

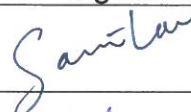

Environmental Protection Department

Contract No. HY/2012/06

**Widening of Fanling Highway
- Tai Hang to Wo Hop Shek
Interchange**

**Monthly EM&A Report
For December 2016**

[1/2017]

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Reviewed & Approved:	Y W Fung	

Version:	Rev. 0	Date: 13 January 2017
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**Environmental Monitoring and Audit (EM&A) for Widening of Tolo Highway/Fanling Highway between Island House Interchange and Fanling Stage 2 (between Tai Hang to Wo Hop Shek Interchange)
Environmental Permit No. EP-324/2008/D Condition 3.3 – Submission of Monthly EM&A Report – December 2016 for the portion of Stage 2 works under Contract No. HY/2012/06**

13 January 2017

By Fax (2805 5028) & Hand

We refer to the revised Monthly EM&A Report – December 2016 received on 13 January 2017 submitted by the Environmental Team via email. Pursuant to Environmental Permit Condition 3.3, I hereby verify the Monthly EM&A Report – December 2016 (Rev. 0) for the portion of works under Stage 2 of the captioned Project which is managed under Contract No. HY/2012/06.

Yours faithfully
for MOTT MACDONALD HONG KONG LIMITED



Steven Tang
Independent Environmental Checker

c.c.
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EXECUTIVE SUMMARY

The proposed widening of Tolo Highway and Fanling Highway between Island House Interchange and Fanling (the Project) is a Designated Project under the Environmental Impact Assessment Ordinance (Cap. 499) (EIAO). An Environmental Impact Assessment (EIA) Report (the approved EIA Report) together with an Environmental Monitoring and Audit (EM&A) Manual (the approved EM&A Manual) were completed and approved under the EIAO on 14 July 2000 (Register Number: EIA-043/2000).

The objective of the Project “Widening of Tolo Highway / Fanling Highway between Island House Interchange and Fanling” is to widen Tolo Highway and Fanling Highway to dual 4-lane carriageway in order to alleviate the current traffic congestion problems and to cope with the increasing transport demands to and from the urban areas and also cross boundary traffic.

The Project is a designated project and governed by an Environmental Permit (EP-324/2008) issued by the EPD on 23 December 2008. Subsequently, the EPD issued Variation of Environmental Permits of EP-324/2008/A, EP-324/2008/B and EP-324/2008/C on 31 January 2012, 17 March 2014 and 27 March 2015 respectively. The current valid VEP was applied on 19 August 2015 and the VEP (EP-324/2008/D) was subsequently granted on 27 August 2015.

The construction works for this Project are delivered in 2 stages i.e. Stage 1 (between Island House Interchange and Tai Hang) and Stage 2 (between Tai Hang and Wo Hop Shek Interchange). Stage 2 would be implemented under two works contracts. Contract No. HY2012/06 “Widening of Fanling Highway – Tai Hang to Wo Hop Shek Interchange” and the entrusted portion to CEDD under Contract No. CV/2012/09 “Liantang/Heung Yuen Wai Boundary Control Point Site Formation and Infrastructure Works – Contract 3”. This report focuses on Contract No. HY2012/06 “Widening of Fanling Highway – Tai Hang to Wo Hop Shek Interchange” in Stage 2 of the Project only.

Pursuant to the EP (EP-324/2008/D) Condition 2.7, the Capture Survey Trip Report for Ma Wat River Northern Meander (Version 2) for the Project was submitted on 24 December 2013 by the Environmental Team (ET) and verified by the Independent Environmental Checker (IEC) on 6 January 2014.

The construction phase of the Contract under the EP and the Environmental Monitoring and Audit (EM&A) programme of the contract commenced on 21 November 2013. The impact environmental monitoring and audit includes air quality and noise monitoring.

This report documents the findings of EM&A works conducted in the period between 1 and 31 December 2016. As informed by the Contractor, construction activities in the reporting period were:

- Site clearance
- Ground investigation
- Pipe laying
- Retaining wall construction
- Noise Barrier
- Excavation
- Backfilling
- Drainage
- Temporary bridge construction
- House Construction
- Foot Bridge demolition
- Bridge construction

Reporting Change

There was no reporting change required in the reporting period.

Breaches of Action and Limit Levels for Air Quality

No exceedance of Action and Limit Level was recorded for 1-hour and 24-hour TSP monitoring in the reporting period.

Breaches of Action and Limit Levels for Noise

No Action or Limit Level exceedance of construction noise was recorded in the reporting month. No noise complaints related to 0700 – 1900 hours on normal weekdays was received and followed by Environmental Team in the reporting month.

Complaint, Notification of Summons and Successful Prosecution

No complaint, notification of summons and successful prosecution was received in the reporting period.

Future Key Issues

Key issues to be considered in the coming month include:

- Properly store and label oils and chemicals on site;
- Chemical, chemical waste and waste management;
- Collection of construction waste should be carried out regularly;
- Properly maintain all drainage facilities and wheel washing facilities on site;
- Exposed slopes should be covered up properly if no temporary work will be conducted;
- Quieter powered mechanical equipment should be used;
- Suppress dust generated from excavation activities and haul road traffic; and
- Tree protective measures for all retained trees should be well maintained.

1 INTRODUCTION

1.1 Background

- 1.1.1. Tolo Highway and Fanling Highway are the expressways in the North East New Territories (NENT) connecting Sha Tin, Tai Po and Fanling. These highways form a vital part of the strategic Route 9, which links Hong Kong Island to the boundary at Shenzhen. At present, this section of Route 9 is a dual 3-lane carriageway. However, at several major interchanges along this section of Route 9, the highway is a dual-2 lane carriageway only. Severe congestion is a frequent occurrence during the peak periods, particularly in the Kowloon-bound direction.
- 1.1.2. The objective of the Project “Widening of Tolo Highway / Fanling Highway between Island House Interchange and Fanling” is to widen Tolo Highway and Fanling Highway to dual 4-lane carriageway in order to alleviate the current traffic congestion problems and to cope with the increasing transport demands to and from the urban areas and also cross boundary traffic.
- 1.1.3. The Project is a designated project and governed by an Environmental Permit (EP-324/2008) issued by the EPD on 23 December 2008. Subsequently, the EPD issued Variation of Environmental Permits of EP-324/2008/A, EP-324/2008/B and EP-324/2008/C on 31 January 2012, 17 March 2014 and 27 March 2015 respectively. The current valid VEP was applied on 19 August 2015 and the VEP (EP-324/2008/D) was subsequently granted on 27 August 2015.
- 1.1.4. The scope of the Project comprises mainly:-
- (i) Widening of a 5.7 km section of Tolo Highway and 3.0 km section of Fanling Highway between Island House Interchange and Wo Hop Shek Interchange from the existing dual 3-lane to dual 4-lane, including construction of new vehicular bridges;
 - (ii) Widening of interchange sections at Island House Interchange, Tai Po North Interchange, and Lam Kam Road Interchange from dual 2-lane to dual 3-lane, except Sha Tin bound carriageway at Tai Po North Interchange, which is widened from 3-lane to 4-lane, including realignment of various slip roads;
 - (iii) Modification and reconstruction of highways, vehicular bridges, underpasses and footbridges.
- 1.1.5. The construction works for this Project will be delivered in 2 stages i.e. Stage 1 (between Island House Interchange and Tai Hang) and Stage 2 (between Tai Hang and Wo Hop Shek Interchange). Stage 2 would be implemented under two works contracts. Contract No. HY/2012/06 “Widening of Fanling Highway – Tai Hang to Wo Hop Shek Interchange” and the entrusted portion to CEDD under Contract No. CV/2012/09 “Liantang/Heung Yuen Wai Boundary Control Point Site Formation and Infrastructure Works – Contract 3”. This report focuses on Contract No. HY2012/06 “Widening of Fanling Highway – Tai Hang to Wo Hop Shek Interchange” in Stage 2 of the Project only.
- 1.1.6. Hyder-Arup-Black and Veatch Joint Venture (HABVJV) are appointed by Highways Department (HyD) as the consultants for the design and construction assignment for the Tolo project under Agreement No. CE 58/2000 Supplementary Agreement No. 3 (SA3) (i.e. the Engineer for the Contract).
- 1.1.7. China State Construction Engineering (Hong Kong) Ltd. (CSHK) was commissioned as the Contractor of the Contract.
- 1.1.8. AECOM Asia Co. Ltd. was commissioned by China State Construction Engineering (Hong Kong) Limited as the Environmental Team (ET) to undertake the Environmental Monitoring and Audit (EM&A) works for the Contract and Mott MacDonald Hong Kong Ltd. acts as the Independent Environmental Checker (IEC) for the Contract.
- 1.1.9. The construction phase of the Contract under the EP commenced on 21 November 2013.
- 1.1.10. According to the updated EM&A Manual of Stage 2 of the Project, there is a need of an EM&A programme including air quality and noise monitoring. The EM&A programme for Stage 2 of the Project commenced on 21 November 2013.

1.2 Scope of Report

1.2.1 This is the thirty-eighth monthly EM&A Report under the Contract No. HY/2012/06 “Widening of Fanling Highway – Tai Hang to Wo Hop Shek Interchange. This report presents a summary of the environmental monitoring and audit works, list of activities and mitigation measures proposed by the ET for the Contract in December 2016.

1.3 Project Organization

1.3.1 The project organization structure is shown in Appendix A. The key personnel contact names and numbers are summarized in Table 1.1.

Table 1.1 Contact Information of Key Personnel

Party	Position	Name	Telephone	Fax
ER (Hyder-Arup-Black & Veatch Joint Venture)	Chief Resident Engineer	Edwin Chung	6115 0818	2638 0950
IEC (Mott MacDonald Hong Kong Limited)	Independent Environmental Checker	Steven Tang	2828 5920	2827 1823
Contractor (China State Construction Engineering (Hong Kong) Limited)	Environmental Officer	Michael Tsang	9277 4956	2672 2501
		C C Chow	9679 6315	2672 2501
ET (AECOM Asia Company Limited)	ET Leader	Y W Fung	3922 9393	3922 9797

1.4 Summary of Construction Works

1.4.1 The construction phase for the Contract under the EP commenced on 21 November 2013.

1.4.2 Details of the construction works carried out by the Contractor in this reporting period are listed below:

- Site clearance
- Ground investigation
- Pipe laying
- Retaining wall construction
- Noise Barrier
- Excavation
- Backfilling
- Drainage
- Temporary bridge construction
- House Construction
- Foot Bridge demolition
- Bridge construction

1.4.3 The Construction Programme is shown in Appendix B.

1.4.4 The general layout plan of the Project site showing the contract areas is shown in Figure 1.1.

1.4.5 The environmental mitigation measures implementation schedule are presented in Appendix C.

1.5 Summary of EM&A Programme Requirements

1.5.1 The EM&A programme required environmental monitoring for air quality, noise and environmental site inspections for air quality, water quality, noise, waste management, ecology, and landscape and visual impact. The EM&A requirements for each parameter described in the following sections include:-

- All monitoring parameters;
- Monitoring schedules for the reporting period and forthcoming months;
- Action and Limit levels for all environmental parameters;
- Event / Action Plan;
- Environmental mitigation measures, as recommended in the Project EIA study final report; and
- Environmental requirement in contract documents.

2 AIR QUALITY MONITORING

2.1 Monitoring Requirements

2.1.1 In accordance with the updated EM&A Manual, baseline 1-hour and 24-hour TSP levels at one air quality monitoring station was established. Impact 1-hour TSP monitoring was conducted for at least three times every 6 days, while impact 24-hour TSP monitoring was carried out for at least once every 6 days. The Action and Limit level of the air quality monitoring is provided in Appendix D.

2.2 Monitoring Equipment

2.2.1 24-hour TSP air quality monitoring was performed using High Volume Sampler (HVS) located at each designated monitoring station. The HVS meets all the requirements of the updated EM&A Manual. Portable direct reading dust meters were used to carry out the 1-hour TSP monitoring. Brand and model of the equipment is given in Table 2.1.

Table 2.1 Air Quality Monitoring Equipment

Equipment	Brand and Model
Portable direct reading dust meter (1-hour TSP)	Sibata Digital Dust Monitor (Model No. LD-3)
High Volume Sampler (24-hour TSP)	Tisch Total Suspended Particulate Mass Flow Controlled High Volume Air Sampler (Model No. TE-5170)

2.3 Monitoring Locations

2.3.1 The monitoring station was set up at the proposed location in accordance with updated EM&A Manual. Table 2.2 describes details of the monitoring station. The locations are shown in Figure 1.2a.

Table 2.2 Locations of Impact Air Quality Monitoring Station

Location	Monitoring Station
AM2 (SR2)	Fanling Government Secondary School

2.4 Monitoring Parameters and Frequency

2.4.1 Table 2.3 summarizes the monitoring parameters, frequency and duration of impact TSP monitoring.

Table 2.3 Air Quality Monitoring Parameters and Frequency

Parameter	Frequency
24-hour TSP	Once every 6 days
1-hour TSP	3 times every 6 days while the highest dust impact was expected

2.5 Monitoring Methodology

2.5.1 24-hour TSP Monitoring

- (a) The HVS was installed in the vicinity of the air sensitive receivers. The following criteria were considered in the installation of the HVS.
- (i) A horizontal platform with appropriate support to secure the sampler against gusty wind was provided.
 - (ii) The distance between the HVS and any obstacles, such as buildings, was at least twice the height that the obstacle protrudes above the HVS.
 - (iii) A minimum of 2 meters separation from walls, parapets and penthouse for rooftop sampler.
 - (iv) A minimum of 2 meters separation from any supporting structure, measured horizontally.
 - (v) No furnace or incinerator flues nearby.
 - (vi) Airflow around the sampler was unrestricted.
 - (vii) Permission was obtained to set up the samplers and access to the monitoring stations.
 - (viii) A secured supply of electricity was obtained to operate the samplers.
 - (ix) The sampler was located more than 20 meters from any dripline.
 - (x) Any wire fence and gate, required to protect the sampler, did not obstruct the monitoring process.
 - (xi) Flow control accuracy was kept within $\pm 2.5\%$ deviation over 24-hour sampling period.
- (b) Preparation of Filter Papers
- (i) Glass fibre filters, G810 were labelled and sufficient filters that were clean and without pinholes were selected.
 - (ii) All filters were equilibrated in the conditioning environment for 24 hours before weighing. The conditioning environment temperature was around 25 °C and not variable by more than ± 3 °C; the relative humidity (RH) was < 50% and not variable by more than $\pm 5\%$. A convenient working RH was 40%.
 - (iii) All filter papers were prepared and analysed by ALS Technichem (HK) Pty Ltd., which is a HOKLAS accredited laboratory and has comprehensive quality assurance and quality control programmes.
- (c) Field Monitoring
- (i) The power supply was checked to ensure the HVS works properly.
 - (ii) The filter holder and the area surrounding the filter were cleaned.
 - (iii) The filter holder was removed by loosening the four bolts and a new filter, with stamped number upward, on a supporting screen was aligned carefully.
 - (iv) The filter was properly aligned on the screen so that the gasket formed an airtight seal on the outer edges of the filter.
 - (v) The swing bolts were fastened to hold the filter holder down to the frame. The pressure applied was sufficient to avoid air leakage at the edges.
 - (vi) Then the shelter lid was closed and was secured with the aluminum strip.
 - (vii) The HVS was warmed-up for about 5 minutes to establish run-temperature conditions.
 - (viii) A new flow rate record sheet was set into the flow recorder.
 - (ix) On site temperature and atmospheric pressure readings were taken and the flow rate of the HVS was checked and adjusted at around 1.1 m³/min, and complied with the range specified in the updated EM&A Manual (i.e. 0.6-1.7 m³/min).
 - (x) The programmable digital timer was set for a sampling period of 24 hrs, and the starting time, weather condition and the filter number were recorded.
 - (xi) The initial elapsed time was recorded.
 - (xii) At the end of sampling, on site temperature and atmospheric pressure readings were taken and the final flow rate of the HVS was checked and recorded.
 - (xiii) The final elapsed time was recorded.

- (xiv) The sampled filter was removed carefully and folded in half length so that only surfaces with collected particulate matter were in contact.
 - (xv) It was then placed in a clean plastic envelope and sealed.
 - (xvi) All monitoring information was recorded on a standard data sheet.
 - (xvii) Filters were then sent to ALS Technichem (HK) Pty Ltd. for analysis.
- (d) Maintenance and Calibration
- (i) The HVS and its accessories were maintained in good working condition, such as replacing motor brushes routinely and checking electrical wiring to ensure a continuous power supply.
 - (ii) 5-point calibration of the HVS was conducted using TE-5025A Calibration Kit prior to the commencement of baseline monitoring. Bi-monthly 5-point calibration of the HVS will be carried out during impact monitoring.
 - (iii) Calibration certificate of the HVSs are provided in Appendix E.

2.5.2 1-hour TSP Monitoring

(a) Measuring Procedures

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

- (i) Turn the power on.
- (ii) Close the air collecting opening cover.
- (iii) Push the "TIME SETTING" switch to [BG].
- (iv) Push "START/STOP" switch to perform background measurement for 6 seconds.
- (v) Turn the knob at SENSI ADJ position to insert the light scattering plate.
- (vi) Leave the equipment for 1 minute upon "SPAN CHECK" is indicated in the display.
- (vii) Push "START/STOP" switch to perform automatic sensitivity adjustment. This measurement takes 1 minute.
- (viii) Pull out the knob and return it to MEASURE position.
- (ix) Push the "TIME SETTING" switch the time set in the display to 3 hours.
- (x) Lower down the air collection opening cover.
- (xi) Push "START/STOP" switch to start measurement.

(b) Maintenance and Calibration

- (i) The 1-hour TSP meter was calibrated at 1-year intervals against a continuous particulate TEOM Monitor, Series 1400ab. Calibration certificates of the Laser Dust Monitors are provided in Appendix E.
- (ii) 1-hour validation checking of the TSP meter against HVS is carried out yearly at the air quality monitoring locations.

2.6 Monitoring Schedule for the Reporting period

2.6.1 The schedule for environmental monitoring in December 2016 is provided in Appendix F.

2.7 Results and Observations

2.7.1 The monitoring results for 1-hour TSP and 24-hour TSP are summarized in Table 2.4 and 2.5 respectively. Detailed impact air quality monitoring results are presented in Appendix G.

Table 2.4 Summary of 1-hour TSP Monitoring Results in the Reporting Period

Location	Average ($\mu\text{g}/\text{m}^3$)	Range ($\mu\text{g}/\text{m}^3$)	Action Level ($\mu\text{g}/\text{m}^3$)	Limit Level ($\mu\text{g}/\text{m}^3$)
AM2 (Fanling Government Secondary School)	72.1	68.6 – 74.8	317.8	500

Table 2.5 Summary of 24-hour TSP Monitoring Results in the Reporting Period

Location	Average ($\mu\text{g}/\text{m}^3$)	Range ($\mu\text{g}/\text{m}^3$)	Action Level ($\mu\text{g}/\text{m}^3$)	Limit Level ($\mu\text{g}/\text{m}^3$)
AM2 (Fanling Government Secondary School)	53.2	41.4 – 67.1	200.7	260

2.7.2 The major dust source during the monitoring was mainly from nearby traffic emission.

2.7.3 All 1-hour and 24-hour TSP results were below the Action and Limit Level at all monitoring locations in the reporting period.

2.7.4 The event action plan is annexed in Appendix J.

2.7.5 Weather information including wind speed and wind direction is annexed in Appendix H. The information was obtained from the Hong Kong Observatory Tai Po and Tai Mei Tuk Automatic Weather Stations.

3 NOISE MONITORING

3.1 Monitoring Requirements

3.1.1 In accordance with the EM&A Manual, impact noise monitoring was conducted for at least once per week during the construction phase of the Contract. The Action and Limit level of the noise monitoring is provided in Appendix D.

3.2 Monitoring Equipment

3.2.1 Noise monitoring was performed using sound level meter at each designated monitoring station. The sound level meters deployed comply with the International Electrotechnical Commission Publications (IEC) 651:1979 (Type 1) and 804:1985 (Type 1) specifications. Acoustic calibrator was deployed to check the sound level meters at a known sound pressure level. Brand and model of the equipment is given in Table 3.1.

Table 3.1 Noise Monitoring Equipment

Equipment	Brand and Model
Integrated Sound Level Meter	B&K 2238
Acoustic Calibrator	Rion NC-73

3.3 Monitoring Locations

3.3.1 Monitoring stations M2 and M3 were set up at the proposed locations in accordance with updated EM&A Manual. Figure 1.2a-b shows the locations of the monitoring stations. Table 3.2 describes the details of the monitoring stations.

Table 3.2 Locations of Impact Noise Monitoring Stations

Monitoring Station	Location	Description
M2	West Tai Wo	1.2m from the ground floor free-field of the Residential
M3	Fanling Government Secondary School	1m from the exterior of the roof top façade of the school

3.4 Monitoring Parameters and Frequency

3.4.1 Table 3.3 summarizes the monitoring parameters, frequency and duration of impact noise monitoring.

Table 3.3 Noise Monitoring Parameters, Frequency and Duration

Parameter	Frequency
30-mins measurement at each monitoring station between 0700 and 1900 on normal weekdays. L_{eq} , L_{10} and L_{90} would be recorded.	At least once per week

3.5 Monitoring Methodology

3.5.1 Monitoring Procedure

- (a) Façade measurement was made at monitoring station M3, while free-field measurement was made at monitoring station M2.
- (b) The sound level meter was set on a tripod at a height of 1.2 m above the ground for free-field measurements at monitoring station M2.
- (c) The battery condition was checked to ensure the correct functioning of the meter.
- (d) Parameters such as frequency weighting, the time weighting and the measurement time were set as follows:-
 - (i) frequency weighting: A
 - (ii) time weighting: Fast
 - (iii) time measurement: $L_{eq(30\text{-minutes})}$ during non-restricted hours i.e. 07:00 – 1900 on normal weekdays; $L_{eq(5\text{-minutes})}$ during restricted hours i.e. 19:00 – 23:00 and 23:00 – 07:00 of normal weekdays, whole day of Sundays and Public Holidays
- (e) Prior to and after each noise measurement, the meter was calibrated using the acoustic calibrator for 94dB(A) at 1000 Hz. If the difference in the calibration level before and after measurement was more than 1 dB(A), the measurement would be considered invalid and repeat of noise measurement would be required after re-calibration or repair of the equipment.
- (f) During the monitoring period, the L_{eq} , L_{10} and L_{90} were recorded. In addition, site conditions and noise sources were recorded on a standard record sheet.
- (g) Noise measurement was paused during periods of high intrusive noise (e.g. dog barking, helicopter noise) if possible. Observations were recorded when intrusive noise was unavoidable.
- (h) Noise monitoring was cancelled in the presence of fog, rain, wind with a steady speed exceeding 5m/s, or wind with gusts exceeding 10m/s.

3.5.2 Maintenance and Calibration

- (a) The microphone head of the sound level meter was cleaned with soft cloth at regular intervals.
- (b) The meter and calibrator were sent to the supplier or HOKLAS laboratory to check and calibrate at yearly intervals.
- (c) Calibration certificates of the sound level meters and acoustic calibrators are provided in Appendix E.

3.6 Monitoring Schedule for the Reporting period

3.6.1 The schedule for environmental monitoring in December 2016 is provided in Appendix F.

3.7 Monitoring Results

3.7.1 The monitoring results for construction noise are summarized in Table 3.4 and the monitoring data is provided in Appendix I.

Table 3.4 Summary of Construction Noise Monitoring Results in the Reporting Period

Location	Average, dB(A), L_{eq} (30 mins)	Range, dB(A), L_{eq} (30 mins)	Limit Level, dB(A), L_{eq} (30 mins)
M2* (West Tai Wo)	69.1	68.9 – 69.2	75
M3# (Fanling Government Secondary School)	65.2	64.0 – 66.3	65/70

*+3dB(A) Façade correction included

Limit Level of 70dB(A) applies to education institutes while 65dB(A) applies during school examination period.

- 3.7.2 No Action or Limit Level exceedance of construction noise was recorded in the reporting month. No noise complaints related to 0700 – 1900 hours on normal weekdays was received and followed by Environmental Team in the reporting month.
- 3.7.3 Major noise sources during noise monitoring in the reporting period were mainly road traffic noise.
- 3.7.4 The event action plan is annexed in Appendix J.

4 ENVIRONMENTAL SITE INSPECTION AND AUDIT

4.1 Site Inspection

4.1.1 Site Inspections were carried out on a weekly basis to monitor the implementation of proper environmental pollution control and mitigation measures for the Contract. In the reporting period, 5 site inspections were carried out respectively on 1, 7, 15, 20 and 28 December 2016 for the Contract. While no specific observation was recorded, recommendations on remedial actions were given to the Contractor for precautionary purpose.

4.1.2 The environmental site inspections summaries are provided in Appendix K.

4.1.3 Particular observations during the site inspections are described below:

Air Quality

4.1.4 Exposed stockpile of dusty materials were found at NB46. The Contractor should cover the stockpile entirely by impervious sheeting; or paved with hard surface and keep clear of dusty materials; to prevent windblown dust emission.

4.1.5 Mud trails were observed at SA328. The Contractor should provide wheel washing facilities at the vehicle exit points and clean up the mud trails for dust suppression.

4.1.6 Public access road at SA325 was observed dusty. The Contractor should provide sufficient measures to keep the public access road clear of dusty materials.

4.1.7 Water sprayed for breaking operation was observed inadequate at SA340. The Contractor should spray the surface with water to prevent windblown dust emission.

Noise

4.1.8 No adverse observation was identified in the reporting period.

Water Quality

4.1.9 Silts and debris were found in drainage at NB46. The Contractor should remove the sandy materials and implement measures to prevent surface runoff of site and silt from entering the drainage system.

4.1.10 Surface runoff of muddy water was observed at SA325 and NB46. The Contractor should remove the muddy water and implement preventive measures to prevent sand from being flushed to public road.

Chemical and Waste Management

4.1.11 Construction materials and wastes were found scattered at SA326. The Contractor should clean up wastes and maintain the site clean and tidy.

4.1.12 General refuse collected without sorting was observed at SA340. The Contractor should provide recycle bins for collection and sorting.

4.1.13 Construction materials and wastes were found scattered near existing vegetation at SA340. The Contractor should remove the construction materials and wastes and maintain the site clean and tidy.

Landscape and Visual Impact

4.1.14 No adverse observation was identified in the reporting period.

Miscellaneous

- 4.1.15 Stagnant water was found at NB46 and SA340. The Contractor should remove the water or apply larvicidal oil to prevent mosquito breeding.

4.2 Advice on the Solid and Liquid Waste Management Status

- 4.2.1 The Contractor has registered as chemical waste producers for the Contract. C&D material sorting was carried out on site. Sufficient numbers of receptacles were available for general refuse collection.
- 4.2.2 As advised by the Contractor, 1,961 m³ of inert C&D material was generated in the reporting month (470 m³ disposed of as public fill to Tuen Mun 38, 654 m³ of inert C&D materials was reused on site, 837 m³ of inert C&D materials was reused in other projects and 0 m³ was broken concrete). For C&D wastes, 140 m³ of general refuse was disposed of at NENT landfill, 58 kg of paper/cardboard packaging, 1,650 kg of plastics and 0 kg of metals were collected by recycling Contractors, and 0 kg of chemical wastes was collected by licensed Contractors in the reporting period.
- 4.2.3 The actual amounts of different types of waste generated by the activities of the Project in the reporting period are shown in Table 4.1.

Table 4.1 Summary of Waste Flow Table

Waste Type	Actual Amount	Disposal/Reuse Locations
Inert C&D materials disposed as public fill	470 m ³	Tuen Mun 38
Broken concrete	0 m ³	Tuen Mun 38
C&D wastes disposed as general refuse	140 m ³	NENT Landfill
Paper/cardboard packaging	58 kg	Recycling Facilities
Plastics	1,650 kg	Recycling Facilities
Metals	0 kg	Recycling Facilities
C&D materials reused on site	654 m ³	Site Area
C&D materials reused in other projects	837 m ³	Other projects
Chemical wastes	0 kg	Licensed Contractors

- 4.2.4 The Contractor was advised to maintain on-site waste sorting and recording system and maximize reuse / recycle of C&D wastes.

4.3 Environmental Licenses and Permits

- 4.3.1 The environmental licenses and permits for Stage 2 of the Project and valid in the reporting period is summarized in Table 4.2.

Table 4.2 Summary of Environmental Licensing and Permit Status

Statutory Reference	License/ Permit	License or Permit No.	Valid Period		License / Permit Holder	Remarks
			From	To		
EIAO	Environmental Permit	EP-324/2008/D	27/08/2015	N/A	HyD	
WPCO	Discharge License (Site)	WT00017159-2013	18/09/2013	30/09/2018	CSHK	--
WDO	Chemical Waste Producer Registration	5213-722-C3822-01	05/09/2013	N/A	CSHK	Chemical waste produced in Contract HY/2012/06

Statutory Reference	License/ Permit	License or Permit No.	Valid Period		License / Permit Holder	Remarks
			From	To		
WDO	Billing Account for Disposal of Construction Waste	7017860	N/A	N/A	CSHK	Waste disposal in Contract HY/2012/06
NCO	Construction Noise Permit	GW-RN0776-16	22/10/2016	31/12/2016	CSHK	Zone 2 Demolition of Tai Wo Footbridge
		GW-RN0777-16	26/10/2016	02/04/2017	CSHK	Zone 2 Dismantling of steel platform of Kau Lung Hang Vehicular Bridge
		GW-RN0884-16	6/12/2016	28/02/2017	CSHK	Zone 2 Removal of Catch Fence near Ho Ka Yuen
		GW-RN0888-16	6/12/2016	10/02/2017	CSHK	Zone 2 Roofing Installation for KLHVB
		GW-RN0914-16	20/12/2016	31/05/2017	CSHK	Zone 2 Demolition of NWPFB near Ho Ka Yuen
		GW-RN0938-16	15/12/2016	14/06/2017	CSHK	Zone 4 Grouting for Piling Works near Wo Hop Shek Village

4.4 Implementation Status of Environmental Mitigation Measures

4.4.1 A summary of the Implementation Schedule of Environmental Mitigation Measures (EMIS) is presented in Appendix C.

4.5 Summary of Exceedances of the Environmental Quality Performance Limit

4.5.1 All 1-hour and 24-hour TSP monitoring results complied with the Action / Limit Levels in the reporting period.

4.5.2 No Action or Limit Level exceedance of construction noise was recorded in the reporting month. No noise complaints related to 0700 – 1900 hours on normal weekdays was received and followed by Environmental Team in the reporting month.

4.6 Summary of Complaints, Notification of Summons and Successful Prosecutions

- 4.6.1 The Environmental Complaint Handling Procedure is annexed in Figure 4.1.
- 4.6.2 No complaint, notification of summons and successful prosecution was received in the reporting period.
- 4.6.3 Statistics on complaints, notifications of summons and successful prosecutions are summarized in Appendix L.

5 FUTURE KEY ISSUES

5.1 Construction Programme for the Coming Months

5.1.1 The major construction works for the Contract in January 2017 will be:-

- Site clearance
- Ground investigation
- Pipe laying
- Retaining wall construction
- Noise Barrier
- Excavation
- Backfilling
- Drainage
- Temporary bridge construction
- House Construction
- Foot Bridge demolition
- Bridge construction
- Piling

5.2 Key Issues for the Coming Month

5.2.1 Key issues to be considered in January 2017:-

- Properly store and label oils and chemicals on site;
- Chemical, chemical waste and waste management;
- Collection of construction waste should be carried out regularly;
- Properly maintain all drainage facilities and wheel washing facilities on site;
- Exposed slopes should be covered up properly if no temporary work will be conducted;
- Quieter powered mechanical equipment should be used;
- Suppress dust generated from excavation activities and haul road traffic; and
- Tree protective measures for all retained trees should be well maintained.

5.3 Monitoring Schedule for the Coming Month

5.3.1 The tentative schedule for environmental monitoring in January 2017 is provided in Appendix F.

6 CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

- 6.1.1 The construction phase and EM&A programme of the Contract commenced on 21 November 2013.
- 6.1.2 All 1-hour and 24-hour TSP monitoring results complied with the Action / Limit Levels in the reporting period.
- 6.1.3 No Action or Limit Level exceedance of construction noise was recorded in the reporting month. No noise complaints related to 0700 – 1900 hours on normal weekdays was received and followed by Environmental Team in the reporting month.
- 6.1.4 5 environmental site inspections were carried out in December 2016. Recommendations on remedial actions were given to the Contractors for the deficiencies identified during the site audits.
- 6.1.5 No complaint, notification of summons and successful prosecution was received in the reporting period.

6.2 Recommendations

- 6.2.1 According to the environmental site inspections performed in the reporting period, the following recommendations on remedial actions were provided to the Contractor for precautionary purpose:

Air Quality Impact

- The Contractor should cover the stockpile entirely by impervious sheeting; or paved with hard surface and keep clear of dusty materials; to prevent windblown dust emission.
- The Contractor should provide wheel washing facilities at the vehicle exit points and clean up the mud trails for dust suppression.
- The Contractor should provide sufficient measures to keep the public access road clear of dusty materials.
- The Contractor should spray the surface of breaking operation with water to prevent windblown dust emission.

Noise Impact

- No adverse observation was identified in the reporting period.

Water Quality Impact

- The Contractor should remove the sandy materials and implement measures to prevent surface runoff of site and silt from entering the drainage system.
- The Contractor should remove the muddy water and implement preventive measures to prevent sand from being flushed to public road.

Chemical and Waste Management

- The Contractor should remove the construction materials and wastes and maintain the site clean and tidy.
- The Contractor should provide recycle bins for collection and sorting.

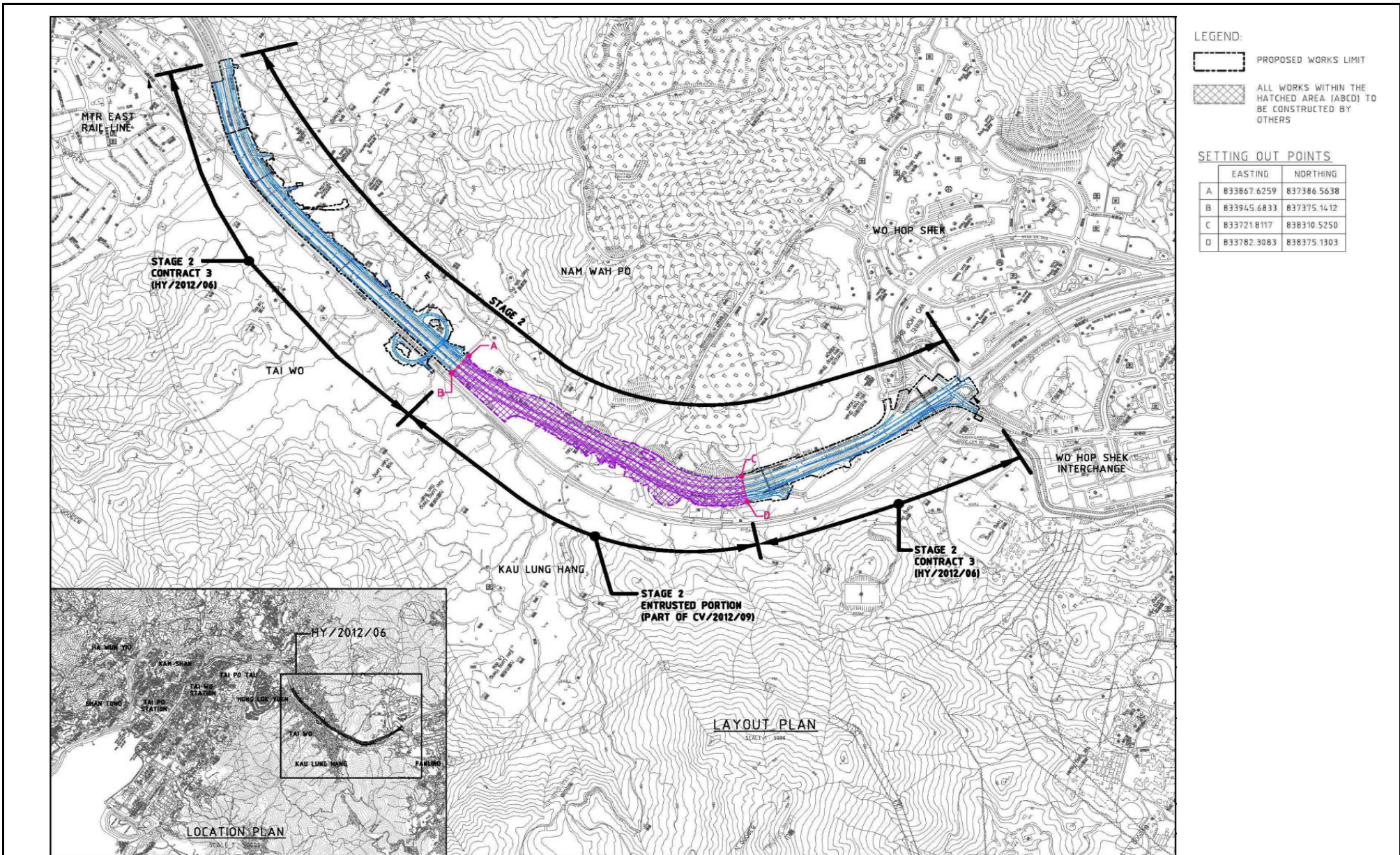
Landscape and Visual Impact.

- No adverse observation was identified in the reporting period.

Miscellaneous

- The Contractor should remove the stagnant water or apply larvicidal oil to prevent mosquito breeding.

FIGURES



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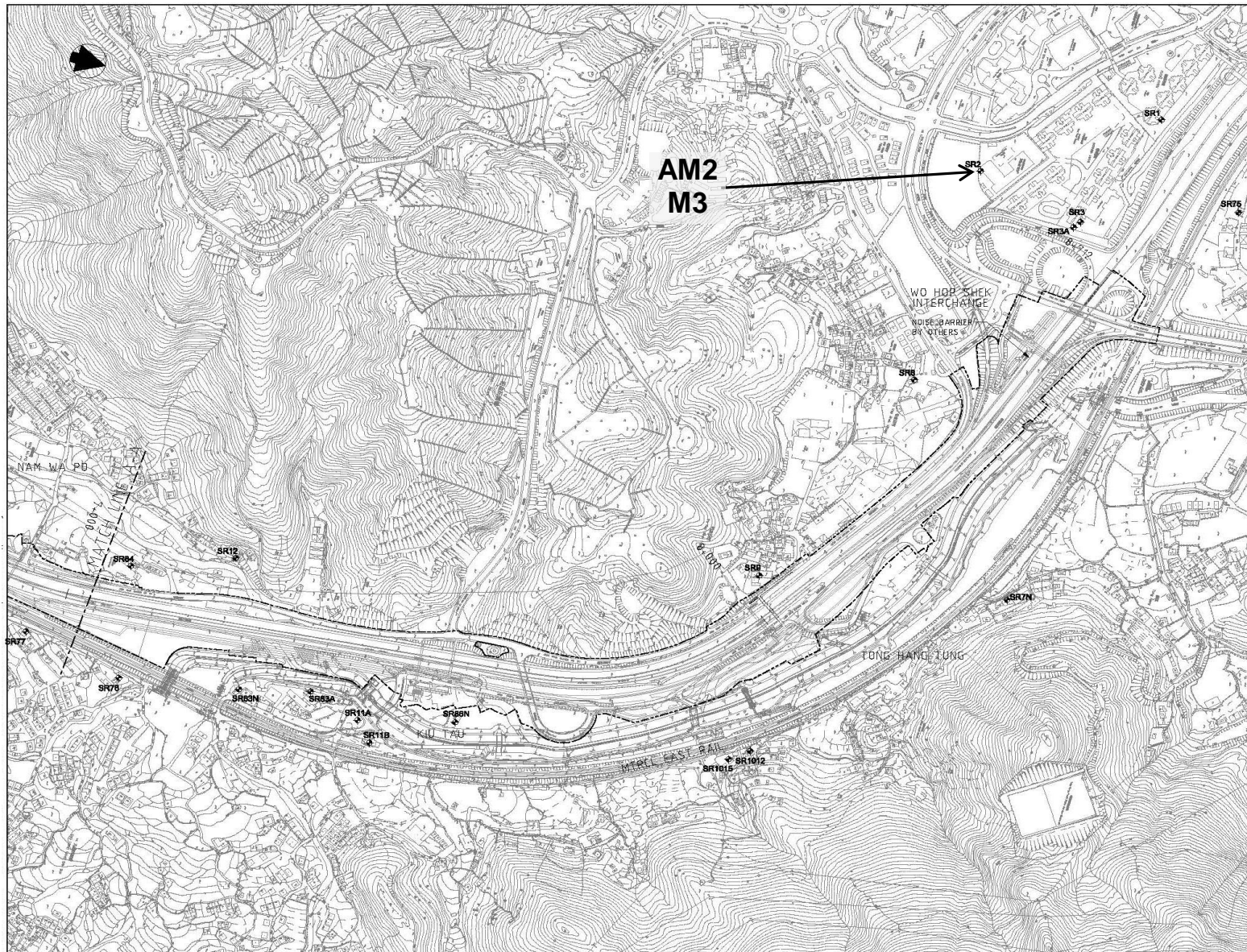
CONTRACT NO. HY/2012/06
 WIDENING OF FANLING HIGHWAY
 - TAI HANG TO WO HOP SHEK INTERCHANGE



Layout Plan

Date: Dec 2013

Figure 1.1



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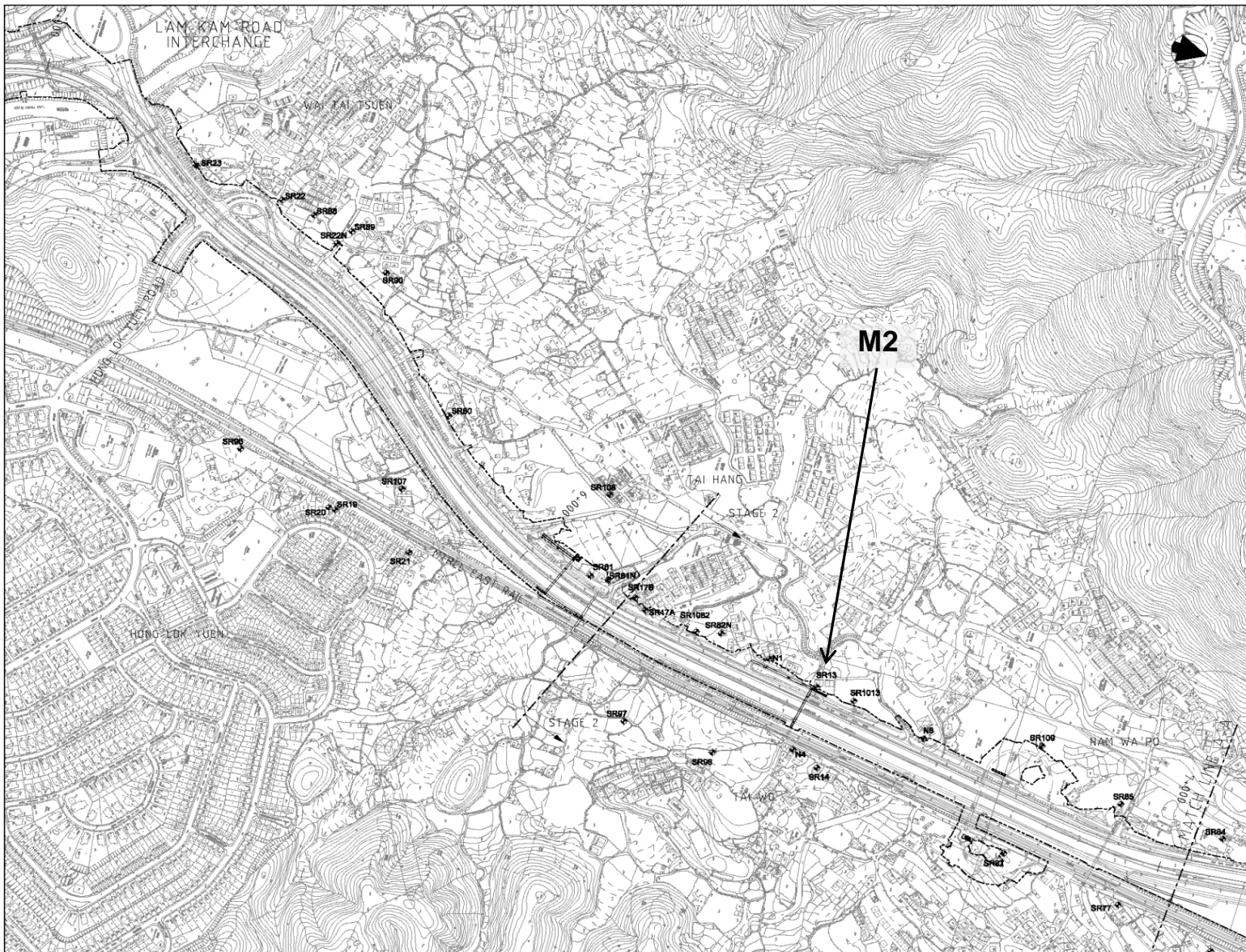
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Locations of Monitoring Station

Date: Dec 2013

Figure 1.2a



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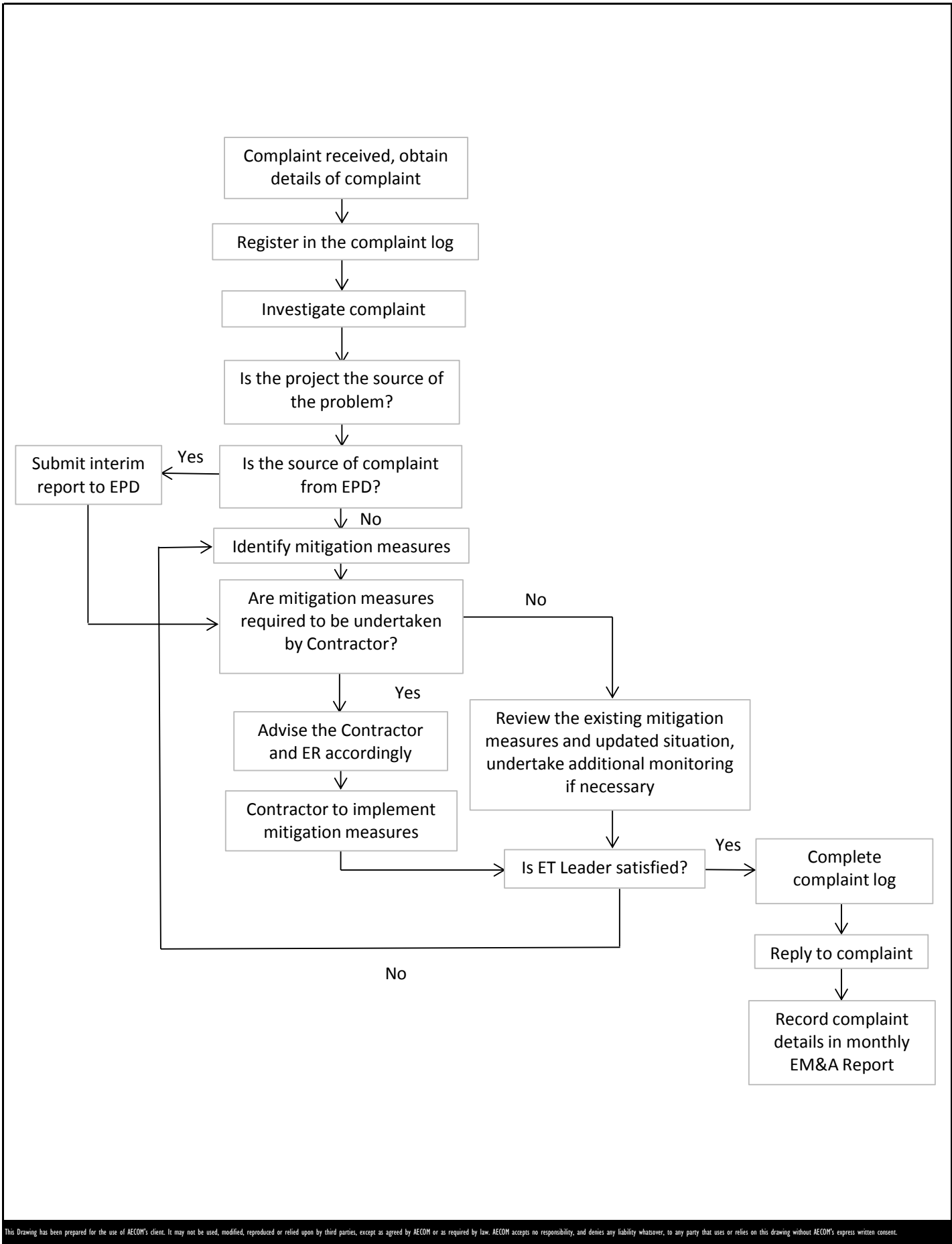
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Locations of Monitoring Station

Date: Dec 2013

Figure 1.2b



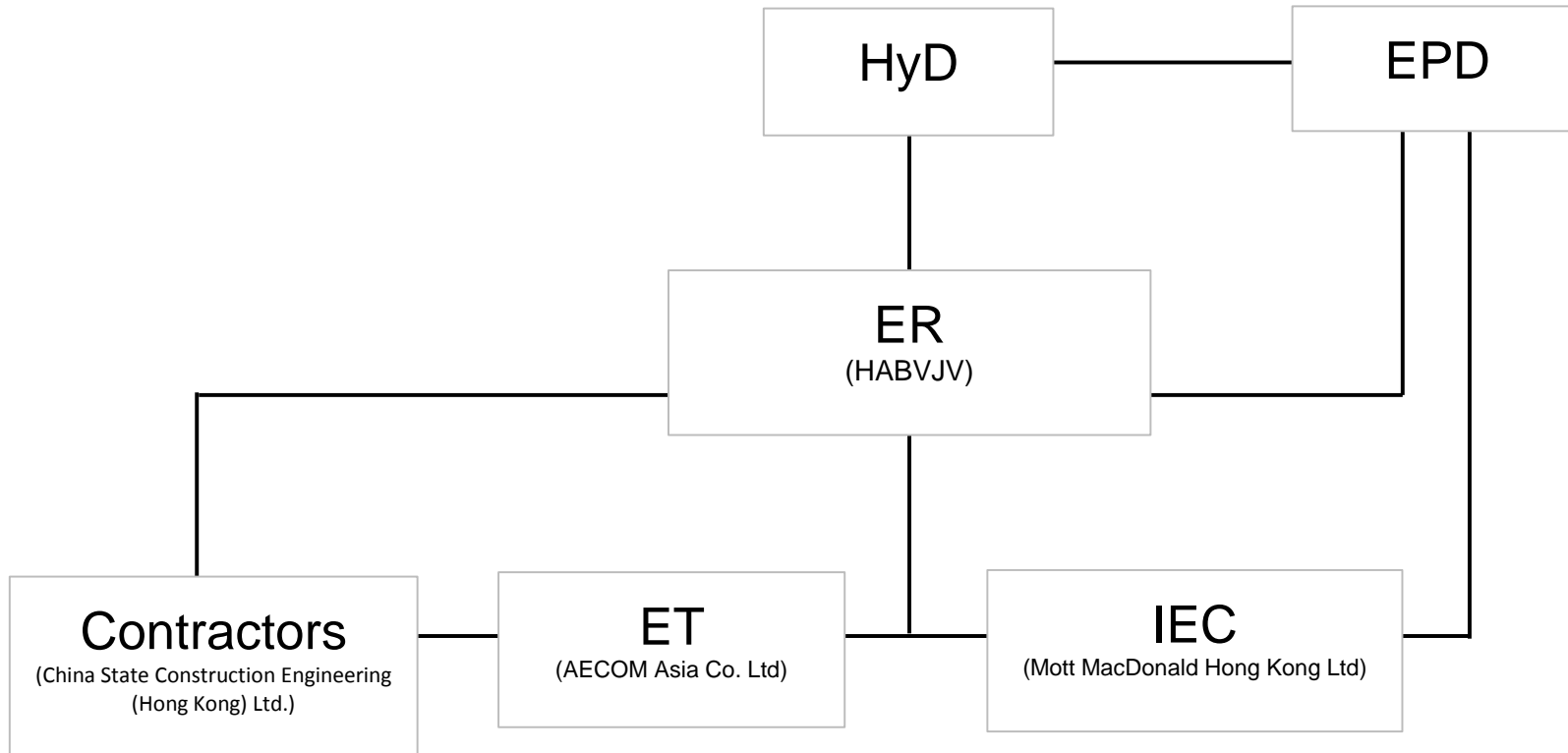
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Environmental Complaint Handling Procedure

**APPENDIX A
PROJECT ORGANIZATION STRUCTURE**



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CONTRACT NO. HY/2012/06
 WIDENING OF FANLING HIGHWAY
 - TAI HANG TO WO HOP SHEK INTERCHANGE



Project Organization Structure

**APPENDIX B
CONSTRUCTION PROGRAMMES**

Activity ID	Activity Name	Dur. % Complete	Rem. Duration	Original Duration	Start	Finish	Total Float	2016				2017				
								Dec				Jan			Feb	Mar
TSZ10340	Firemain installation (along NB63)	76.34%	31	131	20-Jun-16 A	27-Jan-17	60									
Noise Barrier Along Fanling Highway N/B																
Site Clearance & Demolition of Existing Structure																
General																
ADVZ20160	TTA for NB works	0%	60	60	13-Jan-17	31-Mar-17	235									
Bridge Construction																
New Tai Hang Footbridge																
General																
THBF0370	Steel Staircase & Bridge prefabrication (THFB-TWSR-E side)	90%	9	90	20-Jul-16 A	31-Dec-16	384									
THBF0380	Steel Staircase & Bridge available on site (THFB-TWSR-E side)	0%	0	0	03-Jan-17		384					◆ Steel Staircase & Bridge available on site (THFB-TWSR-E side)				
TWSR-West/ FL Highway N/B Side Section																
THBF0235	Steel Staircase ready for erection (THFB-TWSR-W side)	0%	0	0		20-Dec-16	453					20-Dec-16 ◆ Steel Staircase ready for erection (THFB-TWSR-W side)				
THBF0270	THP6, THP7 - Pile cap, Pier and Pier Head	92.14%	22	280	01-Feb-16 A	17-Jan-17	341									
THBF0325	Steel Ramp ready for erection (THFB-TWSR-W side)	0%	0	0		17-Jan-17	341					17-Jan-17 ◆ Steel Ramp ready for erection (THFB-TWSR-W side)				
THBF0410	Erect Staircase (THFB-TWSR-W side)	0%	30	30	20-Dec-16	26-Jan-17	453									
THBF0420	Erect Ramp	0%	60	60	18-Jan-17	06-Apr-17	341									
Crossing Fanling Highway Section																
THBF0530	THP1 - Predrilling	0%	12	12	31-Dec-16	14-Jan-17	216									
THBF0540	THP1 - Pre-bored H pile (6 nos)	0%	45	45	16-Jan-17	16-Mar-17	216									
THBF0550	THP1 - Pile Test	0%	28	28	17-Mar-17	13-Apr-17	265									
TWSR-East FL Highway S/B Side Section																
THBF0470	THAB1 - pile cap & abutment wall	29.41%	60	85	21-Nov-16 A	10-Mar-17	268									
THBF0480	THAB1 - Backfilling (~3m)	0%	20	20	11-Mar-17	03-Apr-17	268									
THBF0730	THP3 - Pile cap, Pier and Pier Head	0%	76	45	26-Nov-16 A	29-Mar-17	317									
THBF0770	THP4 - Pile cap, Pier and Pier Head	50%	56	112	20-Jul-16 A	06-Mar-17	277									
THBF0780	Modified existing column head of existing footbridge	0%	30	30	07-Mar-17	11-Apr-17	277									
Lift at TWSR-W Side																
L1520	Lift shaft & roof	33.91%	76	115	16-Jul-16 A	29-Mar-17	287									
L1557	Lift submission & ordering period	59.58%	97	240	02-Jul-16 A	27-Apr-17	340									
L1600	CLP Power available (by CLP)	46.19%	212	394	21-Jun-16 A	19-Jul-17	419									
Lift at FLHY S/B																
L1370	Lift shaft & roof	46.36%	59	110	20-Sep-16 A	09-Mar-17	321									
L1380	Structural Laminated glass wall installation	0%	30	30	10-Mar-17	18-Apr-17	351									
L1390	RC Platform connect to bridge (THSC-2 & TH-P2)	0%	30	30	10-Mar-17	18-Apr-17	321									
L1450	CLP Power available (by CLP)	46.19%	212	394	21-Jun-16 A	19-Jul-17	422									
New Tai Wo Footbridge																
General																
TWFB1090	Steel Bridge prefabrication (TWFB)	87.78%	11	90	15-Aug-16 A	04-Jan-17	533									
TWFB1100	Steel Bridge available on site (TWFB)	0%	0	0	05-Jan-17		533					◆ Steel Bridge available on site (TWFB)				
TWSR-West/ FL Highway N/B Side Section																
TWFB1240	TWAB2 - pile cap & abutment wall	94.44%	6	108	20-Jul-16 A	28-Dec-16	1041									
TWFB1250	TWAB2 - Backfilling (~4m)	66.67%	9	27	12-Nov-16 A	31-Dec-16	1038									
TWFB1260	Steel Staircase ready for erection (THFB-TWSR-W side)	0%	0	0		31-Dec-16	1038					31-Dec-16 ◆ Steel Staircase ready for erection (THFB-TWSR-W side)				
TWFB1360	Steel Ramp ready for erection (TWFB-TWSR-W side)	0%	0	0		20-Dec-16	1047					20-Dec-16 ◆ Steel Ramp ready for erection (TWFB-TWSR-W side)				
TWFB1370	Erect Staircase (TWFB-TWSR-W side)	70%	9	30	07-Dec-16 A	31-Dec-16	77									
TWFB1380	Erect Ramp	70%	9	30	07-Dec-16 A	31-Dec-16	77									
TWFB1390	Finishes Work	0%	30	30	03-Jan-17	14-Feb-17	641									
TWFB1400	Bridge Structure complete (TWFB-TWSR-W side)	0%	0	0		14-Feb-17	641					14-Feb-17 ◆ Bridge Structure complete (TWFB-TWSR-W side)				
Crossing Fanling Highway Section																
TWFB1410	TWP2 - Predrilling	0%	18	18	09-Jan-17*	06-Feb-17	66									
TWFB1420	TWP2 - Pre-bored H pile (6 nos)	0%	30	30	07-Feb-17	13-Mar-17	66									
TWFB1430	TWP2 - Pile Test	0%	28	28	14-Mar-17	10-Apr-17	85									
Lift at TWSR-W Side																
L1670	Lift shaft & roof	80.63%	31	160	21-Jun-16 A	27-Jan-17	469									
L1680	Structural Laminated glass wall installation	0%	30	30	06-Feb-17	11-Mar-17	512									
L1690	RC Link slab connect to bridge	0%	30	30	06-Feb-17	11-Mar-17	469									
L1700	Metal cover on RC platform	0%	30	30	13-Mar-17	20-Apr-17	469									
L1730	Lift submission & ordering period	48.64%	151	294	02-Jul-16 A	04-Jul-17	422									
L1780	CLP Power available (by CLP)	30.89%	273	395	20-Aug-16 A	18-Sep-17	526									
Temporary Tai Wo Footbridge																
Design Works																
TWFB-T1020	Engineer Comment	81.03%	22	116	28-Jun-16 A	17-Jan-17	65									
TWFB-T1030	Design amendment	0%	73	73	18-Jan-17	25-Apr-17	65									
Construction Works																
TWFB-T1065	TW Bridge Ramp at TWSR-W available	0%	0	0		31-Dec-16	251					31-Dec-16 ◆ TW Bridge Ramp at TWSR-W available				
TWSR-West Construction																
Drainage & Road Works																
Ch 5880-6740																
RDZ20160	Z2 : New TWSR-West D&R Works (lane 1)	35%	78	120	01-Nov-16 A	31-Mar-17	0									
Noise Barrier Along Fanling Highway S/B																
NB46A (Ch.5880-5935)-FH S/B Side																
Noise Barrier Works																
NB03230	Sheet piling for DN600 watermain diversion work (VO70)	0%	14	14	20-Dec-16*	07-Jan-17	455									

Activity ID	Activity Name	Dur. % Complete	Rem. Duration	Original Duration	Start	Finish	Total Float	2016				2017					
								Dec		Jan		Feb		Mar			
Bridge Construction																	
Kau Lung Hang Vehicular Bridge																	
KLH Bridge - West Ramp																	
KLH.1290	West Ramp - Planting	0%	21	21	20-Dec-16	16-Jan-17	673										
KLH Bridge - Deck 1																	
KLH.3430	Deck 1 - Planting	0%	21	21	20-Dec-16	16-Jan-17	673										
KLH.3630	Pedestrian walkway Roof P2 to P3	63.16%	14	38	09-Dec-16 A	07-Jan-17	5										
KLH.3640	Pedestrian walkway floor finishes P2 to P3	0%	14	14	09-Jan-17	24-Jan-17	5										
KLH Bridge - Deck 2																	
KLH.3160	Pedestrian walkway Roof P5-P6	0%	14	14	09-Dec-16 A	07-Jan-17	9										
KLH.3170	Pedestrian walkway floor finishes P5-P6 (include barrier and lighting)	0%	14	14	04-Jan-17	19-Jan-17	9										
KLH.3260	Pedestrian walkway Roof P4 to P5	0%	9	9	09-Dec-16 A	31-Dec-16	10										
KLH.3270	Pedestrian walkway floor finishes P4 to P5 (include barrier and lighting)	0%	14	14	03-Jan-17	18-Jan-17	10										
KLH.3360	Pedestrian walkway Roof P3 to P4	0%	6	6	09-Dec-16 A	28-Dec-16	13										
KLH.3370	Pedestrian walkway floor finishes P3 to P4 (include barrier and lighting)	0%	14	14	29-Dec-16	14-Jan-17	13										
KLH Bridge - Deck 3																	
KLH.3500	Deck 3 - Planting	0%	21	21	20-Dec-16	16-Jan-17	705										
KLH.3650	Pedestrian walkway Roof P6 to P7	24%	19	25	01-Dec-16 A	13-Jan-17	0										
KLH.3660	Pedestrian walkway floor finishes P6 to P7 (include barrier and lighting)	0%	14	14	14-Jan-17	07-Feb-17	0										
KLH Bridge - East Ramp																	
KLH.3590	East Ramp - Planting	0%	34	34	20-Dec-16	08-Feb-17	1013										
KLH Bridge - Ramp R1																	
Z2.KLH.1685	Ramp R1 - Ramp construction (R1P1 to P1P3)	76.67%	7	30	19-Nov-16 A	29-Dec-16	0										
Z2.KLH.1740	Ramp R1 complete	0%	0	0		06-Feb-17	0										06-Feb-17 ♦ Ramp R1 complete
Z2.KLH.3610	Ramp R1 - Steel roof	0%	20	20	30-Dec-16	23-Jan-17	0										
Z2.KLH.3620	Ramp R1 - finishes work (include barrier and lighting)	0%	20	20	06-Jan-17	06-Feb-17	0										
KLH Bridge - Ramp R2																	
Z2.KLH.1523	VO 028 - Boundary Wall to Hse 190B structure	0%	24	24	20-Dec-16*	19-Jan-17	644										
Z2.KLH.1524	VO 028 - Boundary Wall to Hse 190B E&M, Drainage	0%	26	26	20-Jan-17	27-Feb-17	644										
Z2.KLH.1530	Ramp R2 - Pile cap, abutment and pier construction	97.01%	9	301	20-Nov-15 A	31-Dec-16	2										
Z2.KLH.1540	Ramp R2 - Ramp construction	55.56%	20	45	17-Nov-16 A	14-Jan-17	0										
Z2.KLH.1545	Ramp R2 - Ramp construction (section after VBP6-7 deck)	42.86%	20	35	17-Nov-16 A	14-Jan-17	0										
Z2.KLH.1550	Ramp R2 - Steel roof	0%	24	24	13-Mar-17	10-Apr-17	-53										
Z2.KLH.1920	Ramp R2 - finishes work (include barrier and lighting)	0%	12	12	16-Jan-17	06-Feb-17	0										
Z2.KLH.2000	Prepare Shop drawing re-submission	44.44%	25	45	08-Dec-16 A	20-Jan-17	-53										
Z2.KLH.2010	Shop drawing approval	0%	2	2	21-Jan-17	23-Jan-17	-53										
Z2.KLH.2050	Factory fabrication	0%	34	34	24-Jan-17	11-Mar-17	-53										
Bridge Road Work																	
Z2.KLH.2040	Landscape work of KLHVB	0%	120	120	20-Dec-16	26-May-17	574										
Lift at TWSR-W Side																	
L01040	Temp work & Pile cap	0%	45	45	07-Feb-17	30-Mar-17	422										
L01094	Lift submission & ordering period	31.63%	201	294	01-Aug-16 A	31-Aug-17	404										
L01140	CLP Power available (by CLP)	55.83%	182	412	04-Apr-16 A	19-Jun-17	655										
Lift at FLHY S/B																	
L01180	Earliest date for lift construction resume	0%	0	0	20-Dec-16		409										♦ Earliest date for lift construction resume
L01190	Set up & Pile test	0%	30	30	20-Dec-16	26-Jan-17	409										
L01200	Temp work & Pier cap	0%	45	45	27-Jan-17	28-Mar-17	409										
L01300	CLP Power available (by CLP)	51.69%	214	443	04-Apr-16 A	21-Jul-17	629										
Demolition of Existing Nam Wa Po Footbridge																	
Demolition Work																	
Z2.NWP.1060	Temporary support installation at existing Fanling Highway	0%	45	45	17-Feb-17	11-Apr-17	-53										
Z2.NWP.1100	RMO additional road closure stopping period	0%	32	32	13-Jan-17*	13-Feb-17	0										
TWSR-West Construction																	
Drainage & Road Works																	
General																	
CW01	1st interface connection to CW at S/B	0%	0	0		31-Jan-17*	0										31-Jan-17* ♦ 1st interface connection to CW at S/B
Noise Barrier Along Fanling Highway S/B																	
NB62 (Ch.6745-6910)-FH S/B Side (MTRC I&P Area)																	
Noise Barrier Works																	
NB03090	NB62 (0-80m) - Footing & Wall Structure	11.67%	53	60	12-Dec-16 A	02-Mar-17	601										
NB03100	NB62 (0-80m) - backfilling	0%	20	20	03-Mar-17	25-Mar-17	616										
NB03110	NB62 (0-80m) - NB production	0%	45	45	03-Mar-17	16-Apr-17	739										
NB03130	NB62 (80-110m) Under bridge - Sheet piling & Excavation	0%	12	12	03-Jan-17*	16-Jan-17	555										
NB03140	NB62 (80-110m) Under bridge - Footing & Wall Structure	0%	25	25	17-Jan-17	22-Feb-17	608										
NB03150	NB62 (80-110m) Under bridge - backfilling	0%	14	14	23-Feb-17	10-Mar-17	629										
NB03160	NB62 (80-110m) Under bridge - NB production	0%	45	45	23-Feb-17	08-Apr-17	747										
NB03180	NB62 (110-170m) - Sheet piling & Excavation	0%	18	18	17-Jan-17	14-Feb-17	555										
NB03190	NB62 (110-170m) - Footing & Wall Structure	0%	60	60	15-Feb-17	29-Apr-17	555										
NB70 (Ch.6910-6930)-FH S/B Side																	
Noise Barrier Works																	
NB03290	NB70- NB post & panel installation	0%	5	5	20-Dec-16	24-Dec-16	689										
North Buffer Zone 2 (NBZ2) (within Zone 4) (Ch. 7925 to 8100)																	
Bridge Construction																	

Activity ID	Activity Name	Dur. % Complete	Rem. Duration	Original Duration	Start	Finish	Total Float	2016				2017			
								Dec		Jan		Feb		Mar	
New Ho Ka Yuen Footbridge															
TWSR-West/ FL Highway N/B Side Section															
HKY1250	HKYAB3 - pile cap & abutment wall	63.53%	31	85	20-Aug-16 A	27-Jan-17	653								
HKY1260	HKYAB3 - Backfilling (~4m)	0%	12	12	06-Feb-17	18-Feb-17	653								
HKY1270	Steel Staircase ready for erection (THFB-TWSR-W side)	0%	0	0		18-Feb-17	653								
HKY1273	Erect Staircase (HKY-TWSR-W side)	0%	30	30	20-Feb-17	25-Mar-17	653								
HKY1440	Remaining Finishes works of HKYFB	16%	126	150	21-Nov-16 A	03-Jun-17	555								
TWSR-East FL Highway S/B Side Section															
HKY1870	Steel Ramp finishes work (HKYFB-TWSR-E side)	16.67%	30	36	13-Oct-16 A	26-Jan-17	696								
Other Works															
Slope Works															
TWSR-East FL Highway S/B Side Section															
S1000	Slope S51-Fill ~3m	0%	40	40	20-Dec-16	15-Feb-17	590								
ZONE 4 (Ch. 7925 to 8700)															
Noise Barrier Along Fanling Highway N/B															
NB75 (Ch.7930-8090)-FH N/B Side															
Noise Barrier Works															
NB4040	NB75 -Pre-drilling (Ch7930-7990)	45.83%	13	24	28-Nov-16 A	06-Jan-17	0								
NB4050	NB75 - piling (NB75/01-05, 0.19m -24no)	0%	48	48	07-Jan-17	11-Mar-17	0								
NB4060	NB75 - Footing & Wall Structure (Ch7930-7990)	0%	60	60	13-Mar-17	27-May-17	21								
NB4100	NB75 -Pre-drilling (Ch7990-8000)-(HKY-P1) & G34	0%	24	24	07-Jan-17	11-Feb-17	62								
NB4110	NB75 - piling (NB75/06, 0.19m -4no) & G34 (10 nos)	0%	21	21	13-Mar-17	06-Apr-17	38								
NB4160	NB75 -Pre-drilling (Ch8000-8050)	0%	48	48	07-Jan-17	11-Mar-17	0								
NB4170	NB75 - piling (NB75/07-10, 0.19m -20no)	0%	32	32	13-Mar-17	22-Apr-17	0								
NB4220	NB75 -Pre-drilling (Ch8050-8090)	0%	42	42	01-Mar-17	22-Apr-17	14								
NB77 (Ch.8090-8450)-FH N/B Side															
Noise Barrier Works															
NB4290	NB77 -Pre-drilling (Ch8090-8190)	0%	24	24	01-Dec-16 A	19-Jan-17	7								
NB4300	NB77 - piling (NB77/01-08, 0.19m -34no)	0%	68	68	09-Jan-17	06-Apr-17	7								
NB4350	NB77 -Pre-drilling (Ch8190-8290)	0%	72	72	20-Dec-16	24-Mar-17	27								
NB4360	NB77 - piling (NB77/09-17, 0.19m -36no)	0%	72	72	04-Mar-17	03-Jun-17	27								
NB4410	NB77 -Pre-drilling (Ch8290-8390)	0%	60	60	20-Jan-17	08-Apr-17	21								
Bridge Construction															
New Wo Hop Shek Pedstrian & Cycle Bridge															
TWSR-West/ FL Highway N/B Side Section															
WHS1300	Existing WHS bridge structure removed	0%	0	0		10-Mar-17	268								
WHS1350	WHSAB2 - Predrilling (VO018)	0%	24	24	11-Mar-17	08-Apr-17	268								
Demolition of Existing Wo Hop Shek Pedstrian & Cycle Bridge															
TWSR-West/ FL Highway N/B Side Section															
WHS1870	Install Temp support to remove existing ramp	0%	25	25	20-Dec-16	20-Jan-17	268								
WHS1880	Remove existing ramp for 2nd half new ramp construction	0%	35	35	21-Jan-17	10-Mar-17	268								
WHS1890	Demolish existing WHS footbridge (TWSR-W side)	0%	30	30	20-Dec-16	26-Jan-17	530								
WHS2030	Remove temp filled platform	0%	30	30	27-Jan-17	10-Mar-17	530								
Crossing Fanling Highway Section															
WHS1790	Erect Temp platform for bridge demolition	7.5%	37	40	17-Oct-16 A	11-Feb-17	413								
WHS1800	Demolish existing WHS Footbridge	0%	60	60	13-Feb-17	27-Apr-17	413								
TWSR-East FL Highway S/B Side Section															
WHS1840	Demolish existing WHS Footbridge abutment wall at W77A	0%	20	20	20-Dec-16	14-Jan-17	4								
Slip Road Y Construction															
Drainage & Road Works															
TWSR-East FL Highway S/B Side Section															
RDZ41085	Construct Slip Rd Y (Ch7925-8050)(SA346) - remaining	0%	150	150	20-Dec-16	03-Jul-17	364								
Underground Utility Works															
DN600 and DN900 Watermain															
DN1070	DN600 watermain laying (Ch8400 - 8600) (W77A to	0%	280	280	28-Feb-17	05-Feb-18	34								
VO - Wall 76A Construction															
Retaining Wall W76A															
TWSR-East FL Highway S/B Side Section															
W76A1050	Drainage work for Caltex access road	0%	150	150	20-Dec-16	03-Jul-17	426								
Fanling Highway Construction															
Drainage & Road Works															
TWSR-East FL Highway S/B Side Section															
RDZ41086	Construct FH S/B Lane 1 & 2 (Ch7925-8000)(SA346) (after HKY	0%	145	145	20-Dec-16	26-Jun-17	238								
Other Works															
Retaining Wall W77A															
TWSR-East FL Highway S/B Side Section															
RWZ4.1075	Temp Shoring & Excavation	0%	45	45	16-Jan-17	16-Mar-17	4								
RWZ4.1080	Base slab & Wall (3-7m high)-RW77A (Ch.0-20)	0%	90	90	27-Jan-17	26-May-17	4								
RWZ4.1140	Base slab & Wall (0-3m high)-RW77A (Ch.92-120)	91.8%	5	61	13-Sep-16 A	24-Dec-16	64								
RWZ4.1150	Backfilling (0-3m) - RW77A (Ch.92-120)	0%	30	30	28-Dec-16	09-Feb-17	64								
RWZ4.1160	CLP 132kV cable diversion	46.3%	29	54	15-Nov-16 A	25-Jan-17	34								
RWZ4.1170	Base slab & Wall (0-3m high)-RW77A last 1 bay at CH120	0%	21	21	26-Jan-17	27-Feb-17	34								
RWZ4.1180	DN600 pipe installation ready to start	0%	0	0	28-Feb-17		34								
Retaining Wall W77B															
TWSR-East FL Highway S/B Side Section															
RWZ4.1100	Base slab & Wall (0-3m high)-RW77B (Ch 0-23)	0%	60	60	20-Dec-16	10-Mar-17	24								

Activity ID	Activity Name	Dur. % Complete	Rem. Duration	Original Duration	Start	Finish	Total Float	2016				2017			
								Dec				Jan		Feb	Mar
RWZ4.1110	Backfilling (0-3m) - RW77B (Ch 0-23)	0%	30	30	11-Mar-17	19-Apr-17	24								
RWZ4.1115	Temp Shoring & Excavation	92.86%	15	210	01-Mar-16 A	09-Jan-17	104								
RWZ4.1120	Base slab & Wall (3-4m high)- RW77B (Ch.23-75)	76.65%	39	167	01-Jun-16 A	14-Feb-17	75								
Retaining Wall W78															
TWSR-East FL Highway S/B Side Section															
RWZ4.0900	Site Clearance	0%	30	30	10-Jan-17	21-Feb-17	104								
TCSS Works															
TCSS Pre-Construction Works															
TCSS0120	Prepare Shop Drawing-TCSS	0%	45	45	20-Dec-16	21-Feb-17	201								
TCSS0130	Shop Drawing Comment & Approval	0%	21	21	22-Feb-17	14-Mar-17	246								
TCSS0140	Revised & Re-submission TCSS shop Drawing	0%	18	18	15-Mar-17	04-Apr-17	200								
G35															
TCSS1550	Slip road island footing - G35 (CH8410, N/B)	0%	30	30	20-Dec-16	26-Jan-17	454								
FVMS2 (Deleted by RFI-138, Pending for VO)															
TCSS1640	Slow lane footing - FVMS2 (CH8400, S/B)- Deleted by RFI-138	0%	30	30	20-Dec-16	26-Jan-17	574								

**APPENDIX C
IMPLEMENTATION SCHEDULE OF
ENVIRONMENTAL MITIGATION MEASURES
(EMIS)**

Appendix C - Implementation Schedule of Environmental Mitigation Measures (EMIS)

Air Quality – Schedule of Recommended Mitigation Measures

Impact	Mitigation Measures	Timing	Implementation Status
Air Quality during construction	Restricting heights from which materials are dropped, as far as practicable to minimize the fugitive dust arising from unloading/loading.	During construction	V
	All stockpiles of excavated materials or spoil of more than 50m ³ shall be enclosed, covered or dampened during dry or windy conditions.		@
	Effective water sprays shall be used to control potential dust emission sources such as unpaved haul roads and active construction areas.		@
	All spraying of materials and surfaces shall avoid excessive water usage.		V
	Vehicles that have the potential to create dust while transporting materials shall be covered, with the cover properly secured and extended over the edges of the side and tail boards.		V
	Materials shall be dampened, if necessary, before transportation.		V
	Travelling speeds shall be controlled to reduce traffic induced dust dispersion and re-suspension within the site from the operating haul trucks.		V
	Vehicle washing facilities shall be provided to minimize the quantity of material deposited on public roads.		@

Noise – Schedule of Recommended Mitigation Measures

Impact	Mitigation Measures	Timing	Implementation Status
Noise during construction	Use of silenced plant or plant equipped with mufflers or dampers in substitute of ordinary plant.	During construction	V
	Reduce the number of equipment and their percentage on-time.		V
	3.5 m and 5.5 m high temporary noise barrier at culvert construction work area (Figure 2a of the Environmental Permit).		V
	3 m high temporary noise barrier along the northern edge of Bridge 12 at ground level (Figure 2b of the Environmental Permit).		V
	2 m high temporary noise barrier along the northern edge of Bridge 12 at bridge level (Figure 2b of the Environmental Permit).		V
	2.5 m high temporary noise barrier along Tai Wo Service Road West (Figure 2c of the Environmental Permit).		V
	3.5m and 7m high temporary noise barrier along Tai Wo Services Road West near Tai Hang (Figure 2c of the Environmental Permit).		V
	7 m high temporary noise barrier along Tai Wo Service Road West near Tai Wo Footbridge work area (Figure 2d of the Environmental Permit).		V
	7 m high temporary noise barrier near Kiu Tau Footbridge work area (Figure 2d of the Environmental Permit).		V
	2.5 m high temporary noise barrier near river diversion work area (Figure 2e of the Environmental Permit).		N.A.

Water Quality – Schedule of Recommended Mitigation Measures

Impact	Mitigation Measures	Timing	Implementation Status
Water quality during construction	Demolition and reconstruction of bridges - Prevent off-site migration through use of sheet piles. - Minimise duration of works as far as practical. - All sewer and drainage connections should be sealed to prevent debris, soil, sand, etc, from entering public sewers/drains. - Site surface runoff should be settled to remove sand/silt before it is discharged into the existing storm drains.	During construction	@
	Road Widening Works, Earthworks and Culvert Extension Works - Wastewater generated from any concrete batching washdown of equipment or similar activities should be discharged into foul sewers, after the removal of settleable solids, and pH adjustment as necessary. All sewage discharges from the study area should meet the TM standards and approval from EPD through the licensing process is required. - Sand traps, oil interceptors and other pollution prevention installations should be provided, properly cleaned and maintained. - Runoff from exposed working areas, unfinished slopes and from unlined temporary channels should be directed to stilling basins and/or silt traps before discharging to the drainage outfalls. - Regular inspections of stilling basins and/or silt traps are required to ensure that sediment is not conveyed into the existing drainage system. - Open stockpiles should be covered with a tarpaulin cover. - During the wet season, any exposed top soils should be covered with a tarpaulin, shotcreted or hydroseeded. - Sand and silt from wash-water from vehicle washing should be settled out before discharging into storm drains. - Fuels should be stored in bunded areas such that spillage can be easily collected.		@

Waste – Schedule of Recommended Mitigation Measures

Impact	Mitigation Measures	Timing	Implementation Status
Waste management during construction	General Waste <ul style="list-style-type: none"> - Transport of wastes off site as soon as possible. - Maintenance of accurate waste records. - Minimisation of waste generation for disposal (via reduction/recycling/re-use). - No on-site burning will be permitted. - Use of re-useable metal hoardings/signboards. 	During construction	@
	Vegetation from site clearance <ul style="list-style-type: none"> - Segregation of materials to facilitate disposal. - Mulching to reduce bulk and where possible review opportunities for the possible beneficial use within landscaping areas. 		V
	Demolition Wastes <ul style="list-style-type: none"> - Segregation of materials to facilitate disposal. - Appropriate stockpile management. 		V
	Excavated Materials <ul style="list-style-type: none"> - Segregation of materials to facilitate disposal / reuse. - Appropriate stockpile management. - Re-use of excavated material on or off site (where possible). - Special handling and disposal procedures in the event that contaminated materials are excavated. 		V
	Construction Wastes <ul style="list-style-type: none"> - Segregation of materials to facilitate recycling/reuse (within designated area in appropriate containers/stockpiles). - Appropriate stockpile management. - Planning to reduce over ordering and waste generation. - Recycling and re-use of materials where possible (e.g. metal, wood from formwork) - For material which cannot be re-used/recycled, collection should be carried out by an approved waste contractor for landfill disposal. 		@
	Bentonite Slurries <ul style="list-style-type: none"> - Bentonite slurries should be reused as far as possible. - Disposal in accordance with Practice Note For Professional Persons ProPECC PN 1/94. 		#

	<p>Chemical Wastes</p> <ul style="list-style-type: none"> - Storage within locked, covered and bunded area. - The storage area shall not be located adjacent to sensitive receivers e.g. drains. - Minimise waste production and recycle oils/solvents where possible. - A spill response procedure shall be in place and absorption material available for minor spillages. - Use appropriate and labelled containers. - Educate site workers on site cleanliness/waste management procedures. - If chemical wastes are to be generated, the contractor must register with EPD as a chemical waste producer. - The chemical wastes shall be collected by a licensed chemical waste collector. 		V
	<p>Municipal Wastes</p> <ul style="list-style-type: none"> - Waste shall be stored within a temporary refuse collection facility, in appropriate containers prior to collection and disposal. - Regular, daily collections are required by an approved waste collector. 		@

Ecology – Schedule of Recommended Mitigation Measures

Impact	Mitigation Measures	Timing	Implementation Status
Ecology during construction	<p>Accurate Delineation of Works Area</p> <ul style="list-style-type: none"> - Boundaries of proposed works areas shall be clearly identified and separated from external areas by a physical barrier to prevent encroachment of adjacent habitats. - Individual trees which fall within the works areas but which work plans do not require removal are to be retained and fenced off to maximize protection. 	During construction	V
	<p>Vegetation Clearance</p> <ul style="list-style-type: none"> - No fires shall be lit within the works area for the purpose of burning cleared vegetation. - The Contractor shall give consideration to mulching the cleared vegetation for recycling within the works area / adjacent land. 		V
	<p>Dust generation</p> <p>There are a number of measures which shall be taken as specified in the Air Pollution Control (Construction Dust) Regulation on 'Dust Control Requirements, including the following key measures to be applied during construction:</p> <ul style="list-style-type: none"> - Vehicle washing facilities to be provided at every discernible or designated vehicle exit point; - All temporary site access roads shall be sprayed with water to suppress dust as necessary; - All dusty materials should be sprayed with water immediately prior to any handling; and - All debris should be covered entirely by impervious sheeting or stored in a sheltered debris collection area. 		@
	<p>Surface Run-off</p> <p>In general, mitigation measures shall be in accordance with ProPECC PN1/94 on 'Construction Site Drainage'. Key measures include:</p> <ul style="list-style-type: none"> - Bund and cover stock piles to avoid run-off; - Channel any run-off through a system of oil, grease and sediment / silt traps and reuse water on site where ever practical; - All vehicle maintenance to be undertaken within a bunded area; and - Maximise vegetation retention on-site to maximise absorption (minimise transport). 		V

Landscape and Visual Impact – Schedule of Recommended Mitigation Measures

Impact	Mitigation Measures	Timing	Responsibility
Landscape & Visual during construction	Preservation of Existing Vegetation - Trees identified for retention within the project limit would be protected during the works; - The tree transplanting and planting works shall be implemented by approved Landscape Contractors.	During construction	V
	Temporary Works Areas - Where feasible the works areas would be screened using hoarding and existing vegetation would be retained where possible to reduce the landscape and visual impacts arising from the construction activity. The landscape of these works areas would be restored following the completion of the construction phase.		V
	Hoarding - A hoarding would be erected where practicable in the most visually sensitive locations to screen the temporary construction works from the local VSRs.		V
	Top Soils - The works will result in disturbance to extensive areas of topsoil. Topsoil worthy of retention should be stockpiled for use following completion of the civil engineering works. It should either be temporarily vegetated with hydroseeded grass or turned over on a regular basis.		#
	Protection of Important Landscape Features - Important features such as temples, Island House and kilns within the study area, although remote from the proposed works retained and adequately protected.		#

Legend:

- V = implemented;
- x = not implemented;
- @ = partially implemented;
- + = recommended and immediately implemented during the site inspection by the Contractor;
- N/A = not applicable - No such work was undertaken or no such material was used on site;
- # = to be implemented.

**APPENDIX D
SUMMARY OF ACTION AND LIMIT LEVELS**

Appendix D - Summary of Action and Limit Levels

Table 1 – Action and Limit Levels for 1-hour TSP

Location	Action Level	Limit Level
AM2	317.8 µg/m ³	500 µg/m ³

Table 2 – Action and Limit Levels for 24-hour TSP

Location	Action Level	Limit Level
AM2	200.7 µg/m ³	260 µg/m ³

Table 3 – Action and Limit Levels for Construction Noise (0700-1900 hrs of normal weekdays)

Location	Action Level	Limit Level
M2	When one documented complaint, related to 0700 – 1900 hours on normal weekdays, is received from any one of the sensitive receivers	75 dB(A)
M3*		65/70 dB(A)

*Daytime noise Limit Level of 70 dB(A) applies to education institutions, while 65dB(A) applies during school examination period

**APPENDIX E
CALIBRATION CERTIFICATES OF
MONITORING EQUIPMENTS**



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

ORIFICE TRANSFER STANDARD CERTIFICATION WORKSHEET TE-5025A

Date - May 31, 2016 Rootmeter S/N 0438320 Ta (K) - 298
 Operator Tisch Orifice I.D. - 0988 Pa (mm) - 754.38

PLATE OR Run #	VOLUME START (m3)	VOLUME STOP (m3)	DIFF VOLUME (m3)	DIFF TIME (min)	METER	ORFICE
					DIFF Hg (mm)	DIFF H2O (in.)
1	NA	NA	1.00	1.3670	3.2	2.00
2	NA	NA	1.00	0.9750	6.4	4.00
3	NA	NA	1.00	0.8700	7.9	5.00
4	NA	NA	1.00	0.8260	8.7	5.50
5	NA	NA	1.00	0.6830	12.7	8.00

DATA TABULATION

Vstd	(x axis) Qstd	(y axis)	Va	(x axis) Qa	(y axis)
0.9884	0.7230	1.4090	0.9957	0.7284	0.8888
0.9842	1.0094	1.9926	0.9915	1.0170	1.2570
0.9821	1.1289	2.2278	0.9894	1.1373	1.4054
0.9811	1.1878	2.3365	0.9884	1.1967	1.4740
0.9758	1.4288	2.8179	0.9831	1.4394	1.7777
Qstd slope (m) = 1.99349			Qa slope (m) = 1.24829		
intercept (b) = -0.02737			intercept (b) = -0.01727		
coefficient (r) = 0.99988			coefficient (r) = 0.99988		
y axis = SQRT[H2O(Pa/760)(298/Ta)]			y axis = SQRT[H2O(Ta/Pa)]		

CALCULATIONS

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

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

For subsequent flow rate calculations:

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

EQUIPMENT CALIBRATION RECORD

Type: Laser Dust Monitor
 Manufacturer/Brand: SIBATA
 Model No.: LD-3
 Equipment No.: A.005.07a
 Sensitivity Adjustment Scale Setting: 557 CPM

Operator: Mike Shek (MSKM)

Standard Equipment

Equipment: Rupprecht & Patashnick TEOM®
 Venue: Cyberport (Pui Ying Secondary School)
 Model No.: Series 1400AB
 Serial No: Control: 140AB219899803
 Sensor: 1200C143659803 K_o: 12500
 Last Calibration Date*: 7 May 2016

*Remarks: Recommended interval for hardware calibration is 1 year

Calibration Result

Sensitivity Adjustment Scale Setting (Before Calibration): 557 CPM
 Sensitivity Adjustment Scale Setting (After Calibration): 557 CPM

Hour	Date (dd-mm-yy)	Time	Ambient Condition		Concentration ¹ (mg/m ³) Y-axis	Total Count ²	Count/ Minute ³ X-axis
			Temp (°C)	R.H. (%)			
1	07-05-16	12:15 - 13:15	28.1	77	0.04530	1812	30.20
2	07-05-16	13:15 - 14:15	28.2	76	0.04659	1863	31.05
3	07-05-16	14:15 - 15:15	28.4	78	0.04560	1824	30.40
4	07-05-16	15:15 - 16:15	28.5	77	0.04434	1774	29.57

Note: 1. Monitoring data was measured by Rupprecht & Patashnick TEOM®
 2. Total Count was logged by Laser Dust Monitor
 3. Count/minute was calculated by (Total Count/60)

By Linear Regression of Y or X

Slope (K-factor): 0.0015
 Correlation coefficient: 0.9969

Validity of Calibration Record: 7 May 2017

Remarks:

QC Reviewer: YW Fung Signature:  Date: 09 May 2016

EQUIPMENT CALIBRATION RECORD

Type: Laser Dust Monitor
 Manufacturer/Brand: SIBATA
 Model No.: LD-3
 Equipment No.: A.005.09a
 Sensitivity Adjustment Scale Setting: 797 CPM

Operator: Mike Shek (MSKM)

Standard Equipment

Equipment: Rupprecht & Patashnick TEOM®
 Venue: Cyberport (Pui Ying Secondary School)
 Model No.: Series 1400AB
 Serial No: Control: 140AB219899803
 Sensor: 1200C143659803 Ko: 12500
 Last Calibration Date*: 7 May 2016

*Remarks: Recommended interval for hardware calibration is 1 year

Calibration Result

Sensitivity Adjustment Scale Setting (Before Calibration): 797 CPM
 Sensitivity Adjustment Scale Setting (After Calibration): 797 CPM

Hour	Date (dd-mm-yy)	Time	Ambient Condition		Concentration ¹ (mg/m ³) Y-axis	Total Count ²	Count/ Minute ³ X-axis
			Temp (°C)	R.H. (%)			
1	07-05-16	11:45 - 12:45	28.2	77	0.04623	1847	30.78
2	07-05-16	12:45 - 13:45	28.2	78	0.04708	1885	31.42
3	07-05-16	13:45 - 14:45	28.3	76	0.04591	1836	30.60
4	07-05-16	14:45 - 15:45	28.4	77	0.04333	1726	28.77

Note: 1. Monitoring data was measured by Rupprecht & Patashnick TEOM®
 2. Total Count was logged by Laser Dust Monitor
 3. Count/minute was calculated by (Total Count/60)

By Linear Regression of Y or X

Slope (K-factor): 0.0015
 Correlation coefficient: 0.9964

Validity of Calibration Record: 7 May 2017

Remarks:

QC Reviewer: YW Fung Signature:  Date: 09 May 2016



CERTIFICATE OF CALIBRATION

Certificate No.: 16CA0704 03-01 Page 1 of 2

Item tested

Description:	Sound Level Meter (Type 1)	,	Microphone
Manufacturer:	B & K	,	B & K
Type/Model No.:	2238	,	4188
Serial/Equipment No.:	2800927 / N.009.06	,	2791211
Adaptors used:	-	,	-

Item submitted by

Customer Name: AECOM ASIA CO., LTD.
Address of Customer: -
Request No.: -
Date of receipt: 04-Jul-2016

Date of test: 07-Jul-2016

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Multi function sound calibrator	B&K 4226	2288444	18-Jun-2017	CIGISMEC
Signal generator	DS 360	33873	18-Apr-2017	CEPREI
Signal generator	DS 360	61227	18-Apr-2017	CEPREI

Ambient conditions

Temperature: 22 ± 1 °C
Relative humidity: 60 ± 10 %
Air pressure: 1000 ± 5 hPa

Test specifications

- 1, The Sound Level Meter has been calibrated in accordance with the requirements as specified in BS 7580: Part 1: 1997 and the lab calibration procedure SMTP004-CA-152.
- 2, The electrical tests were performed using an electrical signal substituted for the microphone which was removed and replaced by an equivalent capacitance within a tolerance of $\pm 20\%$.
- 3, The acoustic calibration was performed using an B&K 4226 sound calibrator and corrections was applied for the difference between the free-field and pressure responsiveness of the Sound Level Meter.

Test results

This is to certify that the Sound Level Meter conforms to BS 7580: Part 1: 1997 for the conditions under which the test was performed.

Details of the performed measurements are presented on page 2 of this certificate.

Actual Measurement data are documented on worksheets.

Approved Signatory:

Huang Jian Min/Feng Jun Qi

Date: 09-Jul-2016

Company Chop:



Comments: The results reported in this certificate refer to the condition of the instrument on the date of calibration and carry no implication regarding the long-term stability of the instrument.



CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.: 16CA0704 03-01 Page 2 of 2

1, Electrical Tests

The electrical tests were performed using an equivalent capacitance substituted for the microphone. The results are given in below with test status and the estimated uncertainties. The "Pass" means the result of the test is inside the tolerances stated in the test specifications. The "-" means the result of test is outside these tolerances.

Test:	Subtest:	Status:	Expanded Uncertainty (dB)	Coverage Factor
Self-generated noise	A	Pass	0.3	
	C	Pass	1.0	2.1
	Lin	Pass	2.0	2.2
Linearity range for Leq	At reference range, Step 5 dB at 4 kHz	Pass	0.3	
	Reference SPL on all other ranges	Pass	0.3	
	2 dB below upper limit of each range	Pass	0.3	
	2 dB above lower limit of each range	Pass	0.3	
Linearity range for SPL	At reference range, Step 5 dB at 4 kHz	Pass	0.3	
	Frequency weightings			
Time weightings	A	Pass	0.3	
	C	Pass	0.3	
	Lin	Pass	0.3	
Peak response	Single Burst Fast	Pass	0.3	
	Single Burst Slow	Pass	0.3	
R.M.S. accuracy	Single 100µs rectangular pulse	Pass	0.3	
	Crest factor of 3	Pass	0.3	
Time weighting I	Single burst 5 ms at 2000 Hz	Pass	0.3	
	Repeated at frequency of 100 Hz	Pass	0.3	
Time averaging	1 ms burst duty factor 1/10 ³ at 4kHz	Pass	0.3	
	1 ms burst duty factor 1/10 ⁴ at 4kHz	Pass	0.3	
Pulse range	Single burst 10 ms at 4 kHz	Pass	0.4	
Sound exposure level	Single burst 10 ms at 4 kHz	Pass	0.4	
Overload indication	SPL	Pass	0.3	
	Leq	Pass	0.4	

2, Acoustic tests

The complete sound level meter was calibrated on the reference range using a B&K 4226 acoustic calibrator with 1000Hz and SPL 94 dB. The sensitivity of the sound level meter was adjusted. The test result at 125 Hz and 8000 Hz are given in below with test status and the estimated uncertainties.

Test:	Subtest	Status	Expanded Uncertainty (dB)	Coverage Factor
Acoustic response	Weighting A at 125 Hz	Pass	0.3	
	Weighting A at 8000 Hz	Pass	0.5	

3, Response to associated sound calibrator

N/A

The expanded uncertainties have been calculated in accordance with the ISO Publication "Guide to the expression of uncertainty in measurement", and gives an interval estimated to have a level of confidence of 95%. A coverage factor of 2 is assumed unless explicitly stated.

- End -

Calibrated by:

Date:

Fung Chi Yip
07-Jul-2016

Checked by:

Date:

Lam Tze Wai
09-Jul-2016

The standard(s) and equipment used in the calibration are traceable to national or international recognised standards and are calibrated on a schedule to maintain the required accuracy level.



CERTIFICATE OF CALIBRATION

Certificate No.: 16CA0408 02 Page 1 of 2

Item tested

Description:	Sound Level Meter (Type 1)	,	Microphone
Manufacturer:	B & K	,	B & K
Type/Model No.:	2238	,	4188
Serial/Equipment No.:	2285692	,	2791211
Adaptors used:	-	,	-

Item submitted by

Customer Name: AECOM ASIA CO., LTD.
Address of Customer: -
Request No.: -
Date of receipt: 08-Apr-2016

Date of test: 11-Apr-2016

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Multi function sound calibrator	B&K 4226	2288444	19-Jun-2016	CIGISMEC
Signal generator	DS 360	33873	16-Apr-2016	CEPREI
Signal generator	DS 360	61227	16-Apr-2016	CEPREI

Ambient conditions

Temperature: 21 ± 1 °C
Relative humidity: 50 ± 10 %
Air pressure: 1010 ± 5 hPa

Test specifications

1. The Sound Level Meter has been calibrated in accordance with the requirements as specified in BS 7580: Part 1: 1997 and the lab calibration procedure SMTP004-CA-152.
2. The electrical tests were performed using an electrical signal substituted for the microphone which was removed and replaced by an equivalent capacitance within a tolerance of $\pm 20\%$.
3. The acoustic calibration was performed using an B&K 4226 sound calibrator and corrections was applied for the difference between the free-field and pressure responsiveness of the Sound Level Meter.


Test results

This is to certify that the Sound Level Meter conforms to BS 7580: Part 1: 1997 for the conditions under which the test was performed.

Details of the performed measurements are presented on page 2 of this certificate.

Actual Measurement data are documented on worksheets.

Approved Signatory:


Huang Jian Min/Feng Jun Qi

Date: 12-Apr-2016

Company Chop:



Comments: The results reported in this certificate refer to the condition of the instrument on the date of calibration and carry no implication regarding the long-term stability of the instrument.



CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.: 16CA0408 02 Page 2 of 2

1, Electrical Tests

The electrical tests were performed using an equivalent capacitance substituted for the microphone. The results are given in below with test status and the estimated uncertainties. The "Pass" means the result of the test is inside the tolerances stated in the test specifications. The "-" means the result of test is outside these tolerances.

Test:	Subtest:	Status:	Expanded Uncertainty (dB)	Coverage Factor
Self-generated noise	A	Pass	0.3	
	C	Pass	1.0	2.1
	Lin	Pass	2.0	2.2
Linearity range for Leq	At reference range , Step 5 dB at 4 kHz	Pass	0.3	
	Reference SPL on all other ranges	Pass	0.3	
	2 dB below upper limit of each range	Pass	0.3	
	2 dB above lower limit of each range	Pass	0.3	
Linearity range for SPL	At reference range , Step 5 dB at 4 kHz	Pass	0.3	
	Frequency weightings			
Time weightings	A	Pass	0.3	
	C	Pass	0.3	
	Lin	Pass	0.3	
Peak response	Single Burst Fast	Pass	0.3	
	Single Burst Slow	Pass	0.3	
R.M.S. accuracy	Single 100µs rectangular pulse	Pass	0.3	
Time weighting I	Crest factor of 3	Pass	0.3	
	Single burst 5 ms at 2000 Hz	Pass	0.3	
Time averaging	Repeated at frequency of 100 Hz	Pass	0.3	
	1 ms burst duty factor 1/10 ³ at 4kHz	Pass	0.3	
	1 ms burst duty factor 1/10 ⁴ at 4kHz	Pass	0.3	
Pulse range	Single burst 10 ms at 4 kHz	Pass	0.4	
Sound exposure level	Single burst 10 ms at 4 kHz	Pass	0.4	
Overload indication	SPL	Pass	0.3	
	Leq	Pass	0.4	

2, Acoustic tests

The complete sound level meter was calibrated on the reference range using a B&K 4226 acoustic calibrator with 1000Hz and SPL 94 dB. The sensitivity of the sound level meter was adjusted. The test result at 125 Hz and 8000 Hz are given in below with test status and the estimated uncertainties.

Test:	Subtest	Status	Expanded Uncertainty (dB)	Coverage Factor
Acoustic response	Weighting A at 125 Hz	Pass	0.3	
	Weighting A at 8000 Hz	Pass	0.5	

3, Response to associated sound calibrator

N/A

The expanded uncertainties have been calculated in accordance with the ISO Publication "Guide to the expression of uncertainty in measurement", and gives an interval estimated to have a level of confidence of 95%. A coverage factor of 2 is assumed unless explicitly stated.

- End -

Calibrated by:

Fung Chi Yip
Date: 11-Apr-2016

Checked by:

Lam Tze Wai
Date: 12-Apr-2016

The standard(s) and equipment used in the calibration are traceable to national or international recognised standards and are calibrated on a schedule to maintain the required accuracy level.



CERTIFICATE OF CALIBRATION

Certificate No.: 15CA1203 03

Page: 1 of 2

Item tested

Description: Acoustical Calibrator (Class 1)
Manufacturer: Rion Co., Ltd.
Type/Model No.: NC-73
Serial/Equipment No.: 10307223 (N-4-2)
Adaptors used: -

Item submitted by

Customer: AECOM ASIA CO., LTD.
Address of Customer: -
Request No.: -
Date of receipt: 03-Dec-2015

Date of test: 03-Dec-2015

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Lab standard microphone	B&K 4180	2341427	15-Apr-2016	SCL
Preamplifier	B&K 2673	2239857	22-Apr-2016	CEPREI
Measuring amplifier	B&K 2610	2346941	22-Apr-2016	CEPREI
Signal generator	DS 360	61227	16-Apr-2016	CEPREI
Digital multi-meter	34401A	US36087050	17-Apr-2016	CEPREI
Audio analyzer	8903B	GB41300350	17-Apr-2016	CEPREI
Universal counter	53132A	MY40003662	16-Apr-2016	CEPREI

Ambient conditions

Temperature: 22 ± 1 °C
Relative humidity: 50 ± 10 %
Air pressure: 1010 ± 5 hPa

Test specifications

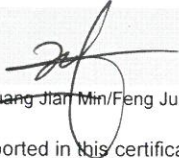
- The Sound Calibrator has been calibrated in accordance with the requirements as specified in IEC 60942 1997 Annex B and the lab calibration procedure SMTP004-CA-156.
- The calibrator was tested with its axis vertical facing downwards at the specific frequency using insert voltage technique.
- The results are rounded to the nearest 0.01 dB and 0.1 Hz and have not been corrected for variations from a reference pressure of 1013.25 hectoPascals as the maker's information indicates that the instrument is insensitive to pressure changes.

Test results

This is to certify that the sound calibrator conforms to the requirements of annex B of IEC 60942: 1997 for the conditions under which the test was performed. This does not imply that the sound calibrator meets IEC 60942 under any other conditions.

Details of the performed measurements are presented on page 2 of this certificate.

Approved Signatory:


Huang Jian Min/Feng Jun Qi

Date: 04-Dec-2015

Company Chop:



Comments: The results reported in this certificate refer to the condition of the instrument on the date of calibration and carry no implication regarding the long-term stability of the instrument.



CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.: 15CA1203 03 Page: 2 of 2

1, Measured Sound Pressure Level

The output Sound Pressure Level in the calibrator head was measured at the setting and frequency shown using a calibrated laboratory standard microphone and insert voltage technique. The results are given in below with the estimated uncertainties.

(Output level in dB re 20 μ Pa)

Frequency Shown Hz	Output Sound Pressure Level Setting dB	Measured Output Sound Pressure Level dB	Estimated Expanded Uncertainty dB
1000	94.00	94.04	0.10

2, Sound Pressure Level Stability - Short Term Fluctuations

The Short Term Fluctuations was determined by measuring the maximum and minimum of the fast weighted DC output of the B&K 2610 measuring amplifier over a 20 second time interval as required in the standard. The Short Term Fluctuation was found to be:

At 1000 Hz STF = 0.002 dB

Estimated expanded uncertainty 0.005 dB

3, Actual Output Frequency

The determination of actual output frequency was made using a B&K 4180 microphone together with a B&K 2673 preamplifier connected to a B&K 2610 measuring amplifier. The AC output of the B&K 2610 was taken to an universal counter which was used to determine the frequency averaged over 20 second of operation as required by the standard. The actual output frequency at 1 KHz was:

At 1000 Hz Actual Frequency = 987.5 Hz

Estimated expanded uncertainty 0.1 Hz Coverage factor k = 2.2

4, Total Noise and Distortion

For the Total Noise and Distortion measurement, the unfiltered AC output of the B&K 2610 measuring amplifier was connected to an Agilent Type 8903 B distortion analyser. The TND result at 1 KHz was:

At 1000 Hz TND = 0.4 %

Estimated expanded uncertainty 0.7 %

The expanded uncertainties have been calculated in accordance with the ISO Publication "Guide to the expression of uncertainty in measurement", and gives an interval estimated to have a level of confidence of 95%. A coverage factor of 2 is assumed unless explicitly stated.

Calibrated by: 

Date: 03-Dec-2015

- End -

Checked by: 

Date: 04-Dec-2015

The standard(s) and equipment used in the calibration are traceable to national or international recognised standards and are calibrated on a schedule to maintain the required accuracy level.



CERTIFICATE OF CALIBRATION

Certificate No.: 16CA1201 01

Page: 1 of 2

Item tested

Description: Acoustical Calibrator (Class 1)
Manufacturer: Rion Co., Ltd.
Type/Model No.: NC-73
Serial/Equipment No.: 10307223 (CN.004.08)
Adaptors used: -

Item submitted by

Customer: AECOM ASIA CO. LTD.
Address of Customer: -
Request No.: -
Date of receipt: 01-Dec-2016

Date of test: 05-Dec-2016

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Lab standard microphone	B&K 4180	2412857	14-Apr-2017	SCL
Preamplifier	B&K 2673	2239857	28-Apr-2017	CEPREI
Measuring amplifier	B&K 2610	2346941	26-Apr-2017	CEPREI
Signal generator	DS 360	61227	18-Apr-2017	CEPREI
Digital multi-meter	34401A	US36087050	18-Apr-2017	CEPREI
Audio analyzer	8903B	GB41300350	19-Apr-2017	CEPREI
Universal counter	53132A	MY40003662	19-Apr-2017	CEPREI

Ambient conditions

Temperature: 22 ± 1 °C
Relative humidity: 55 ± 10 %
Air pressure: 1005 ± 5 hPa

Test specifications

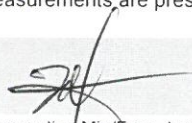
- The Sound Calibrator has been calibrated in accordance with the requirements as specified in IEC 60942 1997 Annex B and the lab calibration procedure SMTP004-CA-156.
- The calibrator was tested with its axis vertical facing downwards at the specific frequency using insert voltage technique.
- The results are rounded to the nearest 0.01 dB and 0.1 Hz and have not been corrected for variations from a reference pressure of 1013.25 hectoPascals as the maker's information indicates that the instrument is insensitive to pressure changes.

Test results

This is to certify that the sound calibrator conforms to the requirements of annex B of IEC 60942: 1997 for the conditions under which the test was performed. This does not imply that the sound calibrator meets IEC 60942 under any other conditions.

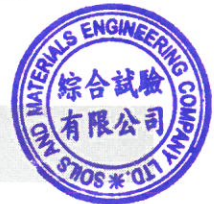
Details of the performed measurements are presented on page 2 of this certificate.

Approved Signatory:


Huang Jian Min / Feng Jun Qi

Date: 08-Dec-2016

Company Chop:



Comments: The results reported in this certificate refer to the condition of the instrument on the date of calibration and carry no implication regarding the long-term stability of the instrument.



CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.: 16CA1201 01 Page: 2 of 2

1, Measured Sound Pressure Level

The output Sound Pressure Level in the calibrator head was measured at the setting and frequency shown using a calibrated laboratory standard microphone and insert voltage technique. The results are given in below with the estimated uncertainties.

Frequency Shown Hz	Output Sound Pressure Level Setting dB	Measured Output Sound Pressure Level dB	(Output level in dB re 20 µPa)
			Estimated Expanded Uncertainty dB
1000	94.00	94.22	0.10

2, Sound Pressure Level Stability - Short Term Fluctuations

The Short Term Fluctuations was determined by measuring the maximum and minimum of the fast weighted DC output of the B&K 2610 measuring amplifier over a 20 second time interval as required in the standard. The Short Term Fluctuation was found to be:

At 1000 Hz STF = 0.002 dB

Estimated expanded uncertainty 0.005 dB

3, Actual Output Frequency

The determination of actual output frequency was made using a B&K 4180 microphone together with a B&K 2673 preamplifier connected to a B&K 2610 measuring amplifier. The AC output of the B&K 2610 was taken to an universal counter which was used to determine the frequency averaged over 20 second of operation as required by the standard. The actual output frequency at 1 KHz was:

At 1000 Hz Actual Frequency = 986.6 Hz

Estimated expanded uncertainty 0.1 Hz Coverage factor k = 2.2

4, Total Noise and Distortion

For the Total Noise and Distortion measurement, the unfiltered AC output of the B&K 2610 measuring amplifier was connected to an Agilent Type 8903 B distortion analyser. The TND result at 1 KHz was:

At 1000 Hz TND = 0.5 %

Estimated expanded uncertainty 0.7 %

The expanded uncertainties have been calculated in accordance with the ISO Publication "Guide to the expression of uncertainty in measurement", and gives an interval estimated to have a level of confidence of 95%. A coverage factor of 2 is assumed unless explicitly stated.

- End -

Calibrated by:

Fung Chi Yip

Date: 05-Dec-2016

Checked by:

Lam Tze Wai

Date: 08-Dec-2016

The standard(s) and equipment used in the calibration are traceable to national or international recognised standards and are calibrated on a schedule to maintain the required accuracy level.

**APPENDIX F
EM&A MONITORING SCHEDULES**

Contract No. HY/2012/06
Widening of Fanling Highway – Tai Hang to Wo Hop Shek Interchange
Impact Monitoring and Audit Schedule for December 2016

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				1-Dec	2-Dec	3-Dec
				Site Audit		
4-Dec	5-Dec	6-Dec	7-Dec	8-Dec	9-Dec	10-Dec
		1-hr TSP 24-hr TSP Noise	Site Audit			
11-Dec	12-Dec	13-Dec	14-Dec	15-Dec	16-Dec	17-Dec
	1-hr TSP 24-hr TSP Noise			Site Audit		1-hr TSP 24-hr TSP
18-Dec	19-Dec	20-Dec	21-Dec	22-Dec	23-Dec	24-Dec
		Site Audit			1-hr TSP 24-hr TSP Noise	
25-Dec	26-Dec	27-Dec	28-Dec	29-Dec	30-Dec	31-Dec
			Site Audit	1-hr TSP 24-hr TSP Noise		

Contract No. HY/2012/06
Widening of Fanling Highway – Tai Hang to Wo Hop Shek Interchange
Tentative Impact Monitoring and Audit Schedule for January 2017

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1-Jan	2-Jan	3-Jan	4-Jan	5-Jan	6-Jan	7-Jan
		1-hr TSP 24-hr TSP Noise Site Audit				
8-Jan	9-Jan	10-Jan	11-Jan	12-Jan	13-Jan	14-Jan
	1-hr TSP 24-hr TSP Noise	Site Audit				1-hr TSP 24-hr TSP
15-Jan	16-Jan	17-Jan	18-Jan	19-Jan	20-Jan	21-Jan
				Site Audit	1-hr TSP 24-hr TSP Noise	
22-Jan	23-Jan	24-Jan	25-Jan	26-Jan	27-Jan	28-Jan
		Site Audit		1-hr TSP 24-hr TSP Noise		
29-Jan	30-Jan	31-Jan				

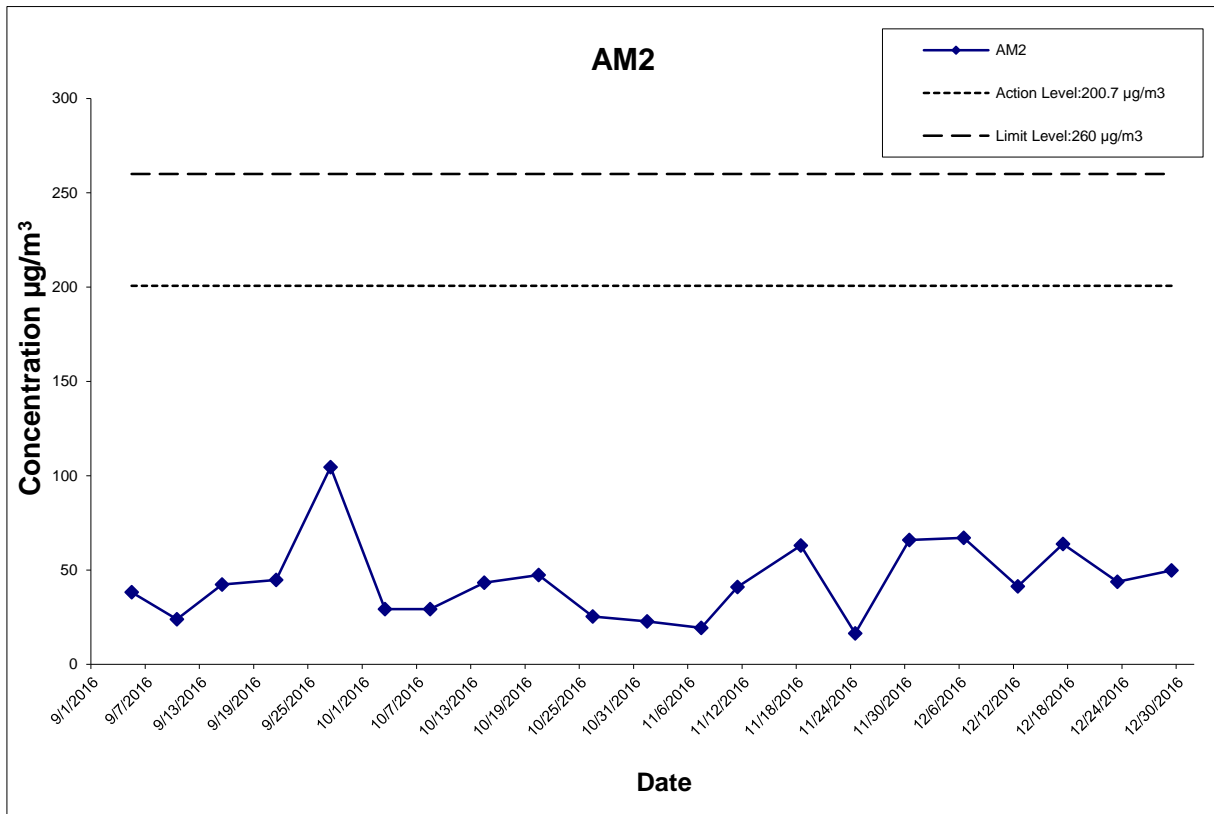
The schedule is subject to change due to unforeseeable circumstances (e.g. adverse weather, etc)

**APPENDIX G
IMPACT AIR QUALITY MONITORING
RESULTS AND THEIR GRAPHICAL
PRESENTATION**

**Appendix G
Impact Air Quality Monitoring Results**

24-hour TSP Monitoring Results at Station AM2 (Fanling Government Secondary School)

Date	Weather Condition	Air Temp. (°C)	Atmospheric Pressure(hPa)	Flow Rate (m ³ /min.)		Av. flow (m ³ /min)	Total vol. (m ³)	Filter Weight (g)		Particulate weight(g)	Elapse Time		Sampling Time(hrs.)	Conc. (µg/m ³)	Action Level (µg/m ³)	Limit Level (µg/m ³)
				Initial	Final			Initial	Final		Initial	Final				
6-Dec-16	Cloudy	23.3	1017.7	1.314	1.314	1.314	1892.2	2.7860	2.9129	0.1269	7986.03	8010.03	24.00	67.1	200.7	260
12-Dec-16	Rainy	21.1	1015.1	1.314	1.314	1.314	1892.2	2.8405	2.9189	0.0784	8010.03	8034.03	24.00	41.4	200.7	260
17-Dec-16	Clousy	16.6	1023.2	1.314	1.314	1.314	1892.2	2.7630	2.8838	0.1208	8034.03	8058.03	24.00	63.8	200.7	260
23-Dec-16	Sunny	20.2	1019.0	1.314	1.314	1.314	1892.2	2.7800	2.8629	0.0829	8058.03	8082.03	24.00	43.8	200.7	260
29-Dec-16	Cloudy	15.9	1024.1	1.314	1.314	1.314	1892.2	2.7647	2.8590	0.0943	8082.03	8106.03	24.00	49.8	200.7	260
													Average	53.2		
													Min	41.4		
													Max	67.1		



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CONTRACT NO. HY/2012/06
 WIDENING OF FANLING HIGHWAY
 - TAI HANG TO WO HOP SHEK INTERCHANGE



Graphical Presentation of Impact 24-hour TSP Monitoring Results

Project No.: 60307376

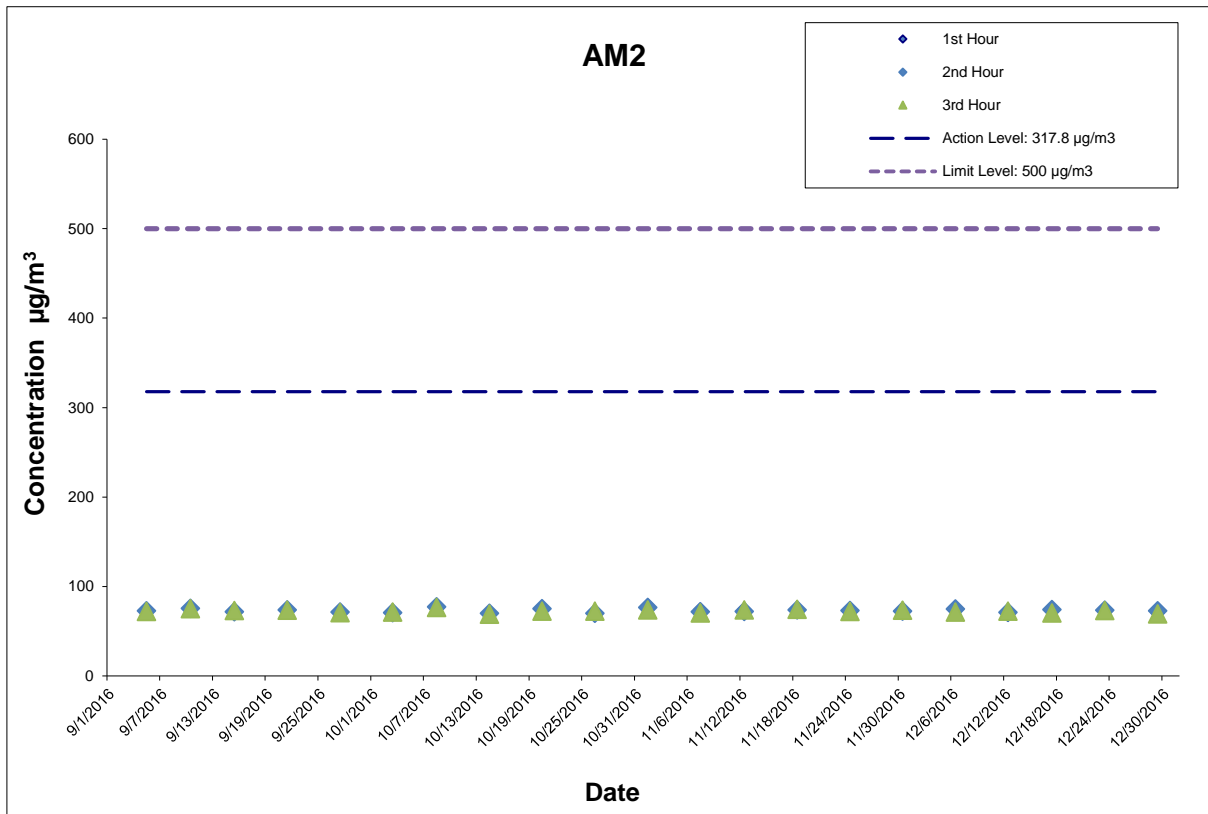
Date: Jan-17

Appendix G

Appendix G
Impact Air Quality Monitoring Results

1-hour TSP Monitoring Results at Station AM2
(Fanling Government Secondary School)

Date	Start Time (hh:mm)	1st Hour	2nd Hour	3rd Hour
		Conc. ($\mu\text{g}/\text{m}^3$)	Conc. ($\mu\text{g}/\text{m}^3$)	Conc. ($\mu\text{g}/\text{m}^3$)
6-Dec-16	13:05	73.3	74.8	71.5
12-Dec-16	10:30	68.6	71.2	72.6
17-Dec-16	10:30	73.3	74.0	70.4
23-Dec-16	12:12	72.8	73.5	73.1
29-Dec-16	13:10	70.6	72.8	69.2
Average				72.1
Min				68.6
Max				74.8



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CONTRACT NO. HY/2012/06
 WIDENING OF FANLING HIGHWAY
 - TAI HANG TO WO HOP SHEK INTERCHANGE



Graphical Presentation of Impact 1-hour TSP Monitoring Results

Project No.: 60307376

Date: Jan-17

Appendix G

**APPENDIX H
METEOROLOGICAL DATA FOR THE
REPORTING MONTH**

[Home](#)[What's new](#)[About us](#)[HKO Side Lights](#)[Our Services](#)[Visitors Figures](#)[Press releases](#)[Today's Weather Warnings](#)[Local Weather](#)[Observations](#)[Weather Forecast](#)[Weather Monitoring](#)[Imagery](#)[Computer Forecast](#)[Products](#)[MyObservatory](#)[Met on Map](#)[Tropical Cyclones](#)[Aviation Weather Services](#)[Marine Meteorological Services](#)[Weather Information for Sports](#)[Weather Information for Communities](#)[China Weather](#)[World Weather](#)[Climatological Information Services](#)[> Climate Watch](#)[> Climate Statistics](#)[> Climate Prediction](#)[> Climate Knowledge](#)[> Need More Information?](#)[> Global Climate Services](#)[> Other Useful Links](#)[Climate Forecast](#)[Climate Change](#)[El Nino and La Nina](#)[Earthquakes and Tsunamis](#)[Astronomy, Space Weather and Geomagnetism](#)[Time and Calendar](#)[Radiation Monitoring, Assessment and](#)[Back](#)

Daily Extract of Meteorological Observations , December 2016 - Tai Po

Year Month

Day	Mean Pressure (hPa)	Air Temperature			Mean Dew Point (deg. C)	Mean Relative Humidity (%)	Total Rainfall (mm)	Prevailing Wind Direction (degrees)	Mean Wind Speed (km/h)
		Absolute Daily Max (deg. C)	Mean (deg. C)	Absolute Daily Min (deg. C)					
01	1022.3	22.1#	18.1	14.2#	12.5	70	***	***	***
02	1022.7	22.0	19.2	15.8	14.6	75	***	***	***
03	1021.0	21.9	20.4	18.3	16.6	79	***	***	***
04	1018.0	26.0	21.7	19.2	18.1	80	***	***	***
05	1017.6	26.3	22.6	20.5	19.1	81	***	***	***
06	1020.8	22.6	19.7	17.4	11.0	58	***	***	***
07	1019.1	22.2	18.7	15.7	11.9	65	***	***	***
08	1016.5	22.0#	17.5	13.5#	11.1	67	***	***	***
09	1015.4	22.4#	17.6	13.0#	12.6	74	***	***	***
10	1016.4	24.3	20.1	15.7	15.6	77	***	***	***
11	1016.5	21.7	20.5	19.3	16.3	77	***	***	***
12	1015.1	24.0	21.0	18.7	17.1	79	***	***	***
13	1014.4	26.1	22.1	18.8	18.3	80	***	***	***
14	1018.3	22.9	20.5	17.7	14.3	68	***	***	***
15	1022.9	20.1	17.1	13.8	9.8	62	***	***	***
16	1025.9	16.8	13.6	10.8	6.8	64	***	***	***
17	1023.4	18.7	15.4	10.5	9.7	70	***	***	***
18	1021.6	23.3	19.1	16.2	14.9	77	***	***	***
19	1018.4	23.4	19.9	16.7	15.2	76	***	***	***
20	1017.3	24.2	20.8	17.8	17.4	82	***	***	***
21	1016.8	22.0	20.9	19.4	20.1	96	***	***	***
22	1017.0	25.0	21.4	17.1	17.0	78	***	***	***
23	1019.2	21.4	18.7	16.4	14.1	75	***	***	***
24	1019.3	19.4#	17.5	15.6#	14.3	81	***	***	***
25	1018.4	20.4	19.3	18.2	16.4	83	***	***	***
26	1017.0	24.7#	21.2	18.7#	17.9	82	***	***	***
27	1021.2	20.2#	15.6	11.4#	7.5	59	***	***	***
28	1023.5	15.3#	12.9	9.5#	4.9	59	***	***	***
29	1024.4	17.3#	14.8	12.2#	5.6	55	***	***	***
30	1024.6	18.7	15.1	12.6	7.3	60	***	***	***
31	1023.0	21.7#	17.6	13.2#	12.8	75	***	***	***

*** unavailable

data incomplete

Rainfall measured in increment of 0.5 mm. Amount of < 0.5 mm cannot be detected

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Daily Extract of Meteorological Observations , December 2016 - Tai Mei Tuk

Year Month

Day	Mean Pressure (hPa)	Air Temperature			Mean Dew Point (deg. C)	Mean Relative Humidity (%)	Total Rainfall (mm)	Prevailing Wind Direction (degrees)	Mean Wind Speed (km/h)
		Absolute Daily Max (deg. C)	Mean (deg. C)	Absolute Daily Min (deg. C)					
01	***	22.8	18.5	15.0	***	***	0.0	040	6.6
02	***	21.6	19.3	16.7	***	***	0.0	040	10.3
03	***	22.2	20.4	18.6	***	***	0.0	040	10.8
04	***	25.2	21.7	19.4	***	***	0.0	260	3.1
05	***	25.4#	22.5	20.8#	***	***	0.0	260	4.6
06	***	22.2	19.5	18.0	***	***	0.0	040	15.9
07	***	22.9	19.1	16.3	***	***	0.0	050	7.8
08	***	21.3#	18.0	15.1#	***	***	0.0	040	10.1
09	***	21.9	18.2	14.9	***	***	0.0	100	6.9
10	***	23.3#	20.0	16.8#	***	***	0.0	050	12.4
11	***	22.1#	19.9	18.0#	***	***	0.0	100	21.6
12	***	23.7#	20.4	18.3#	***	***	0.0	080	12.3
13	***	25.8#	22.3	19.3#	***	***	0.0	260	5.5
14	***	22.7#	19.9	17.1#	***	***	0.0	040	16.6
15	***	19.2#	16.5	13.2#	***	***	0.0	040	15.3
16	***	16.2#	13.6	10.9#	***	***	0.0	040	13.0
17	***	18.3#	15.6	11.5#	***	***	0.0	040	12.8
18	***	23.0	18.8	16.6	***	***	0.0	050	10.8
19	***	23.2#	19.8	17.1#	***	***	0.0	060	9.8
20	***	23.8#	20.8	18.6#	***	***	0.0	070	7.0
21	***	22.1#	20.9	20.1#	***	***	5.0	050	6.9
22	***	24.6#	21.1	17.2#	***	***	0.0	040	11.1
23	***	20.7#	18.4	16.4#	***	***	0.0	050	12.0
24	***	18.7	16.9	15.3	***	***	1.0	040	16.2
25	***	19.6#	18.8	18.0#	***	***	0.0	090	16.5
26	***	24.5	21.2	18.7	***	***	0.0	090	6.3
27	***	21.2	14.9	10.9	***	***	0.0	030	24.0
28	***	15.4#	12.9	9.2#	***	***	0.0	040	11.3
29	***	17.6#	14.8	12.3#	***	***	0.0	040	13.5
30	***	18.4#	15.5	13.1#	***	***	0.0	040	8.1
31	***	21.2#	17.6	14.1#	***	***	0.0	040	11.9

*** unavailable

data incomplete

Rainfall measured in increment of 0.5 mm. Amount of < 0.5 mm cannot be detected

**APPENDIX I
IMPACT DAYTIME CONSTRUCTION NOISE
MONITORING RESULTS AND THEIR
GRAPHICAL PRESENTATION**

Appendix I Impact Daytime Construction Noise Monitoring Results

Location : M2 (West Tai Wo - Free Field)

Day time 07:00-19:00 hrs Normal Weekdays Impact Noise Monitoring Results

Date	Measured Noise Level for 30-min, dB(A)				Limit Level, dB(A)	Exceedance (Y/N)
	Start Time	Leq*	L10*	L90*		
6-Dec-16	14:00	68.9	70.5	66.3	75	N
12-Dec-16	11:20	69.2	71.0	67.0	75	N
23-Dec-16	14:08	69.0	70.2	65.9	75	N
29-Dec-16	11:10	69.2	72.4	66.5	75	N
	Min	68.9	70.2	65.9		
	Max	69.2	72.4	67.0		
	Average	69.1	71.1	66.4		

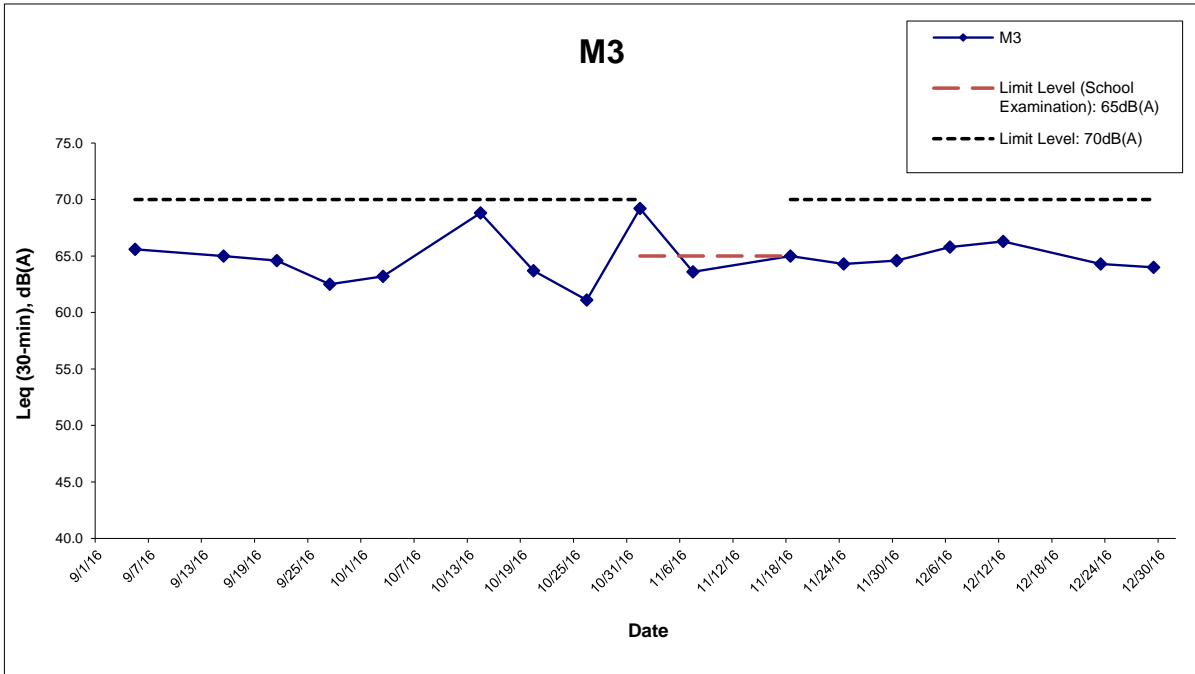
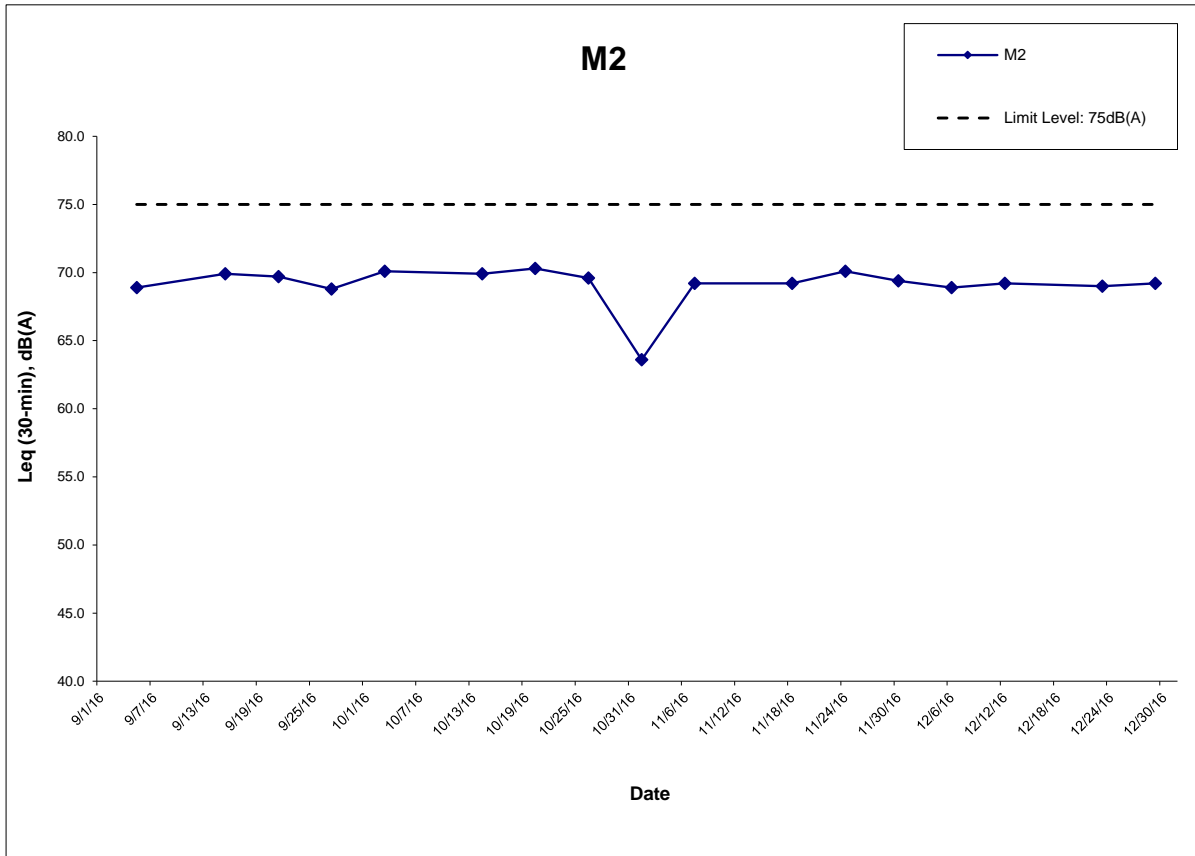
Location : M3 (Fanling Government Secondary School- Façade)

Day time 07:00-19:00 hrs Normal Weekdays Impact Noise Monitoring Results

Date	Measured Noise Level for 30-min, dB(A)				Limit Level, dB(A)^	Exceedance (Y/N)
	Start Time	Leq	L10	L90		
6-Dec-16	13:05	65.8	67.2	63.3	70	N
12-Dec-16	10:25	66.3	67.9	63.8	70	N
23-Dec-16	15:01	64.3	65.1	62.2	70	N
29-Dec-16	13:12	64.0	66.8	60.5	70	N
	Min	64.0	65.1	60.5		
	Max	66.3	67.9	63.8		
	Average	65.2	66.9	62.6		

* +3dB(A) Façade effect correction included

^ Limit Level of 70dB(A) applies to education institutes while 65dB(A) applies during school examination period.



Remark:

^ Limit Level of 70dB(A) applies to education institutes while 65dB(A) applies during school examination period.

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CONTRACT NO. HY/2012/06
 WIDENING OF FANLING HIGHWAY
 - TAI HANG TO WO HOP SHEK INTERCHANGE

Graphical Presentation of Impact Daytime Construction Noise
 Monitoring Results

Project No.: 60307376 Date: Jan-17



Appendix I

**APPENDIX J
EVENT ACTION PLAN**

Appendix J – Event Action Plan

Event / Action Plan for Air Quality

Event	Action			
	ET Leader	IEC	ER	Contractor
Action Level				
Exceedance for one sample	<ol style="list-style-type: none"> 1. Identify source; 2. Inform IEC and ER; 3. Repeat measurement to confirm finding; 4. Increase monitoring frequency to daily. 	<ol style="list-style-type: none"> 1. Check monitoring data submitted by ET; 2. Check Contractor's working method. 	<ol style="list-style-type: none"> 1. Notify Contractor. 	<ol style="list-style-type: none"> 1. Rectify any unacceptable practice; 2. Amend working methods if appropriate.
Exceedance for two or more consecutive samples	<ol style="list-style-type: none"> 1. Identify source; 2. Inform IEC and ER; 3. Repeat measurements to confirm findings; 4. Increase monitoring frequency to daily; 5. Discuss with IEC and Contractor on remedial actions required; 6. If exceedance continues, arrange meeting with IEC and ER; 7. If exceedance stops, cease additional monitoring. 	<ol style="list-style-type: none"> 1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss with ET and Contractor on possible remedial measures; 4. Advise the ER on the effectiveness of the proposed remedial measures; 5. Supervise Implementation of remedial measures. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented. 	<ol style="list-style-type: none"> 1. Submit proposals for remedial actions to IEC within 3 working days of notification; 2. Implement the agreed proposals; 3. Amend proposal if appropriate.

Event / Action Plan for Air Quality

Event Action Level	Action			
	ET Leader	IEC	ER	Contractor
Limit Level				
Exceedance for one sample	<ol style="list-style-type: none"> 1. Identify source; 2. Inform IEC, ER, Contractor and EPD; 3. Repeat measurement to confirm finding; 4. Increase monitoring frequency to daily; 5. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results. 	<ol style="list-style-type: none"> 1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss with ET and Contractor on possible remedial measures; 4. Advise ER on the effectiveness of the proposed remedial measures; 5. Supervise implementation of remedial measures. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of exceedance in writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented. 	<ol style="list-style-type: none"> 1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within 3 working days of notification; 3. Implement the agreed proposals; 4. Amend proposal if appropriate.
Exceedance for two or more consecutive samples	<ol style="list-style-type: none"> 1. Notify IEC, ER, Contractor and EPD; 2. Identify source; 3. Repeat measurement to confirm findings; 4. Increase frequency to daily; 5. Analyse Contractor's working procedures to determine possible mitigation to be; 6. Arrange meeting with IEC and ER to discuss the remedial actions to be taken; 7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results; 8. If exceedance stops, cease additional monitoring. 	<ol style="list-style-type: none"> 1. Discuss amongst ER, ET, and Contractor on the potential remedial actions; 2. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise ER accordingly; 3. Supervise the implementation of remedial measures. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of exceedance in writing; 2. Notify Contractor; 3. In consultation with the IEC, agree with the Contractor on the remedial measures to be implemented; 4. Ensure remedial measures properly implemented; 5. 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. 	<ol style="list-style-type: none"> 1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within 3 working days of notification; 3. Implement the agreed proposals; 4. Resubmit proposals if problem still not under control; 5. Stop the relevant portion of works as determined by ER until the exceedance is abated.

Event / Action Plan for Noise Impact

Event Limit Level	Action			
	ET Leader	IEC	ER	Contractor
Action Level	<ol style="list-style-type: none"> 1. Notify IEC and the Contractor. 2. Carry out investigation. 3. Report the results of investigation to IEC and the Contractor. 4. Discuss with the Contractor and formulate remedial measures. 5. Increase monitoring frequency to check mitigation effectiveness. 	<ol style="list-style-type: none"> 1. Review with analysed results submitted by ET. 2. Review the proposed remedial measures by the Contractor and advise ER accordingly. 3. Supervise the implement of remedial measures. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing. 2. Notify the Contractor. 3. Require the Contractor to propose remedial measures for the analysed noise problem. 4. Ensure remedial measures are properly implemented. 	<ol style="list-style-type: none"> 1. Submit noise mitigation proposals to IEC. 2. Implement noise mitigation proposals.
Limit Level	<ol style="list-style-type: none"> 1. Notify, IEC, ER, EPD and the Contractor. 2. Identify the source. 3. Repeat measurement to confirm findings. 4. Increase monitoring frequency. 5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented. 6. Inform IEC, ER, and EPD the causes & actions taken for the exceedances. 7. Assess effectiveness of the Contractor's remedial actions and keep IEC, EPD and ER informed of the results. 8. If exceedance stops, cease additional monitoring. 	<ol style="list-style-type: none"> 1. Discuss amongst ER, ET Leader and the Contractor on the potential remedial actions. 2. Review the Contractor's remedial actions whenever necessary to assure their effectiveness and advise ER accordingly. 3. Supervise the implementation of remedial measures. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing. 2. Notify the Contractor. 3. Require the Contractor to propose remedial measures for the analysed noise problem. 4. Ensure remedial measures are properly implemented. 5. If exceedance continues, consider what activity of the work is responsible and instruct the Contractor to stop that activity of work until the exceedance is abated. 	<ol style="list-style-type: none"> 1. Take immediate action to avoid further exceedance. 2. Submit proposals for remedial actions to IEC within 3 working days of notification. 3. Implement the agreed proposals. 4. Resubmit proposals if problem still not under control. 5. Stop the relevant activity of works as determined by the ER until the exceedance is abated.

**APPENDIX K
SITE INSPECTION SUMMARIES**

Site Inspection Summary

Inspection Information

Contract No.	HY/2012/06
Date:	01 December 2016
Time:	14:00
Inspection No.:	159

Non-compliance

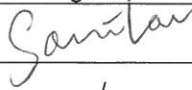
Nil

Observations

	<p><u>Follow-up Observation(s)</u></p> <ol style="list-style-type: none"> 1. Surface runoff of muddy water on pedestrian at SA342 was cleaned. (Closed) 2. Construction wastes found at SA340 and SA342 were collected and removed off site regularly. (Closed) 3. Construction materials found inside the fenced area of retained trees at SA340 were removed. (Closed) <p><u>New Observation(s)</u></p> <ol style="list-style-type: none"> 4. Exposed stockpile of dusty materials were found at NB46. The Contractor should cover the stockpile entirely by impervious sheeting; or paved with hard surface and keep clear of dusty materials; to prevent windblown dust emission. 5. Silts and debris were found in drainage at NB46. The Contractor should remove the sandy materials and implement measures to prevent surface runoff of site and silt from entering the drainage system. 6. Stagnant water was found at NB46. The Contractor should remove the water or apply larvicidal oil to prevent mosquito breeding. <p><u>Reminder (s)</u></p> <p>Nil.</p>
--	--

Remarks

Nil

	Name	Signature	Date
Prepared by	Sammi Lam		01 December 2016
Checked by	Y W Fung	/	01 December 2016

Site Inspection Summary

Inspection Information

Contract No.	HY/2012/06
Date:	07 December 2016
Time:	14:00
Inspection No.:	160

Non-compliance

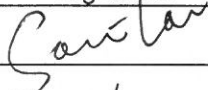

Nil

Observations

	<p><u>Follow-up Observation(s)</u></p> <ol style="list-style-type: none"> 1. Exposed stockpile of dusty materials found at NB46 was covered entirely by impervious sheeting. (Closed) 2. Silts and debris found in drainage at NB46 were removed. (Closed) 3. Stagnant water found at NB46 was removed. (Closed) <p><u>New Observation(s)</u></p> <ol style="list-style-type: none"> 4. Surface runoff of muddy water was observed at SA325. The Contractor should remove the muddy water and implement preventive measures to prevent sand from being flushed to public road. 5. Construction materials and wastes were found scattered at SA326. The Contractor should clean up wastes and maintain the site clean and tidy. 6. Mud trails were observed at SA328. The Contractor should provide wheel washing facilities at the vehicle exit points and clean up the mud trails for dust suppression. <p><u>Reminder (s)</u></p> <p>Nil.</p>
--	---

Remarks

Nil

	Name	Signature	Date
Prepared by	Sammi Lam		07 December 2016
Checked by	Y W Fung		07 December 2016

Site Inspection Summary

Inspection Information

Contract No.	HY/2012/06
Date:	15 December 2016
Time:	14:00
Inspection No.:	161

Non-compliance

Nil

Observations

	<p><u>Follow-up Observation(s)</u></p> <ol style="list-style-type: none"> 1. Surface runoff of muddy water observed at SA325 was cleared. (Closed) 2. Construction materials and wastes found scattered at SA326 were removed. (Closed) 3. Mud trails observed at SA328 were cleared. (Closed) <p><u>New Observation(s)</u></p> <ol style="list-style-type: none"> 4. General refuse collected without sorting was observed at SA340. The Contractor should provide recycle bins for collection and sorting. 5. Construction materials and wastes were found scattered near existing vegetation at SA340. The Contractor should remove the construction materials and wastes and maintain the site clean and tidy. <p><u>Reminder (s)</u></p> <p>Nil.</p>
--	--

Remarks

Nil

	Name	Signature	Date
Prepared by	Sammi Lam		15 December 2016
Checked by	Y W Fung		15 December 2016

Site Inspection Summary

Inspection Information

Contract No.	HY/2012/06
Date:	20 December 2016
Time:	14:00
Inspection No.:	162

Non-compliance

Nil

Observations

	<p><u>Follow-up Observation(s)</u></p> <ol style="list-style-type: none"> 1. Recycle bins for waste segregation were provided at SA340. (Closed) 2. Construction materials and wastes were found scattered near existing vegetation at SA340 were removed. (Closed) <p><u>New Observation(s)</u></p> <ol style="list-style-type: none"> 3. Exposed stockpiles of dusty materials were found at NB46. The Contractor should cover the stockpiles entirely by impervious sheeting; or paved with hard surface and keep clear of dusty materials; to prevent windblown dust emission. 4. Surface runoff of muddy water was observed at NB46. The Contractor should remove the muddy water and implement measures to prevent sand from being flushed to public road. 5. Public access road at SA325 was observed dusty. The Contractor should provide sufficient measures to keep the public access road clear of dusty materials. <p><u>Reminder (s)</u></p> <p>Nil.</p>
--	--

Remarks

Nil

	Name	Signature	Date
Prepared by	Sammi Lam		20 December 2016
Checked by	Y W Fung	/	20 December 2016

Site Inspection Summary

Inspection Information

Contract No.	HY/2012/06
Date:	28 December 2016
Time:	14:00
Inspection No.:	163

Non-compliance

Nil

Observations

<p><u>Follow-up Observation(s)</u></p> <ol style="list-style-type: none"> 1. Exposed stockpiles of dusty materials found at NB46 were covered by impervious sheeting. (Closed) 2. Surface runoff of muddy water observed at NB46 was removed. (Closed) 3. Dusty public access road observed at SA325 was sprayed with water. (Closed) <p><u>New Observation(s)</u></p> <ol style="list-style-type: none"> 4. Water sprayed for breaking operation was observed inadequate at SA340. The Contractor should spray the surface with water to prevent windblown dust emission. 5. Stagnant water was found at SA340. The Contractor should remove the water or apply larvicidal oil to prevent mosquito breeding. 6. Construction wastes were found near existing vegetation at SA340. The Contractor should remove the construction wastes regularly to keep the site clean and tidy. <p><u>Reminder (s)</u></p> <p>Nil.</p>

Remarks

Nil

	Name	Signature	Date
Prepared by	Sammi Lam		28 December 2016
Checked by	Y W Fung	/	28 December 2016

**APPENDIX L
STATISTICS ON COMPLAINTS,
NOTIFICATION OF SUMMONS AND
SUCCESSFUL PROSECUTIONS**

Appendix L

Statistics on Complaints, Notifications of Summons and Successful Prosecutions

	Date Received	Subject	Status	Total no. followed up by the ET this month	Total no. followed up by the ET since project commencement
Environmental complaints	19 December 2013	EPD referred a complaint from Lot no. 116 of Fui Sha Wai at Tai Hang of Tai Po which is concerned about the construction noise and diesel-like smell generated from construction activities nearby which caused nuisance and health problems on 19 December 2013 morning.	Closed	0	5
	24 February 2014	EPD referred an air-and-odour complaint on 24 February 2014. The complainant complained about the construction site located near the bus stop in Fui Sha Wai, Tai Hang, Tai Wo Service Road West. When construction works were carried out, odour, white smoke and dust were generated. The complainant asked for follow-up actions.	Closed		

Date Received	Subject	Status	Total no. followed up by the ET this month	Total no. followed up by the ET since project commencement
23 October 2014	<p>EPD referred an air complaint on 24 October 2014.</p> <p>A resident complained against the excavation works of Tai Wo Service Road West between Nam Wah Po & Tai Hang Tsuen, which have piled up high stockpiles, causing serious dust nuisance to his house.</p> <p>The resident also complained that the stockpiles have not been covered and watered properly. He now requires the EPD to follow up.</p> <p>The location of complaint is near Lamppost Location EB5717.</p>	Closed		
31 December 2014	<p>EPD referred a water complaint on 31 December 2014.</p> <p>The complainant complained about the muddy river outside Tai Hang Village Office on 29 December 2014. It was suspected that the muddy water was discharged from the construction works of the Project.</p> <p>He required the EPD to follow up.</p>	Closed		

	Date Received	Subject	Status	Total no. followed up by the ET this month	Total no. followed up by the ET since project commencement
	25 March 2015	<p>EPD referred a water complaint on 25 March 2015.</p> <p>The complainant complained about the generation of the smell of gasoline from the Widening of Fanling Highway construction site on Tai Wo Service Road West, causing serious nuisance to nearby houses.</p> <p>The situation has continued for a few weeks and she asked the EPD to follow up as soon as possible.</p>	Closed		
Notification of summons	-	-	-	0	0
Successful Prosecutions	-	-	-	0	0