



Maeda Corporation

# MTRCL Contract C3840-13C

Tsim Sha Tsui Station Carnarvon Road Subway and Entrances Modification Works

# MONTHLY REPORT (OCTOBER 2016)



AECOM 8/F, Grand Central Plaza, Tower 2, +852 2317 7609 fax 138 Shatin Rural Committee Road, Shatin, Hong Kong 香港新界沙田鄉事會路 138 號新城 市中央廣場第2座8樓 www.aecom.com

+852 3922 9000 tel

Your Ref: 40032976/456561 Our Ref:

#### By Email and Post

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

Attn.: Mr. Kenneth Chow / Environmental Engineer II

14 November 2016

Dear Sirs

#### **Consultancy Agreement A130-13** Independent Environmental Checker for CRS and LTS CRS - Verification for 32<sup>nd</sup> Monthly Environmental Monitoring and Audit (EM&A) Report (October 2016) (Report No.: EB001340R00441)

We refer to the 32<sup>nd</sup> Monthly EM&A Report (October 2016) received under cover of the email from the Environmental Team, Hyder Consulting Limited (HCL), dated on 10 November 2016.

Further to our comments provided on 11 and 14 November 2016 and subsequent revision of the Report by HCL on 11 and 14 November 2016, we have no further comment and have verified the captioned report (Report No.: EB001340R00441).

Should you have any queries, please feel free to contact the undersigned at 3922 9366.

Yours faithfully **AECOM Consulting Services Ltd** 

Y. W. Fung Independent Environmental Checker

LLMC/wwsc

via email (Attn.: Mr. F. N. Wong) Hyder Consulting Limited CC (Attn.: Ms. Cecilia Lee) via email Maeda Corporation





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# **MONTHLY REPORT (OCTOBER 2016)**

Author	Tung Chi Sun	
Checker	Wong Fu Nam	agen -
Proof Reader	Kelvin Au	P.P. Ferrad - Cuntinha
Approver	John Berry	Joh B
Report No	EB001340R00441	/
Date	14 November 2016	



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## **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 breaches of Action and Limit Levels of air quality and construction noise during the Reporting Period.
- ES02 No corrective action were required as the environmental audit during the Reporting Period observed:
  - 1) No deficiencies with major environmental significance of the required environmental mitigation measures;
  - 2) No non-compliance with the required waste management; and
  - 3) 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 Report Period.

## Notification of Summons & 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 Construction noise, air quality and water quality are continued to be the key issues for the coming construction period. In order to alleviate potential adverse environmental impacts generated from construction activities to acceptable levels, environmental mitigation measures recommended in the EM&A Plan and summarised in the Implementation Schedule should be fully implemented and improved whenever appropriate.

#### **Construction Noise**

ES07 Particular attention should be paid to construction noise mitigation measures to ensure full compliance with statutory and non-statutory requirements and guidelines. Proactive review of working methods, careful selection and arrangement of the noisy equipment as well as effective noise mitigation measures are strongly recommended.

#### Water Quality

ES08 In addition, compliance with water quality mitigation measures remains one of the key environmental issues within the construction period, especially when water usage is high.

#### Air quality

ES09 Furthermore, implementation of necessary construction dust suppression measures are recommended during dusty activities under dry and windy conditions.



# **1** INTRODUCTION

# 1.1 The Reporting Period

- 1.1.1 This is the 32<sup>nd</sup> monthly EM&A report (hereinafter referred as 'This Report') covering construction period from 1 to 31 October 2016 (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 Meada 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 Project was commenced in March 2014 and is anticipated to be completed in September 2017.
- 1.2.2 The existing TST Station had been in operation before the *Environmental Impact Assessment Ordinance* (hereafter referred as 'EIAO') comes 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, after the Project Profile and the associated *EM&A Plan* were 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 (hereinafter referred as 'the Implementation Schedule') are summarised in *Appendix D*, which fine tunes the construction activities and shows inter-relationships with the environmental protection / mitigation measures for the construction period.



# 1.3 Environmental Status

- 1.3.1 As required in the EP, AECOM Consulting Services Limited 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 summarised in *Table 1-3-1* below. They are detailed in *Appendix E*.

ltem	Description	License/Permit Status
1	Air Pollution Control (Construction Dust)	Notification Ref. 365953 acknowledged on 21 Oct 2013 (superseded by Ref. 403252 dated 02 Jun 2016)
2	Water Pollution Control Ordinance (Discharge License)	The discharge license (Ref No. WT00019722-2014) was granted on 01 Sep 2014 superseding the previous license (Ref No. WT00018229-2014).
3	Billing Account for Disposal of Construction Waste	A/C Ref. 7018523 granted on 25 Oct 2013
4	Chemical Waste Producer Registration	Registration Ref. 5213-2214-M2446-16 granted on 4 Mar 2014
5	Construction Noise Permit	CNP No. GW-RE0804-16 approved on 4 August 2016 for operation of 4 submersible water pumps (electric) from 15 August 2016 to 14 February 2017.

#### Table 1-3-1 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 summarised in *Table 1-4-1*:

Table 1-4-1 Construction Activities

ltem	Description		
	Construction Activities Undertaken during the Reporting Period		
1	Excavation for UU identification and support tailoring at G1-6		
2	Demolition of the underground section of entrance D2		
3	Demolition the top slab of existing subway		
4	Excavation of the mined tunnel		
5	Water pumping test for C&C tunnel		
6	Portal frame and steel rib installation for the mined tunnel		
	Construction Activities to be Undertaken in the Up-Coming Month		
1	Excavation for UU identification and support tailoring at G1-6		
2	Portal frame and steel rib installation for the mined tunnel		
3	Excavation of the mined tunnel		
4	Demolition the top slab of existing subway		
5	Demolition of the underground section of entrance D2		



# 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 month were prepared and submitted to MTRC, IEC and MC prior to implementation via e-mail and / or facsimile for ease of necessary inspection. If amendment is necessary under ad hoc conditions, including actual and broadcast adverse weather, accidental instrument failures, etc., notification will be 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 summarised 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

Equipment Type	Model	Serial Number	Calibration Orifice Number
High Volume Air Sampler	TE5005X	0462	1785
Sibata Digital Dust Monitor	LD-3B	296098	Not Applicable

2.1.7 Weather information including wind speeds and wind directions is obtained from King's Park Weather Station. The weather information is used as weather conditions during the Reporting Period. They are presented in *Appendix H*.



## Calibration of Monitoring Equipment

- 2.1.8 The HVAS is calibrated before commencement of monitoring using standard orifice 5points calibration method with orifice calibrator to determine the actual flow rate of each HVAS. A calibration Kit (Model - TE5025A) is used for calibration of the HVAS. At least
- 2.1.9 Once every 12 months, recalibration of the calibration kit is carried out during its maintenance.
- 2.1.10 Calibration of the HVAS is conducted following the manufacturer's instruction manual. Initial calibration of the equipment is conducted upon installation and thereafter at bimonthly intervals throughout the period of impact monitoring. The transfer standard should be traceable to the internationally recognised primary standard and be calibrated annually.
- 2.1.11 The Sibata Digital Dust Monitor LD-3B for 1-hour TSP monitoring is calibrated annually and the calibration certificates of the equipment are shown in *Appendix I*.

#### Monitoring Methodology – 24-Hr TSP

2.1.12 Air quality monitoring (24-Hr TSP) 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

- 2.1.13 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;
  - e) 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 drip line;
  - 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

- 2.1.14 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%.
- 2.1.15 Preparation of filters and subsequent laboratory analysis of the collected 24-Hr TSP samples were performed by ALS Technetiem (HK) Pty Ltd (hereinafter referred as 'ALS'), a local laboratory which have been accredited under Hong Kong Laboratory Accreditation Scheme (HOKLAS).
- 2.1.16 All the collected samples should be kept by the ET in standard office conditions for 6 months before disposal.



#### Field Monitoring Procedures

- 2.1.17 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.
  - 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 – 1-Hr TSP

#### Field Monitoring

2.1.18 The procedures for measurement of 1-Hr TSP follow Manufacturer's Instruction Manual, which is summarised as follows:

- a) Turn on the power.
- b) Close the air collecting opening cover.
- c) Set the "TIME SETTING" switch to [BG].
- d) Press "START/STOP" switch to perform background measurement.
- e) Turn the knob at SENSI ADJ position.
- f) Leave the equipment upon "SPAN CHECK" is indicated in the display.
- g) Press "START/STOP" switch to perform automatic sensitivity adjustment.
- h) Turn the knob at MEASURE position.
- i) Set time period of 1 hour for the 1-hour TSP measurement.
- j) Press "START/STOP" to start the 1-hour TSP measurement.
- k) Check the time period to ensure monitoring time of 1 hour.
- I) Record all monitoring information on a Field Data Sheet.

#### Maintenance and Calibration

- 2.1.19 The procedures for maintenance and calibration of 1-Hr TSP follow Manufacturer's Instruction Manual as follows:
  - 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:

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

Parameter	Action Level	Limit Level
24-Hr TSP	For baseline level ≤200 µg/m³, Action level = (130% of baseline level + Limit level)/2	260
1-Hr TSP	For baseline level ≤384 µg/m³, Action level = (130% of baseline level + Limit level)/2 For baseline level >384 µg/m³, Action level = Limit level	500

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

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

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

## **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, related environmental regulation including Air Pollution Control (Construction Dust) Regulation as well as those recommended in the Implementation Schedule 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
<i>L<sub>eq</sub></i> 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

Item	Equipment Name	Model
1	Sound Level Meter	B&K 2238 (Serial no. 2448529)
2	Acoustic Calibrator	CAL 200 (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
K11	K11 Art Mall	Rooftop, 4/F

## Monitoring Methodology

#### Field Monitoring

- 2.2.6 Procedures for noise monitoring summarised 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, the measurement time and monitoring frequency are set as follows:
    - i. Frequency weighting: A
    - ii. Time weighting: Fast
    - iii. Time measurement: 30 minutes intervals (between 0700-1900 on normal weekdays)
    - iv. Monitoring frequency: one set of measurement on a weekly basis
  - 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<sub>eq</sub>(30 min) are recorded.
  - f) Record all monitoring information on a Field Data Sheet as shown in *Appendix J*.



- g) Maintenance and Calibration.
- h) 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

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

#### Action and Limit Levels

2.2.8 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:

#### Table 2-2-4 Action and Limit Levels for Construction Noise

Time Period	Action Level	Limit Level
0700-1900 hours on normal	When one valid documented	75*
weekdays	complaint is received.	75

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**

2.2.9 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

- 2.2.10 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 as well as those recommended in the Implementation Schedule should be fully implemented in order to minimise noise impacts during the construction phase. They are summarised 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;
  - 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 utilised as noise barriers, whenever practicable; and
  - j) Enclosure of Entrance D1 with acoustic mat during demolition.
- 2.2.11 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 summarised in the following *Table 3-1-1*. Graphical plots of the parameter are illustrated in *Appendix K*.

-	_		
Monitoring Date	24-Hr TSP	Action Level	Limit Level
3-Oct-16	37.1		
11-Oct-16	34.1		
17-Oct-16	41.7	222	260
24-Oct-16	31.0		
Mean (Min – Max)	36.0 (31.0-41.7)		

#### Table 3-1-1 Summary of 24-Hr TSP Monitoring Results, µg/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 was 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 summarised in the following *Table 3-2-1*. Graphical plots of the parameter are illustrated in *Appendix K*.

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

Monitoring Date	L <sub>eq (30 min)</sub>	A/L Levels
4-Oct-16	67.9	Limit Level: 75
11-Oct-16	70.6	
20-Oct-16	72.9	Action Level:
25-Oct-16	71.2	Any documented
Mean (Min – Max), <i>Leq</i> (30 min)	71.0 (67.9 – 72.9)	complaint against construction noise.



#### 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 fell below the Limit Level of the parameter. 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.
- 3.2.5 The Contractor's attention is drawn to certain noisy construction activities, which were scheduled to be conducted during the coming month as listed in **Table 1-4-1** under **Section 1.4:** Construction Activities Undertaken during the Reporting Period and Up-Coming Month.
- 3.2.6 It is re-instated that adequate mitigation measures should be implemented during the noisy construction activities in order to alleviate noise nuisance generated from the Project related construction activities.

#### Weather Conditions

- 3.2.7 No weather conditions and any other factors were identified to have significant effects on the air and noise monitoring results within the Reporting Period.
- 3.2.8 Weather information during the Reporting Period which is extracted from Hong Kong Observatory King's Park Weather Station and 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 summarised 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 during the Reporting Period were conducted by MTRC, MC and ET, whereas the monthly site inspection of the Reporting Period was jointly conducted by the IEC, MTRC, MC and ET. The site inspection follows strictly to 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 relevant parties 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 04, 11, 18 and 25 October 2016. A joint site inspection was conducted by IEC, MTRC, MC and ET on 18 October 2016.
- 4.1.4 As the Air Pollution Control (Non-road Mobile Machinery) (Emission) Regulation has been enforced since December 2015, particular attention was paid to check EPD's Non-Road Mobile Machinery (NRMM) labels demonstrated on the regulated NRMM, except those which application is in progress. Deficiencies or findings of the site audit and the associated follow up actions are summarised in the following **Table 4-1-1**:

Date	Deficiencies or findings	Follow-Up Action
	Follow-up item(s)	
04.0-1-10040	No follow-up item.	Not required.
04-October-2016	Observation(s) on the day of inspection	
	No deficiency was observed on site.	Not required.
	Follow-up item(s)	
	No follow-up item.	Not required.
11-October-2016	Observation(s) on the day of inspection	
	No deficiency was observed on site.	Not required.
	Follow-up item(s)	
18-October-2016	No follow-up item.	Not required.
	Observation(s) on the day of inspection	
	No deficiency was observed on site.	Not required.
	Follow-up item(s)	
	No follow-up item.	Not required.
25-October-2016	Observation(s) on the day of inspection	
	No deficiency was observed on site.	Not required.

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

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



# 4.2 Compliance with Legal/Contractual Requirement

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 4-2-1** summarizes breaches of legal and contractual requirements.

#### Table 4-2-1 Summary of Breaches of Legal and Contractual Requirements

Month	No. of Breach(s)	Cumulative no. from March 2014 to the Reporting Period
October 2016	0	0

# 4.3 Environmental Complaints

- 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 4-3-1* below:

#### Table 4-3-1 Summary of Complaint

Month	No. of Complaint(s)	Cumulative no. from March 2014 to the Reporting Period
October 2016	0	5

# 4.4 Notification of Summons/Successful Prosecutions

4.4.1 Notification of summons and successful prosecutions registered during the Reporting Period are summarised in *Table 4-4-1* below:

#### Table 4-4-1 Summary of Summon and Successful Prosecutions

Month	No. of Breach(s)	Cumulative no. from March 2014 to the Reporting Period
October 2016	0	0



# 5 **CONSTRUCTION WASTE**

## 5.1 Waste Management

5.1.1 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 Status and 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.
- 5.2.2 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.

# 6 FUTURE ENVIRONMENTAL ISSUES

## 6.1 Key Environmental Issues

- 6.1.1 Future key environmental issues include:
  - 1) Air quality, in particular construction dust during dusty construction activities, e.g. demolishment of the Entrance D2 and excavation works under dry and windy conditions;
  - 2) Construction noise during noisy activities; and
  - 3) Site surface water run-off and construction wastewater discharge.

# 6.2 Mitigation Measures

- 6.2.1 To avoid potential adverse environmental impacts to be generated from future key environmental issues as stated above, full implementation of the mitigation measures as stipulated in the Implementation Schedule in *Appendix D* is required.
- 6.2.2 Mitigation measures for air quality, construction noise and water quality implemented to date shall be properly maintained.
- 6.2.3 Where appropriate, improvement of the implemented mitigation measures is reminded to ensure effectiveness of the mitigation measures.



# 7 CONCLUSIONS AND RECOMMENDATIONS

## 7.1 Conclusions

- 7.1.1 EM&A results during the Reporting Period showed that adverse environmental impacts generated from construction activities under the Project was alleviated to acceptable levels via implementation of the recommended environmental mitigation measures recommended in the EM&A Plan and summarised in the Implementation Schedule.
- 7.1.2 Neither NOE & the associated NOE investigation nor 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.
- 7.1.3 No corrective actions were required as the environmental audit during the Reporting Period observed:
  - 1) No deficiencies with major environmental significance of the required environmental mitigation measures;
  - 2) No non-compliance with the required waste management; and
  - 3) No adverse environmental impacts on the sensitive receivers environed with the site of the project.
- 7.1.4 In addition, no remedial actions were required as no notification of summons and successful prosecutions were reported during the Reporting Period.
- 7.1.5 Although inadequacies of proactive environmental mitigation measures were occasionally observed during the regular site inspection and audit, they were rectified in situ upon identification or notification or timely before the following site audit.

# 7.2 Recommendations

- 7.2.1 The existing environmental mitigation measures have been proven to be effective. They should be properly maintained.
- 7.2.2 Where appropriate, additional or improvement of the environmental mitigation measures should be implemented.
- 7.2.3 Particular attention should be paid to construction noise mitigation measures to ensure full compliance with statutory and non-statutory requirements and guidelines. Proactive review of working methods, careful selection and arrangement of the noisy equipment as well as effective noise mitigation measures are strongly recommended.
- 7.2.4 In addition, suppression of construction dust is reminded during dusty construction activities under dry and windy conditions.
- 7.2.5 Furthermore, monitoring of site water runoff is reminded to prevent any direct water discharge off site, especially when water usage is high during the construction period. When necessary, the Contractor is reminded to apply additional precautionary measures to prevent any possible environmental deficiency.



#### Arcadis Design and Engineering Limited

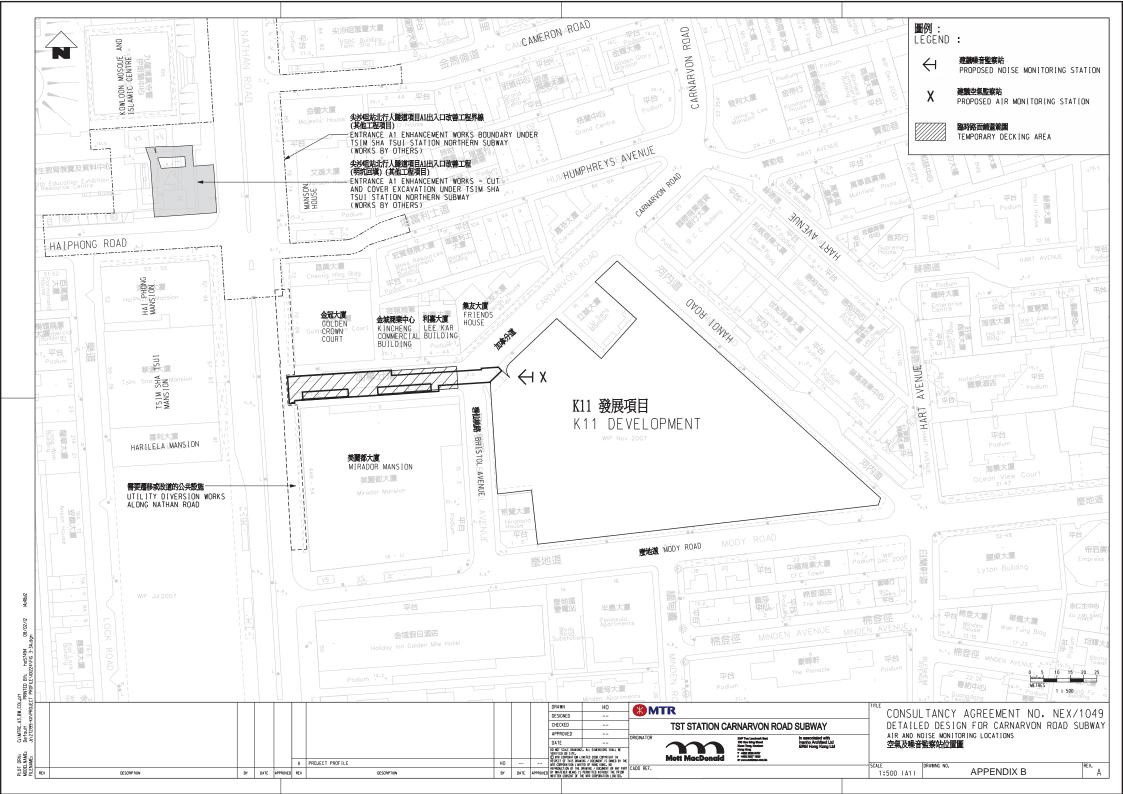
20/F., AXA Tower, Landmark East, 100 How Ming Street, Kwun Tong, Kowloon, Hong Kong

T: +852 2911 2233

arcadis.com

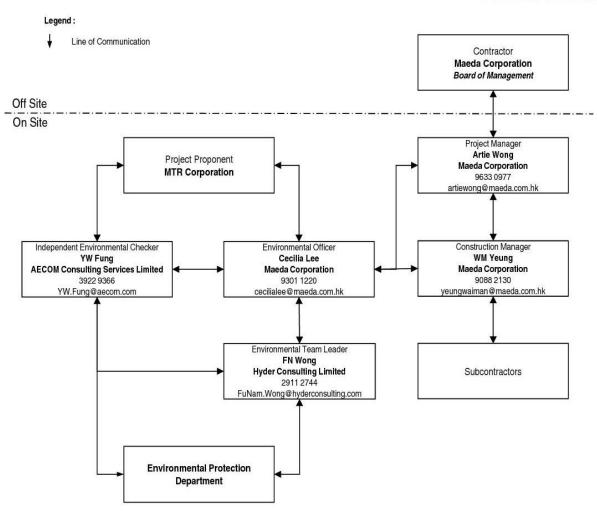
# **APPENDIX A**

**Site Location Plan** 



# **APPENDIX B**

# **Management Structure**



#### Project Organization Chart in Environmental Management (Rev.03)

Effective Date: 12 Mar 2016

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**

	MTR					CONT	[RAC	CT C3	840-13C Tsim Sha Tsui Station	n, Carnarvon R	oad S	Subwa	ay								
ity ID	Activity Name	Orig Dur	Planned Start	Planned Finish	Total Flo			ELMIA	2014 .pr M J Jul A S Oct N D Jan F M	2015	S Oct	ND		Apr. M	2016				2017		
Preliminary Master Pre	rogramme Revision 2	827d	14-Oct-13	3 31-Jul-16			Jan				3 001	NU			3   301 A			Jan i			
Preliminaries		827d	14-Oct-13	3 31-Jul-16		d															
Contract Key Dates		Od	14-Oct-13	3 14-Oct-13	3	d															
C3840-CD-20	Date of Commencement	0d	14-Oct-13	3		d Date of	Comm	encement													
Specified Degrees of Co	ompletion	Od	31-Jul-16	31-Jul-16		d															
C3840-CD-2A	Complete to Deg. 1 status for all civil engineering works and ABWF in Subway outside	0d		31-Jul-16		d									<b>r</b> • 0	Complete	to Deg. 1 s	tatus for all	civil engineering v	works and AB	3WF in Su
Possession of Works Ar	K11 Lot Boundary (31 Jul 16) rea As PS Clause P8 & PS Appendix G	Od	31-Oct-13	3 31-Oct-13	3	d															
C3840-AD-20	Access Date for Works Area 3840.W1 (subject to SLG/TMLG Approval)	b0	31-Oct-13	3		d 🖚 Acce	ss Date	for Worl	s Area 3840.W1 (subject to SLG/TMLG Approval)												
Initial Site Survey				3 10-Dec-1																	
	Velidate the summer second and compare out any second and different summer at Wester						Velider				40 1014	wa									
C3840-SS-20	Validate the survey record and carry out any necessary additional survey at Works Areas 3840.W1 & W2			3 10-Dec-1			validat	etnesurv	ey record and carry out any necessary additional s	urvey at works Areas 38	40.001 8	« VV 2									
	gn & Approval Process (Incl. Demolition)			3 30-Oct-13		d															
Temporary Traffic Mang	gement Scheme (TTM)	12d	16-Oct-13	3 30-Oct-13	3	d															
C3840-TTM-100	Appoint Traffic Consultant	0d		16-Oct-13	3	d 🕨 Appoint	t Traffic	Cohsulta	nt												
C3840-TTM-110	Pepare & submit review by Eng Outline TTM Schemes as per PS P20.4	6d	17-Oct-13	3 23-Oct-13	3	d Pepar	e⊂	mit review	v by Eng Outline TTM Schemes as per PS P20.4												
C3840-TTM-120	Eng review Outline TTM Schemes	4d	24-Oct-13	3 28-Oct-13	3	d 📕 Eng r	eview (	utline TT	M Schemes												
C3840-TTM-130	Prepare Detailed TTMS	5d	24-Oct-13	3 29-Oct-13	3	d l Prepa	are Deta	ailed TTM	S												
C3840-TTM-140	Discussion and agree in priniciple at TMLG Meeting	1d	30-Oct-13	3 30-Oct-13	3	id 🎫 Discu	ussion a	ind agree	in priniciple at TMLG Meeting												
Carnarvon Road Subv	way and Entrances	769d	14-Nov-13	3 22-Jun-16	6	d															
Open Cut Sequence 1 (A	Advance Ground Works & Piling Works)	135d	14-Nov-13	3 02-May-1	4	d															
Advance Ground Works	(S	69d	14-Nov-13	3 08-Feb-14	4	d															
C3840-AGW-020	Trial Pit/trench excavation	69d	14-Nov-13	3 08-Feb-14	4	d F		Trial Pi	//trench excavation												
C3840-AGW-040	Pre-drilling works	24d	27-Dec-1	3 24-Jan-14	4	id	-	Pre-drillin	q works												
Piles & Grouting for Ver		51d	27-Eeb-14	4 02-May-14		d															
C3840-EVS-010	Mobilization for Piling Rig and Setup			4 03-Mar-14					bilization for Piling Rig and Setup												
						id .															
C3840-EVS-020	52 nos. pipe piles with 1m. to 2.2m. minimum rock socket			4 14-Apr-14		d		- F - E	52 nos. pipe piles with 1m. to 2.2m. minimum roc	k socket											
C3840-EVS-030	Grouting for Vertical Shaft Bulk Head	18d	17-Mar-14	4 07-Apr-14	1	d		Π	Grouting for Vertical Shaft Bulk Head												
C3840-EVS-040	Curtain Grouting vertical shaft	18d	08-Apr-14	02-May-1	4	d		<b>L</b> =1	urtain Grouting vertical shaft												
Tunnel (Vertical Shaft Ex	xcavation)	226d	03-May-1	4 31-Jan-15	5	d															
C3840-SH-100	Pump Test	24d	03-May-1	4 31-May-1	4	d			Pump Test												
C3840-SH-110	Excavation for 1st layer 140m3 50m3/day	3d	03-Jun-14	1 05-Jun-14	4	d			Excavation for 1st layer 140m3 50m3/day	/											
C3840-SH-120	Install 1st waling, strut & legging wall	4d	06-Jun-14	10-Jun-14	4	d			Install 1st waling, strut & legging wall					÷							
C3840-SH-130	Shotcrete 1st layer	2d	11-Jun-14	12-Jun-14	4	d			Shotcrete 1st layer												
Actual Work	Milestone			C	Data Date	11-Oct-13	3		n						Data				P/PMP/2		000000
Remaining Work					Page	1 of 3			Preliminary M	laster Program	mme	9		27-	Date Feb-14		Rev REV 2		Checked BG	AW	Approve
Critical Remaining	g Work								Extract C	ritical Path 1											

	<b>MTR</b>						FRACT	55040	-130	- 131		130	Jial	.on, 0	and		Juan	Jub	way			
	Activity Name	Orig Dur	Planned Start	Planned Finish	Total Float		) Jan F	MAprin	20 N J		S Oct	ND	lan F	M Apr		015 Jul A	50	ct N	D lan	FM	Apr M	2016 I J JI
C3840-SH-140	Excavation for 2nd layer 190m3 50m3/d	4d	13-Jun-14	17-Jun-14	8d			101 / ¢1   1			on for 2nd								Diodan		i pi m	
C3840-SH-150	Install 2nd waling, strut & lagging wall	4d	18-Jun-14	4 21-Jun-14	8d				Ŀ	Install 2	id waling,	strut &	agging v	/all								
C3840-SH-160	Shotcrete 2nd layer	2d	23-Jun-14	4 24-Jun-14	8d				Ŀ	Shotcre	te 2nd lay	/er										
C3840-SH-170	Install Decking with Subframe to cover all area	4d	25-Jun-14	28-Jun-14	- 8d					Install	ecking v	/ith \$ubf	ame to	over all a	rea							
C3840-SH-180	Excavation for 3rd layer 360m3 50m3/d	7d	30-Jun-14	4 08-Jul-14	8d				Ļ	Exca	ation for	3rd layer	360m3	50m3/d								
3840-SH-190	Install 3rd waling, strut & lagging wall	5d	09-Jul-14	14-Jul-14	8d				Ļ	linsta	ll 3rd wali	ng, strut	& laggin	g wall								
3840-SH-200	Shotcrete 3rd layer	2d	15-Jul-14	16-Jul-14	8d				Ļ	Sho	crete 3rd	layer										
840-SH-210	Excavation for 4th layer117m3 (soil) @ 50m3/d, 205m3 (rock) 3m3/d	71d	17-Jul-14	10-Oct-14	8d				ļ			xcavatio	ሰ for 4th	layer 117r	h3 (soil)	@ 50m3	/d, 205m	n3 (rock	) 3m3/d			
840-SH-230	Shotcrete 4th layer	2d	11-Oct-14	13-Oct-14								Shotcret	• 4th lay	er								
3840-SH-240	Make formation and Blinding	2d	14-Oct-14	4 15-Oct-14	8d						Γ,	Make for	mation a	nd Blindin	g							
840-SH-250	Modify waling and strut	3d	16-Oct-14	18-Oct-14	8d						Γ		/aling an									
840-SH-260	Adjustable Steel Platform Setup for Grouting & Piling Works)	12d		01-Nov-14	8d						Ĺ			el Platforn	Setun	for Grouti	na & Pili	nd Worl	ks)			
3840-SH-270	Horizontal Grouting (48 Nos. Grout Holes)			4 03-Dec-14	8d						Ĺ			Grouting					,			
3840-SH-280	Horizontal Pipe Roofing (59 Nos. Pipe Pile)			4 07-Jan-15										ontal Pipe								
																	. гіре г					
D-SH-290	Horizontal Re-grouting	14d		5 23-Jan-15	8d							-	Γ	prizontal R								
40-SH-300	Install Portal Frame	3d		5 27-Jan-15	8d								Ι <b>Γ</b> Ι	stall Porta								
840-SH-310	Cut Pipe Pile	4d	28-Jan-15	5 31-Jan-15	8d									ut Pipe Pi	le							
el (ELS, Excavati	ion & 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 -								-		Exca	vation, sh	otcrete 8	& install	steel fra	mework	support	for 1st
40-TU-110	Excavation, shotcrete & install steel framework support for next 7m	75d	04-May-1	5 01-Aug-15	8d									<b>ا</b>	_		xcavatio	on, shoto	crete & i	nstall ste	el framev	work su
840-TU-120	Excavation, shotcrete & install steel framework support for last 7m	75d	03-Aug-15	5 31-Oct-15	8d											┕╴		Exc	avation	shotcre	te & insta	all steel
840-TU-130	Install intermediate portal frame	3d	02-Nov-15	5 04-Nov-15	8d													Ins	tallinter	mediate	portal fra	ame
C3840-TU-140	Install intermediate horizontal pipe roofing incl. mobilization & demobilization	19d	05-Nov-15	5 26-Nov-15	8d														Install ir	htermedi	ate horizo	ohtal pip
3840-TU-150	Horizontal re-grouting for intermediate section	6d	27-Nov-15	5 03-Dec-15	- 8d													- 1-1	Horizo	ntal re-g	routing fo	or interr
3840-TU-160	Install Support, excavation & shotcret for intermediate section	33d	04-Dec-1	5 14-Jan-16	8d													L	_	Install Su	ipport, ex	kçavatic
3840-TU-180	Install dowel bars & concrete collar beams	10d	15-Jan-16	6 26-Jan-16	8d															Install	dowel bar	rs & co
3840-TU-210	Breakthrough (core & saw cut) into K11 Lot & associated works	18d	27-Jan-16	6 19-Feb-16	8d														L	Bre	akthroug	jh (care
3840-TU-220	Construct Slab 2 Bays (2 pours)	12d	20-Feb-16	6 04-Mar-16	8d															- <b>-</b> c	Construct	Slab 2
3840-TU-230	Construct Wall & Roof (incl. removal of struts) 2 Bays (8 pours)	64d	05-Mar-16	6 25-May-16																		Const
3840-TU-240	Curing	10d	26-May-16	6 06-Jun-16	8d																L	🗖 Curi
3840-TU-250	Dismantle falsework	10d	31-May-16	6 11-Jun-16	8d																	<b>—</b> Dis
3840-TU-260	Grouting into void above	6d	13-Jun-16	6 18-Jun-16	8d																	G
																						ГЦ
Actual Work	♦ ♦ Milestone			Data	Date: 11-	Oct-1	3															
Remaining Wor	rk				Page 2 of	3					Pre	limi	nary	Mast	ter P	rogra	amm	ne			27	Da 7-Feb-
Critical Remaini	ing Work				5 5.									Criti							21	-rep-

				M A E D A 2017 U1													
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uting	into	void	abov	/e													
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e		Т	F	Rev	isio		Ť		Che	ecke	ed			App	orov	/ed	
4			EV.				-	3G					AW				
•			_ •	-													

<b>MTR</b>				CONTRACT C3840-13C Tsim Sha Tsui Station, Carnarvon Road Subway																					
Activity ID Activity Name		Orig	Planned	Planned	Total Float				20	014				2015					2016		i			2017	
		Dur	Start	Finish		Oct N	D Jan	F M Apr	M J	Jul A	S Oct N	D Jar	n F M Apr I	1 J Jul	A S	Oct N	D Jan	F M Apr N	∕l J Jul	A S	Oct N D J	lan F I	M Apr M	J Jul	A S Oct N
	C3840-TU-270 Cut Pipe pile at interface	3d	20-Jun-16	22-Jun-16	8d														Left Cut	Pipe pile	le at interface				
Bu	ilding Services & ABWF Works	70d	27-Apr-16	21-Jul-16	8d																				
E	3S & 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	1 Complet	ion		

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											
e	Revision	Checked	Approved								
1	REV 2	BG	AW								

<b>MTR</b>	CONTRACT	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 A	2016 018 xor M L Luul A S Oct N D Jan E M Aor M L Luul A S Oct N D Jan											
Preliminary Master Programme Revision 2	898d 11-Oct-13 23-Oct-16 0d													
Preliminaries	898d 11-Oct-13 23-Oct-16 0d													
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	ment												
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 Equir											
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)	0d 31-Oct-13 0d 🕁 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	s 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 <b>-1</b> Temporary Traffic													
		Jive slow (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	Isultant												
C3840-TTM-110 Pepare & submit review by Eng Outline TTM Schemes as per PS P20.4	6d 17-Oct-13 23-Oct-13 0d 1 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 0d 1 Eng review Outli	ne TTM Schemes												
C3840-TTM-130 Prepare Detailed TTMS	5d 24-Oct-13 29-Oct-13 0d Prepare Detailed	ттия												
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 Od													
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 Rit/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	Medization 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 1 m. 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 0d	■ Image: The second												
Actual Work    Milestone	Data Date: 11-Oct-13		Maeda/P/PMP/2											
Remaining Work	Page 1 of 5	Preliminary Master Programme	Date         Revision         Checked         Approved           27-Feb-14         REV 2         BG         AW											
Critical Remaining Work		Extract Critical Path 2												

	MTR	CONTRACT C3840-13C Tsim Sha Tsui Station, Carnarvon Road Subway										
vity ID	Activity Name	Orig Planned Planned Total Float	2014         2015         2016           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	MAEDA           2017           Det N D Ian E M Apri M L Juli A S Oct N F								
C3840-ETS-030	Curtain Grouting along Grid Line A	24d 29-May-14 26-Jun-14 2d										
C3840-ETS-070	Type III Sheet Plle, 355m along between Grids A & B	6d         22-Apr-14         28-Apr-14         0d	Type III Sheet Pile, 355m along between Grids A & B									
C3840-ETS-080	Toe Grouting	8d 29-Apr-14 09-May-14 Od	Top Grouting									
C3840-ETS-090	Mobilization for Piling Rig and Setup	4d 10-May-14 14-May-14 0d	Mobilization for Piling Rig and Setup									
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 Od	37 nos. pipe piels along Grid Line B with 1m. to 1.5m. minimum rock socket									
C3840-ETS-120 (	Curtain Grouting along Grid Line B	13d 14-Jun-14 28-Jun-14 Od	Curtain Grouting along Grid Line B									
Piles & Grouting for Rema	ining Section of Cofferdam at D2	20d 24-Apr-15 18-May-15 0d										
C3840-ECD-010	Mobilization for Piling Rig and Setup	4d 24-Apr-15 28-Apr-15 0d	P									
C3840-ECD-020 2	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 0d	23 nos. pipe piles along Grid Line B at D2 with 1m. to 3.2m minimum rock	sokket								
	avation for Temporary Staricase)	209d 30-Jun-14 11-Mar-15 0d										
	avation of remporary stancase)											
Excavation		93d 30-Jun-14 20-Oct-14 0d										
C3840-EXC-100	Pump test prior to excavate for temporary staricase	24d 30-Jun-14 28-Jul-14 Od	Putting test prior to excavate for temporary staricase									
C3840-EXC-120	Excavation for 1st layer at D1 208m3	4d 29-Jul-14 01-Aug-14 0d	Excavation for 1st layer at D1:208h3									
C3840-EXC-130 I	Install 1st waling & strut 21ton & temporary support to underground UUs	7d 02-Aug-14 09-Aug-14 0d	Install 1st walling & strut 21ton & temporary support to underground UUs									
C3840-EXC-140	Install Truss for Suport Temp D1	6d 11-Aug-14 16-Aug-14 0d	Install Truss for Suport Temp D									
C3840-EXC-150 \$	Shotcrete 1st layer	2d 18-Aug-14 19-Aug-14 Od	Shotcrete 1st layer									
C3840-EXC-160	Demolish D1 4m below GL	6d 20-Aug-14 26-Aug-14 0d	Demolish D1 4m below GL									
C3840-EXC-170	Excavation for 2nd layer at D1 230m3	5d 27-Aug-14 01-Sep-14 0d	Excavation for 2nd layer at D1 230m3									
C3840-EXC-180	Install 2nd waling & strut 17ton	7d 02-Sep-14 10-Sep-14 0d	Iḥstall 2nd waling & strut 17ton									
C3840-EXC-190 \$	Shotcrete 2nd layer	2d 11-Sep-14 12-Sep-14 0d	♣ \$hot¢rete 2nd layer									
C3840-EXC-200	Excavation for 3rd layer at D1 216m3	5d 13-Sep-14 18-Sep-14 0d	- ■ Excavation for 3rd layer at 101 216m/3									
C3840-EXC-210	Install 3rd waling & strut 15ton	6d 19-Sep-14 25-Sep-14 0d	-∎ Install 3rd waling & strut 15ton									
	Shotcrete 3rd layer	4d 26-Sep-14 30-Sep-14 0d	Shotcrete 3rd layer									
			Г									
	Excavation for 4th layer at D1 166m3	4d 03-Oct-14 07-Oct-14 0d	Excavation for 4th layer at D1 166m3									
	Install channel on opening	3d 08-Oct-14 10-Oct-14 0d	linstali channelon opening									
C3840-EXC-250 \$	Shotcrete 4th layer	4d 11-Oct-14 15-Oct-14 0d	Shotcrete 4th layer									
C3840-EXC-260 I	Make formation and Blinding	4d 16-Oct-14 20-Oct-14 0d	Make formation and Binding									
RC Structure (Temporary S	Staricase)	116d 21-Oct-14 11-Mar-15 0d										
C3840-TSC-100 I	Install Dowel bars (130#)	6d 21-Oct-14 27-Oct-14 0d	Install Dowel bars (120#)									
C3840-TSC-110 (	Const. Bay1 : 18m3	6d 28-Oct-14 03-Nov-14 0d	Const. Bayl : 18m3									
C3840-TSC-120	Const. Bay2 : 16m3	9d 04-Nov-14 13-Nov-14 0d	Const. Bay2 ::16m3									
C3840-TSC-130	Const. Bay3 : 6m3	6d 14-Nov-14 20-Nov-14 0d	Const. Bay3: 6m									
Actual Work	♦ ♦ Milestone	Data Date: 11-Oct-13		Maeda/P/PMP/2								
Remaining Work		Page 2 of 5	Preliminary Master Programme Date 27-Feb-14	Revision Checked Approved								
Critical Remaining W	Vork		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         2017           ct         N         D         Jan         F         M         April         M         J         Jul         A         S         Oct         N         D         Jan         F         M         April         M         J         Jul         A         S         Oct         N         D         Jan         F         M         April         M         J         Jul         A         S         Oct         N         D         Jan         F         M         April         M         J         Jul         A         S         Oct         N         D         Jan         F         M         April         M         J         Jul         A         S         Oct         N         D         Jan         F         M         April         M         Jul         A         S         Oct         N         D         Jan         F         M         April         M         Jul         A         S         Oct         N         D         Jan         F         M         April         M         Jul         A         S         Oct         N         D         Jul
с	3840-TSC-150	Const. Bay5 : 35m3	13d	21-Nov-14	05-Dec-14		
c	3840-TSC-160	Const. Bay6 : 39m3	15d	06-Dec-14	4 23-Dec-14	Od	Const. Bay6. 39m3
с	3840-TSC-170	Const. Bay7 : 34m3	14d	16-Dec-14	1 03-Jan-15	Od	Const Bay: : 34m3
c	3840-TSC-180	Const. Bay8 : 4m3	6d	31-Dec-14	4 07-Jan-15	Od	under Stein
С	3840-TSC-190	Const. Bay9 : 44m3	14d	08-Jan-15	23-Jan-15	Od	Const. Eay9 : 44m3
с	3840-TSC-240	Temporary Staircase Commissioning & open for use	Od		11-Mar-15	Od	Temporary Staircase Commissioning & open for use
Open (	Cut Sequence 3 (A	dvance Ground Works & Piling Works at D2 & in front of D1)	33d	12-Mar-15	5 23-Apr-15	Od	
C384	40-ELS-510	Joint Survey & Remove existing BS & ABWF Services at D2	6d	12-Mar-15	5 18-Mar-15	Od	Joint Survey & Remové existing BS & ABWF Services at D2
C384	40-ELS-520	Const Flood Barrier at Concourse and D2	9d	19-Mar-15	5 28-Mar-15	Od	Const Flood Barrier at Concourse and D2
C384	40-ELS-530	Demolish D2 above GL	12d	30-Mar-15	5 16-Apr-15	Od	Demdlish D2 above GL
C384	40-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	
C384	40-ELSD1-100	Excavation for 1st layer 378m3, 25m3/day	15d	27-Jun-15	5 15-Jul-15	Od	Excavation for 1st/layer 378m3, 25m3/day
C384	40-ELSD1-110	Install 1st waling & strut & Utility Support	24d	03-Jul-15	30-Jul-15	Od	Install 1st waling & strut & Utility Support
C384	40-ELSD1-130	Install Decking with Subframe to cover all area	12d	31-Jul-15	13-Aug-15	Od	🤟 İnstall Decking with Subframe to cover all area
C384	40-ELSD1-140	Shotcrete 1st layer	2d	14-Aug-15	5 15-Aug-15	Od	Shotcrete 1st;layer
C384	40-ELSD1-150	Excavation for 2nd layer 421m3 50m3/day	9d	17-Aug-15	5 26-Aug-15	Od	Excavation for 2nd layer 421m3 50m3/day
C384	40-ELSD1-160	Install 2nd waling & strut	8d	21-Aug-15	5 29-Aug-15	Od	Install 2nd waling & strut
C384	40-ELSD1-170	Shotcrete 2nd layer	2d	31-Aug-15	5 01-Sep-15	Od	Shotcrete 2nd layer
C384	40-ELSD1-180	Demolish existing subway 7.5m below GL	6d	02-Sep-15	6 08-Sep-15	Od	Demojish existing subway 7.5m below GL
C384	40-ELSD1-190	Excavation for 3rd layer 421m3, 50m3/d	9d	09-Sep-15	5 18-Sep-15	Od	Excavation for 3rd layer 421m3; 50m3/d
C384	40-ELSD1-200	Install 3rd waling & strut	8d	14-Sep-15	5 22-Sep-15	Od	Install 3rd waling & strut
C384	40-ELSD1-210	Shotcrete 3rd layer	2d	23-Sep-15	5 24-Sep-15	Od	Shotcrete 3rd layer
C384	40-ELSD1-220	Demolish existing subway 10.6m below GL	6d	25-Sep-15	5 03-Oct-15	Od	Demofish existing subway 10,6m below GL
C384	40-ELSD1-230	Excavation for 4th layer 443m3, 50m3/d	9d	05-Oct-15	14-Oct-15	Od	Excavation for 4th layer 443m3, 50m3/d
C384	40-ELSD1-240	Install 4th waling & strut	8d	09-Oct-15	17-Oct-15	Od	jnstall 4th waing & strut
C384	40-ELSD1-250	Shotcrete 4th layer	2d	19-Oct-15	20-Oct-15	Od	Shotcrete 4th layer
C384	40-ELSD1-260	Excavation for 5th layer 443m3, 50m3/d	9d	22-Oct-15	31-Oct-15	Od	Excavation for 5th layer 443m3, 50m3/d
C384	40-ELSD1-270	Install 5th waling & strut	8d	27-Oct-15	04-Nov-15	Od	└╾∰ InstallSth waling & strut
C384	40-ELSD1-280	Shotcrete 5th layer	2d	05-Nov-15	5 06-Nov-15	Od	Shotcrete 5th layer
C384	40-ELSD1-290	Excavation Soil for 6th layer 392m3, 50m3/d	8d	07-Nov-15	5 16-Nov-15	Od	Excavation Soil for 6th layer 392m3, 50m3/d
C384	40-ELSD1-300	Excavation Rock (Grade 2) 402m3, 8m3/d	50d	17-Nov-15	5 16-Jan-16	Od	Excavation Rock (Grade 2) 402m3, 3m3/d
						ata Date: 11-	
	ctual Work	<ul><li>♦ Milestone</li></ul>			Da		Preliminary Master Programme Date Revision Checked Approv
	emaining Work ritical Remaining	) Work				Page 3 of	f 5 27-Feb-14 REV 2 BG AW
							Extract Critical Path 2

	<b>MTR</b>							
Activity ID	Activity Name	Orig Planned Dur Start	Planned Finish	Total Float	2014 Oct N D Jan F M Apr M J Jul A S Oct N [		2016	2017 0' A S Oct N D Jan F M Apr M J Jul A S Oct N D Ja
C3840-ELSD1-310	Install 6th waling & strut	8d 18-Jan-16	6 26-Jan-16	0d			Install 6th waling & strut	
C3840-ELSD1-320	Shotcrete 6th layer	2d 27-Jan-16	6 28-Jan-16	0d			Shotcrete 6th layer	
C3840-ELSD1-330	Make formation and Blinding	4d 29-Jan-16	02-Feb-16	0d			Make formation and Blindi	ng
Open Cut Sequence 5 (C	Construction of Subway & D2)	116d 03-Feb-16	6 28-Jun-16	0d				
C3840-STR-110	Const. Bay1 : 4m3	6d 03-Feb-16	3 12-Feb-16	Od			Const. Bay1 : 4m3	
C3840-STR-120	Const. Bay2 : 123m3	10d 13-Feb-16	6 24-Feb-16	0d			Const. Bay2 : 123m3	
C3840-STR-130	Const. Bay3.1 : 125m3	10d 25-Feb-16	6 07-Mar-16	0d			Const. Bay3.1 : 125m	3
C3840-STR-140	Const. Bay3.2 : 120m3	15d 08-Mar-16	6 24-Mar-16	0d			Const. Bay3 2 : 12	lm3
C3840-STR-150	Const. Bay4 : 29m3	6d 18-Mar-16	6 24-Mar-16	0d			Const. Bay4 : 29m	3
C3840-STR-160	Const. Bay4.5 : 13m3	6d 23-Mar-16	6 01-Apr-16	0d			Const. Bay4.5 : 1	3m(3
C3840-STR-170	Const. Bay5 : 141m3	10d 31-Mar-16	6 12-Apr-16	0d			Const. Bay5 : 14	ит3
C3840-STR-180	Const. Bay6.1 : 130m3	12d 13-Apr-16	26-Apr-16	0d			Const. Bay6.1	: 130m3
C3840-STR-190	Const. Bay6.2 : 130m3	12d 18-Apr-16	30-Apr-16	0d			Const. Bay6.	2: 1130013
C3840-STR-200	Const. Bay6.3 : 130m3	12d 22-Apr-16	06-May-16	Od			<b>≻</b> ⊟ Const. Bay6	3 130 <mark>n</mark> 3
C3840-STR-210	Const. Bay6.4 : 130m3	12d 27-Apr-16	11-May-16	Od			Const. Baye	.4: 130m3
C3840-STR-220	Const. Bay6.5 : 130m3	15d 03-May-1	6 20-May-16	Od			Const. Ba	76.5 : 1\$0m3
C3840-STR-240	Const. Bay7 : 90m3	15d 06-May-1	6 24-May-16	0d			Const. Ba	y7: 90m3
C3840-STR-260	Const. Bay8.1 : 104m3	10d 12-May-10	6 24-May-16	Od			Cohst. Ba	y8;1:104m3
C3840-STR-270	Const. Bay8.2 : 104m3	10d 19-May-1	6 30-May-16	0d			Const. B	ay8.2 : 04m3
C3840-STR-280	Const. Bay8.5 : 39m3 (D2)	15d 25-May-1	6 11-Jun-16	0d			Çonst.	Baye.5 39m3 (D2)
C3840-STR-290	Curing, remove strut & falsework	14d 13-Jun-16	6 28-Jun-16	0d			Curi	ng, remwve strut;& falsewprk
Building Services & A	NRWF Works	533d 05-Jan-15	5 22-Oct-16	0d				
BS & ABWF Works at Te		54d 05-Jan-15		0d				
C3840-TSBA-100		0d	23-Jan-15	0d		► <b>P</b> Complețe RC works		
C3840-TSBA-110		40d 05-Jan-15		Od		Symplete Rowerks     The stallation of BS and ABWF works		
C3840-TSBA-120		40d 05-Jan-15		1d		CN&SE access & cable routing connecting to		
C3840-TSBA-130		6d 25-Feb-1		Od				
C3840-TSBA-140		6d 04-Mar-1		Od		Inspection prior to open for public use		
C3840-TSBA-150		0d	11-Mar-15	0d		Open for public use		
		96d 29-Jun-16		Od				
C3840-BSM-100		56d 29-Jun-16	02-Sep-16	Od				BS 1st Fix
C3840-BSM-110	BS 2nd Fix	40d 03-Sep-16	6 22-Oct-16	0d				BS 2nd Fix
			Da	ata Date: 11	1-0ct-13		1	Maeda/P/PMP/2
Actual Work	♦ Milestone		Da		Prelim	inary Master Programme	Date	Revision Checked Approved
Critical Remaining				Page 4 c	015	xtract Critical Path 2	27-Feb-14	REV 2 BG AW
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	<b>MTR</b>		CONTRACT C3840-13C Tsim Sha Tsui Station, Carnarvon Road Subway																				
Activity ID	Activity Name		Planned Start	Planned Finish	Total Floa	Cct N D	Jan F	M Apr M	2014 J Jul A	S Oct N D	Jan F	M Apr M	2015 J Jul A	S Oct N D	Jan F M	201 Apr M J	6 Jul A	S Oct N	J D Jan F	M Apr	2017 M J Jul	ASOC	018 ct N D Jan
C3840-BSM-120	Complete all BS works in TER	Od		22-Oct-16	00													<b>□</b> → C	omplete all BS	works in Tf	ER		
						•		, , , ,															

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	

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е	Revision	Checked	Approved						
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# **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					
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**



Contract No. C3840-13C Tsim Sha Tsui Station Carnarvon Road Subway

### Licence Summary

ltem No.	Our Ref.	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	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 #002	APCO	Notification	Construction Dust Notification	Form NB – Notification S3(3) of APCO (Construction Dust)	403252	27 - 05 - 2016	02 - 06 - 2016	01 - 02 - 2014	31 - 10 - 2017	Demolition of a Building	Change of anticipated date of completed is notified
001	APCO #002	APCO	Notification	Construction Dust Notification	Form NB – Notification S3(3) of APCO (Construction Dust)	403252	27 - 05 - 2016	02 - 06 - 2016	01 - 08 - 2014	31 - 08 - 2018	Work carried out in any part of a tunnel that is within 100m of any exit to the open air	Change of anticipated date of completed is notified
001	APCO #002	APCO	Notification	Construction Dust Notification	Form NB – Notification S3(3) of APCO (Construction Dust)	403252	27 - 05 - 2016	02 - 06 - 2016	01 - 01 - 2016	31 - 08 - 2018	Construction of the Superstructure of a Building	Change of anticipated date of completed is notified
001	APCO #002	APCO	Notification	Construction Dust Notification	Form NB – Notification S3(3) of APCO (Construction Dust)	403252	27 - 05 - 2016	02 - 06 - 2016	01 - 11 - 2016	28 - 02 - 2019	Road Construction Work	Change of anticipated date of completed is notified
002	APCO #002	WDO	Account	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 #002	WPCO	Licence	Water Discharge Licence	EPD-117 (Form A) Application for a Licence of Water Discharge	WT00019722-2014	24 - 07 - 2014	01 - 09 - 2014	01 - 09 - 2014	31 - 03 - 2019	Quarterly Report FlowRate 25m3/d, pH 6-9, SS 30mg/L, COD 80mg/L	
004	CWP #001	WDO	Registration	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	
005	CNP#006	NCO	Permit	Construction Noise Permit	EPD74A(s) Form 1 - Application for a Construction Noise Permit	Application: 405344 Permit: GW-RE0804-16	22 - 07 - 2016	04 - 08 - 2016	15 - 08 - 2016	14 - 02 - 2017	Apply for 4nos Submersible Water pump (Electric) w/ whole site area	



**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 avoi further exceedance;</li> <li>Submit proposals for remedial actions to IEC within 3 work days of notification;</li> <li>Implement th agreed proposals;</li> <li>Resubmit proposals if problem still r under control</li> <li>Stop the relevant porti of works as determined b the ER until ti exceedance i 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.

<ol> <li>Notify IEC and Contractor.</li> <li>Carry out investigation.</li> <li>Report the results of investigation to</li> </ol>	<ol> <li>Review the analyzed result submitted by ET.</li> <li>Review the proposed remedial</li> </ol>	<ol> <li>Confirm receipt of notification of exceedance</li> <li>Notify Contractor</li> </ol>	1. Submit noise mitigation proposals to IEC
<ul> <li>the IEC and Contractor.</li> <li>4. Discuss with the Contractor and formulate remedial measures</li> <li>5. Increase monitoring frequency to check mitigation effectiveness.</li> </ul>	<ul><li>measures by the Contractor and advise the ER accordingly.</li><li>3. Supervise the implementation of remedial measures.</li></ul>	<ol> <li>Require Contractor to propose remedial measures for the analysed noise problem</li> <li>Ensure remedial measures are properly implemented.</li> </ol>	2. Implement noise mitigation proposals
<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 proposals for remedial actions to IEC within 3 working days of notifications</li> <li>Implement the agreed proposals</li> <li>Revise and resubmit proposals if problem still not under control</li> <li>Stop the relevant portion of works as determined by the ER until the exceedance is abated</li> </ol>
	Contractor. 4. Discuss with the Contractor and formulate remedial measures 5. Increase monitoring frequency to check mitigation effectiveness. 1. Notify IEC, ER, EPD and Contractor, and follow other actions 2. Identify source 3. Repeat measurement to confirm findings 4. Increase monitoring frequency 5. Check Contractor's working procedures to determine possible mitigation to be implemented 6. Inform IEC, ER and EPD the causes and actions taken for the exceedances	<ul> <li>Contractor.</li> <li>Discuss with the Contractor and formulate remedial measures</li> <li>Increase monitoring frequency to check mitigation effectiveness.</li> <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>Increase monitoring</li> <li>Repeat measurement to confirm findings</li> <li>Increase monitoring frequency</li> <li>Increase monitoring</li> <li>Supervise the implementation of remedial measures.</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 effectiveness of</li> </ul>	<ul> <li>Contractor.</li> <li>4. Discuss with the Contractor and formulate remedial measures</li> <li>5. Increase monitoring frequency to check mitigation effectiveness.</li> <li>1. Notify IEC, ER, EPD and Contractor, and follow other actions</li> <li>2. Identify source</li> <li>3. Repeat monitoring frequency</li> <li>4. Increase monitoring frequency</li> <li>5. Increase accordingly.</li> <li>3. Supervise the implementation of remedial actions</li> <li>4. Increase monitoring frequency</li> <li>5. Check Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ET accordingly</li> <li>5. Check Contractor's working procedures to determine possible mitigation to be implemented</li> <li>6. Inform IEC, ER and EPD the causes and actions taken for the exceedances</li> <li>7. Assess effectiveness of</li> </ul>

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



**Monitoring Schedule** 

			tal Monitoring & A October 201			
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						Holiday
2	3 24-hr TSP	4 Noise Weekly Site Audit	5	6	7	8
9	<sup>10</sup> Holiday	11 24-hr TSP Noise Weekly Site Audit	12	13	14	15
16	<b>17</b> 24-hr TSP	18 Weekly Site Audit	19	20 Noise	21	22
23	<b>24</b> 24-hr TSP	25 Noise Weekly Site Audit	26	27	28	29
30	31					

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Environmental Monitoring & Audit Schedule November 2016									
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday			
		1	2	3	4	5			
		24-hr TSP Noise							
		Weekly Site Audit							
0	7	0		40		40			
6	7	8	9	10	11	12			
	24-hr TSP	Noise							
		Weekly Site Audit							
13	14	15	16	17	18	19			
	24-hr TSP	Noise							
		Weekly Site Audit							
20	21	22	23	24	25	26			
-•									
	24-hr TSP	Noise Weekly Site Audit							
		Weekly Old Addit							
27	28	29	30						
	24-hr TSP	Noise							

# **APPENDIX H**

Weather Information Extracted from HK Observatory

		Air	Temperat	ture				
Date September	Mean Pressure (hPa)	Maximum (deg. C)	Mean (deg. C)	Minimum (deg. C)	Mean Relative Humidity (%)	Total Rainfall (mm)	Prevailing Wind Direction (degrees)	Mean Wind Speed (km/h)
1	1009.9	29.4	26.6	24.0	89	95.5	090	16.2
2	1009.0	29.8	27.6	26.2	82	Trace	060	17.8
3	1007.8	28.3	27.5	26.6	82	0.2	050	28.5
4	1008.1	29.5	27.5	26.5	83	0.0	050	17.5
5	1008.9	31.9	28.6	26.9	78	Trace	070	18.7
6	1009.1	32.4	28.5	25.9	75	16.7	010	19.3
7	1007.1	29.3	27.7	25.5	79	17.3	010	23.6
8	1006.8	29.9	28.1	27.0	71	Trace	360	35.2
9	1008.9	28.8	26.5	24.9	69	0.0	010	33.0
10	1010.2	28.1	25.3	23.5	70	0.0	020	28.0
11	1010.7	26.8	24.5	22.0	79	0.1	010	29.8
12	1012.5	25.8	24.6	23.0	84	0.9	060	39.7
13	1013.5	29.3	26.0	24.2	77	Trace	080	39.5
14	1013.2	29.9	26.7	25.0	76	Trace	080	34.6
15	1012.6	30.3	27.2	24.6	72	0.0	050	20.3
16	1010.9	30.8	28.0	25.9	71	0.0	020	20.3
17	1009.1	28.8	26.6	24.1	81	16.7	070	43.5
18	1008.1	25.5	24.8	23.9	96	178.7	090	57.5
19	1008.7	25.9	25.1	24.4	96	223.4	100	36.0
20	1004.6	29.5	27.3	24.7	82	0.0	010	15.8
21	997.1	28.0	26.1	24.4	86	72.5	220	60.8
22	1007.8	29.4	27.5	26.1	84	1.9	220	18.2
23	1010.0	29.1	27.1	25.8	88	0.0	100	6.0
24	1011.3	29.1	27.3	26.1	88	Trace	120	13.8
25	1013.3	29.8	27.3	26.1	87	Trace	090	16.5
26	1015.6	30.0	27.1	25.7	84	0.0	070	17.1
27	1016.0	30.9	27.5	25.4	79	0.0	060	11.1
28	1014.9	31.5	28.2	26.3	75	0.0	020	8.6
29	1017.2	29.0	26.7	24.3	79	0.5	080	31.5
30	1019.8	26.6	24.4	22.9	74	0.0	020	32.3
31	1019.1	28.7	25.5	23.1	70	0.0	070	24.0
Mean/Total	1010.7	29.1	26.8	25.0	80	624.4	070	26.3
Normal*	1014.1	27.8	25.5	23.7	73	100.9	080	27.4
Station		F	long Kong	Observato	ry		Waglan	Island^

#### EXTRACT OF METEOROLOGICAL OBSERVATIONS FOR HONG KONG OCTOBER 2016

^ In case the data are not available from Waglan Island, observations of Cheung Chau or other nearby weather stations will be incorporated in computing the Prevailing Wind Direction and Mean Wind Speed.

#### Note: Monitoring days

# **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		Rootsmeter	S/N 04	138320	Ta (K) -	295
Operator		Orifice I.I	D 2	1785	Pa (mm) -	- 751.84
PLATE OR Run #  1 2 3 4 5	VOLUME START (m3) NA NA NA NA NA NA	VOLUME STOP (m3) NA NA NA NA NA NA	DIFF VOLUME (m3) 1.00 1.00 1.00 1.00 1.00	DIFF TIME (min) 1.3850 0.9830 0.8760 0.8320 0.6910	METER DIFF Hg (mm) 3.2 6.4 7.9 8.8 12.7	ORFICE DIFF H2O (in.) 2.00 4.00 5.00 5.50 8.00

#### DATA TABULATION

Vstd	(x axis) Qstd	(y axis)		Va	(x axis) Qa	(y axis)
0.9951 0.9908 0.9887 0.9876 0.9824	0.7184 1.0080 1.1287 1.1870 1.4217	$ \begin{array}{r} 1.4137\\ 1.9993\\ 2.2353\\ 2.3444\\ 2.8275 \end{array} $		0.9957 0.9915 0.9894 0.9883 0.9831	0.7189 1.0087 1.1295 1.1878 1.4227	0.8859 1.2528 1.4007 1.4690 1.7717
Qstd slo intercep coeffici	t (b) =	2.00462 -0.02664 0.99989	ı e n	Qa slope intercept coefficie	t (b) =	1.25526 -0.01669 0.99989
y axis = SQRT[H2O(Pa/760)(298/T			I Ta)]	y axis =	SQRT [H20 (7	[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 =  $1/m\{ [SQRT H2O(Ta/Pa)] - b \}$ 

Location :	4/F Roof top, K11 Commercial Complex			
Sampler :	TE-5170 MFC			
Calibration Date :	18-Aug-16			
Tech :	Sun			
Operator :	Tisch			
Model :	TE-5025A			
Calibrator Orifice no.:	1785			
Slope (m):	2.00462			
Intercept (b):	-0.02664			
Date Certified :	2-May-16			

Standard Pressure (Pstd)	298.00 K
Standard Temperature (Tstd)	302.50 K
Ambient Pressure (Pa)	760.00 mmHg
Ambient Temperature (Ta)	754.20 mmHg

Sample no.	H₂O (in)	Qstd (m³/min)	I (Flow Chat)	IC (corrected)
1	11.2	1.664	56.0	54.96
2	9.1	1.501	46.0	45.14
3	7.1	1.328	41.0	40.24
4	5.1	1.127	31.0	30.42
5	3.0	0.868	20.0	19.63

Linear Regression					
Slope =	43.340				
Intercept =	-18.157				
Correlation Coefficient =	0.9933				

Calibrations

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

Qstd = actual flow rate as indicticated by the calibrator orifice

H2O = orifice manometer reading during calibration

Ta = ambient temperature during calibration, K = 273 +  $^{\circ}$ C

Tstd = standard temperature, a constant that never changes, 298 K

Pa = ambient barometric pressure during calibration, mmHg

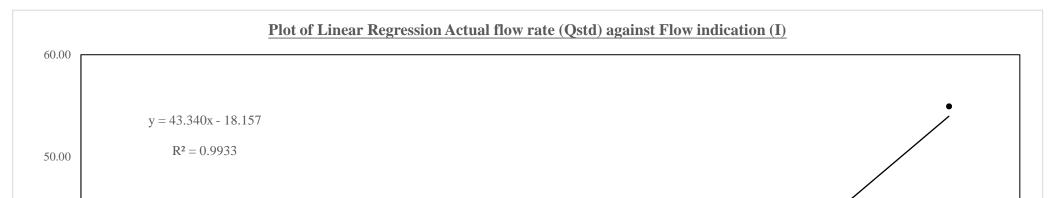
Pstd = standard barometric pressure, a constant that never changes, 760 mm Hg

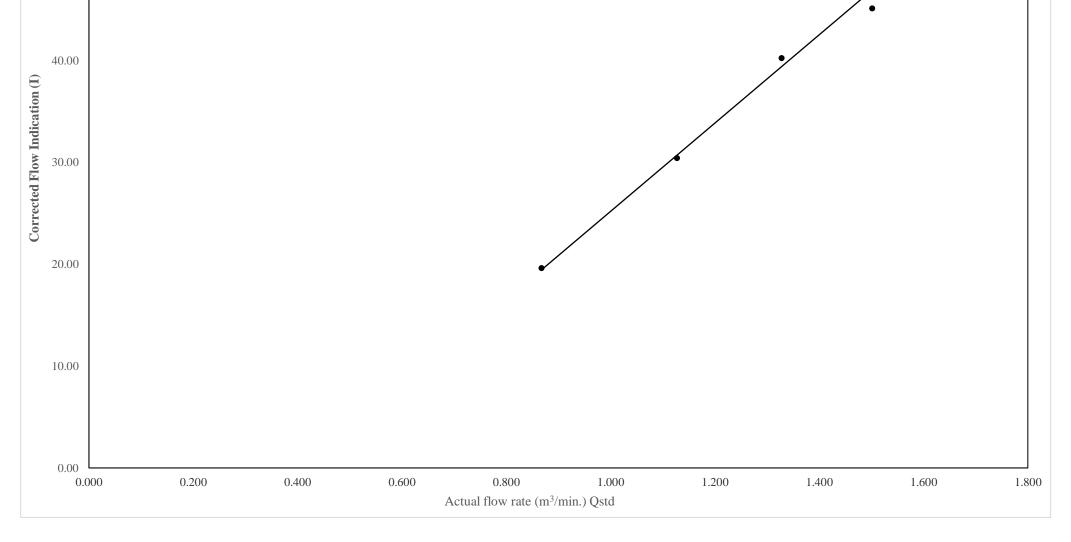
m = Qstandard slope of orifice calibrator relationship

b = Qstandard intercept of orifice calibrator relationship

IC = continuous flow recorder readings corrected to current Ta and Pa

I = continuous flow recorder readings during calibration







Location :	4/F Roof top, K11 Commercial Complex			
Sampler :	TE-5170 MFC			
Calibration Date :	6-Oct-16			
Tech :	Sun			
Operator :	Tisch			
Model :	TE-5025A			
Calibrator Orifice no.:	1785			
Slope (m):	2.00462			
Intercept (b):	-0.02664			
Date Certified :	2-May-16			

Standard Pressure (Pstd)	298.00 K
Standard Temperature (Tstd)	304.00 K
Ambient Pressure (Pa)	760.00 mmHg
Ambient Temperature (Ta)	755.70 mmHg

Sample no.	H₂O (in)	Qstd (m³/min)	I (Flow Chat)	IC (corrected)
1	11.7	1.698	54.0	52.78
2	9.2	1.507	47.0	45.94
3	7.0	1.316	40.0	39.10
4	4.6	1.070	30.0	29.32
5	3.2	0.894	20.0	19.55

Linear Regression					
Slope =	40.608				
Intercept =	-15.330				
Correlation Coefficient =	0.9925				

Calibrations

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

Qstd = actual flow rate as indicticated by the calibrator orifice

H2O = orifice manometer reading during calibration

Ta = ambient temperature during calibration, K = 273 +  $^{\circ}$ C

Tstd = standard temperature, a constant that never changes, 298 K

Pa = ambient barometric pressure during calibration, mmHg

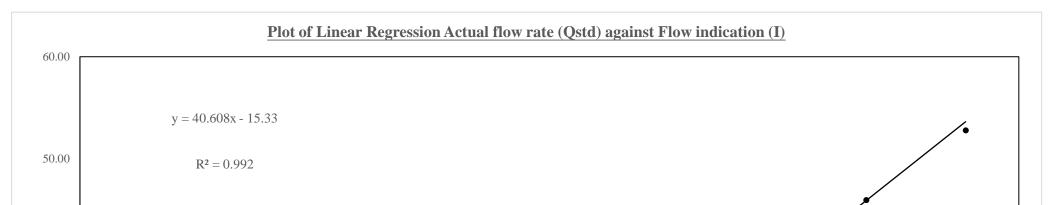
Pstd = standard barometric pressure, a constant that never changes, 760 mm Hg

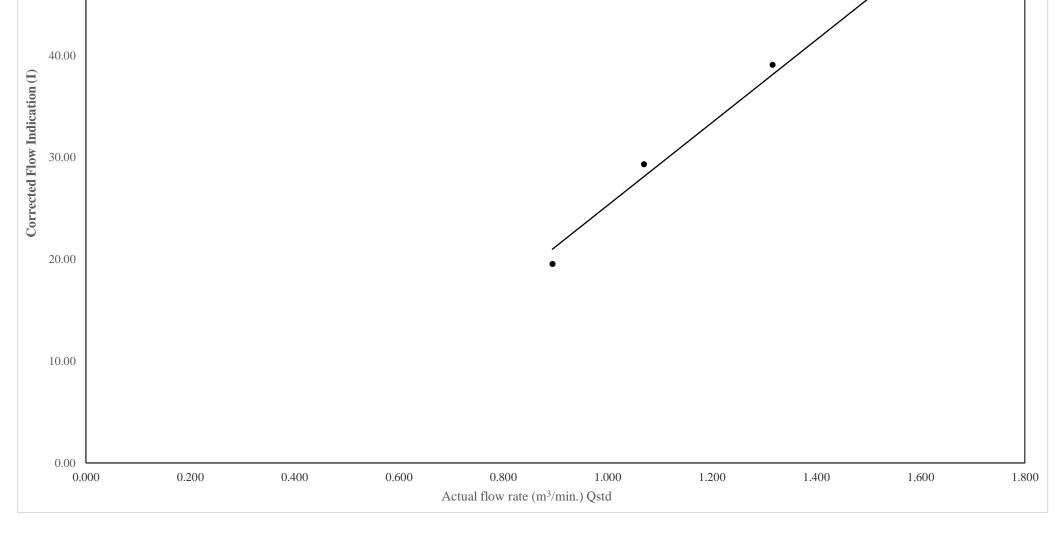
m = Qstandard slope of orifice calibrator relationship

b = Qstandard intercept of orifice calibrator relationship

IC = continuous flow recorder readings corrected to current Ta and Pa

I = continuous flow recorder readings during calibration









Certificate No.	510616		Page	1	of	3	Pages		
Customer :	Hyder Consulting Limited								
Address :	20/F, AXA Tower, Landmark Eas	st, 100 How Ming St	treet, Kwun Tong	, HK					
Order No. :	Q54035		Date of receipt	:			1-Dec-15		
Item Tested									
•	Description : Sound Level Meter								
Manufacturer :						500			
Model :	2238		Serial No.	:	2448	529			
Test Conditi	ons								
Date of Test :	7-Dec-15		Supply Voltage	:					
Ambient Temp	erature : (23 ± 3)°C		Relative Humid	lity :	(50 ±	25)	%		
Test Specifi	cations								
Calibration cheo	ck.								
Ref. Document/	Procedure: Z01,IEC 61672.								
Test Results	5								
restitesuite	2								
	within the IEC 61672 Type1 spec	ification.							
The results are	shown in the attached page(s).								
Main Test equip	oment used:								
Equipment No.	Description	<u>Cert. No.</u>		Trac	eable	e to			
S017	Multi-Function Generator	C147450		SCL	-HKS	AR			
S240	Sound Level Calibrator	500563		NIM	-PRC	& S	SCL-HKSAR		

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), or by reference to a natural constant. The test results apply to the above Unit-Under-Test only

Calibrated by :	Approv	ved by :	Steve Kwan
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 Ko Tel: 2425 8801 Fax: 2425 8646	Date:	7-Dec-15	,



Certificate No. 510616

Page 2 of 3 Pages

Results :

- 1. Self-generated noise: 19.8 dBA
- 2. Acoustical signal test

	UUT S	etting		
	Frequency	Time	Applied	UUT
Range (dB)	Weighting	Weighting	Value (dB)	Reading (dB)
40-120	A	F	94.0	93.5
40 120		S		93.5
	C	F		93.5
	I I	F		93.5
	A	F	114.0	113.5
	Π	S		113.5
	C	5 F	-	113.5
		F	-	113.5

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

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

The second secon	Attenuation (dB)	IEC 61672 Type 1 Spec.
Frequency	×	• •
31.5 Hz	- 39.2	- 39.4 dB, ± 2 dB
63 Hz	- 26.1	- 26.2 dB, ± 1.5 dB
125 Hz	- 16.2	- 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)	$0 \text{ dB}, \pm 1.1 \text{ dB}$
2 kHz	+ 1.2	$+ 1.2 \text{ dB}, \pm 1.6 \text{ dB}$
4 kHz	+ 1.0	$+ 1.0 \text{ dB}, \pm 1.6 \text{ dB}$
8 kHz	- 1.1	- 1.1 dB, +2.1 dB ~ -3.1 dB
	- 6.6	- 6.6 dB, + 3.5 dB ~ - 17.0 dB
16 kHz	- 0.0	0.0 42, 0.0 42 1.0

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



Certificate No. 510616

Page 3 of 3 Pages

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

4.1 Frequency Weighting (Fast)

4.1 Trequency	()		D:00	IDC (1(7)
UUT	Applied	UUT	Difference	IEC 61672
Setting	Value (dB)	Reading (dB)	(dB)	Type 1 Spec.
A	94.0	93.5 (Ref.)		± 0.4 dB
С	94.0	93.5	0.0	
L	94.0	93.5	0.0	

### 4.2 Time Weighting (A-weighted)

	1.2 11110 11 018-10-18	(			100 (1(00
	UUT	Applied	UUT	Difference	IEC 61672
	Setting	Value (dB)	Reading (dB)	(dB)	Type 1 Spec.
	Fast	94.0	93.5 (Ref.)		± 0.3 dB
-	Slow	94.0	93.5	0.0	
	Time-averaging	94.0	93.5	0.0	

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

Remarks : 1. UUT : Unit-Under-Test

- 2. The uncertainty claimed is for a confidence probability of not less than 95%.
- 3. Atmospheric Pressure : 1018 hPa.
- 4. Preamplifier model : ZC 0030 , S/N : --
- 5. Firmware Version: 1.2.0
- 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 ------



Certificate No.	602136	-	Page	1 of 2 Pages
Customer :	Hyder Consulting Limited			
Address :	20/F, AXA Tower, Landmark Ea	ast, 100 How Ming S	treet, Kwun Tong	g, HK
Order No. :	Q60851		Date of receipt	<b>t :</b> 14-Mar-16
Item Tested				
Description :	Precision Acoustic Calibrator			
Manufacturer :	Larson Davis		I.D.	:
Model :	CAL200		Serial No.	: 10929
Test Conditi	ons			
Date of Test :	18-Mar-16		Supply Voltage	e :
Ambient Temp	erature : $(23 \pm 3)^{\circ}C$		Relative Humi	<b>dity:</b> (50 ± 25) %
Test Specifi	cations			
Calibration chee	ck.			
	Procedure : F06, F20, Z02.			
6				
Test Results	3			
All results were	within the IEC 942 specification.			
The results are	shown in the attached page(s).			
Main Test equip				
Equipment No.		<u>Cert. No.</u>		Traceable to
S014	Spectrum Analyzer	505317		NIM-PRC & SCL-HKSAR
S240	Sound Level Calibrator	601604		NIM-PRC & SCL-HKSAR
S041	Universal Counter	506951		SCL-HKSAR
will not include allow overloading, mis-ha	this Calibration Certificate only relate to wance for the equipment long term drift, indling, or the capability of any other lab age resulting from the use of the equipm	variations with environme oratory to repeat the mea	ental changes, vibrati	on and shock during transportation,
	used for calibration are traceable to Inte bly to the above Unit-Under-Test only	ernational System of Unit	s (SI), or by reference	e to a natural constant.
	And			
Calibrated by		App	proved by :	Alan

Elva Chong

Date: 18-Mar-16

Alan Chu

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

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Certificate No. 602136

Page 2 of 2 Pages

Results :

#### 1. Level Accuracy

UUT Nominal Value (dB)	Measured Value (dB)	IEC 942 Class 1 Spec.
94	93.7	± 0.3 dB
114	114.7	

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

### 2. Frequency Accuracy

UUT Nominal Value	Measured Value	IEC 942 Class 1 Spec.
1 kHz	1.000 kHz	±2 %

Uncertainty :  $\pm 0.5$  %

- Level Stability : 0.0 dB IEC 942 Class 1 Spec. : ± 0.1 dB Uncertainty : ± 0.01 dB
- Total Harmonic Distortion : < 0.5 % 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 : 1 012 hPa

----- END -----



### **Sample Data Record Sheet**

Monitoring Location		4/F Roof top, K11
Sampler Identification		TE-5170 MFC
Start date & time of sampling		03 October 2016, 08:30 a.m.
Elapsed-time Meter Reading	Start (Hours)	7235.75
	Stop (Hours)	7260.14
Total Sampling Time (min.)		1463.4 (24.39 Hours)
Weather Conditions		Sunny
Abnormal Site Conditions		Nil
	Pi (mm Hg)	
Initial Flow Pata Opi	Ti (°C)	26.5
Initial Flow Rate, Qsi	Hi (cfm)	36
	Qsi (Std. m <sup>3</sup> )	1.25
	Pi (mm Hg)	759.4
Final Flow Rate, Qsf	Ti (°C)	26.8
Filidi Filow Rate, QSI	Hf (cfm)	36
	Qsf (Std. m <sup>3</sup> )	1.25
Average Flow Rate (Std. m <sup>3</sup> )		1.25
Total Volume (Std. m <sup>3</sup> )		1829
Filter Identification No.		201706
Initial Weight of Filter (g)		2.8550
Final Weight of Filter (g)		2.9229
Measured TSP Level (µg/m <sup>3</sup> )		37.1

Name & Designation

<u>Signature</u>

<u>Date</u>

Record by: Tung Chi Sun

Jun Marson

20 October 2016

20 October 2016

Monitoring Location		4/F Roof top, K11
Sampler Identification		TE-5170 MFC
Start date & time of sampling		11 October 2016, 08:00 a.m.
Elapsed-time Meter Reading	Start (Hours)	7260.19
	Stop (Hours)	7284.99
Total Sampling Time (min.)		1488.0 (24.80 Hours)
Weather Conditions		Sunny
Abnormal Site Conditions		Nil
Pi (mm Hg)		760.3
Initial Flow Pata Oai	Ti (°C)	26.2
Initial Flow Rate, Qsi	Hi (cfm)	36
	Qsi (Std. m <sup>3</sup> )	1.26
	Pi (mm Hg)	760.3
Final Flow Rate, Qsf	Ti (°C)	26.2
	Hf (cfm)	36
	Qsf (Std. m <sup>3</sup> )	1.26
Average Flow Rate (Std. m <sup>3</sup> )		1.26
Total Volume (Std. m <sup>3</sup> )		1881
Filter Identification No.		201707
Initial Weight of Filter (g)		2.8736
Final Weight of Filter (g)		2.9377
Measured TSP Level (µg/m <sup>3</sup> )		34.1

Name & Designation

<u>Signature</u>

<u>Date</u>

Record by: Tung Chi Sun

Jun

20 October 2016

20 October 2016

Monitoring Location		4/F Roof top, K11
Sampler Identification		TE-5170 MFC
Start date & time of sampling		17 October 2016, 08:00 a.m.
Elapsed-time Meter Reading	Start (Hours)	7284.99
	Stop (Hours)	7310.18
Total Sampling Time (min.)		1511.4 (25.19 Hours)
Weather Conditions		Sunny
Abnormal Site Conditions		Nil
	Pi (mm Hg)	
Initial Flow Pata Oni	Ti (°C)	25.6
Initial Flow Rate, Qsi	Hi (cfm)	33
	Qsi (Std. m <sup>3</sup> )	1.19
	Pi (mm Hg)	760.7
Final Flow Rate, Qsf	Ti (°C)	25.6
	Hf (cfm)	33
	Qsf (Std. m <sup>3</sup> )	1.19
Average Flow Rate (Std. m <sup>3</sup> )		1.19
Total Volume (Std. m <sup>3</sup> )		1799
Filter Identification No.		201709
Initial Weight of Filter (g)		2.8308
Final Weight of Filter (g)		2.9059
Measured TSP Level (µg/m <sup>3</sup> )		41.7

Name & Designation

<u>Signature</u>

Date

Record by: Tung Chi Sun

Checked by: Wong Fu Nam



07 November 2016

07 November 2016

Monitoring Location		4/F Roof top, K11
Sampler Identification		TE-5170 MFC
Start date & time of sampling		24 October 2016, 08:00 a.m.
Elenced time Motor Reading	Start (Hours)	7310.18
Elapsed-time Meter Reading	Stop (Hours)	7335.24
Total Sampling Time (min.)		1503.6 (25.06 Hours)
Weather Conditions		Fine
Abnormal Site Conditions		Nil
	Pi (mm Hg)	
Initial Flow Data Opi	Ti (°C)	24.6
Initial Flow Rate, Qsi	Hi (cfm)	33
	Qsi (Std. m <sup>3</sup> )	1.19
	Pi (mm Hg)	761.5
Final Flow Pote Oof	Ti (°C)	24.4
Final Flow Rate, Qsf	Hf (cfm)	33
	Qsf (Std. m <sup>3</sup> )	1.19
Average Flow Rate (Std. m <sup>3</sup> )		1.19
Total Volume (Std. m <sup>3</sup> )		1790
Filter Identification No.		201708
Initial Weight of Filter (g)		2.8549
Final Weight of Filter (g)		2.9103
Measured TSP Level (µg/m <sup>3</sup> )		31.0

Name & Designation

<u>Signature</u>

<u>Date</u>

Record by: Wong Fu Nam

Checked by: Tung Chi Sun

10 November 2016 10 November 2016

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

Monitoring Location		4/F Roof top, K11			
Date of Monitoring		04 October 2016			
Monitoring Start Time		13:07			
Measurement Time Length		30			
Weather Condition		Sunny			
Wind Speed		0			
Noise Meter Model / Identific	ation	BK 2238			
Calibrator Model / Identificat	ion	CAL 200			
Calibration Before Measurer	nent	94.0			
Calibration After Measureme	ent	94.0			
	L <sub>eq</sub>	(dB(A))	67.9		
Measurement Results	L <sub>10</sub>	(dB(A))	69.5		
	L90	(dB(A))	64.0		
Major Construction Noise So Monitoring	ource(s)	On-site powered mechanical equipment			
Other Noise Source(s) Durin	g Monit	Traffic noise			
Remarks					

Name & Designation

<u>Signature</u>

Date

Record by: Tung Chi Sun

Jun .

04 October 2016

04 October 2016

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

Monitoring Location		4/F Roof top, K11			
Date of Monitoring		11 October 2016			
Monitoring Start Time		11:30			
Measurement Time Length		30			
Weather Condition		Sunny			
Wind Speed		0.9			
Noise Meter Model / Identific	ation	BK 2238			
Calibrator Model / Identificat	ion	CAL 200			
Calibration Before Measurer	nent	94.3			
Calibration After Measureme	ent	94.1			
	L <sub>eq</sub>	(dB(A))	70.6		
Measurement Results	L <sub>10</sub>	(dB(A))	73.5		
	L90	(dB(A))	64.5		
Major Construction Noise So Monitoring	ource(s)	On-site powered mechanical equipment			
Other Noise Source(s) Durin	g Monit	Jackhammers from neighborhood			
Remarks					

Name & Designation

<u>Signature</u>

Date

Record by: Tung Chi Sun

11 October 2016

Jun

11 October 2016

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

Monitoring Location		4/F Roof top, K11			
Date of Monitoring		20 October 2016			
Monitoring Start Time		10:14			
Measurement Time Length		30			
Weather Condition		Sunny			
Wind Speed		0.2			
Noise Meter Model / Identific	ation	BK 2238			
Calibrator Model / Identificat	ion	CAL 200			
Calibration Before Measurer	nent	94.0			
Calibration After Measureme	ent	94.1			
	L <sub>eq</sub>	(dB(A))	72.9		
Measurement Results	L <sub>10</sub>	(dB(A))	74.5		
	L90	(dB(A))	70.5		
Major Construction Noise So Monitoring	ource(s)	On-site powered mechanical equipment			
Other Noise Source(s) Durin	g Monit	Traffic and ambulance			
Remarks					

Name & Designation

<u>Signature</u>

Date

Record by: Tung Chi Sun

20 October 2016

Jun

20 October 2016

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

Monitoring Location		4/F Roof top, K11			
Date of Monitoring		25 October 2016			
Monitoring Start Time		14:00			
Measurement Time Length		30			
Weather Condition		Fine			
Wind Speed		(m/s)	1.0		
Noise Meter Model / Identific	ation	BK 2238			
Calibrator Model / Identificat	ion	CAL 200			
Calibration Before Measurer	nent	94.1			
Calibration After Measureme	ent	94.0			
	L <sub>eq</sub>	(dB(A))	71.2		
Measurement Results	L <sub>10</sub>	(dB(A))	75.3		
	L90	(dB(A))	69.4		
Major Construction Noise So Monitoring	ource(s)	On-site powered mechanical equipment			
Other Noise Source(s) Durin	g Monit	Traffic			
Remarks					

Name & Designation

<u>Signature</u>

Date

Record by: Wong Fu Nam



25 October 2016

Checked by: Tung Chi Sun

25 October 2016

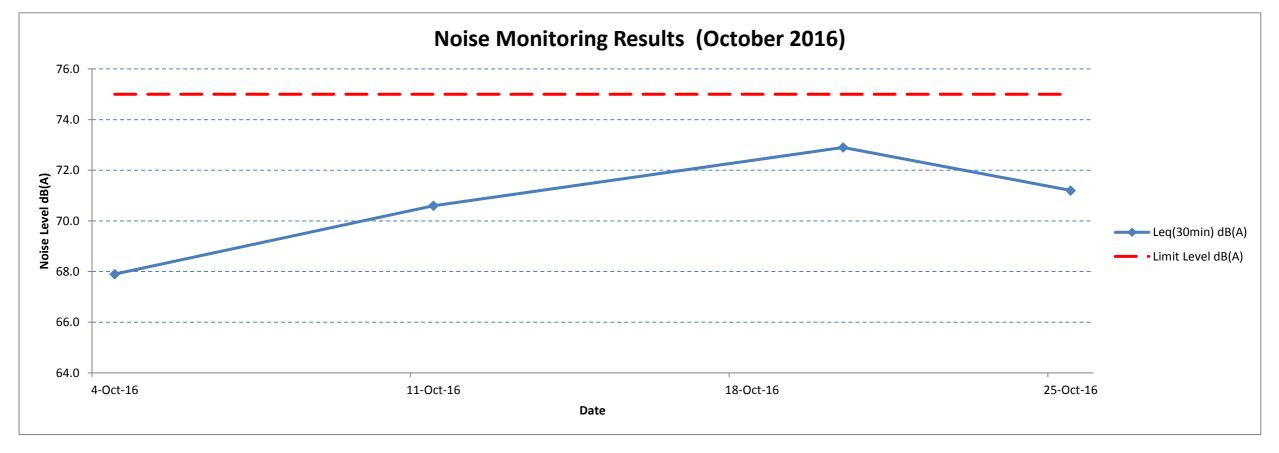


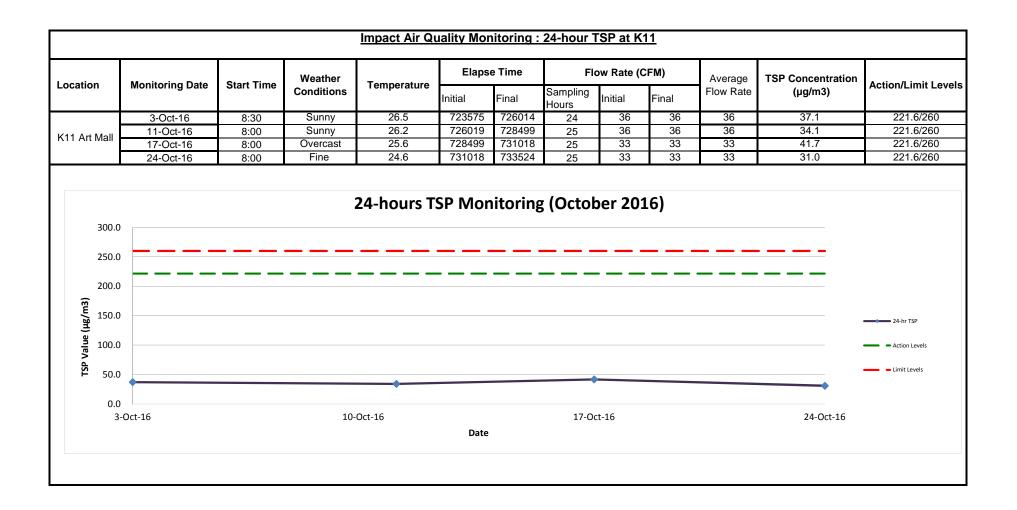
## **Monitoring Results and plots**

### Noise Impact Monitoring Results at K11

Monitoring Locations	Date	Weather Conditions	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-Oct-16	Sunny	0.0	13:07	13:37	65.3	75	67.9	69.5	64.0
K11 Art Mall	11-Oct-16	Sunny	0.9	11:30	12:00	65.3	75	70.6	73.5	64.5
	20-Oct-16	Sunny	0.2	10:14	10:44	65.3	75	72.9	74.5	70.5
	25-Oct-16	Fine	1.0	14:00	14:30	65.3	75	71.2	75.3	69.4

#### Red Bold indicates an exceedance of Limit Level



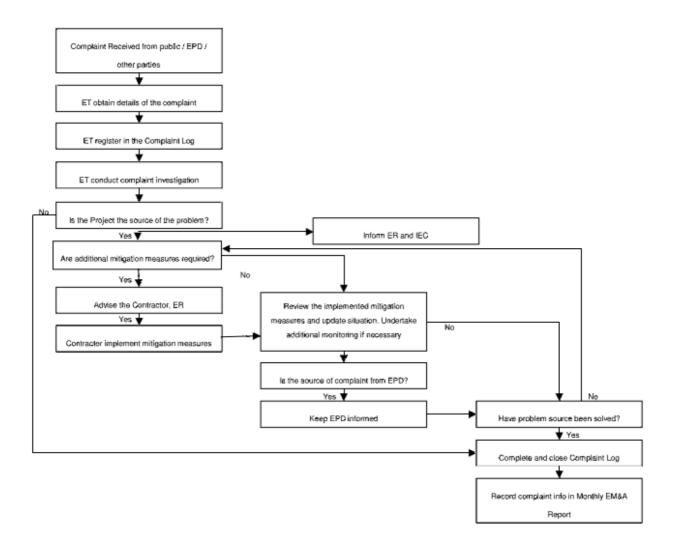


# **APPENDIX L**

Flow Chat for Handing Environmental Complaints

### APPENDIX L

### **Complaint Response Procedure**





### **Waste Management Records**

### Monthly Summary Waste Flow Table for 2016 (year)

# Contract No:C3840-13C Tsim Sha Tsui Station Carnarvon Road SubwayDate Reported:2-November-2016

		Actual Qua	ntities of Inert C&I	O Materials Generate	Actual Quantities of Non-inert C&D Wastes Generated Monthly						
Month	Total Quantity Generated	Hard Rocks and Large Broken Concrete (See Note 3)	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 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)
Carried from Project Start	2.5295	-	-	-	2.5295	-	-	-	-	-	0.0202
Jan	0.1751	-	-	-	0.1751	-	-	-	-	-	0.0036
Feb	0.0326	-	-	-	0.0326	-	-	-	-	-	0.0029
Mar	0.0932	-	-	-	0.0932	-	-	-	-	-	0.0023
Apr	0.0786	-	-	-	0.0786	-	-	-	-	-	0.0000
May	0.1061	-	-	-	0.1061	-	-	-	-	-	0.0033
June	0.0411	-	-	-	0.0411	-	-	-	-	-	0.0000
Sub-total	0.5267	-	-	-	0.5267	-	-	-	-	-	0.0121
July	0.0951	-	-	-	0.0951	-	-	-	-	-	0.0010
Aug	0.1478	-	-	-	0.1478	-	-	-	-	-	0.0000
Sept	0.0427	-	-	-	0.0427	-	-	-	-	-	0.0007
Oct	0.1806	-	-	-	0.1806	-	-	-	-	-	0.0000
Nov	-	-	-	-	-	-	-	-	-	-	-
Dec	-	-	-	-	-	-	-	-	-	-	-
Total	0.9929	-	-	-	0.9929	-	-	-	-	-	0.0138
Acc. Total	al 3.5224 (accumulated quantity of the project = carried amount + this year amount)										0.0340

#### 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.