



# Maeda Corporation

# MTRCL Contract C3840-13C Tsim Sha Tsui Station Carnarvon Road Subway and Entrances Modification Works

Monthly EM&A Report (April 2014)

(Version 3.0)

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MAEDA



## Maeda Corporation

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Monthly EM&A Report (April 2014) Version (3.0)

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Report No	EB001340R0041-v3	
Date	13 May 2014	

This Monthly EM&A Report is prepared for Maeda Corporation in accordance with the terms and conditions of appointment dated 30 October 2013. Hyder Consulting Limited (Company Number 126012) cannot accept any responsibility for any use of or reliance on the contents of this report by any third party.



14 May 2014

#### By Email and Post

MTR Corporation Limited Fo Tan Railway House No. 9, Lok King Street, Fo Tan Shatin, N.T., Hong Kong Your reference:

Our reference:

40032976/428336

Attention: Mr. Kenneth Chow / Environmental Engineer II

Dear Sir,

Consultancy Agreement A130-13 Independent Environmental Checker for CRS and LTS Verification for Second Monthly Environmental Monitoring and Audit (EM&A) Report (April 2014) (Report No.: EB001340R0041-v3)

We refer to the Second Monthly EM&A Report (April 2014) received under cover of the email from the Environmental Team, Hyder Consulting Limited (HCL), dated on 14 May 2014.

Further to our comments provided on 13 May 2014 and subsequent revision of the Report by HCL on 14 May 2014, we have no comment and have verified the captioned report (Report No.: **EB001340R0041-v3**).

Should you have any queries, please feel free to contact the undersigned at 2410 3750 or our Mr. Thomas Wong at 2410 3795.

Yours faithfully URS Hong Kong Ltd

Rodney Ip Independent Environmental Checker

TWKW/wwsc

cc. via email Hyder Consulting Limited Maeda Corporation

(Attn.: Mr. F. N. Wong) (Attn.: Ms. Cecilia Lee)

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# CONTENTS

	EXECUTIVE SUMMARY ES-1
1.	INTRODUCTION
2. 2.1 2.2	EM&A REQUIREMENTS
3. 3.1 3.2 3.3	MONITORING RESULTS.       11         Air Quality       11         Construction Noise       11         Conclusions and Recommendations       12
4. 4.1 4.2 4.3 4.4 4.5	ENVIRONMENTAL AUDIT.14Site Inspection14Compliance with Legal/Contractual Requirements14Environmental Complaints15Notification of Summons /Successful Prosecutions15Future key environmental issues15
5. 5.1 5.2	WASTE MANAGEMENT16Waste Management
6. 6.1 6.2	CONCLUSIONS / RECOMMENDATIONS



# TABLES

- Table 1-1
   Summary of Status of Environmental Licenses and Permits
- Table 1-2
   Construction Activities Undertaken during the Reporting Period
- Table 2-1-1
   Air Quality Monitoring Location
- Table 2-1-2
   Air Quality Monitoring Equipment
- Table 2-1-3 Derivation of Action and Limit Levels for Air Quality at K11, µg/m3
- Table 2-1-4 Action & Limit Levels for Air Quality at K11, µg/m3
- Table 2-2-1
   Noise Monitoring Parameters and Frequency
- Table 2-2-2 Construction Noise Monitoring Equipment
- Table 2-2-3 Noise Monitoring Location
- Table 2-2-4
   Action and Limit Levels for Construction Noise
- Table 3-1-1 Summary of 24-Hr TSP Monitoring Results, ug/M3
- Table 3-2-1 Summary of Construction Noise Monitoring Results at K11, dB(A)
- Table 4-1
   Summary of Findings and Follow-Up Actions of the Site Inspection
- Table 4-2
   Summary of Breaches of Legal and Contractual Requirements
- Table 4-3 Summary of Complaint
- Table 4-4 Summary of Summon and Successful Prosecutions

# APPENDICES

Appendix A	Site Location Plan
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- Appendix B Management Structure
- Appendix C Construction Programme
- Appendix D Implementation Schedule
- Appendix E Status of Environmental Licenses and Permits
- Appendix F Event and Action Plan
- Appendix G Monitoring Schedule
- Appendix H Weather Information Extracted from HK Observatory
- Appendix I Certificate of Laboratory and Equipment Calibration
- Appendix J Sample Data Record Sheet
- Appendix K Monitoring Results and Plots
- Appendix L Flow Chart for Handling Environmental Complaints
- Appendix M Waste Management Records



# EXECUTIVE SUMMARY

## Breaches of Action and Limit Levels

- ES01 No Notice of Exceedance and the associated investigation and follow-up actions were required as the environmental monitoring results registered no exceedances of Action / Limit Levels of air quality and construction noise during the Reporting Period.
- ES02 No corrective actions were required as the environmental audit during the Reporting Period observed:
  - a) no deficiencies with major environmental significance of the required environmental mitigation measures;
  - b) no non-compliance with the required waste management; and
  - c) no adverse environmental impacts on the sensitive receivers environed with the site of the Project .

### **Environmental Complaints**

ES03 No environmental complaints were recorded during the Reporting Period.

### Notification of Summons and Successful Prosecutions

ES04 No notification of summons and successful prosecutions were recorded during the Reporting Period.

### **Reporting Changes**

ES05 No major reporting changes were made during the Reporting Period.

### Future Key Issues

#### General

ES06 Full implementation of the environmental mitigation measures, which are required in the EM&A Plan and summarized in Implementation Schedule of Appendix D, is recommended. Where necessary, proper maintenance and improvement of the implemented mitigation measures are reminded.

#### Air quality

- ES06 Construction dust is considered to be one of the key issues in the coming construction period, in particular during dusty activities under dry and windy conditions.
- ES07 Where appropriate, construction dust suppression measures including decking over the excavation areas, watering of exposed site surface and covering of all excavated and stockpiles of dusty material by impervious sheeting, etc., are reminded.

### **Construction Noise**

ES08 Construction noise is another key issue in the coming construction period. Working method, equipment and noise mitigation should be regularly reviewed to ensure compliance with statutory and non-statutory requirements and guidelines.

#### Water Quality

ES09 As rain season has been approaching, particular attention is drawn to the compliance with water quality mitigation measures.



# 1. INTRODUCTION

## 1.1 REPORTING PERIOD

- 1.1.1 This is the 2<sup>nd</sup> monthly EM&A report (hereinafter referred as 'This Report') covering construction period from 1 to 30 April 2014 (hereinafter referred as 'the Reporting Period').
- 1.1.2 This Report has been written in accordance with the *Environmental Monitoring and Audit Plan* (hereinafter referred as 'the EM&A Plan') enclosed in the *Project Profile – MTR Tsim Sha Tsui Station Carnarvon Road Subway and Entrances Modification Works*, which is registered in the *Environmental Permit No. EP-440/2012* (hereinafter referred as 'the EP') (Register No.: PP-462/2012).

## 1.2 PROJECT BACKGROUND

- 1.2.1 In order to improve the appearance of Carnarvon Road Entrance D1 and D2 of Tsim Sha Tsui (hereafter referred as 'TST') Station and to provide a more comfortable walking environment nearby, MTR Corporation Limited (hereafter referred as 'MTRC' or 'the Corporation') has commissioned Maeda Corporation (hereinafter referred as 'MC') the contract *MTR Tsim Sha Tsui Station Carnarvon Road Subway and Entrances Modification Works* (hereafter referred as 'the Project'). The Project is proposed to rebuild the existing Entrance D1 and D2 and construct a new Entrance D3 at the basement B2 level of the K11 Art Mall to connect to the TST station by a subway, which extends from the Entrance D1 and D2 and runs approximately 80m along Carnarvon Road and across the Bristol Avenue to the Entrance D3. The tentative programme for the Project is approximately 25 months, scheduled to be commenced in March 2014.
- 1.2.2 The existing TST Station had been in operation before the **Environmental Impact Assessment Ordinance** (hereafter referred as 'EIAO') came into effect on 1 April 1998. It constitutes an exempted Designated Project (hereinafter referred as 'DP') according to Section 9(2) (g) of the EIAO (Cap. 499). As the Project involves a material change to an exempted DP which may have potential environmental impacts, an environmental permit is required prior to the commencement of the modification works. The Project Profile has been developed to provide information for direct application of an environmental permit. The EP has been granted since 18 July 2012, where the Project Profile and the associated **EM&A Plan** are registered.
- 1.2.3 Site map, works area and locations of the environmental monitoring under the Project are illustrated in Figure 1.1 Site Location Plan of *Appendix A*.
- 1.2.4 Management structure of the Project, including organization chart, lines of communication and contact names and telephone numbers of key personnel, is demonstrated in *Appendix B*.
- 1.2.5 Construction programme is shown in *Appendix C*, whereas implementation schedule for the recommended environmental mitigation measures is summarized in *Appendix D*, which fine tunes construction activities and shows inter-relationship with environmental protection / mitigation measures for the construction period.



## 1.3 ENVIRONMENTAL STATUS

- 1.3.1 As required in the EP, URS Hong Kong Ltd has been appointed as the Independent Environmental Checker under the Project (hereinafter referred as 'the IEC'), whereas Hyder Consulting Limited has been appointed as the Environmental Team under the Project (hereinafter referred as 'the ET').
- 1.3.2 According to the EP Condition 3.2 (a) under Environmental Monitoring and Audit (EM&A) during the Construction Period, baseline monitoring has been completed and the required Baseline Monitoring Report has been submitted to EPD on 14 February 2014 prior to commencement of the works under the Project.
- 1.3.3 Status of relevant environmental permits, licences, and/or notifications on environmental protection for the Project is summarized in *Table 1-1* below. They are detailed in *Appendix E.*

Item	Description	License/Permit Status
1	Air pollution Control (Construction Dust)	Notification Ref. 365953 acknowledged on 21 Oct 2013.
2	Water Pollution Control Ordinance (Discharge License)	Water Discharge Licence Ref. WT00018229-2014 granted on 4 Mar 2014
3	Billing Account for Disposal of Construction Waste	A/C Ref. 7018523 granted on 25 October 2013
4	Chemical waste Producer Registration	Registration Ref. 5213-2214-M2446- 16 granted on 4 Mar 2014

#### Table 1-1 Summary of Status of Environmental Licenses and Permits

## 1.4 CONSTRUCTION ACTIVITIES

1.4.1 Construction activities undertaken during the Reporting Period and the following month are summarized in the following *Table 1-2*:

#### Table 1-2 Construction Activities Undertaken during the Reporting Period and Up-Coming Month

Item	Description
	Construction Activities Undertaken during the Reporting Period
1	Excavation and exposure of the existing unidentified utility (UU) at south side.
2	Erection of site hoarding.
3	Installation of the noise insulation mat to the site hoarding.
4	Demolition of Entrance D1 above ground level
	Construction Activities to be Undertaken in the Following Month
5	Pipe piling for excavation lateral support (ELS).



6 Exposure of the existing unidentified utility (UU) at south side.

7 Realignment of the hoarding

# 2.EM&A REQUIREMENTS

2.1 Air Quality

### Monitoring Parameters and Frequency

- 2.1.1 24-Hour Total Suspended Particulates (hereinafter referred as '24-Hr TSP') is required to be monitored once a week during construction period of the Project.
- 2.1.2 1-Hour Total Suspended Particulates (hereinafter referred as '1-Hr TSP') is required to be monitored when exceedances of 24-Hr TSP occur, following the Event and Action Plan presented in *Appendix F*.
- 2.1.3 Schedules for 24-Hr TSP monitoring for the Reporting Period and the next Reporting Period are prepared and submitted to MTRC, IEC and MC prior to implementation via e-mail and / or facsimile for ease of necessary inspection. Where amendment is necessary under ad hoc conditions, including actual and broadcast adverse weather, accidental instrument failures, etc., advanced notification is given at least 24 hours prior to implementation or as practical as possible. The Monitoring Schedules are enclosed in *Appendix G*.

### Monitoring Location

- 2.1.4 According to the EM&A Plan, Mirador Mansion was designated to be the air quality monitoring station of the Project. As the access to the air monitoring location designated in the EM&A Plan has been denied by the owner of the property, the ET proposes an alternative monitoring location on the roof-top above the 4/F of the commercial complex of K11 (hereinafter referred as 'K11'), which has been agreed among MTRC, IEC and MC, and the associated access to K11 has been granted by the management office of K11 prior to the commencement of the baseline monitoring in January 2014.
- 2.1.5 Air quality monitoring location is summarized in *Table 2-1-1* below and illustrated in *Appendix A*.

#### Table 2-1-1 Air Quality Monitoring Location

Location ID	Name of Premises	Description
K11	K11 Art Mall	Rooftop, 4/F

### Monitoring Equipment

2.1.6 The air quality monitoring equipment to be used for construction air impact monitoring is shown in *Table 2-1-2* below:



Table 2-1-2	Air Quality	Monitoring	Equipment
		monitoring	Equipment

Equipment Type	Model	Serial Number	Calibration Orifice Number	Location
High Volume Air Sampler	TE5005X	1713	1785	K11
Sibata Digital Dust Monito	rLD-3B	296098	Not Applicable	K11

- 2.1.7 High Volume Air Sampler (hereinafter referred as 'the HVAS') is used to monitor 24-Hr TSP, following the standard sampling method set out in High Volume Method for Total Suspended Particulates, Part 50 Chapter 1 Appendix B, Title 40 of the Code of Federal Regulations of the USEPA.
- 2.1.8 Weather information including wind speeds and wind directions is obtained from King's Park Weather Station (about 1.7 km to the north of the monitoring station) and used as weather conditions during the Reporting Period. They are presented in *Appendix H*.

### Calibration of Monitoring Equipment

- 2.1.9 The HVAS is calibrated before commencement of monitoring using standard orifice 5-points calibration method with orifice calibrator to determine the actual flow rate of each HVAS. Calibration Kit Model TE5025A is used for calibration of the HVAS. Recalibration of the HVAS is carried out after motor maintenance, at least once every six months, which is about the expected life of carbon brush.
- 2.1.10 Calibration of the HVAS is conducted following the instruction manual of the manufacturer. Initial calibration of the dust monitoring equipment is conducted upon installation (and thereafter at bi-monthly intervals during impact monitoring). The transfer standard should be traceable to the internationally recognized primary standard and be calibrated annually.
- 2.1.11 The Sibata Digital Dust Monitor (hereinafter referred as 'the Sibata') is calibrated annually.
- 2.1.12 The calibration certificate of the equipment is shown in Appendix I.

### Monitoring Methodology for 24-Hr TSP

2.1.13 Air quality monitoring will be conducted once a week under typical weather conditions (with no adverse weather such as typhoon signal or rain storm warning).

#### Installation of HVAS for 24-Hr TSP Monitoring

- 2.1.14 When positioning the HVAS, the following points will be noted:
  - a) A horizontal platform with appropriate support to secure the samplers against gusty wind will be provided;
  - b) No two samplers will be placed less than 2 m apart;
  - c) The distance between the sampler and an obstacle, such as buildings, must be at least twice the height that the obstacle protrudes above the sampler where possible;
  - d) A minimum of 2 m of separation from walls, parapets and penthouses is required for rooftops samplers;
  - A minimum of 2 m of separation from any supporting structure, measured horizontally is required;
  - f) No furnace or incinerator flue or building vent is nearby;
  - g) Airflow around the sampler is unrestricted;



- h) The sampler is more than 20 m from the dripline;
- i) Any wire fence and gate, to protect the sampler, should not cause any obstruction during monitoring;
- j) Permission must be obtained to set up the samplers and to obtain access to the monitoring stations; and
- k) A secured supply of electricity is needed to operate the samplers.

#### Preparation of Filter Papers and Laboratory Analysis

- 2.1.15 Sufficient pieces of filter paper should be labelled before sampling. It should be a clean filter paper with no pinholes, and should be conditioned in a humidity-controlled chamber for over 24-hour and be pre-weighed before use for the sampling. The preferred room temperature is around 25 °C ±3 °C with relative humidity (hereinafter referred as 'the RH') less than 50% ± 5%, preferably 40%.
- 2.1.16 Preparation of filters and subsequent laboratory analysis of the collected 24-Hr TSP samples were performed by ALS Technichem (HK) Pty Ltd (hereinafter referred as 'ALS'), a local laboratory which have been accredited under Hong Kong Laboratory Accreditation Scheme (HOKLAS).
- 2.1.17 All the collected samples should be kept by the ET in standard office conditions for 6 months before disposal.

#### Field Monitoring Procedures

- 2.1.18 Procedures for field monitoring are as follows:
  - a) Check power supply to ensure the HVAS works properly.
  - b) Clean the filter holder and the area surrounding the filter.
  - c) Remove the filter holder by loosening the four bolts and carefully align a new filter, with stamped number upward, on a supporting screen.
  - d) Align the filter properly on the screen so that the gasket forms an airtight seal on the outer edges of the filter.
  - e) Fasten the swing bolts to hold the filter holder down to the frame. The pressure applied should be sufficient to avoid air leakage at the edges.
  - f) Close the shelter lid and secure with the aluminium strip.
  - g) Warmed-up the HVAS for about 5 minutes to establish run-temperature conditions.
  - h) Set a new flow rate record sheet into the flow recorder.
  - i) Checked and adjust the flow rate of the HVAS at around 1.1 m<sup>3</sup> per minute. (The range specified in the EM&A Plan is between 0.6-1.7 m<sup>3</sup> per minute.)
  - j) Set the programmable timer for a sampling period of 24 hours, and record the starting time, weather condition and the filter number.
  - k) Record the initial elapsed time.
  - I) At the end of sampling, remove the sampled filter carefully and fold it in half-length so that only surfaces with collected particulate matter are in contact.
  - m) Place the sampled filter in a clean plastic envelope and seal.
  - n) Record all monitoring information on a Field Data Sheet as shown in *Appendix J*.
  - o) Send the filters to ALS for analysis.



### Monitoring Methodology for 1-Hr TSP

#### Field Monitoring

- 2.1.19 The procedures for measurement of 1-Hr TSP follow Manufacturer's Instruction Manual, which is summarised as follows:
  - a) 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).
  - b) Push the knob at MEASURE position.
  - c) Push "O-ADJ" button. (Then meter's indication is 0).
  - d) 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.
  - e) Pull out the knob and return it to MEASURE position.
  - f) Push "START" button.
  - g) Record all monitoring information on a Field Data Sheet as shown in Appendix J.

#### Maintenance and Calibration

- a) The Sibata is checked at 3-month intervals and calibrated at 1-year intervals throughout the whole construction period.
- b) Calibration records for the Sibata Digital Dust Monitor direct dust meters are shown in *Appendix I*.

### Action and Limit Levels

2.1.20 The Action and Limit levels (hereinafter referred as 'the A/L Levels) at K11 have been established in the Baseline Monitoring Report in accordance with the derivation criteria specified in Section 3.7 of the EM&A Plan, which are summarised in *Table 2-1-3* as follows:

Parameter	Action Level	Limit Level
24-Hr TSP	For baseline level ≤200 μg/m <sup>3</sup> , Action level = (130% of baseline level + Limit level)/2 For baseline level >200 μg/m <sup>3</sup> , Action level = Limit level	260
1-Hr TSP	For baseline level ≤384 µg/m <sup>3</sup> , Action level = (130% of baseline level + Limit level)/2 For baseline level >384 µg/m <sup>3</sup> , Action level = Limit level	500

#### Table 2-1-3 Derivation of Action and Limit Levels for Air Quality at K11, µg/m<sup>3</sup>

2.1.21 The established A/L Levels for 24-Hr and 1-Hr TSP are summarized in *Table 2-1-4* as follows:



Parameter	Action Level	Limit Level
24-Hr TSP	222	260
1-Hr TSP	373	500

#### Table 2-1-4 Action & Limit Levels for Air Quality at K11, µg/m<sup>3</sup>

### Event and Action Plan

2.1.22 In case exceedances of Action and/or Limit levels for air quality occur, *Event and Action Plan* for Air Quality enclosed in *Appendix F* will be implemented.

### Environmental Mitigation Measures for Air Quality

- 2.1.23 Although most of the construction works would be carried out underground, appropriate dust mitigation measures as stipulated in the EP, Project Profile as well as related environmental regulation including Air Pollution Control (Construction Dust) Regulation should be implemented to control fugitive dust emission. The following key dust suppression measures are recommended:
  - a) Decking over the excavation areas;
  - b) Regular watering to reduce dust emissions from all exposed site surface, particularly during dry weather;
  - c) Frequent watering for particularly dusty construction areas and areas close to air sensitive receivers;
  - d) Cover all excavated or stockpiles of dusty material by impervious sheeting or spraying with water to maintain the entire surface wet;
  - e) Provision of vehicle washing facilities at the exit points of the site; and
  - f) Provision of tarpaulin covering for any dusty materials on a vehicle leaving the site.
- 2.1.24 Details of the implementation schedule for the required environmental mitigation measures are presented in *Appendix D*.

### 2.2 Construction Noise

### Monitoring Parameters and Frequency

2.2.1 *Table 2-2-1* summarizes the monitoring parameters and frequency for construction noise.

#### Table 2-2-1 Noise Monitoring Parameters and Frequency

Parameters	Frequency
L <sub>eq</sub> in 30 minutes	Once a week

2.2.2 Monitoring schedules for construction noise for the Reporting Period and the next Reporting Period are prepared and submitted to MTRC, IEC and MC prior to implementation via e-mail and / or facsimile for ease of necessary inspection. Where amendment is necessary under ad hoc conditions, including actual and broadcast adverse weather, accidental instrument



failures, etc., advanced notification is given at least 24 hours prior to implementation or as practical as possible.

### Monitoring Equipment

2.2.3 With reference to the Technical Memorandum (TM) issued under the Noise Control Ordinance (NCO), sound level meters in compliance with the International Electrotechnical Commission Publications 651: 1979 (Type 1) and 804: 1985 (Type 1) specifications (both publications have been withdrawn and replaced by 61672:2003) are used for carrying out the noise monitoring. The details of the calibration of the sound level meters and their respective calibrators are as shown in the following **Table 2-2-2**.

Table 2-2-2 Construction Noise Monitoring Equipment	Table 2-2-2	Construction Noise Monitoring Equipment
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ltem	Equipment Name	Model		
1	Sound Level Meter	B&K 2238 (Serial no. 2562782)		
2	Larson Davis CAL200 Acoustic Calibrator	(Serial no. 10929)		

### Monitoring Location

- 2.2.4 As stated in previous **Section 2.1.4**, the alternative air quality monitoring location K11 which is proposed by the ET and agreed among MTRC, IEC and MC, i.e. on the roof-top above the 4/F of the commercial complex of K11, is used for the construction noise monitoring location. The access to K11 has been granted by the management office of the K11 prior to the commencement of the baseline monitoring in January 2014.
- 2.2.5 **Table 2-2-3** summarizes the recommended alternative noise monitoring location, which is illustrated in **Appendix A**.

#### Table 2-2-3 Noise Monitoring Location

Location ID	Name of Premises	Description
К11	K11 Art Mall	Rooftop, 4/F

## Monitoring Methodology

#### Field Monitoring

- 2.2.6 Procedures for noise monitoring summarized as follows:
  - a) The microphones of the Sound Level Meter are about 1 m from the exterior of the building façade.
  - b) The battery condition is checked to ensure the correct functioning of the meter.
  - c) Parameters such as frequency weighting, the time weighting and the measurement time are set as follows:
    - i. Frequency weighting: A
    - ii. Time weighting: Fast
    - iii. Time measurement: 30 minutes intervals (0700-1900 daily)
  - d) Prior to and after each noise measurement, the meter is calibrated using a Calibrator for 94 dB at 1 kHz. If the difference in the calibration level before and after measurement is



more than 1 dB, the measurement should be considered invalid and the measurement repeated after re-calibration or repair of the equipment.

- e) During the monitoring period, the  $L_{eq(30 min)}$  are recorded.
- f) Record all monitoring information on a Field Data Sheet as shown in Appendix J.

#### Maintenance and Calibration

2.2.7 The meter and calibrator are sent to the supplier or HOKLAS laboratory to check and calibrate prior to the monitoring. Calibration records are presented in *Appendix I*.

#### Weather Condition

2.2.8 The wind speeds and directions during the monitoring period are recorded and shown in Appendix H.

### Action and Limit Levels

2.2.9 The Action and Limit levels (hereinafter referred as 'the A/L Levels) at K11 have been established in the **Baseline Monitoring Report**. They are summarised in **Table 2-2-4** as follows:

Time Period	Action Level	Limit Level
0700-1900 hours on normal weekdays	When one valid documented complaint is received.	75*
Nate: *70 dD(A) for askasla and	CE dD(A) during as has low primetics no visited	If we also and to be as which as it also in a

Note: \*70 dB(A) for schools and 65 dB(A) during school examination periods. If works are to be carried out during restricted hours, the conditions stipulated in the Construction Noise Permit (CNP) issued by the Noise Control Authority have to be followed.



### Event and Action Plan

2.2.10 In case exceedances of Action and/or Limit levels for construction noise occur, the Event and Action Plan enclosed in *Appendix F* will be triggered.

### Mitigation Measures for Construction Noise

- 2.2.11 Although no residual noise impact would be generated after the proposed mitigation measures are in place, the general construction noise control measures stipulated in the EP, Project Profile are recommended in order to minimise noise impacts during the construction phase. They are summarized as follows:
  - a) The Code of Practice on Good Management Practice to Prevent Violation of the Noise Control Ordinance (Chapter 400) (for Construction Industry) published by EPD shall be adopted;
  - b) The statutory and non-statutory requirements and guidelines shall be complied with;
  - c) Approval for the method of working, equipment and noise mitigation measures intended to be used at the site shall be granted from the Project Engineer before commencing any work;
  - d) Working methods to minimize the noise impact on the surrounding NSRs shall be formulated and executed, and the implementation of these methods shall be monitored by experienced personnel with suitable training;
  - e) Noisy equipment and noisy activities shall be located as far away from the NSRs as is practical;
  - f) Unused equipment shall be turned off;
  - g) PME should be kept to a minimum and the parallel use of noisy equipment / machinery should be avoided;
  - h) All plant and equipment shall be maintained regularly;
  - i) Material stockpiles and other structures shall be effectively utilized as noise barriers, whenever practicable; and
  - j) Enclosure of Entrance D1 with acoustic mat during demolition.
- 2.2.12 Details of the implementation schedule for the mitigation measures are presented in *Appendix D*.



# 3. MONITORING RESULTS

## 3.1 Air Quality

### Monitoring Results

- 3.1.1 24-Hr TSP monitoring during the Reporting Period was conducted following the agreed monitoring schedule.
- 3.1.2 24-Hr TSP results of the Reporting Period are summarized in the following *Table 3-1-1*. Graphical plots of the parameter are illustrated in *Appendix K*.

Table 3-1-1 Summary of 24-Hr TSP Monitoring Results, ug/m <sup>3</sup>							
Monitoring Date	24-Hr TSP	A/L L	evels				
4 April 2014	138						
8 April 2014	37						
10 April 2014	49						
15 April 2014	98	Action Level:	Limit Level: 260				
24 April 2014	98						
28 April 2014	63						
Mean (Min – Max)	84 (37-138)						

#### Table 3-1-1 Summary of 24-Hr TSP Monitoring Results, ug/m<sup>3</sup>

#### Discussion

- 3.1.3 **Table 3-1-1** demonstrates that all 24-Hr TSP results of the Reporting Period fluctuated well below the A/L Levels of the parameter, i.e. neither Action Level nor Limit Level exceedances were recorded.
- 3.1.4 No Notice of Exceedances (thereinafter referred as 'NOE') and the associated NOE Investigation as well as remedial actions were required during the Reporting Period.

## 3.2 Construction Noise

#### Monitoring Results

- 3.2.1 Construction noise monitoring during the Reporting Period was conducted following the agreed monitoring schedule.
- 3.2.2 Construction noise monitoring results of the Reporting Period are summarized in the following *Table 3-2-1*. Graphical plots of the parameter are illustrated in *Appendix K*.



Monitoring Date	Leq (30 min)	A/L Levels		
4 April 2014	69	Limit Level: 75		
11 April 2014	68			
15 April 2014	67	Action Level: Documented		
25 April 2014	66	complaint against construction noise.		
30 April 2014	66			
Mean (Min – Max), L <sub>eq (30 min)</sub>	68 (66-69)			

#### Table 3-2-1 Summary of Construction Noise Monitoring Results at K11, dB(A)

### Discussion

- 3.2.3 No environmental complaint against construction noise was registered during the Reporting Period, whereas **Table 3-2-1** demonstrates that all construction noise results of the Reporting Period were well below the Limit Level of the parameter, i.e. neither exceedances of Action Level nor exceedances of Limit Level were recorded.
- 3.2.4 Neither NOE nor NOE investigation and the associated remedial actions were required during the Reporting Period.

#### Weather Conditions

- 3.2.5 No weather conditions and any other factors were identified to have significant effects on the monitoring results of air quality and construction noise during the Reporting Period were identified.
- 3.2.6 Weather information during the Reporting Period which is extracted from Hong Kong Observatory King's Park Weather Station is enclosed for reference in *Appendix H*.

### 3.3 Conclusions and Recommendations

#### Conclusions

- 3.3.1 No exceedances of A/L Levels of air quality and construction noise were registered during the Reporting Period.
- 3.3.2 No NOE and the associated NOE Investigation and corrected actions were required during the Reporting Period.

### Recommendations

3.3.3 Full implementation of the environmental mitigation measures, which are required in the EM&A Plan and summarized in Implementation Schedule of *Appendix D*, is recommended.



Where necessary, proper maintenance and improvement of the implemented mitigation measures are reminded.

- 3.3.4 Nevertheless, construction dust shall be suppressed during dusty construction activities under dry and windy conditions.
- 3.3.5 In addition, construction noise shall be eliminated to avoid adverse impacts on the nearby sensitive receivers.



# 4. ENVIRONMENTAL AUDIT

## 4.1 Site Inspection

- 4.1.1 Weekly site inspections are jointly conducted among MTRC, MC and ET. The site inspection follows strictly the agreed Site Inspection Checklist, which covers all the site audit requirements stipulated in the EM&A Plan, PS and all relevant environmental laws.
- 4.1.2 The completed Site Inspection Checklists are distributed to all relevant parties within 48 hours upon completion of the site inspection for agreement and signature of the relevant parties and, where appropriate, for implementation of the recommended corrected actions to promptly rectify the situation.
- 4.1.3 The site inspections during the Reporting Period were conducted on 4, 11, 18 and 25 April 2014. Deficiencies or findings of the site audit and the associated follow up actions are summarized in the following **Table 4-1**:

Date of Site Inspection	Deficiencies or findings	Follow-Up Action
01 April 2014	No observations were recorded.	Not required.
08 April 2014	Stagnant water was observed within the site, posing potential of direct discharge to the receiving water body and mosquito breeding. Regular clearance was required.	Stagnant water was cleared.
15 April 2014	No observations were recorded.	Not required.
22 April 2014	No observations were recorded.	Not required.
29 April 2014	No observations were recorded.	Not required.

#### Table 4-1 Summary of Findings and Follow-Up Actions of the Site Inspection

4.1.4 As shown in *Table 4-1*, no deficiencies or non-compliance of environmental mitigation measures or adverse environmental impacts were observed during the Reporting Period.

## 4.2 Compliance with Legal/Contractual Requirements

4.2.1 Construction activities under the Project must comply with all environmental protection and pollution control laws in Hong Kong, as well as the contractual requirements of the Project. **Table 4-2** summarizes breaches of legal and contractual requirements.

#### Table 4-2 Summary of Breaches of Legal and Contractual Requirements

Month	Number of Breaches	Cumulative
April 2014	0	0



#### **Environmental Complaints** 4.3

- 4.3.1 Environmental complaints are handled following closely the flow chart of complaint response procedure which is enclosed in Appendix L.
- 4.3.2 Environmental complaints registered during the Reporting Period are summarised in Table 4-3 below:

		Table 4-3 Summary of Complain	<u>t</u>
Mont	th Number Complai		<i>Cumulative</i> Number of Complaint
April 20	014 0	Not Applicable	0

#### Notification of Summons /Successful Prosecutions 4.4

4.4.1 Notification of summons and successful prosecutions registered during the Reporting Period are summarised in Table 4-4 below:

	Table 4-4         Summary of Summon and Successful Prosecutions					
Month	Number of Issue	Nature of Issue	Cumulative Number of Issue			
April 2014	0	Not Applicable	0			

#### -. . . .

#### 4.5 Future key environmental issues

- 4.5.1 Future key environmental issues include
  - a) air quality in particular construction dust during dusty construction activities, e.g. demolishment of the Entrance D1 and excavation works, under dry and windy conditions;
  - b) construction noise during noisy activities; and
  - c) particularly in the approaching rain season, site surface water run-off and construction wastewater discharge.
- 4.5.2 To avoid potential of adverse environmental impacts of the key environmental issues stated above, full implementation of the mitigation measures as stipulated in the Implementation Schedule shown in **Appendix D** is required, and the mitigation measures for air quality, construction noise and water quality implemented to date shall be properly maintained. Where appropriate, improvement of the implemented mitigation measures is reminded to ensure effectiveness of the mitigation measures.



# 5. WASTE MANAGEMENT

## 5.1 Waste Management

- 5.1.1 Despite small scale of the Project and the amount of C&D material that needs to be hauled off site and disposed of is anticipated not to be significant, 3-R waste management i.e. Reduce, Reuse and Recycle, is adopted in order to minimize adverse environmental impacts to be generated from construction of the Project.
- 5.1.2 Waste management under the Project is performed in accordance with the Waste Management Plan, which has been prepared for implementation of the construction waste mitigation measures in compliance with the requirements stipulated in the EM&A Plan, PS, Waste Disposal Ordinance and the associated subsidiary regulations.

## 5.2 Waste Management Record

5.2.1 Updated waste management status is detailed in *Appendix M*, where the 3-R status of the construction waste generated from construction of the Project during the Reporting Period is presented.



# 6. CONCLUSIONS / RECOMMENDATIONS

### 6.1 Conclusions

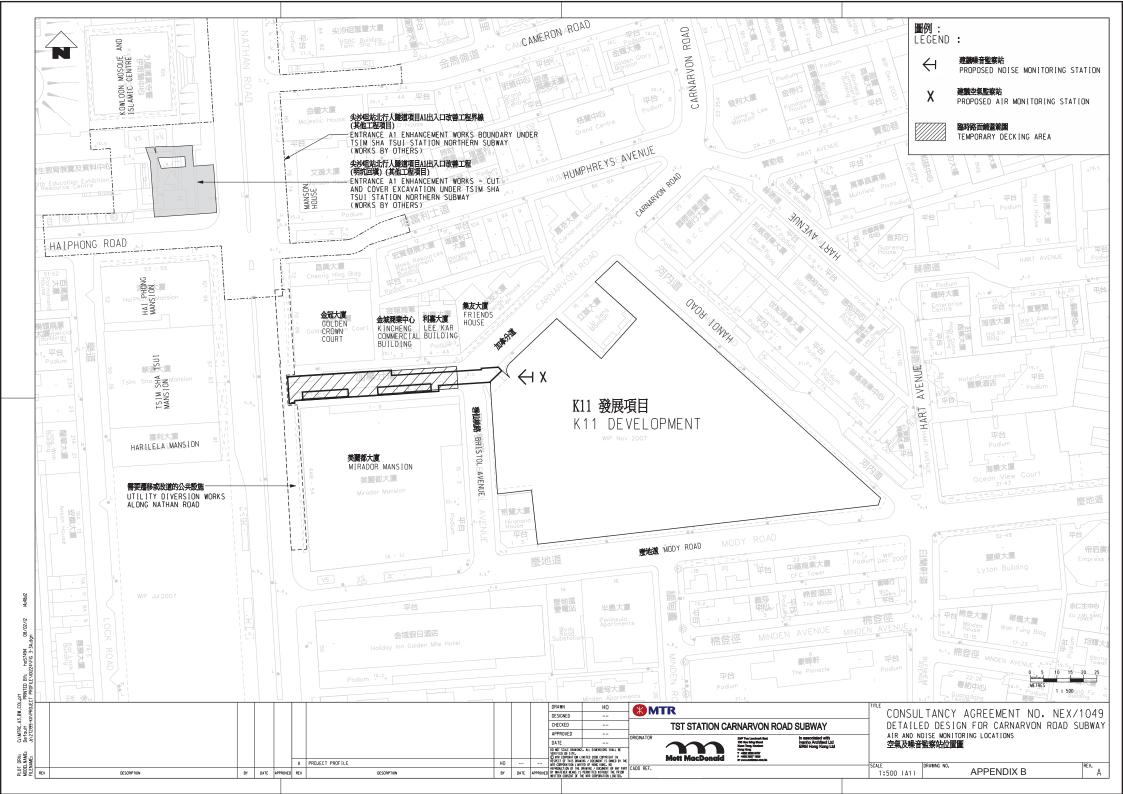
- 6.1.1 No NOE and the associated NOE investigation and follow-up actions were required as the environmental monitoring results registered no exceedances of A/L Levels of air quality and construction noise during the Reporting Period.
- 6.1.2 No corrective actions were required as the environmental audit during the Reporting Period observed:
  - a) no deficiencies with major environmental significance of the required environmental mitigation measures;
  - b) no non-compliance with the required waste management; and
  - c) no adverse environmental impacts on the sensitive receivers environed with the site of the Project.
- 6.1.3 In addition, no remedial actions were required as no environmental complaints, notification of summons and successful prosecutions were reported during the Reporting Period.
- 6.1.4 Nevertheless, occasional observations of inadequacies of proactive environmental mitigation measures were recorded during the regular site inspection and audit. They were rectified in situ or before the following site audit upon identification or notification.

## 6.2 Recommendations

- 6.2.1 Full implementation of the environmental mitigation measures stipulated in the EM&A Plan and summarized in *Implementation Schedule* of *Appendix D* is required. Where necessary, proper maintenance and improvement of the implemented mitigation measures are reminded.
- 6.2.2 Particular attention is drawn to the compliance with water quality mitigation measures during the approaching rain season.
- 6.2.3 In addition, suppression of construction dust is required during dusty construction activities under dry and windy conditions.
- 6.2.4 Furthermore, construction noise shall be eliminated to avoid adverse impacts on the nearby sensitive receivers.

Appendix A

Site Location Plan

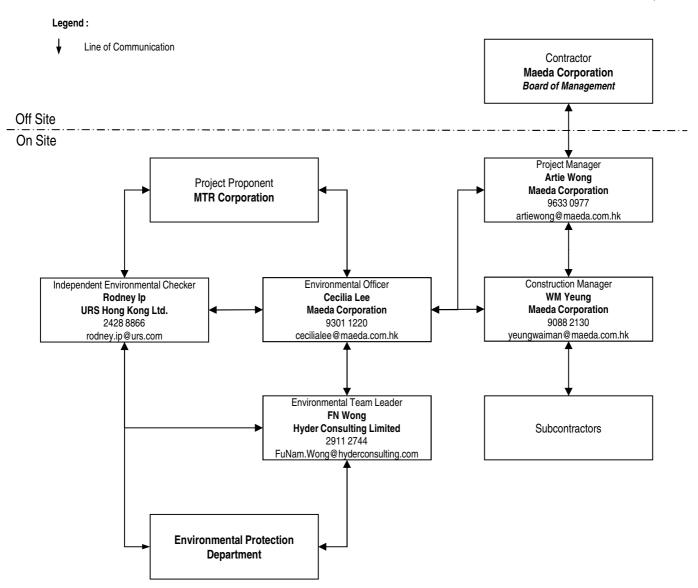


Appendix B

Management Structure

### **Project Organization Chart in Environmental Management (Rev.01)**

Effective Date: 2 Apr 2014



Note: In compliance with

i) Clause. 1.3 of Environmental Monitoring and Audit Manual (Appendix VII of Project Profile PP462/2012)

Appendix C

**Construction Programme** 

	<b>MTR</b>					CONTRACT C3840-13C Tsim Sha Tsui Station, Carnarvon Road Subway	
١D	Activity Name	Orig Dur	Planned Start	Planned Finish	Total Flo	2014         2015         2016         2017           Oct N D Jan F M Apr M J Jul A S Oct N D Jan F M Apr M J Jul A S Oct N D Jan F M Apr M J Jul A S Oct N D Jan F M Apr M J Jul A S Oct N D Jan F M Apr M J Jul A S         2016         2017	S Oct N D
Preliminary Master Pro	ogramme Revision 2	827d	14-Oct-13	31-Jul-16			5 000 11 0
Preliminaries		827d	14-Oct-13	31-Jul-16			
Contract Key Dates		Od	14-Oct-13	14-Oct-13	;   · · ·		
C3840-CD-20	Date of Commencement	Od	14-Oct-13			▶ Datejof Commiencement	
Specified Degrees of Co	mpletion	Od	31-Jul-16	31-Jul-16			
C3840-CD-2A	Complete to Deg. 1 status for all civil engineering works and ABWF in Subway outside	Od		31-Jul-16		r⊷♦ Complete to Deg. 1 status for all civil engineering warks an	Id ABWF in Sub
Possession of Works Are	K11 Lot Boundary (31 Jul 16) ea As PS Clause P8 & PS Appendix G	Od	31-Oct-13	31-Oct-13			
C3840-AD-20	Access Date for Works Area 3840.W1 (subject to SLG/TMLG Approval)		31-Oct-13			Access Date for Works Area 3840.W1 (subject to SLG/TMLG Approval)	
	Access Date for Works Area 3040.00 ( (Subject to SLS) Third Approval)						
Initial Site Survey				10-Dec-13			
C3840-SS-20	Validate the survey record and carry out any necessary additional survey at Works Areas 3840.W1 & W2	35d	31-Oct-13	10-Dec-13	3	Validate the survey record and carry out any necessary additional survey at Works Areas 3840.W1 & W2	
Temporary Works Desig	n & Approval Process (Incl. Demolition)	12d	16-Oct-13	30-Oct-13			
Temporary Traffic Mang	jement Scheme (TTM)	12d	16-Oct-13	30-Oct-13			
C3840-TTM-100	Appoint Traffic Consultant	0d		16-Oct-13		Appoint Traffic Consultant	
C3840-TTM-110	Pepare & submit review by Eng Outline TTM Schemes as per PS P20.4	6d	17-Oct-13	23-Oct-13	i	Pepare & submit review by Eng Outline TTM Schemes as per PS P20.4	
C3840-TTM-120	Eng review Outline TTM Schemes	4d	24-Oct-13	28-Oct-13	i	Eng review Outline TTM Schemes	
C3840-TTM-130	Prepare Detailed TTMS	5d	24-Oct-13	29-Oct-13		Prepare Detailed TTMS	
C3840-TTM-140	Discussion and agree in priniciple at TMLG Meeting	1d	30-Oct-13	30-Oct-13		Discussion and agree in priniciple at TMLG Meeting	
Carnarvon Road Subv				22-Jun-16			
				02-May-14			
	dvance Ground Works & Piling Works)						
Advance Ground Works				08-Feb-14			
C3840-AGW-020	Trial Pit/trench excavation	69d	14-Nov-13	08-Feb-14		Trial Pit/trench excavation	
C3840-AGW-040	Pre-drilling works	24d	27-Dec-13	3 24-Jan-14		Pre-drilling works	
Piles & Grouting for Ver	rtical Shaft	51d	27-Feb-14	02-May-14	1		
C3840-EVS-010	Mobilization for Piling Rig and Setup	4d	27-Feb-14	03-Mar-14	+	Mobilization for Piling Rig and Setup	
C3840-EVS-020	52 nos. pipe piles with 1m. to 2.2m. minimum rock socket	35d	04-Mar-14	14-Apr-14		52 nos. pipe piles with 1m. to 2.2m. minimum rock socket	
C3840-EVS-030	Grouting for Vertical Shaft Bulk Head	18d	17-Mar-14	07-Apr-14		Gro <mark>uting for Vertical Shaft Bulk Head</mark>	
C3840-EVS-040	Curtain Grouting vertical shaft	18d	08-Apr-14	02-May-14	1	urtain Grouting ventical shaft	
Tunnel (Vertical Shaft Ex	cavation)	226d	03-May-14	31-Jan-15			
C3840-SH-100	Pump Test			4 31-May-14		Pump Test	
C3840-SH-110	Excavation for 1st layer 140m3 50m3/day			05-Jun-14			
C3840-SH-120	Install 1st waling, strut & legging wall			10-Jun-14			
C3840-SH-130	Shotcrete 1st layer	2d	11-Jun-14	12-Jun-14		Shotcrete 1st layer	
				~	ata D-1		
Actual Work	♦ Milestone			D	ata Date	1-Oct-13     Maeda/P/PMP/2       Preliminary Master Programme     Date     Revision     Checked	Approve
Remaining Work     Critical Remaining					Page	of 3 of 3 Premining Waster Flogramme Date Nevision Checked	W

	<b>MTR</b>				0011	TRACT C3840-13C Tsim Sha Tsui Station, Carnarvon Road Subway
	Activity Name	Orig Dur	Planned Start	Planned T Finish	otal Float	2014 2015 2016 D Jan F M Apr M J Jul A S Oct N D Jan F M Apr M J Jul A S Oct N D Jan F M Apr M J J
C3840-SH-140	Excavation for 2nd layer 190m3 50m3/d	4d	13-Jun-14	17-Jun-14	8d	D Jan F M Apr M J Jul A S Oct N D Jan F M Apr M J Jul A S Oct N D Jan F M Apr M J Jul A S Oct N D Jan F M Apr M J J
3840-SH-150	Install 2nd waling, strut & lagging wall	4d	18-Jun-14	4 21-Jun-14	8d	🚽 Install 2nd waling, strut & lagging wall
40-SH-160	Shotcrete 2nd layer	2d	23-Jun-14	4 24-Jun-14	8d	Shotcrete 2nd laver
3840-SH-170	Install Decking with Subframe to cover all area	4d	25-Jun-14	4 28-Jun-14	8d	Install Decking with Subframe to cover all area
3840-SH-180	Excavation for 3rd layer 360m3 50m3/d	7d	30-Jun-14	4 08-Jul-14	8d	Excavation for 3rd layer 360m3 50m3/d
840-SH-190	Install 3rd waling, strut & lagging wall	5d	09-Jul-14	14-Jul-14	8d	install 3rd waling, strut β lagging wall
840-SH-200	Shotcrete 3rd layer	2d	15-Jul-14	16-Jul-14	8d	Shottcrete 3rd layer
840-SH-210	Excavation for 4th layer117m3 (soil) @ 50m3/d, 205m3 (rock) 3m3/d	71d	17-Jul-14	10-Oct-14	8d	Excavation for 4th layer117m3 (soil) @ 50m3/d, 205m3 (rock) 3m3/d
40-SH-230	Shotcrete 4th layer	2d	11-Oct-14	13-Oct-14	8d	Shotcrete 4th layer
840-SH-240	Make formation and Blinding	2d	14-Oct-14	4 15-Oct-14	8d	Make formation and Blinding
840-SH-250	Modify waling and strut	3d	16-Oct-14	4 18-Oct-14	8d	Modify waling and strut
3840-SH-260	Adjustable Steel Platform Setup for Grouting & Piling Works)	12d	20-Oct-14	4 01-Nov-14	8d	Adjustable Steel Platform Setup for Grouting & Piling Works)
8840-SH-270	Horizontal Grouting (48 Nos. Grout Holes)	27d	03-Nov-14	4 03-Dec-14	8d	Horizontal Grouting (48 Nos. Grout Holes)
3840-SH-280	Horizontal Pipe Roofing (59 Nos. Pipe Pile)	27d	04-Dec-14	4 07-Jan-15	8d	Horizontal Pipe Roofing (59 Nos. Pipe Pile)
3840-SH-290	Horizontal Re-grouting	14d	08-Jan-15	5 23-Jan-15	8d	Horizontal Re-grouting
840-SH-300	Install Portal Frame	3d	24-Jan-15	5 27-Jan-15	8d	
840-SH-310	Cut Pipe Pile	4d	28-Jan-15	5 31-Jan-15	8d	Cùt Pipe Pile
nel (ELS, Excavati	on & Construction of Tunnel)	408d	02-Feb-15	5 22-Jun-16	8d	
3840-TU-100	Excavation, shotcrete & install steel framework support for 1st 6m	70d	02-Feb-15	5 02-May-15	8d	Excavation, shotcrete & install steel framework support for 1st
340-TU-110	Excavation, shotcrete & install steel framework support for next 7m	75d	04-May-18	5 01-Aug-15	8d	Excavation, shotcrete & install steel framework su
840-TU-120	Excavation, shotcrete & install steel framework support for last 7m	75d	03-Aug-15	5 31-Oct-15	8d	Excavation, shotcrete & install steel
3840-TU-130	Install intermediate portal frame	3d	02-Nov-15	5 04-Nov-15	8d	Iristall'intermediate portal frame
3840-TU-140	Install intermediate horizontal pipe roofing incl. mobilization & demobilization	19d	05-Nov-15	5 26-Nov-15	8d	Install intermediate horizontal pi
3840-TU-150	Horizontal re-grouting for intermediate section	6d	27-Nov-15	5 03-Dec-15	8d	Horizontal re-grouting for interr
C3840-TU-160	Install Support, excavation & shotcret for intermediate section	33d	04-Dec-18	5 14-Jan-16	8d	install Support, excavatio
3840-TU-180	Install dowel bars & concrete collar beams	10d	15-Jan-16	6 26-Jan-16	8d	Install dowel bars & co
3840-TU-210	Breakthrough (core & saw cut) into K11 Lot & associated works	18d	27-Jan-16	5 19-Feb-16	8d	Breakthrough (cdre
3840-TU-220	Construct Slab 2 Bays (2 pours)	12d	20-Feb-16	6 04-Mar-16	8d	Constfuct Slab 2
3840-TU-230	Construct Wall & Roof (incl. removal of struts) 2 Bays (8 pours)	64d	05-Mar-16	6 25-May-16	8d	Cons
3840-TU-240	Curing	10d	26-May-16	6 06-Jun-16	8d	
3840-TU-250	Dismantle falsework	10d	31-May-16	6 11-Jun-16	8d	
3840-TU-260	Grouting into void above	6d	13-Jun-16	6 18-Jun-16	8d	
Actual Work	Milestone			Data	Date: 11-Oct-13	<sup>3</sup> Preliminary Master Programme D
Remaining Wor	rk				Page 2 of 3	

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Activity ID	Activity Name	Orig	Planned	Planned	Total Float				2	2014				2015					2016				20	17	0.
		Dur	Start	Finish		Oct N	D Jan	F M Apr	MJ	Jul A	S Oct N	D Jar	n F M Apr M	1 J Jul	A S O	Oct N	D Jan I	M Apr M	1 J Jul	A S	Oct N D Ja	n F M	Npr M J	Jul A	S Oct N D Ja
	C3840-TU-270 Cut Pipe pile at interface	3d	20-Jun-16	22-Jun-16	8d														Left Cut	Pipe pile	e at interface				
Βι	uilding Services & ABWF Works	70d	27-Apr-16	21-Jul-16	8d																				
	BS & ABWF Works at Subway Conc. Level and Plant Room & D3	70d	27-Apr-16	21-Jul-16	8d																				
	C3840-BSS-120 ABWF Works to Deg. 1 Completion	70d	27-Apr-16	21-Jul-16	8d														+	ABWF	Works to Deg. 1	Completion			

Actual Work   Milestone	Data Date: 11-Oct-13		
Remaining Work		Preliminary Master Programme	Date
	Page 3 of 3		27-Feb-14
Critical Remaining Work		Extract Critical Path 1	

Maeda/P/PMP/2													
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<b>MTR</b>	CONTRACT	C3840-13C Tsim Sha Tsui Station, Carnarvon Road Subway	
Activity ID Activity Name	Orig Planned Planned Total Float Dur Start Finish Oct N D Jan F	2014         2015           M Apr M J Juli A S Oct N D Jan F M Apr M J Juli A S Oct N D Jan F M Apr M J Juli A S Oct N D Jan F M Apr M J Juli A S Oct N D Jan F M Apr M J Juli A S Oct N D Jan F M Apr M Apr M J Juli A S Oct N D Jan F M Apr M Apr M J Juli A S Oct N D Jan F M Apr M Apr M J Juli A S Oct N D Jan F M Apr M Apr M J Juli A S Oct N D Jan F M Apr M Apr M J Juli A S Oct N D Jan F M Apr M Apr M J Juli A S Oct N D Jan F M Apr M Apr M Apr M J Juli A S Oct N D Jan F M Apr M Apr M Apr M J Juli A S Oct N D Jan F M Apr M Apr M Apr M J Juli A S Oct N D Jan F M Apr M Apr M J Juli A S Oct N D Jan F M Apr M Apr M Apr M J Juli A S Oct N D Jan F M Apr M Ap	2016 2017 018
Preliminary Master Programme Revision 2	898d 11-Oct-13 23-Oct-16 0d		
Preliminaries	898d 11-Oct-13 23-Oct-16 Od		
Contract Key Dates	3d 11-Oct-13 14-Oct-13 0d		
C3840-CD-10 Date of Contract Award	0d 11-Oct-13 0d 🕈 Date of Contract A	vard	
C3840-CD-20 Date of Commencement	0d 14-Oct-13 0d → Date of Commence	ament	
Specified Degrees of Completion	0d 23-Oct-16 23-Oct-16 0d		
C3840-CD-2C Complete energisation of the power isolator in the Telephone Equipment Rm (23 Oct	0d 23-Oct-16 0d		Complete energisation of the power isolator in the Telephone Equip
Possession of Works Area As PS Clause P8 & PS Appendix G	0d 31-Oct-13 31-Oct-13 0d		
C3840-AD-20 Access Date for Works Area 3840.W1 (subject to SLG/TMLG Approval)	Od 31-Oct-13 Od 🛨 Access Date fo	Works Area 3840.W1 (subject to SLG/TMLG Approval)	
Initial Site Survey	35d 31-Oct-13 10-Dec-13 0d		
C3840-SS-20 Validate the survey record and carry out any necessary additional survey at Works	35d 31-Oct-13 10-Dec-13 0d ➡ ➡ Validate th	e survey/record and carry out any necessary additional survey at Works Areas 3840.W1 & W2	
Areas 3840.W1 & W2 Procurement of Subcontract Packages	4d 11-Oct-13 16-Oct-13 0d		
Preliminaries and Utilities Diversion	4d 11-Oct-13 16-Oct-13 0d		
C3840-PRC-140 Temporary Traffic Diversion (Consultant)	4d 11-Oct-13 16-Oct-13 0d D Temporary Traffic	Diversion (Consultant)	
Temporary Works Design & Approval Process (Incl. Demolition)	12d 16-Oct-13 30-Oct-13 0d		
Temporary Traffic Mangement Scheme (TTM)	12d 16-Oct-13 30-Oct-13 0d		
C3840-TTM-100 Appoint Traffic Consultant	0d 16-Oct-13 0d ≯Appoint Traffic Co		
C3840-TTM-110 Pepare & submit review by Eng Outline TTM Schemes as per PS P20.4		review bý Eng Oulline TTM Schemes as per PS P20.4	
C3840-TTM-120 Eng review Outline TTM Schemes	4d 24-Oct-13 28-Oct-13 0d 1 Eng review Outli	ne TTM Schemes	
C3840-TTM-130 Prepare Detailed TTMS	5d 24-Oct-13 29-Oct-13 0d H Préparé Dețailec		
C3840-TTM-140 Discussion and agree in priniciple at TMLG Meeting	1d 30-Oct-13 30-Oct-13 0d Discussion and	agree in priniciple;at TMLG Meeting	
Carnarvon Road Subway and Entrances	774d 14-Nov-13 28-Jun-16 0d		
Utility Diversion	57d 10-Feb-14 17-Apr-14 0d		
C3840-UTD-290 Diversion of Gasmain as necessary	57d 10-Feb-14 17-Apr-14 0d	Diversion of Gasmain as necessary	
Open Cut Sequence 1 (Advance Ground Works & Piling Works)	444d 14-Nov-13 18-May-15 0d		
Advance Ground Works	69d 14-Nov-13 08-Feb-14 0d		
C3840-AGW-020 Trial Pit/trench excavation	69d 14-Nov-13 08-Feb-14 0d	rial Pit/trench excavation	
Piles & Grouting for Vertical Shaft	39d 27-Feb-14 14-Apr-14 0d		
C3840-EVS-010 Mobilization for Piling Rig and Setup	4d 27-Feb-14 03-Mar-14 0d	Monization for Piling Rig and Setup	
C3840-EVS-020 52 nos. pipe piles with 1m. to 2.2m. minimum rock socket	35d 04-Mar-14 14-Apr-14 0d	52 nos. ppe piles with 1m. to 2.2m. minimum rock socket	
Piles & Grouting for Temporary Staricase & C&C Subway	59d 15-Apr-14 28-Jun-14 0d	╌╏╴╊	
C3840-ETS-020 70 nos. pipe piles along Grid Line A with 1m. to 3.1m minimum rock socket	47d 15-Apr-14 14-Jun-14 Od	-10 nos. pipe piles along Grid Line A with 1m. to 3.1m minimum rock socket	
Actual Work   Milestone  Remaining Work	Data Date: 11-Oct-13	Preliminary Master Programme	Maeda/P/PMP/2           Date         Revision         Checked         Approved
Critical Remaining Work	Page 1 of 5		27-Feb-14 REV 2 BG AW
		Extract Critical Path 2	

	MTR				
vity ID	Activity Name		Planned Total Fl Finish	at 2014 2015 Oct N D Jan F M Apr M J Jul A S Oct N D Jan F M Apr M J Jul A S Oct N D Jan F M Apr	2016 2017
C3840-ETS-030	Curtain Grouting along Grid Line A	24d 29-May-14	26-Jun-14		
C3840-ETS-070	Type III Sheet Plle, 355m along between Grids A & B	6d 22-Apr-14	28-Apr-14	Dd Type III Sheet Plle, 355m along between Grids A & B	
C3840-ETS-080	Toe Grouting	8d 29-Apr-14	09-May-14	Da Grouting	
C3840-ETS-090	Mobilization for Piling Rig and Setup	4d 10-May-14	14-May-14	Dd	
C3840-ETS-110	37 nos. pipe piels along Grid Line B with 1m. to 1.5m. minimum rock socket	25d 15-May-14	13-Jun-14	Dd \$7 nos. pipe piels along Grid Line B with 1m. to 1.5m. minimum tock socket	
C3840-ETS-120	Curtain Grouting along Grid Line B	13d 14-Jun-14	28-Jun-14	Dd Curtain Grouting along Grid Line B	
Piles & Grouting for Re	maining Section of Cofferdam at D2	20d 24-Apr-15	18-May-15		
C3840-ECD-010	Mobilization for Piling Rig and Setup	4d 24-Apr-15	28-Apr-15	Dd Mobilization for Piling Rig and Setup	
C3840-ECD-020	23 nos. pipe piles along Grid Line B at D2 with 1m. to 3.2m minimum rock socket	16d 29-Apr-15	18-May-15	Jd 23 nos. pipe piles along Grid Line B at D2 with 1	1m. to \$.2m minimum rock socket
Open Cut Sequence 2 (E	Excavation for Temporary Staricase)	209d 30-Jun-14	11-Mar-15		
Excavation		93d 30-Jun-14	20-Oct-14		
C3840-EXC-100	Pump test prior to excavate for temporary staricase	24d 30-Jun-14	28-Jul-14	d	
C3840-EXC-120	Excavation for 1st layer at D1 208m3	4d 29-Jul-14		Dd	
C3840-EXC-130	Install 1st waling & strut 21ton & temporary support to underground UUs	7d 02-Aug-14		Dd	
C3840-EXC-140	Install Truss for Suport Temp D1	6d 11-Aug-14		d	
C3840-EXC-150	Shotcrete 1st layer	2d 18-Aug-14	19-Aug-14	d	
C3840-EXC-160	Demolish D1 4m below GL	6d 20-Aug-14	26-Aug-14	d	
C3840-EXC-170	Excavation for 2nd layer at D1 230m3	5d 27-Aug-14		Dd Excavátion for 2nd layer at D1 230m3	
C3840-EXC-180	Install 2nd waling & strut 17ton	7d 02-Sep-14	10-Sep-14	Dd I I I I I I I I I I I I I I I I I I I	
C3840-EXC-190	Shotcrete 2nd layer	2d 11-Sep-14	12-Sep-14	d \$hot¢rete 2nd layer	
C3840-EXC-200	Excavation for 3rd layer at D1 216m3	5d 13-Sep-14	18-Sep-14	d	
C3840-EXC-210	Install 3rd waling & strut 15ton	6d 19-Sep-14		d	
C3840-EXC-220	Shotcrete 3rd layer	4d 26-Sep-14		Dd Shotcrete 3rd lalver	
C3840-EXC-230	Excavation for 4th layer at D1 166m3	4d 03-Oct-14	07-Oct-14	Dd Excavation for 4th layer at D1 166m3	
C3840-EXC-240	Install channel on opening	3d 08-Oct-14	10-Oct-14	Dd Install channel on opening	
C3840-EXC-250	Shotcrete 4th layer	4d 11-Oct-14	15-Oct-14	Dd Shotcrete 4th Jayer	
C3840-EXC-260	Make formation and Blinding	4d 16-Oct-14	20-Oct-14	Dd Make formation and Binding	
RC Structure (Temporal	ry Staricase)	116d 21-Oct-14	11-Mar-15		
C3840-TSC-100	Install Dowel bars (130#)	6d 21-Oct-14	27-Oct-14	Dd Install Dowe) bars (13,0#)	
C3840-TSC-110	Const. Bay1 : 18m3	6d 28-Oct-14	03-Nov-14	Dd Const.; Bay/1 : 18m3	
C3840-TSC-120	Const. Bay2 : 16m3	9d 04-Nov-14	13-Nov-14	Dd Const. Bay2 :16m3	
C3840-TSC-130	Const. Bay3 : 6m3	6d 14-Nov-14	20-Nov-14	Dd Const. Bay3 : 6m3	
Actual Work	♦ Milestone		Data Date	11-Oct-13	Maeda/P/PMP/2
Remaining Work			Page	2 of 5 Preliminary Master Programme	Date         Revision         Checked         Approved           27-Feb-14         REV 2         BG         AW
Critical Remaining	) Work			Extract Critical Path 2	

		<b>MTR</b>					CONTRACT C3840-13C Tsim Sha Tsui Station, Carnarvon Road Subway		
Activity ID		Activity Name	Orig Dur	Planned Start	Planned Finish	Total Float	2014         2015         2016           ct         N         D         Jan         F         M         Apr         M         J         Jul         A         S         Oct         N         D         Jan         F         M         Apr         M         J         Jul         A         S         Oct         N         D         Jan         F         M         Apr         M         J         Jul         A         S         Oct         N         D         Jan         F         M         Apr         N         D         Jan         F         M         Apr         A         S         Oct         N         D         Jan         F         M         Apr         M         D         Jan         F         M         Apr         N         D         Jan         F         M         Apr         N         D         Jan         F         M         Apr         Ap	2017	S Oct N D Jar
C384	0-TSC-150	Const. Bay5 : 35m3	13d	21-Nov-14	05-Dec-14				
C384	0-TSC-160	Const. Bay6 : 39m3	15d	06-Dec-14	23-Dec-14	Od	Const. Bay6 39m3		
C384	0-TSC-170	Const. Bay7 : 34m3	14d	16-Dec-14	03-Jan-15	DO	Const: Bay: : 34m3		
C384	0-TSC-180	Const. Bay8 : 4m3	6d	31-Dec-14	07-Jan-15	Od	∎≪Const. Bay8 : 4m3		
C384	0-TSC-190	Const. Bay9 : 44m3	14d	08-Jan-15	23-Jan-15	Od	Const. Bay9: 44m3		
C384	40-TSC-240	Temporary Staircase Commissioning & open for use	Od		11-Mar-15	Od	Temporary Staircase Commissioning & open for use		
Open Cut	Sequence 3 (Ac	dvance Ground Works & Piling Works at D2 & in front of D1)	33d	12-Mar-15	23-Apr-15	Od			
С3840-Е	ELS-510	Joint Survey & Remove existing BS & ABWF Services at D2	6d	12-Mar-15	18-Mar-15	Od	Joint Survey & Remové existing BS & ABWF Services at D2		
С3840-Е	ELS-520	Const Flood Barrier at Concourse and D2	9d	19-Mar-15	28-Mar-15	Od	Const Flood Barrier at Concourse and D2		
С3840-Е	ELS-530	Demolish D2 above GL	12d	30-Mar-15	16-Apr-15	Od	Demdish D2 above GL		
С3840-Е	ELS-540	Set Conc block in D2 opening	6d	17-Apr-15	23-Apr-15	Od	Set;Conc black in D2;opening		
Open Cut	Sequence 4 (E)	xcavation for Subway in front of D1)	182d	27-Jun-15	02-Feb-16	Od			
С3840-Е	ELSD1-100	Excavation for 1st layer 378m3, 25m3/day	15d	27-Jun-15	15-Jul-15	Od	Excalvation for 1st layer 378m3, 25m3/day		
С3840-Е	ELSD1-110	Install 1st waling & strut & Utility Support	24d	03-Jul-15	30-Jul-15	Od	Install 1st waling & strut & Utility Support		
С3840-Е	ELSD1-130	Install Decking with Subframe to cover all area	12d	31-Jul-15	13-Aug-15	Od	Install Decking with Subframe to cover all area		
С3840-Е	ELSD1-140	Shotcrete 1st layer	2d	14-Aug-15	15-Aug-15	Od	Shotprete 1st layer		
С3840-Е	ELSD1-150	Excavation for 2nd layer 421m3 50m3/day	9d	17-Aug-15	26-Aug-15	Od	Excavation for 2nd layer 421m3 50m3/day		
С3840-Е	ELSD1-160	Install 2nd waling & strut	8d	21-Aug-15	29-Aug-15	Od	nstall 2nd waling & strut		
С3840-Е	ELSD1-170	Shotcrete 2nd layer	2d	31-Aug-15	01-Sep-15	Od	Shotcrete 2nd layer		
С3840-Е	ELSD1-180	Demolish existing subway 7.5m below GL	6d	02-Sep-15	08-Sep-15	Od	Demolish existing subway 7.5m below GL		
С3840-Е	ELSD1-190	Excavation for 3rd layer 421m3, 50m3/d	9d	09-Sep-15	18-Sep-15	Od	Excavation for 3rd layer 421m3, 50m3/d		
С3840-Е	ELSD1-200	Install 3rd waling & strut	8d	14-Sep-15	22-Sep-15	Od	Install 3td waling & strut		
С3840-Е	ELSD1-210	Shotcrete 3rd layer	2d	23-Sep-15	24-Sep-15	Od	Shotcrete 3rd layer		
С3840-Е	ELSD1-220	Demolish existing subway 10.6m below GL	6d	25-Sep-15	03-Oct-15	Od	Demoish existing subway 10,6m below GL		
С3840-Е	ELSD1-230	Excavation for 4th layer 443m3, 50m3/d	9d	05-Oct-15	14-Oct-15	Od	Excavation for 4th layer 443m3, 50m3/d		
С3840-Е	ELSD1-240	Install 4th waling & strut	8d	09-Oct-15	17-Oct-15	Od	Install 4th waling & strut		
С3840-Е	ELSD1-250	Shotcrete 4th layer	2d	19-Oct-15	20-Oct-15	Od	Shotcrete 4th layer		
С3840-Е	ELSD1-260	Excavation for 5th layer 443m3, 50m3/d	9d	22-Oct-15	31-Oct-15	Od	Excavation for 5th layer 443m3, 50m3/d		
С3840-Е	ELSD1-270	Install 5th waling & strut	8d	27-Oct-15	04-Nov-15	Od	Install/5th waling & strut		
С3840-Е	ELSD1-280	Shotcrete 5th layer	2d	05-Nov-15	06-Nov-15	Od	Shotcrete 5th layer		
С3840-Е	ELSD1-290	Excavation Soil for 6th layer 392m3, 50m3/d	8d	07-Nov-15	16-Nov-15	Od	Excavation Soil for 6th layer 392m3, 50m3/d		
С3840-Е	ELSD1-300	Excavation Rock (Grade 2) 402m3, 8m3/d	50d	17-Nov-15	16-Jan-16	0d	Excavatión Rock (Grade 2) 402m3, 2m3/d		
					D-	nta Data: 44	Oct 12	Maada/D/DMD/2	
	al Work	<ul><li>♦ Milestone</li></ul>			Da	ata Date: 11	Preliminary Master Programme Date Rev	Maeda/P/PMP/2 vision Checked	Approved
	naining Work cal Remaining	Work				Page 3 o	f 5 27-Feb-14 REV 2		AW
							Extract Critical Path 2		

<b>MTR</b>									
Activity ID Activity Name D	Drig Planned Dur Start	Planned Finish	Total Float	2014 M Apr M J Jul A S Oct N D	2015 Jan F M Apr M J Jul A S Oct N D		2016	2017	
C3840-ELSD1-310 Install 6th waling & strut 8	3d 18-Jan-16	26-Jan-16	Od Od			Install 6th			
C3840-ELSD1-320 Shotcrete 6th layer 2	2d 27-Jan-16	28-Jan-16	Od			Shotcrete	6th layer		
C3840-ELSD1-330 Make formation and Blinding 4	4d 29-Jan-16	02-Feb-16	Od			Make for	mation and Blinding		
Open Cut Sequence 5 (Construction of Subway & D2) 11	16d 03-Feb-16	28-Jun-16	Od						
C3840-STR-110 Const. Bay1 : 4m3 6	6d 03-Feb-16	12-Feb-16	Od			Const.	Bay1 : 4m3		
C3840-STR-120 Const. Bay2 : 123m3 10	0d 13-Feb-16	24-Feb-16	Od			Const	. Bay2 : 123m3		
C3840-STR-130 Const. Bay3.1 : 125m3 10	0d 25-Feb-16	07-Mar-16	Od			Con	st. Bay3.1 : 125m3		
C3840-STR-140 Const. Bay3.2 : 120m3 15	5d 08-Mar-16	24-Mar-16	Od			L <mark>+</mark> ∎ c	onst. Bay3'2 : 1'20m'3		
C3840-STR-150 Const. Bay4 : 29m3 6	6d 18-Mar-16	24-Mar-16	Od			c	onst. Bay4 : 29m3		
C3840-STR-160 Const. Bay4.5 : 13m3 6	6d 23-Mar-16	01-Apr-16	Od		-		Const. Bay4.5 : 13m3		
C3840-STR-170 Const. Bay5 : 141m3 10	0d 31-Mar-16	12-Apr-16	Od				Const. Bay5 : 141m3		
C3840-STR-180 Const. Bay6.1 : 130m3 12	2d 13-Apr-16	26-Apr-16	Od			Ļ	Const. Bay6.1 : 130	Dm3	
C3840-STR-190 Const. Bay6.2 : 130m3 12	2d 18-Apr-16	30-Apr-16	Od			-	Const. Bay6.2 : 130	0 <b>n</b> 3	
C3840-STR-200 Const. Bay6.3 : 130m3 12	2d 22-Apr-16	06-May-16	Od			-	📕 Const. Bay6.3 : 13	30 <mark>i</mark> n3	
C3840-STR-210 Const. Bay6.4 : 130m3 12	2d 27-Apr-16	11-May-16	Od				Çonst. Bay6.4 : 1	30m3	
C3840-STR-220 Const. Bay6.5 : 130m3 15	5d 03-May-16	20-May-16	Od				Const. Bay6.5 :	1\$0m3	
C3840-STR-240 Const. Bay7 : 90m3 15	5d 06-May-16	24-May-16	Od				Const. Bay7: 9	30 <b>m</b> 3	
C3840-STR-260 Const. Bay8.1 : 104m3 10	0d 12-May-16	24-May-16	Od				Const. Bay8.1 :	: 104m3	
C3840-STR-270 Const. Bay8.2 : 104m3 10	0d 19-May-16	30-May-16	Od				Const. Bay8.2	:: 04m3	
C3840-STR-280 Const. Bay8.5 : 39m3 (D2) 15	5d 25-May-16	11-Jun-16	Od				¢onst. Bay8.	.5 39m3 (D2)	
C3840-STR-290 Curing, remove strut & falsework 14	4d 13-Jun-16	28-Jun-16	Od				Curing, re	move strut & falsework	
Building Services & ABWF Works 53	33d 05-Jan-15	22-Oct-16	Dd						
	4d 05-Jan-15	11-Mar-15	Od						
		23-Jan-15	Od		⊷ Complete RC works				
	0d 05-Jan-15		Od		Installation of BS and ABWF works	· · · · · · · · · · · · · · · · · · ·			
	0d 05-Jan-15		10		CN&SE access & cable routing connecting	to existing TST \$	Station		
	6d 25-Feb-15		Od		T&C				
	6d 04-Mar-15		Od		Inspection prior to open for public use				
	Dd	11-Mar-15	Od		<ul> <li>Open for public use</li> </ul>				
	6d 29-Jun-16		00						
	6d 29-Jun-16		b0					BS 1st Fix	
C3840-BSM-110 BS 2nd Fix 40	0d 03-Sep-16	22-UCT-16	Od					BS 2nd Fix	
	I	Data	a Date: 11-Oct-13				1	Maeda/P/PMP/2	
Actual Work   Milestone  Remaining Work		Date	Page 4 of 5	Prelimi	nary Master Programme		Date	Revision Checked	Approved
Critical Remaining Work				Exercise Figure 1	xtract Critical Path 2		27-Feb-14	REV 2 BG A	VV

Activity ID     Activity Name     Orig     Planned     Planned     Finsh     Total Float     Call Float     C				CONTRACT C3840-13C Tsim Sha Tsui Station, Carnarvon Road Subway																			
	Jul A S Oct N D				MADE	D lon E		15 WI A SI	201		Dian	S Oct N	2014	Apr. M	EM	Dilan	Total Float				Activity Name		Activity ID
		te all BS works in TER	000 11 2 000	<u>J Jul A J</u>		D Jan 1			VI J		DJaii	3 000				D Jaii	Od	22-Oct-16	0d		Complete all BS works in TER	C3840-BSM-120	

Actual Work   Milestone	Data Date: 11-Oct-13		
Remaining Work		Preliminary Master Programme	Date
Critical Remaining Work	Page 5 of 5		27-Feb-14
		Extract Critical Path 2	

	Maeda/F	P/PMP/2	
е	Revision	Checked	Approved
4	REV 2	BG	AW

Appendix D

Implementation Schedule

### Appendix VIII

### Implementation Schedule

Project Profile Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Parties	Location of the measure	When to implement the measure	Relevant requirements or standards for the measure to achieve
	Noise Impact	1				
S.3.1	Use of quieter plant	To minimise construction noise emissions	Contractor	Work site	Construction Stage	ProPECC PN2/93 and Noise Control Ordinance
S.3.1	<ul> <li>Use of noise enclosure and movable barrier</li> <li>movable barrier can achieve a 5 dB(A) reduction for movable PME and 10 dB(A) reduction for stationary PME;</li> <li>noise enclosure can achieve 15dB(A) reduction for PME;</li> <li>A typical design barrier with a steel frame of vertical / cantilever type would be adopted and located close to the noise generating part of PME;</li> <li>Barrier material of surface mass in excess of 7kg/m<sup>2</sup> shall be required to achieve the maximum screening effect (and minimum 10kg/m<sup>2</sup> for noise enclosure);</li> <li>The length of barrier should generally be at least five times greater than its height and the minimum height of a barrier should be such that no part of the noise source will be visible from the noise sensitive receiver being protected.</li> </ul>	To minimize construction noise emissions	Contractor	Work site	Construction Stage	ProPECC PN2/93, Noise Control Ordinance and EIAO Guidance Note NO. 9/2010
S.3.1	<ul><li>General Construction Noise Control Measures</li><li>The Code of Practice on Good Management Practice</li></ul>	To minimize construction noise	Contractor	Work site	Construction Stage	ProPECC PN2/93 and Noise Control

Project Profile Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Parties	Location of the measure	When to implement the measure	Relevant requirements or standards for the measure to achieve
	<ul> <li>to Prevent Violation of the Noise Control Ordinance (Chapter 400) (for Construction Industry) published by EPD shall be adopted;</li> <li>The statutory and non-statutory requirements and guidelines shall be complied with;</li> <li>Approval for the method of working, equipment and noise mitigation measures intended to be used at the site shall be granted from the Project Engineer before commencing any work;</li> <li>Working methods to minimize the noise impact on the surrounding NSRs shall be formulated and executed, and the implementation of these methods shall be monitored by experienced personnel with suitable training;</li> <li>Noisy equipment and noisy activities shall be located as far away from the NSRs as is practical;</li> <li>Unused equipment shall be turned off;</li> <li>PME should be kept to a minimum and the parallel use of noisy equipment shall be maintained regularly; and</li> <li>Material stockpiles and other structures shall be effectively utilized as noise barriers, whenever practicable.</li> </ul>	emissions				Ordinance
	Air Quality Impact					
S.3.2	<ul> <li>Construction Dust Control Measures</li> <li>Decking will be provided subsequent to the completion of surface excavation works. The duration</li> </ul>	To minimise the dust impacts arising from the	Contractor	Work site	Construction Stage	Air Pollution Control (Construction

Project Profile Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Parties	Location of the measure	When to implement the measure	Relevant requirements or standards for the measure to achieve
	<ul> <li>of decking is around 13 months after surface excavation works;</li> <li>Regular watering to reduce dust emissions from all exposed site surface, particularly during dry weather;</li> <li>Frequent watering for particularly dusty construction areas and areas close to air sensitive receivers;</li> <li>Cover all excavated or stockpile of dusty material by impervious sheeting or spraying with water to maintain the entire surface wet;</li> <li>Provision of vehicle washing facilities at the exit points of the site; and</li> <li>Provision of tarpaulin covering of any dusty materials on a vehicle leaving the site.</li> </ul>	construction works				Dust) Regulation
	Water Quality Impact					
S.3.3	<ul> <li>Construction Water Quality Impact Measures</li> <li>The Contractor should design and implement all the mitigation measures and practices specified in the ProPECC PN 1/94 "Construction Site Drainage" and "Recommended Pollution Control Clauses for Construction Contracts" issued by EPD.</li> <li>All runoffs arising from the construction site should be properly collected and treated to ensure the discharge standards as stipulated in WPCO are met. Silt trap and oil interceptor should be provided to remove the oil, lubricants, grease, silt, grit and debris from the wastewater before being pumped to the public stormwater drainage system. The silt traps and oil interceptors should be cleaned and maintained regularly.</li> </ul>	To reduce water quality impact induced by the construction work	Contractor	Work Site	Construction Stage	ProPECC PN1/94; Water Pollution Control Ordinance

Project Profile Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Parties	Location of the measure	When to implement the measure	Relevant requirements or standards for the measure to achieve
	<ul> <li>Any foul effluent should not be discharged into any public sewer and stormwater drain, unless an effluent discharge permit is obtained under the WPCO by the Contractor.</li> <li>Site toilet facilities, if needed, should be chemical toilets or should have the foul water effluent directed to a foul sewer.</li> </ul>					
	Waste Management					
S.3.4	<ul> <li>Construction Waste Management Measures</li> <li>Excavated material should be reused on site as far as possible to minimise off-site disposal. Scrap metals or abandoned equipment should be recycled if possible.</li> <li>Waste arising should be kept to a minimum and be handled, transported and disposed of in a suitable manner.</li> <li>The Contractor should adopt a trip ticket system for the disposal of C&amp;D materials to any designated public filling facility and/or landfill. Independent audits of the Contractor and resident site staff will be undertaken to ensure that the correct procedures are being followed.</li> <li>Chemical waste shall be handled in accordance with the Code of Practice on the Packaging, Handling and Storage of Chemical Wastes.</li> <li>All general refuse should be segregated and stored in enclosed bins or compaction units and waste separation facilities for paper, aluminium cans, plastic bottles etc. should be provided to facilitate reuse or</li> </ul>	To adopt waste management measures in the way of avoiding, minimising, reusing and recycling so as to reduce waste generation	Contractor	Work Site	Construction Stage	Waste Disposal Ordinance (Cap. 54); Waste Disposal (Chemical Waste) (General) Regulation; ETWB TCW No. 31/2004; ETWB TCW No. 19/2005.

Project Profile Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Parties	Location of the measure	When to implement the measure	Relevant requirements or standards for the measure to achieve
	recycling of materials and their proper disposal.					
	Landscape and Visual Impact	·				
S.3.5	<ul> <li>Landscape and Visual Measures</li> <li>Screening of construction works by hoardings/noise barriers around works area with visually unobtrusive colours</li> </ul>	To reduce visual impact by construction works.	Contractor	Temporary Storage Area at Salisbury Road	Construction Stage	EIAO
S.3.5	<ul> <li>Reinstating the affected amenity planting area at Salisbury Road after the completion of works</li> </ul>	To prevent loss of planter after construction	Contractor	Temporary Storage Area at Salisbury Road	Operation Stage	ETWB TCW No. 2/2004



Appendix E

Status of Environmental Licenses and Permits



# Licence Summary

Item No.	Govt. Ord.	Type? (License / Permit / Account / Notification / Registration & etc.)	Description	Submission	Ref. No	Date of Submission (to EPD) (DD-MM-YYYY)	Date of Approval / Receipt (from EPD) (DD-MM-YYYY)	Date of Activation (DD-MM-YYYY)	Date of Expiry (DD-MM-YYYY) Green = expire next mth; Yellow = expire this wk; Red = Expired	Description	Remarks
000	EIAO	Permit	Environmental Permit	N/A	AEP-440/2012	N/A	N/A	18 - 07 - 2012	N/A	Baseline, Air & Noise Impact Monitoring	
001	APCO		Construction Dust Notification	Form NA – Notification S3(1) of APCO (Construction Dust)	365953	18 - 10 - 2013	21 - 10 - 2013	01 - 11 - 2013	01 - 12 - 2014	Site Formation	
001	APCO		Construction Dust Notification	Form NA – Notification S3(1) of APCO (Construction Dust)	365953	18 - 10 - 2013	21 - 10 - 2013	01 - 02 - 2014	01 - 10 - 2016	Demolition of a Building	
001	APCO		Construction Dust Notification	Form NA – Notification S3(1) of APCO (Construction Dust)	365953	18 - 10 - 2013	21 - 10 - 2013	01 - 08 - 2014	01 - 08 - 2016	Work carried out in any part of a tunnel that is within 100m of any exit to the open air	
001	APCO		Construction Dust Notification	Form NA – Notification S3(1) of APCO (Construction Dust)	365953	18 - 10 - 2013	21 - 10 - 2013	01 - 01 - 2016	01 - 03 - 2017	Construction of the Superstructure of a Building	
001	APCO		Construction Dust Notification	Form NA – Notification S3(1) of APCO (Construction Dust)	365953	18 - 10 - 2013	21 - 10 - 2013	01 - 11 - 2016	10 - 09 - 2017	Road Construction Work	
002	WDO		Construction Waste Billing Account	EPD-211 (Form 1) Application for a Billing Account for Disposal of Construction Waste	7018523	18 - 10 - 2013	25 - 10 - 2013	25 - 10 - 2013	N/A	Disposal of C&D Waste	Application No. WFG12765
003	WPCO		Water Discharge Licence	EPD-117 (Form A) Application for a Licence of Water Discharge	WT00018229-2014	09 - 01 - 2014	04 - 03 - 2014	04 - 03 - 2014	31 - 03 - 2019	Self Monitoring Only FlowRate 9m3/d, pH 6-9, SS 50mg/L, COD 100mg/L	
004	WDO	Ũ	Chemical Waste Producer	EPD-129 Application for Registration as a Chemical Waste Producer	5213-2214-M2446-16	15 - 01 - 2014	04 - 03 - 2014	04 - 03 - 2014	N/A	Surplus paint, spent lubrucating oil, spent battery	

Appendix F

**Event and Action Plan** 

## Event and Action Plan for Air Quality

In case the Action and Limit Levels are not complied during construction stage, the Event and Action Plan shown below should be followed.

Event / Action	ET	IEC	ER	Contractor
Action Level Exceedance for one sample	<ol> <li>Identify source;</li> <li>If valid, inform IEC and ER;</li> <li>Repeat measurement to confirm finding;</li> <li>Increase monitoring frequency to daily.</li> </ol>	<ol> <li>Check monitoring data submitted by ET;</li> <li>Check Contractor's working method.</li> </ol>	1. Notify Contractor	<ol> <li>Rectify any unacceptable practice;</li> <li>Amend working methods if appropriate</li> </ol>
Exceedance for two or more consecutive samples	<ol> <li>Identify source;</li> <li>Inform IEC and EPD;</li> <li>Repeat measurements to confirm findings;</li> <li>Increase monitoring frequency to daily;</li> <li>Discuss with IEC and Contractor on remedial action required;</li> <li>If exceedance continues, arrange meeting with IEC and ER;</li> <li>If exceedance stops, cease additional monitoring.</li> </ol>	<ol> <li>Check monitoring data submitted by ET;</li> <li>Check Contractor's working method;</li> <li>Discuss with ET and Contractor on possible remedial measures;</li> <li>Advise the ER on the effectiveness of the proposed remedial measures;</li> <li>Supervise implementation of remedial measures.</li> </ol>	<ol> <li>Confirm receipt of notification of failure in writing;</li> <li>Notify Contractor;</li> <li>Ensure remedial measure properly implemented.</li> </ol>	<ol> <li>Submit proposals for remedial action to IEC within 3 working days of notification;</li> <li>Implement the agreed proposals;</li> <li>Amend proposal if appropriate.</li> </ol>
Limit Level Exceedance for one sample	<ol> <li>Identify source;</li> <li>Inform ER and EPD;</li> <li>Repeat measurement to confirm finding;</li> <li>Increase</li> </ol>	<ol> <li>Check monitoring</li> <li>data submitted by ET;</li> <li>Check Contractor's working</li> </ol>	<ol> <li>Confirm receipt of notification of failure in writing;</li> <li>Notify Contractor;</li> <li>Ensure remedial</li> </ol>	<ol> <li>Take immediate action to avoid further exceedance;</li> <li>Submit proposals for remedial actions to IEC</li> </ol>

Action	ET	IEC	ER	Contractor
	monitoring frequency to daily; 5. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results.	<ul> <li>method;</li> <li>4. Discuss with ET and the Contractor on possible remedial measures;</li> <li>5. Advise the ER on the effectiveness of the proposed remedial measures;</li> <li>6. Supervise implementation of remedial measures.</li> </ul>	measures properly implemented.	within 3 worki days of notification; 3. Implement the agreed proposals; 4. Amend proposal if appropriate.
Exceedance for two or more consecutive samples	<ol> <li>Notify IEC, ER, Contractor and EPD;</li> <li>Identify sources;</li> <li>Repeat measurement to confirm findings;</li> <li>Increase monitoring frequency to daily;</li> <li>Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented;</li> <li>Arrange meeting with IEC and ER to discuss the remedial actions to be taken;</li> <li>Assess the effectiveness of Contractor's remedial actions and keep IEC, EPD and ER</li> </ol>	<ol> <li>Discuss amongst ER, ET and Contractor on the potential remedial actions;</li> <li>Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ET accordingly.</li> <li>Supervise the implementation of remedial measures.</li> </ol>	<ol> <li>Confirm receipt of notification of failure in writing;</li> <li>Notify Contractor;</li> <li>In consultation with IEC, agree with the Contractor on the remedial measures to be implemented;</li> <li>Ensure remedial measures properly implemented;</li> <li>If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated.</li> </ol>	<ol> <li>Take immedia action to avoid further exceedance;</li> <li>Submit proposals for remedial actions to IEC within 3 worki days of notification;</li> <li>Implement the agreed proposals;</li> <li>Resubmit proposals if problem still n under control;</li> <li>Stop the relevant portio of works as determined by the ER until th exceedance is abated.</li> </ol>

Event / Action	ET	IEC	ER	Contractor
	results;			
	8. If exceedance stops, cease additional monitoring.			

# Event and Action Plan for Construction Noise

In case the Action and Limit Levels are not complied during the construction stage, the Event and Action Plan shown below should be followed.

Event / Action	ET	IEC	ER	Contractor
Action Level	<ol> <li>Notify IEC and Contractor.</li> <li>Carry out investigation.</li> <li>Report the results of investigation to the IEC and Contractor.</li> <li>Discuss with the Contractor and formulate remedial measures</li> <li>Increase monitoring frequency to check mitigation effectiveness.</li> </ol>	<ol> <li>Review the analyzed result submitted by ET.</li> <li>Review the proposed remedial measures by the Contractor and advise the ER accordingly.</li> <li>Supervise the implementation of remedial measures.</li> </ol>	<ol> <li>Confirm receipt of notification of exceedance</li> <li>Notify Contractor</li> <li>Require Contractor to propose remedial measures for the analysed noise problem</li> <li>Ensure remedial measures are properly implemented.</li> </ol>	<ol> <li>Submit noise mitigation proposals to IEC</li> <li>Implement noise mitigation proposals</li> </ol>
Limit Level	<ol> <li>Notify IEC, ER, EPD and Contractor, and follow other actions</li> <li>Identify source</li> <li>Repeat measurement to confirm findings</li> <li>Increase monitoring frequency</li> <li>Check Contractor's working procedures to determine possible mitigation to be implemented</li> <li>Inform IEC, ER and EPD the causes and actions taken for the exceedances</li> <li>Assess</li> </ol>	<ol> <li>Discuss amongst ER, ET and Contractor on the potential remedial actions</li> <li>Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ET accordingly</li> <li>Supervise the implementation of remedial measures</li> </ol>	<ol> <li>Confirm receipt of notification of exceedances</li> <li>Notify Contractor</li> <li>Require Contractor to propose remedial measures</li> <li>Ensure remedial measures are properly implemented</li> <li>If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated.</li> </ol>	<ol> <li>Take immediate action to avoid further exceedance</li> <li>Submit proposal for remedial actions to IEC within 3 working days of notifications</li> <li>Implement the agreed proposal</li> <li>Revise and resubmit proposals if problem still not under control</li> <li>Stop the relevan portion of works as determined b the ER until the exceedance is abated</li> </ol>
	causes and actions taken for the exceedances			abated

Event / Action	ET	IEC	ER	Contractor	
	remedial actions and keep IEC, EPD, ER informed of the results				
	8. If exceedance stops, cease additional monitoring				



Appendix G

Monitoring Schedule

C3840-13C MTRCL Tsim Sha Tsui Station Carnarvon Road Subway and Entrances Modification Works Tentative Monitoring Schedule

		APF	RIL	2014		
Sunday	Monday	Tuesday 1 Weekly Site Audit	Wednesda 2	y Thursday 3	Friday 4 24-hr TSP Noise	Saturday 5
6	7	8 24-hr TSP Noise Weekly Site Audit	9	10	11 24-hr TSP	12
13	14 24-hr TSP	15 Noise Weekly Site Audit	16	17	18	19
20	21	22 24-hr TSP Noise Weekly Site Audit	23	24	25	26
27	28 24-hr TSP	29 Noise Weekly Site Audit	30			
		Su         M         Tu         W         Th         F           2         3         4         5         6         7           9         10         11         12         13         1           16         17         18         19         20         2           23         24         25         26         27         2           30         31	Sa         Su         M           1         1         -         -           7         8         4         5         -           4         15         11         12         1           1         22         18         19         2           8         29         25         26         2	May 2014           Tu         W         Th         F         Sa           1         1         2         3           6         7         8         9         10           13         14         15         16         17           20         21         22         23         24           27         28         29         30         31		Monthly Calendar © 2007 Vertex42 LLC

This schedule may be subject to change due to unexpected circumstances (e.g. adverse weather)

C3840-13C MTRCL Tsim Sha Tsui Station Carnarvon Road Subway and Entrances Modification Works Tentative Monitoring Schedule for May 2014

MAY 2014						
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				1	2	3
4	5	6	7 24-hr TSP Noise Weekly Site Audit	8	9	10
11	<b>12</b> 24-hr TSP	13 Noise Weekly Site Audit	14	15	16	17
18	19 24-hr TSP	20 Noise Weekly Site Audit	21	22	23	24
25	<b>26</b> 24-hr TSP	27 Noise Weekly Site Audit	28	29	30	31
		Su         M         Tu         W         Th           Su         M         Tu         W         Th           6         7         8         9         10           13         14         15         16         17           20         21         22         23         24           27         28         29         30         14	F         Sa         Su         M           4         5         1         2           11         12         8         9           18         19         15         16	June 2014           Tu         W         Th         F         Sa           3         4         5         6         7           10         11         12         13         14           17         18         19         20         21           24         25         26         27         28		<u>Monthly Caler</u> © 2007 Vertex42 I

This schedule may be subject to change due to unexpected circumstances (e.g. adverse weather)

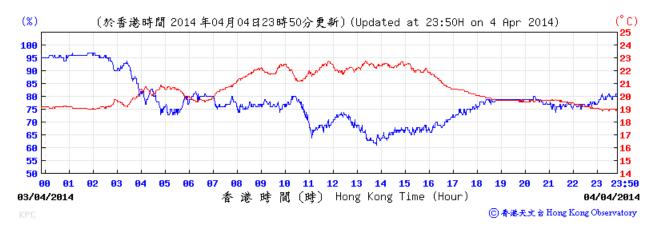


Appendix H

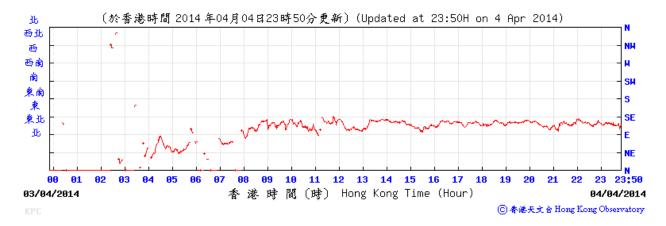
Weather Information Extracted from HK Observatory

#### King's Park Weather Station - 04 April 2014

Temperature/ Humidity:



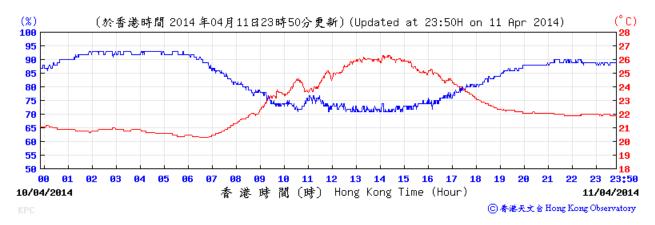
Wind Direction:



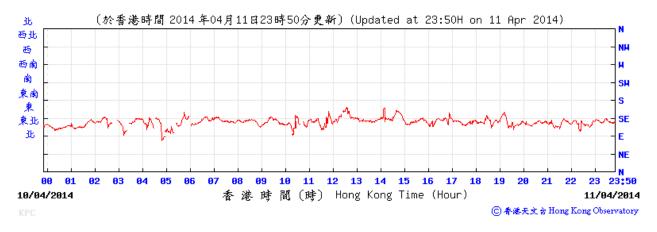


#### King's Park Weather Station - 11 April 2014

Temperature/ Humidity:



Wind Direction:



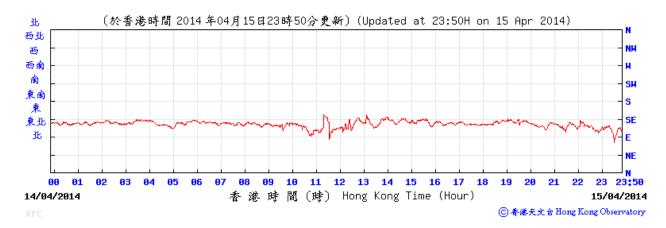


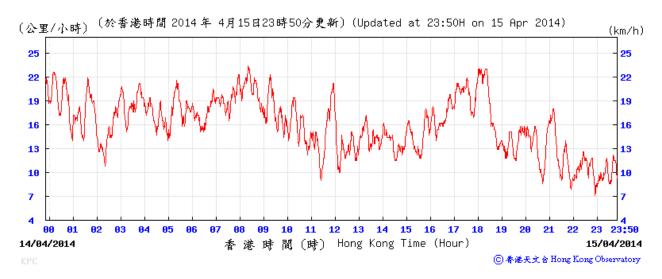
#### King's Park Weather Station – 15 April 2014



Temperature/ Humidity:

Wind Direction:





#### King's Park Weather Station – 25 April 2014



Temperature/ Humidity:

Wind Direction:



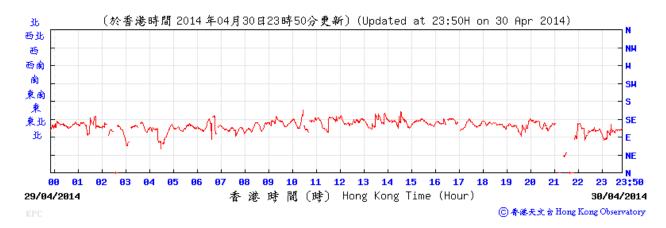


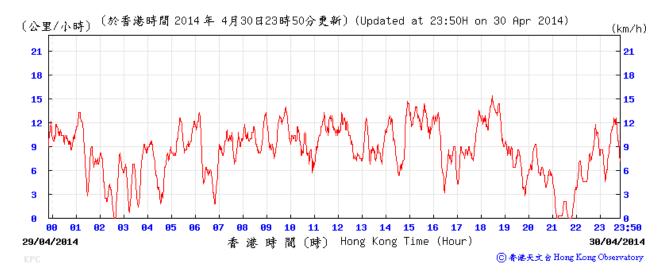
#### King's Park Weather Station – 30 April 2014



Temperature/ Humidity:

Wind Direction:





Appendix I

Certificate of Laboratory and Equipment Calibration



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 - Ma Operator ========		1 Rootsmeter Orifice I.I	• • •	438320 1785 	Ta (K) - Pa (mm)	293 - 758.19
PLATE OR Run #  1 2	VOLUME START (m3)  NA NA	VOLUME STOP (m3) NA NA	DIFF VOLUME (m3) 1.00 1.00	DIFF TIME (min) 1.4150 0.9940	METER DIFF Hg (mm) 3.2 6.4	ORFICE DIFF H2O (in.) 2.00 4.00
3 4 5	NA NA NA	NA NA NA	1.00 1.00 1.00	0.8890 0.8490 0.7020	7.9 8.7 12.6	5.00 5.50 8.00

#### DATA TABULATION

Vstd 	(x axis) Qstd 0.7140	(y axis)		Va	(x axis) Qa	(y axis)
1.0061 1.0040 1.0030 0.9977	1.0122 1.1293 1.1814 1.4213	2.0146 2.2524 2.3623 2.8491		0.9958 0.9916 0.9895 0.9885 0.9833	0.7037 0.9976 1.1130 1.1643 1.4008	0.8791 1.2433 1.3900 1.4579 1.7583
Qstd slop intercept coefficie	(b) =	2.01484 -0.01898 0.99991	n e n	Qa slope intercept coefficie	t (b) =	1.26166 -0.01171 0.99991
y axis =	SQRT [H2O (F	Pa/760) (298/1	[a)]	y axis =	SQRT [H2O (1	[a/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 =  $1/m\{ [SQRT(H2O(Ta/Pa)] - b \}$ 

#### TSP Sampler Calibration

	SITE	
Location: Tsim Sha Tsui Sampler:		January 10, 2014 Sam Wong

		CON	IDITIONS		
Barometric Pressure	(in Hg):	40.35	Corrected Pressure	(mm Hg):	1025
Temperature	(deg F):	59	Temperature	(deg K):	288
Average Press.	(in Hg):	40.35	Corrected Average	(mm Hg):	1025
Average Temp.	(deg F):	59	Average Temp.	(deg K):	288

CALIBRATION ORIFICE				
Make:	Tisch	Qstd Slope:	2.00979	
Model:	TE-5025A	Qstd Intercept:	-0.01403	
Serial#:	1785	Date Certified:	April 9, 2013	

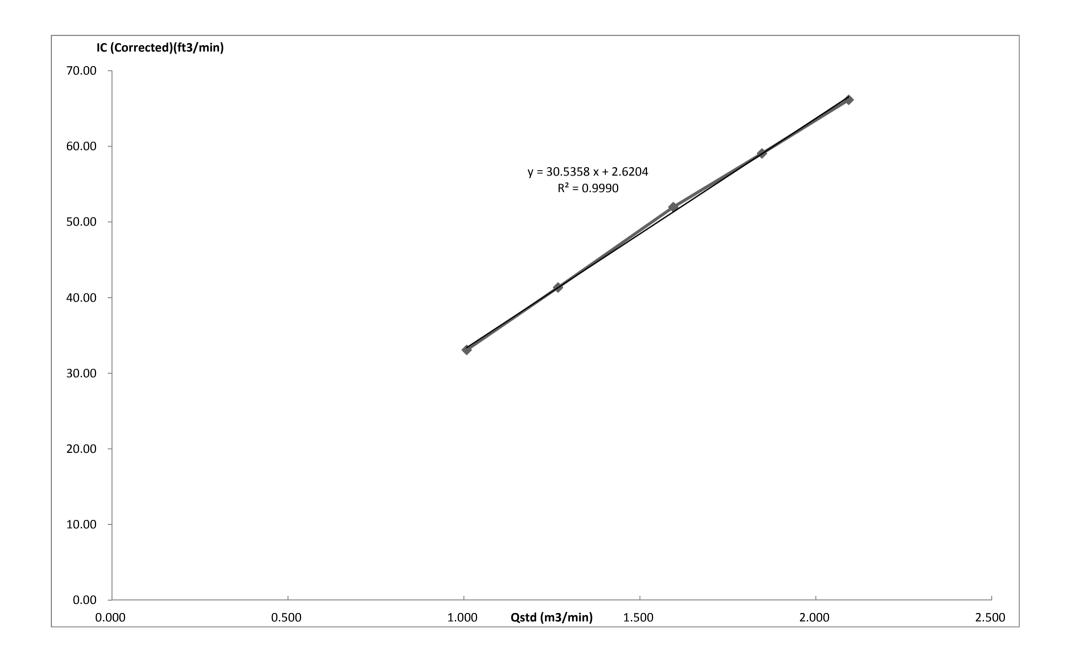
CALIBRATIONS						
Plate or Test #	H2O (in)	Qstd (m3/min)	I (chart)	IC (corrected)	LINEAR REGRESSION	
1	12.60	2.093	56.0	66.15	Slope =	30.5358
2	9.80	1.847	50.0	59.06	Intercept =	2.6204
3	7.30	1.595	44.0	51.98	Corr. coeff.=	0.9995
4	4.60	1.268	35.0	41.34		
5	2.90	1.008	28.0	33.08	<pre># of Observations:</pre>	5

Calculations

IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]
Qstd = standard flow rate
IC = corrected chart response
I = actual chart response
m = calibrator Qstd slope
b = calibrator Qstd intercept
Ta = actual temperature during calibration (deg K)
Pa = actual pressure during calibration (mm Hg)
Tstd = 298 deg K
Pstd = 760 mm Hg
For subsequent calculation of sampler flow:
1/m((I)[Sqrt(298/Tav)(Pav/760)]-b)

Qstd = 1/m[Sqrt(H2O(Pa/Pstd)(Tstd/Ta))-b]

m = sampler slope b = sampler intercept I = chart response Tav = daily average temperature Pav = daily average pressure



#### High Volume Air Sampler Calibration Worksheet

Project Title: Monitoring Location: Calibration Date: **Calibration Due Date** Time:

MTR Tsim Sha Tsui Station Carnarvon Road Subway and Entrances Modification Works K11 Commercial Complex 11-Mar-14 10-May-14 11:30

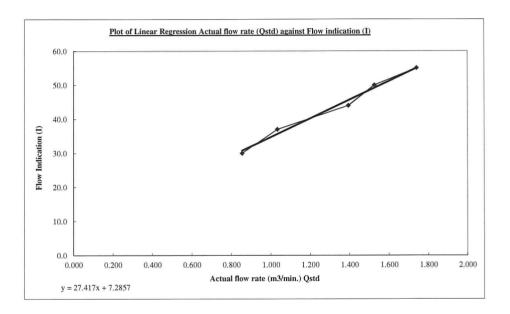
Sampler Model:	TE5005X	
Serial No.:	1713	
Calibrator Orifice no.:	1785	
Slope (m):	2.00979	
Intercept (b):	-0.01403	
Correction coeff. (r)	0.99995	
Standard pressure (mmHg) Pstd:	763.9	
Standard temp. (K) Tstd:	290.8	
Calibration pressure (mmHg) Pa:	766.4	
Calibration temp. (K) Ta:	288.3	

$$Flow(corrected) = \sqrt{H \times \frac{Pa}{Pstd} \times \frac{Tstd}{Ta}}$$

$$Qstd = \frac{1}{m} \times (\sqrt{H \times \frac{Pa}{Pstd} \times \frac{Tstd}{Ta}} - b)$$

Sample no.	Pressure Drop (H), inch	Flow (corrected), m <sup>3</sup> /min	Actual flow rate (Qstd), m3/min	Flow indication (I), arbitrary
1	11.7	3.483	1.740	55.0
2	9.0	3.055	1.527	50.0
3	7.5	2.789	1.395	44.0
4	4.1	2.062	1.033	37.0
5	2.8	1.704	0.855	30.0

Correlation Coefficient: 0.9931



Remark 1 hPa = 0.750062 mmHg

Calibrated by:

Checked by:

Kelvin Chiang Velven Inden ( ) F.N. Wong ) ( 6

Date: 11 March 2014

Date: 08 April 2014



Certificate No. 37521			Page	1 of 2 Pa	iges
Customer :	Enovative Environmental Service	e Limited			
Address :	Room 3, 12/F., New City Centre,	2 Lei Yue Mun Roa	ad, Kwun Tong, K	owloon, H.K.	
Order No. :	Q32432		Date of receipt	: 16	6-Oct-13
Item Tested					
Description : Manufacturer :	Sound Level Calibrator B&K				
Model :	Туре 4231		Serial No.	: 2685684	
Test Conditi	ons				
Date of Test : Ambient Temp	31-Oct-13 erature : (23 ± 3)°C		Supply Voltage Relative Humid		ò
Test Specifi	cations				
Calibration chec Ref. Document/	sk. Procedure : F21, Z02.				
Test Results	6				
All results were	within the IEC 942 Class 1 specif	fication.			
	shown in the attached page(s).				
Main Test equip	oment used:				
Equipment No.		Cert. No.		Traceable to	
S014	Spectrum Analyzer	35730		NIM-PRC & SC	L-HKSAR
S205	Ref. Sound Level Calibrator	PHCO40002		SCL-HKSAR	
S041	Universal Counter	34621		SCL-HKSAR	
S206	Sound Level Meter	36203		SCL-HKSAR	
S031	61/2 dgt. Multimeter	30128		NIM-PRC	
will not include allow overloading, mis-ha	this Calibration Certificate only relate to wance for the equipment long term drift, v andling, or the capability of any other labo age resulting from the use of the equipme	ariations with environme ratory to repeat the mea	ental changes, vibratio	on and shock during	transportation,

The test equipment used for calibration are traceable to International System of Units (SI). The test results apply to the above Unit-Under-Test only

Calibrated by : Dorothy Cheuk

Approved by : Steve Kwan Date: 31-Oct-13

This Certificate is issued by: Hong Kong Calibration Ltd.

Unit 8B, 24/F., Well Fung Industrial Centre, No. 58-76, Ta Chuen Ping Street,Kwai Chung, NT,Hong Kong. Tel: 2425 8801 Fax: 2425 8646



#### Certificate No. 37521

Page 2 of 2 Pages

Results :

#### 1. Level Accuracy

UUT Nominal Value (dB)	Measured Value (dB)	IEC 942 Class 1 Spec.
94	94.08	± 0.3 dB
114	114.07	

Uncertainty :  $\pm 0.1 \text{ dB}$ 

#### 2. Frequency

UUT Nominal Value	Measured Value	IEC 942 Class 1 Spec.
1 kHz	1.002 kHz	± 2 %

Uncertainty :  $\pm$  3.6 x 10 <sup>-6</sup>

- Level Stability : 0.0 dB IEC 942 Class 1 Spec. : ± 0.1 dB Uncertainty : ± 0.01 dB
- 4. Total Harmonic Distortion : < 0.7 % IEC 942 Class 1 Spec. : < 3 % Uncertainty : ± 2.3 % of reading

#### Remark : 1. UUT : Unit-Under-Test

- 2. The uncertainty claimed is for a confidence probability of not less than 95%.
- 3. Atmospheric Pressure : 1014 hPa.

----- END -----



Certificate No.	36604		Page	1 of 4	Pages
Customer :	Enovative Environmental Service	Limited			
Address :	Room 3, 12/F., New City Centre,	2 Lei Yue Mun Roa	ad, Kwun Tong, K	owloon, H.K.	
Order No. :	Q32395		Date of receipt	:	4-Sep-13
Item Tested					
Description :	Sound Level Meter (N12-RION-0	04)			
Manufacturer :	Rion				
Model :	NL-52		Serial No.	: 0022055	53
Test Conditi	ons				
Date of Test :	10-Sep-13		Supply Voltage	:	
Ambient Temp	erature : (23 ± 3)°C		Relative Humid	lity: (50 ± 25	i) %
Test Specific	cations				
Calibration chec Ref. Document/	k. Procedure: Z01.				
Test Results	;				
	within the IEC 61672 Type1 speci shown in the attached page(s).	fication.			
Main Test equip	oment used:				
Equipment No.	Description	Cert. No.		Traceable to	1
S017	Multi-Function Generator	C127181		SCL-HKSAF	R
S205	Ref. Sound Level Calibrator	PHCO40002		SCL-HKSAF	R

The values given in this Calibration 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 environmental changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Hong Kong Calibration Ltd. 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 International System of Units (SI). The test results apply to the above Unit-Under-Test only

Calibrated by : **Dorothy Cheuk** 

Approved by :

Steve Kwan

Date: 16-Sep-13

Steve Kwa

This Certificate is issued by: Length Kong Calibration Ltd. Unit 8B, 24/F., Well Fung Industrial Centre, No. 58-76, Ta Chuen Ping Street, Kwai Chung, NT, Hong Kong. Tel: 2425 8801 Fax: 2425 8646



Certificate No. 36604

Page 2 of 4 Pages

Results :

**1.** Self-generated noise: 16.4 dBA (Mfr's Spec  $\leq 17$  dBA)

#### 2. Acoustical signal test

U	UT Setting			
Level Range (dB)	Weight	Response	Applied Value (dB)	UUT Reading (dB)
30-130	L <sub>A</sub>	Fast	94.0	94.0
		Slow		94.0
	L <sub>C</sub>	Fast	· · · ·	94.0
	Lz	Fast		94.0
	LA	Fast	114.0	114.0
		Slow		114.0
	L <sub>C</sub>	Fast		114.0
	Lz	Fast		114.0

IEC 61672 Type 1 Spec. :  $\pm$  1.1 dB Uncertainty :  $\pm$  0.1 dB

#### **3** Electrical signal tests of frequency weightings (A weighting)

Frequency	Attenuation (dB)	IEC 61672 Type 1 Spec.
31.5 Hz	-39.8	- 39.4 dB, ± 2 dB
63 Hz	-26.4	- 26.2 dB, ± 1.5 dB
125 Hz	-16.3	- 16.1 dB, ± 1.5 dB
250 Hz	-8.7	- 8.6 dB, ± 1 dB
500 Hz	-3.3	- 3.2 dB, ± 1.4 dB
1 kHz	0.0 (Ref)	0 dB, ± 1.1 dB
2 kHz	+1.2	+ 1.2 dB, ± 1.6 dB
4 kHz	+0.9	$+ 1.0 \text{ dB}, \pm 1.6 \text{ dB}$
8 kHz	-1.1	- 1.1 dB, +2.1 dB ~ -3.1 dB
16 kHz	-8.0	- 6.6 dB, + 3.5 dB ~ - 17.0 dB

Uncertainty :  $\pm 0.1 \text{ dB}$ 



#### Certificate No. 36604

Page 3 of 4 Pages

#### 4. Frequency & Time weightings at 1 kHz

4.1 Frequency Weighting (Fast)

III I require				
UUT	Applied	UUT	Difference	IEC 61672
Setting	Value (dB)	Reading (dB)	(dB)	Type 1 Spec.
A	94.0	94.0 (Ref.)		± 0.4 dB
С	94.0	94.0	0.0	
Z	94.0	94.0	0.0	

### 4.2 Time Weighting (A-weighted)

UUT	Applied	UUT	Difference	IEC 61672
Setting	Value (dB)	Reading (dB)	(dB)	Type 1 Spec.
Fast	94.0	94.0 (Ref.)		± 0.3 dB
Slow	94.0	94.0	0.0	
Time-averaging	94.0	94.0	0.0	

Uncertainty :  $\pm 0.1 \text{ dB}$ 

#### 5. Level linearity on the reference level range

	Applied			
UUT Range	Value (dB)	UUT Reading (dB)	Difference (dB)	IEC 61672 Type 1 Spec.
130 dB	129.0	129.0	0.0	± 1.1 dB
(Ref Level)	124.0	124.0	0.0	
	119.0	119.0	0.0	
	114.0	114.0	0.0	
	109.0	109.0	0.0	
	104.0	104.0	0.0	
	99.0	99.0	0.0	
	94.0	94.0 (Ref)		
	89.0	89.0	0.0	
	84.0	84.0	0.0	_
	. 79.0	79.0	0.0	
	74.0	74.0	0.0	
	69.0	69.0	0.0	
	64.0	64.0	0.0	
	59.0	59.0	0.0	
	54.0	54.0	0.0	
	49.0	49.0	0.0	
	44.0	44.0	0.0	

Uncertainty :  $\pm 0.1 \text{ dB}$ 



#### Certificate No. 36604

Page 4 of 4 Pages

#### 6. Toneburst response (4kHz)

	1			
UUT	Tone Burst	UUT	Difference	IEC 61672
Setting	Duration(ms)	Reading(dB)	(dB)	Type 1 Spec.
Fast	Steady	127.0(Ref)		
	200	126.0	-1.0	$-1.0 \pm 0.8$ dB
	2	108.9	-18.1	-18.0, +1.3 dB ~ -1.8 dB
	0.25	99.9	-27.1	-27.0, +1.3 dB ~ -3.3 dB
Slow	Steady	127.0(Ref)		
	200	120.2	-6.8	$-7.4 \pm 0.8$ dB
	2	100.6	-26.4	-27.0, +1.3 dB ~ -3.3 dB
Time	Steady	127.0(Ref)		
averaging	200	120.1	-6.9	-7.0±0.8dB
	2	99.5	-27.5	-27.0, +1.3 dB ~ -1.8 dB
	0.25	91.7	-35.3	-36.0, +1.3 dB ~ -3.3 dB

Uncertainty :  $\pm 0.1 \text{ dB}$ 

### 7. Overload indication (130 dB range, A-weighted, Time-average, 4kHz)

UUT Reading	at overload (dB)		
+ ve one half cycle	- ve one half cycle	Difference (dB)	IEC 61672 Type 1 Spec.
138.4	138.2	0.2	< 1.8 dB

The overload indicator latched on until reset Uncertainty : ± 0.1 dB

#### Remarks : 1. UUT : Unit-Under-Test

- 2. The uncertainty claimed is for a confidence probability of not less than 95%.
- 3. Atmospheric Pressure : 996 hPa.
- 4. Preamplifier model : NH-25, S/N : 10553
- 5. Firmware Version: 1.2
- 6. Power Supply Check: OK
- 7. The UUT was adjusted with the laboratory's sound calibrator at the reference sound pressure level before the calibration.

----- END ------



Appendix J

Sample Data Record Sheet

### C3840-13C MTRCL Tsim Sha Tsui Station Carnarvon Road Subway and Entrances Modification Works

### Noise Monitoring Field Record Sheet

Monitoring Location		
Description of Location		
Date of Monitoring		
Measurement Start Time (h	ıh:mm)	
Measurement Time Length (r	nin.)	
Noise Meter Model / Identifica	ation	
Calibrator Model / Identification	on	
	L <sub>90</sub> (dB (A))	
Measurement Results	L <sub>10</sub> (dB (A))	
	L <sub>eq</sub> (dB (A))	
Major Construction Noise So Monitoring	urce(s) during	
Other Noise Source(s) during Monitoring		
Remarks		

		Name & Designation	<u>Signature</u>	<u>Date</u>
Recorded By	:			
Checked by	:			

# C3840-13C MTRCL Tsim Sha Tsui Station Carnarvon Road Subway and Entrances Modification Works

### Data Sheet for TSP Monitoring

Monitoring Location		
Details of Location		
Sampler Identification	on	
Date & Time of Sam	npling	
Elapsed-time	Start (min.)	
Meter Reading	Stop (min.)	
Total Sampling Time	e (min.)	
Weather Conditions		
Site Conditions		
	Pi (mm Hg)	
Initial Flow	Ti (°C)	
Rate, Qsi	Hi (in.)	
	Qsi (Std. m <sup>3</sup> )	
	Pf (mm Hg)	
Final Flow	Tf (°C)	
Rate, Qsf	Hf (in.)	
	Qsf (Std. m <sup>3</sup> )	
Average Flow Rate	(Std. m <sup>3</sup> )	
Total Volume (Std. m <sup>3</sup> )		
Filter Identification No.		
Initial Weight. of Filter (g)		
Final Weight of Filte	er (g)	
Measured TSP Leve	el (µg/m³)	

		Name & Designation	<u>Signature</u>	<u>Date</u>
Field Operator	:			
Laboratory Staff	:			
Checked by	:			

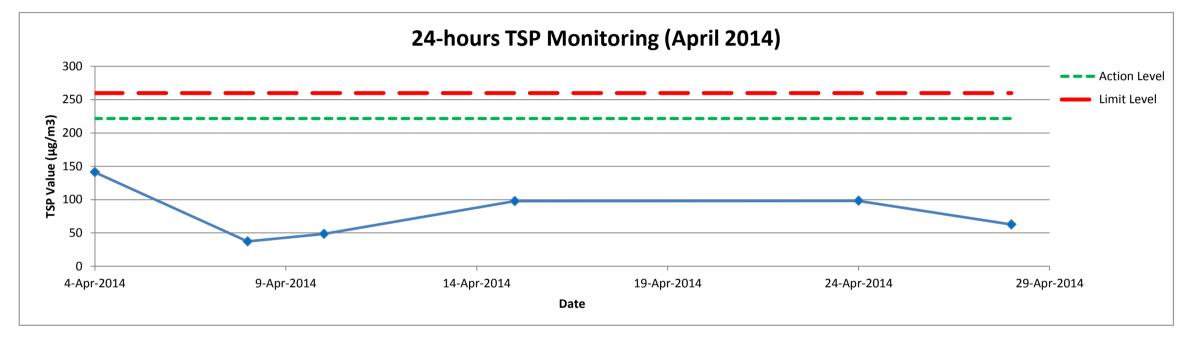


# Appendix K

Monitoring Results and Plots

### Impact Air Quality Monitoring : 24-hour TSP at K11

Location	Monitoring Date	Start Time	Weather Conditions	Temperature	Elapse Time			Flow Rate (CFM)			TSP Concentration	Action/Limit
					Initial	Final	Sampling Hours	Initial	Final	Average Flow Rate	(μg/m3)	Levels
	4-Apr-14	14:32	Fine	17	661153	663553	24	40	40	40	141.1340	221.6/260
	8-Apr-14	12:00	Rainy	20	663553	665953	24	40	40	40	37.1895	221.6/260
K11 Art Mall	10-Apr-14	10:00	Rainy	22	666300	668700	24	45	45	45	48.6158	221.6/260
KTT AIT Mall	15-Apr-14	11:05	Fine	22	668701	671101	24	40	40	40	97.6589	221.6/260
	24-Apr-14	11:05	Fine	21	673502	675902	24	40	40	40	98.1245	221.6/260
	28-Apr-14	10:05	Fine	26	676501	678901	24	33	35	34	62.7186	221.6/260

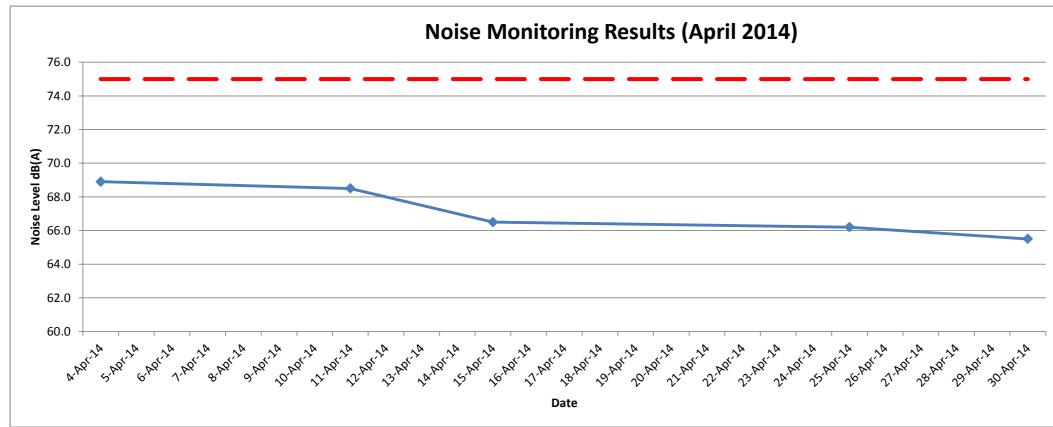


### Noise Impact Monitoring Results at K11

Monitoring Locations	Date	Weather Conditions	Temperature	Wind Speed (m/s)	Start Time	End Time	Background Level dB(A)	Limit Level dB(A)	Leq(30min) dB(A)	L10(30min) dB(A)	L90(30min) dB(A)
	4-Apr-14	Sunny	20	0.3	14:20	14:50	65.3	75	68.9	70.9	65.3
	11-Apr-14	Sunny	20	0.3	14:48	15:18	65.3	75	68.5	71.5	65.3
11 Art Mall	15-Apr-14	Fine	22	0.3	11:10	11:40	65.3	75	66.5	67.9	64.7
	25-Apr-14	Cloudy	26	0.3	10:32	11:02	65.3	75	66.2	68.1	64.1
	30-Apr-14	Fine	25	0.2	11:25	11:55	65.3	75	65.5	67.0	63.0

Note:

The limit level of NSR1 is 65dB(A) during school examination period. **Red Bold indicates an exceedance of Limit Level** 

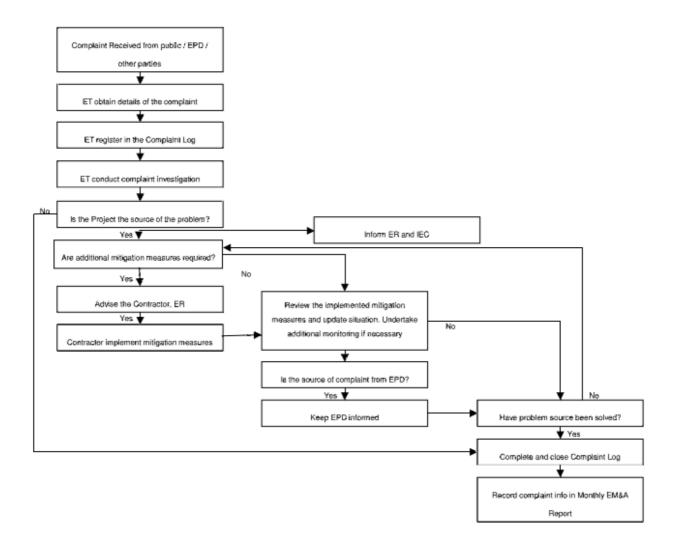


Leq(30min) dB(A)

Appendix L

Flow Chart for Handling Environmental Complaints

### **Complaint Response Procedure**





Appendix M

Waste Management Records

### Monthly Summary Waste Flow Table for 2014 (year)

# Contract No:C3840-13C Tsim Sha Tsui Station Carnarvon Road SubwayDate Reported:25-April-2014

Month		Actual Qua	ntities of Inert C&I	O Materials Generate	Actual Quantities of Non-inert C&D Wastes Generated Monthly						
	Total Quantity Generated	Hard Rocks and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper/ cardboard packaging	Plastics	Chemical Waste	Others, e.g. general refuse
		(See Note 3)							(see Note 2)		
	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000kg)	(in '000kg)	(in '000kg)	(in'000kg)	(in '000m³/tonne)
Jan	0.0206	-	-	-	0.0206	-	-	-	-	-	-
Feb	0.0233	-	-	-	0.0233	-	-	-	-	-	-
Mar	0.0120	-	-	-	0.0120	-	-	-	-	-	-
Apr	0.0281	-	-	-	0.0281	-	-	-	-	-	0.0035
May	-	-	-	-	-	-	-	-	-	-	-
June	-	-	-	-	-	-	-	-	-	-	-
Sub-total	0.0840	-	-	-	0.0840	-	-	-	-	-	0.0035
July	-	-	-	-	-	-	-	-	-	-	-
Aug	-	-	-	-	-	-	-	-	-	-	-
Sept	-	-	-	-	-	-	-	-	-	-	-
Oct	-	-	-	-	-	-	-	-	-	-	-
Nov	-	-	-	-	-	-	-	-	-	-	-
Dec	-	-	-	-	-	-	-	-	-	-	-
Total	0.0840	-	-	-	0.0840	-	-	-	-	-	0.0035

Notes:

- (1) The performance targets are given below:
  - All excavated materials to be sorted for recovering the inert portion of C&D materials, e.g. hard rocks, soil and broken concrete, for reuse on the Site or disposal to designated outlets;
  - All metallic waste to be recovered for collection by recycling contractors;
  - All cardboard and paper packaging (for plant, equipment and materials) to be recovered, properly stockpiled in dry and covered condition to prevent cross contamination;
  - All chemical wastes to be collected and properly disposed of by specialist contractors; and
  - All demolition debris to be stored to recover broken concrete, reinforcement bars, mechanical and electrical fittings, hardware as well as other fitting / materials that have established recycling outlets.
- (2) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material.
- (3) Broken concrete for recycling into aggregates.
- (4) The waste flow table shall also include C&D materials that are specified in the Contract to be imported for use at the Site.