / approval of ELS design	92 days	2013/1/1	2013/4/2
45	General site clearance	7 days	2013/1/11	2013/1/17
46	Set out the boundary line & erect fence	21 days	2013/1/18	2013/2/7
47	Hoarding erection	35 days	2012/12/25	2013/1/28
48	Construction of temporary drainage & access	11 days	2013/1/29	2013/2/8
49	Earthwork with Shoring System	302 days	2013/1/29	2013/11/26
50	Set up Enviromental impact monitoring location	18 days	2013/1/29	2013/2/15
51	Chinese New Year Holiday	9 days	2013/2/16	2013/2/24
52	Enviromental baseline monitoring report	50 days	2013/2/25	2013/4/15
53	Drive sheetpiles to designed level	117 days	2013/4/16	2013/8/10
54	Excavation for rock, AHM and soil (1st layer - 1.4m depth)	10 days	2013/8/11	2013/8/20
55	Installation of wailing & strut (1st layer - 1.4m depth)	10 days	2013/8/21	2013/8/30
56	Excavation for rock, AHM and soil (2nd layer - 2.8m depth)	21 days	2013/8/31	2013/9/20
57	Installation of wailing & strut	21 days	2013/9/21	2013/10/11
58	Excavation for rock, AHM and soil (3rd layer - 2.4m depth)	14 days	2013/10/12	2013/10/25
59	Installation of wailing & strut	21 days	2013/10/26	2013/11/15
60	Excavation for rock, AHM and soil (to formation)	7 days	2013/11/16	2013/11/22
61	Trim formation and place 75mm blinding layer	4 days	2013/11/23	2013/11/26
62	Construction of Wall & Slab	211 days	2013/11/27	2014/6/25
106	N. Site H Prepare the Contamination Assessment Plan (CAP)	107 days	2012/10/15	2013/1/29
107	Prepare the Contamination Assessment Plan (CAP)	21 days	2012/10/15	2012/11/4
108	Obtain approval of CAP	9 days	2012/11/5	2012/11/13
109	Sampling & preparation of Remedation Assessment Plan (RAP)	14 days	2012/11/14	2012/11/27
110	Obtain approval of RAP	9 days	2012/11/28	2012/12/6
111	Excavate and soil treatment	20 days	2012/12/7	2012/12/26
112	Chinese New Year Holiday	9 days	2012/12/27	2013/1/4
113	Excavate and soil treatment	11 days	2013/1/5	2013/1/15
114	Sampling of treatment soil & reporting	14 days	2013/1/16	2013/1/29
115				
116	Section 2 of the Works	889 days	2013/5/21	2015/10/26
117	O. Works Adjacent to Sewage Pumping Station (CHE0+00 to CHE1+15)	841 days	2013/7/8	2015/10/26
118	Construction of 600 dia. Pipe from pumping station of proposed discharge manhole to J/O of Tsc Tin Road	841 days	2013/7/8	2015/10/26
119	Drive sheetpiles	30 days	2014/6/3	2014/7/2
120	Excavate & shoring support	60 days	2014/7/3	2014/8/31
121	Lay bedding & pipe laying	35 days	2014/9/1	2014/10/5
122	Construction of manholes (M15 to M18 & discharge manhole)	60 days	2014/10/6	2014/12/4
123	Backfill	21 days	2014/12/5	2014/12/25
124	Excavation of storm manholes (SMH1 to SMH6) and associated 75	31 days	2014/12/26	2015/1/25
125	Pipe bedding & pipe laying	21 days	2015/1/26	2015/2/15
126	Construction of manholes (SMH1 to SMH6)	30 days	2015/1/26	2015/2/24
127	Excavation and Rockfill formation of Retaining wall	10 days	2015/1/26	2015/2/4
128	Construction of Retaining wall(Bay1 and Bay2) and slope works	30 days	2015/2/5	2015/3/6
129	Construction of maintanence access	30 days	2015/3/7	2015/4/5
130	Construction of 300 dia. Pipeline form pumping station to SM3	21 days	2015/3/7	2015/3/27
131	Construction of proposed emergency overflow bypass manhole	21 days	2015/3/28	2015/4/17
132	Construction of flowmeter chamber & Surface channel	60 days	2015/4/18	2015/6/16
133	Construction of earthpits and cable drawpit	30 days	2015/5/18	2015/6/16
134	Construction of boundary wall & bay Planter Kerb	91 days	2015/5/18	2015/8/16
135	Installation of irrigation system	30 days	2015/8/17	2015/9/15
136	Green roof	30 days	2015/8/17	2015/9/15
137	External finishes of sewage pumping station	50 days	2015/8/17	2015/10/5
138	Landscape	21 days	2015/10/6	2015/10/26
139	Twin rising mains using open cut method (CHB0+00 to CHB1+50), 150m long	265 days	2013/7/8	2014/3/29
140	DN500 twin rising mains - Stage 1 (35m long)	50 days	2013/7/8	2013/8/26
141	DN500 twin rising mains - Stage 2 (35m long)	50 days	2013/8/27	2013/10/15
142	DN500 twin rising mains - Stage 3 (35m long)	50 days	2013/10/16	2013/12/4
143	DN500 twin rising mains - Stage 4 (45m long)	60 days	2013/12/5	2014/2/2
144	Hydrostatic presure test (Stage 1 to 4)	10 days	2014/2/3	2014/2/12
145	Construction of inspection chamber no.1	45 days	2014/2/13	2014/3/29
146	P. Works at San Fuk Road Van Track(CHB 1+51 to CHB 3+50), 199m long	579 days	2013/5/21	2014/12/20
147	DN500 twin rising mains using open cut method	333 days	2013/5/21	2014/4/18
148	DN500 twin rising mains - Stage 1 (50m long)	106 days	2013/5/21	2013/9/3
149	Construction of air valve inspection chamber no.1	42 days	2013/9/4	2013/10/15
150	DN500 twin rising mains - Stage 2 (50m long)	45 days	2013/10/16	2013/11/29
151	DN500 twin rising mains - Stage 3 (50m long)	45 days	2013/11/30	2014/1/13
152	DN500 twin rising mains - Stage 4 (50m long)	45 days	2014/1/14	2014/2/27
153	Hydrostatic presure test (Stage 1 to 4)	7 days	2014/2/28	2014/3/6
154	Construction of inspection chamber no.2	43 days	2014/3/7	2014/4/18
155	DN500 twin rising mains using trenchless method (CHB 3+51 to CHB 4+51) 100m long	289 days	2014/3/7	2014/12/20
161	Q. Works at San Fuk Road (CHB 4+52 to CHB 8+30), 380m long	791 days	2013/8/27	2015/10/26

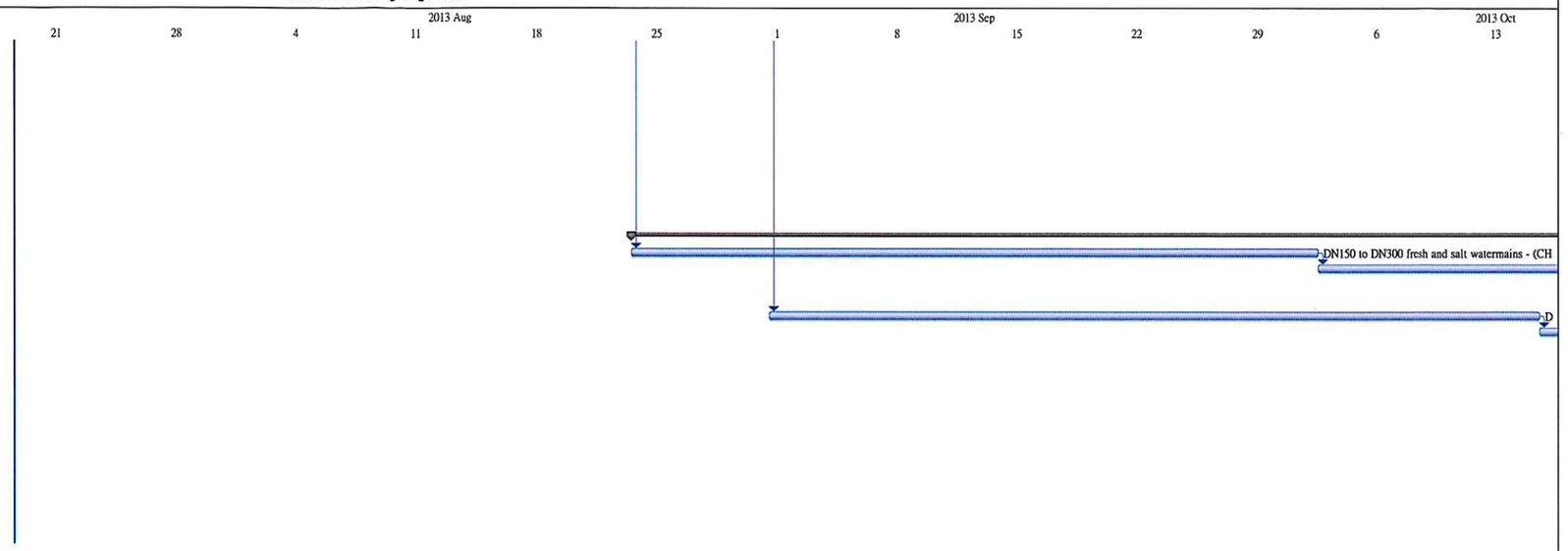


Project: Project3(20-7-2013)
Date: 2013/7/22

Task | Progress | Summary | Rolled Up Critical Task | Rolled Up Progress | External Tasks | Group By Summary
Critical Task | Milestone | Rolled Up Task | Rolled Up Milestone | Split | Project Summary | Deadline

Contract No. CV/2012/02
Construction of Sewerage Pumping Station Near Tsz Tin Road and Associated Sewage Works in Area 54, Tuen Mun
Three Month Rolling Programme

識別碼	Task Name	工期	開始時間	完成時間
162	DN500 twin rising mains using open cut method	643 days	2013/11/4	2015/8/8
163	DN500 twin rising mains - (CHB6+80 - CHB6+40)	45 days	2013/11/4	2013/12/18
164	DN500 twin rising mains - (CHB6+40 - CHB6+00)	45 days	2013/12/19	2014/2/1
165	DN500 twin rising mains - (CHB6+00 - CHB5+60)	45 days	2014/2/2	2014/3/18
166	DN500 twin rising mains - (CHB5+60 - CHB5+20)	45 days	2014/3/19	2014/5/2
167	DN500 twin rising mains - (CHB5+20 - CHB4+80)	45 days	2014/5/3	2014/6/16
168	DN500 twin rising mains - (CHB4+80 - CHB4+52)	45 days	2014/6/17	2014/7/31
169	Hydrostatic presure test	10 days	2014/8/1	2014/8/10
170	Construction of air valve inspection chamber no.2	30 days	2014/8/11	2014/9/9
171	Construction of discharge chamber	30 days	2014/9/30	2014/10/29
172	DN500 twin rising mains using trenchless method(CHB 6+81 to CHB 7+45), 64m long	283 days	2014/10/30	2015/8/8
180	Watermain works (CHA0+00 - CHA6+93), 693m long	778 days	2013/8/27	2015/10/13
181	DN150 to DN300 fresh and salt watermains - (CHA3+00 - CHA3+	40 days	2013/8/27	2013/10/5
182	DN150 to DN300 fresh and salt watermains - (CHA3+51 - CHA4+(	40 days	2013/10/6	2013/11/14
183	DN150 to DN300 fresh and salt watermains - (CHA4+01 - CHA4+	40 days	2013/11/15	2013/12/24
184	DN150 to DN300 fresh and salt watermains - (CHA4+51 - CHA5+(	60 days	2013/12/25	2014/2/22
185	DN150 to DN300 fresh and salt watermains - (CHA1+50 - CHA2+(	45 days	2013/9/4	2013/10/18
186	DN150 to DN300 fresh and salt watermains - (CHA2+00 - CHA2+	45 days	2013/10/19	2013/12/2
187	DN150 to DN300 fresh and salt watermains - (CHA2+50 - CHA3+(	45 days	2013/12/3	2014/1/16
188	DN150 to DN300 fresh and salt watermains - (CHA5+09 - CHA6+(	140 days	2014/11/27	2015/4/15
189	Hydrostatic pressure test (CHA5+09 - CHA6+00)	10 days	2015/4/16	2015/4/25
190	DN150 to DN300 fresh and salt watermains - (CHA6+93 - CHA6+	51 days	2014/5/3	2014/6/22
191	DN150 to DN300 fresh and salt watermains - (CHA6+42 - CHA6+(	51 days	2014/6/23	2014/8/12
192	Hydrostatic pressure test (CHA6+00 - CHA6+42)	10 days	2014/8/13	2014/8/22
193	DN150 to DN300 fresh and salt watermains - (CHA0+00 - CHA0+	30 days	2015/6/17	2015/7/16
194	DN150 to DN300 fresh and salt watermains - (CHA0+50 - CHA1+(	30 days	2015/7/17	2015/8/15
195	DN150 to DN300 fresh and salt watermains - (CHA1+00 - CHA1+	45 days	2015/8/16	2015/9/29
196	Hydrostatic pressure test (CHA0+00 - CHA3+00)	14 days	2015/9/30	2015/10/13
197	R. Works at Tsun Wen Road (CHB 8+31 to CHB 9+98), 167m long	497 days	2014/6/17	2015/10/26
215				
216	Section 3 of the Works	365 days	2015/10/27	2016/10/25



Project: Project3(20-7-2013)
Date: 2013/7/22

Task | Progress | Summary | Rolled Up Critical Task | Rolled Up Progress | External Tasks | Group By Summary
Critical Task | Milestone | Rolled Up Task | Rolled Up Milestone | Split | Project Summary | Deadline

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 C1: Action and Limit Levels for 1-hour TSP

Monitoring Station	Action Level (μg/m^3)	Limit Level (μg/m^3)
A5	375	500

Table C2: Action and Limit Levels for 24-hour TSP

Monitoring Station	Action Level (μg/m^3)	Limit Level (μg/m^3)
A5	188	260

Noise

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

Table C3: 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
Action Level				
1. Exceedance for one sample	1. Identify source and investigate the causes of exceedance. 2. Inform Contractor, IEC and ER. 3. Repeat measurement to confirm finding.	1. Check monitoring data submitted by ET. 2. Check Contractor's working method.	1. Notify Contractor.	1. Rectify any unacceptable practice. 2. Amend working methods if appropriate.
2. Exceedance for two or more consecutive samples	1. Identify the source and investigate the causes of exceedance. 2. Inform Contractor, IEC and ER. 3. Increase monitoring frequency to daily. 4. Discuss with IEC and the Contractor on remedial actions required. 5. Assess the effectiveness of Contractor's remedial actions. 6. If exceedance continues, arrange meeting with IEC and ER. 7. If exceedance stops, cease additional monitoring.	1. Check monitoring data submitted by ET. 2. Check the Contractor's working method. 3. Discuss with ET and the Contractor on possible remedial measures. 4. Advise ER on the effectiveness of the proposed remedial measures.	1. Confirm receipt of notification of exceedance in writing. 2. Notify the Contractor. 3. In consolidation with the IEC, agree with the Contractor on the remedial measures to be implemented. 4. Supervise implementation of remedial measures. 5. Conduct meeting with ET and IEC if exceedance continues.	1. Discuss with ET and IEC on proper remedial actions. 2. Submit proposals for remedial actions to ER and IEC within 3 working days of notification. 3. Implement the agreed proposals. 4. Amend proposal if appropriate.
Limit Level				
1. Exceedance for one sample	1. Identify source and investigate the causes of	1. Check monitoring data submitted by ET.	1. Confirm receipt of notification of exceedance	1. Take immediate action to avoid further

Event	Action			
	ET Leader	IEC	ER (Engineer's Representative)	Contractor
	exceedance. 2. Inform Contractor, IEC, ER and EPD. 3. Repeat measurement to confirm finding. 4. Assess effectiveness of Contractor's remedial actions and keep EPD, IEC and ER informed of the results.	2. Check the Contractor's working method. 3. Discuss with ET Leader and the Contractor on possible remedial measures. 4. Advise ER on the effectiveness of the proposed remedial measures.	in writing. 2. Notify the Contractor. 3. In consolidation with the IEC, agree with the Contractor on the remedial measures to be implemented. 4. Supervise implementation of remedial measures. 5. Conduct meeting with ET and IEC if exceedance continues.	exceedance. 2. Discuss with ET and IEC on proper remedial actions. 3. Submit proposals for remedial actions to IEC within 3 working days of notification. 4. Implement the agreed proposals.
2. Exceedance for two or more consecutive samples	1. Notify IEC, ER, Contractor and EPD. 2. Repeat measurements to confirm findings. 3. Carry out analysis of the Contractor's working procedures to identify source and investigate the causes of exceedance. 4. Increase monitoring frequency to daily. 5. Arrange meeting IEC, ER and Contractor to discuss the remedial actions to be taken. 6. Assess effectiveness of the Contractor's remedial actions and keep IEC, EPD and ER informed of the results. 7. If exceedance stops, cease	1. Check monitoring data submitted by ET. 2. Check the Contractor's working method. 3. Discuss amongst ER, ET and Contractor on the potential remedial actions. 4. Review the Contractor's remedial actions whenever necessary to assure their effectiveness and advise ER accordingly.	1. Confirm receipt of notification of exceedance in writing. 2. Notify Contractor. 3. In consultation with IEC, agree with the Contractor on the remedial measures to be implemented. 4. Supervise implementation of remedial measures. 5. If exceedance continues, consider stopping the Contractor to continue working on that portion of work which causes the	1. Take immediate action to avoid further exceedance. 2. Discuss with ET and IEC on proper remedial actions. 3. Submit proposals for remedial actions to IEC within 3 working days of notification. 4. Implement the agreed proposals. 5. Submit further remedial actions if problem still not under control. 6. Stop the relevant portion of works as instructed by ER until the exceedance is abated.

Event	Action			
	ET Leader	IEC	ER (Engineer's Representative)	Contractor
	additional monitoring.		exceedance until the exceedance is abated.	

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	1. Notify ER, IEC and Contractor. 2. Carry out investigation. 3. Report the results of investigation to IEC, ER and Contractor. 4. Discuss with the IEC and Contractor on remedial measures required. 5. Increase monitoring frequency to check mitigation measures.	1. Review the investigation results submitted by ET. 2. Review the proposed remedial measures by the Contractor and advise ER accordingly. 3. Advise the ER on the effectiveness of the proposed remedial measures.	1. Confirm receipt of notification of failure in writing. 2. Notify Contractor. 3. In consolidation with the IEC, agree with the Contractor on the remedial measures to be implemented. 4. Supervise the implementation of remedial measures.	1. Submit noise mitigation proposals to ET and ER. 2. Implement noise mitigation proposals.
Limit Level	1. Inform IEC, ER, Contractor and EPD. 2. Repeat measurement to confirm findings. 3. Increase monitoring frequency. 4. Identify source and investigate the cause of exceedance. 5. Carry out analysis of Contractor's working procedures. 6. Discuss with the IEC, Contractor and ER on remedial measures required. 7. Assess effectiveness of the Contractor's remedial actions and keep IEC, EPD and ER informed of the results. 8. If exceedance stops, cease additional monitoring.	1. Discuss amongst ER, ET and Contractor on the potential remedial actions. 2. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise ER accordingly.	1. Confirm receipt of notification of failure in writing. 2. Notify Contractor. 3. In consolidation with the IEC, agree with the Contractor on the remedial measures to be implemented. 4. Supervise the implementation of remedial measures. 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.	1. Take immediate action to avoid further exceedance. 2. Submit proposals for remedial actions to ET and ER within 3 working days of notification. 3. Implement the agreed proposals. 4. Submit further proposal if problem still not under control. 5. Stop the relevant portion of works as instructed by the ER until the exceedance is abated.

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	1. Identify source 2. Inform the IEC and ER. 3. Discuss remedial actions with the IEC, the ER and Contractor. 4. Monitor remedial action until rectification has been completed.	1. Check report. 2. Check the Contractor's working method. 3. Discuss with the ER and the Contractor on possible remedial measures. 4. Advise the ER on effectiveness of proposed remedial measures.	1. Notify the Contractor. 2. Ensure remedial measures are properly implemented.	1. Amend working methods. 2. Rectify damage and undertake remedial measures or any necessary replacement.
Repeated non-conformity	1. Identify source. 2. Notify IEC and the ER. 3. Increase monitoring (site audit) frequency. 4. Discuss remedial actions with the IEC, the ER and the Contractor. 5. Monitor remedial actions until rectification has been completed. 6. If exceedance stops, cease additional monitoring (site audit).	1. Check report. 2. Check the Contractor's working method. 3. Discuss with the ER and the Contractor on possible remedial measures. 4. Advise the ER on effectiveness of proposed remedial measures. 5. Supervise implementation of remedial measures.	1. Notify the Contractor. 2. Ensure remedial measures are properly implemented.	1. Amend working methods. 2. Rectify damage and undertake remedial measures or any necessary replacement.

Appendix E. Monitoring Schedule

Table E1: Monitoring Schedule for the reporting month

Air Quality & Noise Monitoring Schedule for September 2013

Sep-13						
Sun	**Mon**	**Tue**	**Wed**	**Thu**	**Fri**	**Sat**
1	2	3 24-hr TSP 1-hr TSP x 3 Noise	4 Weekly Audit	5	6	7
8	9 24-hr TSP 1-hr TSP x 3 Noise	10	11 Weekly Audit	12	13 24-hr TSP 1-hr TSP x 3	14
15	16	17	18 Weekly Audit	19 24-hr TSP 1-hr TSP x 3 Noise	20 The day following the Chinese Mid-Autumn Festival	21
22	23	24	25 24-hr TSP 1-hr TSP x 3 Noise	26 Weekly Audit	27	28
29	30 24-hr TSP 1-hr TSP x 3 Noise					

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 E2: Tentative Monitoring Schedule for the coming month

Tentative Air Quality & Noise Monitoring Schedule for October 2013

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

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

High-Volume TSP Sampler
5-Point Calibration Record

Location	:	A5
Calibrated by	:	P.F.Yeung
Date	:	21/08/2013

Sampler

Model	:	GMWS-2310 ACCU-VOL
Serial Number	:	S/N 0764

Calibration Orfice and Standard Calibration Relationship

Serial Number	:	2323
Service Date	:	26 Dec 2012
Slope (m)	:	2.09107
Intercept (b)	:	-0.02838
Correlation Coefficient(r)	:	0.99996

Standard Condition

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

Calibration Condition

Pa (hpa)	:	996
Ta(K)	:	302

Resistance Plate		dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC	Y
1	18 holes	11	3.267	1.576	46	45.3
2	13 holes	8.9	2.938	1.419	41	40.4
3	10 holes	6.8	2.569	1.242	36	35.5
4	7 holes	4.4	2.066	1.002	28	27.6
5	5 holes	2.6	1.588	0.773	22	21.7

Sampler Calibration Relationship

Slope(m):29.688 Intercept(b): -1.613 Correlation Coefficient(r): 0.9993

Checked by: _____ Date: 25/08/2013

Magnum Fan

TEST CERTIFICATE

Report No. 13-0716

CUSTOMER : Innotech Instrumentation Co.,Ltd

SIBATA SCIENTIFIC TECHNOLOGY LTD.

DATE 07/June /2013

APPROVE DY	VERIFIED BY	ISSUED BY
西田	小野寺	永岡

PRODUCT NAME	:	Digital Dust Indicator
MODEL NUMBER	:	LD-3B
SERIAL NUMBER	:	1Y5546
CALIBRATION DATE	:	05−June−2013

Testing Category	Judging Standard	Judgment			
Function Test	Switch, Display, Wiring will nomally function	OK			
Sensitivity Calibration	Count is ±2% accurate to the master by the standard calibration particle	Reading of Master	Reading of this Instrument	Correction	Inspection chart
		5721 CPM	5720 CPM	± 0 %	Reference Value(S)
Dust Concentration Measuring	Count is ±10% accurate to the master under the 3 different concentration.	1650 CPM	1619 CPM	−1.9 %	655 CPM
		1013 CPM	1005 CPM	−0.8 %	
		550 CPM	550 CPM	± 0 %	Test atmosphere
Stability	The maximum value of the sensitivity adjustment scale setting value of the machine and the difference with minimum value are within 5% compared with the maximum value. (The measurement is repeated three times for one minute.)	OK			Temperature: 26 ℃ / Humidity: 55 %
Synthetic Judgment		Good			

TISCH ENVIROMENTAL, INC.
145 SOUTH MIAMI AVE.
VILLAGE OF CLEVES, OH 45002
513.467.9000
877.263.7610 TOLL FREE
513.467.9009 FAX
WWW.TISCH-ENV.COM

AIR POLLUTION MONITORING EQUIPMENT

ORIFICE TRANSFER STANDARD CERTIFICATION WORKSHEET TE-5025A

Date - Dec 26, 2012 Rootsmeter S/N 0438320 Ta (K) - 295
Operator Tisch Orifice I.D. - 2323 Pa (mm) - 753.11

PLATE OR Run #	VOLUME START (m3)	VOLUME STOP (m3)	DIFF VOLUME (m3)	DIFF TIME (min)	METER DIFF Hg (mm)	ORFICE DIFF H2O (in.)
1	NA	NA	1.00	1.4440	3.2	2.00
2	NA	NA	1.00	1.0240	6.4	4.00
3	NA	NA	1.00	0.9120	8.0	5.00
4	NA	NA	1.00	0.8720	8.8	5.50
5	NA	NA	1.00	0.7200	12.8	8.00

DATA TABULATION

Vstd	(x axis) Qstd	(y axis)
0.9967	0.6902	1.4149
0.9925	0.9693	2.0010
0.9903	1.0858	2.2372
0.9893	1.1345	2.3464
0.9840	1.3666	2.8299

Qstd slope (m) = 2.09107
intercept (b) = -0.02838
coefficient (r) = 0.99996

y axis = SQRT[H2O(Pa/760)(298/Ta)]

Va	(x axis) Qa	(y axis)
0.9957	0.6896	0.8851
0.9915	0.9683	1.2517
0.9893	1.0847	1.3995
0.9883	1.1334	1.4678
0.9830	1.3652	1.7702

Qa slope (m) = 1.30939
intercept (b) = -0.01775
coefficient (r) = 0.99996

y axis = SQRT[H2O(Ta/Pa)]

CALCULATIONS

Vstd = Diff. Vol[(Pa-Diff. Hg)/760](298/Ta)
Qstd = Vstd/Time

Va = Diff Vol [(Pa-Diff Hg)/Pa]
Qa = Va/Time

For subsequent flow rate calculations:

Qstd = 1/m{[SQRT(H2O(Pa/760)(298/Ta))]- b}
Qa = 1/m{[SQRT H2O(Ta/Pa)]- b}

輝創工程有限公司
Sun Creation Engineering Limited
Calibration and Testing Laboratory

Certificate of Calibration
校正證書

Certificate No. : C134309
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC13-1709)

Description / 儀器名稱	:	Precision Integrating Sound Level Meter
Manufacturer / 製造商	:	Rion
Model No. / 型號	:	NL-18
Serial No. / 編號	:	00360030
Supplied By / 委託者	:	Envirotech Services Co. Shop 6, G/F., Casio Mansion, 209 Shaukeiwan Road, Hong Kong

TEST CONDITIONS / 測試條件

Temperature / 溫度 : (23 ± 2)°C
Relative Humidity / 相對濕度 : (55 ± 20)%
Line Voltage / 電壓 : ---

TEST SPECIFICATIONS / 測試規範

Calibration

DATE OF TEST / 測試日期 : 12 July 2013

TEST RESULTS / 測試結果

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

The test equipment used for calibration are traceable to National Standards via :
- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory
- Rohde & Schwarz Laboratory, Germany
- Fluke Everett Service Center, USA
- Agilent Technologies, USA

Tested By 測試 : K C Lee

Certified By 核證 : K M Wu

Date of Issue 簽發日期 : 15 July 2013

The test equipment used for calibration are traceable to the Nation Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.
本證書所載校正用之測試器材均可溯源至國際標準。局部複印本證書需先獲本實驗所書面批准。

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c/o 4 F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
輝創工程有限公司 – 校正及檢測實驗所
c/o 香港新界屯門興安里一號青山灣機樓四樓
Tel/電話: 2927 2606 Fax/傳真: 2744 8986 E-mail/電郵: callab@suncreation.com Website/網址: www.suncreation.com

Certificate of Calibration
校正證書

Certificate No. : C134309
證書編號

1. The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 12 hours, and switched on to warm up for over 10 minutes before the commencement of the test.

2. Self-calibration using the internal standard (After Adjustment) was performed before the test from 6.1.2 to 6.4.

3. The results presented are the mean of 3 measurements at each calibration point.

4. Test equipment :

Equipment ID	Description	Certificate No.
CL280	40 MHz Arbitrary Waveform Generator	C130019
CL281	Multifunction Acoustic Calibrator	DC130171

5. Test procedure : MA101N.

6. Results :

6.1 Sound Pressure Level

6.1.1 Reference Sound Pressure Level

6.1.1.1 Before Adjustment

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
50 - 110	LA	A	Fast	94.00	1	* 93.1	± 0.7

* Out of Mfr's Spec.

6.1.1.2 After Adjustment

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
50 - 110	LA	A	Fast	94.00	1	94.1	± 0.7

6.1.2 Linearity

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

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

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6.2 Time Weighting

6.2.1 Continuous Signal

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
50 - 110	LA	A	Fast	94.00	1	94.1	Ref.
			Slow			94.1	± 0.1

6.2.2 Tone Burst Signal (2 kHz)

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Burst Duration		
50 -110	LA	A	Fast	106.00	Continuous	106.0	Ref.
	LAmx				200 ms	105.1	-1.0 ± 1.0
	LA		Slow		Continuous	106.0	Ref.
	LAmx				500 ms	102.4	-4.1 ± 1.0

6.3 Frequency Weighting

6.3.1 A-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
50 - 110	LA	A	Fast	94.00	31.5 Hz	54.4	-39.4 ± 1.5
					63 Hz	67.7	-26.2 ± 1.5
					125 Hz	77.7	-16.1 ± 1.0
					250 Hz	85.3	-8.6 ± 1.0
					500 Hz	90.7	-3.2 ± 1.0
					1 kHz	94.1	Ref.
					2 kHz	95.3	+1.2 ± 1.0
					4 kHz	95.1	+1.0 ± 1.0
					8 kHz	93.0	-1.1 (+1.5 ; -3.0)
					12.5 kHz	89.8	-4.3 (+3.0 ; -6.0)

The test equipment used for calibration are traceable to the Nation Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.
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c/o 4/F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
輝創工程有限公司 – 校正及檢測實驗所
c/o 香港新界屯門興安里一號青山灣機樓四樓
Tel 電話: 2927 2606 Fax 傳真: 2744 8986 E-mail 電郵: callab@suncreation.com Website 網址: www.suncreation.com

Certificate of Calibration
校正證書

Certificate No. : C134309
證書編號

6.3.2 C-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
50 - 110	LC	C	Fast	94.00	31.5 Hz	91.0	-3.0 ± 1.5
					63 Hz	93.2	-0.8 ± 1.5
					125 Hz	93.9	-0.2 ± 1.0
					250 Hz	94.1	0.0 ± 1.0
					500 Hz	94.1	0.0 ± 1.0
					1 kHz	94.1	Ref.
					2 kHz	93.9	-0.2 ± 1.0
					4 kHz	93.3	-0.8 ± 1.0
					8 kHz	91.0	-3.0 (+1.5 ; -3.0)
					12.5 kHz	87.8	-6.2 (+3.0 ; -6.0)

6.4 Time Averaging

UUT Setting				Applied Value					UUT Reading (dB)	IEC 60804 Type 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Integrating Time	Freq. (kHz)	Burst Duration (ms)	Burst Duty Factor	Burst Level (dB)	Equivalent Level (dB)		
50 - 110	LAeq	A	10 sec.	4	1	1/10	110	100	100.0	± 0.5
						$1/10^2$		90	90.0	± 0.5
			60 sec.			$1/10^3$		80	79.5	± 1.0
			5 min.			$1/10^4$		70	69.7	± 1.0

Remarks : - UUT Microphone Model No. : UC-53A & S/N : 307435

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

- Uncertainties of Applied Value :

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

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

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

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c/o 4/F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
輝創工程有限公司 – 校正及檢測實驗所
c/o 香港新界屯門興安里一號青山灣機樓四樓
Tel 電話: 2927 2606 Fax 傳真: 2744 8986 E-mail 電郵: callab@suncreation.com Website 網址: www.suncreation.com

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Sun Creation Engineering Limited
Calibration and Testing Laboratory

Certificate of Calibration
校正證書

Certificate No. : C124011
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC12-1674)

Description / 儀器名稱	:	Sound Level Calibrator
Manufacturer / 製造商	:	Rion
Model No. / 型號	:	NC-73
Serial No. / 編號	:	10997142
Supplied By / 委託者	:	Envirotech Services Co. Shop 6, G/F., Casio Mansion, 209 Shaukeiwan Road, Hong Kong

TEST CONDITIONS / 測試條件

Temperature / 溫度 : (23 ± 2)°C
Relative Humidity / 相對濕度 : (55 ± 20)%
Line Voltage / 電壓 : ---

TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 9 July 2012

TEST RESULTS / 測試結果

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

The test equipment used for calibration are traceable to National Standards via :
- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory
- Rohde & Schwarz Laboratory, Germany
- Fluke Everett Service Center, USA
- Agilent Technologies, USA

Tested By 測試 : L K Yeung

Certified By 核證 : K C Lee

Date of Issue 簽發日期 : 10 July 2012

The test equipment used for calibration are traceable to the Nation Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.
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c/o 4/F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
輝創工程有限公司 - 校正及檢測實驗所
c/o 香港新界屯門興安里一號青山灣機場中樓
Tel 電話: 2927 2606 Fax 傳真: 2744 8986 E-mail 電郵: calfab@suncreation.com Website 網址: www.suncreation.com

Certificate of Calibration
校正證書

Certificate No. : C124011
證書編號

1. The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 12 hours before the commencement of the test.

2. The results presented are the mean of 3 measurements at each calibration point.

3. Test equipment :

Equipment ID	Description	Certificate No.
CL130	Universal Counter	C123541
CL281	Multifunction Acoustic Calibrator	DC110233
TST150A	Measuring Amplifier	C120886

4. Test procedure : MA100N.

5. Results :

5.1 Sound Level Accuracy

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

5.2 Frequency Accuracy

UUT Nominal Value (kHz)	Measured Value (kHz)	Mfr's Spec.	Uncertainty of Measured Value (Hz)
1	0.990	1 kHz ± 2 %	± 1

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

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

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c/o 4/F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
輝創工程有限公司－校正及檢測實驗所
c/o 香港新界屯門興安里一號青山灣機廠四樓
Tel 電話: 2927 2606 Fax 傳真: 2744 8986 E-mail 電郵: calilabo@suncreation.com Website 網址: www.suncreation.com

輝創工程有限公司
Sun Creation Engineering Limited
Calibration and Testing Laboratory

Certificate of Calibration
校正證書

Certificate No. : C134307
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC13-1709)

Description / 儀器名稱 : Sound Level Calibrator
Manufacturer / 製造商 : Rion
Model No. / 型號 : NC-73
Serial No. / 編號 : 10997142
Supplied By / 委託者 : Envirotech Services Co.
Shop 6, G/F., Casio Mansion, 209 Shaukeiwan Road,
Hong Kong

TEST CONDITIONS / 測試條件

Temperature / 溫度 : (23 ± 2)°C
Relative Humidity / 相對濕度 : (55 ± 20)%
Line Voltage / 電壓 : ---

TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 12 July 2013

TEST RESULTS / 測試結果

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

The test equipment used for calibration are traceable to National Standards via :
- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory
- Rohde & Schwarz Laboratory, Germany
- Fluke Everett Service Center, USA
- Agilent Technologies, USA

Tested By 測試 : K C Lee

Certified By 核證 : K M Wu

Date of Issue 簽發日期 : 15 July 2013

The test equipment used for calibration are traceable to the Nation Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.
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c o 4 F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
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c o 香港新界屯門興安里一號青山灣機樓四樓
Tel 電話: 2927 2606 Fax 傳真: 2744 8986 E-mail 電郵: callab@suncreation.com Website 網址: www.suncreation.com

Certificate of Calibration
校正證書

Certificate No. : C134307
證書編號

1. The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 12 hours before the commencement of the test.

2. The results presented are the mean of 3 measurements at each calibration point.

3. Test equipment :

Equipment ID	Description	Certificate No.
CL130	Universal Counter	C133632
CL281	Multifunction Acoustic Calibrator	DC130171
TST150A	Measuring Amplifier	C120886

4. Test procedure : MA100N.

5. Results :

5.1 Sound Level Accuracy

UUT Nominal Value	Measured Value (dB)	Mfr's Spec. (dB)	Uncertainty of Measured Value (dB)
94 dB, 1 kHz	93.7	± 0.5	± 0.2

5.2 Frequency Accuracy

UUT Nominal Value (kHz)	Measured Value (kHz)	Mfr's Spec.	Uncertainty of Measured Value (Hz)
1	0.988	1 kHz ± 2 %	± 1

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

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

The test equipment used for calibration are traceable to the Nation Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.
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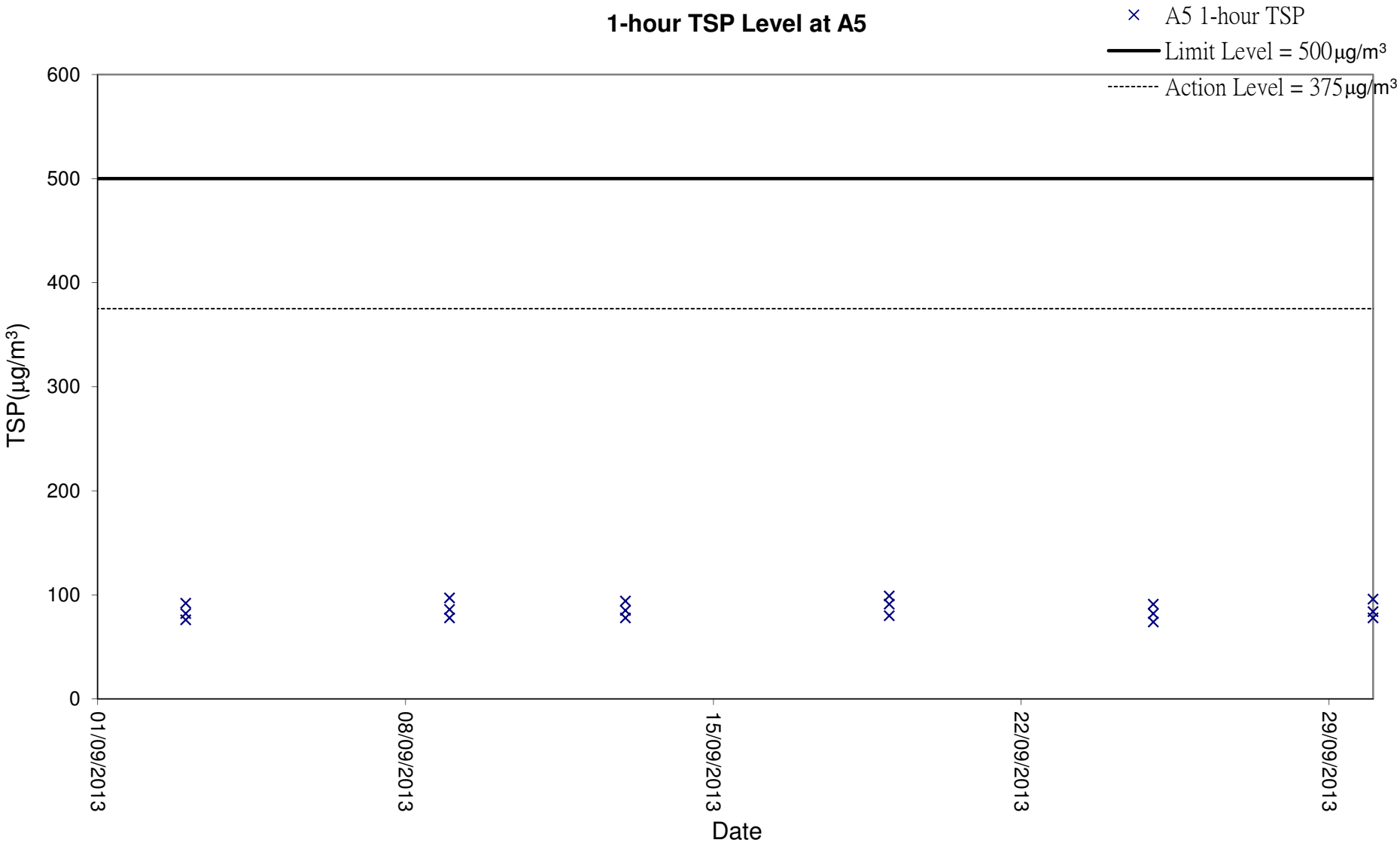
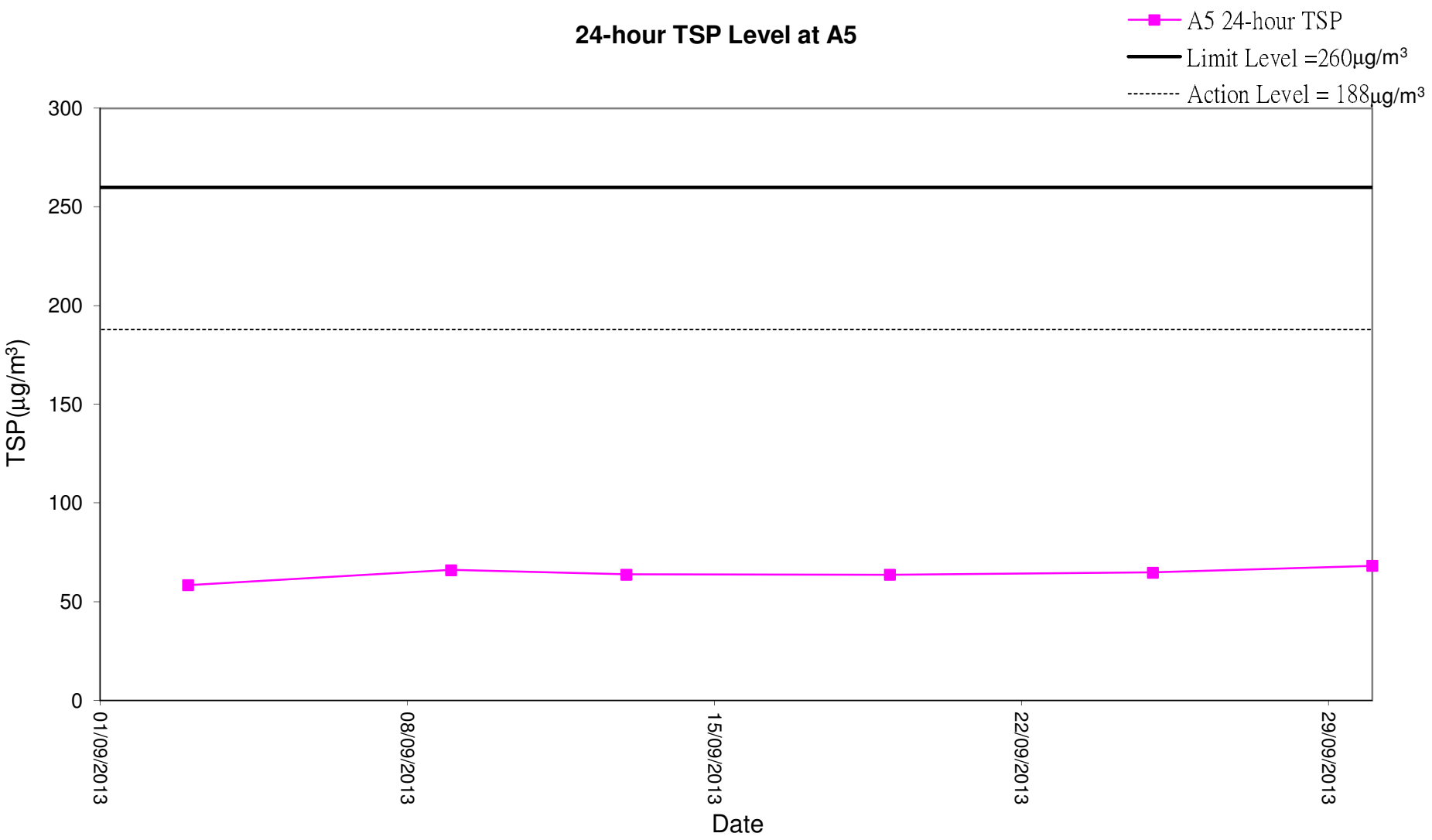
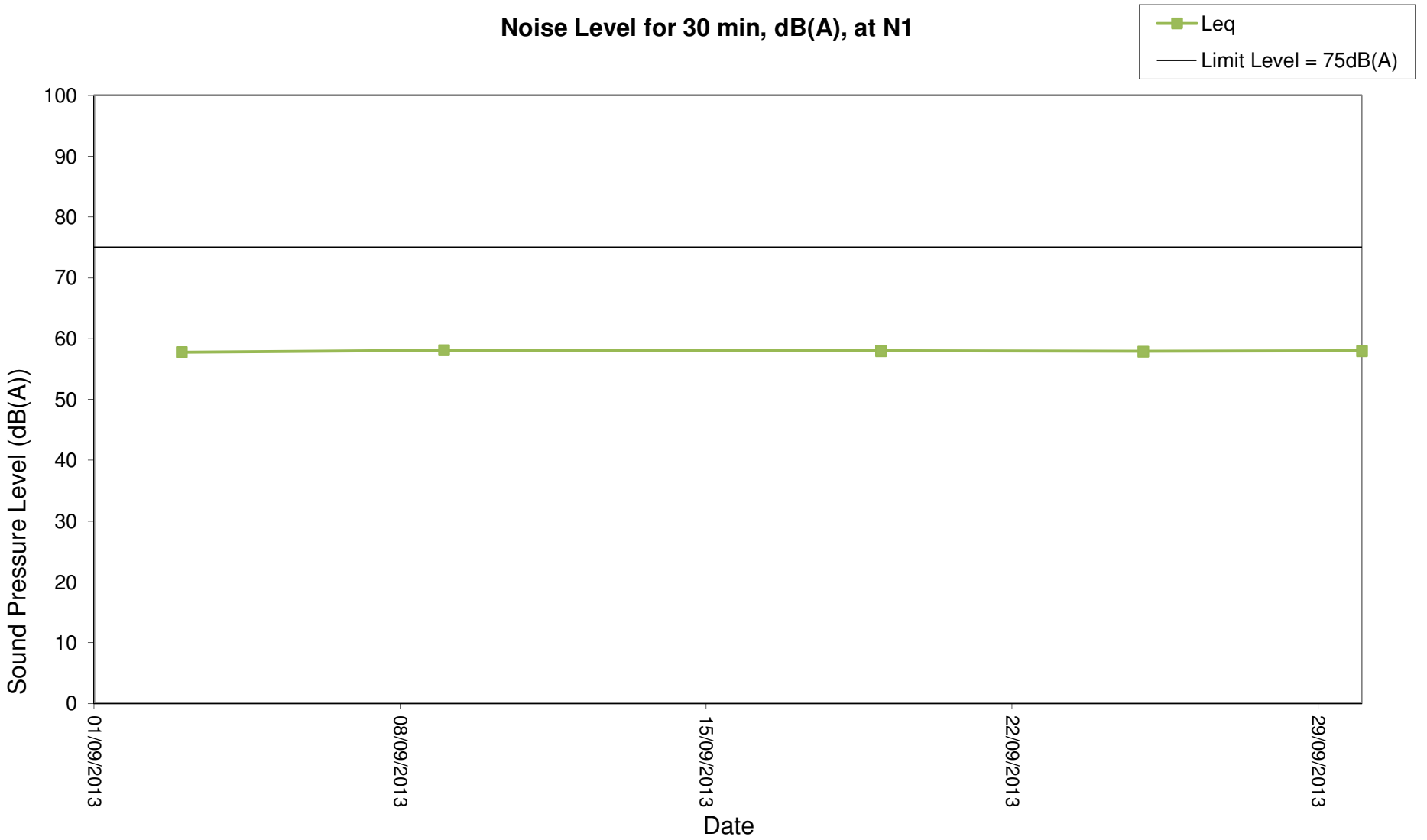
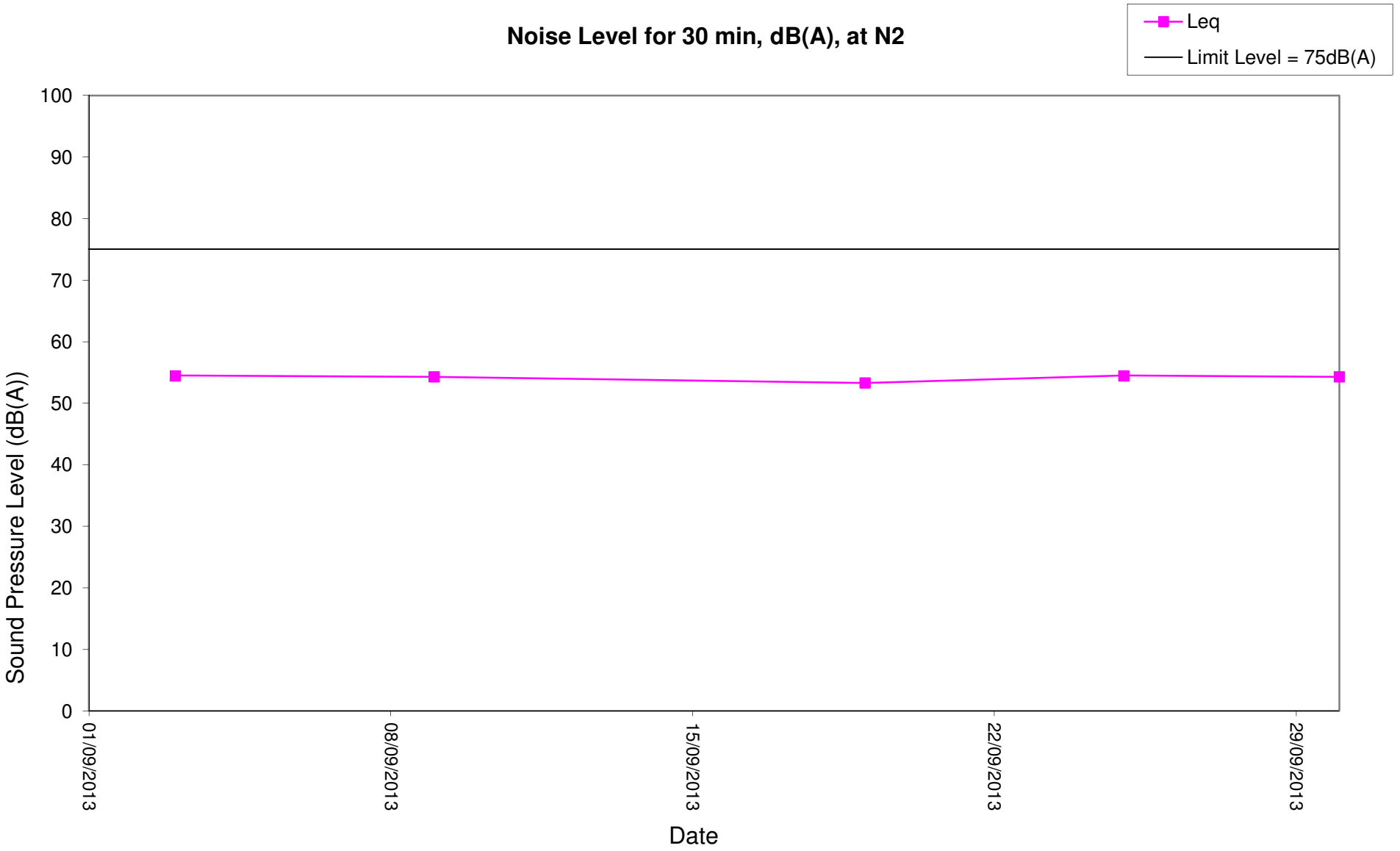
輝創工程有限公司 – 校正及檢測實驗所
c/o 香港新界屯門興安里一號青山灣機樓四樓
Tel 電話: 2927 2606 Fax 傳真: 2744 8986 E-mail/電郵: callab@suncreation.com Website/網址: www.suncreation.com

Appendix G. Graphical plots of the monitoring results


1-hour TSP Level at A5
A5 1-hour TSP
Limit Level = 500µg/m³
Action Level = 375µg/m³
TSP(µg/m³)
600
500
400
300
200
100
0
01/09/2013
08/09/2013
15/09/2013
22/09/2013
29/09/2013
Date

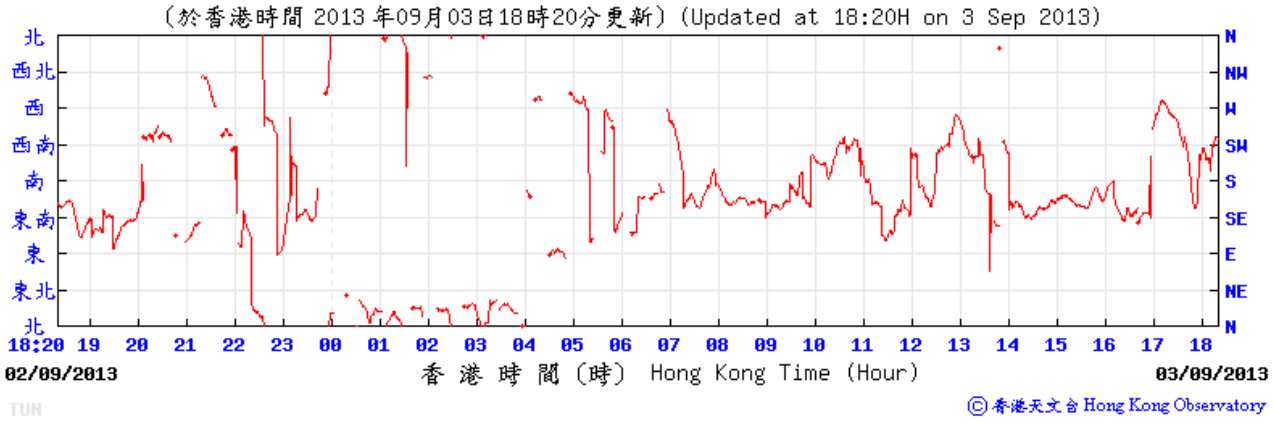

24-hour TSP Level at A5
A5 24-hour TSP
Limit Level =260µg/m³
Action Level = 188µg/m³
TSP(µg/m³)
300
250
200
150
100
50
0
01/09/2013
08/09/2013
15/09/2013
22/09/2013
29/09/2013
Date

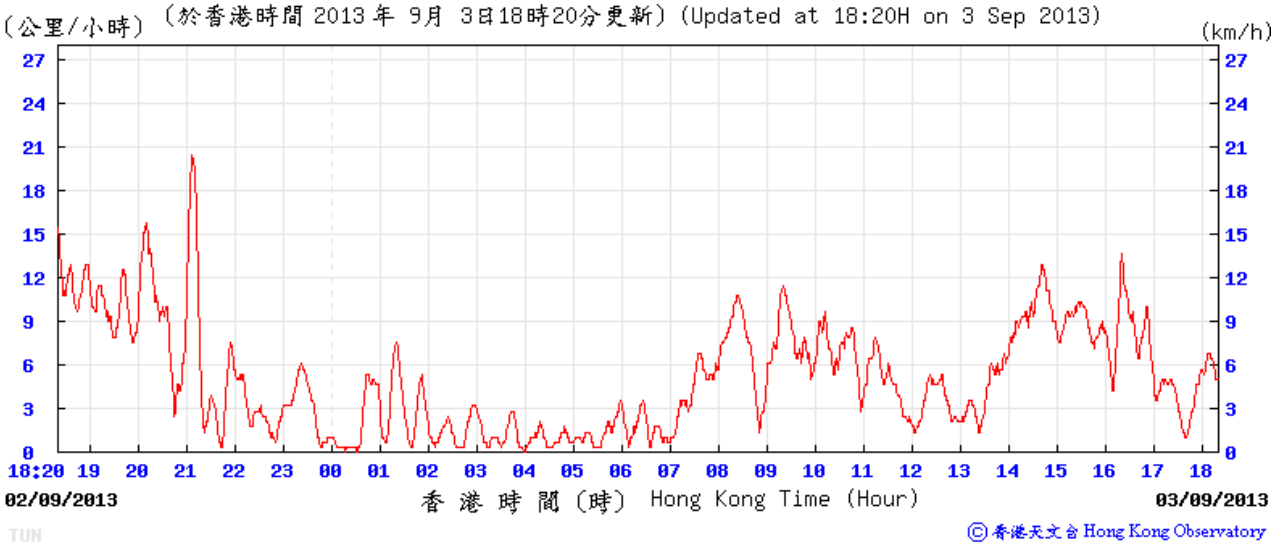

Noise Level for 30 min, dB(A), at N1
Leq
Limit Level = 75dB(A)
Sound Pressure Level (dB(A))
100
90
80
70
60
50
40
30
20
10
0
01/09/2013
08/09/2013
15/09/2013
22/09/2013
29/09/2013
Date

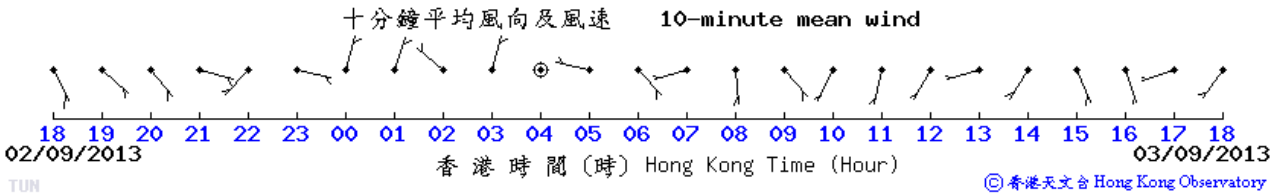

Noise Level for 30 min, dB(A), at N2
Leq
Limit Level = 75dB(A)
Sound Pressure Level (dB(A))
100
90
80
70
60
50
40
30
20
10
0
01/09/2013
08/09/2013
15/09/2013
22/09/2013
29/09/2013
Date

Appendix H. Wind data from Hong Kong Observatory Weather Station

Tuen Mun – 3 September 2013







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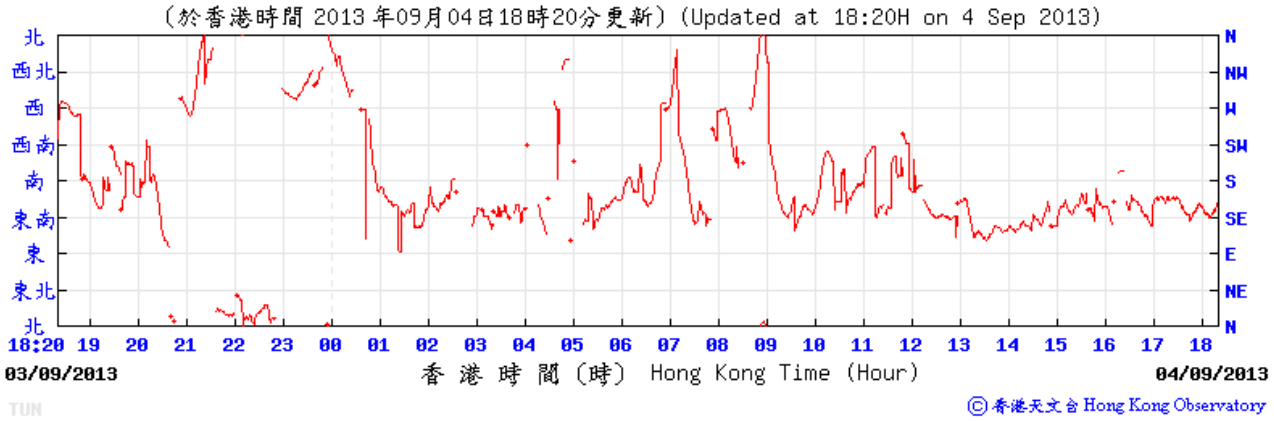

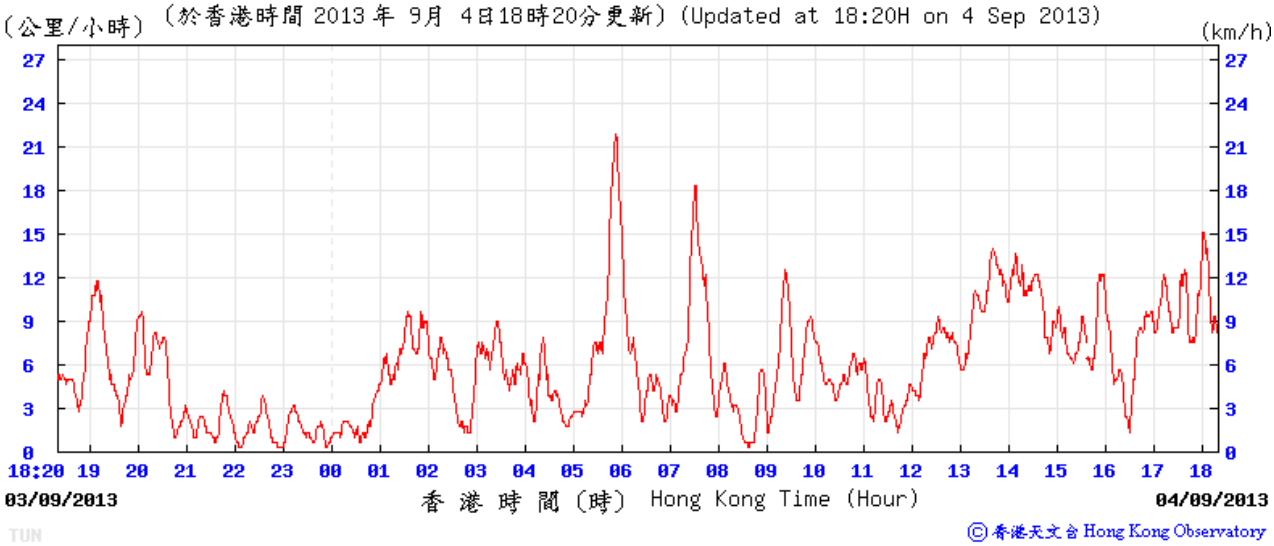

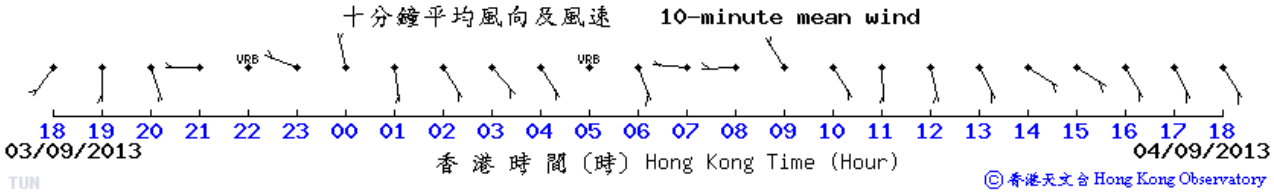

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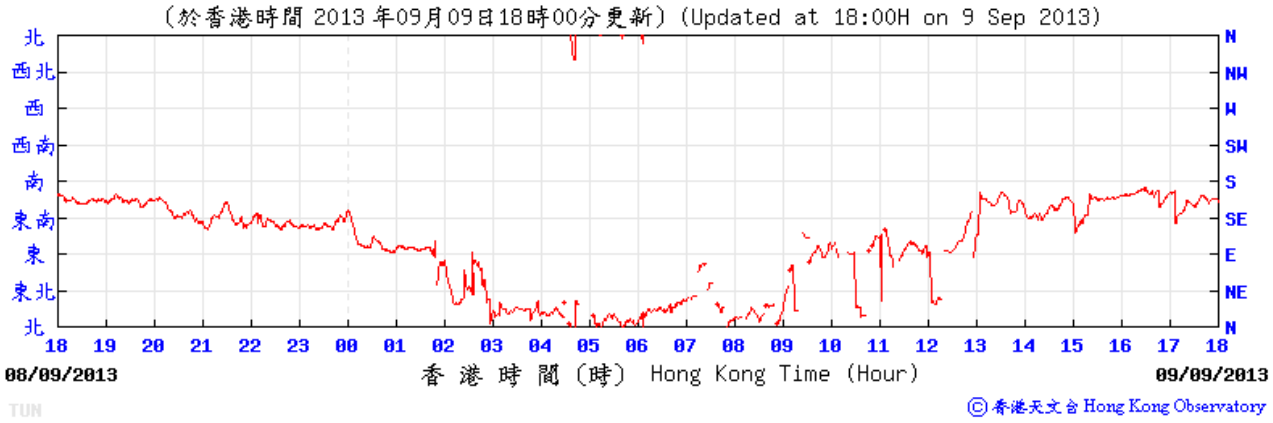

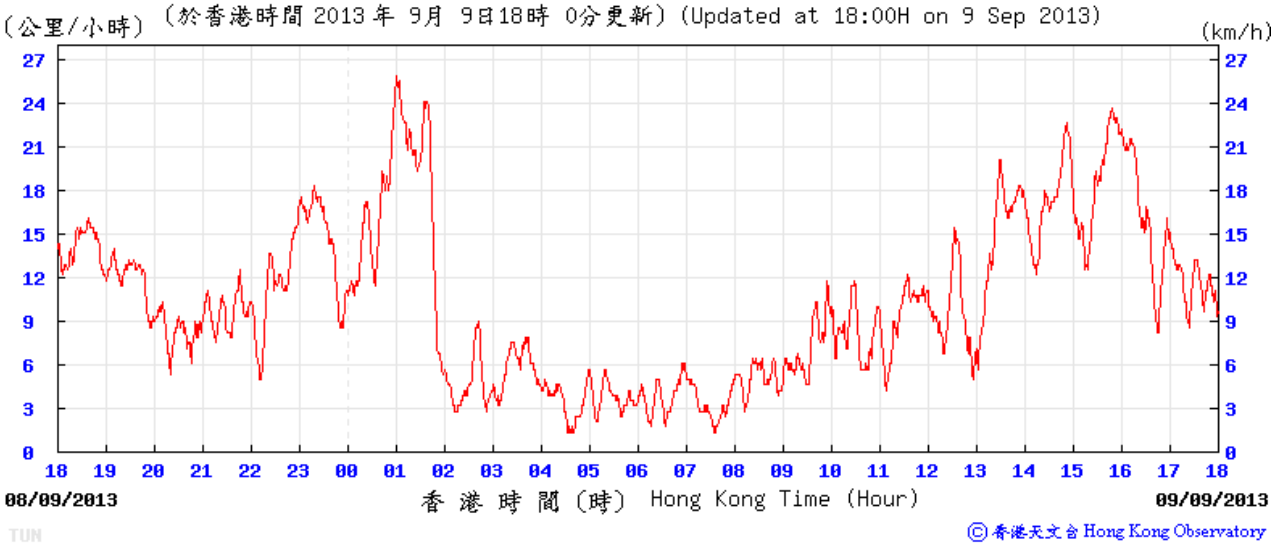

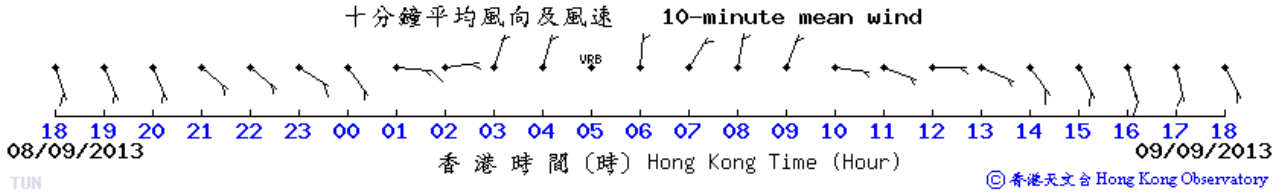

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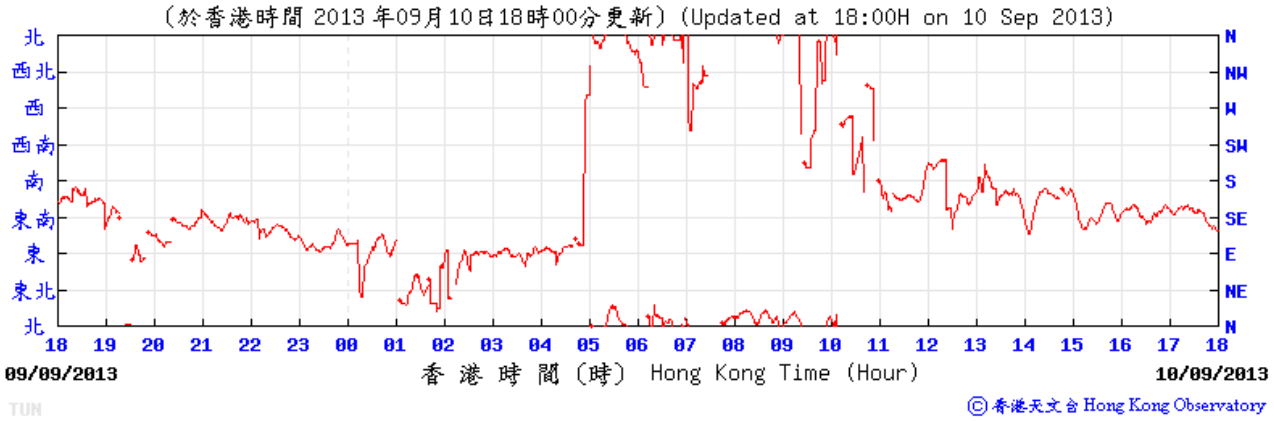

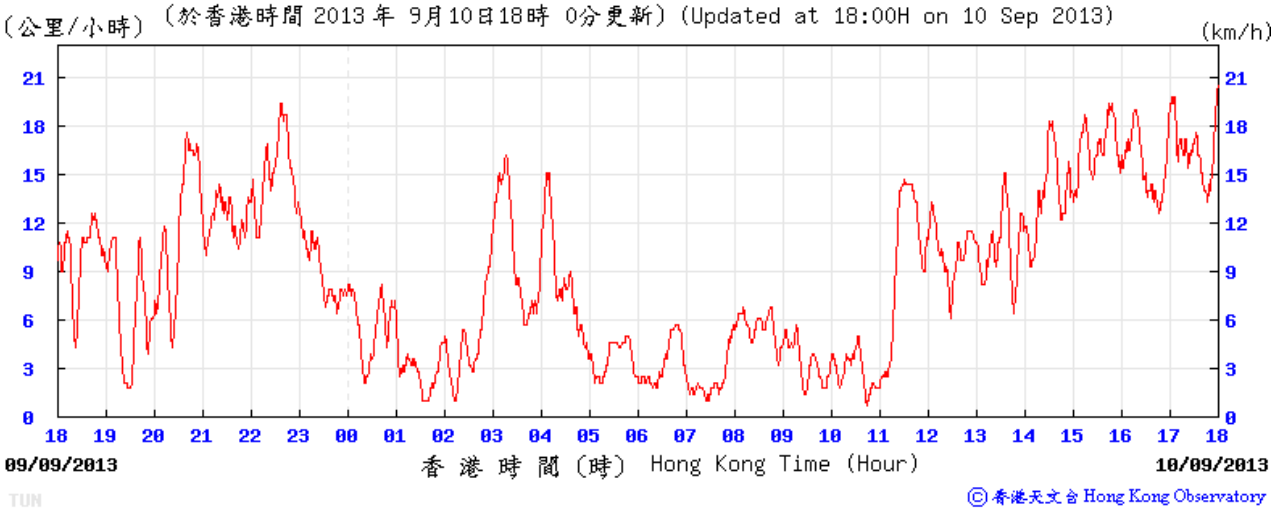

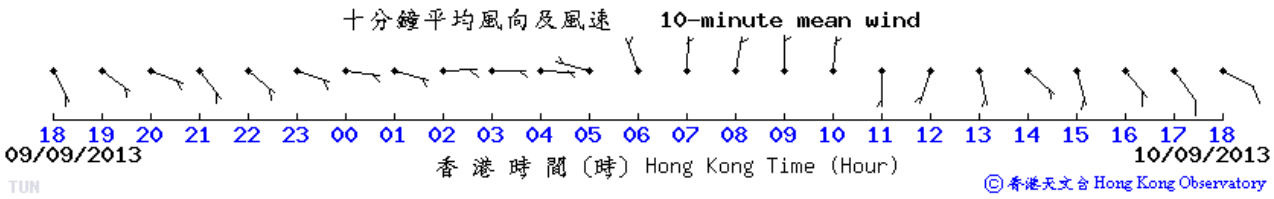

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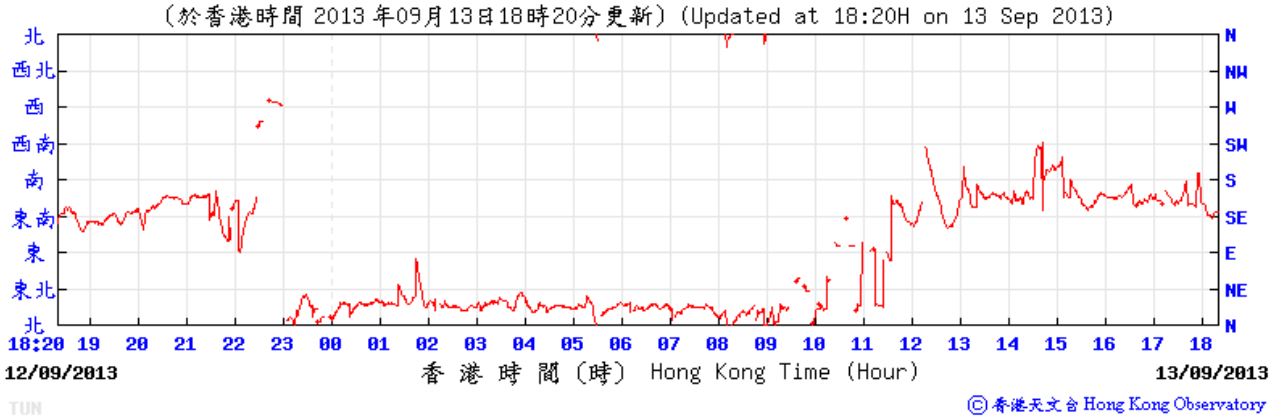

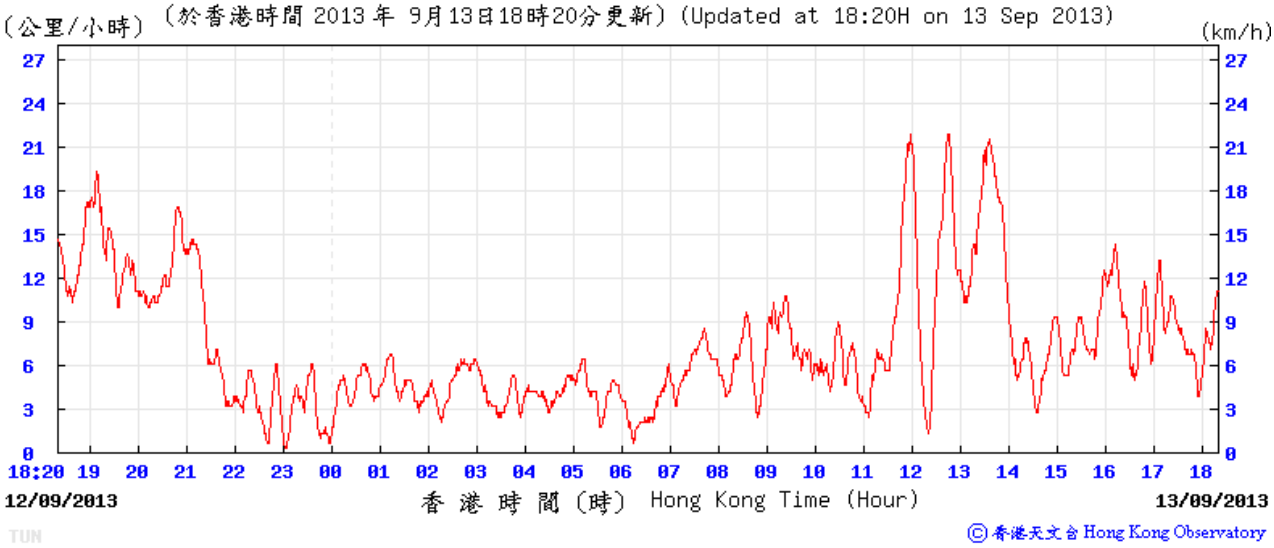

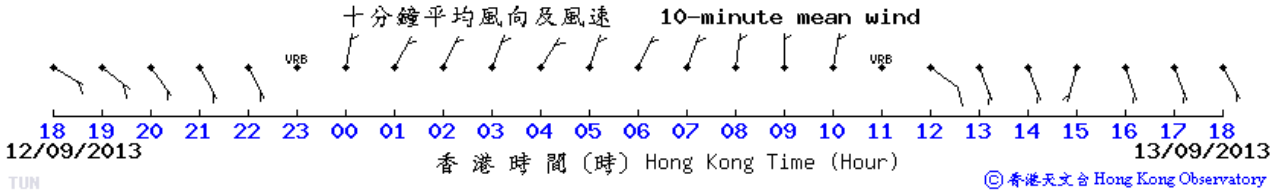

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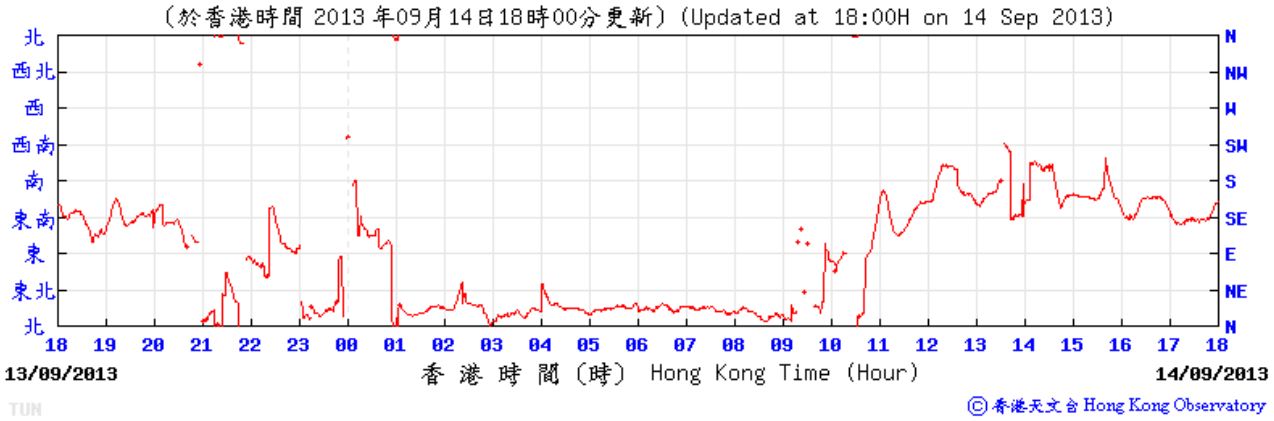

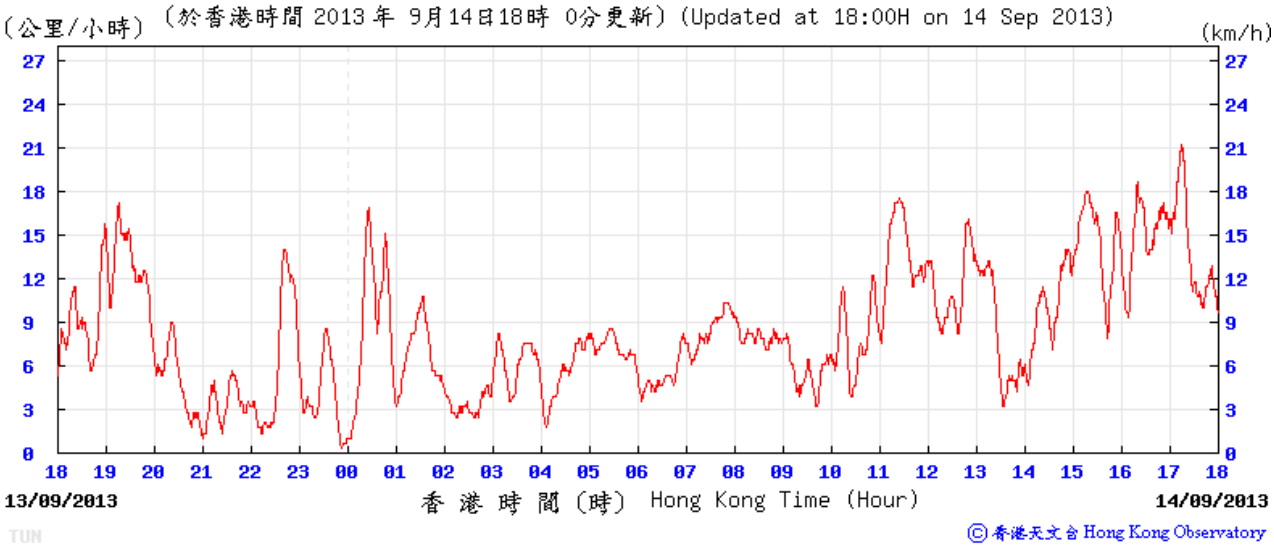

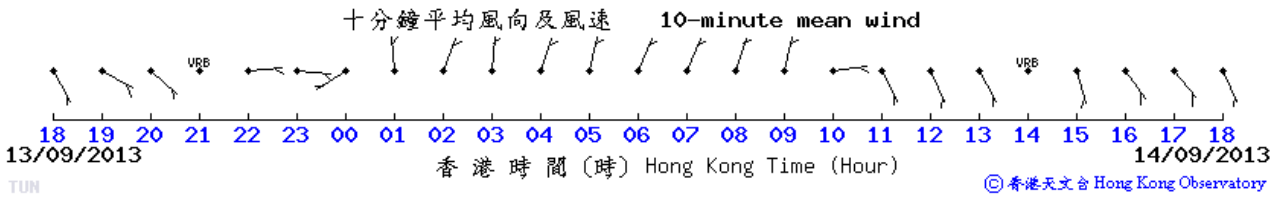

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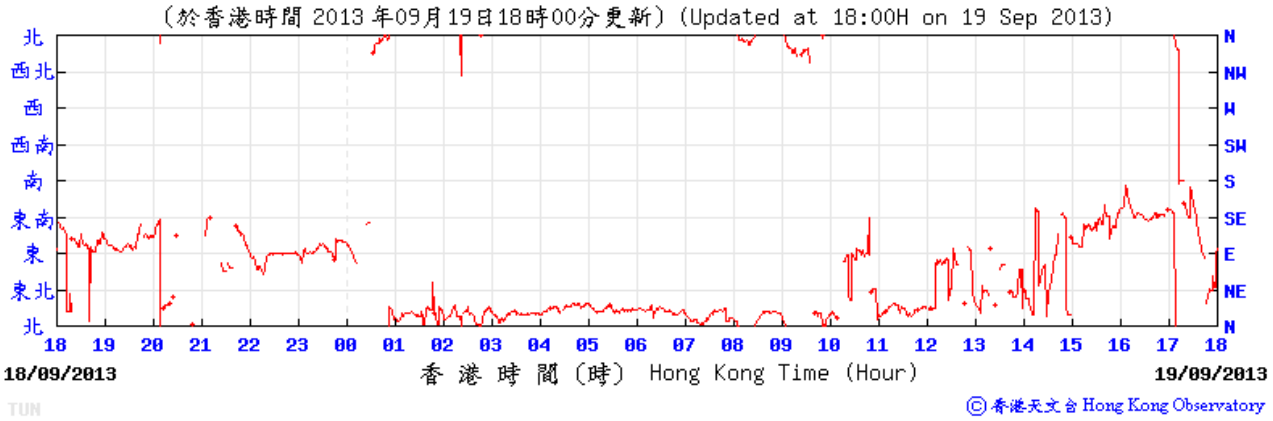

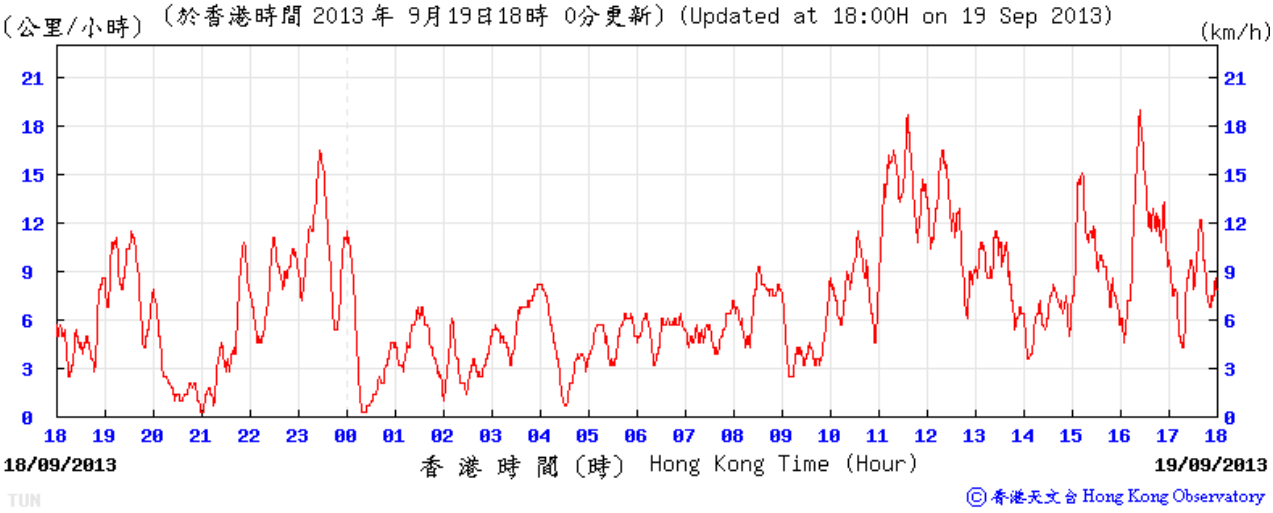

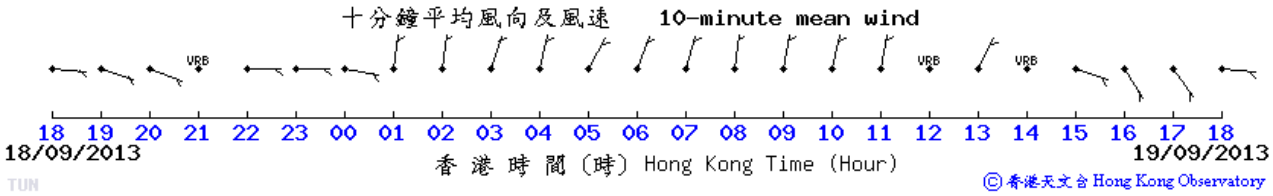

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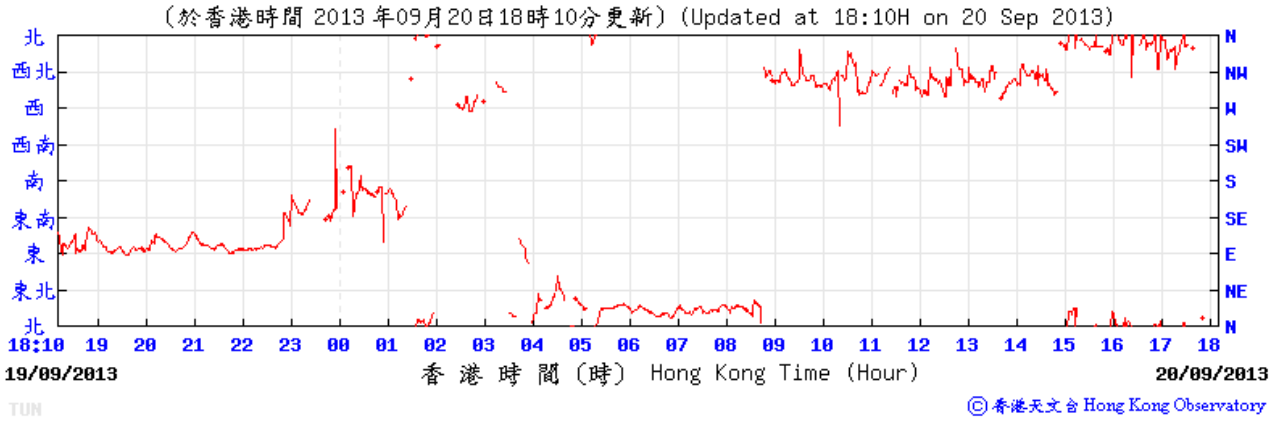

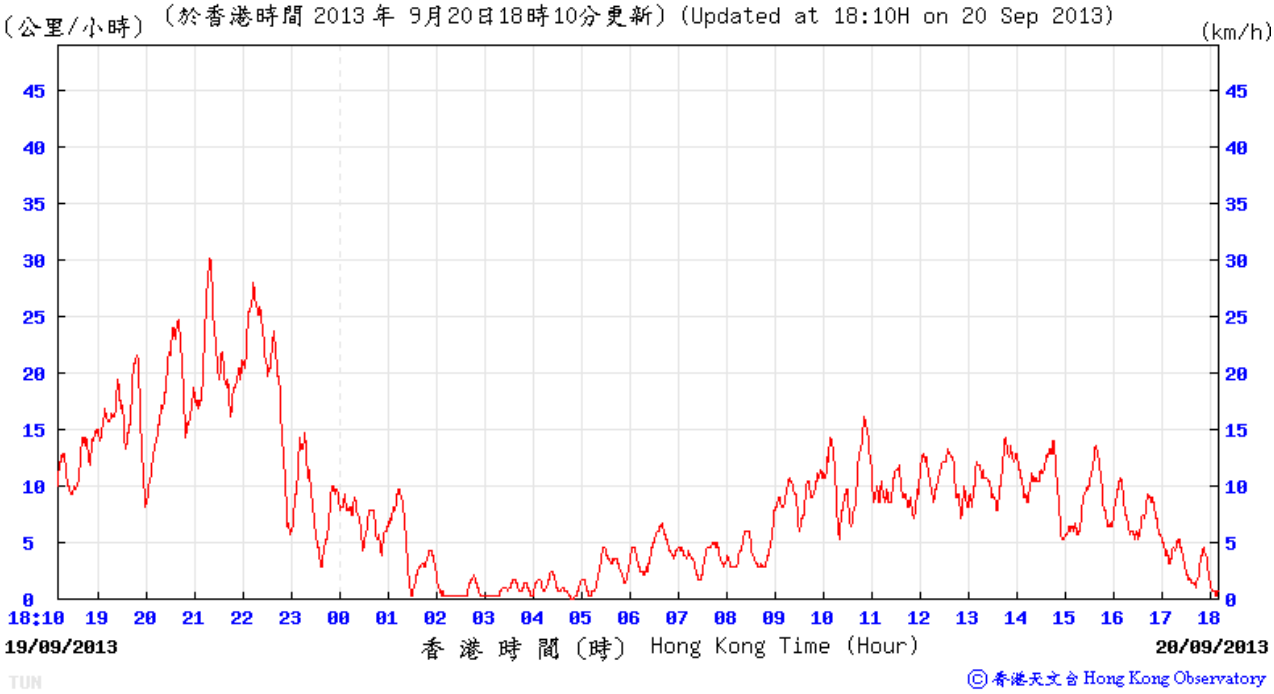

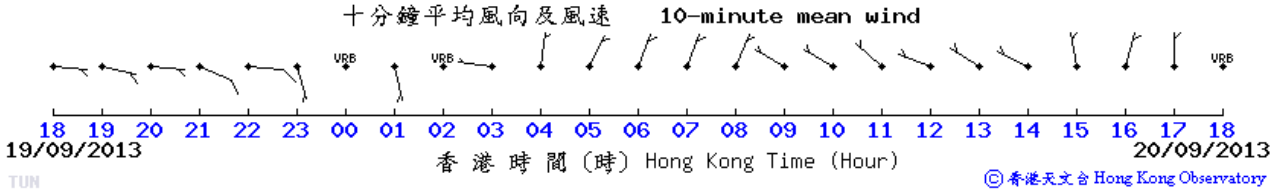

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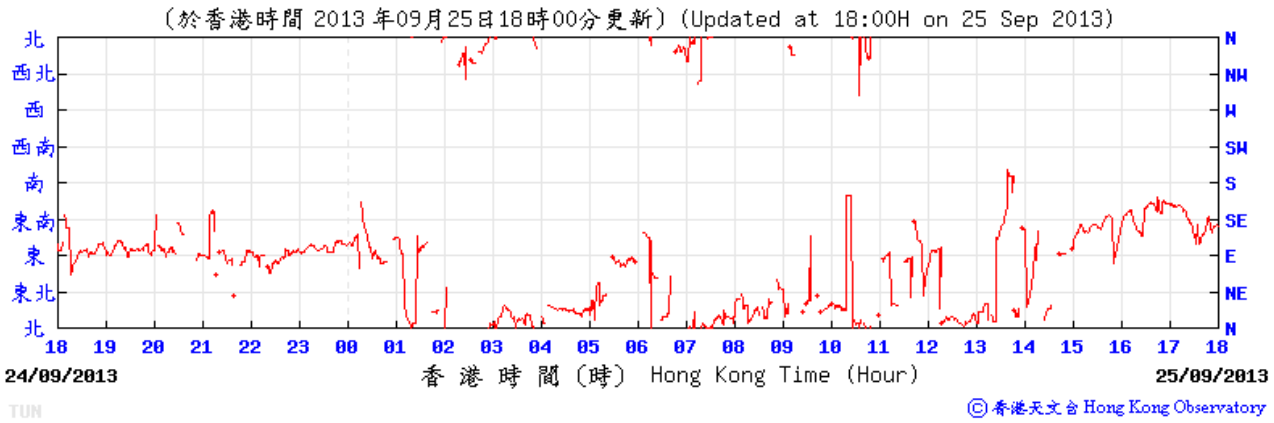

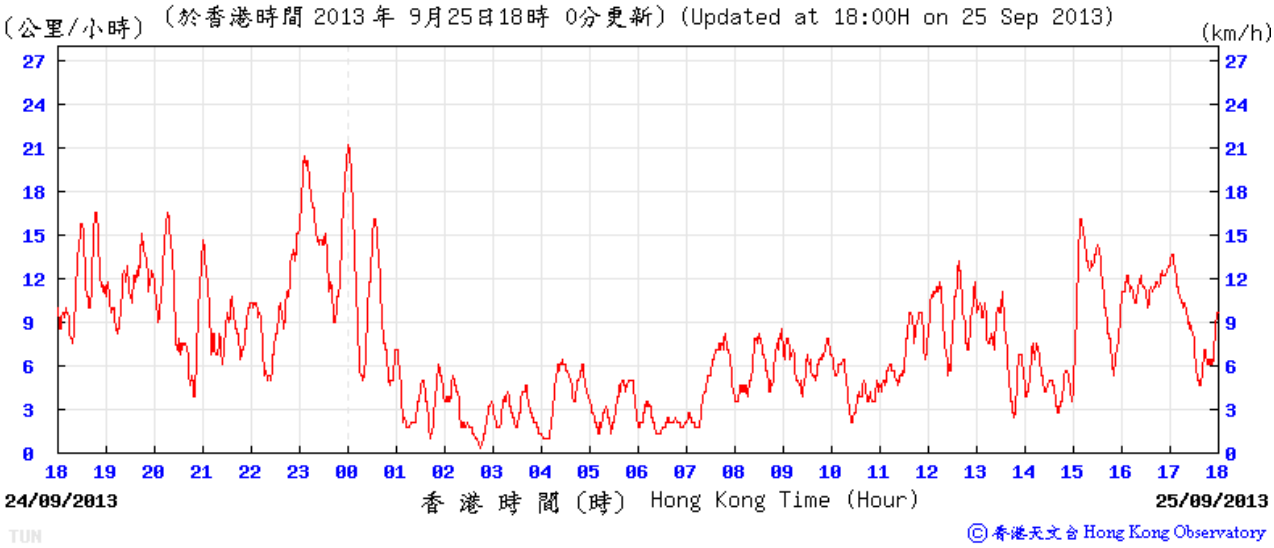

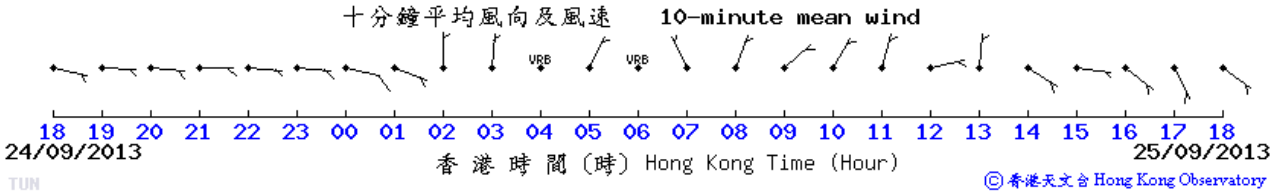

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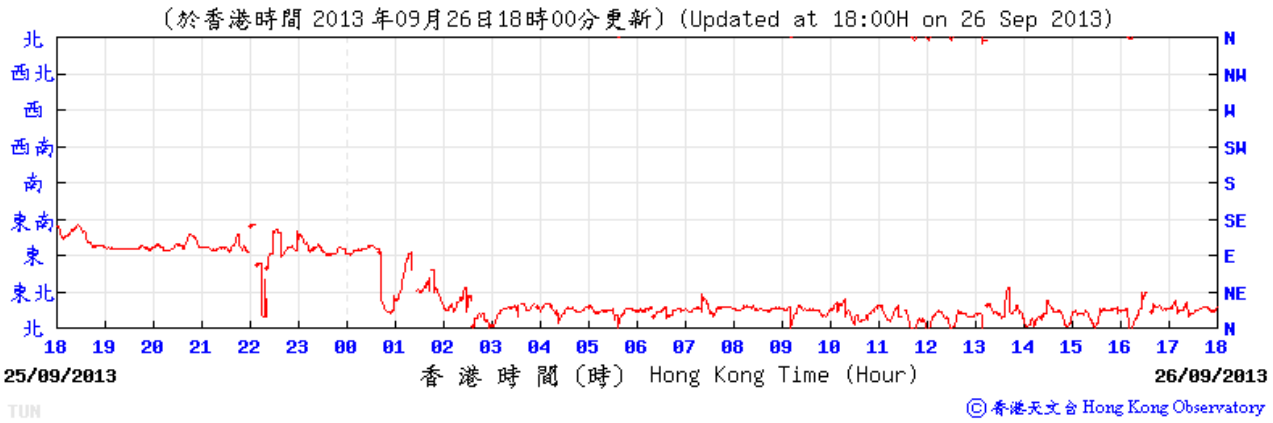

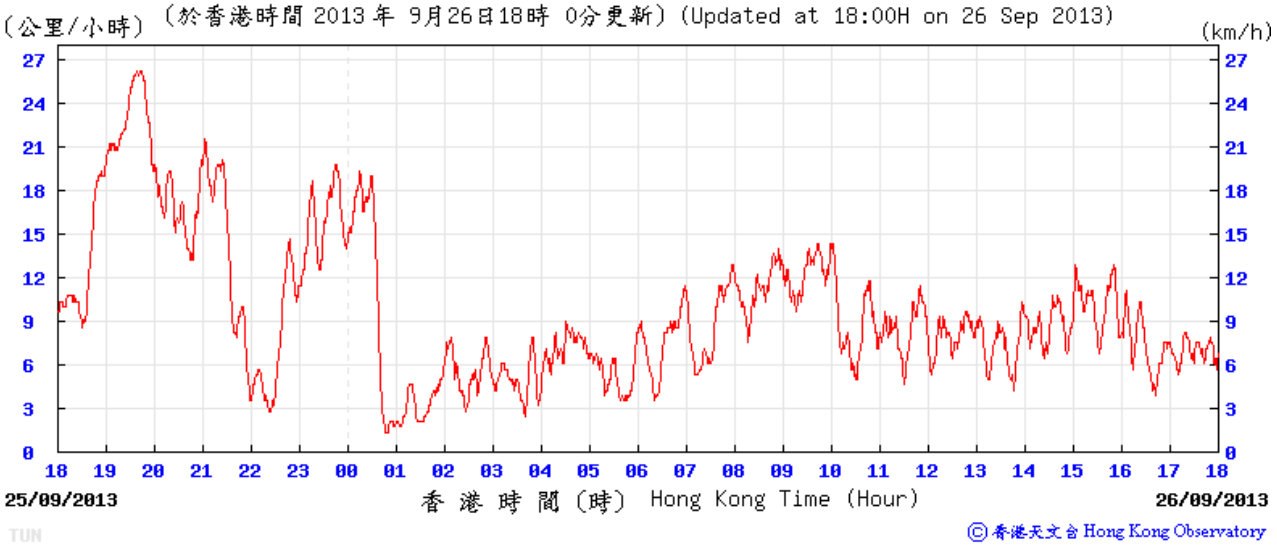

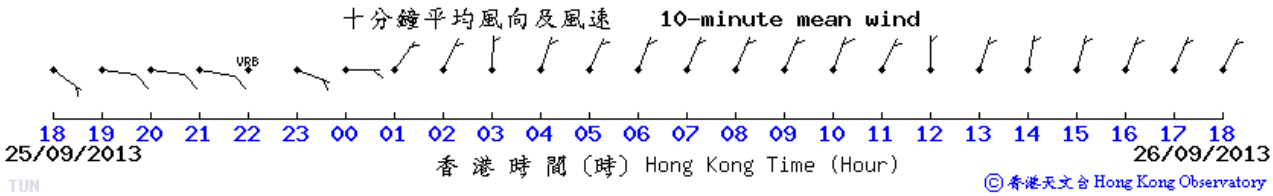

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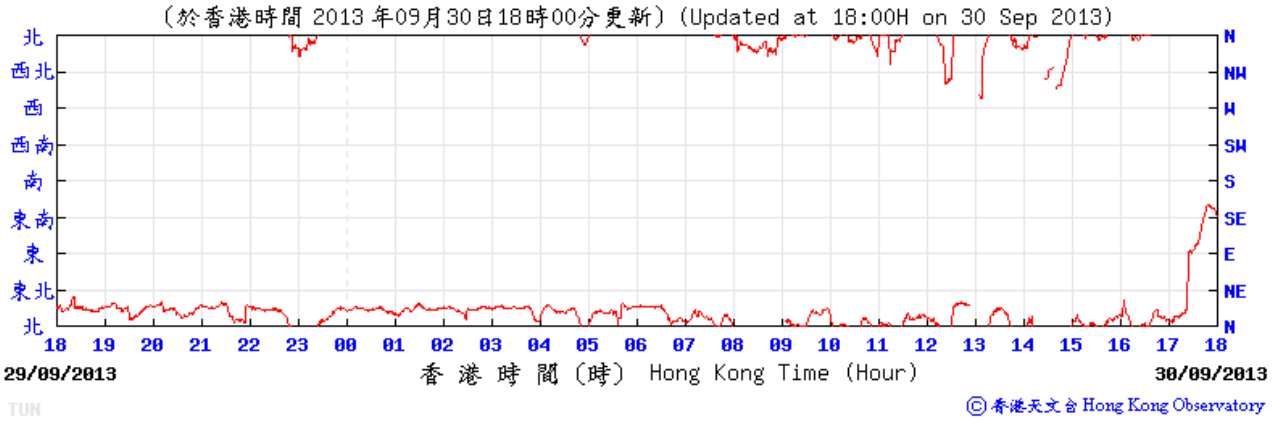

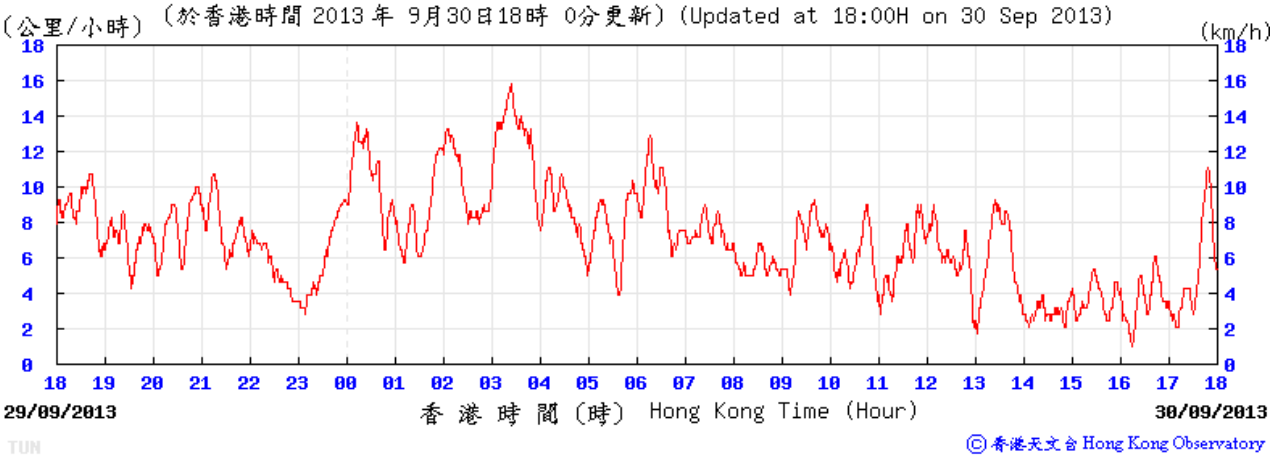

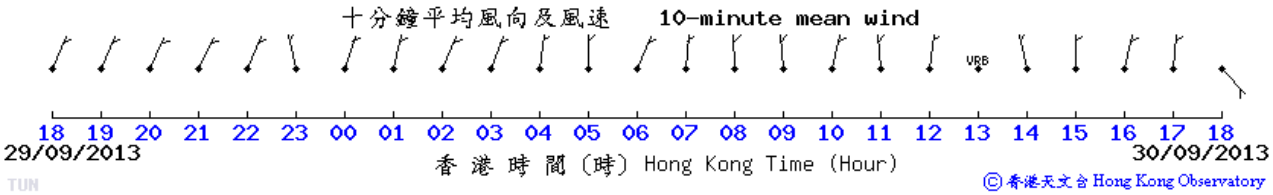

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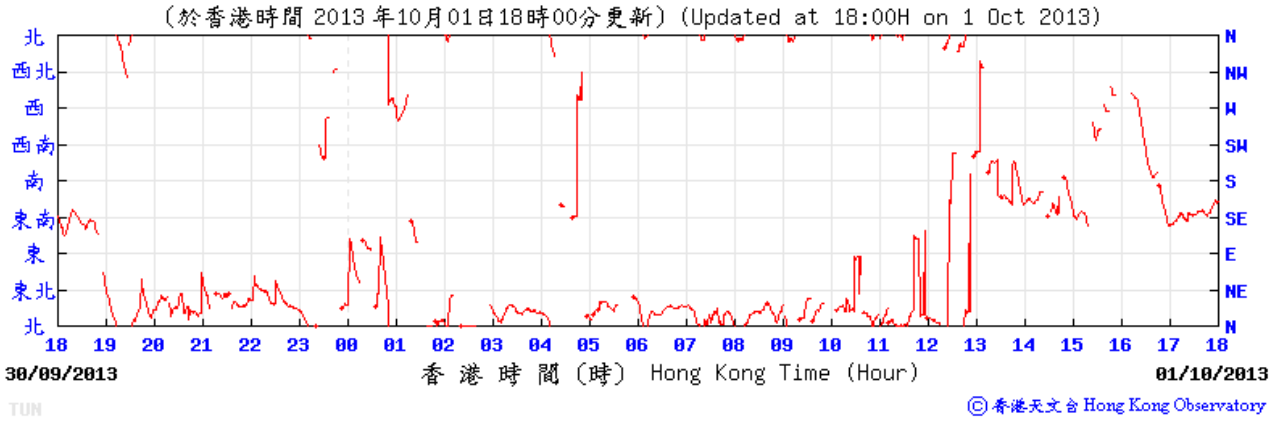

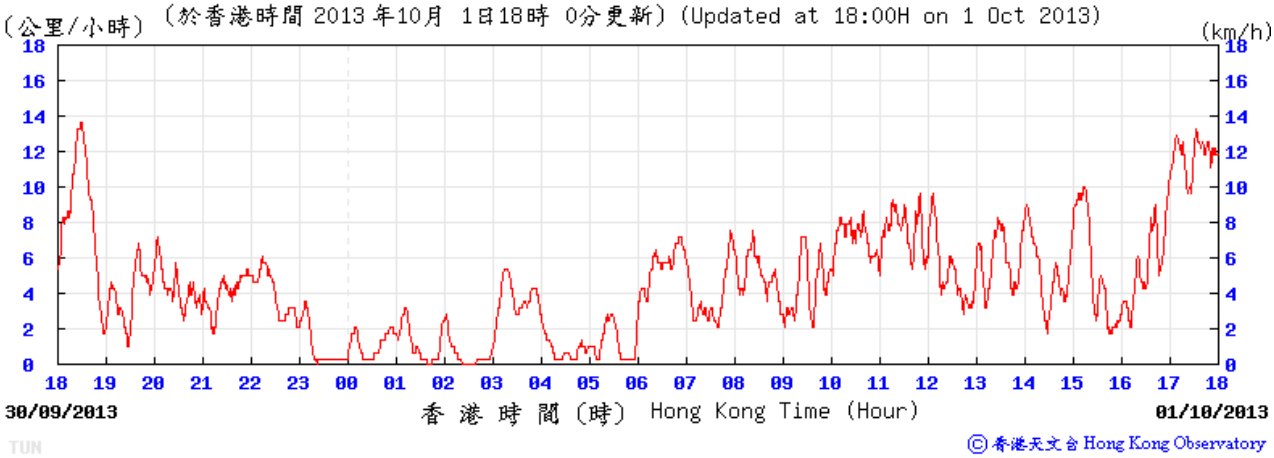

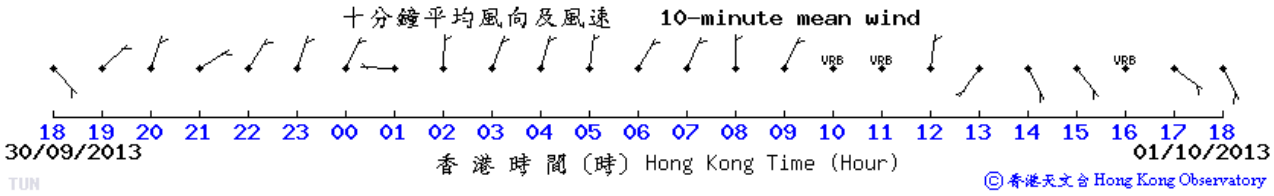

Appendix I. Waste Flow Table

Appendix I

Name of Department: CEDD

Contract No.: CV/2012/02

Monthly Summary Waste Flow Table for 2013

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^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000 kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m^3)
Jan-13	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.006
Feb-13	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Mar-13	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Apr-13	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.006
May-13	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Jun-13	0.084	0.000	0.000	0.000	0.084	0.000	0.000	0.000	0.000	0.000	0.012
Jul-13	0.624	0.000	0.000	0.000	0.624	0.000	0.000	0.000	0.000	0.000	0.000
Aug-13	3.912	0.000	0.000	0.000	3.912	0.000	0.000	0.000	0.000	0.000	0.000
Sep-13	1.380	0.000	0.000	0.000	1.380	0.000	0.000	0.000	0.000	0.000	0.000
Oct-13											
Nov-13											
Dec-13											
Total	6.000	0.000	0.000	0.000	6.000	0.000	0.000	0.000	0.000	0.000	0.024

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^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000 kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m^3)
8.000	0.000	1.000	0.000	7.000	0.000	1.000	2.000	0.000	0.200	0.500

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 6m3 capacity per dump truck

Appendix J. Environmental Mitigation Measures- Implementation Status

Table J1: 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	P
	• Side enclosure and covering of any aggregate or dusty material storage piles to reduce emissions. Where this is not practicable owing to frequent usage, watering shall be applied to aggregate fines;	✓
	• 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;	N/A
	• Every vehicle should be washed to remove any dusty materials from its body and wheels before leaving the construction sites	P
	• 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 J2: 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	✓

* EM&A / ^ EP ref:	Recommended measures	Implementation Status
	• Mobile plant should be sited as far away from NSRs as possible.	✓
	• 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 J3: 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.	P
	• Open stockpiles of construction materials or construction wastes on-site of more than 50m3 should be covered with tarpaulin or similar fabric during rainstorms	N/A
^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 J4: 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 J5: 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.	✓

* EM&A / ^ EP ref:	Recommended measures	Implementation Status
*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 J6: 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
×	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

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

Landscape and Visual Impact Monitoring - September 2013

October 2013

Civil Engineering and Development Department

Civil Engineering Office, Civil Engineering and Development Building, 101 Princess Margaret Road, Kowloon, Hong Kong

Mott MacDonald, 20/F AIA Kowloon Tower, Landmark East, 100 How Ming Street, Kwun Tong, Kowloon, Hong Kong
t +852 2828 5757 f +852 2827 1823, www.mottmac.com

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This document is issued for the party which commissioned it and for specific purposes connected with the above-captioned project only. It should not be relied upon by any other party or used for any other purpose.

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Pursuant to Condition 7.7 of EM&A Manual,

this Landscape and Visual Impact Monitoring – September 2013 has been reviewed and certified by the Registered Landscape Architect (RLA).

Certified by:

Aloysius Wong
Registered Landscape Architect (RLA)

Date 7 October 2013

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Annexes

Annex A. Event and Action Plan
Annex B. Monitoring Photos

1. Introduction

1.1 Background

Civil Engineering and Development Department (CEDD) has proposed to construct the Tuen Mun Area 54 Sewage Pumping Station (TM54SPS) and the associated sewerage works in Area 54, Tuen Mun under Contract No. CV/2012/02, the construction works commenced on 22 February 2013. This is the September 2013 monthly landscape and visual (L&V) monitoring report presenting the findings of the L&V site audit conducted during the period from 1 to 30 September 2013.

1.2 Monitoring Parameters

According to the EM&A Manual, the L&V monitoring includes auditing the design, implementation and maintenance of L&V mitigation measures to ensure that they are undertaken in accordance with the recommendations of the approved EIA Report (EIA-150/2008). The September 2013 monthly site audit was undertaken on 11 September 2013 at Project site. The L&V mitigation measures recommended in the approved EIA Report (EIA-150/2008) for the construction and operation phases are listed in **Tables 1.1** and **1.2**.

Table 1.1: Proposed Landscape and Visual Mitigation Measures in Construction Phase

ID No.	Landscape and Visual Mitigation Measures
CM1	No-intrusion Zone To maximize protection to existing trees, woodland, plantation areas and ground vegetation, construction contracts may designate “No-intrusion Zone” to various areas within the site boundary with rigid and durable fencing for each individual no-intrusion zone. The contractor should closely monitor and restrict the site working staff not to enter the “no-intrusion zone”, even for non-direct construction activities and storage of equipment.
CM2	Hoarding Hoarding or boundary fencing for construction shall be considered. It should be sensitively designed, subtle, camouflaged and more ‘permeable’ so that they fit into the existing environment when looking from outside.
CM3	Minimize disturbance of construction workers To ensure minimum disturbance to existing village, rustic dwellings and workshops users, construction workers may only enter these areas with their helmets and safety vests properly stored or carried in non-transparent bags. They shall also be properly and cleanly dress. 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.
CM4	Dust and Erosion Control for Exposed Soil Excavation works and demolition of existing squatters / workshops which will be highly visible form 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.
CM5	Construction Light 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.
CM6	Re-use of Existing Soil Existing topsoil shall be re-used where possible for new planting areas within the project. The construction program shall consider using the soil removed from one phase for backfilling another.

ID No.	Landscape and Visual Mitigation Measures
	Suitable storage ground, gathering ground and mixing ground may be set up on-site as necessary.
CM7	Establishment Period 12 month establishment period for the soft landscape works will be allowed in the main contract. Most construction contracts in Hong Kong require the Contractor to carry out routine horticultural operations, including watering, pruning, weeding, pest control, replacement of dead plants etc. to ensure healthy establishment of new planting during a 12 month establishment period. This period also serves as a kind of warranty / guarantee on the quality of the plants supplied and installed by the Contractor.

Table 1.2: Proposed Landscape and Visual Mitigation Measures in Operation Phase

ID No.	Landscape and Visual Mitigation Measures
OM1	Re-instatement of excavated Area All excavated area and disturbed area for utilities diversion, temporary road diversion, and pipeline works will be reinstated to former conditions, subject to applicable Government Standards.
OM2	Architectural Treatment for the proposed structures Compatible design, construction materials and surface finishes of the proposed Sewage Pumping Station should be harmony with proposed GIC development within Site 4A. (Open space and 6 nos. schools development) so as to achieve visual uniformity. Finishing materials shall have due consideration to form, basic color, color/tone variation, micro- and macro-texture, and reflectivity/light absorbance to avoid glare.
OM3	Greening for the proposed Sewage Pumping Station Permeable boundary wall with tree and shrub planting (with 1.2m topsoil depth planting strip) shall be used. The tree planting (21 nos. of trees) should be in heavy standard sized (the stem diameter is exceeding 75mm but not exceeding 150mm measure at a height of 1m from the root collar) to provide early screening effect. Trees with normal standard size (the stem diameter is exceeding 45mm but not exceeding 75mm measure at a height of 1m from the root collar) (14 nos. of trees) and shrub are proposed for buffer planting. The trees would be one or more of following species: *Bauhinia blakeana*, *Bischofia trifoliate*, *Cassia surattensis*, *Callistemon rigidus* and *Magnolia grandiflora*. The shrubs would be one or more of following species: *Codiaeum variegatum*, *Hibiscus rosasinensis*, *Jasminum sambac*, *Osmanthus fragrans* and *Rhododendron pulchrum*. One or more of the following climbers: *Bauhinia glauca*, *Bougainvillea spectabilis*, *Lonicera japonica*, *Parthenocissus himalayana*, *Pyrostegia venusta* and *Wisteria sinensis*, flowers racks or other vertical greening should be installed to soften the monolithic effects of boundary wall. Green roof with shrub and groundcovers is proposed.

2. Site Findings and Observations

2.1 Observations and Recommendations

During site audit, implementation of recommended mitigation measures where applicable was observed. **Table 2.1** summarizes the observations and recommendations for the site audit this month.

Table 2.1: Site Inspection Checklist for Landscape and Visual Mitigation Measures

ID No.	Landscape and Visual Mitigation Measures	Observation	Recommendation
CM1	"No-intrusion Zone(s)" with rigid and durable fencing has/have been designated with no working staff entry, no construction activity and no storage of equipment.	Not applicable	No
CM2	Sensitively designed, subtle, camouflaged and more permeable hoardings are used.	Yes	No
CM3	Construction workers are properly and cleanly dressed with their helmets and safety vests properly stored or carried in non-transparent bags.	Yes	No
CM4	Exposed soil is covered or 'camouflaged' and watered. Areas that are expected to be left with bare soil for a long period of time after excavation are properly covered with suitable protective fabric. Silt and erosion are controlled by ground barriers around the slope cutting area.	Not applicable	No
CM5	All security floodlights for construction sites are equipped with adjustable shield, frosted diffusers and reflective covers, and carefully controlled to minimize light pollution and night-time glare to nearby village.	Yes	No
CM6	Existing topsoil is re-used where possible for new planting areas within the project site. Soil removed is used for backfilling within the project site. Suitable storage ground, gathering ground and mixing ground have been set up on-site.	Not applicable	No
CM7	Routine horticultural operations is undertaken to ensure healthy establishment of new planting during the 12-month establishment period.	Not applicable	No
OM1	All excavated area and disturbed area for utilities diversion, temporary road diversion, and pipeline works are reinstated to former conditions.	Not applicable	No
OM2	Compatible design, construction materials and surface finishes of the proposed Sewage Pumping Station are in harmony with proposed GIC development within Site 4A. (Open space and 6 nos. schools development).	Not applicable	No
OM3	Permeable boundary wall with tree and shrub planting (with 1.2m topsoil depth planting strip) is used. The tree planting (21 nos. of trees) is in heavy standard sized (the stem diameter is exceeding 75mm but not exceeding 150mm measure at a height of 1m from the root collar) to provide early screening effect. Trees with normal standard size (the stem diameter is exceeding 45mm but not exceeding 75mm measure at a height of 1m from the root collar) (14 nos. of trees) and shrub are provided as buffer planting. Flower racks or other vertical greening are installed to soften the monolithic effects of boundary wall. Green roof with shrub and groundcovers is provided.	Not applicable	No

In case of non-conformity, specific recommendations will be made and actions will be proposed in accordance with the Event and Action Plan as shown in **Annex A**.

Photographs taken during the site audit are shown in **Annex B**.

3. Conclusion

3.1 Conclusion

The September 2013 monthly landscape and visual site audit was undertaken on 11 September 2013 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.

All recommended L&V mitigation measures have been implemented where applicable. No specific recommendations are made.

Annex A. Event and Action Plan

Event	Action			
	ET Leader	IEC	ER	Contractor
Non-conformity on one occasion	1. Identify source 2. Inform the IEC and ER. 3. Discuss remedial actions with the IEC, the ER and Contractor. 4. Monitor remedial action until rectification has been completed.	1. Check report. 2. Check the Contractor's working method. 3. Discuss with the ER and the Contractor on possible remedial measures. 4. Advise the ER on effectiveness of proposed remedial measures.	1. Notify the Contractor. 2. Ensure remedial measures are properly implemented.	1. Amend working methods. 2. Rectify damage and undertake remedial measures or any necessary replacement.
Repeated non-conformity	1. Identify source. 2. Notify IEC and the ER. 3. Increase monitoring (site audit) frequency. 4. Discuss remedial actions with the IEC, the ER and the Contractor. 5. Monitor remedial actions until rectification has been completed. 6. If exceedance stops, cease additional monitoring (site audit).	1. Check report. 2. Check the Contractor's working method. 3. Discuss with the ER and the Contractor on possible remedial measures. 4. Advise the ER on effectiveness of proposed remedial measures. 5. Supervise implementation of remedial measures.	1. Notify the Contractor. 2. Ensure remedial measures are properly implemented.	1. Amend working methods. 2. Rectify damage and undertake remedial measures or any necessary replacement.

Annex B. Landscape Audit Photos

CM2

Hoarding was set up around Project site area with lightings for pedestrians.

CM3

All on site staff was wearing uniform and cleanly dressed.

CM5

Security lighting was placed facing away from sensitive receivers.