Environmental Team Services for Contract No. CV/2011/01 Site Formation and Infrastructural works near Tsing Lun Road and Tsz Tin Road in Area 54, Tuen Mun

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

January 2017

Civil Engineering and Development Department

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Pursuant to Condition 3.2 of Environmental Permit No. EP-331/2009, this Monthly EM&A Report for December 2016 has been reviewed and certified by the Environmental Team Leader (ETL) and verified by the Independent Environmental Checker (IEC).

Certified by:

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

Date 11 January 2017

Verified by:

Keith Chau
Independent Environmental Checker (IEC)
Atkins China Limited

Date 16 January 2017

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Executive Summary

In September 2011, Mott MacDonald Hong Kong Limited (MMHK) was commissioned by the Civil Engineering and Development Department (CEDD) under Agreement No. LW 05/2011 to undertake the Environmental Team (ET) services (including environmental monitoring and audit (EM&A)) for the Site formation and Infrastructural works near Tsing Lun Road and Tsz Tin Road in Area 54, Tuen Mun (The Project).

The Environmental Permit (EP) No. EP-331/2009 for the "Widening of Tsing Lun Road, Tuen Mun" was granted by the Environmental Protection Department (EPD) on 17 March 2009. This is the 61st Monthly EM&A Report submitted under Condition 3.2 of the EP which summarises the findings on EM&A during the period from 1 to 31 December 2016.

Exceedance of Action and Limit Levels

No exceedance of Action or Limit Levels for Air Quality and Noise monitoring were recorded in the reporting month.

Implementation of Mitigation Measures

Site inspections were carried out on 7, 15, 22 and 28 December 2016 to confirm the implementation measures undertaken by the Contractor in the reporting month. The outcomes are presented in **Section 4** and the status of implementation of mitigation measures in the site is shown in **Appendix J**.

Record of Complaints

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 three months include:

- Demolition of existing structures
- Construction of stormwater drain and sewage
- Construction of Noise barrier
- Finishing works for public toilet & Refuse Collection Point (RCP)
- Roadworks
- Finishing works for footbridge
- Laying of watermain

Potential environmental impacts due to the construction activities, including air quality, noise, water quality, waste and trees 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

In September 2011, Mott MacDonald Hong Kong Limited (MMHK) was commissioned by the Civil Engineering and Development Department (CEDD) under Agreement No. LW 05/2011 to undertake the Environmental Team (ET) services (including environmental monitoring and audit (EM&A)) for the Site formation and Infrastructural works near Tsing Lun Road and Tsz Tin Road in Area 54, Tuen Mun (The Project). The construction of the project commenced on 8 Dec 2011.

The Monthly EM&A Report is required under the approved EM&A Manual and is submitted to fulfil Condition 3.2 of the Environmental Permit (EP) No. EP-331/2009 for the "Widening of Tsing Lun Road, Tuen Mun", which was granted by the Environmental Protection Department (EPD) on 17 March 2009.

This is the 61st Monthly EM&A Report presenting the monitoring works conducted from 1 to 31 December 2016. The purpose of this report is to summarise the findings in the EM&A of the project over the reporting period.

1.2 Project Organisation

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

1.3 Environmental Status in the Reporting Period

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

- Construction of watermain
- Demolition of existing structures
- Construction of stormwater drain and sewage
- Roadworks
- Finishing works for footbridge
- Finishing works for Public Toilet and RCP
- Construction of Noise barrier and enclosure

The Construction Works Programme of the Project is provided in **Appendix B**. A layout plan of the Project is provided in **Figure 1.1** and **Figure 1.2**.

1.4 Summary of EM&A Requirements

The EM&A programme requires environmental monitoring of air quality and noise 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	AM3	Once every 6 days
	1-hour TSP	AM3	3 times every 6 days
Noise	L_{eq}, 30 minutes	NM8, NM9	Weekly

The Environmental Quality Performance Limits (Action and Limit Levels) for air quality and noise are shown in **Appendix C**.

The Event and Action Plan for air quality and noise monitoring 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 equipment 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 Stations	Parameter	Frequency and Duration
Tung Wah Group of Hospitals (TWGHs) Yau Tze Tin Memorial College (AM3)	24-hour TSP	At least once in every six-days
	1-hour TSP	3 times every six-days

2.2.2 Monitoring Locations

Four monitoring stations (AM1, AM2, AM3 and AM4) were proposed in the EM&A Manual. Only AM3, i.e. TWGHs Yau Tze Tin Memorial College, was considered relevant to this project based on the scope and layout of the construction works. The location of the monitoring station is given in **Table 2-2** and is shown in **Figure 2.1**.

Table 2-2: Air Quality Monitoring Station

Monitoring Station	Location
AM3	TWGHs Yau Tze Tin Memorial College, at roof of the Assembly Hall (accessed from 4/F)

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 meters were 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-hour TSP monitoring	
High Volume Sampler	GMWS 2310 Accu-vol (Serial no. 0890)
Calibration Orifice	TE-5025A (Serial no. 2454)
1-hour TSP monitoring	
Portable direct reading dust meter	Sibata LD-3B (Serial no. 1Y5546)

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%.

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:

- Set POWER to "ON", push BATTERY button, make sure that the meter's indicator is in the range with a red line and allow the instrument to stand for about 3 minutes (Then, the air sampling inlet has been capped).
- Push the knob at MEASURE position.
- Push "O-ADJ" button. (Then meter's indication is 0).
- Push the knob at SENSI ADJ position and set the meter's indication to S value described on the Test Report using the trimmer for SENSI ADJ.
- Pull out the knob and return it to MEASURE position.
- Push "START" button.

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**. For monitoring at hours other than daytime on normal weekdays, i.e. 0700-1900 on holidays, 1900-2300 and 2300-0700 of all days, the noise level will be measured in a 5-minute interval. One set of measurement for restricted hour shall include at least 3 consecutive L_{eq} (5 mins) results.

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 (the time period to be monitoring will be randomly selected if there are works at hours other than daytime on normal weekdays; otherwise only the daytime on normal weekdays will be monitored) For restricted hours (outside daytime on normal weekdays), one set of measurement shall include at least 3 consecutive L_{eq} (5 min) results.
Evening time on all days (1900-2300 hrs) and Holidays (including Sundays) during daytime and evening (0700-2300 hrs)	L_{eq}, L_{90} & L_{10} (5 min)	
All days during the night-time (2300-0700 hrs of the next day)		

2.3.2 Monitoring Equipment

Integrating Sound Level Meter was used for noise monitoring. It was a Type 1 sound level meter capable of giving a continuous readout of the noise level readings including equivalent continuous sound pressure level (LA_{eq}) and percentile sound pressure level (L_x). They comply with International Electrotechnical Commission Publications 651:1979 (Type 1) and 804:1985 (Type 1). **Table 2-5** summarizes the noise monitoring equipment model being used.

Table 2-5: Noise Monitoring Equipments

Monitoring Station	Equipment Model	
	Integrating Sound Level Meter	Calibrator
NM8	Rion NL-18 (Serial no. 00360070)	Rion NC-73 (Serial no. 10997142)
NM9		

2.3.3 Monitoring Locations

Ten monitoring stations (NM1 to NM10) were proposed in the EM&A Manual. Only NM8 and NM9, namely Siu Hong Court and Yau Tze Tin Memorial College respectively, were considered relevant to this project based on the scope and layout of the construction works. The exact locations of the stations were slightly adjusted during the baseline monitoring phase and 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
NM8	3/F of Car Park at Siu Hong Court	Facade
NM9	TWGHs Yau Tze Tin Memorial College, at roof of the Assembly Hall (accessed from 4/F)	Facade

2.3.4 Monitoring Methodology

Field Monitoring

- The Sound Level Meter was set on a tripod at a height of at least 1.2 m above the ground.
- Façade 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); and 5 minutes intervals (0700-1900 on holidays, 1900-2300 and 2300-0700 of all days) and at least 3 consecutive measurements for one set of monitoring.
- 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 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.

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**.

3 Monitoring Results

3.1 Impact Monitoring

Impact monitoring for air quality and noise 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-hour 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-hour TSP (μg/m³)			Range (μg/m³)	Action Level (μg/m³)	Limit Level (μg/m³)
		1st Result	2nd Result	3rd Result			
AM3							
01-Dec-16	13:05	49	51	56	49-109	329	500
07-Dec-16	13:05	102	109	91			
13-Dec-16	13:02	78	85	95			
19-Dec-16	13:05	59	64	70			
23-Dec-16	08:00	75	86	80			
29-Dec-16	13:05	74	81	69			

3.2.2 24-hour 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/m³)	Range (μg/m³)	Action Level (μg/m³)	Limit Level (μg/m³)
AM3					
01-Dec-16	13:31	52	52-74	179	260
07-Dec-16	13:31	70			
13-Dec-16	13:31	74			
19-Dec-16	13:31	67			
23-Dec-16	08:05	68			
29-Dec-16	13:31	63			

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	Mean & Range of Noise Levels, dB(A)			Limit Level for L_{eq} (dB(A))
		L_{eq}	L_{10}	L_{90}	
NM8					
01-Dec-16	13:42	67	67	65	75
07-Dec-16	13:43	64	66	62	
13-Dec-16	13:42	65	67	63	
19-Dec-16	13:40	64	66	62	
29-Dec-16	13:40	64	66	61	
NM9					
01-Dec-16	13:00	61	63	59	70*
07-Dec-16	13:00	61	63	59	
13-Dec-16	13:00	61	63	59	
19-Dec-16	13:00	61	63	59	
29-Dec-16	13:00	60	62	57	

Remark: * Reduced to 70 dB (A) for schools and 65 dB (A) during school examination periods

No Action or Limit level exceedance of construction noise was recorded in the reporting period as no noise related environmental complaint was received during the reporting period and noise levels recorded during the monitoring period were below the limit levels.

4 Environmental Site Inspection

4.1 Site Inspection

Construction phase weekly site inspections were carried on 7, 15, 22 and 28 December 2016. All observations have been recorded in the site inspection checklist and passed to the Contractor together with the appropriate recommended mitigation measures where necessary. The key observations from site inspections and associated recommendations are summarized in **Table 4-1**.

Table 4-1: Summary of Site Inspections and Recommendations

Inspection Date	Key Observations	ET Recommendation	Contactor's Responses / Action(s) Undertaken	Close-out Date
07 December 2016	Drip tray for the generator near Siu Hong Court was not found.	The contractor was reminded to place a drip tray for the generator.	The contractor had provided a drip tray for the generator.	22 December 2016
15 December 2016	Chemical container without drip tray was observed near footbridge.	The contractor was reminded to provide a suitable drip tray for the chemical container.	Chemical containers were moved to a bunded area.	22 December 2016
28 December 2016	Chemical containers without drip tray was observed under footbridge.	The contractor was reminded to provide a suitable drip tray for the chemical containers or to move the containers to a bunded area.	A suitable drip tray was provided for the chemical container under footbridge.	04 January 2017
28 December 2016	C&D materials were found at a Tsing Lung Road site near Yau Tse Tin College.	The contractor was reminded to remove the waste frequently.	The contractor has removed the waste at a Tsing Lun Road site near Yau Tse Tin College.	04 January 2017

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 was 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-331/2009	Valid
APCO	Notification of Construction Work under APCO	335179	Valid
WPCO	Discharge License	WT00011754-2012 (Valid to: 31 Jan 2017)	Valid

Statutory Reference	Description	Permit /Reference No.	Status
WDO	Registration as Chemical Waste Producer	0000-423-C1232-08	Valid
WDO	Bill Account for disposal	7013751	Valid

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

The Air Pollution Control (Non-road Mobile Machinery) (Emission) Regulation requires all non-road mobile machinery to bear an approval label or exemption label with a reference number issued by EPD as specified in the Regulation. Compliance to this regulation was examined during site inspection and any deficiencies would be recorded in the site inspection checklist.

4.4 Recommended Mitigation Measures

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

Air Quality

- Excavated dusty materials should be covered by impervious sheeting or sprayed with water to keep the entire surface wet.

Water Quality

- Sediment tanks of sufficient capacity are recommended as a general mitigation measure which can be used for settling storm water prior to disposal.
- Water to be pumped out from trenches or foundation excavations shall be discharged into storm drains via silt removal facilities.
- Construction waste, debris and rubbish shall be properly collected, handled and disposed of to avoid water quality impacts.

Waste Management

- Chemical waste produced should be handled in accordance with the relevant guidelines and regulations.

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

5.1 Record on Non-compliance of Action and Limit Levels

There was no breach of Action or Limit levels for Air Quality (1-hour and 24-hour Total Suspended Particulates) and Noise in the reporting period.

5.2 Record on Environmental Complaints Received

No environmental complaint was received during the reporting 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 three months include:

- Demolition of existing structures
- Construction of stormwater drain and sewage
- Construction of Noise barrier
- Finishing works for public toilet & Refuse Collection Point (RCP)
- Roadworks
- Finishing works for footbridge
- Laying of watermain

6.2 Key Issues for the Coming Month

Key issues to be considered in the coming month include:

- Generation of dust from construction and demolition 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

Impact monitoring for air quality and noise in accordance with the approved EM&A Manual has commenced since 8 December 2011. The tentative monitoring schedule for the coming month is shown in the **Appendix E**.

7 Conclusions and Recommendations

7.1 Conclusions

The EM&A programme as recommended in the EM&A Manual has been undertaken in the reporting month since the construction commenced on 8 December 2011.

Monitoring of air quality and noise due to the Project was underway. In particular, the 1-hour TSP, 24-hour TSP and noise level (as L_{eq}) under monitoring have been checked against established Action and Limit levels. No exceedance of Action or Limit Levels for Air Quality and Noise was recorded in the reporting month.

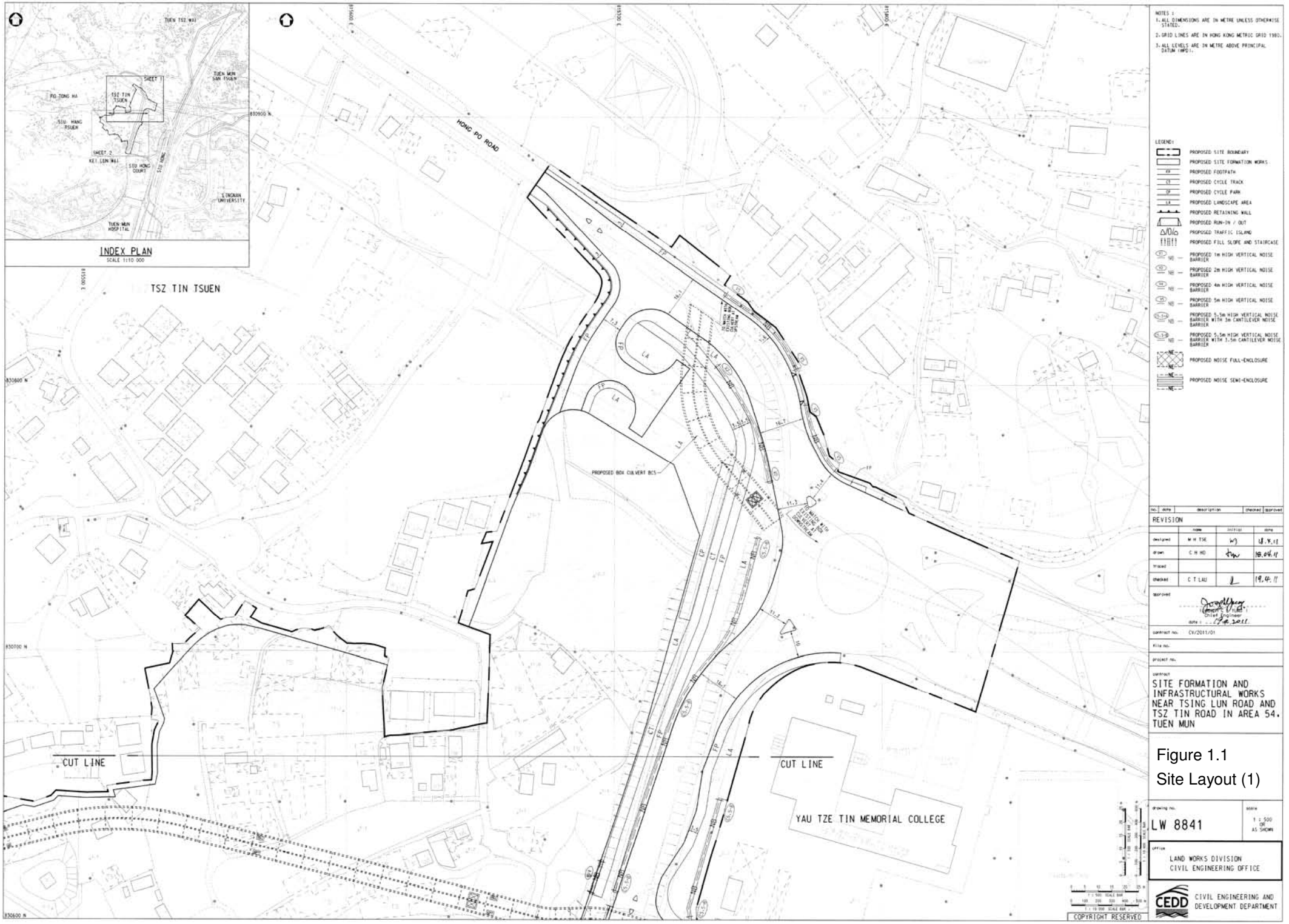
7.2 Recommendations

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.

Although no school examinations are scheduled in December 2016 at the TWGHs Yau Tze Tin Memorial College, school activities may be conducted. However, the construction of new roads, noise barriers, stormwater drain and sewerage and associated works near Siu Hong Court, Unicorn Garden and TWGHs Yau Tze Tin Memorial College are ongoing. The Contractor has been reminded to strictly implement the recommended noise mitigation measures in EM&A Manual:

Noise

- Only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction works.
- 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 be orientated to direct noise away from nearby noise sensitive receivers (NSRs) if possible.
- Silencers or mufflers on construction equipment should be utilized and should be properly maintained during the construction works.
- Mobile plant should be sited as far away from NSRs as possible.
- Material stockpiles and other structures should be effectively utilized, where practicable, to screen noise from on-site construction activities.


INDEX PLAN
SCALE 1:10 000
TSZ TIN TSUEN
HONG PO ROAD
PROPOSED BOX CULVERT BCS
CUT LINE
CUT LINE
YAU TZE TIN MEMORIAL COLLEGE
NOTES :
1. ALL DIMENSIONS ARE IN METRE UNLESS OTHERWISE STATED.
2. GRID LINES ARE IN HONG KONG METRIC GRID 1980.
3. ALL LEVELS ARE IN METRE ABOVE PRINCIPAL DATUM (mPD).
LEGEND :
PROPOSED SITE BOUNDARY
PROPOSED SITE FORMATION WORKS
PROPOSED FOOTPATH
PROPOSED CYCLE TRACK
PROPOSED CYCLE PARK
PROPOSED LANDSCAPE AREA
PROPOSED RETAINING WALL
PROPOSED RUN-IN / OUT
PROPOSED TRAFFIC ISLAND
PROPOSED FILL SLOPE AND STAIRCASE
PROPOSED 1m HIGH VERTICAL NOISE BARRIER
PROPOSED 2m HIGH VERTICAL NOISE BARRIER
PROPOSED 4m HIGH VERTICAL NOISE BARRIER
PROPOSED 5m HIGH VERTICAL NOISE BARRIER
PROPOSED 5.5m HIGH VERTICAL NOISE BARRIER WITH 3m CANTILEVER NOISE BARRIER
PROPOSED 5.5m HIGH VERTICAL NOISE BARRIER WITH 3.5m CANTILEVER NOISE BARRIER
PROPOSED NOISE FULL-ENCLOSURE
PROPOSED NOISE SEMI-ENCLOSURE
REVISION
designed M H TSE 18.4.11
drawn C H HO 18.04.11
traced
checked C T LAU 19.4.11
approved
Chief Engineer
date : 19.4.2011
contract no. CV/2011/01
file no.
project no.
contract
SITE FORMATION AND INFRASTRUCTURAL WORKS NEAR TSING LUN ROAD AND TSZ TIN ROAD IN AREA 54, TUEN MUN
Figure 1.1
Site Layout (1)
drawing no.
LW 8841
scale
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LAND WORKS DIVISION
CIVIL ENGINEERING OFFICE
CEDD
CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT
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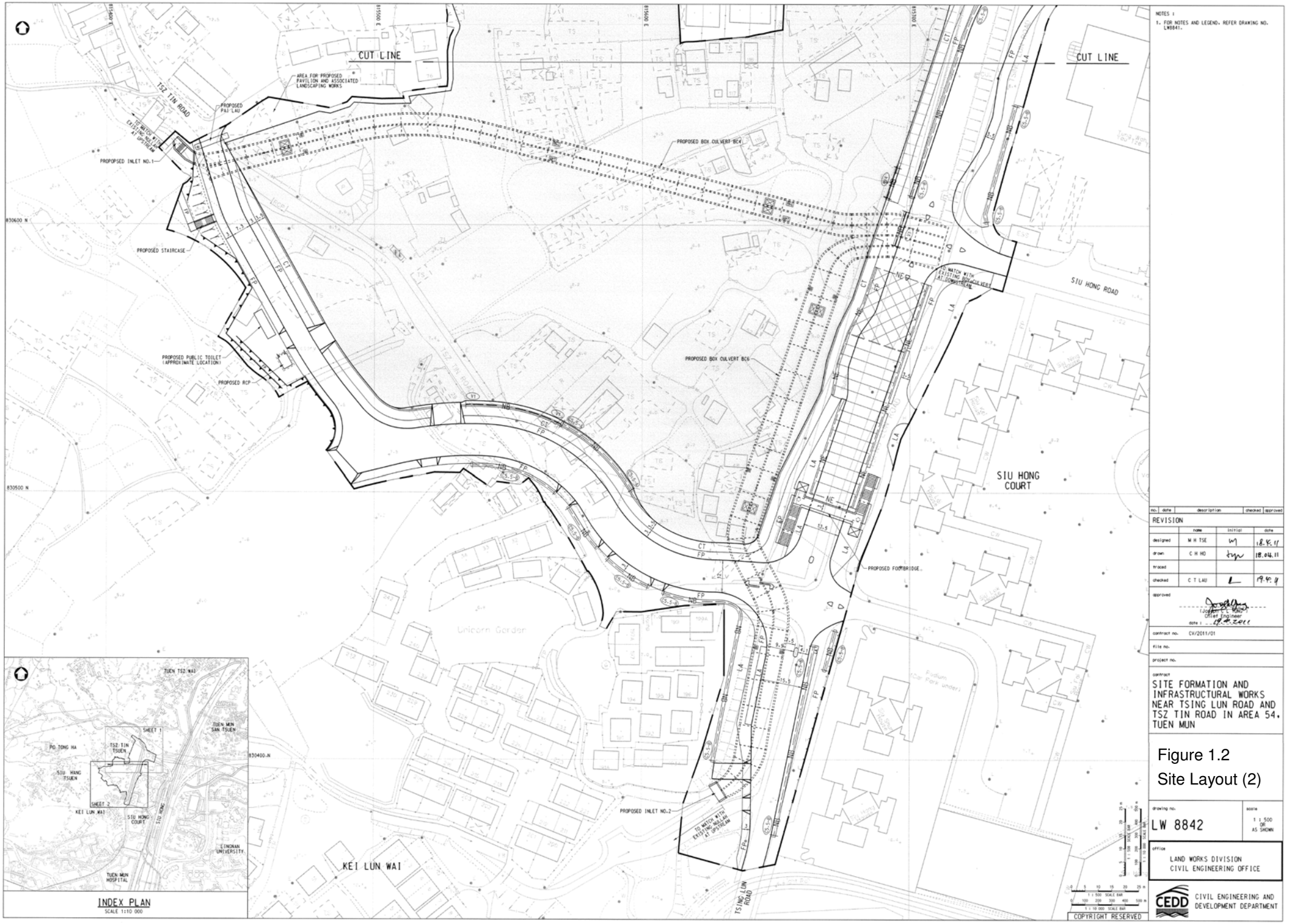

INDEX PLAN
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NOTES :
1. FOR NOTES AND LEGEND, REFER DRAWING NO. LW8841.

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REVISION				

	name	initial	date
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drawn	C H HO		18.04.11
traced			
checked	C T LAU		19.4.11
approved	(Joseph C. WONG) Chief Engineer		date : 19.4.2011

contract no. CV/2011/01
file no.
project no.

contract
SITE FORMATION AND INFRASTRUCTURAL WORKS NEAR TSING LUN ROAD AND TSZ TIN ROAD IN AREA 54, TUEN MUN

Figure 1.2
Site Layout (2)

drawing no. LW 8842
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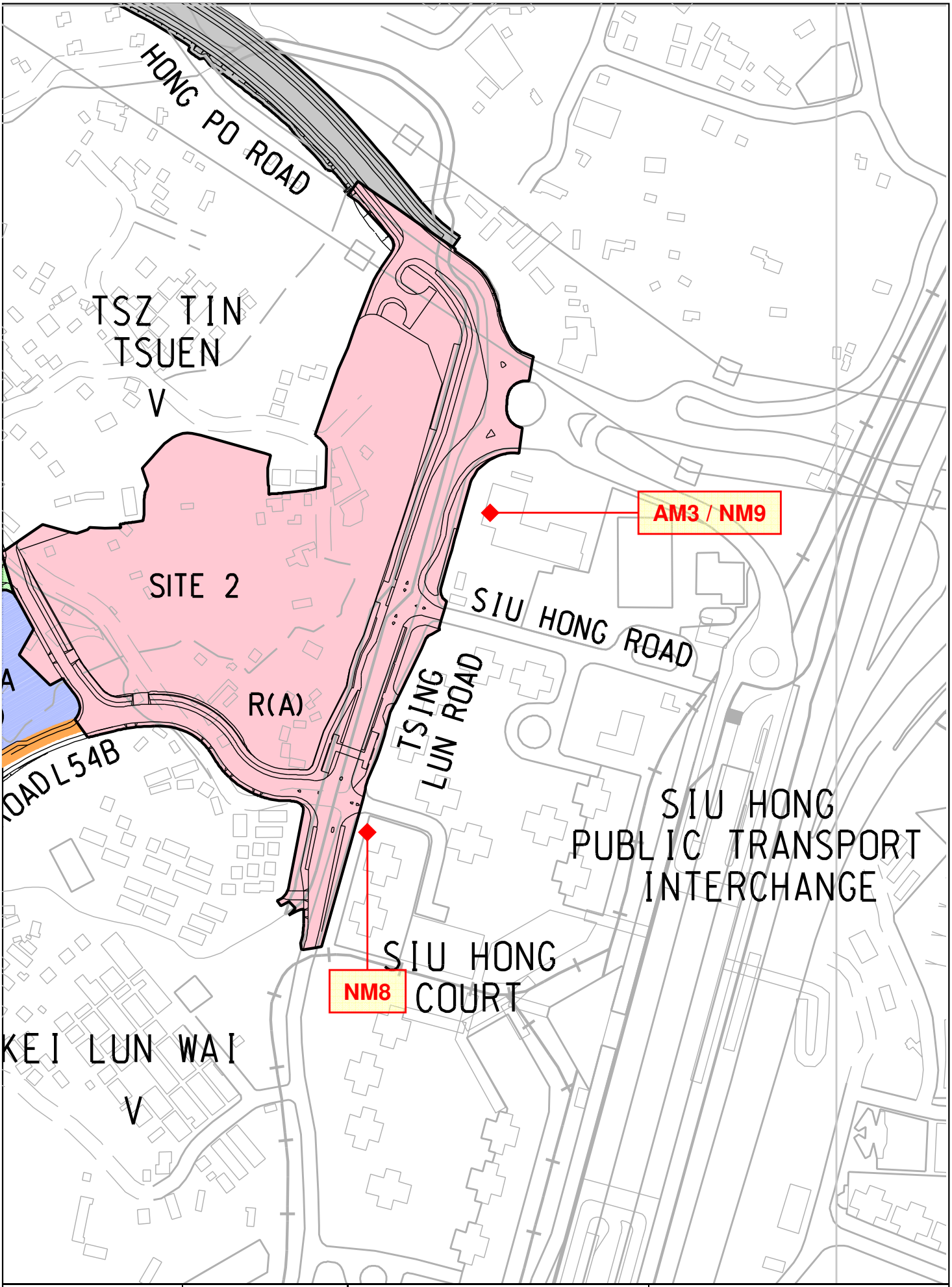
office
LAND WORKS DIVISION
CIVIL ENGINEERING OFFICE

CEDD
CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT



Civil Engineering and Development Department	MOTT MACDONALD	Agreement No. LW 05/2011 Environmental Team Services for Contract No. CV/2011/01 Site formation and Infrastructural works near Tsing Lun Road and Tsz Tin Road in Area 54, Tuen Mun	Title: Locations of Air Quality & Noise Monitoring Stations Figure 2.1

Appendix A. Project Organisation

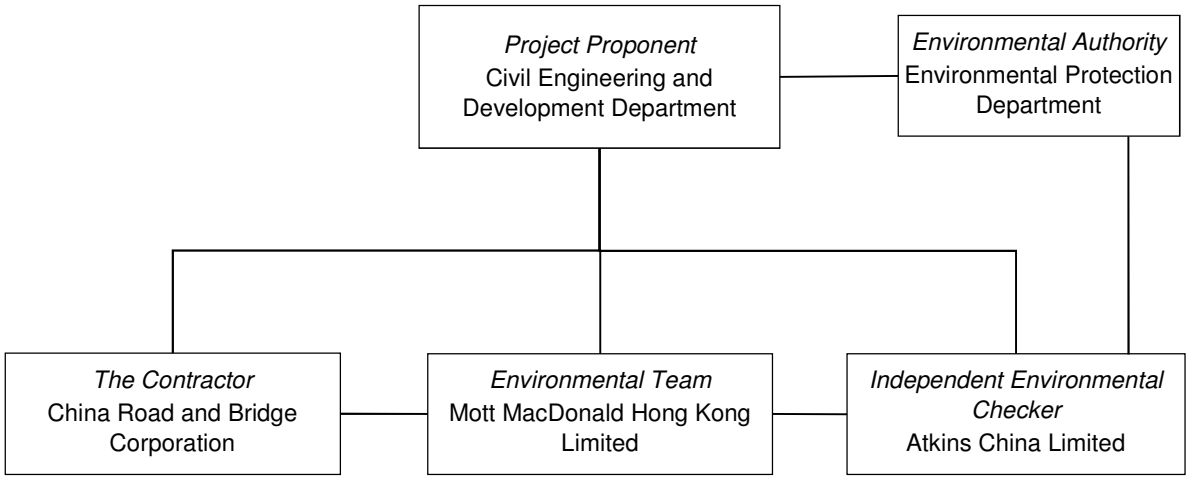


Table A.1: Contact information

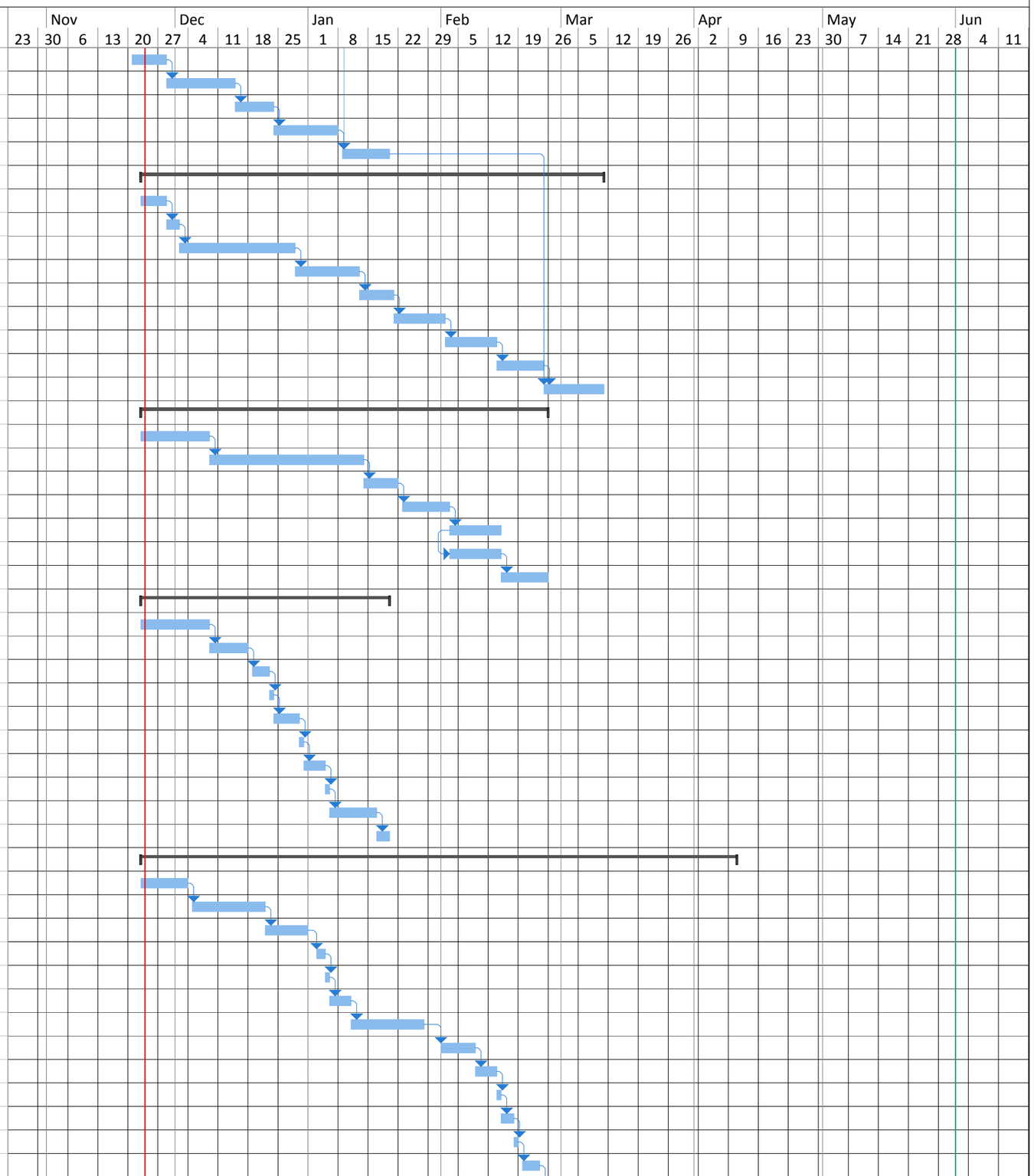
Company / Department	Position	Name	Telephone / Mobile
Civil Engineering and Development Department	Engineer's Representative	Mr FU Shing-chi, Sam	2762 5676
Atkins China Ltd.	Independent Environmental Checker	Mr Keith Chau	2972 1000
Mott MacDonald Hong Kong Ltd.	Environmental Team Leader	Mr Brandon Wong	2828 5875
China Road and Bridge Corporation	Project Manager	Mr William Kwok Chung-yin	2757 8111
China Road and Bridge Corporation	Site Agent	Mr Kau Kwok-hung, Ken	5335 9758
China Road and Bridge Corporation	Environmental Officer	Mr Ray Ma	5335 9755

Appendix B. Tentative Construction Programme

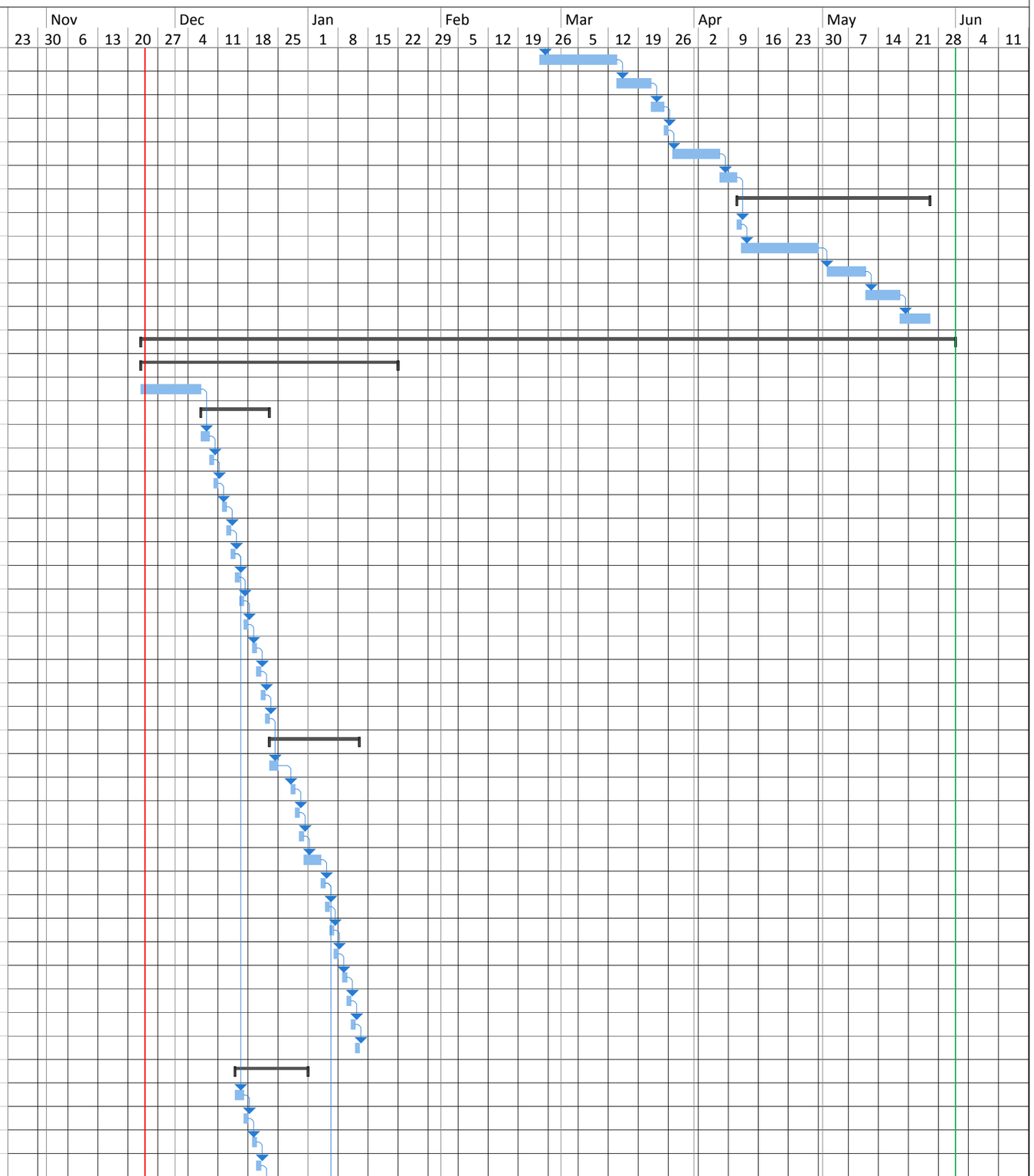
CV/2011/01
Programme for Remaining Works rev.e

ID	Task Calendar	Task Name	Duration	Start	Finish
1	CV2011	**Tsz Tin Road**	**82 days**	**23/11/2016**	**4/3/2017**
2	CV2011	Construction of remaining works of Public Toilet	15 days	23/11/2016	9/12/2016
3	CV2011	Additional works for Refuse Collection Point	15 days	23/11/2016	9/12/2016
4	CV2011	Remaining works in front of House 30 to House 199	52 days	23/11/2016	25/1/2017
5	CV2011	Remaining works in front of House 29 to House 30	30 days	26/1/2017	4/3/2017
6					
7	CV2011	**Hong Po Road**	**55 days**	**21/11/2016**	**26/1/2017**
8	CV2011	Installation of railing in cycle park (the 1st 1/2)	10 days	21/11/2016	1/12/2016
9	CV2011	Concreting for cycle park (the 1st 1/2)	5 days	2/12/2016	7/12/2016
10	CV2011	Kerb and subbase of cycle park (the other 1/2)	5 days	8/12/2016	13/12/2016
11	CV2011	Installation of railing in cycle park (the other 1/2)	4 days	14/12/2016	17/12/2016
12	CV2011	Concreting for cycle park (the other 1/2)	5 days	19/12/2016	23/12/2016
13	CV2011	Installation of tree pit (14 nos.)	5 days	21/11/2016	25/11/2016
14	CV2011	Kerb and subbase of FP (behind of NB Bay 7 to 11)	7 days	26/11/2016	3/12/2016
15	CV2011	Installation of traffic sign and railing	4 days	5/12/2016	8/12/2016
16	CV2011	Installation of public lighting (behind of NB Bay 7 to 11)	4 days	9/12/2016	13/12/2016
17	CV2011	Paving block of FP (behind of NB Bay 7 to 11)	12 days	14/12/2016	29/12/2016
18	CV2011	Formation of FP (RW1 Bay 1 to Bay 5)	7 days	5/12/2016	12/12/2016
19	CV2011	Subbase of FP (RW1 Bay 1 to Bay 5)	4 days	13/12/2016	16/12/2016
20	CV2011	Installation of railing and traffic sign	4 days	17/12/2016	21/12/2016
21	CV2011	Installation of public lighting (along RW1)	4 days	22/12/2016	28/12/2016
22	CV2011	Paving block of FP (RW1 Bay 1 to Bay 5)	7 days	30/12/2016	7/1/2017
23	CV2011	TTA for construction of traffic island at the end of HPR	1 day	9/1/2017	9/1/2017
24	CV2011	Construction of traffic island	7 days	10/1/2017	17/1/2017
25	CV2011	TTA for construction of traffic island near roundabout	1 day	18/1/2017	18/1/2017
26	CV2011	Construction of traffic island	7 days	19/1/2017	26/1/2017
27					
28	CV2011	**Tsing Lun Road**	**153 days**	**21/11/2016**	**31/5/2017**
29	**CV2011**	**Installation of Noise Enclosure**	**48 days**	**21/11/2016**	**18/1/2017**
30	CV2011	Installation of cladding at Housing Site side	5 days	21/11/2016	25/11/2016
31	CV2011	Installation of gutter at Housing Site side	5 days	26/11/2016	1/12/2016
32	CV2011	Installation of drainage	5 days	2/12/2016	7/12/2016
33	CV2011	Installation of cladding at both end of NE at Housing side	3 days	8/12/2016	10/12/2016
34	CV2011	Touch-up painting at Housing Site side	3 days	12/12/2016	14/12/2016
35	CV2011	Reinstate the footpath at bus bay	3 days	15/12/2016	17/12/2016
36	CV2011	TTA diversion	1 day	19/12/2016	19/12/2016
37	CV2011	Installation of remaining cladding at Siu Hong Side	6 days	20/12/2016	28/12/2016
38	CV2011	Installation of drainage at Siu Hong Side	5 days	29/12/2016	4/1/2017
39	CV2011	Reintate the Kerb K1 along NE Bay 1 to Bay 7	12 days	5/1/2017	18/1/2017
40	**CV2011**	**Installation of Footbridge**	**33 days**	**21/11/2016**	**30/12/2016**
41	CV2011	Installation of remaining gutter	6 days	21/11/2016	26/11/2016
42	CV2011	Installation of remaining cladding for roof	6 days	28/11/2016	3/12/2016
43	CV2011	Installation of E&M by others	5 days	5/12/2016	9/12/2016
44	CV2011	Installation of cladding for post	5 days	10/12/2016	15/12/2016
45	CV2011	Touch-up painting	3 days	16/12/2016	19/12/2016
46	CV2011	Demolition of bamboo scafford	3 days	20/12/2016	22/12/2016
47	CV2011	Painting for the decking	5 days	23/12/2016	30/12/2016
48	CV2011	**Location at NB Bay 25 to Bay 28**	**49 days**	**21/11/2016**	**19/1/2017**

ID	Task Calendar	Task Name	Duration	Start	Finish
49	CV2011	Formation of FP	7 days	21/11/2016	28/11/2016
50	CV2011	Kerb and subbase for footpath	14 days	29/11/2016	14/12/2016
51	CV2011	Installation of railing and traffic sign	8 days	15/12/2016	23/12/2016
52	CV2011	Installation of public lighting	10 days	24/12/2016	7/1/2017
53	CV2011	Paving block of footpath	10 days	9/1/2017	19/1/2017
54	CV2011	**Location at NE Bay 1 to Bay 7**	**87 days**	**23/11/2016**	**10/3/2017**
55	CV2011	Break up existing Tsing Lun Road	5 days	23/11/2016	28/11/2016
56	CV2011	Excavation and disposal of AHM	3 days	29/11/2016	1/12/2016
57	CV2011	Laying of UU (CLP & PCCW)	21 days	2/12/2016	28/12/2016
58	CV2011	Construction of U-channel	12 days	29/12/2016	12/1/2017
59	CV2011	Formation for FP	7 days	13/1/2017	20/1/2017
60	CV2011	Construction of kerb and subbase	7 days	21/1/2017	1/2/2017
61	CV2011	Installation of railing and traffic sign	10 days	2/2/2017	13/2/2017
62	CV2011	Installation of public lighting	10 days	14/2/2017	24/2/2017
63	CV2011	Paving block of footpath	12 days	25/2/2017	10/3/2017
64	CV2011	**Location at NB Bay 40a to Bay 44**	**76 days**	**23/11/2016**	**25/2/2017**
65	CV2011	Break up and re-construction of gully	14 days	23/11/2016	8/12/2016
66	CV2011	Laying of UU	28 days	9/12/2016	13/1/2017
67	CV2011	Formation of footpath	7 days	14/1/2017	21/1/2017
68	CV2011	Kerb and subbase of footpath	7 days	23/1/2017	2/2/2017
69	CV2011	Installation of railing and traffic sign	10 days	3/2/2017	14/2/2017
70	CV2011	Installation of public lighting	10 days	3/2/2017	14/2/2017
71	CV2011	Paving block of footpath	10 days	15/2/2017	25/2/2017
72	CV2011	**Junction at Siu Hong Car Park**	**47 days**	**23/11/2016**	**19/1/2017**
73	CV2011	Laying ATC, lighting duct and UU for the part near NB 45	14 days	23/11/2016	8/12/2016
74	CV2011	Formation and subbase for the part near NB 45	8 days	9/12/2016	17/12/2016
75	CV2011	Bitumen to wearing course for the part near NB 45	4 days	19/12/2016	22/12/2016
76	CV2011	TTA for the middle part	1 day	23/12/2016	23/12/2016
77	CV2011	Bitumen to wearing course for the middle part	3 days	24/12/2016	29/12/2016
78	CV2011	TTA for the part near FB	1 day	30/12/2016	30/12/2016
79	CV2011	Bitumen to wearing course for the part near FB	3 days	31/12/2016	4/1/2017
80	CV2011	TTA for the middle part	1 day	5/1/2017	5/1/2017
81	CV2011	Construction of traffic island	9 days	6/1/2017	16/1/2017
82	CV2011	Construction of the traffic lighting	3 days	17/1/2017	19/1/2017
83	CV2011	**Junction at Siu Hong Road**	**112 days**	**23/11/2016**	**10/4/2017**
84	CV2011	Drainage works for the middle part	10 days	23/11/2016	3/12/2016
85	CV2011	Laying ATC, lighting duct and UU for the middle part	15 days	5/12/2016	21/12/2016
86	CV2011	Formation and subbase for the middle part	7 days	22/12/2016	31/12/2016
87	CV2011	Bitumen to BC layer for the middle part	2 days	3/1/2017	4/1/2017
88	CV2011	TTA for the part near NE 7	1 day	5/1/2017	5/1/2017
89	CV2011	Drainage works for the part near NE 7	4 days	6/1/2017	10/1/2017
90	CV2011	Laying ATC, lighting duct and UU for the part near NE 7	15 days	11/1/2017	27/1/2017
91	CV2011	Formation and subbase for the part near NE 7	7 days	1/2/2017	8/2/2017
92	CV2011	Bitumen to wearing course for the part near NE 7	4 days	9/2/2017	13/2/2017
93	CV2011	TTA for the middle part	1 day	14/2/2017	14/2/2017
94	CV2011	Bitumen to wearing course for the middle part	3 days	15/2/2017	17/2/2017
95	CV2011	TTA for the part near NB 28	1 day	18/2/2017	18/2/2017
96	CV2011	Drainage works for the part near NB 28	4 days	20/2/2017	23/2/2017



ID	Task Calendar	Task Name	Duration	Start	Finish
97	CV2011	Laying ATC, lighting duct and UU for the part near NB 28	15 days	24/2/2017	13/3/2017
98	CV2011	Formation and subbase for the part near NB 28	7 days	14/3/2017	21/3/2017
99	CV2011	Bitumen to wearing course for the part near NB 28	3 days	22/3/2017	24/3/2017
100	CV2011	TTA for the middle part	1 day	25/3/2017	25/3/2017
101	CV2011	Construction of traffic island	9 days	27/3/2017	6/4/2017
102	CV2011	Construction of the traffic lighting	3 days	7/4/2017	10/4/2017
103	**CV2011**	**Traffic Island at Tsing Lun Road**	**35 days**	**11/4/2017**	**25/5/2017**
104	CV2011	TTA for the middle line of Tsing Lun Road	1 day	11/4/2017	11/4/2017
105	CV2011	Reconstruction of traffic island 1 near NB 28	14 days	12/4/2017	29/4/2017
106	CV2011	Reconstruction of traffic island 2 near NE 7	7 days	2/5/2017	10/5/2017
107	CV2011	Construction of traffic island 3 near FB	7 days	11/5/2017	18/5/2017
108	None	Construction of traffic island 4 near NB 45	7 days	19/5/2017	25/5/2017
109	CV2011	**Noise Barrier for Bay 48 to Bay 51**	**151 days**	**23/11/2016**	**31/5/2017**
110	CV2011	**Construction of NB, Bay 48 to Bay 51**	**49 days**	**23/11/2016**	**21/1/2017**
111	CV2011	Installation of sheet pile for Bay 48 and Bay 51	12 days	23/11/2016	6/12/2016
112	CV2011	**NB Bay 51**	**14 days**	**7/12/2016**	**22/12/2016**
113	CV2011	Excavation for Bay 51	2 days	7/12/2016	8/12/2016
114	CV2011	Cutting of pile head for Bay 51	1 day	9/12/2016	9/12/2016
115	CV2011	Blinding & setting out	1 day	10/12/2016	10/12/2016
116	CV2011	Formwork for Bay 51 footing	1 day	12/12/2016	12/12/2016
117	CV2011	Rebar fixing for Bay 51 footing	1 day	13/12/2016	13/12/2016
118	CV2011	Concreting for Bay 51 footing	1 day	14/12/2016	14/12/2016
119	CV2011	Striping of formwork for Bay 51 footing	1 day	15/12/2016	15/12/2016
120	CV2011	Formwork for Bay 51 Wall Stem one side	1 day	16/12/2016	16/12/2016
121	CV2011	Rebar fixing for Bay 51 wall stem	1 day	17/12/2016	17/12/2016
122	CV2011	Formwork for Bay 51 Wall Stem the other side	1 day	19/12/2016	19/12/2016
123	CV2011	Installation of holding down bolt for Bay 51	1 day	20/12/2016	20/12/2016
124	CV2011	Concreting for Bay 51 wall stem	1 day	21/12/2016	21/12/2016
125	CV2011	Striping of formwork for Bay 51 wall stem	1 day	22/12/2016	22/12/2016
126	**CV2011**	**NB Bay 50**	**15 days**	**23/12/2016**	**12/1/2017**
127	CV2011	Excavation for Bay 50	2 days	23/12/2016	24/12/2016
128	CV2011	Cutting of pile head for Bay 50	1 day	28/12/2016	28/12/2016
129	CV2011	Blinding & setting out	1 day	29/12/2016	29/12/2016
130	CV2011	Formwork for Bay 50 footing	1 day	30/12/2016	30/12/2016
131	CV2011	Rebar fixing for Bay 50 footing	2 days	31/12/2016	3/1/2017
132	CV2011	Concreting for Bay 50 footing	1 day	4/1/2017	4/1/2017
133	CV2011	Striping of formwork for Bay 50 footing	1 day	5/1/2017	5/1/2017
134	CV2011	Formwork for Bay 50 Wall Stem one side	1 day	6/1/2017	6/1/2017
135	CV2011	Rebar fixing for Bay 50 wall stem	1 day	7/1/2017	7/1/2017
136	CV2011	Formwork for Bay 50 Wall Stem the other side	1 day	9/1/2017	9/1/2017
137	CV2011	Installation of holding down bolt for Bay 50	1 day	10/1/2017	10/1/2017
138	CV2011	Concreting for Bay 50 wall stem	1 day	11/1/2017	11/1/2017
139	CV2011	Striping of formwork for Bay 50 wall stem	1 day	12/1/2017	12/1/2017
140	CV2011	**NB Bay 48**	**13 days**	**15/12/2016**	**31/12/2016**
141	CV2011	Excavation for Bay 48	2 days	15/12/2016	16/12/2016
142	CV2011	Blinding & setting out	1 day	17/12/2016	17/12/2016
143	CV2011	Formwork for Bay 48 footing	1 day	19/12/2016	19/12/2016
144	CV2011	Rebar fixing for Bay 48 footing	1 day	20/12/2016	20/12/2016



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ID	Task Calendar	Task Name	Duration	Start	Finish
145	CV2011	Concreting for Bay 48 footing	1 day	21/12/2016	21/12/2016
146	CV2011	Striping of formwork for Bay 48 footing	1 day	22/12/2016	22/12/2016
147	CV2011	Formwork for Bay 48 Wall Stem one side	1 day	23/12/2016	23/12/2016
148	CV2011	Rebar fixing for Bay 48 wall stem	1 day	24/12/2016	24/12/2016
149	CV2011	Formwork for Bay 48 Wall Stem the other side	1 day	28/12/2016	28/12/2016
150	CV2011	Installation of holding down bolt for Bay 48	1 day	29/12/2016	29/12/2016
151	CV2011	Concreting for Bay 48 wall stem	1 day	30/12/2016	30/12/2016
152	CV2011	Striping of formwork for Bay 48 wall stem	1 day	31/12/2016	31/12/2016
153	**CV2011**	**NB Bay 49**	**15 days**	**5/1/2017**	**21/1/2017**
154	CV2011	Excavation for Bay 49	2 days	5/1/2017	6/1/2017
155	CV2011	Cutting of pile head for Bay 49	1 day	7/1/2017	7/1/2017
156	CV2011	Blinding & setting out	1 day	9/1/2017	9/1/2017
157	CV2011	Formwork for Bay 49 footing	1 day	10/1/2017	10/1/2017
158	CV2011	Rebar fixing for Bay 49 footing	2 days	11/1/2017	12/1/2017
159	CV2011	Concreting for Bay 49 footing	1 day	13/1/2017	13/1/2017
160	CV2011	Striping of formwork for Bay 49 footing	1 day	14/1/2017	14/1/2017
161	CV2011	Formwork for Bay 49 Wall Stem one side	1 day	16/1/2017	16/1/2017
162	CV2011	Rebar fixing for Bay 49 wall stem	1 day	17/1/2017	17/1/2017
163	CV2011	Formwork for Bay 49 Wall Stem the other side	1 day	18/1/2017	18/1/2017
164	CV2011	Installation of holding down bolt for Bay 49	1 day	19/1/2017	19/1/2017
165	CV2011	Concreting for Bay 49 wall stem	1 day	20/1/2017	20/1/2017
166	CV2011	Striping of formwork for Bay 49 wall stem	1 day	21/1/2017	21/1/2017
167	CV2011	**Road works for TLR (NB Bay 48 to Bay 51 Part)**	**105 days**	**19/1/2017**	**31/5/2017**
168	CV2011	Backfilling in front of NB Bay 48 to 51	9 days	19/1/2017	1/2/2017
169	CV2011	Kerb and subbase in front of NB Bay 48 to 51	3 days	2/2/2017	4/2/2017
170	CV2011	Laying of MS700 watermain under footpath	21 days	6/2/2017	1/3/2017
171	CV2011	Removal of sheetpile for NB Bay 48 to Bay 51	5 days	2/3/2017	7/3/2017
172	CV2011	Installation of steel post for NB Bay 48 to Bay 50	2 days	8/3/2017	9/3/2017
173	CV2011	Grouting for steel post NB Bay 48 to Bay 50	2 days	10/3/2017	11/3/2017
174	CV2011	Installation of steel post for NB Bay 51 (CNP)	2 days	13/3/2017	14/3/2017
175	CV2011	Grouting for steel post NB Bay 51	1 day	15/3/2017	15/3/2017
176	CV2011	Installation of panel for NB Bay 48 to Bay 50	4 days	16/3/2017	20/3/2017
177	CV2011	Installation of panel and cladding for NB Bay 51 (CNP)	3 days	21/3/2017	23/3/2017
178	CV2011	Swabbing and Pressure test for MS700 WM	7 days	2/3/2017	9/3/2017
179	CV2011	Testing of water sample	5 days	10/3/2017	15/3/2017
180	CV2011	Connection of MS700 wetermain by WSD	3 days	16/3/2017	18/3/2017
181	CV2011	Backfilling behind of NB Bay 48 to 51	7 days	20/3/2017	27/3/2017
182	CV2011	Re-connection of two 100mm fire system by WSD	3 days	28/3/2017	30/3/2017
183	CV2011	Laying of UU (TG, CLP & PCCW)	14 days	31/3/2017	19/4/2017
184	CV2011	Construction of U-channel	12 days	20/4/2017	5/5/2017
185	CV2011	Kerb and subbase	7 days	6/5/2017	13/5/2017
186	CV2011	Installation of railing and traffic sign	5 days	15/5/2017	19/5/2017
187	CV2011	Installation of public lighting	5 days	15/5/2017	19/5/2017
188	CV2011	Paving block of footpath	9 days	20/5/2017	31/5/2017

Appendix C. Action and Limit Levels for Construction Phase

Air Quality

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

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

Monitoring Station	Action Level ($\mu g/m^3$)	Limit Level ($\mu g/m^3$)
AM3	329	500

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

Monitoring Station	Action Level ($\mu g/m^3$)	Limit Level ($\mu g/m^3$)
AM3	179	260

Noise

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

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

Time Period & Monitoring Locations	Action Level	Limit Level
NM8		
0700-1900 hours on normal weekdays	When one documented complaint is received from any one of the sensitive receivers	75 dB(A)
NM9		
0700-1900 hours on normal weekdays	When one documented complaint is received from any one of the sensitive receivers	70 dB(A) / 65 dB(A) *
NM8, NM9		
0700-2300 hrs on holidays; and 1900-2300 hrs on all other days	When one documented complaint is received from any one of the sensitive receivers	65 dB(A)
2300-0700 hrs of next day	When one documented complaint is received from any one of the sensitive receivers	50 dB(A)

Note: * Reduced to 70 dB(A) for schools and 65 dB(A) during school examination periods.

Appendix D. Event and Action Plan for Air Quality and Noise

Air Quality

Should non-compliance of the air quality criteria occurs during construction stage, actions in accordance with the Event and Action Plan in the below table should be carried out.

Table D.1: Event and Action Plan for Air Quality

Event	Action			
	ET Leader	IEC	ER (Engineer's Representative)	Contractor
Action Level				
Exceedance for one sample	1. Identify source, investigate the causes of exceedance and propose remedial measures. 2. Inform IEC and ER. 3. Repeat measurement to confirm finding. 4. Increase monitoring frequency to daily.	1. Check monitoring data submitted by ET. 2. Check Contractor's working method.	1. Notify Contractor.	1. Rectify any unacceptable practice. 2. Amend working methods if appropriate.
Exceedance for two or more consecutive samples	1. Identify the source, investigate the causes of exceedance and propose remedial measures. 2. Inform IEC and ER. 3. Repeat measurements to confirm findings. 4. Increase monitoring frequency to daily. 5. Discuss with IEC and the Contractor on remedial actions required. 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. 5. Supervise implementation of remedial measures.	1. Confirm receipt of notification of exceedance in writing. 2. Notify the Contractor. 3. Ensure remedial measures properly implemented.	1. Submit proposals for remedial actions to IEC within 3 working days of notification. 2. Implement the agreed proposals. 3. Amend proposal if appropriate.
Limit Level				
Exceedance for one sample	1. Identify source, investigate the causes of exceedance and propose remedial measures. 2. Inform ER and EPD. 3. Repeat measurement to confirm finding. 4. Increase monitoring frequency to daily. 5. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results.	1. Check monitoring data submitted by ET. 2. Check 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. 5. Supervise implementation of remedial measures.	1. Confirm receipt of notification of exceedance in writing. 2. Notify the Contractor. 3. Ensure remedial measures properly implemented.	1. Take immediate action to avoid further exceedance. 2. Submit proposals for remedial actions to IEC within 3 working days of notification. 3. Implement the agreed proposals. 4. Amend proposal if appropriate.

Event	Action			
Exceedance for two or more consecutive samples	1. Notify IEC, ER, EPD and the Contractor. 2. Identify the source. 3. Repeat measurements to confirm findings. 4. Increase monitoring frequency to daily. 5. Carry out analysis of the Contractor's working procedures to determine possible mitigation to be implemented. 6. Arrange meeting IEC and ER to discuss the remedial actions to be taken. 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 Leader and the Contractor on the potential remedial actions. 2. Review the Contractor's remedial actions whenever necessary and advise ER accordingly. 3. Supervise the implementation of remedial measures.	1. Confirm receipt of notification of exceedance in writing. 2. Notify the Contractor. 3. In consultation with IEC, agree with the remedial measures to be implemented. 4. Ensure remedial measures are properly implemented. 5. If exceedance continues, consider what activity of the work is responsible and instruct the Contractor to stop that activity of work until the exceedance is abated.	1. Take immediate action to avoid further exceedance. 2. Submit proposals for remedial actions to IEC within 3 working days of notification. 3. Implement the agreed proposals. 4. Resubmit proposals if problem still not under control. 5. Stop the relevant activity of works as determined by ER 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 D.2: Event and Action Plan for Construction Noise

Event	Action			
	ET Leader	IEC	ER	Contractor
Action Level	1. Notify IEC and the Contractor. 2. Carry out investigation. 3. Report the results of investigation to IEC and the Contractor. 4. Discuss with the Contractor and formulate remedial measures. 5. Increase monitoring frequency to check mitigation measures.	1. Review with analysed results submitted by ET. 2. Review the proposed remedial measures by the Contractor and advise ER accordingly. 3. Supervise the implement of remedial measures.	1. Confirm receipt of notification of exceedance in writing. 2. Notify the Contractor. 3. Require the Contractor to propose remedial measures for the analysed noise problem. 4. Ensure remedial measures are properly implemented.	1. Submit noise mitigation proposals to IEC. 2. Implement noise mitigation proposals.
Limit Level	1. Identify the source. 2. Notify IEC, ER, EPD and the Contractor. 3. Repeat measurement to confirm findings. 4. Increase monitoring frequency. 5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented. 6. Inform IEC, ER, and EPD the causes & actions taken for the	1. Discuss amongst ER, ET Leader and the Contractor on the potential remedial actions. 2. Review the Contractor's remedial actions whenever necessary to assure their effectiveness and advise ER accordingly. 3. Supervise the implementation of remedial measures.	1. Confirm receipt of notification of exceedance in writing. 2. Notify the Contractor. 3. Require the Contractor to propose remedial measures for the analysed noise problem. 4. Ensure remedial measures are properly implemented. 5. If exceedance continues, consider what activity of the work	1. Take immediate action to avoid further exceedance. 2. Submit proposals for remedial actions to IEC within 3 working days of notification. 3. Implement the agreed proposals. 4. Resubmit proposals if problem still not under control. 5. Stop the relevant activity of works as determined by the ER

Event	Action		
	exceedances. 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.	is responsible and instruct the Contractor to stop that activity of work until the exceedance is abated.	until the exceedance is abated.

Appendix E. Monitoring Schedule

Table E.1: Monitoring Schedule for the reporting month

Tentative Air Quality & Noise Monitoring Schedule for December 2016

Dec-16						
Sun	**Mon**	**Tue**	**Wed**	**Thu**	**Fri**	**Sat**
				1 24-hr TSP 1-hr TSP x 3 Noise	2	3
4	5	6	7 Weekly Audit 24-hr TSP 1-hr TSP x 3 Noise	8	9	10
11	12	13 24-hr TSP 1-hr TSP x 3 Noise	14	15 Weekly Audit	16	17
18	19 24-hr TSP 1-hr TSP x 3 Noise	20	21	22 Weekly Audit	23 24-hr TSP 1-hr TSP x 3	24
25	26 The first weekday after Christmas Day	27 The second weekday after Christmas Day	28 Weekly Audit	29 24-hr TSP 1-hr TSP x 3 Noise	30	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

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

Air Quality & Noise Monitoring Schedule for January 2017

Jan-17						
Sun	**Mon**	**Tue**	**Wed**	**Thu**	**Fri**	**Sat**
1	2 The day following the first day of January	3	4 Weekly Audit 24-hr TSP 1-hr TSP x 3 Noise	5	6	7
8	9	10 24-hr TSP 1-hr TSP x 3 Noise	11 Weekly Audit	12	13	14
15	16 24-hr TSP 1-hr TSP x 3 Noise	17 Weekly Audit	18	19	20	21 24-hr TSP 1-hr TSP x 3
22	23	24	25 Weekly Audit	26 24-hr TSP 1-hr TSP x 3 Noise	27	28 Lunar New Year's Day
29	30 The third day of Lunar New Year	31 The forth day of Lunar New Year				

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	:	Yau Tze Tin
Calibrated by	:	K.F.Ho
Date	:	23/10/2016

Sampler

Model	:	GMWS-2310 ACCU-VOL
Serial Number	:	S/N 0890

Calibration Orifice and Standard Calibration Relationship

Serial Number	:	2454
Service Date	:	14 Mar 2016
Slope (m)	:	2.10326
Intercept (b)	:	-0.06696
Correlation Coefficient(r)	:	0.99989

Standard Condition

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

Calibration Condition

Pa (hpa)	:	1013
Ta(K)	:	301

Resistance Plate		dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC (chart)	Y (corrected)
1	18 holes	11.6	3.389	1.643	55	54.73
2	13 holes	9.0	2.985	1.451	49	48.76
3	10 holes	6.4	2.517	1.229	42	41.79
4	7 holes	4.4	2.087	1.024	36	35.82
5	5 holes	2.6	1.604	0.795	28	27.86

Sampler Calibration Relationship

Slope(m):31.406 Intercept(b):3.214 Correlation Coefficient(r): 0.9996

Checked by:_____ Date: 24/10/2016

Magnum Fan

High-Volume TSP Sampler
5-Point Calibration Record

Location	:	Yau Tze Tin
Calibrated by	:	K.F.Ho
Date	:	23/12/2016

Sampler

Model	:	GMWS-2310 ACCU-VOL
Serial Number	:	S/N 0890

Calibration Orifice and Standard Calibration Relationship

Serial Number	:	2454
Service Date	:	14 Mar 2016
Slope (m)	:	2.10326
Intercept (b)	:	-0.06696
Correlation Coefficient(r)	:	0.99989

Standard Condition

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

Calibration Condition

Pa (hpa)	:	1018
Ta(K)	:	295

Resistance Plate		dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC (chart)	Y (corrected)
1	18 holes	11.8	3.461	1.677	60	60.45
2	13 holes	8.6	2.955	1.437	50	50.38
3	10 holes	6.6	2.588	1.263	44	44.33
4	7 holes	4.2	2.065	1.014	32	32.24
5	5 holes	2.7	1.656	0.819	24	24.18

Sampler Calibration Relationship

Slope(m):42.439 Intercept(b):-10.385 Correlation Coefficient(r): 0.9990

Checked by:_____ Date: 28/12/2016

Magnum Fan

TISCH Environmental

TISCH ENVIRONMENTAL, INC.
145 SOUTH MIAMI AVE
VILLAGE OF CLEVES, OH
45002
513.467.9000
877.263.7610 TOLL FREE
513.467.9009 FAX

ORIFICE TRANSFER STANDARD CERTIFICATION WORKSHEET TE-5025A

Date - Mar 14, 2016 Rootsmeter S/N 0438320 Ta (K) - 295
Operator Tisch Orifice I.D. - 2454 Pa (mm) - 745.49

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	1.4020	3.2	2.00
2	NA	NA	1.00	1.0060	6.4	4.00
3	NA	NA	1.00	0.9010	7.9	5.00
4	NA	NA	1.00	0.8590	8.8	5.50
5	NA	NA	1.00	0.7090	12.8	8.00

DATA TABULATION

Vstd	(x axis) Qstd	(y axis)
0.9866	0.7037	1.4078
0.9824	0.9765	1.9909
0.9803	1.0880	2.2259
0.9792	1.1399	2.3345
0.9738	1.3735	2.8155

Qstd slope (m) = 2.10326
intercept (b) = -0.06696
coefficient (r) = 0.99989

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

Va	(x axis) Qa	(y axis)
0.9957	0.7102	0.8896
0.9914	0.9855	1.2581
0.9893	1.0980	1.4066
0.9882	1.1504	1.4753
0.9828	1.3862	1.7792

Qa slope (m) = 1.31703
intercept (b) = -0.04232
coefficient (r) = 0.99989

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}

SIBATA

SIBATA SCIENTIFIC TECHNOLOGY LTD.
1-1-62, Nakane, Soka, Saitama, 340-0005 Japan
TEL : 048-933-1582 FAX : 048-933-1591

CALIBRATION CERTIFICATE

Date: January 25, 2016

Equipment Name	:	Digital Dust Indicator, Model LD-3B
Code No.	:	080000-42
Quantity	:	1 unit
Serial No.	:	1Y5546
Sensitivity	:	0.001 mg/m3
Sensitivity Adjustment	:	593CPM
Scale Setting	:	January 20, 2016

We hereby certify that the avobe mentioned instrment has been calibrated satisfactory.

Sincerely

SIBATA SCIENTIFIC TECHNOLOGY LTD.

Shintaro Okamura

Shintaro Okamura
Overseas Sales Division

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. : C164166
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC16-1465) Date of Receipt / 收件日期 : 20 July 2016

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. Room 113, 1/F, My Loft, 9 Hoi Wing Road, Tuen Mun, New Territories, 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 : 29 July 2016

TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.
The results do not exceed 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
- Agilent Technologies / Keysight Technologies
- Rohde & Schwarz Laboratory, Germany
- Fluke Everett Service Center, USA

Tested By 測試 : H T Wong, Technical Officer

Certified By 核證 : K C Lee, Project Engineer

Date of Issue 簽發日期 : 1 August 2016

Sun Creation Engineering Limited – Calibration & Testing Laboratory
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. : C164166
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 was performed before the test.

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	C160077
CL281	Multifunction Acoustic Calibrator	PA160023

5. Test procedure : MA101N.

6. Results :

6.1 Sound Pressure Level

6.1.1 Reference Sound Pressure Level

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
50 - 110	LA	A	Fast	94.00	1	94.4	± 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	94.4 (Ref.)
				104.00		104.4
				114.00		114.4

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

6.2 Time Weighting

6.2.1 Continuous Signal

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
50 - 110	LA	A	Fast	94.00	1	94.4	Ref.
			Slow			94.4	± 0.1

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Certificate of Calibration
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Certificate No. : C164166
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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	54.7	-39.4 ± 1.5
					63 Hz	68.0	-26.2 ± 1.5
					125 Hz	78.0	-16.1 ± 1.0
					250 Hz	85.6	-8.6 ± 1.0
					500 Hz	91.1	-3.2 ± 1.0
					1 kHz	94.4	Ref.
					2 kHz	95.7	+1.2 ± 1.0
					4 kHz	95.5	+1.0 ± 1.0
					8 kHz	93.3	-1.1 (+1.5 ; -3.0)
					12.5 kHz	90.1	-4.3 (+3.0 ; -6.0)

6.3.2 C-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
50 - 110	LC	C	Fast	94.00	31.5 Hz	91.3	-3.0 ± 1.5
					63 Hz	93.5	-0.8 ± 1.5
					125 Hz	94.2	-0.2 ± 1.0
					250 Hz	94.4	0.0 ± 1.0
					500 Hz	94.5	0.0 ± 1.0
					1 kHz	94.4	Ref.
					2 kHz	94.3	-0.2 ± 1.0
					4 kHz	93.6	-0.8 ± 1.0
					8 kHz	91.4	-3.0 (+1.5 ; -3.0)
					12.5 kHz	88.1	-6.2 (+3.0 ; -6.0)

Certificate of Calibration
校正證書

Certificate No. : C164166
證書編號

6.4 Time Averaging

UUT Setting				Applied Value					UUT	IEC 60804
Range (dB)	Mode	Frequency Weighting	Integrating Time	Freq. (kHz)	Burst Duration (ms)	Burst Duty Factor	Burst Level (dB)	Equivalent Level (dB)	Reading (dB)	Type 1 Spec. (dB)
50 - 110	LAeq	A	10 sec.	4	1	1/10	110	100	100.1	± 0.5
						$1/10^2$		90	89.9	± 0.5
			60 sec.			$1/10^3$		80	79.6	± 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.

Sun Creation Engineering Limited – Calibration & Testing Laboratory
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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. : C163248
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC16-1307) Date of Receipt / 收件日期 : 10 June 2016

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. Room 113, 1/F, My Loft, 9 Hoi Wing Road, Tuen Mun, New Territories, 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 : 15 June 2016

TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.
The results do not exceed 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
- Agilent Technologies / Keysight Technologies
- Rohde & Schwarz Laboratory, Germany
- Fluke Everett Service Center, USA

Tested By 測試 : H T Wong, Technical Officer

Certified By 核證 : K C Lee, Project Engineer

Date of Issue 簽發日期 : 17 June 2016

Sun Creation Engineering Limited – Calibration & Testing Laboratory
c/o 4/F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
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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. : C163248
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	C153519
CL281	Multifunction Acoustic Calibrator	PA160023
TST150A	Measuring Amplifier	C161175

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	0.985	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.

Sun Creation Engineering Limited – Calibration & Testing Laboratory
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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

Figure G-1: Air quality monitoring at Station AM3 (1-hour TSP)

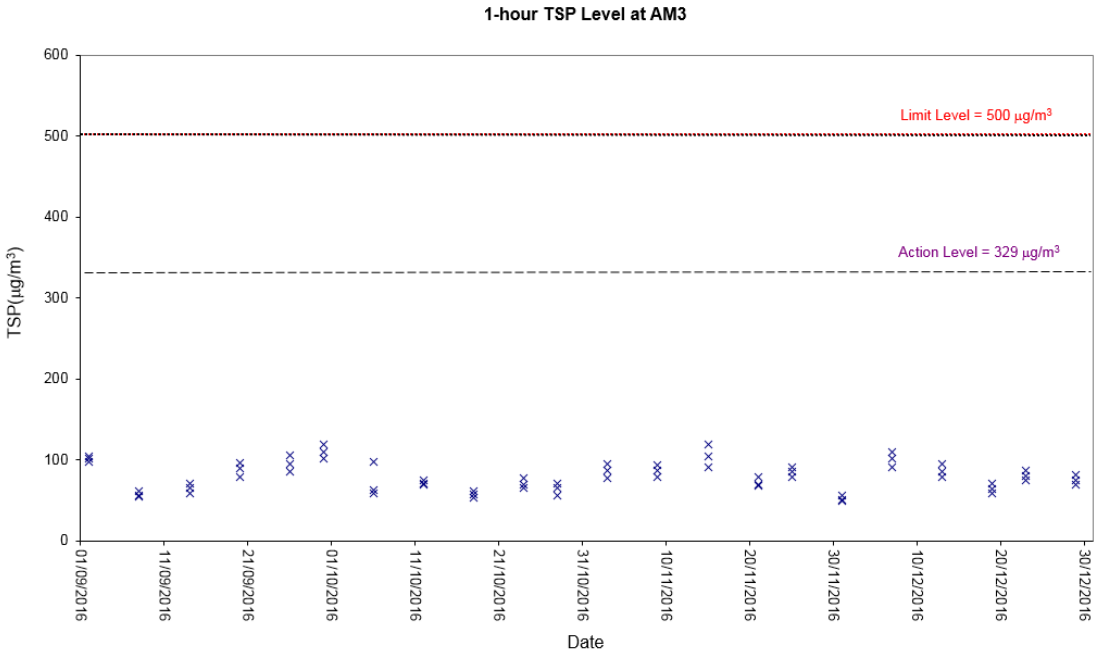


Figure G-2: Air quality monitoring at Station AM3 (24-hour TSP)

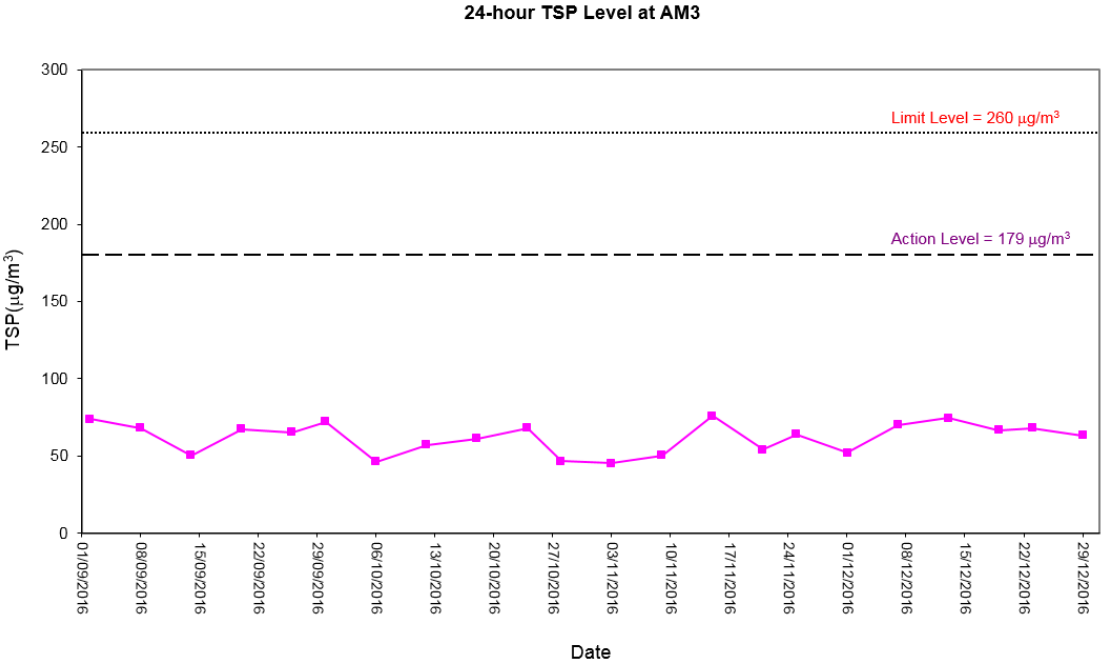


Figure G-3: Construction noise monitoring at Station NM8

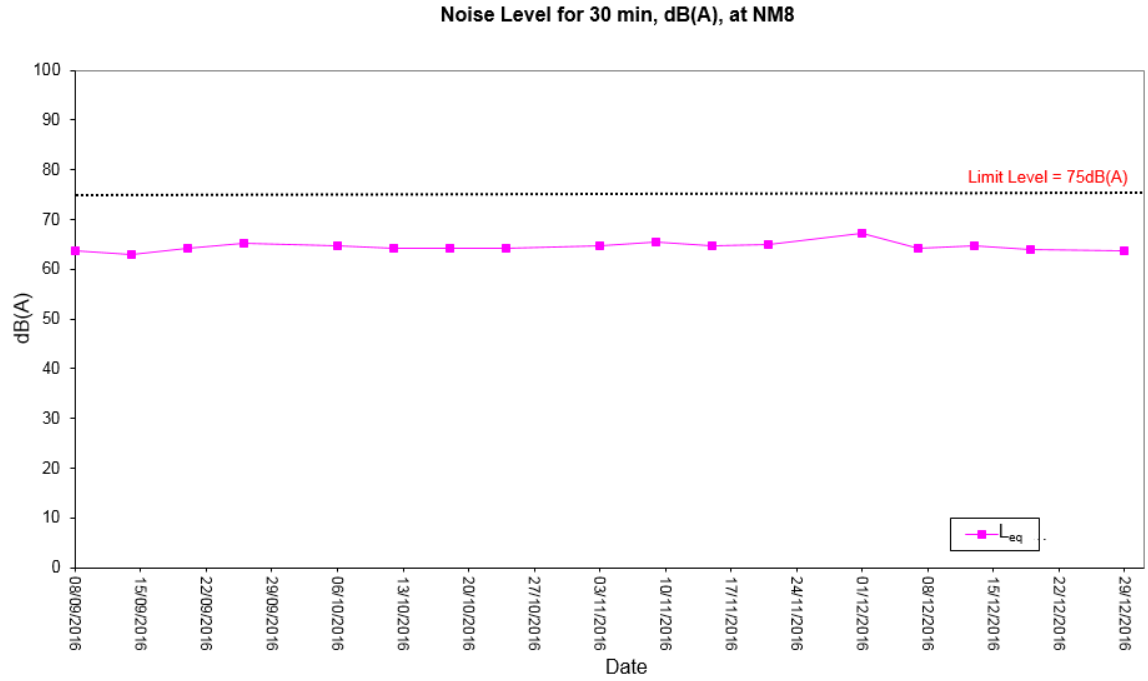
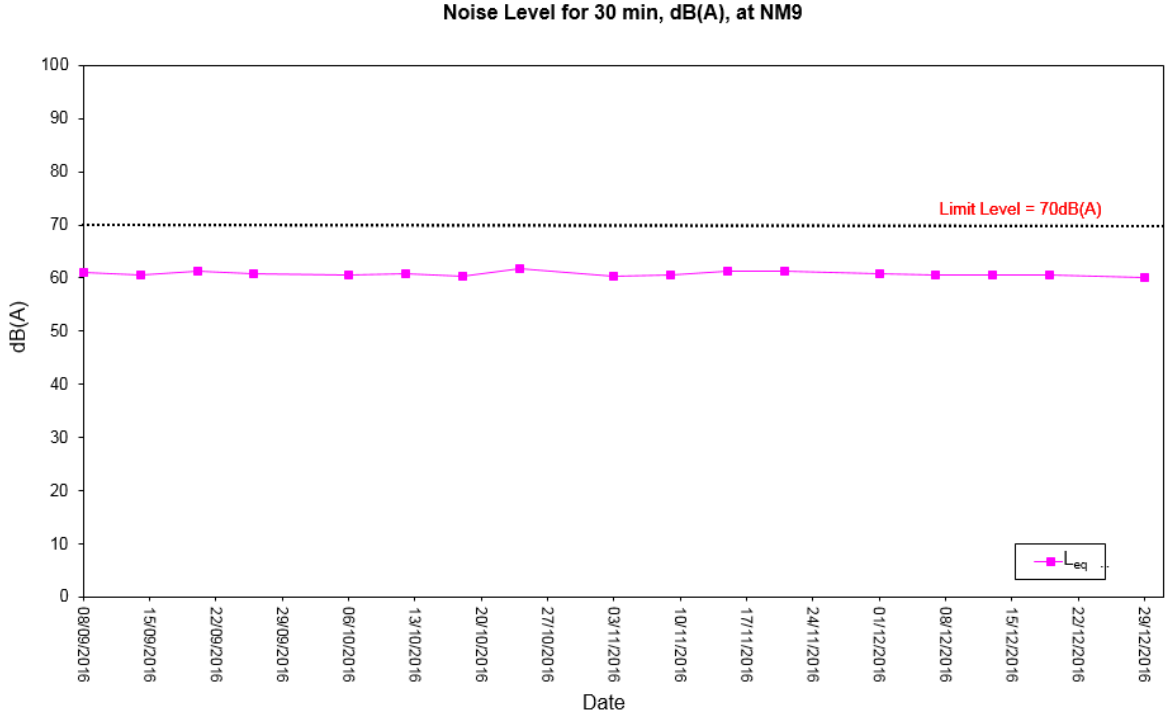
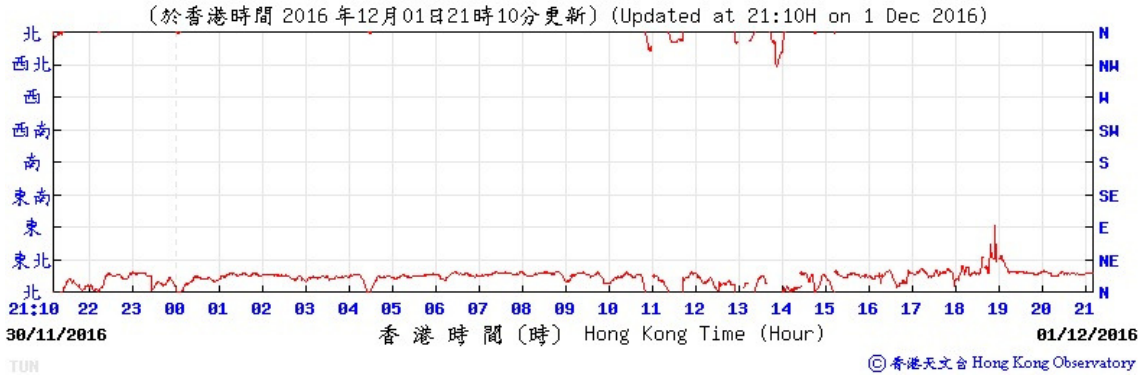


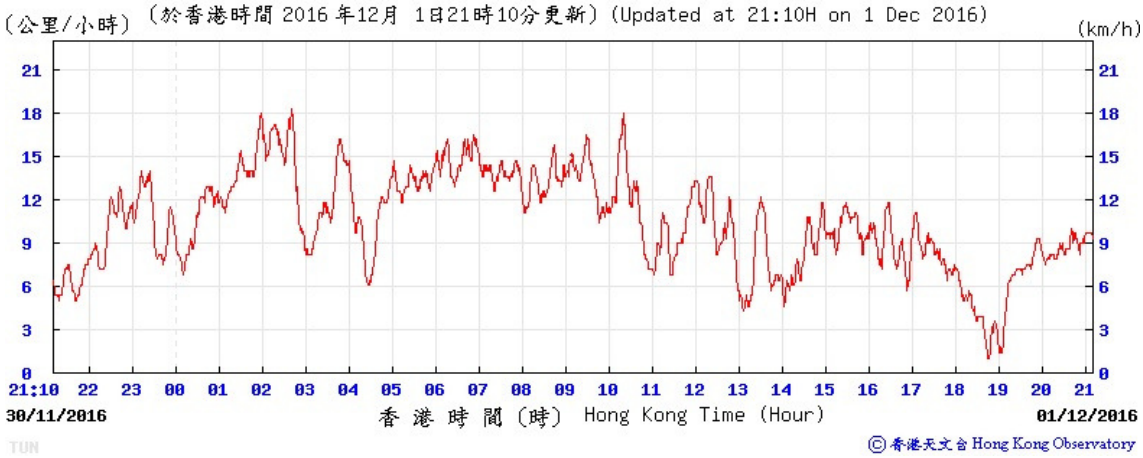
Figure G-4: Construction noise monitoring at Station NM9

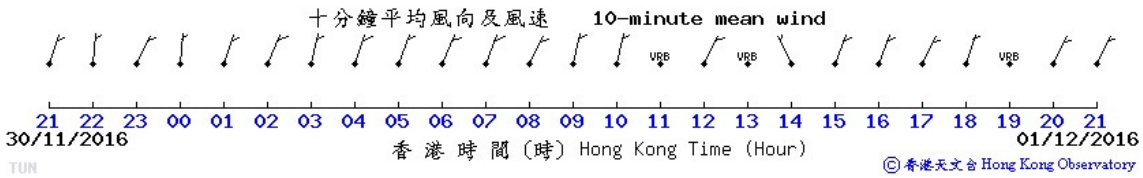


Appendix H. Wind data from Hong Kong Observatory Weather Station

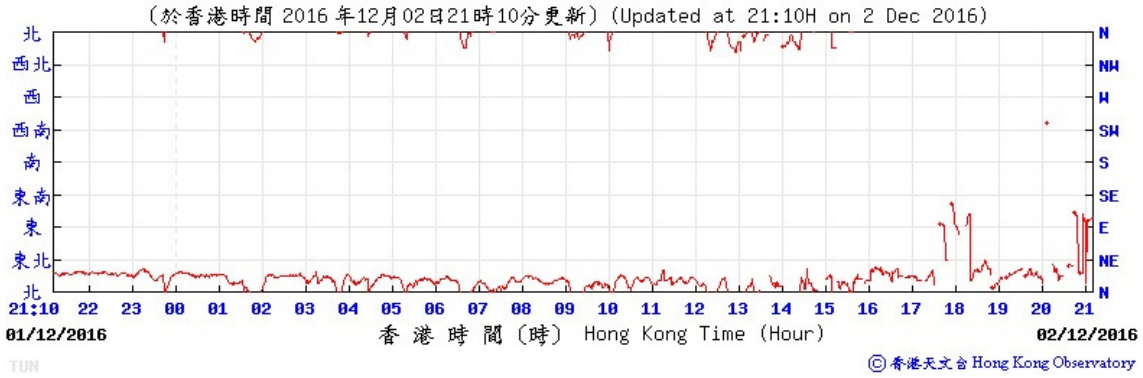
Tuen Mun – 01 December 2016

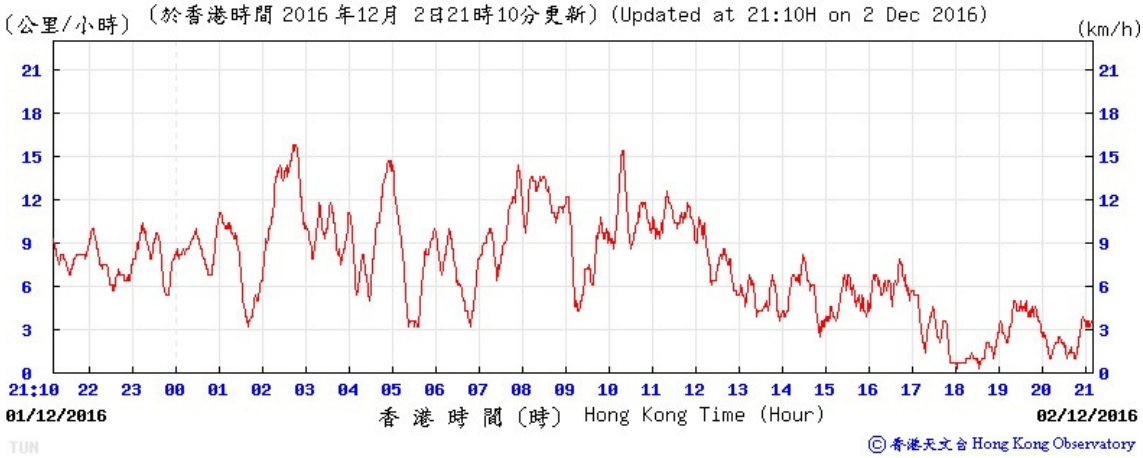


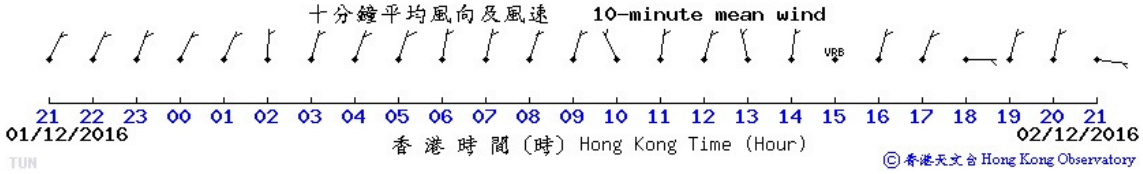




Tuen Mun – 02 December 2016







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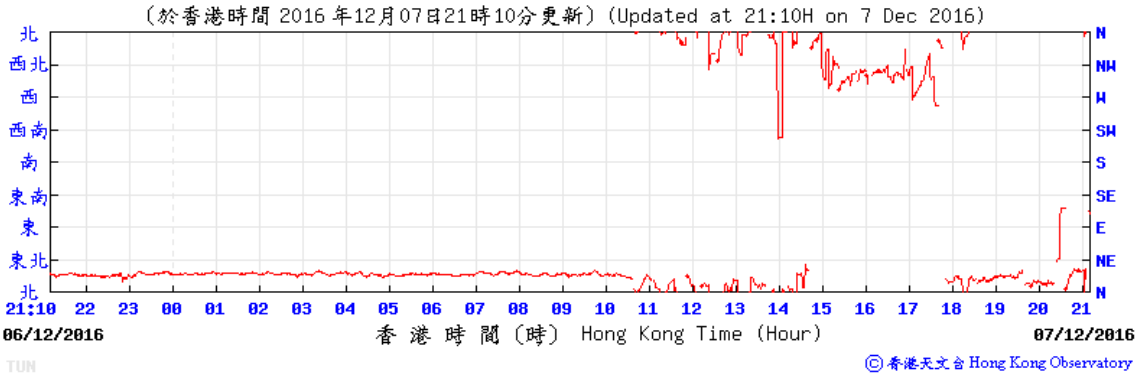

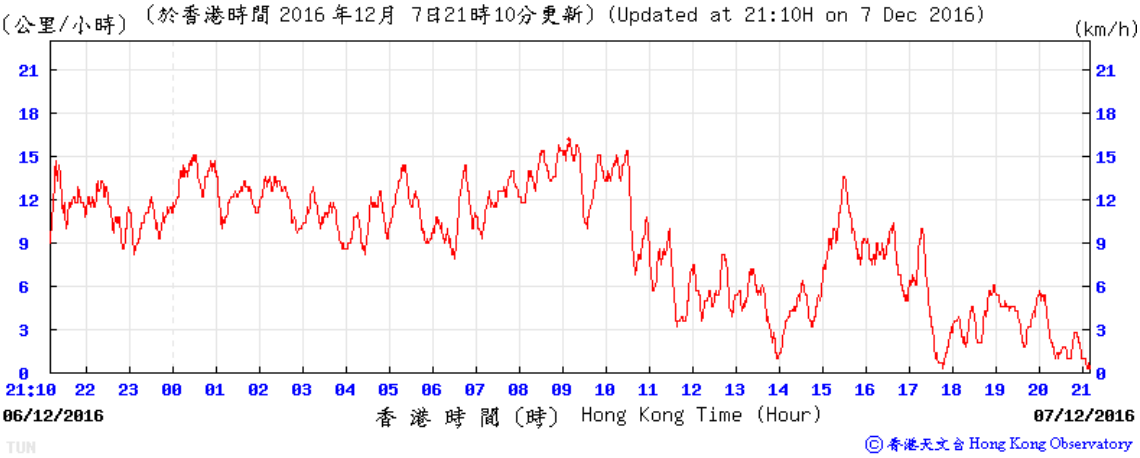

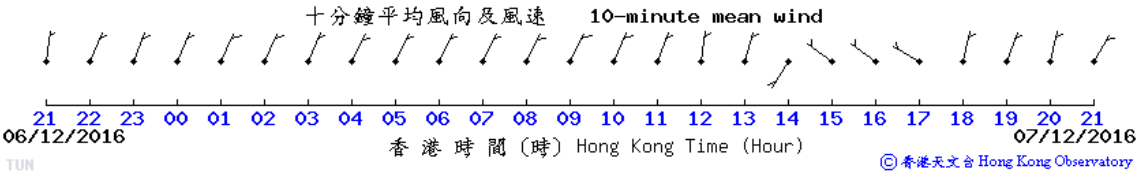

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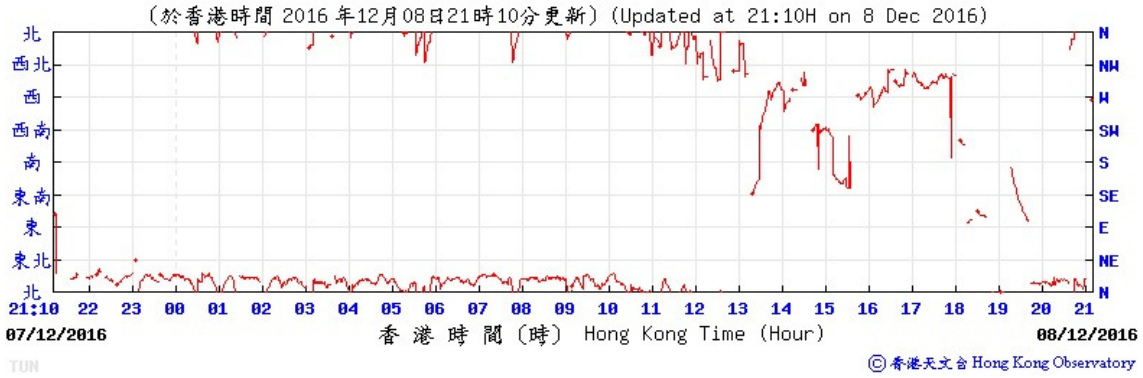

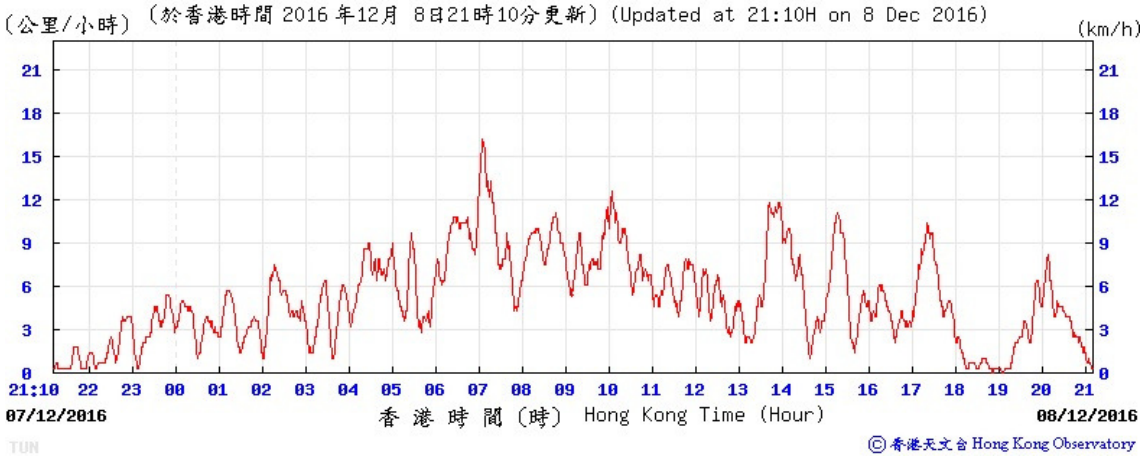

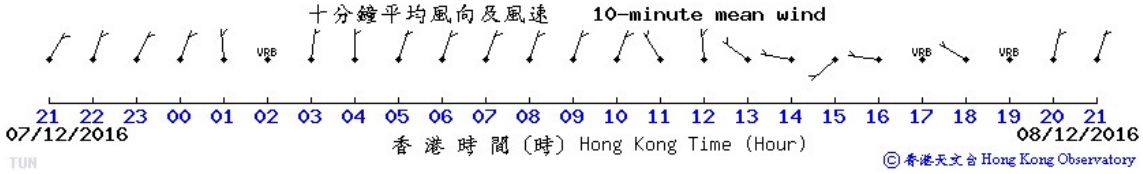

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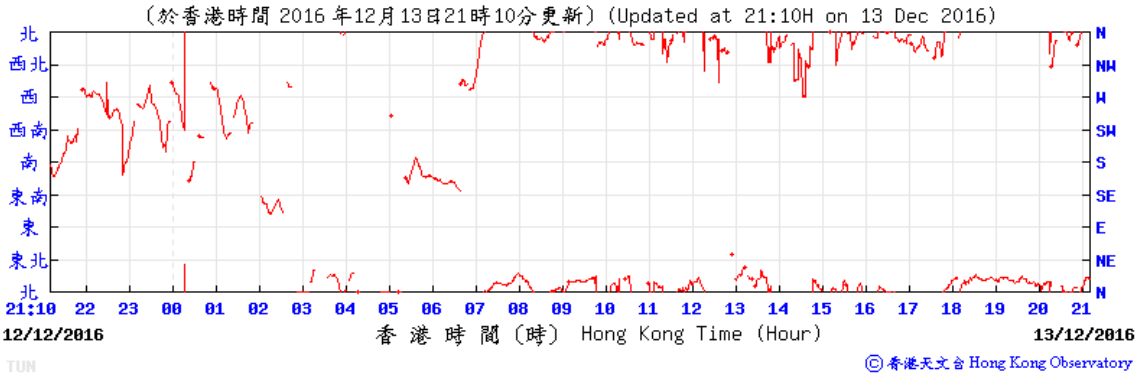

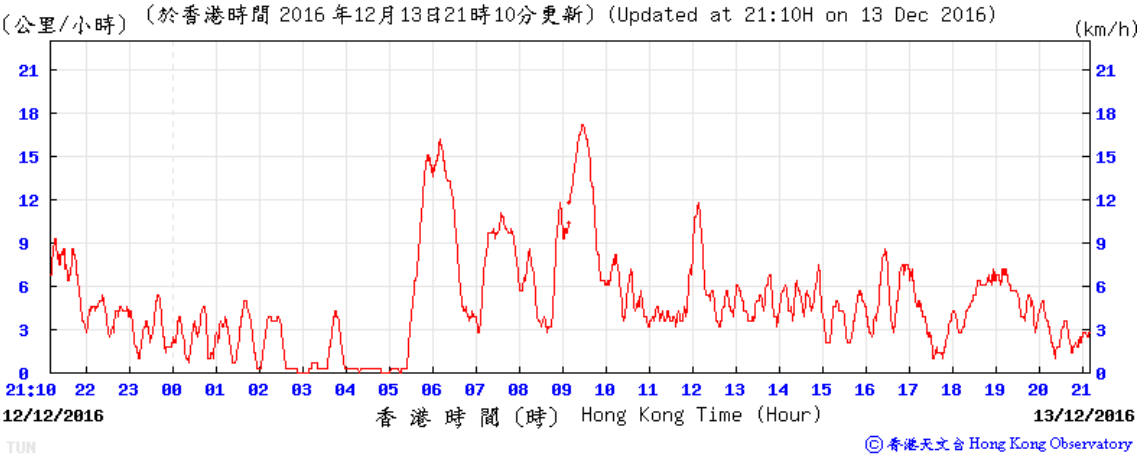

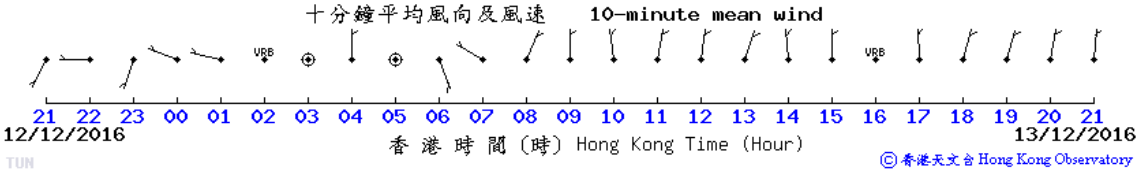

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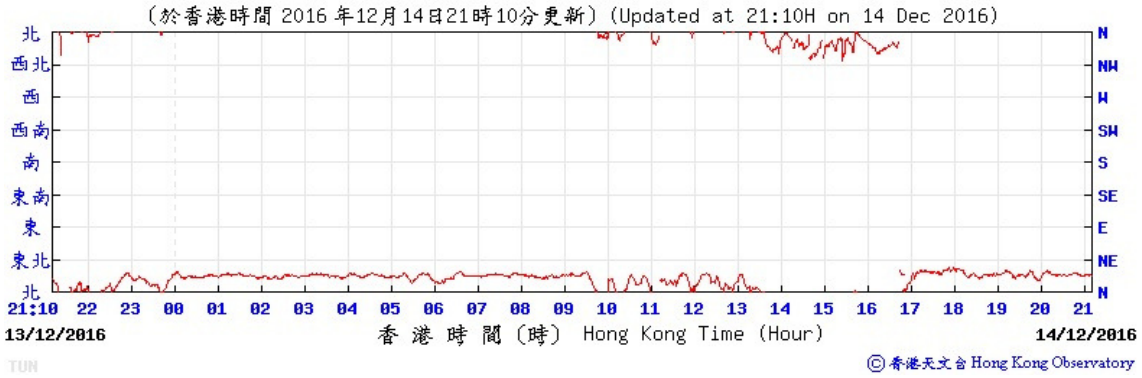

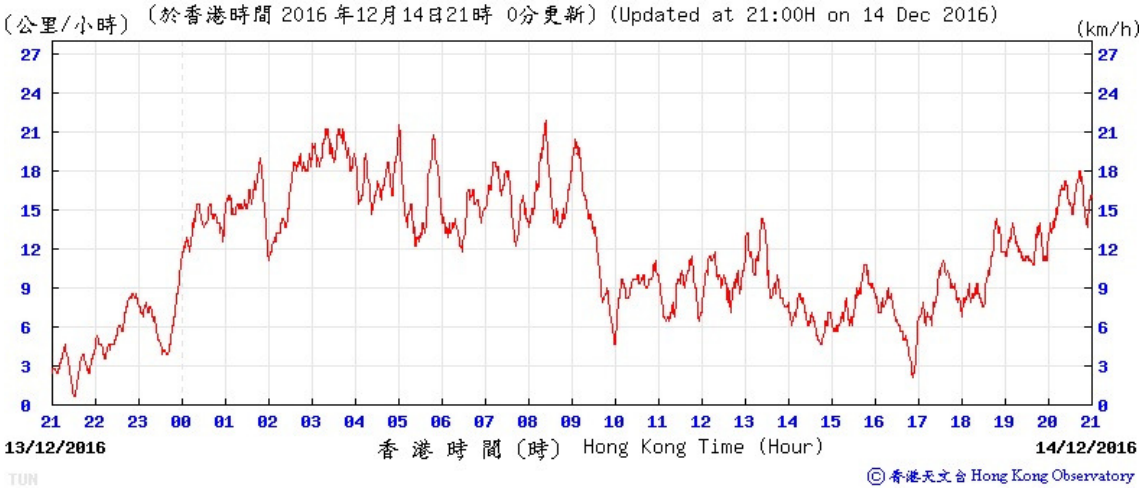

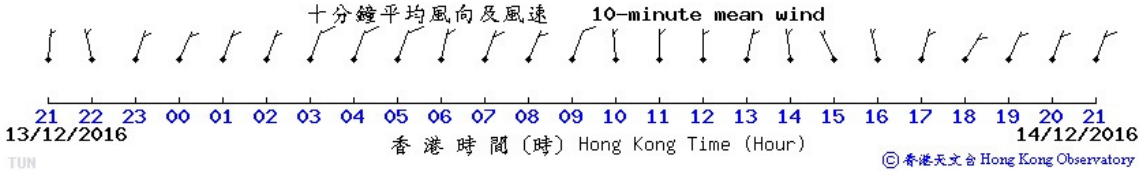

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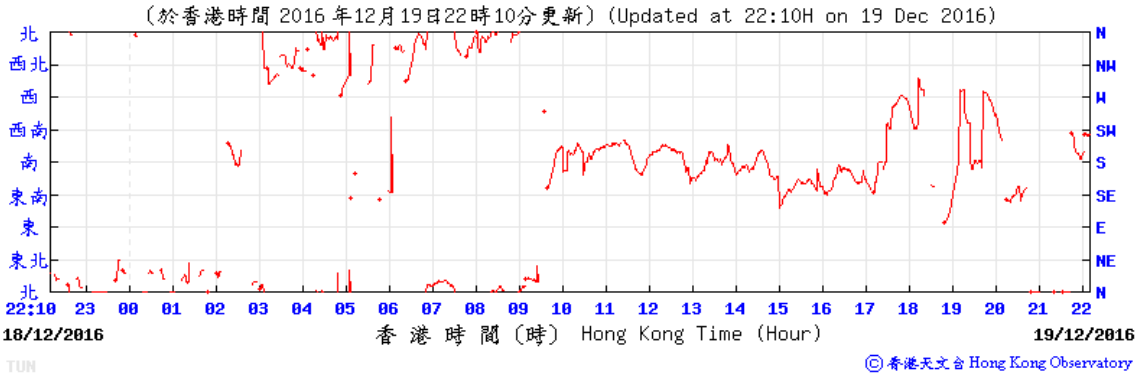

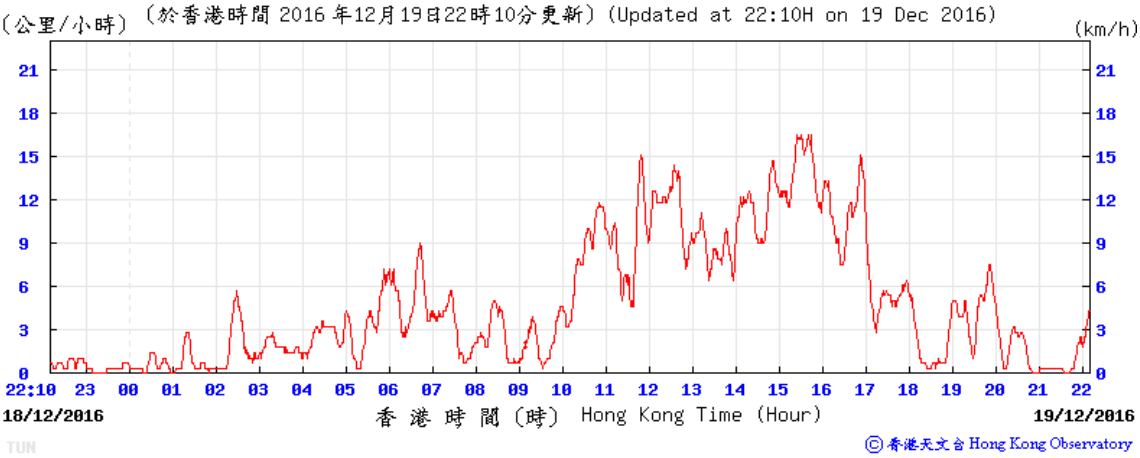

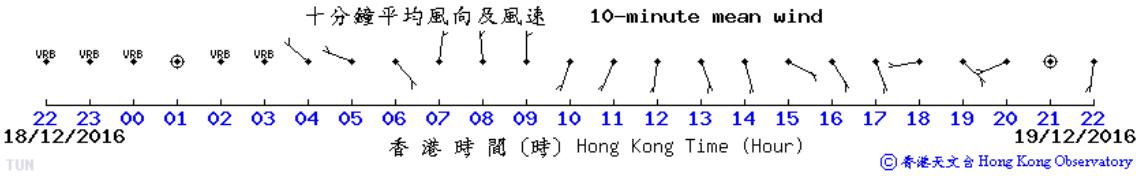

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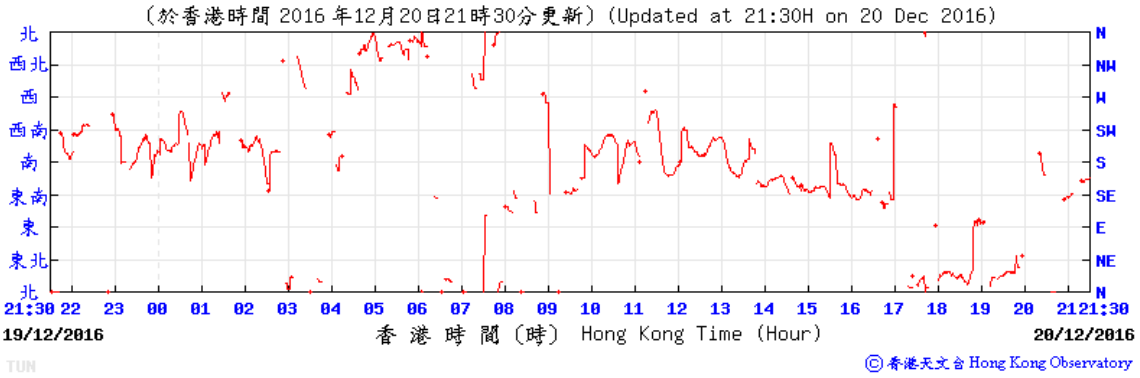

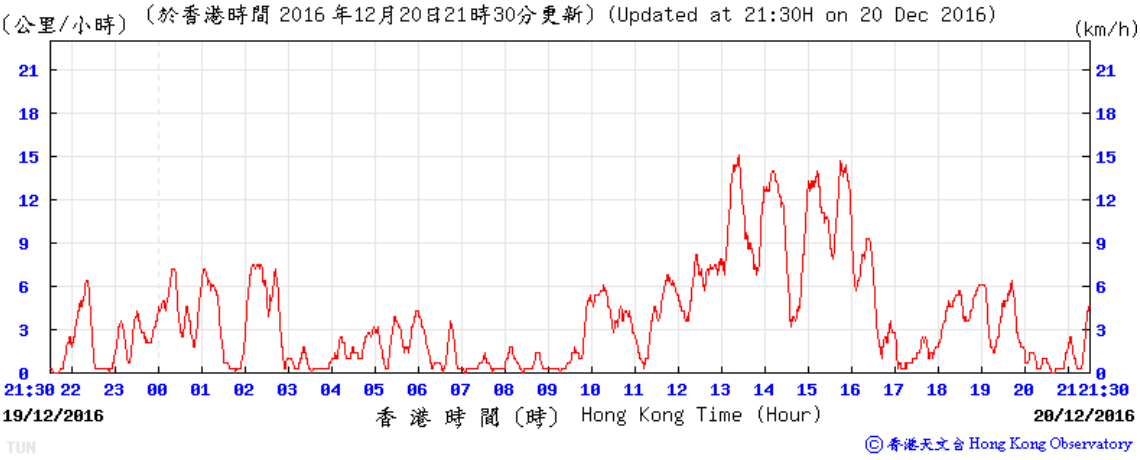

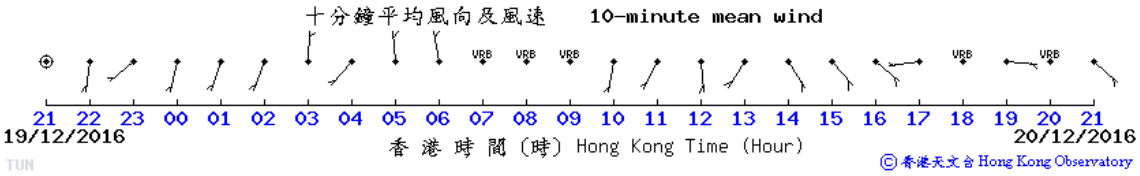

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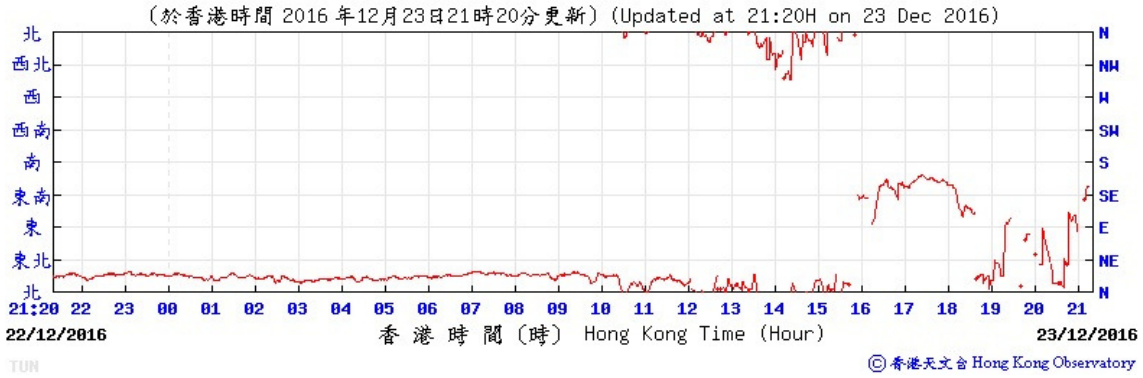

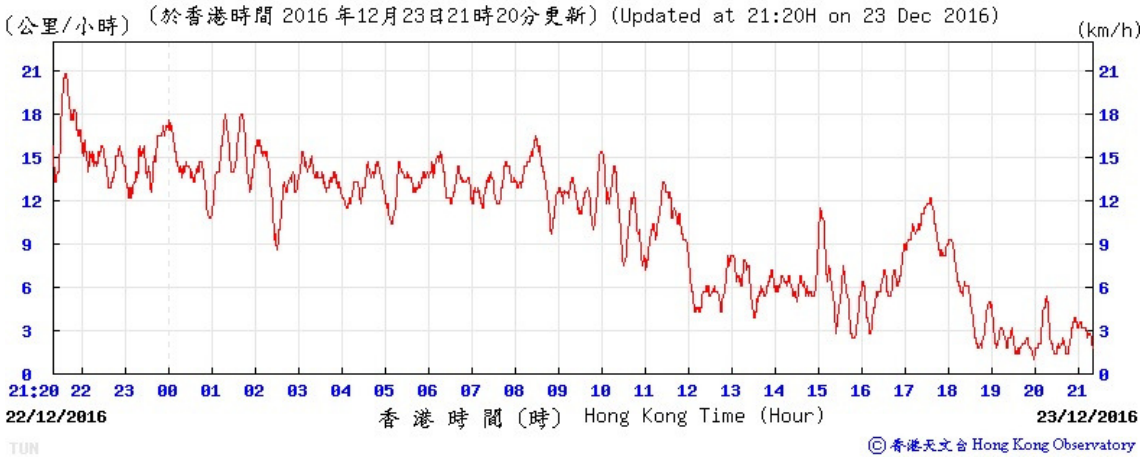

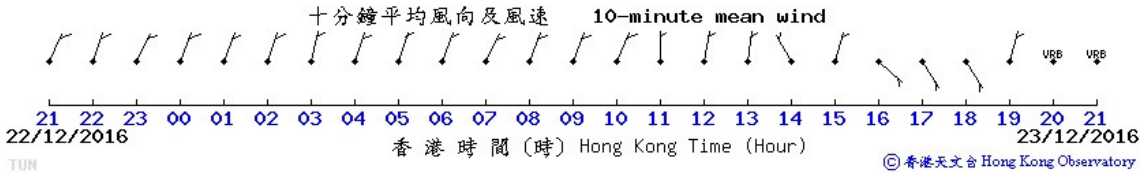

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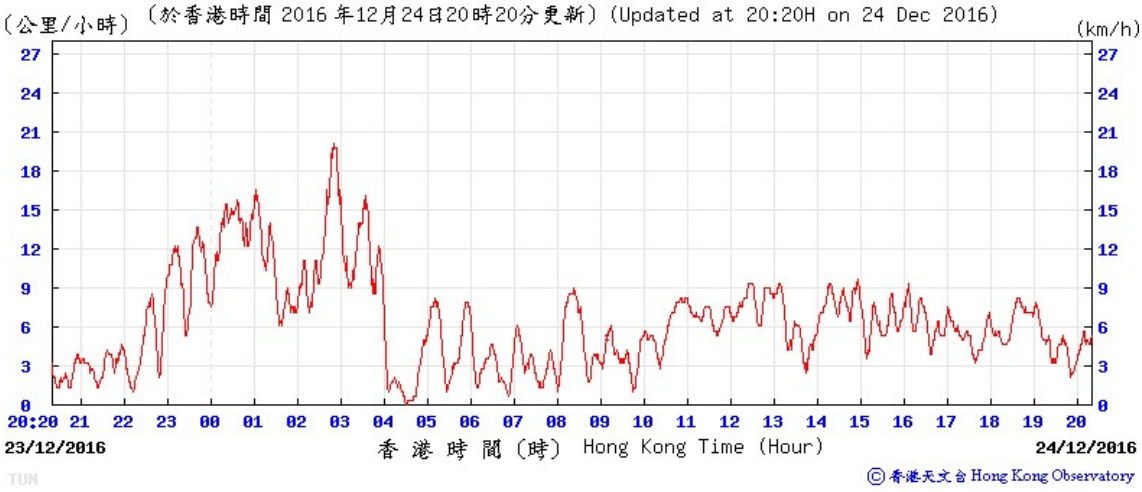

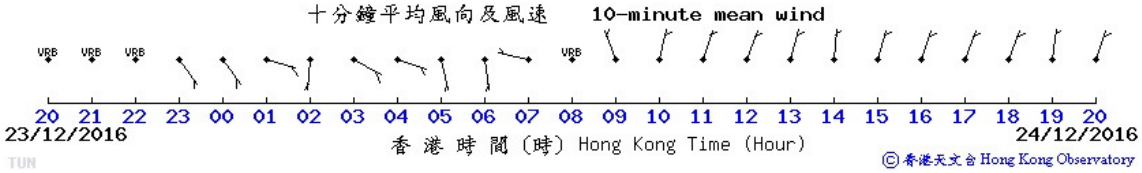

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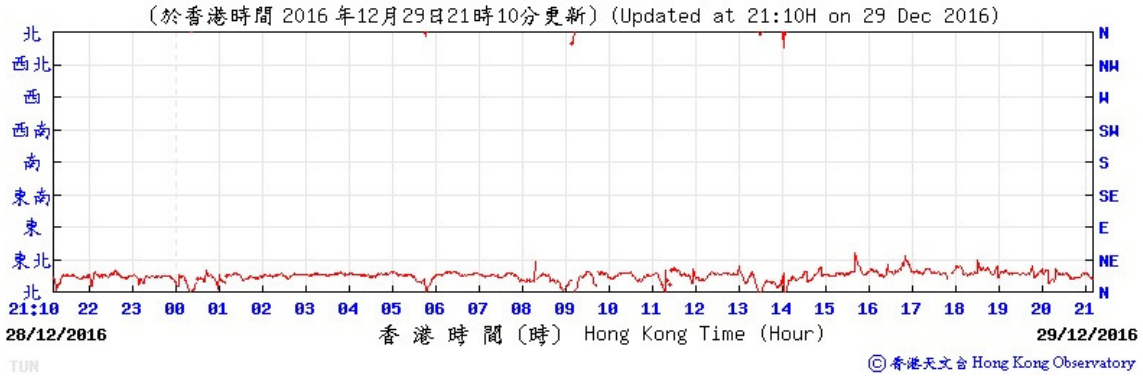

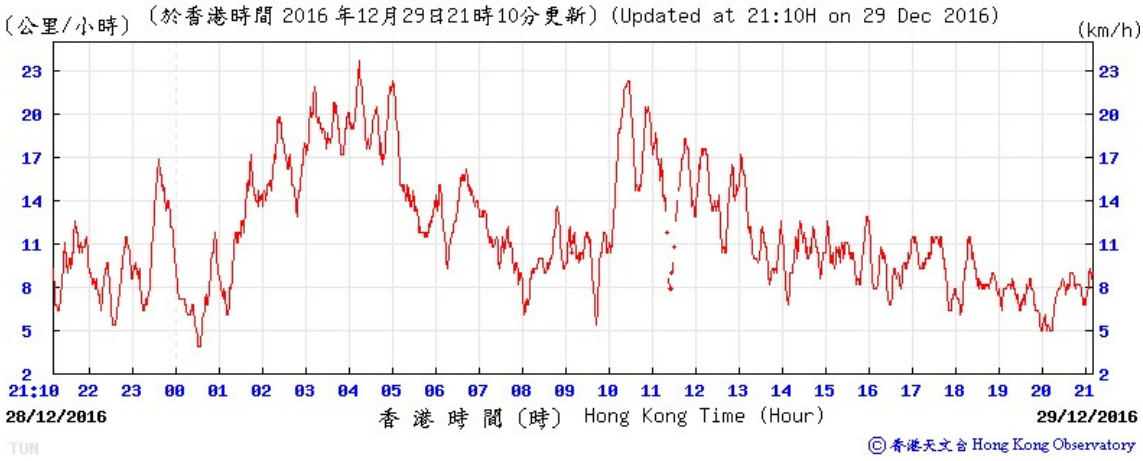

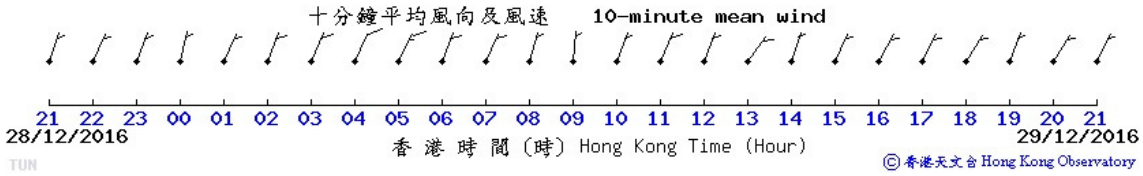

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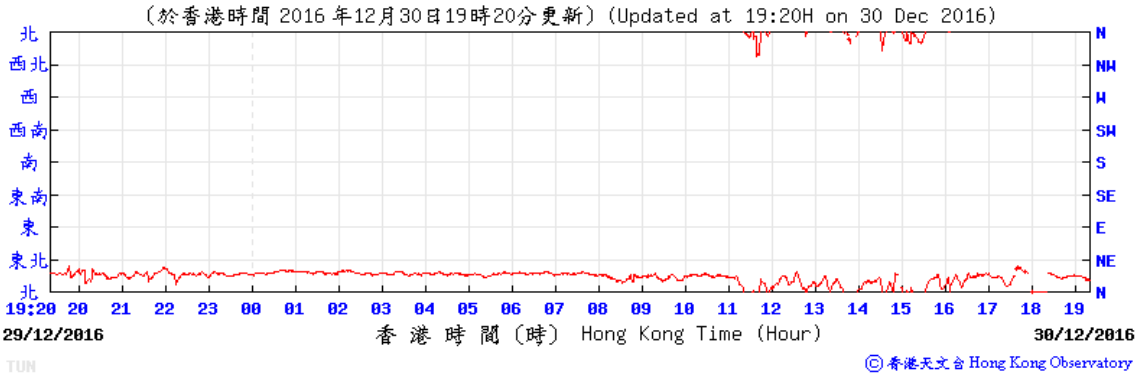

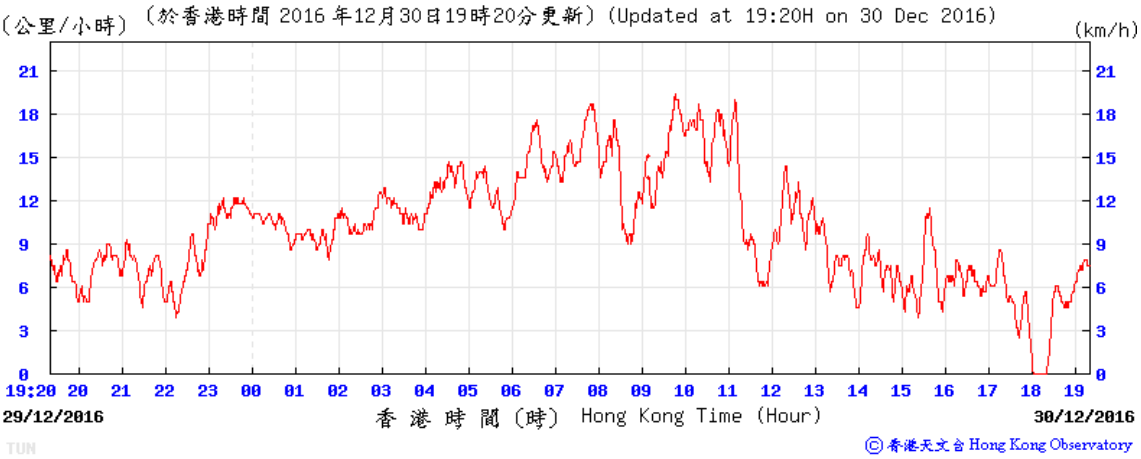

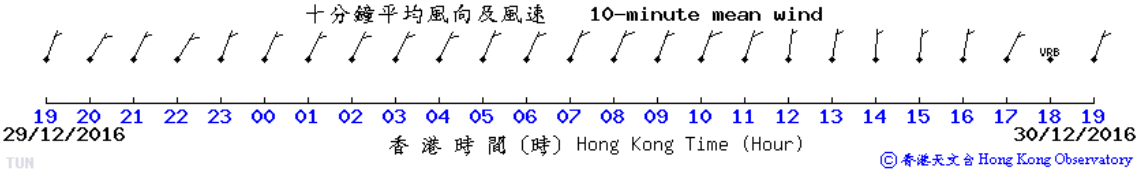

Appendix I. Waste Flow Table

Contract No.: CV/2011/01

Monthly Summary Waste Flow Table for December 2016

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)
Yr 2015	16.65	16.65	6.05	0	10.60	3.89	65.88	0	0	41.67	1.176
Jan	1.81	1.81	0	0	1.81	0	0	0	0	0	0.009
Feb	0.66	0.66	0	0	0.66	0	0	0	0	0	0.004
Mar	1.15	1.15	0	0	1.15	0	0	0	0	0	0.008
Apr	0.57	0.57	0	0	0.57	0	0	0	0	0	0.016
May	0.56	0.56	0	0	0.56	0	0	0	0	0	0.018
June	0.33	0.33	0	0	0.33	0	0	0	0	0	0.018
Sub-total	21.73	21.73	6.05	0	15.68	3.89	65.88	0	0	41.67	1.249
July	0.17	0.17	0	0	0.17	0	0	0	0	0	0.017
Aug	0.03	0.03	0	0	0.03	0	0	0	0	0	0.012
Sept	0.10	0.10	0	0	0.10	0	0	0	0	0.6	0.006
Oct	0.16	0.16	0	0	0.16	0	0	0	0	0	0.003
Nov	0.18	0.18	0	0	0.18	0	0	0	0	0	0.004
Dec	0.71	0.71	0	0	0.71	0	0	0	0	0	0.004
Total	23.08	23.08	6.05	0	17.03	3.89	65.88	0	0	42.27	1.295

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)
22	22	7	0	15	5	80	10	5	50	5

Notes: Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material

Appendix J. Environmental Mitigation Measures – Implementation Status

Table J.1: Air Quality – Recommended Mitigation Measures

* EM&A / ^ EP ref:	Recommended measures	Implementation Status
*2.1.7, Table A	Excavated dusty materials should be covered by impervious sheeting or sprayed with water to keep the entire surface wet.	✓
	Every vehicle should be washed to remove dusty materials from its body and wheels before leaving a construction site.	✓
	The load carried by vehicle should be covered by impervious sheeting to ensure no leakage of dusty materials from the vehicle.	✓
	The heights from which fill materials are dropped should be controlled to a practical level to minimise the fugitive dust arising from unloading.	✓
	The haul roads should be located away from ASRs.	✓
	The haul roads should be sprayed with water to keep the entire road surface wet.	✓
	Vehicle speed within the construction sites should be maintained at 20 km/h or below.	✓

Table J.2: Noise – Recommended Mitigation Measures

* EM&A / ^ EP ref:	Recommended measures	Implementation Status
*3.8, Table A	Only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction works.	✓
*3.8, Table A	Machines and plant that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum.	✓
*3.8, Table A	Plant known to emit noise strongly in one direction, should, where possible, be orientated to direct noise away from nearby NSRs.	✓
*3.8, Table A	Silencers or mufflers on construction equipment should be utilised and should be properly maintained during the construction works.	✓
*3.8, Table A	Mobile plant should be sited as far away from NSRs as possible.	✓
*3.8, Table A	Material stockpiles and other structures should be effectively utilised, where practicable, to screen noise from on-site construction activities.	✓

Table J.3: Water Quality – Recommended Mitigation Measures

* EM&A / ^ EP ref:	Recommended measures	Implementation Status
*5.1, Table A	A temporary drainage channel shall be provided to divert any runoff away from the site.	✓
*5.1, Table A ^2.4	Channels, earth bunds or sand bag barriers shall be provided on site to direct storm water to silt removal facilities. The design of efficient silt removal facilities shall be based on the guidelines in Appendix A1 of ProPECC PN 1/94.	✓
*5.1, Table A	The overall slope of the site shall be kept to a minimum to reduce the erosive potential of surface water flows.	✓
*5.1, Table A	All entrances and exits of construction sites shall be protected by coarse stone ballast.	✓
*5.1, Table A	Sediment tanks of sufficient capacity, constructed from pre-formed individual cells of approximately 6 to 8 m^3 capacity, are recommended as a general mitigation measure which can be used for settling storm water prior to disposal.	✓
*5.1, Table A ^2.6	All drainage facilities and erosion and sediment control structures shall be regularly inspected and maintained to ensure proper and efficient operation at	✓

* EM&A / ^ EP ref:	Recommended measures	Implementation Status
	all times and particularly following rainstorms.	
*5.1, Table A	Measures shall be taken to minimise the ingress of any site drainage into excavations.	✓
^2.5	Water to be pumped out from trenches or foundation excavations shall be discharged into storm drains via silt removal facilities.	✓
*5.1, Table A	Particular attention shall be paid to the control of silty surface runoff during storm events, especially for areas located near steep slopes.	✓
*5.1, Table A	All vehicles and mechanical plant shall be cleaned before leaving a construction site to ensure no earth, mud, debris and the like is deposited by them on roads.	✓
*5.1, Table A	The bentonite, grouting and cement materials shall only be delivered to the construction site when they are to be used.	✓
*5.1, Table A	Dusty materials shall be stored in a covered warehouse and the excess amount should be removed from the site.	✓
^2.7	Construction waste, debris and rubbish shall be properly collected, handled and disposed of to avoid water quality impacts.	✓
^2.8	Construction work force sewage shall be handled by temporary or permanent public toilets or by portable chemical toilets or sewage holding tanks with the sewage to be regularly collected.	✓

Table J.4: Waste Management – Recommended Mitigation Measures

* EM&A / ^ EP ref:	Recommended measures	Implementation Status
*5.1, Table A	Construction solid waste, debris and rubbish on site shall be collected, handled and disposed of properly.	P
	Handle and store wastes in a manner which ensures that they are held securely without loss or leakage, thereby minimising the potential for pollution.	P
	Use waste hauliers authorised or licensed to collect specific category of waste, e.g. chemical wastes.	✓
	Remove wastes in a timely manner.	✓
	Maintain and clean waste storage areas regularly.	✓
	Minimise windblown litter and dust during transportation by either covering trucks or transporting wastes in enclosed containers.	✓
	Obtain the necessary waste disposal permits from the appropriate authorities.	✓
	Dispose of waste at licensed waste disposal facilities.	✓
	Develop procedures such as a ticketing system to facilitate tracking of loads, particularly for chemical waste, and to ensure that illegal disposal of wastes does not occur.	✓
	Maintain records of the quantities of wastes generated, recycled and disposed.	✓
	Surplus excavated materials shall be reused as fill material at public filling areas (PFA).	✓
	Control measures shall be taken at the stockpiling area to prevent the generation of dust and pollution of stormwater channels.	✓
	Wetting the surface of the stockpiled soil with water when necessary especially during the dry season.	✓
*5.1, Table A	Chemical waste produced should be handled in accordance with the relevant guidelines and regulations.	✓

Table J5: Terrestrial Ecology – Recommended Mitigation Measures

* EM&A / ^ EP ref:	Recommended measures	Implementation Status
*4, Table A	Regular checks shall be made to ensure that the work site boundaries are not exceeded and that no damage is being caused to the surrounding areas.	✓

* EM&A / ^ EP ref:	Recommended measures	Implementation Status
*4	Wild and uncontrolled open fires shall be strictly prohibited within the work site boundary.	✓

Table J.6: Others

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

Legend:

✓	Implemented
×	Not implemented
P	Partially implemented
N/A	Not applicable

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 (i.e. 8 Dec 2011) to the end of the reporting month and are summarized in the **Table K1** below.

Table K.1: 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 8 Dec 2011 to end of the reporting month	1	0	0