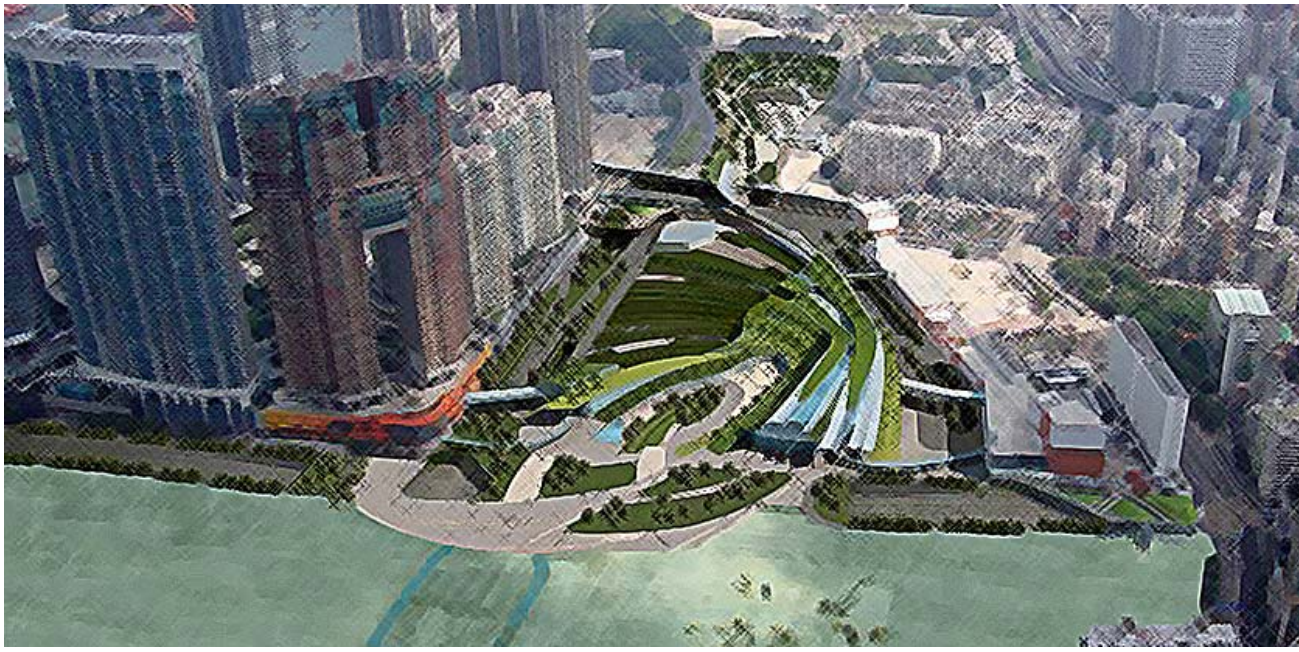
Hong Kong Section of Guangzhou-Shenzhen-Hong Kong Express Rail Link



Environmental Monitoring and Audit Report

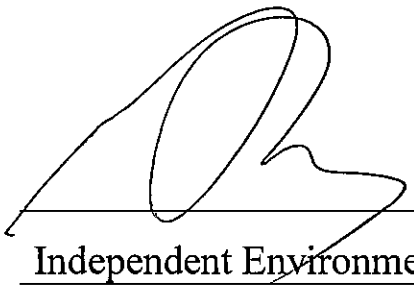
March 2017

MTR Corporation Limited

HONG KONG SECTION OF GUANGZHOU – SHENZHEN – HONG KONG EXPRESS RAIL LINK

(Environmental Permit No. EP-349/2009/L)

Environmental Monitoring and Audit Report No. 85 (March 2017)

Verified by: 

Position: Independent Environmental Checker

Date: 12 April 2017

MTR Corporation Limited

HONG KONG SECTION OF GUANGZHOU – SHENZHEN – HONG KONG EXPRESS RAIL LINK

(Environmental Permit No. EP-349/2009/L)

Environmental Monitoring and Audit Report No. 85 (March 2017)

Certified by: 

Position: Environmental Team Leader

Date: 12 APR 2017

EXECUTIVE SUMMARY

This is the 85th monthly Environmental Monitoring and Audit (EM&A) Report presenting the EM&A works undertaken during the period from 1 to 31 March 2017 for the Hong Kong Section of Guangzhou - Shenzhen - Hong Kong Express Rail Link (hereinafter referred to "the XRL" or "the Project") in accordance with the EM&A Manual and the requirement under EP-349/2009/L issued on 2 July 2014.

Air Quality

Air quality monitoring was conducted for 24-hour Total Suspended Particulates (TSP) at 17 air quality monitoring locations in the vicinity of Works Area in Mai Po (Works Area A), Ngau Tam Mei (Works Area B), Tai Kong Po (Works Area C), Shek Kong (Works Area D), Tse Uk Tsuen, (Works Area E), Pat Heung (Works Area F), Shing Mun (Works Area G), Shek Yam (Works Area H), Kwai Chung (Works Area J), Mei Foo (Works Area L), Nam Cheong (Works Area P and Q) and West Kowloon (Works Area V1 and V2) in the reporting month.

Please refer to the section "Environmental Complaints/Exceedance/Non-compliance/ Summons and Prosecution" below for the exceedance in air quality in the reporting month.

Airborne Noise

Airborne noise was measured in terms of $L_{eq(30min)}$ dB(A) with L_{10} and L_{90} measurements as reference at 29 noise monitoring locations in the vicinity of Works Area in Mai Po (Works Area A), Ngau Tam Mei (Works Area B), Tai Kong Po (Works Area C), Shek Kong (Works Area D), Tse Uk Tsuen (Works Area E), Pat Heung (Works Area F), Shing Mun (Works Area G), Shek Yam (Works Area H), Kwai Chung, (Works Area J and K), Mei Foo (Works Area L), Nam Cheong (Works Area M, P, Q, S and T) and West Kowloon (Works Area V1 and V2) once every week.

Please refer to the section "Environmental Complaints/Exceedance/Non-compliance/ Summons and Prosecution" below for the noise exceedance in the reporting month.

Ground-borne Noise

No ground-borne noise measurement was required during the reporting month, as all TBM tunnelling work has been completed.

Monitoring of Avifaunal Species

Monthly ecological monitoring was conducted during the construction of Mai Po Ventilation Building Works Area (MPV), access road to Tai Kong Po Works Area (TPP-1/2/3), Shek Kong Stabling Sidings (SSS-1/2a/2b/3), Pat Heung Ventilation Building Works Area (PHV-1) and Tse Uk Tsuen (TUW-1/2). Survey results in the reporting month were compared to dry season baseline results from November 2009 to January 2010. The total number of bird species were within the baseline range at most Survey Sites, except those record at TPP-2, SSS-1 and SSS-2b Survey Sites were slightly above the baseline range. Bird abundance recorded at most of the Survey Sites were within the baseline range except MPV-1, SSS-2a and TUW-1. For MPV-1 and SSS-2a, the bird abundance recorded were above the baseline range, while that at TUW-1 was below the baseline range. Considering that both the number of species at point count locations and the total number of bird species recorded at TUW-1 were within the baseline range, and there were no project related or non-related works in the surrounding, the drop in abundance of birds at TUW-1 Survey Site was likely due to natural fluctuation. The number of bird species recorded at Point Count Locations at Survey Sites MPV-1 and SSS-3 were below the baseline range, however, the total number of bird species at both sites were still within the baseline range. Therefore, the slight drop in the number of species at Point Count Locations of MPV-1 and SSS-3 Survey Sites were likely due to natural fluctuation. No adverse indirect impacts arising from the Project were identified. A number of Barn Swallow was recorded at MPV-1 and TPP2 Survey Sites and a few summer visitors such as Plaintive Cuckoo and Large Hawk Cuckoo were recorded at TUW-2 and PHV-1 Survey Sites, indicating a seasonal shift in bird species composition due to approach of the wet season.

Monitoring of Impact at Fishpond due to Noise

In accordance with the Monitoring and Emergency Response Plan, impact noise monitoring was conducted at fish pond on weekly basis for assessment of impact at fishponds due to noise. It was revealed from the monitoring results that all monitoring results were within the Limit Level. Based on the monitoring results, there was no adverse impact at fishpond due to noise.

Landscape and Visual

Regular inspections and audits conducted by certified Arborist found that the tree protection works being carried out by the civil works and transplanting contractors were in accordance with the requirements of EP and EIA.

Environmental Audits

In this reporting month, regular site inspections attended by representative from MTRCL and Contractors were carried out at 810A/B and 811B in West Kowloon, 822 in Pat Heung and Shing Mun, 8217 in Shek Yam, 823A/B in Shek Kong Stabling Sidings, 824 in Tai Kong Po and Ngau Tam Mei, 825 in Mai Po. In addition to the regular site inspections, IEC environmental audits attended by IEC, MTRCL and Contractors were held on monthly basis. Issues observed during these audits are detailed in Section 6.

Environmental Complaints / Exceedance / Non-compliance / Summons and Prosecution

For the reporting month, five environmental complaints were referred from EPD. Three environmental complaints were related to noise nuisance from construction site at Ching Yau Road received on 16 and 17 March 2017, and two dust complaints for works area at Nam Cheong Barging Point (NCBP) received on 27 March 2017. Details of complaints were contained in Section 7.

In the reporting month, one 24-hour TSP Action Level exceedance was recorded at Kong Tai Road Village House (AM3) on 25 March 2017. Details of investigation can be referred to Section 5.1.

No exceedance of air-borne noise Action Level and Limit Level was recorded.

No ground-borne noise measurement was required during the reporting month, as all TBM tunnelling work has been completed.

No notification of summons, non-compliance and prosecution was received during the reporting period.

Works for Coming Month

Construction works were started in Works Areas A, B, C, D, D1, E, F, G, H, I, J, K, L, M, P, Q, S, T, U, V1, V2, W, Y, Z, AA, AC, AG, MWS, YY and ARW. Construction works in Works Areas I, J, N, O, R and AE were completed.

Please refer to Table 8-1 for the major works in the respective works areas. Impact monitoring would be continued in coming reporting month accordingly with reference to the EM&A Manual.

Further Environmental Key Issues

Air quality, airborne noise at NSRs and fishpond, ecological, landscape and visual monitoring shall continue in the following month. Considering the nature of construction activities, key environmental issues in the coming months include the followings:

- Disposal of C&D waste;
- Dust generation from site activities;
- Noise impact from operating equipment;
- Site water discharge;
- Chemical wastes;
- Ecological impact;
- Trees protection.

Reporting Changes

In the reporting period, there was no reporting change.

Table of Contents

EXECUTIVE SUMMARY **1**
1 INTRODUCTION **6**
2 PROEJCT INFORMATION **7**
3 ENVIRONMENTAL STATUS **11**
4 SUMMARY OF EM&A REQUIREMENT **15**
5 MONITORING RESULT **27**
6 SITE INSPECTION **50**
7 NON-COMPLIANCE AND DEFICIENCY **53**
8 FUTURE KEY ISSUES **55**
9 CONCLUSIONS **60**

Appendix

Appendix A Works Area
Appendix B Project Management Organization and Contacts of Key Personnel
Appendix C Implementation Status
Appendix D Monitoring Locations
Appendix E Monitoring Schedule
Appendix F Graphical Plots of Monitoring Results
Appendix G Bird Species and Abundance Recorded during Avifauna Survey
Appendix H Representative Photographs of the Avifauna Monitoring
Appendix I Certified Arborist Inspection Record
Appendix J Meteorological Data
Appendix K Calibration Certificates

1 INTRODUCTION

1.1 Project Background

Further to the Government's decision made in April 2008, MTR Corporation (MTR) commenced to plan and design the Hong Kong Section of Guangzhou - Shenzhen - Hong Kong Express Rail Link (hereinafter referred to "the XRL" or "the Project"), which is a committed cross boundary transport infrastructure project.

The XRL would provide high speed rail services between Hong Kong and Guangzhou, and a connection to the national high-speed passenger rail network serving major mainland cities outside of Guangdong province. The Hong Kong section of the XRL is about 26km from new terminus located in West Kowloon (i.e. West Kowloon Terminus (WKT)) to the boundary at Huang gang. Along the railway corridor, there would be a total of eight ventilation buildings/ emergency access point (EAP), stabling sidings and a maintenance facility at Shek Kong Stabling Sidings (SSS) and an Emergency Rescue Station (ERS) next to SSS serving the operation of the XRL.

1.2 Coverage

This is the 85th monthly Environmental Monitoring and Audit (EM&A) Report presenting the EM&A works undertaken during the period from 1 to 31 March 2017 for XRL in accordance with the EM&A Manual and the requirement under Environmental Permit No. EP-349/2009/L, which was issued on 2 July 2014.

2 PROEJCT INFORMATION

2.1 Project Management Organisation and Management Structure

The project management organisation chart and contact of key personnel are shown in Appendix B.

2.2 Construction Activities

This report marked the 85th month of civil construction in Works Area A, B, C, D, D1, E, F, G, H, K, L, M, P, Q, S, T, U, V1, V2, W, Y, Z, AA, AC, AG, MWS, YY and ARW for March 2017. It is anticipated that the civil construction be completed in year 2018. The updated construction activity for upcoming month is provided in Section 8. Major construction activities undertaken in the reporting month is summarized in the following table.

Contract	**Works Area**	**Major Construction Activities**
Nam Cheong		
802	Q	Nil (construction works completed)
805	N,O	Nil (construction works completed)
805	S	Nil (construction works completed)
810A	Y	Material Storage Area
811B	Y	Operation of Nam Cheong Barging Point
820	M	Nil (construction works completed)
820	P	ABWF in ventilation building
820	Q	Nil (construction works completed)
820	R	Nil (construction works completed)
816D	T	Site Office
West Kowloon		
810A	V1	Slab construction; Wall construction; Erection and dismantling of falsework and formwork; Slab blinding installation; Cleaning construction joint (CJ); Rebar fixing to column and forming column drop; Temporary support and platform fabrication; Welding to cathodic protection and Architectural Builders Works and Finishes (ABWF) Finishes

Contract	**Works Area**	**Major Construction Activities**
810A	Mong Wing Street (MWS)	Material Storage Area
810A	Yick Yuen Site (YY)	Material Storage Area
810A	Austin Road West (ARW)	Material Storage Area
810A	To Wah Road (TWR)	Material Storage Area
810B	V1	Preboring, Installation/Dismantling of Strutting; Bored Piling; Sheet piling; Excavation Lateral Support (ELS) Work; Structural Works of Sea Water Intake Chamber; Bulk Excavation; Concreting; Jet Grouting; Station Structure Construction Work; Utility Diversion & Piling Works; Structural Works of Noise Mitigation Deck; Construction of Austin Road West (ARW) Underpass; Construction of Sewerage Pipeline & Manholes; Haul Road Improvement Work; Bottom Up Erection of Formwork; Overhead Track Exhaust (OTE) and Platform installation at B4; Coring/Cutting Openings; and Screen Wall Construction at B4
810B	W	Operation of Barging Facilities
810A	V2	ABWF in MKV, landscaping, road reinstatement
810A	U	Site Office

Contract	**Works Area**	**Major Construction Activities**
811B	V2	Waterproofing and backfilling to Approach Tunnel (P-way shaft); Casting of internal RC structures at B4, B3 and B2; ABWF works at B4,B3 and B2; Construct PTI Landscaped Deck columns and deck structures; PTI Landscaped Deck ABWF and E&M works; Construct PTI plant building under deck (RC and ABWF works); Construct WKP above ground building (RC and ABWF Works); Sewer/ storm pipe installation and manhole construction; Retaining wall construction along LCR S/B; Construct EAA from B2 to B1 to GF to U1F to Roof; Removal of temporary D1A(N) Road; Construction of Footbridge 14 Pier NP 10, stair and lift on PC7 and PC8; Footbridge 14 span NP9-NP10 RC works; Man Cheong Street Footbridge pile cap PC1 and PC2 – trial pits; Road works at Lin Cheung Road (LCR) southbound (S/B) and under Public Transport Interchange (PTI) landscape deck (LD); Remedial drainage works after Jordan Road Reinstatement; LCR Underpass northbound (NB) (northern section) excavation and reinforced concrete (RC) works; LCR road and drainage works; CLP cable laying and joining; and Installation of temporary portal for FB14 span NP2-NP3, NP4-NP5
Mei Foo		
810A	L	Material Storage Area
Kwai Chung		
821	J	Nil (construction works completed)
810A	J	Material Storage
Pat Heung		
822	F	Erection of site fencing on TOA
Shek Yam		
8217	H	stockpiling, backfilling
822	I	Nil (construction works completed)
822	K	Site Office
Shing Mun		
822	G	Underground drainage construction, Concrete Pavement; Backfill the openings; Manhole excavation; Maintain TTA

Contract	**Works Area**	**Major Construction Activities**
So Kwun Wat		
822	AC	Nil
Tai Shu Ha Road West Magazine Site		
-	AE	Nil (land returned to the Government)
Tsing Chau Tsai		
810A	AG	Material Storage
Shek Kong Stabling Sidings		
823A& 823B	D and D1	Superstructure works for buildings, road and other associated facilities, landscaping and river habitat restoration works
Tse Uk Tsuen		
823A	E	Reinstatement
Rambler Channel Barging Point		
-	Z	Nil (construction works completed)
Ngau Tam Mei		
824	B	Architectural Builders Works and Finishes (ABWF) works for ventilation building. Drainage and road construction. Backfilling
Tai Kong Po		
824	C	EAP remaining works, wall painting. External works. Tunnel cleaning works/defects rectification. EVA road works.
Mai Po		
825	A	Construction of carpark, road and drainage. Backfilling. Surcharge removal.
826	A	Repairing works
Siu Lam Barging Point		
810A	AA	Material Storage
To Kau Wan Works Area		
823B	-	Nil

Table 2-1 Major construction activities in the reporting month

3 ENVIRONMENTAL STATUS

3.1 Status of Implementation of mitigation measures

Environmental mitigation measures recommended in the EIA report were implemented and their implementation statuses are summarized in Appendix C.

3.2 Status of Submissions under EP

A summary of the submissions submitted under the EP for this Project during the reporting month is presented in Table 3-1 below:

EP-349/2009/L Clause No.	Document Title
2.46	Monthly EM&A Report

Table 3-1 Summary of the status of submissions submitted under the EP in the reporting month

3.3 Status of Permit/License/Notifications

A summary of the status of permits, licences and notifications on environmental protection made, applied or approved under this Project during the previous and reporting month is presented in Table 3-2 below. The Environmental Permit No. EP-349/2009/L issued by EPD was used for the XRL project.

Item	Item Description	Application Date	Permit Status
Contract 810A (Works Area V1)			
1	Construction Noise Permit (for Nam Cheong Barging Point)	6 Feb 2017	Granted on 14 Feb 2017 Permit No. GW-RW0059-17; valid from 19 Feb 2017 to 18 Aug 2017
2	Construction Noise Permit (for main site)	27 Feb 2017	Granted on 14 Mar 2017 Permit No. GW-RE0194-17; valid from 15 Mar 2017 to 7 Sep 2017

Item	Item Description	Application Date	Permit Status
3	Construction Noise Permit (for plant/material delivery)	6 Feb 2017	Granted on 15 Feb 2017 Permit No. GW-RE0106-17, valid from 17 Feb 2017 to 16 May 2017
4	Construction Noise Permit (for concrete batching plant maintenance)	24 Nov 2016	Granted on 5 Dec 2016 Permit No. GW-RE1157-16, valid from 5 Dec 2016 to 4 Jun 2017
5	Construction Noise Permit (for To Wah Road storage area)	5 Dec 2016	Granted on 16 Dec 2016 Permit No. GW-RE1191-16, valid from 16 Dec 2016 to 15 Jun 2017
Contract 810B (Works Area V1)			
1	Construction Noise Permit (for installation works at Noise Mitigation Deck (NMD))	21 Feb 2017	Granted on 2 Mar 2017 Permit No. GW-RE0158-17, valid from 2 Mar 2017 to 14 Jul 2017
2	Construction Noise Permit (general)	5 Sep 2016	Granted on 19 Sep 2016 Permit No. GW-RE0911-16, valid from 11 Oct 2016 to 10 Apr 2017
3	Construction Noise Permit (for roadwork)	3 Feb 2017	Granted on 16 Feb 2017 Permit No. GW-RE0099-17, valid 19 Feb 2017 to 19 Mar 2017
4	Construction Noise Permit (for site office maintenance)	5 Sep 2016	Granted on 13 Sep 2016 Permit No. GW-RE0918-16, valid from 18 Sep 2016 to 17 Mar 2017
Contract 810B (Works Area W)			
1	No update in the reporting period		
Contract 811B (Works Area V2 & Y)			

Item	Item Description	Application Date	Permit Status
1	Construction Noise Permit (for main site and combined area)	17 Feb 2017	Granted on 3 Mar 2017 Permit No. GW-RE0173-17, valid from 7 Mar 2017 to 6 Sep 2017
2	Construction Noise Permit (for barging point)	22 Aug 2016	Granted on 5 Sep 2016 Permit No. GW-RW0517-16, valid from 10 Sep 2016 to 9 Mar 2017
3	Construction Noise Permit (for plant moving in/out at site gate)	10 Nov 2016	Granted on 24 Nov 2016 Permit No. GW-RE1124-16; valid from 25 Nov 2016 to 24 May 2017
4	Construction Noise Permit (for flip Lin Cheung Road (N/B) Stage 4A)	10 Jan 2017	Granted on 10 Mar 2017 Permit No. GW-RE0202-17; valid from 26 Mar 2017 to 29 Apr 2017
Contract 820 (Works Area M, P, Q)			
	N/A		
Contract 822 (Works Area F, G, H, K and AC)			
1.	**Works Area G** Construction Noise Permit at Shing Mun Works Area	11 November 2016	Licence No. GW-RW0674-16, valid from 28 November 2016 to 24 May 2017
Contract 8217 (Works Area H)			
1	Construction Noise Permit	13 January 2017	Permit No. GW-RW0028-17 obtained. Valid until 31 July 2017
Contract 823A (Works Areas D, D1 and E)			
	No update in the reporting month.		
Contract 823B (Works Area D, Z and To Kau Wan Works Area)			
	No update in the reporting month.		

Item	Item Description	Application Date	Permit Status
Contract 824 (Works Area B and C)			
1	Construction Noise Permit at Tai Kong Po Works Area	10 August 2016	Permit No. GW-RN0039-16 obtained. Valid until 31 August 2017
2	Construction Noise Permit at Ngau Tam Mei Works Area	20 December 2016	Permit No. GW-RN0019-17 obtained. Valid until 25 July 2017
Contract 825 (Works Area A)			
1	Construction Noise Permit	7 December 2016	Permit No. GW-RN0940-16 obtained. Valid until 13 June 2017
2	Construction Noise Permit	7 December 2016	Permit No. GW-RN0941-16 obtained. Valid until 13 June 2017
Contract 826			
1	Construction Noise Permit	11 November 2016	Permit No. GW-RN0874-16 obtained. Valid until 31 May 2017

Table 3-2 Summary of the status of permits, licences and notifications made, applied and approved under this Project during the previous and reporting month

4 SUMMARY OF EM&A REQUIREMENT

4.1 Air Quality

4.1.1 Air Quality Parameters

In accordance to the EM&A Manual, 24-hour Total Suspended Particulates (TSP) levels were measured at the 17 air monitoring locations in accordance with the EM&A Manual. Monitoring was undertaken at each monitoring location once per every 6 days. Information such as date of monitoring, duration, weather condition, equipment used and monitoring results shall be recorded on the field data sheet developed for the Project. Monitoring results are summarized in Section 5.

4.1.2 Monitoring Methodology and Calibration

Monitoring was undertaken to establish for 24-hour Total Suspended Particulates (TSP) at 17 monitoring locations in the vicinity of the Works Area A, B, C, D, E, F, G, H, J, L, P, Q, V1 and V2. Monitoring of 24-hour TSP was carried out using a high volume sampler (HVS) according to Part 50 Chapter 1 Appendix B, Title 40 of the Code of Federal Regulations of the USEPA.

The sampling procedure follows to that described Part 50 Chapter 1 Appendix B, Title 40 of the Code of Federal Regulations of the USEPA. TSP is sampled by drawing air through a conditioned, pre-weighed filter paper inside the high volume sampler at a controlled rate. After 24-hour sampling the filter paper with retained particles shall be collected and returned to HOKLAS accredited laboratory (ALS Technichem (HK) Pty Ltd) for drying in a desiccators followed by accurate weighing. TSP levels are calculated from the ratio of the mass of particulate retained on the filter paper to the total volume of air sampled.

The flow rate of the high volume sampler with mass flow controller was calibrated using an orifice calibrator. Initial calibration (five points) was conducted upon installation and prior to commissioning. Calibration was carried out every six months. Detail of calibration is shown in Table 4-1 and 4-2 below. The samplers shall be properly maintained. Prior to dust monitoring commencing, appropriate checks shall be made to ensure that all equipment and necessary power supply are in good working condition.

High Volume Sampler (HVS)			
Monitoring Station ID	**Air Quality Monitoring Location**	**HVS Serial Number**	**Last Calibration Date**
AM 1	Mai Po San Tsuen	467	13/12/2016
AM 2	Yau Tam Mei Village House	468	13/12/2016
AM 3	Kong Tai Road Village House	510	16/11/2016
AM 4	DD110 LOT 482, Wang Toi Shan	521	22/11/2016
AM 5	Leung Uk Tsuen Squats	1276	22/11/2016
AM 6	630 Sheung Tsuen	469	18/10/2016
AM 7	Tse Uk Tsuen	1763	20/10/2016
AM 8	No. 305B, Sheung Tsuen San Tsuen Village House	527	15/12/2016
AM 9	Sau Shan House, Cheung Shan Estate	529	13/12/2016
AM 10	Yau Ma Hom Resite Village	509	20/11/2016
AM 11	Chung Shun Knitting Centre	1707	7/10/2016
AM 12	Po Leung Kuk Tong Nai Kan College	520	16/12/2016
AM 13	St. Andrew Primary School	524	16/12/2016
AM 14	Yaumati Catholic Primary School	407	03/03/2017
AM 15	Between Sorrento and The Waterfront	515	16/12/2016
AM 16	Tower 3, The Waterfront	1282	16/12/2016
AM 17	The Victoria Towers	528	16/12/2016

Table 4-1 Calibration details of HVS

Orifice Calibrator	
Serial Number	Last Date of Calibration
0438320	3 January 2017

Table 4-2 Calibration details of Orifice Calibrator

4.1.3 Monitoring Location

Air quality monitoring was carried out at the locations chosen in accordance to the EM&A Manual, the locations are as shown in Table 4-1 above and are illustrated in Appendix D. Since the major site activities which are likely to have air quality impacts have been completed at the works areas adjacent to AM5, AM8 and AM12, it is proposed to cease the monitoring at these 3 stations.

4.1.4 Action and Limit Levels

With reference to the baseline monitoring results, the Action and Limit Levels for the 24-hour TSP monitoring derived are shown in Table 4-3. In the case of exceedance of Action and/or Limit levels for air quality occur, the Event and Action Plan as stipulated the EM&A Manual shall be implemented.

Monitoring Station ID	**24-hour TSP Level in μg/m^3**	
	Action Level	**Limit Level**
AM 1	217.3	260
AM 2	179.4	260
AM 3	154.7	260
AM 4	148.6	260
AM 5	152.0	260
AM 6	145.6	260
AM 7	149.8	260

Monitoring Station ID	24-hour TSP Level in μg/m^3	
	Action Level	Limit Level
AM 8	158.1	260
AM 9	171.2	260
AM 10	174.8	260
AM 11	160.3	260
AM 12	162.5	260
AM 13	180.3	260
AM 14	158.2	260
AM 15	168.8	260
AM 16	155.9	260
AM 17	179.3	260

Table 4-3 Action and Limit Levels for Air Quality

4.2 Air-borne Noise

4.2.1 Noise Parameters

In accordance to the EM&A Manual, construction noise monitoring shall be conducted to obtain one set of 30-minute measurement at each monitoring station between 0700 and 1900 hours on normal weekdays at a frequency of once per week when construction activities are underway. The L_{eq}, L_{10} and L_{90} were also recorded at the specified interval.

4.2.2 Monitoring Methodology and Calibration

As referred to the Technical Memorandum (TM) issued under the NCO, sound level meters in compliance with the International Electrotechnical Commission Publications 651: 1979 (Type 1) and 804: 1985 (Type 1) specifications shall be used for carrying out the noise monitoring. B&K 2250 sound level meters, which complies with the above-mentioned specifications, were used for construction noise monitoring.

Before and after each series of measurements, the accuracy of the sound level meter should be checked using an acoustic calibrator generating a known sound pressure level at a known frequency. Measurements may be accepted as valid only if the difference between calibration levels obtained before and after the noise measurement is less than 1.0 dB.

The sound level meters and calibrator are verified by the certified laboratory or manufacturer at a regular interval to ensure they perform to the same level of accuracy as stated in the manufacturer's specifications. Detail of calibration is shown in Table 4-4 below and Appendix K.

Monitoring Station ID	Noise Monitoring Location	Serial Number	Last Calibration Date
Sound Level Meters			
CN 1	No. 142 Mai Po San Tsuen	N/A [3]	N/A [3]
CN 2	Mai Po San Tsuen Village House	2701826	07/03/2017
CN 3	Yau Tam Mei Village House	2709426	08/03/2017
CN 4	Yau Tam Mei Village House	2718887	08/03/2017
CN 5	Kong Tai Road Village House	2718895	20/05/2015
CN 6	Kong Tai Road Village House	2718879	17/06/2015
CN 7	372 Tai Kong Po Tsuen	2718881	20/05/2015
CN 8	DD110 LOT 482, Wang Toi Shan	2718882	28/05/2015
CN 9	Leung Uk Tsuen Village House	2718889	20/05/2015
CN 10	DD110 LOT 482, Wang Toi Shan	2718891	17/06/2015
CN 11	182B, Wang Toi Shan San Tsuen	2718884	15/07/2015
CN 12	DD108, Nam Hing Lei, Wing Hing Wai	2829334	08/08/2015
CN 13	Tse Uk Tsuen	2718883	11/06/2015
CN 14	Tse Uk Tsuen	2718890	11/06/2015
CN 15	No. 305B - Sheung Tsuen San Tsuen Village House	2718885	11/06/2015

Monitoring Station ID	Noise Monitoring Location	Serial Number	Last Calibration Date
CN 16	DD 114 LOT 1405 Sheung Tsuen	2701819	18/01/2017
CN 18	Sau Shan House	2701831	03/01/2017
CN 19	Sun Fung Centre	2701824	03/04/2015
CN 20	VTC Kwai Chung Training Centre Complex	2718894	11/06/2015
CN 21	Po Leung Kuk Tong Nai Kan College	2701820	22/03/2017
CN 22	Block I, Lai Chi Kok Reception Centre	2709427	28/03/2017
CN 23	HKIVE Haking Wong Waterfront Annex	N/A [5]	N/A [5]
CN 24	St. Andrew Primary School	2701825	18/02/2017
CN 25	St. Mary's Church Mok Hing Yiu College	2709428	03/04/2015
CN 26	Ying Wah College	2701822	07/03/2017
CN 27	Cheong Shun House, Nam Cheong Estate	N/A [6]	N/A [6]
CN 28	Tower 6, Harbour Green	3000103	18/01/2017
CN 29	Yaumati Catholic Primary School	2701815	03/01/2017
CN 30	Man Cheong Street Refuse Collection Point	2701816	21/01/2017
CN 31	Tower 6, Sorrento	N/A [4]	N/A [4]
CN 32	Tower 3, The Waterfront	2701823	06/03/2017
CN 33	Star Tower, The Arch	2701827	18/02/2017
CN 34	The Victoria Towers	2701829	18/01/2017
Calibrator			
Serial Number		**Last Calibration Date**	
N674902		23/03/2016	

Table 4-4 Calibration details of noise monitoring equipments

Note:

1. Due to school closure, monitoring at Tsuen Wan Lutheran School (CN 17) was temporarily suspended. Monitoring would be carried out subject to confirmation of noise sensitive use of the building.

2. A correction factor (9 dB(A)) has been applied at CN19 to take into account the noise barrier effect. The correction factor was agreed with IEC according to Section 3.11 of the EM&A Manual.

3. Impact monitoring at No. 142 Mai Po San Tsuen (CN1) had been temporarily suspended since December 2012 due to house removal. Monitoring at this location will be resumed when an alternative location is determined. Therefore, the sound level meter for CN1 is not calibrated until monitoring is resumed.

4. Impact monitoring at Tower 6, Sorrento (CN31) has been temporarily suspended from end of August 2014 due to the objection from the OC of Sorrento has been received in early August 2014. Monitoring at this location would be resumed when an alternative location is determined.

5. Due to completion of all works at CN23, monitoring at HKIVE Haking Wong Waterfront Annex (CN 23) has been suspended from March 2015.

6. Due to completion of works in the vicinity at CN27, monitoring at Nam Cheong Estate (CN 27) has been suspended from September 2015.

4.2.3 Monitoring Location

According to the EM&A Manual, noise monitoring was carried out at the locations as shown in Table 4-4 above. The monitoring locations are illustrated in Appendix D. Since the major site activities which are likely to have air-borne noise impacts have been completed at the works areas adjacent to CN10, CN11, CN15, CN16, CN22, CN25, CN26 and CN29, particularly some of the works areas have been handed over to Government, it is proposed to cease the monitoring at these 8 stations.

4.2.4 Action and Limit Levels

The Action and Limit Levels for the construction noise are shown in Table 4-5 below. In the case of non-compliance of Action and/or Limit level, the Event and Action Plan stipulated in the EM&A Manual shall be implemented.

Time Period	Action	Limit
0700-1900 hours on normal weekdays	When one documented complaint is received	75 dB(A) for residential premises
		70 dB(A) for school and 65 dB(A) during examination period

Table 4-5 Action and Limit Levels for Airborne Construction Noise

4.3 Ground-borne Noise

No ground-borne noise measurement was required during the reporting month, as all TBM tunnelling work has been completed.

4.4 Ecological Monitoring

4.4.1 Ecological Monitoring on Avifaunal Communities

Monitoring methodology

In accordance with the Ecological Monitoring Plan, avifaunal communities would be surveyed quantitatively by transect count or/and point count method covering the vicinity of the works area as shown in Table 4-6 below. Birds heard or seen within the survey area would be identified to species level and counted. The nature of construction works within works area conducting during each impact monitoring would also be recorded. Weather condition and other noticeable activities occurring within or in the vicinity of the survey areas would be recorded. The impact monitoring results would be compared to the baseline data collected before construction. Should any unpredicted indirect ecological impacts arising from the Project be detected, remedial measures would be implemented by the Contractor.

Monitoring location, frequency and duration

In accordance with the EM&A Manual and Ecological Monitoring Plan, ecological monitoring should be conducted at Works Area in MPV, TPP, SSS/ERS, TUW and PHV. The location, frequency and duration of ecological monitoring at MPV, TPP, SSS/ERS, TUW and PHV are shown in the table below and figures in Appendix D.

Works Area	**Survey Site**	**Monitoring Location**	**Monitoring Frequency**	**Monitoring Duration**
Mai Po Ventilation Building Works Area (MPV)	MPV-1	• Fishponds in Wetland Conservation Area (WCA) within 500 m from the boundary of MPV works area	Monthly	• During construction phase of MPV works area

Works Area	Survey Site	Monitoring Location	Monitoring Frequency	Monitoring Duration
Access road leading to TPP	TPP-1/2/3	• The whole alignment of drainage channel KT5 (TPP-1) • The section of drainage channel 95CD along the proposed alignment of access upgrading (TPP-2) • The whole alignment of abandoned meander of conservation interest 43CD-1 (TPP-3)	Monthly	• During upgrading and operation of access road for construction phase activities
Access road leading to SSS / ERS	SSS-1	• The section of drainage channel 95CD along the proposed alignment of access upgrading	Monthly	• During upgrading of and operation access road for construction phase activities
	SSS-2a and SSS-2b	• The whole alignment of abandoned meanders of conservation interest 95CD-4 and 95CD-5	Monthly	• During upgrading and operation of access road for construction phase activities
	SSS-3	• Agricultural land within 500 m from the boundary of SSS/ ERS works area between Shek Kong Road and Kam Sheung Road	Monthly	• During construction phase of SSS / ERS works area

Works Area	Survey Site	Monitoring Location	Monitoring Frequency	Monitoring Duration
Tse Uk Tsuen Works Area (TUW)	TUW – 1/2 (TUW-2 grouped with PHV-1 due to overlapping of survey area)	• Agricultural land within 500 m from the boundary of TUW works area to the south of Kam Sheung Road (TUW-1) • Woodland in Conservation Area (CA) within 500 m from the boundary of TUW works area (TUW-2)	Monthly	• During construction phase of TUW works area
Pat Heung Ventilation Building Works Area (PHV)	PHV-1 (grouped with TUW-2 due to overlapping of survey area)	• Woodland in CA within 500m from the boundary of PHV works area	Monthly	• During construction phase of PHV works area

Table 4-6 Requirement of Construction Impact Monitoring for Avifaunal Group

4.4.2 Monitoring of impact at fishpond due to noise/vibrations

In accordance with the Monitoring and Emergency Response Plan, during construction stage, air-borne noise monitoring should be carried out at the respective monitoring location at nearby fishpond (Appendix D) when there are project-related construction activities being undertaken within a radius of 300m from the monitoring location. One set of 30-minute measurement at a frequency of once a week when the above-mentioned construction activities are underway.

Monitoring methodology

With reference to the Monitoring and Emergency Response Plan, the noise acceptance criteria of 75 dB(A) was adopted for the assessment of adverse impact to fisheries due to air-borne noise.

Monitoring location, frequency and duration

The nearest fish-pond located in the vicinity of the works area in Mai Po as shown in Appendix D was identified as a representative air-borne and ground-borne noise/vibration monitoring location.

During construction stage, routine air-borne noise monitoring would be carried out at the respective monitoring location when there are project-related construction activities being undertaken within a radius of 300m from the monitoring station. One set of 30-minute measurement at a frequency of once a week when the above-mentioned construction activities are underway.

Action and Limit Levels

The Action and Limit levels for air-borne noise are defined in the table below. Should non-compliance of the noise quality criteria occur, actions in accordance with the Table 4-7 as should be carried out.

Time Period	Action Level	Limit Level
All time period	When one documented complaint related to adverse impact to fisheries from fish-pond operator or any abnormal ecological monitoring results	75 dB(A) for air-borne noise

Table 4-7: Action and Limit Level for potential impact at fishpond due to air-borne noise

4.5 Landscape and Visual

Monitoring of the implementation of the tree protection measures during construction phase was conducted in accordance with the requirements of EP condition 2.15 (iv). The landscape and visual monitoring and auditing was conducted in accordance with the requirement in Section 5.6 of the EM&A Manual throughout the construction stage.

4.6 Cultural Heritage

4.6.1 Archaeology

Further archaeological investigation was completed at Shek Kong Stabling Sidings (SSS) in accordance with the Archaeological Action Plan.

No monitoring and reporting is required at Lung Kwu Sheng Tan (LKST) since the land has been handed over to government.

4.6.2 Built Heritage

Vibration monitoring was ceased since no more construction works was carried out within the 100m buffer area.

4.7 Landfill Gas

Monitoring was carried out in this reporting month for construction within the Ngau Tam Mei Landfill (NTML) consultation zone. No monitoring was carried out at Gin Drinker Bays Landfill (GDBL) since there was no construction carried out within consultation zone.

5 MONITORING RESULT

5.1 Air Quality

The monitoring schedule is shown in Appendix E. Results of 24-hour TSP level and the graphical presentation of monitoring results are shown in Appendix F.

In the reporting month, one exceedance of 24-hour TSP Action Level was recorded at Kong Tai Road Village House (AM3) on 25 March 2017.

For the TSP Action Level exceedance at Kong Tai Road Village House (AM3) on 25 March 2017, actions identified in the Event and Action Plan (Table 3.4 of the EM&A Manual) were undertaken. The ER, IEC and Contractors were informed of the exceedance. According to the investigation, some ground breaking works was noticed on the monitoring day. Dust suppression measures such as water spraying and use of sprinklers were implemented. The Contractor was reminded to strengthen the dust suppression measures. Repeated measurement on 29 March 2017 still exceeded the Action level. However, the second repeated measurement on 30 March 2017 showed no further exceedance.

5.2 Noise

The monitoring schedule is shown in Appendix E. Results of measured noise level, in terms of L_{eq}(30min) and graphical presentations are presented in Appendix F.

5.2.1 Air-borne Noise

In the reporting month, no exceedance of air-borne noise Action Level and Limit Level was recorded.

5.2.2 Ground-borne Noise

Ground-borne noise monitoring is not required in the reporting month, as all TBM tunnelling work has been completed.

5.3 Ecological Monitoring

5.3.1 Ecological Monitoring on Avifaunal Communities

Ecological monitoring at MPV

The weather conditions and other noticeable activities occurring within or in the vicinity of the survey area during the monitoring were summarized in Table 5-1. The MPV-1 survey site comprised about 20 fishponds with most of them being actively managed (Figure 1 in Appendix D refers). Commonly observed pond management activities during the monitoring include pond aeration, removal of bund weeds and fish feeding. Ongoing construction activities were also recorded at the works area of the project "Proposed Comprehensive Development at Wo Shang Wai, Yuen Long" (hereinafter to be referred to as "Wo Shang Wai Project") located near Point Count Location MPV-1/P9. The bird species and their abundance recorded during the avifauna monitoring for the reporting month are presented in Appendix G.

Date	**Weather Conditions**	**Noticeable Activities Observed in the vicinity of MPV-1 Survey Site**
17 March 2017	Overcast	• Overhead nets were observed at Point Count Location MPV-1/P2 (Plate 4, Appendix H refers) • Drained pond at Point Count Location MPV-1/P6 • Overhead wires were observed at Point Count Locations MPV-1/P8 and MPV-1/P 9

Table 5-1 Weather condition and noticeable activities observed in the MPV-1 survey site during monitoring in the reporting month

A total of 367 individuals from 31 avifauna species were recorded from the Point Count Locations at MPV-1 in the reporting month (Table 5-2 refers). The total number of species recorded during the monitoring was 41, with Barn Swallow being the dominant species among the recorded avifaunal population. Recorded waterbirds and wetland-dependent species included Little Grebe, ardeids, Black-faced Spoonbill, Great Cormorant, Tufted Duck, Black Kite, White-breasted Waterhen, Common Moorhen, sandpipers, kingfishers and Red-billed Starling. Migrant and winter visitor species such as Great Cormorant, Grey Heron, Tufted Duck, Olive-backed Pipit, Common Stonechat etc. were recorded. Spring migrant species Barn Swallow was recorded during the survey, indicating a shift in seasonality. Detailed records of avifauna at MPV-1 survey site are presented in Appendix G. Photos of bird species of conservation importance are presented in Appendix H (Plates 1 to 3).

The monitoring results of the reporting month were compared against the dry season results of the baseline data from November 2009 to January 2010. The abundance of

birds was above the baseline range, while the number of bird species at Point Count Locations was below the baseline range. The drop in number of species was likely due to natural fluctuation, as the total number of bird species recorded (including the number of species of conservation importance) at MPV-1 Survey Site were within the baseline range. (Table 5-2 and Table 5-3 refer).

The monitoring results indicated the fishponds within the survey area were utilized by waterbird and wetland-dependent species in the reporting month during the monitoring. No adverse indirect impacts arising from the project were identified.

Survey	MPV-1	
	No. of Species	Abundance
17 March 2017	31	367
November 2009 to January 2010 [1]	37 – 39	259 – 335

Note:

1. Seasonal range obtained from baseline bird survey.

Table 5-2 Number of species and abundance of avifauna recorded in the reporting month during bird survey at the point count locations of the MPV-1 survey site

Month	Total Number of Species Recorded [1,2]
17 March 2017	41 (10)
November 2009 to January 2010 [3]	38 – 46 (7 – 14)

Note:

1. Total number of species recorded included the avifauna recorded from both point count locations and walk transect.

2. The numbers in brackets denote the number of species of conservation interest.

3. Seasonal range obtained from baseline bird survey.

Table 5-3 Total Number of Bird Species Recorded in the Reporting Month Avifauna Monitoring at the MPV-1 survey site

Ecological monitoring at Tai Kong Po (TPP-1)

The avifauna monitoring location for the proposed works area of the TPP access road was sub-divided into three survey sites namely TPP-1, TPP-2 and TPP-3. The TPP-1 survey site is a drainage channel (KT5) with gabion / masonry banks at upper portion. The rest of the channel is trapezoidal with vegetated grasscrete banks on both sides of the channel. The downstream end of the channel joins up with a main drainage channel (95CD) (Figure 3 in Appendix D refers).

The weather condition and other noticeable activities occurring within or in the vicinity of the survey area during the monitoring are summarized in Table 5-4. The bird species and their abundance recorded during the avifauna monitoring for the reporting month are presented in Appendix G.

Date of Monitoring	Weather Condition	Noticeable Activities Observed in the vicinity of TPP-1 Survey Site
17 March 2017	Overcast	• Project-related minor road works were observed at Point Count Locations TPP-1/P3 (Plate 7, Appendix H refers).

Table 5-4 Weather Condition and Noticeable Activities Observed in the TPP-1 Survey Site during the Monitoring in the Reporting Month

A total of 235 individuals from 29 avifauna species were recorded from the Point Count Locations at TPP-1 in the reporting month (Table 5-5 refers). The total number of species recorded at the survey site during the monitoring was 30. Chinese Bulbul was the dominant species recorded. Wetland-dependent species and waterbirds recorded during the survey include ardeids, White-breasted Waterhen, Common Moorhen, Common Snipe, plovers and sandpipers. Migrant and winter species recorded included Wood Sandpiper, Yellow Wagtail, Red-throated Pipit, etc. were recorded. Spring migrant species Barn Swallow was also recorded during the survey, indicating a shift in seasonality. Detailed records of avifauna at TPP-1 are presented in Appendix G. Photos of bird species of conservation importance are presented in Appendix H (Plate 5-6).

The monitoring results in the reporting month were compared against the dry season results of the baseline data from November 2009 to January 2010. The number of species recorded at Point Count Locations, abundance of birds and the total number of bird species recorded (including the number of species of conservation importance) at TPP-1 Survey Site were within the baseline range (Table 5-5 and Table 5-6 refer).

The monitoring results indicated the drainage channel within the survey site was mainly utilized by generalists and waterbirds during the monitoring. No adverse impacts arising from the Project were identified.

Survey Period	TPP-1 Survey Site[2]	
	No. of Bird Species	Abundance of Bird Species
17 March 2017	29	235
November 2009 to January 2010 [1]	24 – 31	228 – 476

Note:

1. Seasonal range obtained from baseline bird survey.

2. The view to drainage channel KT5 between Point Count Locations TPP-1/P2 and TPP-1/P4 was partially blocked, the abundances counted at these Point Count Locations could not fully reflect the actual on-site condition.

Table 5-5 Number of Bird Species and Abundance of Bird Species Recorded in the Reporting Month Avifauna Monitoring at the Point Count Locations of the TPP-1 Survey Site

Survey Period	Total Number of Bird Species Recorded [1,2]
17 March 2017	30 (6)
November 2009 to January 2010 [3]	25 – 31 (6)

Note:

1. Total number of species recorded included the avifauna recorded from both point count locations and walk transect.

2. The numbers in brackets denote the number of species of conservation interest.

3. Seasonal range obtained from baseline bird survey.

Table 5-6 Total Number of Bird Species Recorded in the Reporting Month Avifauna Monitoring at the TPP-1 Survey Site

Ecological monitoring at Tai Kong Po (TPP-2)

The weather condition and other noticeable activities occurring within or in the vicinity of the survey area during the monitoring are summarized in Table 5-7. The TPP-2 survey site covered a section of main drainage channel 95CD, which is a concrete trapezoidal channel with grasscrete banks. Plantation of native or landscape vegetation was observed along the embankment of the channel (Figure 2 in Appendix D refers). The bird species and their abundance recorded during the avifauna monitoring for the reporting month are presented in Appendix G.

Date of Monitoring	Weather Condition	Noticeable Activities Observed in the vicinity of TPP-2 Survey Site
17 March 2017	Overcast	• Nil

Table 5-7 Weather Condition and Noticeable Activities Observed in the TPP-2 Survey Site during the Monitoring in the Reporting Month

A total of 56 individuals from 16 avifauna species were recorded from the Point Count Locations at TPP-2 in the reporting month (Table 5-8 refers). The total number of species recorded during the monitoring was 19, with Barn Swallow being the dominant species. Wetland-dependent and waterbird species recorded included ardeids, Little Ringed Plover and sandpipers. Detailed records of avifauna at TPP-2 are presented in Appendix G. Photos of bird species of conservation importance are presented in Appendix H (Plate 8-9).

The monitoring results in the reporting month were compared against the dry season results of the baseline data from November 2009 to January 2010. The abundance of birds was within the baseline range, while the number of species recorded at Point Count Locations and the total number of species at Survey Site (including the number of species of conservation importance) were slightly above the baseline range (Table 5-8 and Table 5-9 refer).

The monitoring results indicated the main drainage channel within the survey area was utilized by generalists and waterbird species in the reporting month during the monitoring. No adverse impacts from the Project were identified.

Survey Period	TPP-2 Survey Site	
	No. of Bird Species	Abundance of Bird Species
17 March 2017	16	56
November 2009 to January 2010 [1]	12 – 15	49 – 70

Note:

1. Seasonal range obtained from baseline bird survey.

Table 5-8 Number of Bird Species and Abundance of Bird Species Recorded in the Reporting Month. Avifauna Monitoring at the Point Count Locations of the TPP-2 Survey Site

Survey Period	Total Number of Bird Species Recorded [1,2]
17 March 2017	19 (2)
November 2009 to January 2010 [3]	16 – 18 (1)

Note:

1. Total number of species recorded included the avifauna recorded from both point count locations and walk transect.

2. The numbers in brackets denote the number of species of conservation interest.

3. Seasonal range obtained from baseline bird survey.

Table 5-9 Total Number of Bird Species Recorded in the Reporting Month Avifauna Monitoring at the TPP-2 Survey Site

Ecological monitoring at Tai Kong Po (TPP-3)

The weather condition and other noticeable activities occurring within or in the vicinity of the survey area during the monitoring are summarized in Table 5-10. The TPP-3 survey site is an abandoned meander (43CD-1) of conservation interest with natural banks and substratum. The earthen banks of the meander were mostly dominated by grasses and weeds. The section near point count location TPP-3/P1 was found to be usually wet though the water was quite stagnant. Due to its close proximity to a village access road of Kam Hing Wai and Shui Mei Tsuen, this section of meander was subject to higher disturbance from villagers and traffic. Point count locations TPP-3/P2 and TPP-3/P3 were only seasonally wet. During the monitoring in reporting month, point count locations TPP-3/P2 and TPP-3/P3 were dry. The bird species and their abundance recorded during the avifauna monitoring for the reporting month are presented in Appendix G.

Date of Monitoring	Weather Condition	Noticeable Activities Observed in the vicinity of TPP-3 Survey Site
17 March 2017	Overcast	• Nil

Table 5-10 Weather Condition and Noticeable Activities Observed in the TPP-3 Survey Site during the Monitoring in the Reporting Month

A total of 33 individuals from 13 avifauna species were recorded from the Point Count Locations at TPP-3 in the reporting month (Table 5-11 refers). The total number of species recorded during the monitoring was 13, with no apparent dominant species observed amongst the recorded individuals. No waterbird or wetland-

dependent species were recorded. Detailed records of avifauna at TPP-3 are presented in Appendix G.

The monitoring results in the reporting month were compared against the dry season results of the baseline data from November 2009 to January 2010. The number of species recorded at Point Count Locations, the abundance of birds and the total number of bird species recorded at TPP-3 Survey Site were within the baseline range, while the number of species of conservation importance was slightly below the baseline range. (Table 5-11 and Table 5-12 refer).

The monitoring results indicated the abandoned meander within the survey area was utilized mainly by typical generalist species in the reporting month during the monitoring. No adverse impacts arising from the Project were identified.

Survey Period	**TPP-3 Survey Site**	
	No. of Bird Species	**Abundance of Bird Species**
17 March 2017	13	33
November 2009 to January 2010[1]	10 – 16	22 – 70

Note:

1. Seasonal range obtained from baseline bird survey.

Table 5-11 Number of Bird Species and Abundance of Bird Species Recorded in the Reporting Month Avifauna Monitoring at the Point Count Locations of the TPP-3 Survey Site

Survey Period	**Total Number of Bird Species Recorded [1,2]**
March 2017	13 (0)
November 2009 to January 2010[3]	10 – 16 (1)

Note:

1. Total number of bird species recorded included the avifauna recorded from Point Count Locations only as there is no walk transect for TPP-3 survey site.

2. The numbers in brackets denote the number of species of conservation interest.

3. Seasonal range obtained from baseline bird survey.

Table 5-12 Total Number of Bird Species Recorded in the Reporting Month Avifauna Monitoring at the TPP-3 Survey Site

Ecological monitoring at Shek Kong Stabling Sidings (SSS-1)

The SSS-1 survey site covered a section of main drainage channel 95CD and it is contiguous to TPP-2 survey site with similar habitat condition. The weather condition and other noticeable activities occurring within or in the vicinity of the survey area during the monitoring are summarized in Table 5-13. The bird species and their abundance recorded during the avifauna monitoring for the reporting month are presented in Appendix G.

Date of Monitoring	**Weather Condition**	**Noticeable Activities Observed in the vicinity of SSS-1 Survey Site**
17 March 2017	Overcast	• Nil

Table 5-13 Weather Condition and Noticeable Activities Observed in the SSS-1 Survey Site during the Monitoring in the Reporting Month.

A total of 88 individuals from 19 avifauna species were recorded from the Point Count Locations at SSS-1 in the reporting month (Table 5-14 refers). A total of 22 species were recorded during the monitoring, with no apparent dominant species. Waterbirds and wetland-dependent species recorded included White-breasted Waterhen, Little Ringer Plover, sandpipers and Common Snipe. Detailed records of avifauna at SSS-1 are presented in Appendix G.

The monitoring results in the reporting month were compared against the dry season results of the baseline data from November 2009 to January 2010. The abundance of birds and the number species of conservation importance were within the baseline range, while the number of species recorded at Point Count Locations and the total number of species at SSS-1 Survey Site were slightly above the baseline range (Table 5-14 and Table 5-15 refer).

The monitoring results indicated the abandoned meander within the survey area was utilized by typical generalist and waterbird species in the reporting month during the monitoring. No adverse indirect impacts arising from the Project were identified.

Survey Period	**SSS-1 Survey Site**	
	No. of Bird Species	**Abundance of Bird Species**
17 March 2017	19	88
November 2009 to January 2010 [1]	16 – 18	40 – 91

Note:

1. Seasonal range obtained from baseline bird survey.

Table 5-14 Number of Bird Species and Abundance of Bird Species Recorded in the Reporting Month Avifauna Monitoring at the Point Count Locations of the SSS-1 Survey Site

Survey Period	Total Number of Bird Species Recorded [1,2]
17 March 2017	22 (1)
November 2009 to January 2010[3]	16 – 19 (1 – 2)

Note:

1. Total number of bird species recorded included the avifauna recorded from point count locations only as there is no walk transect for SSS-1 survey site.

2. The numbers in brackets denote the number of species of conservation interest.

3. Seasonal range obtained from baseline bird survey.

Table 5-15 Total Number of Bird Species Recorded in the Reporting Month Avifauna Monitoring at the SSS-1 Survey Site

Ecological monitoring at Shek Kong Stabling Sidings (SSS-2a)

The meander is adjacent to car repairing workshops and garage. Riparian vegetation was well established although some areas of the banks were lined with concrete. Coverage of water was low and water quality was appeared to be poor. The weather condition and other noticeable activities occurring within or in the vicinity of the survey area during the monitoring are summarized in Table 5-16.

Date of Monitoring	Weather Condition	Noticeable Activities Observed in the vicinity of SSS-2a Survey Site
17 March 2017	Overcast	• Nil

Table 5-16 Weather Condition and Noticeable Activities Observed in the SSS-2a Survey Site during the Monitoring in the Reporting Month.

A total of 16 individuals from 7 avifauna species were recorded from the Point Count Locations at SSS-2a in the reporting month (Table 5-17 refers). A total of 7 species were recorded during the monitoring, with no apparent dominant species. No wetland-dependent species were recorded. Detailed records of avifauna at SSS-2a are presented in Appendix G.

The monitoring results in the reporting month were compared against the dry season results of the baseline data from November 2009 to January 2010. The abundance of birds was slightly above the baseline range while the number of bird species recorded

at Point Count Locations and the total number of bird species (including the number of species of conservation importance) recorded from the SSS-2a Survey Site were within the baseline range (Table 5-17 and Table 5-18 refer).

The monitoring results indicated the abandoned meander within the survey area was utilized by typical generalist species in the reporting month during the monitoring. No adverse indirect impacts arising from the Project were identified.

Survey Period	SSS-2a Survey Site	
	No. of Bird Species	Abundance of Bird Species
17 March 2017	7	16
November 2009 to January 2010 [1]	3 – 9	10 – 14

Note:

1. Seasonal range obtained from baseline bird survey.

Table 5-17 Number of Bird Species and Abundance of Bird Species Recorded in the Reporting Month Avifauna Monitoring at the Point Count Locations of the SSS-2a Survey Site

Survey Period	Total Number of Bird Species Recorded [1,2]
17 March 2017	7 (0)
November 2009 to January 2010[3]	3 – 9 (0 – 1)

Note:

1. Total number of bird species recorded included the avifauna recorded from point count locations only as there is no walk transect for SSS-2a survey site.

2. The numbers in brackets denote the number of species of conservation interest.

3. Seasonal range obtained from baseline bird survey.

Table 5-18 Total Number of Bird Species Recorded in the Reporting Month Avifauna Monitoring at the SSS-2a Survey Site

Ecological monitoring at Shek Kong Stabling Sidings (SSS-2b)

The weather condition and other noticeable activities occurring within or in the vicinity of the survey site during the monitoring are summarized in Table 5-19. The SSS-2b survey site is a large abandoned meander (95CD-5) of conservation importance located at Shek Kong San Tsuen. Extensive riparian and emergent vegetation (e.g. *Pennisetum alopecurodies* and *Panicum* spp.) including mature trees (e.g. *Macaranga tanarius* and *Ficus hispida*) were recorded. The bird species and

their abundance recorded during the avifauna monitoring for the reporting month are presented in Appendix G.

Date of Monitoring	Weather Condition	Noticeable Activities Observed in the vicinity of SSS-2b Survey Site
17 March 2017	Overcast	• Nil

Table 5-19 Weather Condition and Noticeable Activities Observed in the SSS-2b Survey Site during the Monitoring in the Reporting Month

A total of 34 individuals from 15 avifauna species were recorded from the Point Count Locations at SSS-2b in the reporting month (Table 5-20 refers). A total of 15 avifauna species were recorded during the monitoring. Wetland-dependent and waterbird species recorded at the site during the survey included Little Egret and White-breasted Waterhen. Detailed records of avifauna at SSS-2b are presented in Appendix G.

The monitoring results in the reporting month were compared against the dry season results of the baseline data from November 2009 to January 2010. The abundance of birds and the number of species of conservation importance were within the baseline range, while the number of species recorded at Point Count Locations and the total number of species at SSS-2b Survey Site were slightly above the baseline range (Table 5-20 and Table 5-21 refer).

The monitoring results indicated the agricultural lands within the survey area were utilized by typical generalist species in the reporting month during the monitoring. No adverse indirect impacts arising from the Project were identified.

Survey Period	SSS-2b Survey Site	
	No. of Bird Species	Abundance of Bird Species
17 March 2017	15	34
November 2009 to January 2010 [1]	12 – 13	29 – 39

Note:

1. Seasonal range obtained from baseline bird survey.

Table 5-20 Number of Bird Species and Abundance of Bird Species Recorded in the Reporting Month Avifauna Monitoring at the Point Count Locations of the SSS-2b Survey Site

Survey Period	Total Number of Bird Species Recorded [1,2]
17 March 2017	15 (1)
November 2009 to January 2010[3]	12 – 13 (0 – 3)

Note:

1. Total number of species recorded included the avifauna recorded from both point count locations and walk transect.

2. The numbers in brackets denote the number of species of conservation interest.

3. Seasonal range obtained from baseline bird survey.

Table 5-21 Total Number of Bird Species Recorded in the Reporting Month Avifauna Monitoring at the SSS-2b Survey Site

Ecological monitoring at Shek Kong Stabling Sidings (SSS-3)

The weather condition and other noticeable activities occurring within or in the vicinity of the survey area during the monitoring are summarized in Table 5-22. The farmland in SSS-3 survey site displayed a distinctive seasonal crop rotation pattern between wet agriculture (such as Watercress *Nasturtium officinale*) in summer season and dry agriculture (such as seasonal flowers *Gladiolus gandavensis*) in winter season. The bird species and their abundance recorded during the avifauna monitoring for the reporting month are presented in Appendix G.

Date of Monitoring	Weather Condition	Noticeable Activities Observed in the vicinity of SSS-3 Survey Site
17 March 2017	Overcast	• Dry agricultural activities, such as the planting of Peach (*Prunus persica*), Common Banana (*Musa X paradisiaca*), Cassava (*Manihot esculenta*), Beetroot (*Beta vulgaris*), Carrot (*Daucus carota*) etc. were observed at farmland parcels at Point Count Locations SSS-3/P3, SSS-3/P4, SSS-3/P5, SSS-3/P7, SSS-3/P9 and SSS-3/P12 (Plate 10, Appendix H refers) • Wet agricultural activities, such as the planting of Watercress (*Nasturtium officinale*), were observed at farmland parcels at Point Count Location SSS-3/P12 (Plate 11, Appendix H refers) • Abandoned farmlands were observed at Point Count Location SSS-3/P1

Table 5-22 Weather Condition and Noticeable Activities Observed in the SSS-3 Survey Site during the Monitoring in the Reporting Month

A total of 213 individuals from 22 avifauna species were recorded from the Point Count Locations at SSS-3 in the reporting month (Table 5-23 refers). A total of 28 avifauna species were recorded during the monitoring, with Spotted Dove being the dominant species. Recorded waterbird species included ardeids, White-breasted Waterhen, Common Sandpiper and Collared Crow. Migrant and winter visitor species such as Olive-backed Pipit, Daurian Restart, Dusky Warbler, etc. were recorded. Detailed records of avifauna at SSS-3 are presented in Appendix G.

The monitoring results in the reporting month were compared against the dry season results of the baseline data from November 2009 to January 2010. The number of species recorded at Point Count Locations was lower than the baseline range, while abundance of birds and the total number of bird species recorded at SSS-3 Survey Site (including the number of species of conservation importance) were within the baseline range. Considering that the abundance of birds and total number of bird species recorded at SSS-3 Survey Site were within the baseline range, the drop of number of species recorded at Point Count Locations was likely due to natural fluctuation. (Table 5-23 and Table 5-24 refer).

The monitoring results indicated the agricultural lands within the survey area were utilized by generalist and waterbird species in the reporting month during the monitoring. No adverse impacts from the Project were identified.

Survey Period	**SSS-3 Survey Site [2]**	
	No. of Bird Species	**Abundance of Bird Species**
17 March 2017	22	213
November 2009 to January 2010 [1]	26 – 32	211 – 296

Note:

1. Seasonal range obtained from baseline bird survey.
2. The access to Point Count Locations SSS-3/P6 was blocked due to project related work, therefore, the number of species recorded at Point Count Locations could not fully reflect the actual on-site condition.

Table 5-23 Number of Bird Species and Abundance of Bird Species Recorded in the Reporting Month Avifauna Monitoring at the Point Count Locations of the SSS-3 Survey Site

Survey Period	Total Number of Bird Species Recorded [1,2]
17 March 2017	28 (3)
November 2009 to January 2010[3]	26 – 32 (2 – 5)

Note:

1. Total number of species recorded included the avifauna recorded from both point count locations and walk transect.

2. The numbers in brackets denote the number of species of conservation interest.

3. Seasonal range obtained from baseline bird survey.

Table 5-24 Total Number of Bird Species Recorded in the Reporting Month Avifauna Monitoring at the SSS-3 Survey Site

Ecological monitoring at PHV and TUW

The weather condition and other noticeable activities occurring within or in the vicinity of the survey area during the monitoring are summarized in Table 5-25. The TUW-1 survey site encompassed a large piece of agricultural land located to the south of Kam Sheung Road (i.e. Tse Uk Tsuen). The agricultural land in TUW-1 survey site shared the habitat characteristics of SSS-3 survey site. Similar seasonal alternation between wet and dry agriculture was also recorded from TUW-1 survey site (Figure 5 in Appendix D refers). The bird species and their abundance recorded during the avifauna monitoring for the reporting month are presented in Appendix G.

Date of Monitoring	Weather Condition	Noticeable Activities Observed in the vicinity of TUW-1 Survey Site
20 March 2017	Sunny	• Dry agricultural activities, such as planting of Peach (*Prunus persica*), Beetroot (*Beta vulgaris*), Water Spinach *(Ipomoea aquatica*), Beetroot (*Beta vulgaris*), Cauliflower (*Brassica oleracea*) etc. were observed near Point Count Locations TUW-1/P2, TUW-1/P3 and TUW-1/P7 (Plate 12, Appendix H refers) • Fallow farm parcels were observed at Point Count Location TUW-1/P4.

Table 5-25 Weather Condition and Noticeable Activities Observed in the TUW-1 Survey Site during the Monitoring in the Reporting Month

A total of 83 individuals from 19 avifauna species were recorded from the Point Count Locations at TUW-1 in the reporting month (Table 5-26 refers). The total number of species recorded during the monitoring was 20, with Red-whiskered Bulbul being the dominant species. Waterbird species, White-breasted Waterhen, was recorded. Winter visitor species such as Olive-backed Pipit, Daurian Redstart, Dusky Warbler, etc. were recorded. Spring migrant and summer visitor species Barn Swallow and Large Hawk Cuckoo were also recorded during the survey, indicating a shift in seasonality. Detailed records of avifauna at TUW-1 are presented in Appendix G.

The monitoring results in the reporting month were compared against the dry season data from November 2009 to January 2009. The total number of bird species and number of species recorded at Point Count Locations were within baseline range, while the abundance of birds recorded at Point Count Locations and the number of species of conservation importance were below baseline range. Considering that both the number of species at point count locations and the total number of bird species recorded were within the baseline range, and there were no project related or non-related works in the surrounding, the drop in abundance of birds at TUW-1 Survey Site was likely due to natural fluctuation.
(Table 5-26 and Table 5-27 refer).

The monitoring results indicated the agricultural lands within the survey site were mainly utilized by generalists and waterbird species in the reporting month during the monitoring. No adverse indirect impacts arising from the Project were identified.

Survey Period	**TUW-1 Survey Site**	
	No. of Bird Species	**Abundance of Bird Species**
20 March 2017	19	83
November 2009 to January 2010 [1]	19 – 25	98 – 197

Note:

1. Seasonal range obtained from baseline bird survey.

Table 5-26 Number of Bird Species and Abundance of Bird Species Recorded in the Reporting Month Avifauna Monitoring at the Point Count Locations of the TUW-1 Survey Site

Survey Period	Total Number of Bird Species Recorded [1,2]
20 March 2017	20 (0)
November 2009 to January 2010[3]	20 – 25(2 – 3)

Note:

1. Total number of species recorded included the avifauna recorded from both point count locations and walk transect.

2. The numbers in brackets denote the number of species of conservation interest.

3. Seasonal range obtained from baseline bird survey.

Table 5-27 Total Number of Bird Species Recorded in the Reporting Month Avifauna Monitoring at the TUW-1 Survey Site

Since the extent of PHV-1 survey site is overlapped with that of TUW-2 survey site, the survey data of the TUW-2 and PHV-1 survey sites were reported collectively. The weather condition and other noticeable activities occurring within or in the vicinity of the survey area during the monitoring are summarized in Table 5-28. The TUW-2 and PHV-1 survey site comprised the woodland in Conservation Area (CA) within 500 m from the boundary of the PHV works area (Figure 6 in Appendix D refers). The bird species and their abundance recorded during the avifauna monitoring for the reporting month are presented in Appendix G.

Date of Monitoring	Weather Condition	Noticeable Activities Observed in the vicinity of TUW-2 and PHV-1 Survey Site
20 March 2017	Sunny	Nil

Table 5-28 Weather Condition and Noticeable Activities Observed in the TUW-2 and PHV-1 Survey Site during the Monitoring in the Reporting Month

A total of 16 individuals from 9 avifauna species were recorded from the Point Count Locations at TUW-2 and PHV-1 in the reporting month (Table 5-29 refers). The total number of species recorded during the monitoring was 17. Waterbird species Little Egret was recorded. Summer visitor species Plaintive Cuckoo and Large Hawk Cuckoo were also recorded during the survey, indicating a shift in seasonality. Detailed records of avifauna at TUW-2 and PHV-1 are presented in Appendix G.

The monitoring results in the reporting month were compared against the dry season results of the baseline data from November 2009 to January 2010. The number of species and the number of species of conservation importance recorded at Point Count

Locations was above the baseline, while the abundance of birds and total number of species were within the baseline range (Table 5-29 and Table 5-30 refer).

The monitoring results indicated the woodland within the survey site was mainly utilized by typical forest birds e.g. Blue Whistling Thrush and Rufous-capped Babbler; and generalists e.g. Oriental Magpie Robin and Japanese White-eye during the monitoring. No adverse indirect impacts arising from the Project were identified.

Survey Period	TUW-2 and PHV-1 Survey Site	
	No. of Bird Species	Abundance of Bird Species
20 March 2017	9	16
November 2009 to January 2010 [1]	8	15 – 21

Note:

1. Seasonal range obtained from baseline bird survey.

Table 5-29 Number of Bird Species and Abundance of Bird Species Recorded in the Reporting Month Avifauna Monitoring at the Point Count Locations of the TUW-2 and PHV-1 Survey Site

Survey Period	Total Number of Bird Species Recorded [1,2]
20 March 2017	17 (3)
November 2009 to January 2010[3]	12 – 19 (0)

Note:

1. Total number of bird species recorded included the avifauna recorded from both point count locations and walk transect.

2. The numbers in brackets denote the number of species of conservation interest.

3. Seasonal range obtained from baseline bird survey.

Table 5-30 Total Number of Bird Species Recorded in the Reporting Month Avifauna Monitoring at the TUW-2 and PHV-1 Survey Site

5.3.2 Monitoring of impact at fishpond due to noise

In accordance with the Monitoring and Emergency Response Plan, impact noise monitoring was conducted at fish pond on weekly basis for assessment of impact at fishponds due to noise. The results are displayed in the table below. It was revealed

from the monitoring results that all monitoring results were within the Limit Level of 75 dB(A). Based on the monitoring results, there was no adverse impact at fishpond due to noise.

Monitoring Date	L_{eq}, dB(A)
07/03/2017	50
14/03/2017	51
21/03/2017	52
28/03/2017	53

Table 5-31 Noise monitoring results at fishpond in Mai Po

5.4 Waste Management

The quantities of waste disposed from this Project during the reporting month and the previous 2 months are summarized in the table below. Inert C&D materials are disposed to public fills unless otherwise specified.

Reporting Month	Inert C&D [1, 13] Materials (tonnes)	Non-inert C&D [2] Materials (tonnes)	Chemical Waste (Litre)
Contract 810A[4]			
Jan 2017	8,826.97 {0.00}	49.93	250
Feb 2017	8,076.36 {0.00}	95.56	0
Mar 2017	5,306.17 {0.00}	133.20	0
Contract 810B[5]			
Jan 2017	881.65 {0.00}	527.46	0
Feb 2017	1,945.52 {0.00}	549.96	0
Mar 2017	1,896.12 {0.00}	612.01	0
Contract 811B[6]			
Jan 2017	0.00 {0.00}	1,264.15	0
Feb 2017	1,529.86 {0.00}	1,072.71	0
Mar 2017	1,338.45 {0.00}	2,010.28	0
Contract 820[7]			
Jan 2017	0	0.79	0
Feb 2017	0	0	0
Mar 2017	0	0	0
Contract 822[8]			
Jan 2017	257.32	4.19	0
Feb 2017	166.81	9.87	0
Mar 2017	63.34	15.68	0
Contract 8217			
Jan 2017	0	0	0

Reporting Month	Inert C&D Materials (tonnes) [1, 13]	Non-inert C&D Materials (tonnes) [2]	Chemical Waste (Litre)
Feb 2017	0	1.60	0
Mar 2017	0	0	0
Contract 823A[9]			
Jan 2017	3,300.14	21.08	0
Feb 2017	385.97	4.96	0
Mar 2017	1,247.02	17.34	0
Contract 823B[10]			
Jan 2017	662.75	51.43	0
Feb 2017	62.08	43.69	0
Mar 2017	206.65	45.75	0
Contract 824[11]			
Jan 2017	1,878.60	240.70	0
Feb 2017	1,174.00	122.60	0
Mar 2017	541.60	52.70	0
Contract 825[12]			
Jan 2017	8	10	0
Feb 2017	8	138	0
Mar 2017	0	38	0
Contract 826			
Jan 2017	0	0	0
Feb 2017	0	0	0
Mar 2017	0	0	0

Table 5-32 Summary of construction waste generated and disposed

Note:

1. Inert C&D materials include bricks, concrete, building debris, rubble and excavated soil.
2. Non-inert C&D materials include steel, paper / cardboard packaging waste, plastics and other wastes such as general refuse.
4. Alternative disposal sites for inert C&D material from 810A include SENT Landfill and Zhongshan & Zhuhai, Mainland China.
5. Alternative disposal sites for inert C&D Material from 810B include Central-Wan Chai Bypass (Typhoon Shelter and HKCEC) and Zhongshan Torch Hi-Tech Zone.
6. Alternative disposal sites for inert C&D Material from Contract 811B include Widening of Tolo highway / Fanling Highway (HY/2009/908), SIL Contract 908, HY/2009/15 – Central WanChai Bypass – Tunnel (Causeway Bay Typhoon Shelter Section), MaXin District Development, Zhong Shan.
7. Liquid chemical waste (waste oil) reported in litres (L), while solid waste such as waste battery reported in tonnes (tons).
8. No alternative disposal sites for inert C&D Material from Contract 822 in this month.
9. Alternative disposal sites for inert C&D Material from Contract 823A include NENT landfill (re-used as cover material) and Shui Mei Tsuen.
10. Alternative disposal sites for inert C&D Material from Contract 823B include WENT landfill, CCSV, Pak Fu Shan (DC/2011/06) and Pillar Point (DC/2008/03).

11. Alternative disposal sites for inert C&D Material from Contract 824 include Contract 8217 Shek Yam site.

12. No alternative disposal sites for inert C&D Material from Contract 825 in this month.

13 Figures in { } denotes the quantity of marine sediment disposal not included in inert C&D Material.

The cumulative quantities are summarized as follows.

Inert C&D Materials (tonnes)	**Marine Sediment Materials (tonnes)**	**Non-inert C&D Materials (tonnes)[1]**	**Chemical Waste (Litre)**	**Chemical Waste (Kg)**
22,230,489.07	1,765,151.24	150,639.70	387,139.50	19,792.00

5.5 Landscape and Visual

5.5.1 Monitoring Requirement

A Certified Arborist was employed and has conducted inspection and audits and found that the tree protection works being carried out by the civil works and transplanting contractors were in accordance with EP/EIA.

Monitoring of the implementation of landscape and visual aspect including the tree protection measures during construction phase was conducted in accordance with the requirements of EP condition 2.15 and Section 5.6 of the EM&A Manual.

5.5.2 Audit Result

Regular monitoring and audit was undertaken in accordance with the requirement of EP condition 2.15 and Section 5.6 of the EM&A Manual.

Tree Transplanting Works at Contract 801

A number of trees are being replanted to their final receptor locations. Dead trees should be removed and replaced.

Unwanted vegetation should be removed, and pesticide should be applied to some tree to improve tree health.

Tree Protection Work 810A

Hanging dead branches should also be removed, and tree protection zone should be properly maintained.

Tree Protection Work 810B
No major observation.

Tree Protection Work 811B
No major observation.

Tree Protection Work 816D
A hazardous tree should be removed.

Tree Protection Work 821
No major observation.

Tree Protection Work 8217
No major observation.

Tree Protection Work 822
Surface water drainage should be improved to avoid ponding.

Tree Protection Work 823A
Dead tree shall be removed.

Tree Protection Work 823B
Status of T14636 unchanged, continuous monitoring was recommended and will be reported when deterioration is observed.

Tree Protection Work 824
Leaning tree should be removed.

Tree Protection Work 825
Tree protection zone was re-established.

Tree Protection Work 830
No major observation.

5.6 Cultural Heritage

No construction work was performed within 100m buffer area from Cheung Yuen (LET-06) in the reporting month; hence no vibration monitoring was performed.

5.7 Landfill Gas

No monitoring was carried out in this reporting month since there was no construction within Gin Drinker Bays Landfill (GDBL) consultation zone. Monitoring was carried out in the reporting month within the Ngau Tam Mei Landfill (NTML) and no exceedance was recorded.

6 SITE INSPECTION

6.1 Regular Site Inspection

Regular site inspections on all environmental aspects under the EM&A Manual were attended by representatives from ET and Contractors. The site inspections were carried out at 810A/B and 811B in West Kowloon, 822 in Pat Heung and Shing Mun, 8217 in Shek Yam, 823A/B in Shek Kong Stabling Sidings, 824 in Tai Kong Po and Ngau Tam Mei, 825 in Mai Po and dates are shown in the following table. In addition to the regular site inspections attended by ET and Contractors, monthly IEC environmental audits attended by IEC, ET and Contractors were held on 8 March 2017 for 810A; 8 March2017 for 810B; 7 March 2017 for 811B; 7 March 2017 for 822; 7 March 2017 for 8217; 23 March 2017 for 823A; 23 March 2017 for 823B; 10 March 2017 for 824 and 9 March 2017 for 825.

Contract	**Date of Site Inspections**
810A	2/3, 8/3, 16/3, 23/3 and 31/3
810B	1/3, 8/3, 14/3, 22/3 and 27/3
811B	7/3, 14/3, 21/3 and 28/3
822	3/3, 7/3, 15/3, 24/3 and 28/3
8217	3/3, 7/3, 15/3, 21/3 and 28/3
823A	3/3, 9/3, 16/3, 23/3 and 28/3
823B	3/3, 9/3, 16/3, 23/3 and 28/3
824	2/3, 10/3, 14/3, 21/3 and 28/3
825	1/3, 9/3, 15/3, 22/3 and 29/3

Table 6-1: Date of site inspection

All observations have been recorded in the audit checklist and passed to the Contractor together with the appropriate recommended mitigation measures where necessary. The key observations from these site inspections and Contractor's follow-up action are summarized in Table 6-2 below.

Item	Description	Contractor's Follow-up Action(s) Undertaken
Contract 810A		
1	Dry and dusty haul road was found along most of the works areas within the Project.	Water spraying has been applied regularly to different parts of haul roads to maintain the surface wet in order to minimize the dust emission.
Contract 810B		
1	Mud trace was observed at the exit of Austin Road West Phase 3 works area.	The mud trace has been cleaned and the frontlines have been reminded to wash the vehicles' wheels before leaving.
Contract 811B		
1	Chemical drums which stored on site were found without proper control.	The chemical drums in question have been removed offsite in the following day when the observation has been made. Also the frontlines have been reminded to provide drip tray when the chemical drums are stored on site.
Contract 822		
1	N/A	N/A
Contract 8217		
1	Some oily water was observed from drip tray.	Oily water was cleared.
Contract 823A		
1	Mud was found at public road.	Wheel washing has been enhanced.
2	No wheel washing was provided to vehicle leaving the site.	Wheel washing has been provided to vehicles leaving the site.
Contract 823B		
	No significant observation	-
Contract 824		
1	Completed slope at retaining wall and excavated slope with exposed soil was not covered.	Tarpaulin sheet was provided for covering excavated slope, more tarpaulin sheet will be provided for completed slope.
2	No water sparying was provided for concrete breaking.	Water spraying was provided.
3	Haul road and unpaved area was observed dry and dusty.	Regular water spraying was applied for dust suppression.
Contract 825		
1	Haul road was observed dry and dusty, sometimes with mud trails.	Regular water spraying and road washing was provided.

Item	Description	Contractor's Follow-up Action(s) Undertaken
2	Wastewater treatment facilities were disconnected, only sedimentation tank was provided.	Wastewater treatment facilities (WetSep) and sump pits were provided for treating site runoff.
3	Materials were observed underneath the tree at Castle Peak Road.	The materials were removed.

Table 6-2 Summary of site inspections, recommendations and follow-up actions

6.2 Other Site Inspection

All XRL tunnelling works have been substantially completed, the groundwater level monitoring for the XRL project was suspended since 1 November 2016.

7 NON-COMPLIANCE AND DEFICIENCY

7.1 Summary of Complaint

For this reporting month, five environmental complaints were referred from EPD. There are a total of 248 environmental complaints since commencement of the construction. The complaints were handled in accordance to the EM&A Manual and relevant parties including the Engineer's Representative and IEC were informed of the complaint.

Three complaints were referred from EPD on 16 and 17 March 2017 regarding alleged noise from waterflow in stream from construction site at Ngau Tam Mei. The complaint handling procedures in accordance with the EM&A Manual has been taken. Through the case investigation, no abnormal noise sources were identified at the vicinity. Nonetheless, as a goodwill to maintain good neighbourhood, the Contractor has provided measures such as connecting water pipe from outfall in order to minimize sound of waterflow.

Two complaints were referred from EPD on 27 March 2017 regarding dust from works area at Nam Cheong Barging Point (NCBP). The complaint handling procedures in accordance with the EM&A Manual has been taken. Through the case investigation, no abnormal operation was identified on site. However the Contractors have been reminded to maintain the dust control, including water tanker shall be wetted the haul road along NCBP in a regular interval, dump trucks shall be washed and the mechanical cover shall be closed before leaving the site. Also the stockpile of fine material shall be wetted properly in order to minimize the dust impact to the vicinity.

7.2 Summary of Exceedance

In the reporting month, one exceedance of 24-hour TSP Action Level was recorded at Kong Tai Road Village House (AM3) on 25 March 2017. Details can be referred to Section 5.1 above.

In the reporting month, no exceedance of air-borne noise Action Level and Limit Level was recorded.

7.3 Summary of Notification of Summons, Prosecutions, Non-compliance and Corrective Actions

No notification of summons, non-compliance and prosecution was received during the reporting period.

8 FUTURE KEY ISSUES

8.1 Construction Works in Coming Months

Works to be undertaken for the following months are summarized below. The works presented below is tentative and subject to change in actual construction programme.

Contract 802 (Works Area Q)
Nil
Contract 805 (Works Area N & O)
Nil (Construction works completed)
Contract 805 (Works Area S)
Nil
Contract 810A (Works Area V1)
Slab construction; Column installation; Erection and dismantling of falsework and formwork; Cruciform column encasement; Strut and bracing installation; Rebar fixing; Welding; Concrete curing; Bored pile head trimming; Blinding; Cleaning Construction Joint (CJ) and welding coupler; Rebar fixing to column and forming column drop; Concreting; Delivery of oversized steel structures; Erection of column head; Temporary support and platform fabrication; Wall construction; Welding to cathodic protection; and Architectural Builders Works and Finishes (ABWF)
Contract 810A (Works Area J, Y, AG)
Material Storage
Contract 810B (Works Area V1)
Preboring, Installation/Dismantling of Strutting; Bored Piling; Sheet piling; Excavation Lateral Support (ELS) Work; Structural Works of Sea Water Intake Chamber; Bulk Excavation; Concreting, Jet Grouting; Station Structure Construction Work; Utility Diversion & Piling Works; Structural Works of Noise Mitigation Deck; Construction of Austin Road West (ARW) Underpass; Construction of Sewerage Pipeline & Manholes; Haul Road Improvement Work; Bottom Up Erection of Formwork; Overhead

Track Exhaust (OTE) and Platform installation at B4 slab; Coring / Cutting Openings; and Screen Wall Construction at B4 slab
Contract 810B (Works Area W)
Operation of Barging Facilities
Contract 810A (Works Area V2)
ABWF in MKV, landscaping, road reinstatement
Contract 810A (Works Area U)
Site Office
Contract 811B (Works Area V2)
Waterproofing and backfilling to Approach (P-way shaft); Casting of internal RC structures at B4, B3 and B2; Construct PTI Landscaped Deck columns and deck structures; PTI Landscaped Deck ABWF works at B4, B3 and B2; Construct PTI plant building under deck and WKP above ground building (RC and ABWF works); Retaining wall construction along LCR S/B; Sewer/ storm pipe installation and manhole construction; Construct EAA from B2 to B1 to GF to U1F; Footbridge 14 Pier NP9 - NP10 stair and lift (steel canopy etc.); Footbridge 14 span NP9-NP10 ABWF works (steel canopy etc.); Man Cheong Street Footbridge pile cap PC1 and PC2 – excavation and pile head preparation; Remedial drainage works after Jordan Road Reinstatement; Footbridge 14 span NP3-BR3 RC works (Removal of temporary portal); Casting of Footbridge 14 piers on pile caps PC3 and PD3; Lin Cheung Road Underpass NB (northern section) excavation and RC works; Lin Cheung Road drainage works; Excavation for CLP cable trenches; CLP cable laying and joining and Installation of temporary portal for FB14 span NP2-NP3, NP4-NP5
Contract 811B (Works Area Y)
Operation of Nam Cheong Barging Point
Contract 810A (Works Area L)
Material Storage Area
Contract 820 (Works Area M)

Nil
Contract 820 (Works Area P)
ABWF in ventilation building
Contract 820 (Works Area Q)
Material storage
Contract 820 (Works Area R)
Nil (Construction works completed)
Contract 816D (Works Area T)
Site Office
Contract 821 (Works Area J)
Nil (construction works completed)
Contract 822 (Works Area F)
Traffic Signage & Underpass Signage; Removal Temporary Water Main; Reinstate land owners' area after removal of the temporary water main
Contract 822 (Works Area G)
Underground drainage construction; Backfill the openings; Fence Wall installation; Green rood construction, Manhole excavation; Maintain TTA
Contract 8217 (Works Area H)
Stockpiling and backfilling.
Contract 822 (Works Area I)
Nil (construction works completed)
Contract 822 (Works Area K)
Site Office
Contract 822 (Works Area AC)
Nil

-- (Works Area AE)
Nil (Land returned to the Government)
Contract 823A and 823B (Works Areas D and D1)
Superstructure works for buildings, road and other associated facilities, reinstatement and landscaping
Contract 823A (Works Area E)
Reinstatement
Contract 823B (To Kau Wan Works Areas)
Nil
Contract 810A (Works Areas Z)
Nil (construction works completed)
Contract 824 (Works Area B)
Architectural Builders Works and Finishes (ABWF) works for ventilation building. Carpark, road and drainage construction.
Contract 824 (Works Area C)
Remaining works and wall painting for EAP. Backfilling, EVA road and drainage construction. Tunnel cleaning works/defects rectification.
-- (Works Area AF)
N/A, land returned to the Government
Contract 825 (Works Area A)
Road and drainage construction. Backfilling.
Contract 810A (Works Area AA)
Material Storage
Contract 826 (Works Area A)
Repairing works

Table 8-1 Summary of construction works in coming months

Impact monitoring would be continued according to the construction programme.

8.2 Monitoring Schedule for Next Month

The tentative schedule of TSP, noise and ecological monitoring for the next reporting period is presented in Appendix E.

9 CONCLUSIONS

The Report presents the results of EM&A works and the impact monitoring for the construction works of the XRL project undertaken during the period of from 1 to 31 March 2017. The major construction activities in the reporting period included works in the West Kowloon Works Areas, Nam Cheong, Kwai Chung, Shing Mun, Shek Yam, Pat Heung, Shek Kong, Tai Kong Po, Ngau Tam Mei, Mai Po Works Area and Barging Points.

Impact monitoring for air quality and noise were conducted in accordance with the EM&A Manual in the reporting period. One 24-hour TSP Action Level exceedance was recorded at Kong Tai Road Village House (AM3) in the reporting month. No air-borne noise Action Level and Limit Level exceedance was recorded. For the ecological monitoring, survey results in the reporting month were compared to dry season baseline results from November 2009 to January 2010. Survey results in the reporting month were compared to dry season baseline results from November 2009 to January 2010. The total number of bird species were within the baseline range at most Survey Sites, except those record at TPP-2, SSS-1 and SSS-2b Survey Sites were slightly above the baseline range. Bird abundance recorded at most of the Survey Sites were within the baseline range except MPV-1, SSS-2a and TUW-1. For MPV-1 and SSS-2a, the bird abundance recorded were above the baseline range, while that at TUW-1 was below the baseline range. Considering that both the number of species at point count locations and the total number of bird species recorded at TUW-1 were within the baseline range, and there were no project related or non-related works in the surrounding, the drop in abundance of birds at TUW-1 Survey Site was likely due to natural fluctuation. The number of bird species recorded at Point Count Locations at Survey Sites MPV-1 and SSS-3 were below the baseline range, however, the total number of bird species at both sites were still within the baseline range. Therefore, the slight drop in the number of species at Point Count Locations of MPV-1 and SSS-3 Survey Sites were likely due to natural fluctuation. No adverse indirect impacts arising from the Project were identified. A number of Barn Swallow was recorded at MPV-1 and TPP2 Survey Sites and a few summer visitors such as Plaintive Cuckoo and Large Hawk Cuckoo were recorded at TUW-2 and PHV-1 Survey Sites, indicating a seasonal shift in bird species composition due to approach of the wet season.

No notification of summons, non-compliance and prosecution was received during the reporting period.

For the reporting month, five environmental complaints were referred from EPD. The environmental complaints were related to noise from construction site at Ching Yau Road received on 16 and 17 March 2017, and dust complaints for works area at Nam Cheong Barging Point received on 27 March 2017. Complaint investigations are being conducted in accordance with the complaint handling procedure in the EM&A Manual.

Site inspections were conducted regularly to monitor proper implementation of environmental pollution control and mitigation measures for the Project. The ET would continue the implementation of the environmental monitoring and audit programme in accordance to the EM&A Manual and to a level consistent with MTRCL's Corporate Sustainability Policy.

Appendix A

Works Area

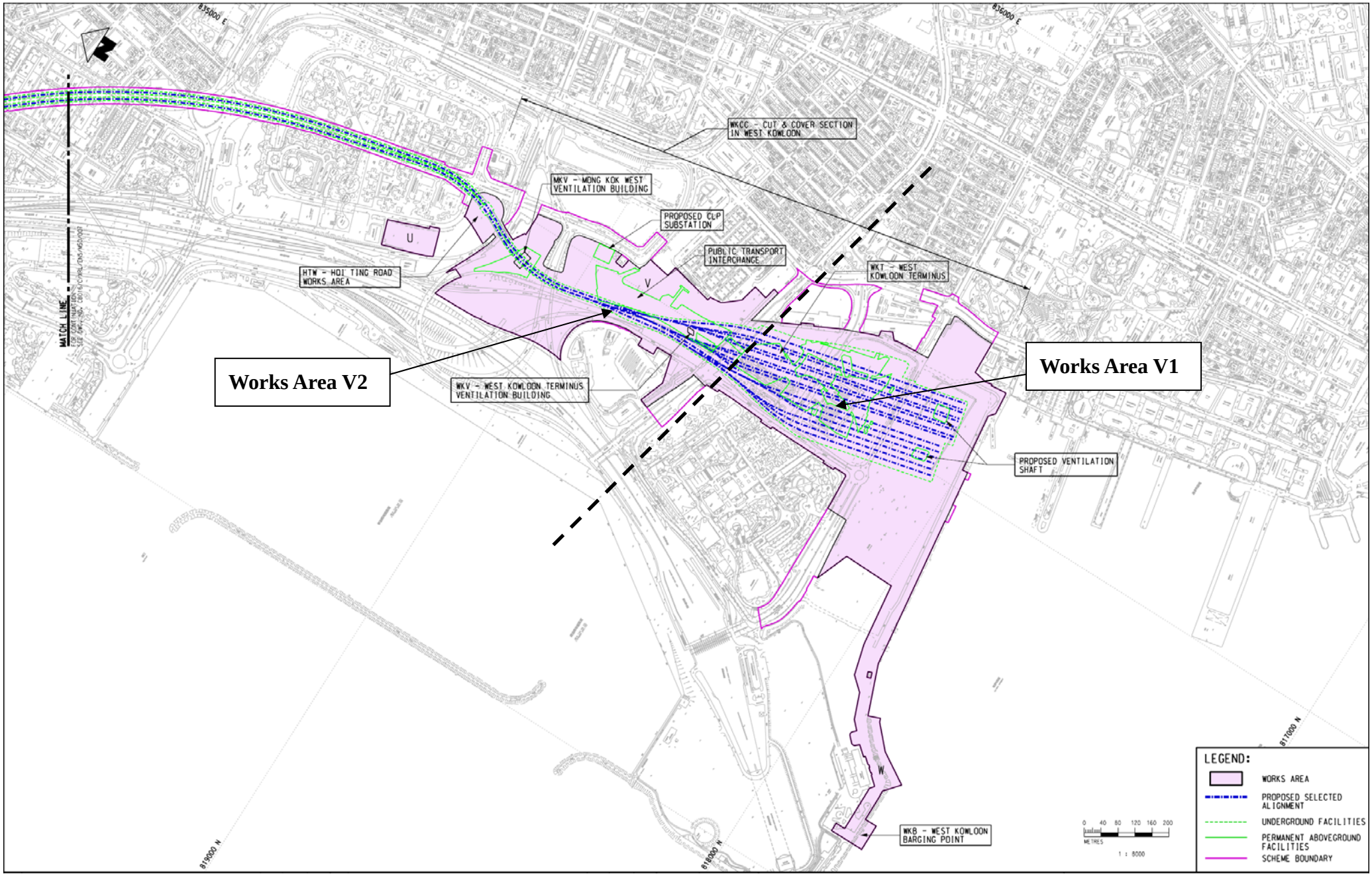
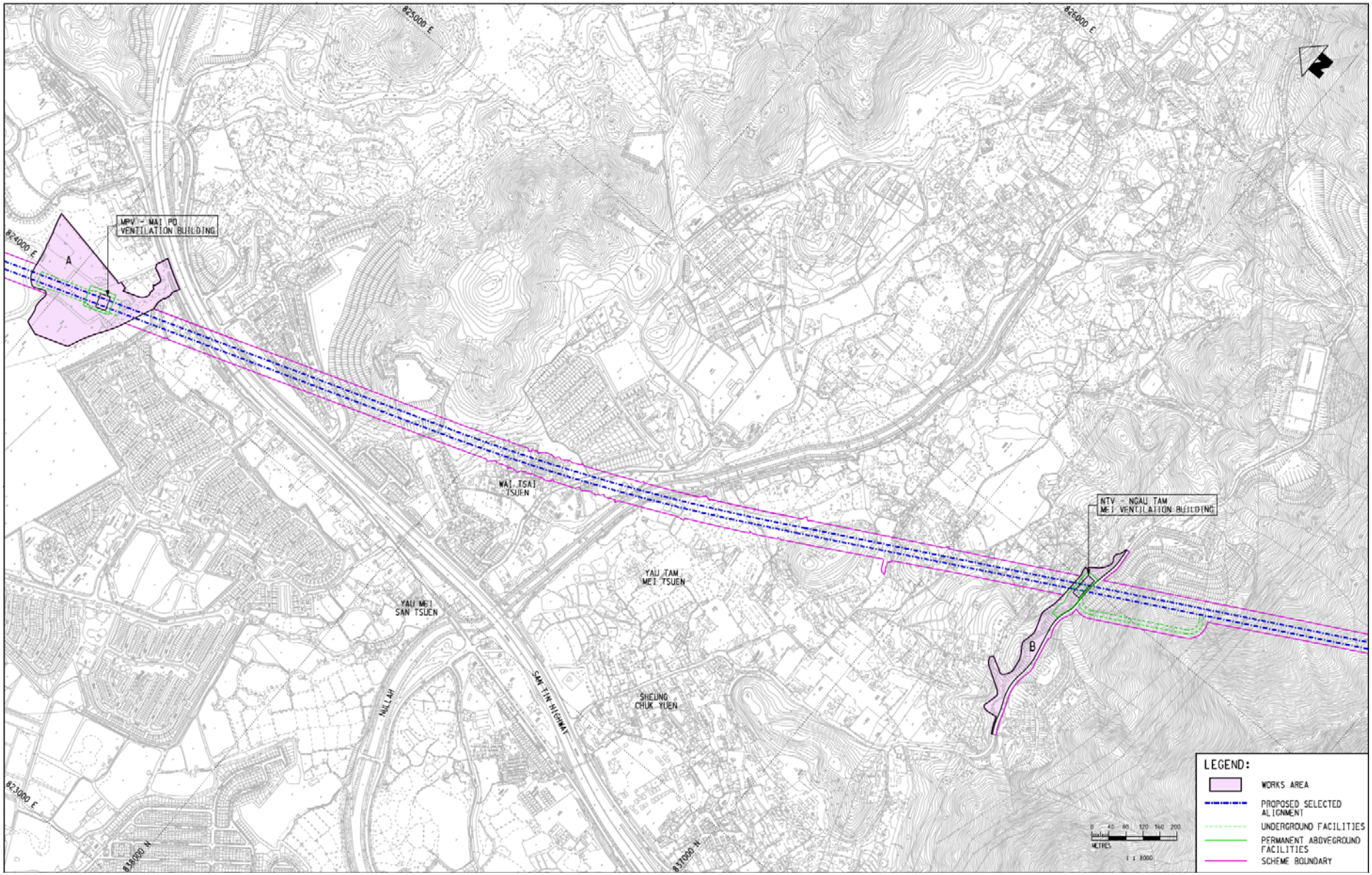
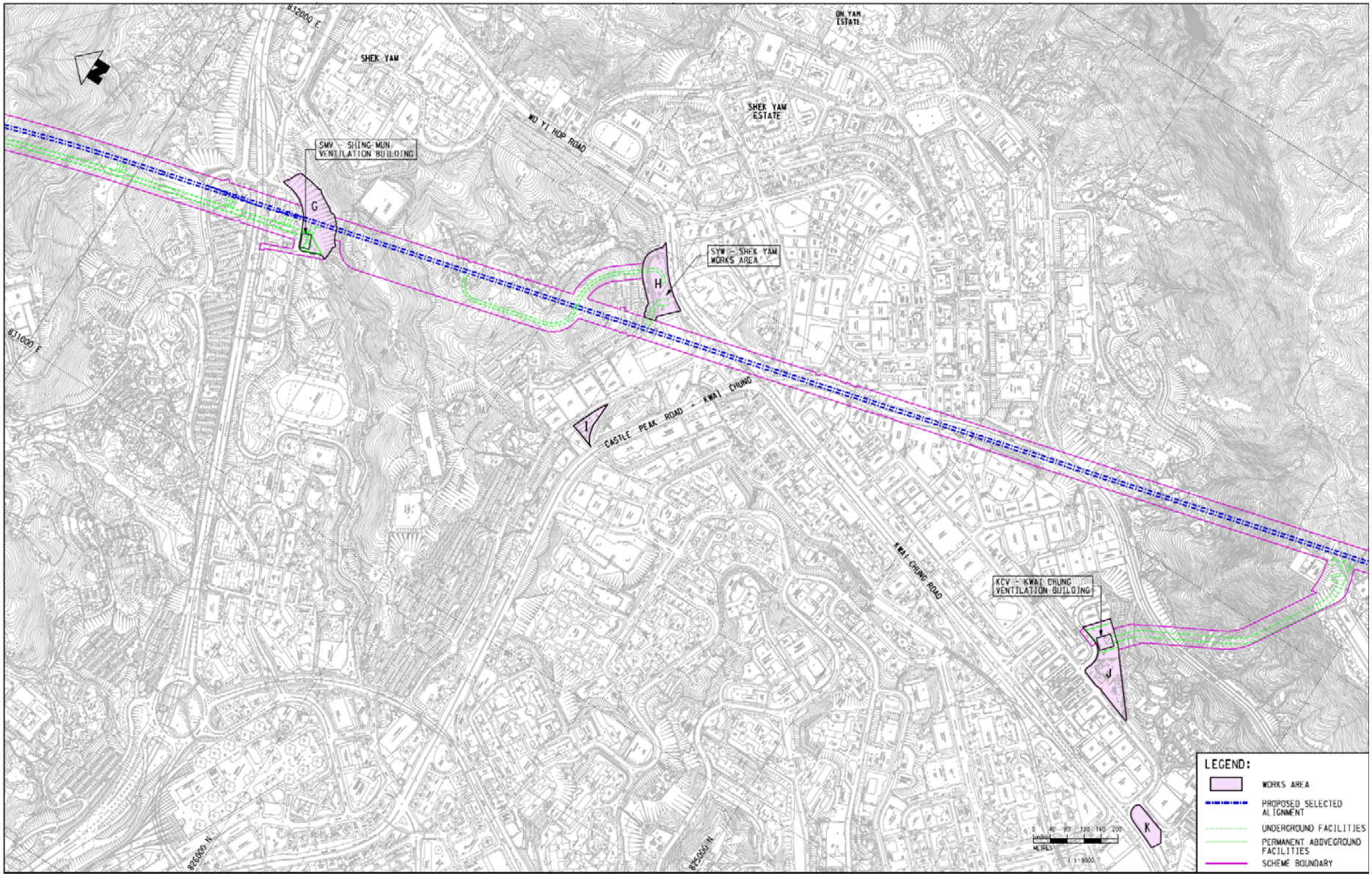
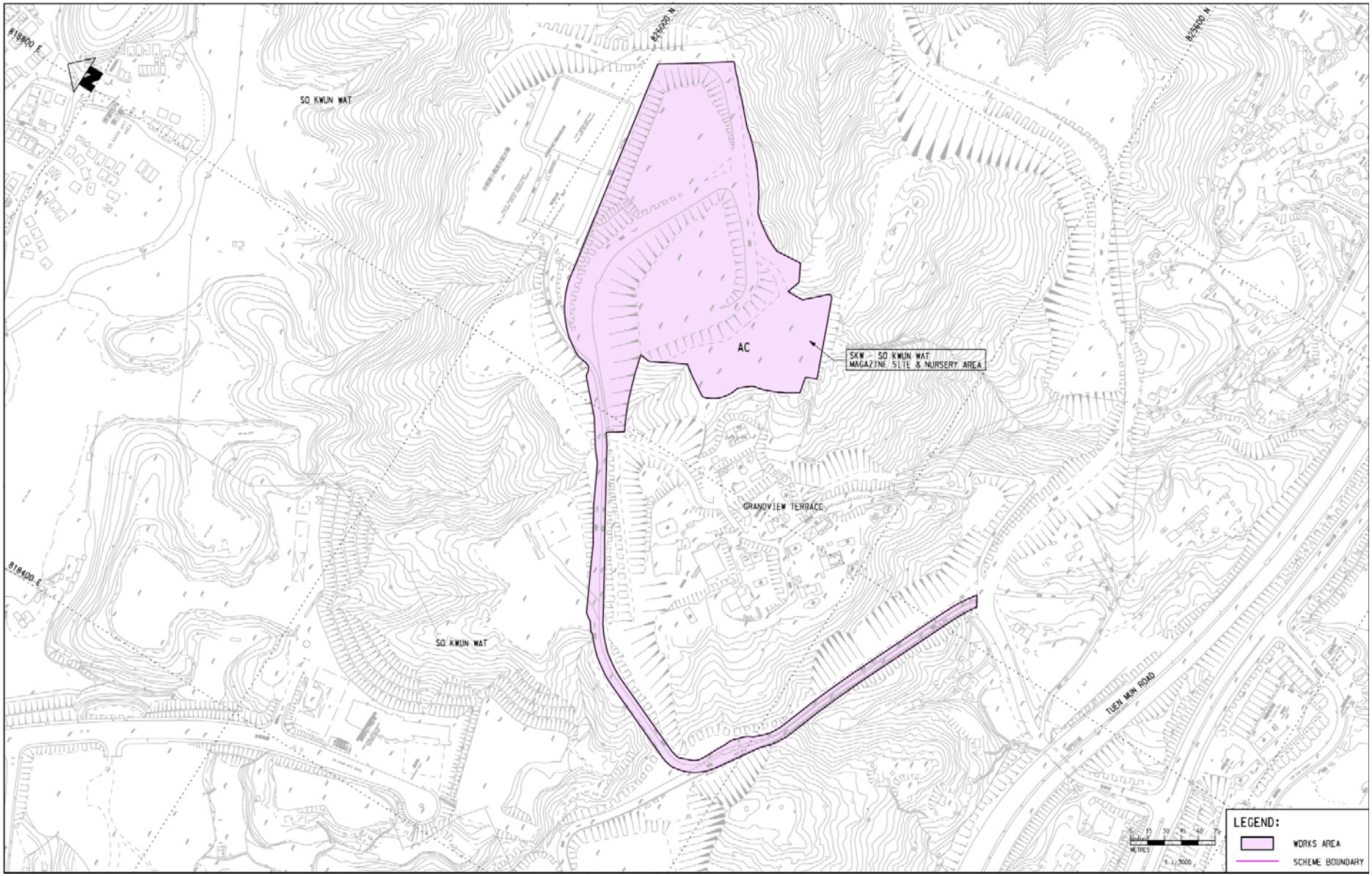
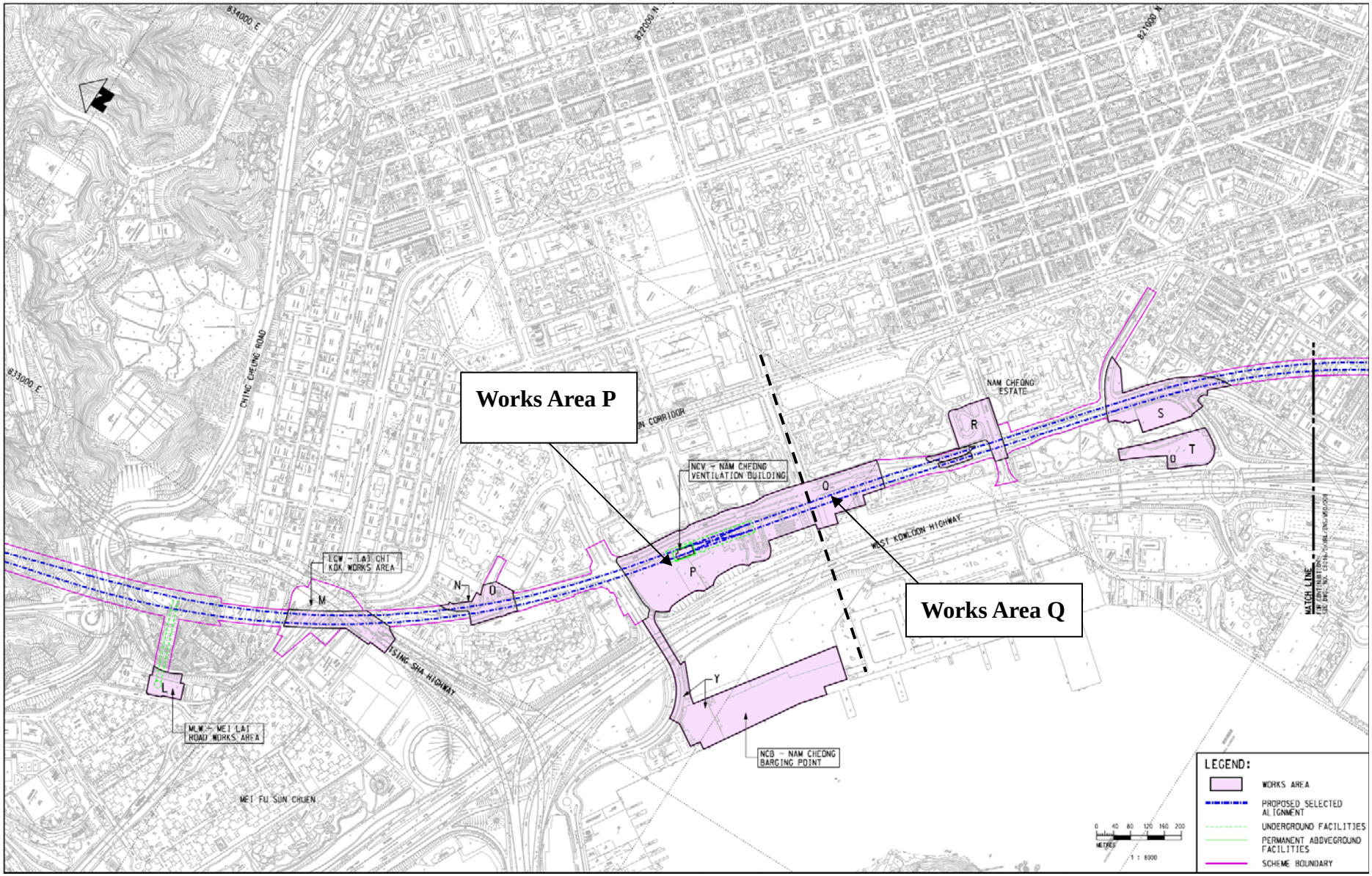


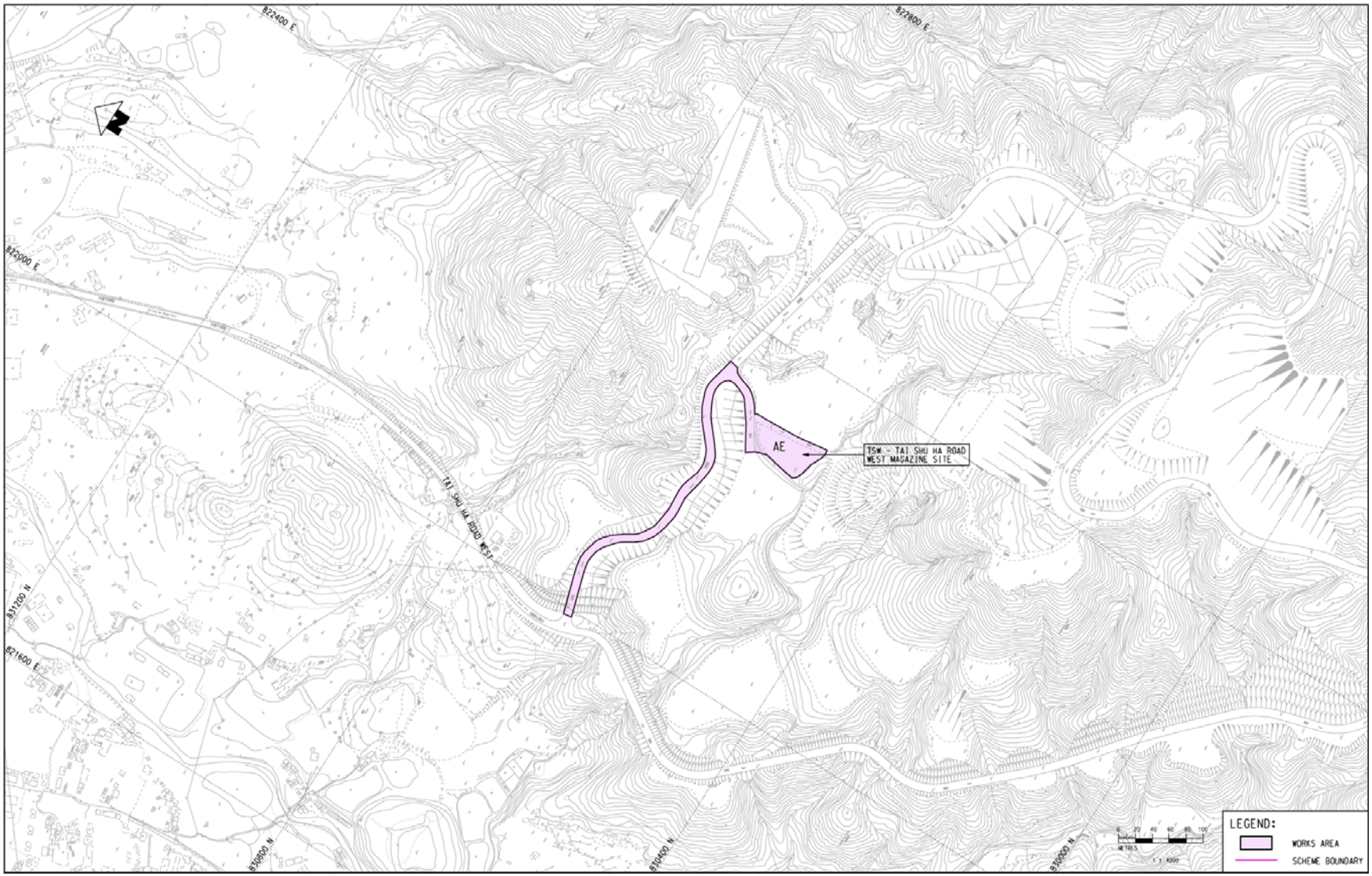
Figure 1 – Works Area

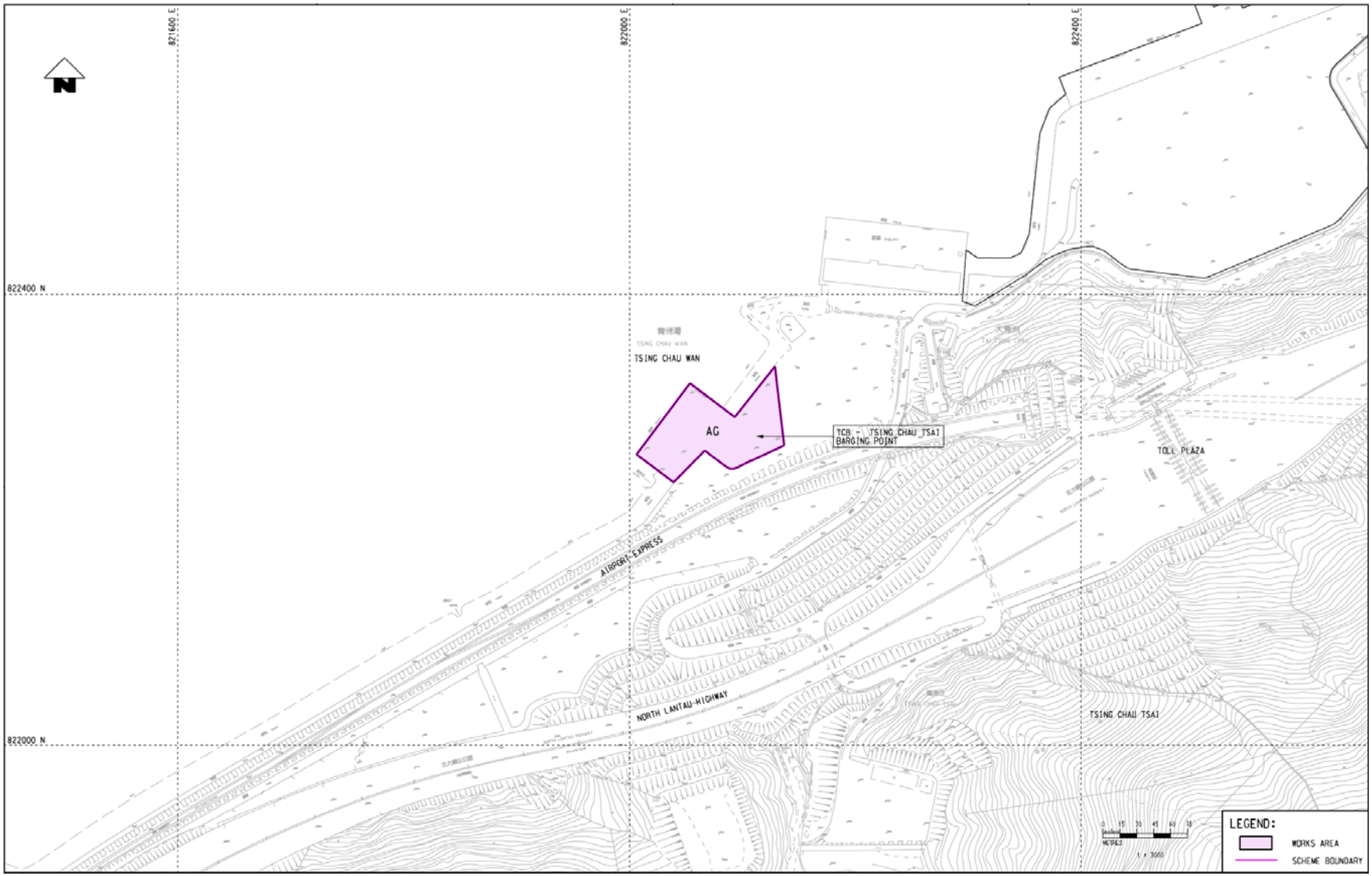

824000 E
825000 E
826000 E
821000 E
838000 N
837000 N
MPV - MAI PO VENTILATION BUILDING
A
NTV - NGAU TAM MEI VENTILATION BUILDING
B
WAI TSAI TSUEN
YAU TAM MEI TSUEN
YAU MEI SAN TSUEN
SHEUNG CHUK YUEN
NULLAH
SAN TIN HIGHWAY
LEGEND:
WORKS AREA
PROPOSED SELECTED ALIGNMENT
UNDERGROUND FACILITIES
PERMANENT ABOVEGROUND FACILITIES
SCHEME BOUNDARY
0 40 80 120 160 200
METRES
1 : 8000

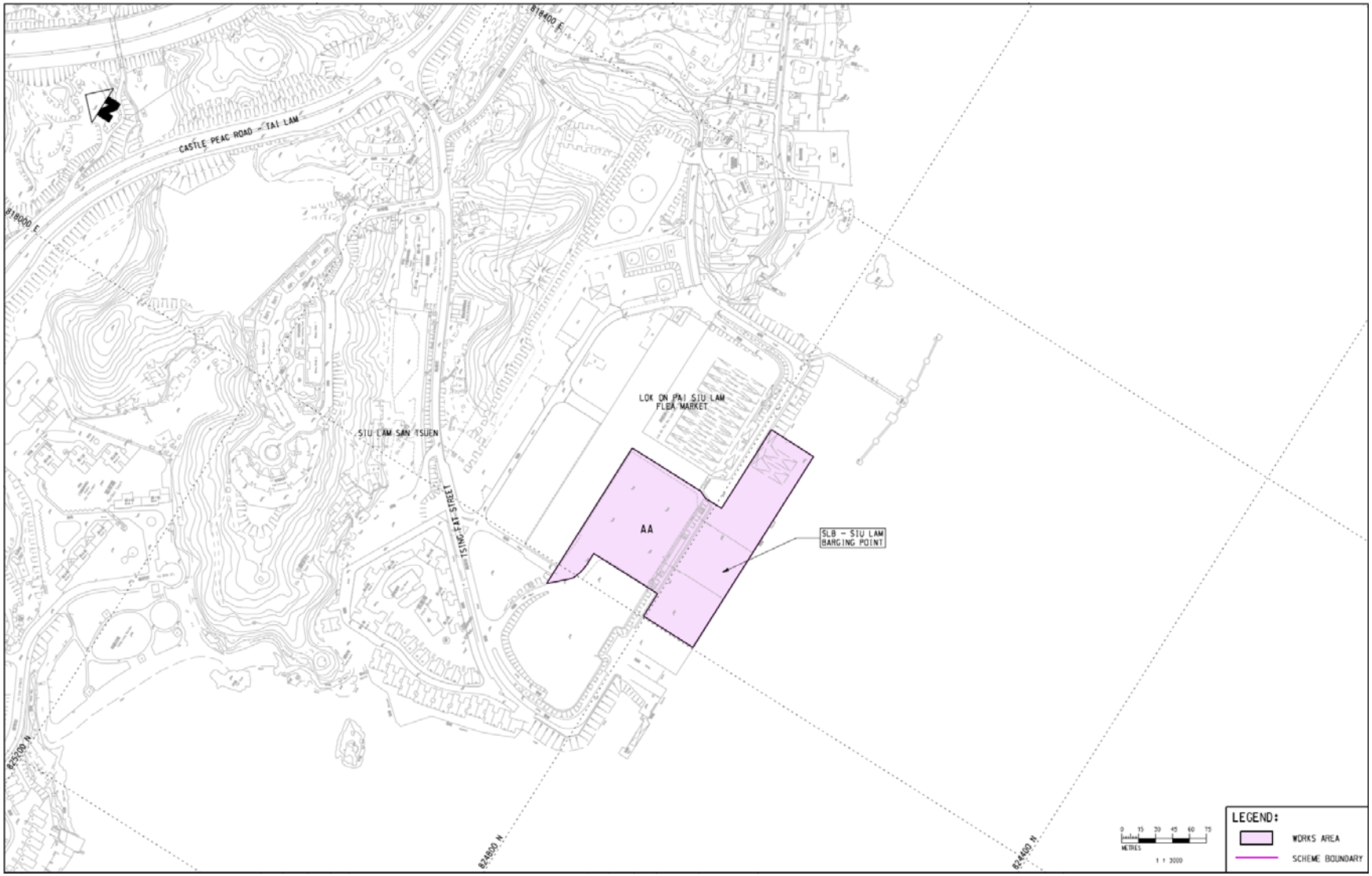

812000 E
831000 E
825600 N
825000 N
SHEK YAM
ON YAM ESTATE
SHEK YAM ESTATE
WO YI HOP ROAD
SMV - SHING MUN VENTILATION BUILDING
SYW - SHEK YAM WORKS AREA
CASTLE PEAK ROAD - KWAI CHUNG
KWAI CHUNG ROAD
KCV - KWAI CHUNG VENTILATION BUILDING
G
H
I
J
K
LEGEND:
WORKS AREA
PROPOSED SELECTED ALIGNMENT
UNDERGROUND FACILITIES
PERMANENT ABOVEGROUND FACILITIES
SCHEME BOUNDARY
METRES
1 : 8000

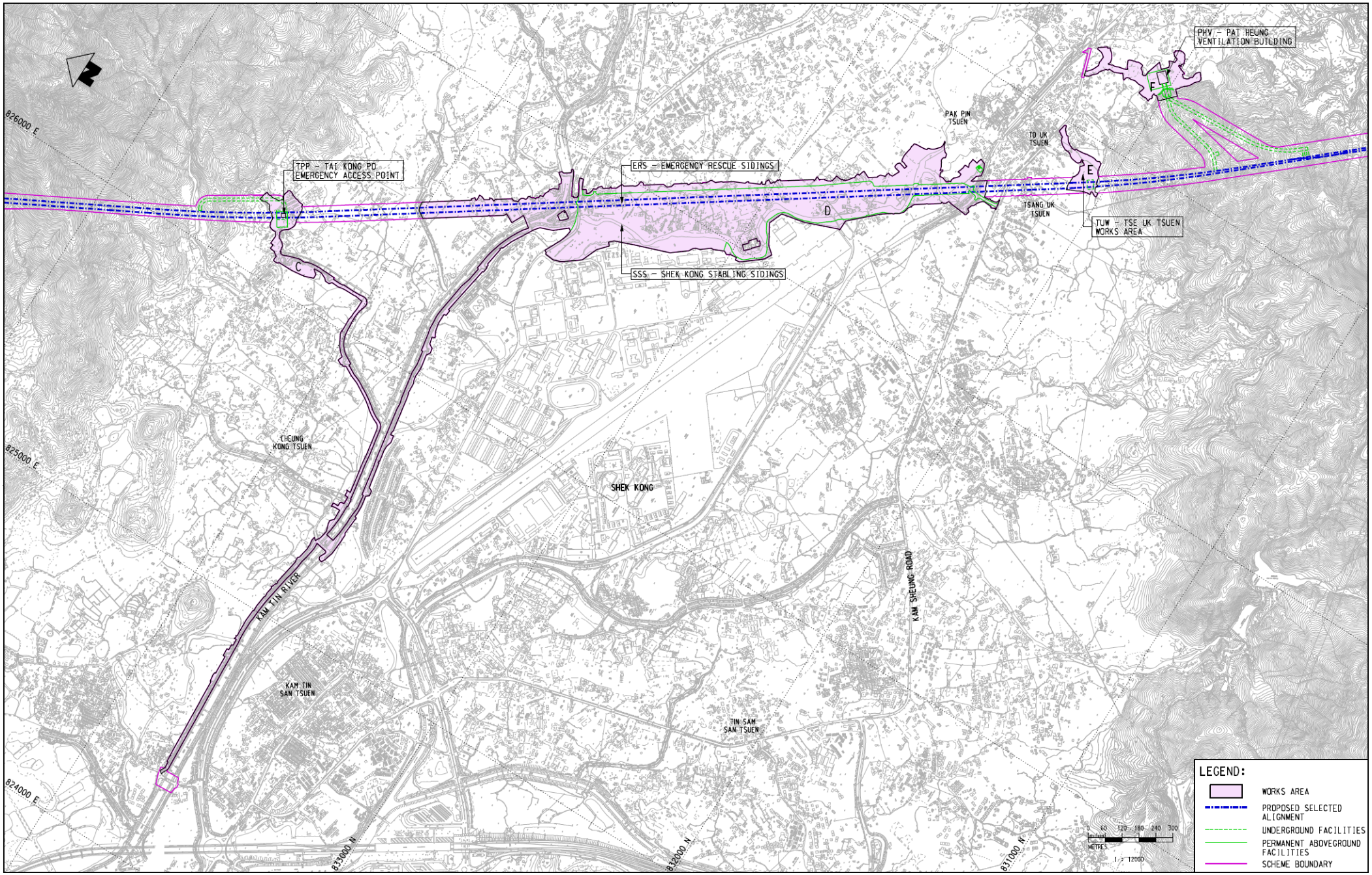

818800 E
818400 E
825600 N
825600 N
SO KWUN WAT
SO KWUN WAT
SO KWUN WAT
AC
SKW – SO KWUN WAT
MAGAZINE SITE & NURSERY AREA
GRANDVIEW TERRACE
TUEN MUN ROAD
METRES
1 : 5000
LEGEND:
WORKS AREA
SCHEME BOUNDARY

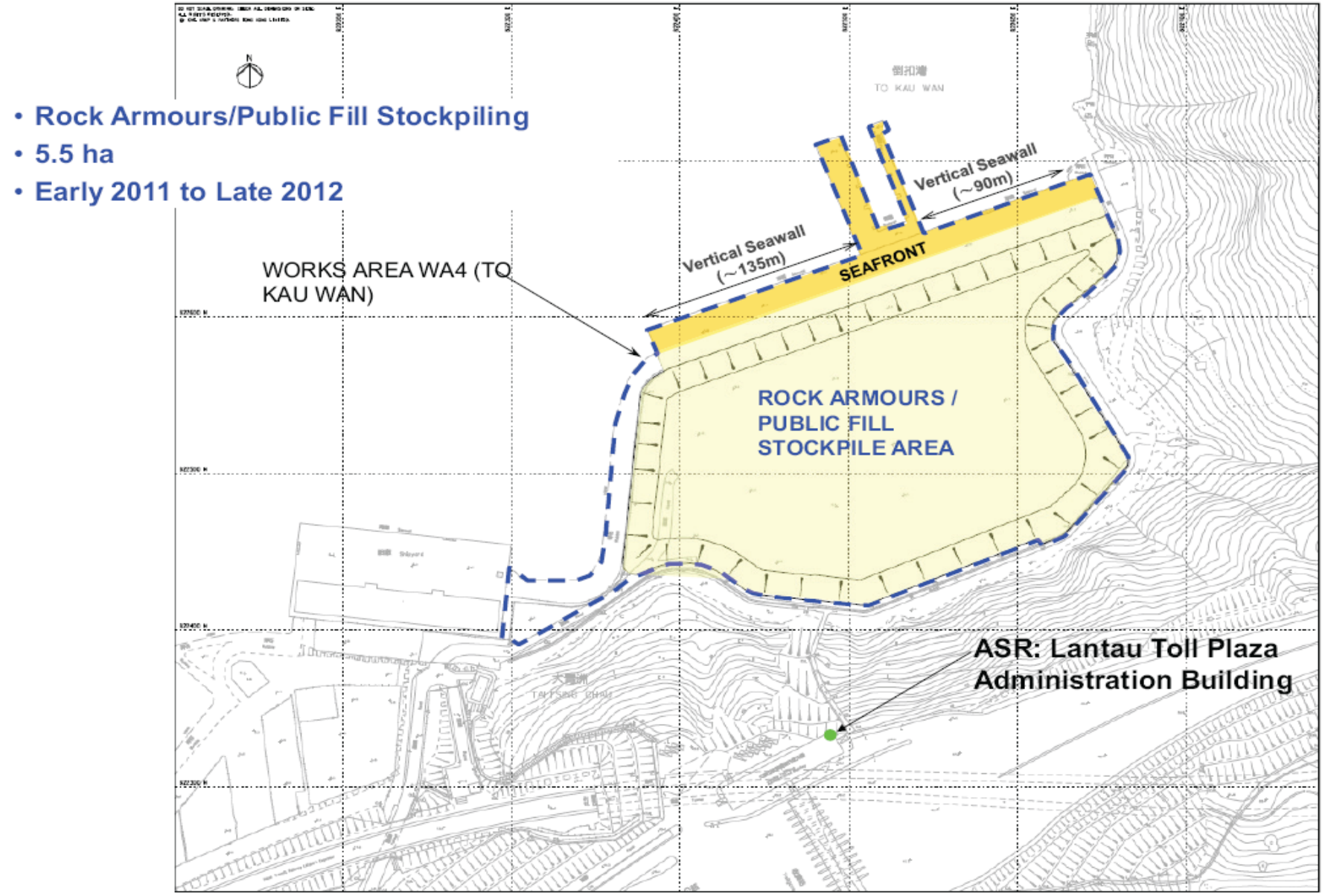

Works Area P
Works Area Q
834000 E
833000 E
822000 N
821000 N
CHING CHEUNG ROAD
NAM CHEONG ESTATE
NCV - NAM CHEONG VENTILATION BUILDING
WEST KOWLOON HIGHWAY
LCW - LAI CHI KOK WORKS AREA
MLW - MEI LAI ROAD WORKS AREA
TSING SHA HIGHWAY
MEI FU SUN CHUEN
NCB - NAM CHEONG BARGING POINT
MATCH LINE
LEGEND:
WORKS AREA
PROPOSED SELECTED ALIGNMENT
UNDERGROUND FACILITIES
PERMANENT ABOVEGROUND FACILITIES
SCHEME BOUNDARY
METRES
1 : 8000


822400 E
822800 E
822000 E
821600 E
831200 N
830800 N
830400 N
830000 N
AE
TSW - TAI SHU HA ROAD WEST MAGAZINE SITE
TAI SHU HA ROAD WEST
LEGEND:
WORKS AREA
SCHEME BOUNDARY

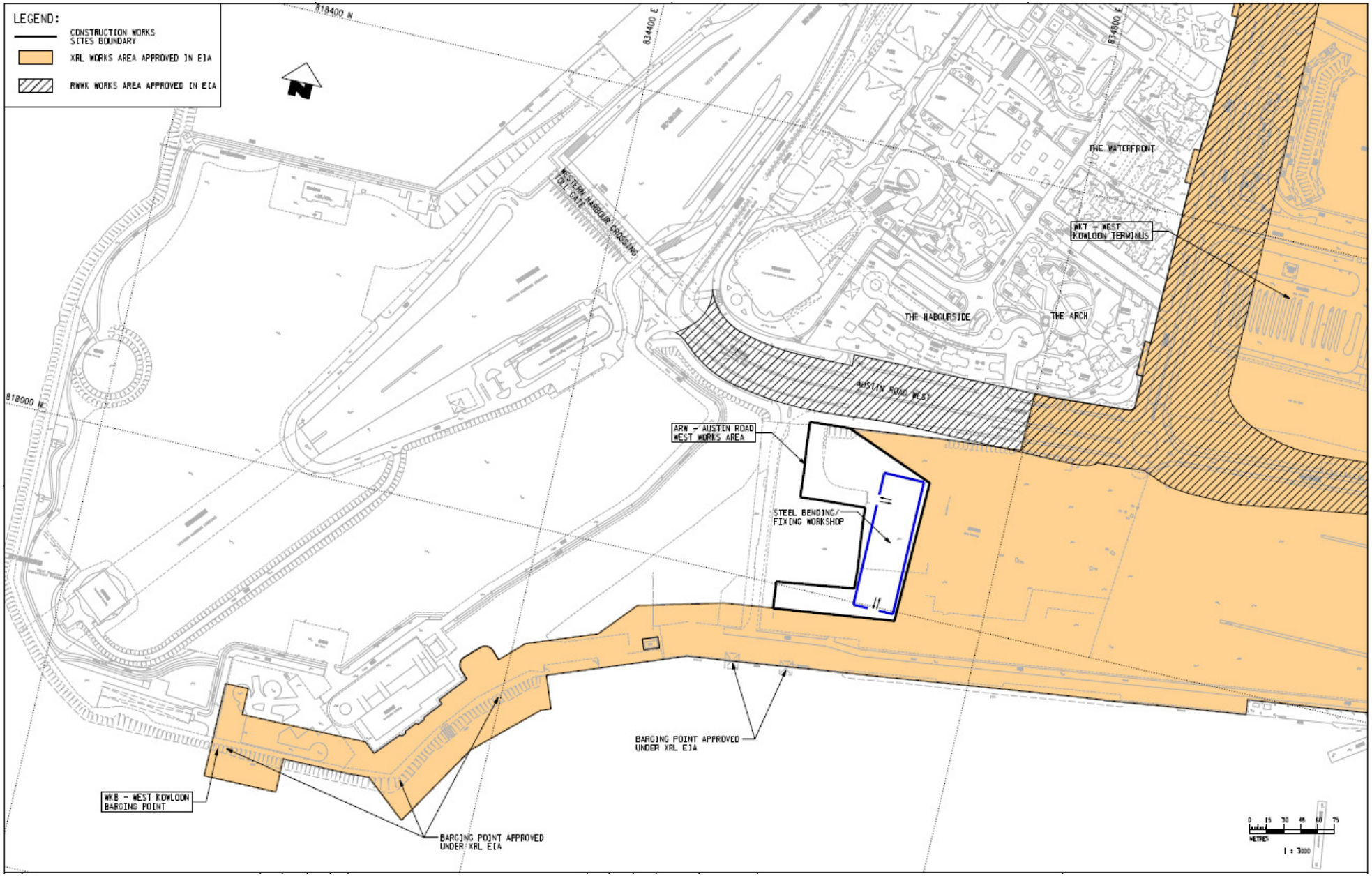

821600 E
822000 E
822400 E
822400 N
822000 N
TSING CHAU WAN
AG
TCB - TSING CHAU TSAI BARGING POINT
TOLL PLAZA
AIRPORT EXPRESS
NORTH LANTAU HIGHWAY
TSING CHAU TSAI
LEGEND:
WORKS AREA
SCHEME BOUNDARY

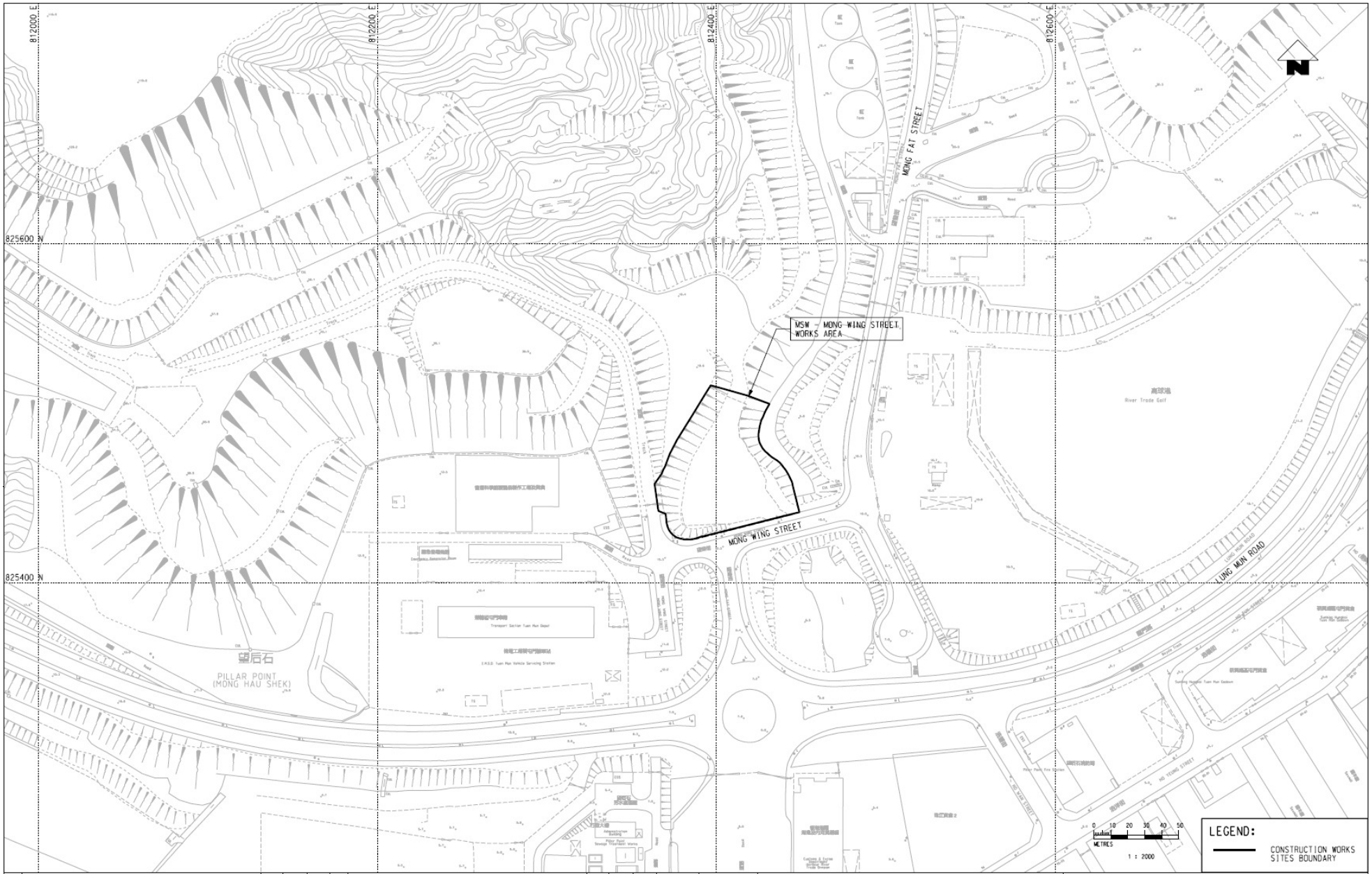

818400 E
CASTLE PEAK ROAD - TAI LAM
818000 E
LOK ON PAI SIU LAM
FLEA MARKET
SIU LAM SAN TSUEN
TSING FAT STREET
AA
SLB - SIU LAM
BARGING POINT
822200 N
824800 N
824400 N
0 15 30 45 60 75
METRES
1 : 3000
LEGEND:
WORKS AREA
SCHEME BOUNDARY

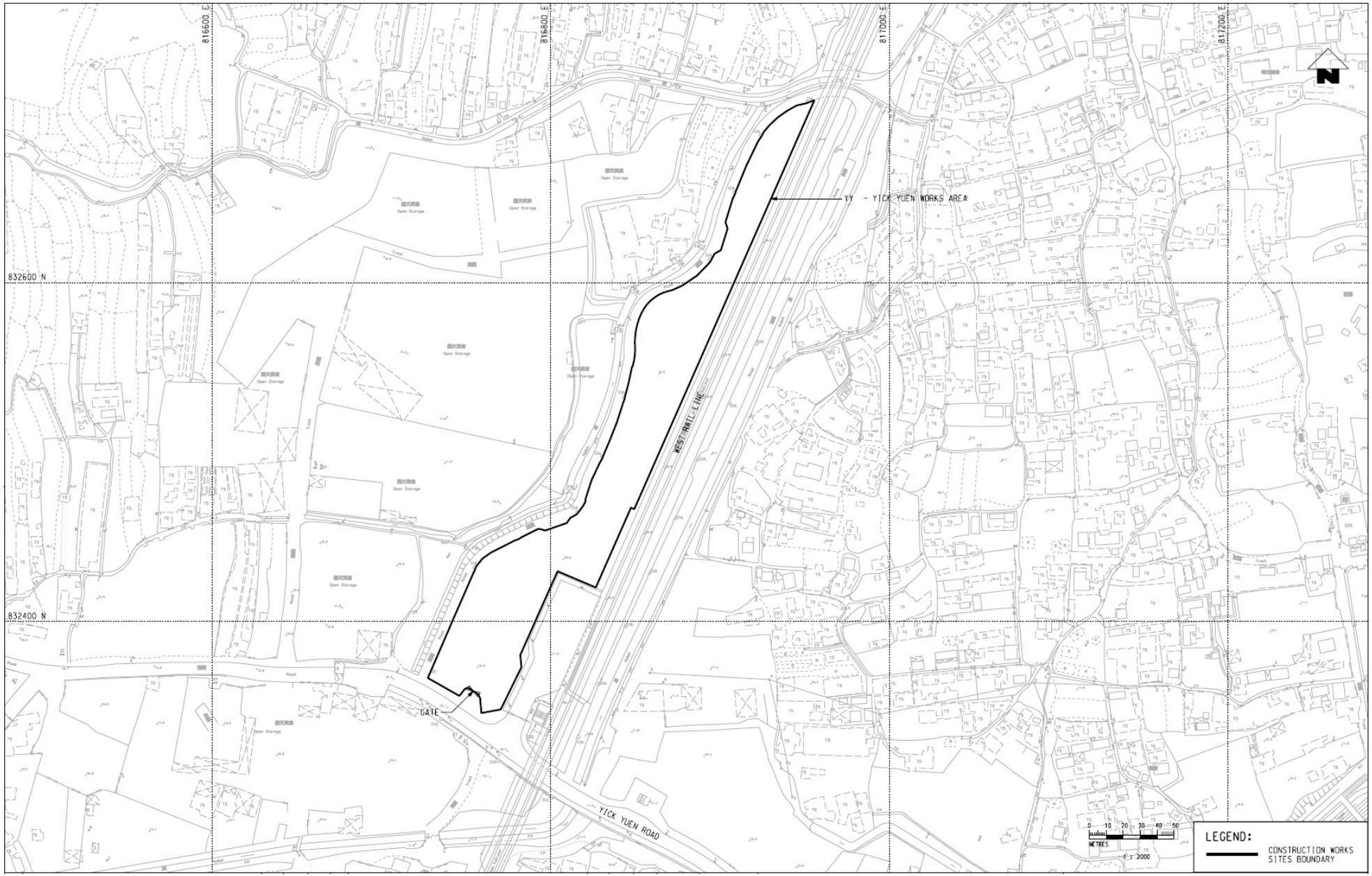

PHV – PAT HEUNG VENTILATION BUILDING
F
PAK PIN TSUEN
TO UK TSUEN
E
TSANG UK TSUEN
TUW – TSE UK TSUEN WORKS AREA
TPP – TAI KONG PO EMERGENCY ACCESS POINT
ERS – EMERGENCY RESCUE SIDINGS
D
SSS – SHEK KONG STABLING SIDINGS
C
826000 E
825000 E
824000 E
CHEUNG KONG TSUEN
SHEK KONG
KAM TIN RIVER
KAM TIN SAN TSUEN
TIN SAM SAN TSUEN
KAM SHEUNG ROAD
833000 N
832000 N
831000 N
0 60 120 180 240 300
METRES
1 : 12000
LEGEND:
WORKS AREA
PROPOSED SELECTED ALIGNMENT
UNDERGROUND FACILITIES
PERMANENT ABOVEGROUND FACILITIES
SCHEME BOUNDARY



MTR	Hong Kong Section of Guangzhou-Shenzhen-Hong Kong Express Rail Link Environmental Review Report – Stock Piling Facility in To Kau Wan	SCALE	N.T.S.	DATE	Dec-10
	Location Plan for To Kau Wan Stockpiling Area	DRAWING NO.	Figure 2.1		


LEGEND:
CONSTRUCTION WORKS SITES BOUNDARY
XRL WORKS AREA APPROVED IN EIA
RWWK WORKS AREA APPROVED IN EIA
818400 N
834400 E
834800 E
818000 N
WESTERN HARBOUR CROSSING TOLL GATE
THE WATERFRONT
WKT - WEST KOWLOON TERMINUS
THE HABOURSIDE
THE ARCH
AUSTIN ROAD WEST
ARW - AUSTIN ROAD WEST WORKS AREA
STEEL BENDING/ FIXING WORKSHOP
BARGING POINT APPROVED UNDER XRL EIA
WKB - WEST KOWLOON BARGING POINT
BARGING POINT APPROVED UNDER XRL EIA
METRES
1 : 3000


812000 E
812200 E
812400 E
812600 E
825600 N
825400 N
MSW - MONG WING STREET WORKS AREA
MONG FAT STREET
MONG WING STREET
LUNG MUN ROAD
PILLAR POINT
(MONG HAU SHEK)
望后石
River Trade Golf
0 10 20 30 40 50
METRES
1 : 2000
LEGEND:
CONSTRUCTION WORKS SITES BOUNDARY


816600 E
816800 E
817000 E
817200 E
832600 N
832400 N
YY - YICK YUEN WORKS AREA
WEST RAIL LINE
GATE
YICK YUEN ROAD
0 10 20 30 40 50
METRES
1 : 2000
LEGEND:
CONSTRUCTION WORKS SITES BOUNDARY

Appendix B

Project Management Organization and Contacts of Key Personnel

Title	Name	Telephone
Engineer's Representative		
Construction Manager (810A)	Mr. Nelson Yeung	2829 2384
Construction Manager (810B)	Mr. Ashley Calvert	2926 9098
Construction Manager (Contract 811B)	Mr. Kit CHAN	2164 2988
Senior Construction Engineer (802, 805, 820, 821 & 822)	Mr. Wilfred Chan	3519 4119
Construction Manager (Acting) (823A, 823B, 824, 825 & 826)	Mr. Eric Chan	2262 4788
Independent Environmental Checker		
Independent Environmental Checker	Mr. Eric Ching	2828 5825
Environmental Team		
Environmental Team Leader	Ms. Felice WONG	2688 1760
Contractor		
Contract 802 Contractor		
Project Manager	Mr. Frankie Lam	6021 2602
Environmental Officer	Ms. Andy Leung	9489 0035
Contract 805 Contractor		
Project Manager	Mr. Richard Chan	6348 8550
Environmental Engineer / Officer	Mr. Justin Lai	6330 6726
Contract 810A Contractor		
Principle Project Director	Mr. Adrian Clamp	6468 7678
Senior Environmental Officer	Mr. Dominic Fung	9664 2565
Contract 810B Contractor		

Title	Name	Telephone
Project Director	Mr. Jeremy Matterson	6629 4430
Environmental Officer	Ms. Diana Lee	9317 1219
Contract 811A Contractor		
Project Director	Mr. Mike O'Hanlon	2561 8072
Quality, Safety and Environmental Manager	Mr. Nick Lau	2164 2810
Environmental Officer (Deputy)	Miss Margaret Chung	9725 3895
Contract 811B Contractor		
Project Manager	Mr. Brian Gowran	2269 1517
Project Construction Manager	Mr. Roger Wong	2269 1520
Environmental Officer	Ms. Sammie Chan	2269 1507
Contract 820 & 821 Contractor		
Project Director	Mr. Alain Hervio	2215 6600 / 6112 9197
Senior QSE Manager	Mr. Y. T. So	2215 6631 / 9307 8728
Environmental Officer (820 & 821)	Ms. Gemini Lam	9430 9104
Contract 822 Contractor		
Project Manager	Mr. David Hutchinson	9738 8779
Environmental Officer	Ms. Lighting Chan	3552 2386
Contract 8217 Contractor		
Project Manager	Mr. Simon Lam	9342 7615
Environmental Officer	Mr. Zeno Fung	9215 8681
Contract 823A & B Contractor		
Project Director	Mr. Austen Hankinson	2411 7600
Environmental Officer	Mr. Calvin Chan	2411 7608

Title	Name	Telephone
Contract 824 Contractor		
Works Manager	Mr. Russell Lang	9200 4157
Environmental Officer	Mr. Snow Ho	6099 4479
Contract 825 Contractor		
Project Manager	Mr. Nakayama	2482 8101
Environmental Officer	Mr. Chan Sze Ming	9384 5494
Contract 826 Contractor		
Project Manager	Mr. Steven Meredith	2774 9886
Environmental Officer	Mr. Ryan Wong	2774 9886

Appendix C

Implementation Status

EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measures	When to implement the measures?	Implementation Status
Ecological Impact (Detailed design Phase / Pre-construction Phase)						
S3.398	- Prior to commencement of channel works, an ecological habitat management plan should be prepared to provide the detailed specifications for the habitats and ecological functions to be provided, and control of colonization of invasive plant species at the mitigation stream habitats and define the long-term management and ecological monitoring and audit requirements for these habitats.	To mitigate the avoidable loss of watercourse habitat	MTR	SSS	Detailed design phase / Prior to commencement of channel works	Ecological Habitat Management Plan (EHMP) formulated and submitted to EPD
S3.388 - S3.397	- The constructed channel in the SSS site should include open channel with ecologically friendly stream feature to mitigate the direct impact due to the loss of a watercourse habitat in Shek Kong.	To mitigate the avoidable loss of watercourse habitat	MTR / DDC	SSS	Detailed design phase	AFCD's comment has been sought during formulation of the EHMP
S3.410	- The implementation details of the impact monitoring programme should be described in ecological monitoring plan for EPD approval before commencement of construction activities.	To outline details of ecological impact monitoring	MTR	MPV, TPP, SSS / ERS, PHV and TUW	Before commencement of construction activities	Implemented

EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measures	When to implement the measures?	Implementation Status
S3.327 & S3.412	- A monitoring and emergency response plan (to be prepared by the Contractor), in relation to potential impacts due to groundwater drawdown, will form part of the EM&A requirement in the EM&A Manual subject to approval by EPD and AFCD before commencement of the tunnelling and MPV construction in Mai Po area. The plan should include, but not be limited to, details of monitoring locations and programme, a mechanism to monitor the implication from the works to the groundwater system and fish pond, action levels and emergency responses such as immediate action, remedial action and investigation.	To detect potential impacts due to groundwater drawdown	Contractor	MPV	Before commencement of the tunnelling and MPV construction	AFCD's comment has been sought during formulation of Plan
S3.413	- A monitoring and emergency response plan, in relation to impacts due to noise/vibration, should form part of the EM&A requirement in the EM&A Manual subject to approval by EPD and AFCD before commencement of the tunnelling and MPV construction in Mai Po area.	To detect and monitor noise / vibration impacts	Contractor	MPV	Before commencement of bore tunnelling and MPV construction	Implemented

EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measures	When to implement the measures?	Implementation Status
Ecological Impact (Construction Phase)						
S3.325 - S3.326	- Implementation of precautionary measures during tunnelling works.	To avoid potential hydrogeological impacts	Contractor	All works areas	Construction phase	Implemented
S3.409 to S3.410	- Ecological impact monitoring focusing on habitats and species of conservation interest should be conducted during the construction phase at the MPV, TPP, SSS / ERS, PHV, and TUW sites where a number of avifauna of conservation interest (e.g. overwintering bird, Greater Painted-snipe) and areas of conservation interest (e.g. country parks, conservation areas, and wetlands) were recorded. - Avifaunal communities should be surveyed quantitatively along transects. Birds heard or seen along the transects should be identified to species and counted. The nature of construction works within works area conducting during each impact monitoring visit should also be recorded. The quantitative monitoring results should be compared to pre-construction condition. The impact monitoring results should be undertaken by qualified ecologist(s) with relevant working experience.	To monitor potential indirect construction impacts to wildlife	MTR MTR	MPV, TPP, SSS / ERS, PHV, and TUW	Construction phase	Implemented

EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measures	When to implement the measures?	Implementation Status
	- Should any unpredicted indirect ecological impacts arising from the proposed Project be detected, remedial measures should be developed and implemented by the Contractor.		Contractor			
S3.327 & S3.412	- Implementation of the groundwater monitoring and emergency response plan.	To detect and minimize hydrological impacts	Contractor	MPV	Construction phase (During bore tunneling works and construction of Mai Po Ventilation Shaft)	Refer to Item for S3.327 & S3.412.
S3.413	- Implementation of monitoring and emergency response plan on noise and vibration.	To detect and minimize noise / vibration impacts	Contractor	MPV	Construction phase (During bore tunneling works and construction of Mai Po Ventilation Shaft)	Implemented

EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measures	When to implement the measures?	Implementation Status
S3.364 -S3.369	- Use of quiet construction plant and temporary noise barriers. - Access to the ventilation building sites should follow existing access roads, such as the maintenance access along the existing drainage channels. - Site hoarding of about 2.4 m high should be erected around the works area of access roads along drainage channels in the TPP and SSS / ERS sites. - Gate and fences should be installed along the construction accesses that are adjacent to public areas. - Gates and hoardings should be provided at the entrances/exits and along the boundary of the works areas respectively to prevent any trespassers from encroaching or will fully disturbing any wild animals and their habitats within the works areas. - A trip-ticket system should be adopted to monitor the disposal of construction and demolition materials. CCTV and warning signs should be provided at the entrance of the proposed temporary and permanent	To minimise impacts to surrounding habitats	MTR / Contractor	All works areas	Construction phase	Implemented

EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measures	When to implement the measures?	Implementation Status
	vehicular access.					
3.370 -3.371 and 3.373	- Vegetation located within the works areas should be preserved as far as practicable. - To avoid soil compaction, heavy machinery should not be used in close proximity to vegetation. Soils that become compacted through the activities of the development should be loosened to an appropriate depth to allow seed germination. - All temporarily affected habitats should be reinstated after the completion of works. - Placement of equipment or stockpiles should be confined to designated works areas. Access routes should be confined on existing disturbed land, where practicable.	To minimize impacts to vegetation	MTR / Contractor	All works areas	Construction phase	Implemented
	- Detailed vegetation survey should be conducted in TSW site prior to commencement of site clearance.	To minimize impacts to vegetation	MTR / Contractor	TSW	Prior to commencement of site clearance	Vegetation Survey Report formulated and deposited

EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measures	When to implement the measures?	Implementation Status
						to EPD
	- To mitigate the loss of the vegetation and habitats, planting of native species should be provided in the areas affected by the Project in TSW site, and other works area, where practicable.	To minimize impacts to vegetation	MTR / Contractor	TSW and all other works areas	Construction phase	Proposal of mitigatory planting at TSW was included in the Vegetation Survey Report. Mitigatory planting to be implemented as per construction programme
S3.372	- The affected individuals of Incense Tree within the NTV works area should be transplanted to nearby suitable habitats prior to the commencement of site clearance at NTV works area as far as practicable. - A detailed vegetation survey covering the affected	To minimize impacts to vegetation	MTR / Contractor	NTV	Construction phase	Vegetation survey was conducted and included in the Vegetation

EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measures	When to implement the measures?	Implementation Status
	habitat at NTV works area should be conducted by a suitably qualified botanist / ecologist to identify and record the affected individuals in order to provide details for the transplantation scheme prior to the commencement of site clearance. Feasibility and suitability of transplanting the affected individuals would be studied and suitable receptor sites would be identified. The transplantation proposal for the affected individuals should be prepared as necessary and transplantation should be supervised by a suitably qualified ecologist / horticulturist.					Survey Report. Transplantation of Incense Tree was completed and monitored.
S3.374 - S3.377	- Site hoarding of 2.4 m high should be set up along the boundary of the works areas as far as practicable.	To minimize disturbance to wildlife	Contractor	All works areas	Construction phase	Implemented
	- The erection of hoarding (2.4 m) along KT5 in the area with high Greater Painted-snipe occurrence (e.g. the proposed access road next to KT5) should avoid their breeding season, prior to construction activities in the area.			KT5 (near TPP)	Prior to the construction of access road	Implemented
	- The use of noisy construction equipment such as hydraulic breakers should be avoided at the area with			KT5 (near TPP)	Construction phase	Implemented

EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measures	When to implement the measures?	Implementation Status
	high painted-snipe occurrence (e.g. the proposed access road next to KT5) during their breeding season as far as practicable.					
	- Hoardings of 2.4 m height should be put in place before commencement of construction activities. Hoarding at the section along the northern boundary of the MPV works area should be installed first. The duration of hoarding erection should be kept as brief as practicable. - Upon the erection of site hoarding, all construction activities should be conducted within the fenced area.			MPV	Right after possession of site	Implemented
	- Major construction site lighting should point inward and downward. Unnecessary lighting should be turned off outside working hours of the construction sites.			All works area	Construction phase	Implemented
S3.378 - S3.380	- Excavation works carried out within waterbodies should be carried out in dry season where practicable. - Excavation works within the watercourse / drainage channel should be restricted when possible to an	To minimise pollution to waterbodies	Contractor	All works areas	Construction phase	Implemented

EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measures	When to implement the measures?	Implementation Status
	enclosed dry section of the watercourse / drainage channel, with containment measures such as bunds and barriers used within the watercourse / drainage channel. - Site runoff should be directed towards regularly cleaned and maintained silt traps and oil / grease separators. The silt and oil / grease separators should be appropriately designed for the local drainage and ground conditions. Tightly sealed closed grab excavators should be deployed where material to be handled is wet. - The flow of the watercourse and drainage channel located with the Project Area should be maintained throughout the construction phase.					
Terrestrial Ecological Impact (Post-construction / Operation Phase)						
S3.327 & S3.412	- Implementation of the groundwater monitoring and emergency response plan.	To detect and minimize hydrogeological impacts	Contractor	MPV	Post-construction phase	To be implemented as per construction programme

EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measures	When to implement the measures?	Implementation Status
S3.381	- The affected agricultural land should be restored to a condition suitable for agricultural use before handing over to landowners / operators.	To minimize impacts to surrounding habitats	MTR / Contractor	All temporarily occupied agricultural land	Operation phase	To be implemented as per construction programme
S3.382 – S3.384	- Vegetation control in the constructed channels should be implemented to prevent the excessive growth of vegetation that would impede the drainage capacity of the channel. To minimise sedimentation, de-silting should be limited to the dry season (November to March). The natural stream bed substrate should not be removed from the channel during de-silting works. - For maintenance de-silting, temporary barrier walls should be used to provide a dewatered zone for de-silting works. Waste material produced during de-silting should be disposed of in a timely and appropriate manner.	To minimise impacts to constructed channels	MTR	All constructed channels in SSS	Operation phase	To be implemented as per construction programme

EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measures	When to implement the measures?	Implementation Status
S3.385 & S3.387	- Large areas of reflective material (including glass) should not be used on the outer surfaces of the buildings. - All the major lighting sources should point inward and downward to minimise glare disturbance to wildlife. The intensity of light should also be controlled to the lowest possible level.	To minimise impacts to wildlife	MTR / DDC	All ventilation buildings in northern section and SSS	Detailed design and Operation phases	To be implemented as per construction programme
S3.411	- Implementation of ecological habitat management plan. - Ecological monitoring of the mitigation stream habitats according to ecological habitat management plan.	To monitor the wildlife use of the mitigation stream habitat	MTR	Mitigation stream habitat in SSS / ERS	Operation phase	To be implemented as per construction programme
Marine Ecological Impact (Construction Phase)						
Appendix3.6 (S1.102)	- The use of high-speed vessels should also be avoided during the construction and operation of the proposed barging point.	To minimise the indirect impact to Chinese White Dolphin habitat	Contractor	LKB	Construction phase	To be implemented as per construction programme
Appendix3.6	- No dumping of rubbish, oil or chemicals would be allowed.	To minimise the pollution to marine habitats	Contractor	LKB	Construction phase	To be implemented

EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measures	When to implement the measures?	Implementation Status
(S1.103)						as per construction programme
Appendix3.6 (S1.104)	- Deployment of silt curtains around the closed grab dredgers to minimize the suspended sediment impact due to dredging activities in dredging region. - To minimize impact on the gorgonians along the coastline near the dredging area, double silt curtains should be deployed around the works area.	To minimise the impact to subtidal habitats	Contractor	LKB	Construction phase	To be implemented as per construction programme
Appendix3.6 (S1.106)	- The number of work vessels and small crafts should be minimized. Dredging should be carried out continuously without unnecessary break to prevent unpredictable or sudden noise outbursts at random intervals.	To minimise disturbance impact on Chinese White Dolphin	Contractor	LKB	Construction phase	To be implemented as per construction programme
Appendix3.7 (S1.83)	- Mitigation measures to control water quality impacts proposed under Section 11 should be adopted.	To minimise indirect impact to intertidal and subtidal flora and fauna	Contractor	WKT	Construction phase	Implemented
Appendix3.6 (S1.105)	- Engines of vessels moored at the barging point would be turned off to minimize unnecessary underwater	To minimise disturbance impact on Chinese White Dolphin	Contractor	LKB	Construction phase	To be implemented as per

EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measures	When to implement the measures?	Implementation Status
	noise.					construction programme
Pond Fisheries Impact (Pre-construction Phase)						
S4.51	- A monitoring and emergency response plan, in relation to potential impacts due to groundwater drawdown, will form part of the EM&A requirement in the EM&A Manual subject to approval by EPD and AFCD before commencement of the tunnelling and MPV construction in Mai Po area. The plan should include, but not be limited to, details of monitoring locations and programme, a mechanism to monitor the implication from the works to the groundwater system and fish ponds including their water levels, action levels and emergency responses such as immediate action, remedial action and investigation.	To detect and minimize potential hydrological impacts	Contractor	MPV	Pre-construction phase (Before commencement of the tunnelling and MPV construction)	AFCD's comment has been sought during formulation of Plan
S4.52	- A monitoring and emergency response plan, in relation to impacts due to noise/vibration, should form part of the EM&A requirement in the EM&A Manual subject to approval by EPD and AFCD	To detect and monitor noise / vibration impacts	Contractor	MPV	Pre-construction phase (Before commencement of bore	Implemented

EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measures	When to implement the measures?	Implementation Status
	before commencement of the tunnelling and MPV construction in Mai Po area.				tunnelling and MPV construction)	
S4.45	- Consultation should be conducted with fish operators in Mai Po before tunnelling starts. The method of construction, potential impact and mitigation measures should be fully explained to the operators at the meeting.	Engagement of stakeholders	Contractor / MTR	MPV	Pre-construction phase (Before commencement of tunneling works)	Consultation with Mai Po Village VR has been conducted.
Pond Fisheries Impact (Construction Phase)						
S4.51	- Implementation of the groundwater monitoring and emergency response plan.	To detect and minimize hydrogeological impacts	Contractor	MPV	Construction phase (During bore tunneling works and construction of Mai Po Ventilation Shaft)	Implemented
S4.52	- Implementation of the monitoring and emergency response plan on noise and vibration.	To detect and minimize noise / vibration impacts	Contractor	MPV	Construction phase (During bore tunneling works and	Implemented

EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measures	When to implement the measures?	Implementation Status
					construction of Mai Po Ventilation Shaft)	
S4.40	- Good site practices and proper dust and water quality control measures should be implemented. These include site confinement with fencing/hoarding erection at the perimeter of the works area, stockpile covering by impervious sheeting to avoid spread of construction dust, and proper handling, storage and disposal of chemical waste to avoid contamination of the existing water system, etc.	To minimize the indirect off-site impacts on the adjacent fishponds	Contractor	MPV	Construction phase	Implemented
S4.44	Implementation of good site practices during the construction phase: ▪ Only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction program; ▪ Silencers or mufflers on construction equipment should be utilized and properly maintained during the construction program;	To minimize disturbance to fishponds by construction noise	Contractor	MPV	Construction phase	Implemented

EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measures	When to implement the measures?	Implementation Status
	▪ Machines and plant (such as trucks) that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum; ▪ Plant known to emit noise strongly in one direction should, wherever possible, be orientated so that the noise is directed away from the nearby fishponds; ▪ Material stockpiles and other structures should be effectively utilized, wherever practicable, in screening noise from on-site construction activities; ▪ Use of movable barrier for certain powered mechanical equipment (PME); and ▪ Use of noise enclosure or acoustic shed to cover certain stationary PME.					
Pond Fisheries Impact (Post-construction Phase)						
S4.51	- Implementation of the groundwater monitoring and emergency response plan.	To detect and minimize hydrogeological impacts	Contractor	MPV	Post-Construction phase	To be implemented as per construction programme
Marine Fisheries Impact (Construction Phase)						
Appendix4.2	- Mitigation measures to control water quality impacts	To minimize the indirect impact on fisheries	Contractor	LKB and WKT	Construction phase	To be implemented

EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measures	When to implement the measures?	Implementation Status
(S1.38)	proposed under Section 11 should be adopted.	resources				as per construction programme
Airborne Noise Impact (Construction Phase)						
S5.120	The following good site practices should be implemented: ▪ Only well-maintained plant should be operated on-site and plants should be serviced regularly during the construction program; ▪ Silencers or mufflers on construction equipment should be utilized and should be properly maintained during the construction program; ▪ Mobile plant, if any, should be sited as far from noise sensitive receivers (NSRs) as possible; ▪ Machines and plant (such as trucks) that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum; ▪ Plant known to emit noise strongly in one direction should, wherever possible, be orientated so that the noise is directed away from the nearby NSRs; and ▪ Material stockpiles and other structures should be effectively utilized, wherever practicable, in	To reduce construction noise impact	MTR / Contractor	All works areas	Construction phase	Implemented

EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measures	When to implement the measures?	Implementation Status
	screening noise from on-site construction activities.					
S5.121-S5.122 and Table 5.22	The following quiet PME should be used: ▪ Pneumatic breaker (SWL=110dB(A)) ▪ Tracked Excavator Fitted with Hydraulic Breaker (SWL=110dB(A)) ▪ Truck Mixer (SWL=100dB(A)) ▪ Tracked Crane (SWL=101dB(A)) ▪ Dump Truck (SWL=103dB(A)) ▪ Tracked Excavator/Loader (SWL=105dB(A)) ▪ Dozer (SWL=111dB(A)) ▪ Road Roller (SWL=101dB(A))	To reduce construction noise impact	MTR / Contractor	Works Areas A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, Y, Z, AA, AC, AE, AF, AG and AH	Construction phase	Implemented
S5.123 - S5.124	Movable noise barrier should be used for the following PME where practicable: ▪ Mini backhoe ▪ Breaker, mini-robot mounted ▪ Vibratory poker ▪ Handheld breaker ▪ Excavator ▪ Grab	To reduce construction noise impact	MTR / Contractor	Works Areas A, C and D	Construction phase	Implemented

EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measures	When to implement the measures?	Implementation Status
	▪ Tracked Crane					
S5.125	Noise enclosure/acoustic shed should be used for the following PME where practicable: ▪ Air compressor ▪ Concrete pump ▪ Grout pump ▪ Shotcrete pump	To reduce construction noise impact	MTR / Contractor	Works Areas A, B, C, D, E, F, G, H, I, J, K, L, M, O, P, Q, S, T, U, V and Z	Construction phase	Implemented
S5.125	Acoustic enclosure should be used for enclosing drilling jumbo as fully as possible.	To reduce construction noise impact	MTR / Contractor	Works Areas B, C, F, H and J	Construction phase	Implemented
S5.127	Silencer should be used for the ventilation fans.	To reduce construction noise impact	MTR / Contractor	Works Areas A, B, C, D, E, F, H, J, L and P	Construction phase	Implemented
S5.128	Noise insulating fabric should be applied where practicable to cover the following PME: ▪ Drill rig ▪ Grab and chisel ▪ Oscillator & casings ▪ Piling rig	To reduce construction noise impact	MTR / Contractor	Works Areas A, B, C, D, E, G, L, M, N, O, Q, R, S, V	Construction phase	Implemented

EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measures	When to implement the measures?	Implementation Status
	▪ Piling, large diameter bored, reverse circulation drill ▪ Piling, vibrating hammer					
S5.130	Use of "Noise Insulating Cover" to cover the mucking out points.	To reduce construction noise impact	MTR / Contractor	Works Area L	Construction phase	To be implemented as per construction programme
S5.131	Use of temporary hoardings along the works boundary.	To reduce construction noise impact	MTR / Contractor	Works Areas B and D	Construction phase	Implemented
S5.134-S5.136	Use of saw instead of mini-robot mounted breaker and oscillator pile for removal of superstructures	To reduce construction noise impact	MTR / Contractor	Works Areas N, O and S	Construction phase	Implemented
S5.137	Scheduling of construction works outside school examination periods	To reduce construction noise impact	MTR / Contractor	Works Areas G, J, K, L, N, O, P, Q, Y, U, V and AH	Construction phase	Implemented
S5.193	Airborne construction noise monitoring should be conducted in accordance with EM&A Manual to monitor the airborne noise impact.	To monitor airborne noise impact	MTR / Contractor	Proposed monitoring locations	Construction phase	Implemented

EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measures	When to implement the measures?	Implementation Status
Airborne Noise Impact (Operation Phase)						
S5.113 and Table 5.21	The maximum permissible sound power levels (Max SWLs) for the fixed plant should be complied with during the selection of equipment and mitigation measures.	To comply with the noise criteria of Noise Control Ordinance	MTR / DDC	MPV, NTV, PHV, SMV, KCV, NCV, MKV, WKV and WKT	Detailed design and operation phases	To be implemented as per construction programme
S5.140	Noise barrier should be erected as follow: ▪ A 8m high barrier along the access road on eastern side of SSS; and ▪ 5.5m barrier along western boundary facing Leung Uk Tsuen squats.	To comply with the noise criteria of Noise Control Ordinance	MTR / DDC	SSS	Detailed design and operation phases	To be implemented as per construction programme
S5.140	Installation of 13m absorptive panels on both sides and full length of ERS.	To comply with the noise criteria of Noise Control Ordinance	MTR / DDC	ERS	Detailed design and operation phases	To be implemented as per construction programme
S5.196	Noise commissioning test is recommended to monitor the ground-borne noise level complying with NCO.	To monitor ground-borne noise impact	MTR / Contractor	Proposed monitoring locations	Operation phase	To be implemented as per

EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measures	When to implement the measures?	Implementation Status
						construction programme
Ground-borne Noise Impact (Construction Phase)						
S6.82	Ground-borne construction noise monitoring should be conducted in accordance with EM&A Manual to monitor the ground-borne noise impact.	To monitor ground-borne noise impact	MTR / Contractor	Proposed monitoring locations	Construction phase	To be implemented as per construction programme
S6.85	Construction groundborne noise measurement results should be used to further update the ground-borne noise prediction where appropriate.	To update the predicted ground-borne noise levels.	MTR / Contractor	TBM tunneling section	Construction phase	To be implemented as per construction programme
S6.83	Conduct tests of the FDL of the train to update the ground-borne noise prediction and the recommended mitigation measures as necessary.	To confirm the predicted ground-borne noise levels	MTR	-	Prior to the final design of the trackform and the extent of each type of trackform, and after the proposed train in operation	To be implemented as per construction programme

EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measures	When to implement the measures?	Implementation Status
					outside Hong Kong	
S6.84	Conduct vibration borehole testing at two carefully selected locations along the proposed tunnel alignment to determine the LSR values under certain geological conditions. The ground-borne noise predictions and the recommendation on mitigation measures should be updated as necessary.	To confirm the predicted ground-borne noise levels	MTR	Proposed two locations	Prior to the commencement of construction works	The measurement was completed and the Performance Test Plan has been approved by EPD
Ground-borne Noise Impact (Operation Phase)						
S6.87	Noise commissioning test is recommended to monitor the ground-borne noise level complying with NCO.	To monitor ground-borne noise impact	MTR / Contractor	Proposed monitoring locations	Operation phase	To be implemented as per construction programme
Landscape and Visual Impact (Construction Phase)						
Table	All existing trees should be carefully protected during construction as far as possible in accordance with	To minimize landscape and visual impacts during	Contractor	Works areas	Detailed design and construction	Implemented

EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measures	When to implement the measures?	Implementation Status
7.10	ETWB TCW No. 29/2004 and 3/2006.	construction phase			phases	
	Trees should be retained on site as far as possible. Should removal of trees be unavoidable due to construction impacts, trees will be transplanted or felled depending on stated criteria in the Tree Removal Applications to be submitted separately in accordance with ETWBC 2/2004 and 3/2006. Wood resulting from tree removal should be recycled as mulch or soil conditioner which could be used within the Project or in other projects as much as possible.		Contractor			
	Control of night-time lighting glare.		Contractor			
	Erection of decorative screen hoarding to screen off undesirable views of the construction site having consideration of safety and security.		Contractor			
	Reuse of existing topsoil where possible for new planting areas within the project.		Contractor			
Landscape and Visual Impact (Operation Phase)						
Table 7.11	Compensatory tree planting should be incorporated into the proposed Project where space is available	To minimize landscape and visual impacts during	MTR	Works areas	Detailed design and operation	To be implemented as per
	Landscape and visual enhancement treatments		MTR			

EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measures	When to implement the measures?	Implementation Status
		operation phase			phases	construction programme
	Compensatory habitat proposal for natural stream course at SSS		MTR			
	Reinstatement of works area in Nam Cheong Park to integrate with the existing park.		MTR			
	Tall buffer tree planting should be incorporated provide screening to ventilation buildings, engineering structures and associated facilities.		MTR			
	Roof greening to mitigate the visual impact of VB on the VSRs at high level.		MTR			
	Vertical greening would be incorporated where practicable to visually soften the façade of ventilation building and/or noise barrier		MTR			
	Incorporation of aesthetically pleasing streetscape design which would be responsive to adjacent landscape context.		MTR			
	Roadside amenity trees to enhance the landscape and visual quality of the existing and proposed road.		MTR			
	Reinstatement of disturbed areas to match adjacent area or to condition to suit future landuse.		MTR			
	Aesthetically pleasing design as regard to the form, material and finishes shall be incorporated to all		MTR			

EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measures	When to implement the measures?	Implementation Status
	buildings, engineering structures and associated infrastructure facilities so as to blend in the buildings and structures to the adjacent landscape and visual context.					
	Control of Operation Night-time Glare		MTR			
	Incorporation of aesthetically pleasing design to boundary fence so as to blend in the structure to the adjacent landscape and visual context.		MTR			
	The scale, location, disposition and design of the ventilation shafts at WKCD would be further reviewed and submitted to relevant parties (e.g. WKCDA and PlanD) for agreement.		MTR			
Cultural Heritage Impact						

EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measures	When to implement the measures?	Implementation Status
S8.100 – S8.103	• Conduct further investigation (a minimum of 18 trial pits, 1m x 1.5m) to confirm any archaeological remains exist in the inaccessible areas (**NOL/ERL/300/C/XRL/ENS/M55/303- 304 & 306-307**). If archaeological data collected from these 18 test pits is insufficient to ascertain the archaeological potential of the inaccessible areas, additional test pits should be conducted • Conduct rescue excavation to preserve archaeological remains by detailed records if found (**NOL/ERL/300/C/XRL/ENS/M55/307**)	To confirm any archaeological remains exist in the inaccessible areas and to preserve archaeological remains if any	MTR	Proposed rescue excavation area in SSS and other archaeological deposit areas identified in the further archaeological investigation	Prior to construction phase	Further Archaeological Investigation has been conducting according to Archaeological Action Plan formulated
S8.103	Conduct archaeological watching brief during construction works at TUW for identification of any historical finds during construction phase	To identify any historical finds in the works area	MTR	TUW	Construction phase	Implemented
S8.104	Conduct regular site audit during the construction of barging point to confirm that no excavation works is conducted at Lung Kwu Sheung Tan archaeological deposit area.	To avoid direct impact	MTR	LKST barging point and associated access road	Construction phase	To be implemented as per construction programme

EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measures	When to implement the measures?	Implementation Status
S8.105	Restriction of works boundary of TPP to be extended to relics discovered area outside TPP.	To avoid direct impact	MTR	TPP	Construction phase	Implemented
S8.107, S8.128	Avoid works areas at the sites of the identified built heritage structures as far as practicable. Identified earth shines within works boundary of SSS and TPP will be relocated by local villagers prior to commencement of construction works at SSS and TPP.	To avoid direct impact	MTR	Earth shines (NHL-04,TKP-02 and LET-07)	Prior to construction phase	Implemented
S8.109, S8.125	Vibration monitoring at Lai Chi Kok Hospital: ▪ Prior to commencement of construction works, the location and installation of the monitoring stations should be discussed and agreed with AMO, Hong Kong Institution for Promotion of Chinese Culture (the "NPO", selected organization for the Revitalisation Scheme), the Commissioner for Heritage's Office and relevant parties before installation. ▪ Compliance monitoring of vibration limits should be conducted and reported as a requirement of EM&A programme.	To monitor vibration impacts on the identified vibration sensitive historical buildings	MTR	Ex-Lai Chi Kok Hospital	Before construction phase; Construction phase	To be implemented as per construction programme

EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measures	When to implement the measures?	Implementation Status
S8.110, S8.126	▪ A further condition survey and appropriate consolidation works (e.g. installation of temporary propping or reinforced timber beam to maintain the stability of structure etc.), if required, will be carried out on Blocks P Q, W and the inaccessible area of LCKH prior to construction. It should be discussed and agreed in advance with AMO, NPO, the Commissioner for Heritage's Office and relevant parties,	To minimize vibration impacts on the identified vibration sensitive historical buildings	MTR	Ex-Lai Chi Kok Hospital	Detailed design	To be implemented as per construction programme
S8.112, S8.127	▪ If consent is given by the property owner, a condition survey will be carried out at Cheung Yuen prior to the commencement of works in SSS. The survey should be discussed and agreed in advance with AMO and property owner prior to commencement of survey.	To minimize vibration impacts on the identified vibration sensitive historical buildings	MTR	Cheung Yuen	Prior to construction phase	AMO's comment has been sought during formulation of Vibration Monitoring Plan
S8.112, S8.127	▪ If consent is given by the property owner, vibration monitoring at LET-06 (Cheung Yuen) will be conducted when excavation works are being conducted within 50m radius from the house. The monitoring location should be discussed and agreed	To monitor vibration impacts on the identified vibration sensitive historical buildings	MTR	Cheung Yuen	Construction phase	Implemented

EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measures	When to implement the measures?	Implementation Status
	with AMO and property owner before installation.					
S8.113, S8.124	▪ Control of vibration levels from the proposed blasting and excavation activities within a peak particle velocity (ppv) limit of 25mm/s to prevent potential vibration impact to all identified built heritage resources.	To minimize vibration impacts on the identified vibration sensitive historical buildings	MTR	All works area where blasting and excavation activities are involved	Construction phase	Implemented
S8.114 - S8.115	▪ Use of sensibly designed screen hoardings for reducing the potential visual impact.	To minimize visual impacts	MTR	All identified heritage buildings in all works areas	Detailed design and construction phase	Implemented
Land Contamination Impact						
S9.28 – S9.33	Remediation of Contaminated Soil ▪ After excavation, confirmation sampling and testing shall be conducted from the sidewalls and at base of the excavations to ensure complete excavation of contaminated soils. ▪ Bioremediation (biopiling) / ex-situ chemical oxidation are proposed to remediate the contaminated soil recorded in Sites H and Q.	To remediate contaminated soil	Contractor	Sites H and Q	Site remediation	For Site H: Remediation has been conducting according to the approved Supplementary

EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measures	When to implement the measures?	Implementation Status
	Remediation Report(s) (RR) for contaminated works area(s) should be prepared by the Land Contamination Specialist to detail the remediation process and demonstrate that contaminated soils are all removed, properly handled and disposal of. The remediated soil should be reused on site to minimise the waste disposal.					RAP. For Site Q: To be implemented as per construction programme
S9.35(i)	For construction works of the alignment close to Ngau Tam Mei Landfill ▪ As a general precautionary measure, visual inspection of excavated materials should be conducted to screen soil for signs of contamination (e.g. discoloration, stains and odour). The inspection process should also be assisted by a photo ionization detector (PID) for volatile organics. If suspected materials are encountered during tunnel boring, sampling and testing for the parameters recommended in Table 6.1 of CAP should be undertaken to verify any contamination. The suspected soil bored out during excavation and tunnel boring should be temporary stockpiled and if laboratory analysis indicated exceedance of relevant RBRG levels, remediation works, should be undertaken depending on the quantity and	Acting as a general precautionary measure to screen soil for signs of contamination during tunnel boring works under/close to Ngau Tam Mei Landfill	MTR/Contractor	Within the Landfill Boundary where signs of contamination is identified	During Tunnel Boring within Ngau Tam Mei Landfill Boundary Section	To be implemented as per construction programme

EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measures	When to implement the measures?	Implementation Status
	quality of contaminated soil identified.					
S9.35(ii)	For construction works at CLP transformer station at Lai Cheung Road and Petrol Filling Station at 82 Tai Kok Tsui Road ▪ As a general precautionary measure, visual inspection of excavated materials should be conducted to screen soil for signs of contamination (e.g. discoloration, stains and odour). The inspection process should also be assisted by a photo ionization detector (PID) for volatile organics. If suspected materials are encountered during tunnel boring, further sampling and testing should also be undertaken to verify any contamination. The soil bored out during excavation and tunnel boring should be temporary stockpiled and if laboratory analysis indicated exceedance of relevant RBRG levels, remediation works, should be undertaken depending on the quantity and quality of contaminated soil identified.	Acting as a general precautionary measure to screen soil for signs of contamination during tunnel boring/ excavation at CLP transformer station at Lai Cheung Road and Petrol Filling Station at 82 Tai Kok Tsui Road	MTR/Contractor	Area close to CLP transformer station at Lai Cheung Road and Petrol Filling Station at 82 Tai Kok Tsui Road where signs of contamination is identified	During Tunnel Boring/ excavation works near CLP transformer station at Lai Cheung Road and Petrol Filling Station at 82 Tai Kok Tsui Road	To be implemented as per construction programme
S9.35 (iii)	For sites with contamination identified (Site H and Site Q) the following environmental mitigation measures should be undertaken during the course of the site remediation: ▪ Excavation profiles must be properly designed and executed with attention to the relevant requirements for environment, health and safety;	To minimise the potentially adverse environmental impacts arising from the handling of potentially contaminated materials.	Contractor	Sites H and Q /during transportation	Site remediation and prior to construction phase	For Site H: Implemented For Site Q: To be

EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measures	When to implement the measures?	Implementation Status
	▪ Excavation should be carried out during dry season as far as possible to minimise contaminated runoff from contaminated soils; ▪ Supply of suitable clean backfill material is needed after excavation; ▪ The chemical oxidant proposed (RegenOxTM) as a contaminant mass reduction technology. Comprises a solid oxidant complex (sodium percarbonate/catalytic formulation) and an activator complex (a composition of ferrous salt embedded in a micro-scale catalyst gel). These chemical will be securely stored, separately and way from sources of ignition or oxidizable items. Handling will & will be undertaken by persons specifically trained and wearing appropriate PPE. ▪ Vehicles containing any excavated materials should be suitably covered to limit potential dust emissions or contaminated wastewater run-off, and truck bodies and tailgates should be sealed to prevent any discharge during transport or during wet conditions; ▪ Speed control for the trucks carrying contaminated materials should be enforced; and ▪ Vehicle wheel and body washing facilities at the site's exist points should be established and used.					implemented as per construction programme
S9.35(iv)	In order to minimise the potentially adverse effects on health and safety of construction workers during the	To minimise the potentially adverse effects on health and safety of	Contractor	Sites H and Q	Site remediation and prior to construction	

EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measures	When to implement the measures?	Implementation Status
	course of site remediation, the Occupation Safety and Health Ordinance (OSHO) (Chapter 509) and its subsidiary Regulations should be followed by all site personnel working on the site at all times. In addition, the following basic health and safety measures should be implemented as far as possible: ▪ Set up a list of safety measures for site workers; ▪ Provide written information and training on safety for site workers; ▪ Keep a log-book and plan showing the contaminated zones and clean zones; ▪ Maintain a hygienic working environment; ▪ Avoid dust generation; ▪ Provide face and respiratory protection gear to site workers; ▪ Provide personal protective clothing (e.g. chemical resistant jackboot, liquid tight gloves) to site workers; and ▪ Provide first aid training and materials to site workers.	construction workers during the course of site remediation			phase	
9.35(v)	For Areas Feasible or Infeasible for On-Site Inspection and Site Investigation	(i) To identify areas with land contamination concern, report laboratory results and propose remediation measures if necessary. (ii) To ensure remediation works have been undertaken to before the commencement of any construction works of the Project that may disturb the ground of the south-western portion of the MPV.	MTR/ Contractor	Areas Infeasible for On-Site Inspection and Site Investigation and WSW	After land resumption and prior to the construction works commencement at respective sites	Implemented

EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measures	When to implement the measures?	Implementation Status
	(i) Phase 2 supplementary SI works ▪ Upon site access is granted, site inspection should be carried out to ascertain any contaminative sources and hotspot of contamination within the site. ▪ The sampling and testing schedule as recommended in the approved CAP should then be updated based on respective site situation and the number of sampling locations may be significantly reduced. A revised CAP should then be submitted to EPD for endorsement. ▪ For supplementary CARs and RAP(s), upon completion of SI and laboratory testing, supplementary CARs should be submitted to EPD for endorsement. If contamination is identified, RAP(s) should also be submitted to EPD for endorsement. ▪ The revised CAPs and supplementary CARs and /or RAP(s) should be submitted in separate packages for different works area depending on the schedule of land resumption and the commencement of construction works for each works area. ▪ RR(s) should be submitted to demonstrate completion of remediation works before construction work starts at the site. (ii) WSW					

EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measures	When to implement the measures?	Implementation Status
	▪ According to WSW EP Condition 3.14, the Project Proponent of the WSW development shall prepare and submit CAR/RAP to EPD within 2 months after commencement of construction of the WSW development and the recommendations in the endorsed CAR/RAP shall be fully implemented before the commencement of any construction works that may disturb the ground of the relevant sites. ▪ This project will ensure that the completion of remediation works before the construction works at contaminated areas start.					
Waste Management Implications (Construction Phase)						
S10.107	Recommendations for good site practices: ▪ Prepare a Waste Management Plan approved by the Engineer/Supervising Officer of the Project based on current practices on construction sites; ▪ Training of site personnel in, site cleanliness, proper waste management and chemical handling procedures; ▪ Provision of sufficient waste disposal points and regular collection of waste; ▪ Appropriate measures to minimize windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers; ▪ Regular cleaning and maintenance programme for	To implement good site practice for handling, sorting reuse and recycling of C&D materials	Contractor	All works areas	Construction phase	Implemented

EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measures	When to implement the measures?	Implementation Status
	drainage systems, sumps and oil interceptors; and ▪ Separation of chemical wastes for special handling and appropriate treatment.					
S10.108	Recommendations for waste reduction measures: ▪ Sorting of demolition debris and excavated materials from demolition works to recover reusable/ recyclable portions (i.e. soil, broken concrete, metal etc.); ▪ Segregation and storage of different types of waste in different containers, skips or stockpiles to enhance reuse or recycling of materials and their proper disposal; ▪ Encourage collection of aluminium cans by providing separate labelled bins to enable this waste to be segregated from other general refuse generated by the workforce; ▪ Proper storage and site practices to minimize the potential for damage or contamination of construction materials; ▪ Plan and stock construction materials carefully to minimize amount of waste generated and avoid unnecessary generation of waste; and ▪ Training should be provided to workers about the concepts of site cleanliness and appropriate waste management procedures, including waste reduction, reuse and recycle.	To implement on-site sorting facilitating reuse and recycling of materials as well as proper disposal of waste	Contractor	All works areas	Construction phase	Implemented

EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measures	When to implement the measures?	Implementation Status
S10.109	The Contractor should prepare and implement a Waste Management Plan (WMP) as a part of the Environmental Management Plan (EMP) in accordance with ETWB TCW No. 19/2005 which describes the arrangements for avoidance, reuse, recovery, recycling, storage, collection, treatment and disposal of different categories of waste to be generated from the construction activities.	To keep trace of the generation, minimization, reuse and disposal of C&D materials in the Project	Contractor	All works areas	Construction phase	Implemented
S10.112	Storage of materials on site may induce adverse environmental impacts if not properly managed, recommendations to minimise the impacts include: ▪ Waste, such as soil, should be handled and stored well to ensure secure containment, thus minimising the potential of pollution; ▪ Maintain and clean storage areas routinely; ▪ Stockpiling area should be provided with covers and water spraying system to prevent materials from wind-blown or being washed away; and ▪ Different locations should be designated to stockpile each material to enhance reuse.	To minimise potential impacts of waste storage and enhance reusable volume	Contractor	All work areas	Construction phase	Implemented
S10.113	Waste hauliers must hold a valid permit for the collection of waste as stipulated in their permits. Removal of waste should be done in a timely manner.	To collect and remove waste generated	Contractor	All work areas	Construction phase	Implemented
S10.114-115	Implementation of trip-ticket system to monitor waste disposal and control fly-tipping.	To monitor disposal of waste and control fly-tipping	Contractor	All work areas	Construction phase	Implemented

EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measures	When to implement the measures?	Implementation Status
	Set up warning signs at vehicular access points reminding drivers of designated disposal sites and penalties of an offence. Installation of close-circuited television at access points of vehicles to monitor and prevent illegal dumping.					
S10.117	Recommendations for excavated materials within works areas: ▪ Several ramps should be used for transportation of different materials as far as practicable (at SSS/ERS site, both soft and hard materials could be generated with the provision of three ramps, each of them can be used for single material for primary separation). Each ramp should be used for transportation of a single material as far as practicable. ▪ If a conveyor system is used, materials should be transported separately on the belts, it is therefore proposed that more than one conveyor belt should be installed if possible. If more than one material is needed to be transported on a single belt, each material should be stockpiled separately once they are removed from the excavation face to the ground and the belt should operate at different times with different materials as far as practicable. ▪ Enclosure should also be provided for the conveyor belt, as far as practicable to minimize the of dust generation.	To mitigate and minimize the potential impacts from the storage and transportation of materials within works areas	Contractor	All works areas	Construction Phase	Implemented

EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measures	When to implement the measures?	Implementation Status
	▪ Different locations should be designated for each material during stockpiling. Stockpiling may be needed when the conveyor system is under constraint or when the spoil could not be transported away from works area immediately after excavation. Cover should be provided to dusty stockpiles to avoid the materials from being wind-blown or flushed away by water. It is expected that water spraying system should also be equipped to moisten the materials.					
S10.119	Wet spoil generated from TBM construction, construction of bored piles and D-wall should be properly handled before disposal to Taishan and Fill Banks respectively for reuse in other projects. Dry materials should be mixed with the wet spoil or by the use of lime to reduce water content where applicable.	To minimise impacts to disposal outlet from reception of wet spoil	Contractor	All works areas	Construction phase	Implemented
S10.120	Wheelwash facilities should be provided before the trucks leave the works area.	To minimise dust impact	Contractor	All works areas	Construction phase	Implemented
S10.121	The Contractor should ensure the on-site separation from inert portion. The waste delivered to landfill should not contain any free water or have water content more than 70% by weight. The haulier must ensure suitable amount of waste would be loaded on different types of trucks used. A one-week notice should be given to EPD with information on Contractor's name and respective contact details.	To meet the requirement for disposal at landfill	Contractor and Waste haulier	All works areas	Construction phase	Implemented

EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measures	When to implement the measures?	Implementation Status
S10.125	This will generally follow the PNAP 25 in handling of dredged/excavated sediment. The dredged / excavated sediments would be loaded onto barges and transported to existing designated disposal sites allocated by the MFC according to their levels of contamination, as presented below: ▪ For Type 1 sediment, the sediments will be excavated/dredged and transport to designated CEDD Facilities, typically at South Cheung Chau and/or Ninepin. ▪ For Type 2 sediment, the sediments will be dredged/excavated and transport to designated CEDD Facilities, typically at East Sha Chau for confined marine disposal. ▪ For Type 3 sediment, it would require special treatment/disposal before confined marine disposal at CEDD Facilities, typically at East Sha Chau. In order to have the least potential of loss of contaminants to the marine environment, containment of the sediments in geosynthetic containers is proposed when transporting the sediment. Field trials are recommended to be undertaken during the detailed design stage to establish the optimum handling method for this approach. The details of the disposal methodology could therefore be confirmed during the detailed design stage, prior to construction.	To dispose sediment in an authorized and least impacted way	Contractor	All works areas with sediments concern	Detailed Design and Construction phase	Implemented

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S10.126	The basic requirements and procedures for dredged / excavated sediment disposal specified under PNAP 252 shall be followed.	To dispose sediment in an authorized and least impacted way	Contractor	All works areas with sediments concern	Construction phase	Implemented
S10.127	The Project Proponent will agree in advance with MFC of CEDD on the site allocation by submitting a Construction & Demolition Material Management Plan. The final disposal sites and arrangement will be determined by the MFC and a dumping permit will be obtained from the DEP prior to the commencement of the dredging and excavation works.	To determine the best handling and disposal option of the sediments.	MTR/ Contractor	All works areas with sediments concern	Detailed Design and Construction phase	Implemented
S10.128	The contractor for the dredging/ excavation works shall apply for the site allocations of marine sediment disposal based on the prior agreement with MFC/CEDD. The contractor shall apply for all necessary permits from relevant authorities for the disposal of dredged / excavated sediment.	To dispose the sediments in an authorized way.	Contractor	All works areas with sediments concern	Construction phase	Implemented
S10.129	If temporary stockpiling of sediments is necessary, the sediment should be covered by tarpaulin and earth bunds or sand bag barriers should be provided on site to prevent leachate from entering the drains and surrounding water bodies. The stockpiling areas should be completely paved or covered by lining avoiding contaminating the soil or groundwater underneath.	To prevent the cross contamination of surrounding soils and water bodies	Contractor	All works areas with sediments concern	Construction phase	Implemented
S10.130	The dredged / excavated sediment should be transported by covering trucks to designated barging points. The barge transporting the sediments to the designated disposal site should be equipped with tight fitting seals	To prevent overflowing of sediments to the surrounding area and water bodies	Contractor	All works areas with sediments concern /	Construction phase	Implemented

EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measures	When to implement the measures?	Implementation Status
	to prevent leakage. Besides, the barge should not be filled to a level that would cause overflow of materials or laden water during loading or transportation.			trucks / barges		
S10.131	Loading of the dredged / excavated sediment to the barge should be controlled to avoid splashing and overflowing of the sediment slurry to the surrounding water.	To prevent overflowing of sediments to the surrounding area and water bodies	Contractor	Barging points	Construction phase	Implemented
S10.132	In order to minimise the potential odour emissions during the dredging / excavation operation and transportation of the sediment, the dredged / excavated sediment placed on barges should be properly covered as far as practicable. Requirement of the *Air Pollution Ordinance (Construction Dust) Regulation*, where relevant, should be adhered to during the construction phase of the Project.	To minimise dust and odor impacts to surrounding environment	Contractor	All works areas with sediments concern / Barging points	Construction phase	Implemented
S10.134	Workers should wear protective gloves when carrying out the dredging / excavation works. Adequate washing and cleaning facilities should be provided on site.	To minimise the exposure to the contaminated sediments	Contractor	All works areas with sediments concern	Construction phase	Implemented
S10.135	For allocation of sediment disposal site and application of marine dumping permit, another proposal for sampling and chemical testing of the sediment will be prepared and submitted to the EPD for approval following the procedures in PNAP 252. The approved detailed sampling and chemical testing will be carried out prior to the commencement of the dredging/excavation activities to confirm the sediment disposal method. The contamination levels of the marine sediment to be dredged / excavated have to be analysed	To analyse the sediments quality and determine the best disposal option	Contractor	All works areas with sediments concern	Construction phase	Implemented

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	and recorded. After carrying out the sampling and testing, a Sediment Quality Report (SQR) will be prepared for EPD approval as required under the *Dumping at Sea Ordinance* to agree and confirm the quantities and extent of the contamination of the sediments prior to the dredging/ construction contract being tendered. The SQR will include the sampling details, the chemical testing results, quality control records, proposed classification and delineation of sediment according to the requirements of the Appendix A of PNAP 252.					
S10.136	If chemical wastes are produced at the construction site, the Contractor would be required to register with the EPD as a chemical waste producer and to follow the guidelines stated in the *Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes*. Containers used for storage of chemical waste should : ▪ Be compatible with the chemical wastes being stored, maintained in good condition and securely sealed; ▪ Have a capacity of less than 450 litres unless the specifications have been approved by EPD; and ▪ Display a label in English and Chinese in accordance with instructions prescribed in Schedule 2 of the *Waste Disposal (Chemical Waste) (General) Regulation*.	To properly store the chemical waste within works areas	Contractor	All works areas	Construction phase	Implemented

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S10.137	The chemical storage areas should: ▪ Be clearly labelled to indicate corresponding chemical characteristics of the chemical waste and used for storage of chemical waste only; ▪ Be enclosed on at least 3 sides; ▪ Have an impermeable floor and bunding, of capacity to accommodate 110% of the volume of the largest container or 20% by volume of the chemical waste stored in that area, whichever is the greatest; ▪ Have adequate ventilation; ▪ Be covered to prevent rainfall from entering; and ▪ Be properly arranged so that incompatible materials are adequately separated.	To prepare appropriate storage areas for chemical waste at works areas	Contractor	All works areas	Construction phase	Implemented
S10.138	Lubricants, waste oils and other chemical wastes would be generated during the maintenance of vehicles and mechanical equipments. Used lubricants should be collected and stored in individual containers which are fully labelled in English and Chinese and stored in a designated secure place.	To clearly label the chemical waste at works areas	Contractor	All works areas	Construction phase	Implemented
S10.139	A trip-ticket system should be operated in accordance with the *Waste Disposal (Chemical Waste) (General) Regulation* to monitor all movements of chemical waste. The Contractor should employ a licensed collector to transport and dispose of the chemical wastes, to either the approved CWTC at Tsing Yi, or another licensed facility, in accordance with the *Waste Disposal*	To monitor the generation, reuse and disposal of chemical waste	Contractor	All works areas	Construction phase	Implemented

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	(Chemical Waste) (General) Regulation.					
S10.140	General refuse should be stored in enclosed bins or compaction units separate from C&D materials and chemical waste. A reputable waste collector should be employed by the contractor to remove general refuse from the site, separately from C&D materials and chemical wastes.	To properly store and separate from other C&D materials for subsequent collection and disposal	Contractor	All works areas	Construction phase	Implemented
S10.141	The recyclable component of general refuse, such as aluminium cans, paper and cleansed plastic containers should be separated from other waste. Provision and collection of recycling bins for different types of recyclable waste should be set up by the Contractor. The Contractor should also be responsible for arranging recycling companies to collect these materials.	To facilitate recycling of recyclable portions of refuse	Contractor	All works areas	Construction phase	Implemented
S10.142	The Contractor should carry out a training programme for workers in avoiding, reducing, reusing and recycling of materials generation. Posters and leaflets advising on the use of the bins should also be provided in the sites as reminders.	To raise workers' awareness on recycling issue	Contractor	All works areas	Construction phase	Implemented
Waste Management Implications (Operation Phase)						
S10.146-10.147	Chemical waste: ▪ The requirements stipulated in the *Code of Practice*	To avoid environmental impacts in handling, storage and disposal of	MTR	Ventilation buildings, SSS and	Operation phase	To be implemented as per

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	on the Packaging, Labelling and Storage of Chemical Wastes should be followed in handling of chemical waste as in construction phase. ▪ A trip-ticket system should be operated in accordance with the *Waste* Disposal *(Chemical Waste) (General) Regulation* to monitor all movements of chemical wastes which would be collected by a licensed collector to a licensed facility for final treatment and disposal. ▪ The recommendations proposed for the mitigation of impacts from chemical waste in construction phase should also be followed (refer to S10.104-S10.106).	chemical waste		WKT		construction programme
S10.148-S10.149	General refuse: ▪ Provide recycling bins at designated areas for proper recycling of papers, aluminium cans and plastics bottles. ▪ Separation from other waste types and collected by licensed collectors at daily basis to minimize the potential impacts from odour and vermin.	To separate general refuse from other waste types and proper disposal of the refuse	MTR	Ventilation buildings, SSS and WKT	Operation phase	To be implemented as per construction programme
S10.150	Industrial waste: ▪ Separation of reusable components like steel before	To recycle useful materials from industrial waste and proper disposal	MTR	Ventilation buildings, SSS and	Operation phase	To be implemented as per

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	collection by licensed collector			WKT		construction programme
Water Quality Impact (Construction Phase)						
S11.128 - S11.153	Construction site run-off and general construction activities: ▪ The mitigation measures as outlined in the ProPECC PN 1/94 Construction Site Drainage should be adopted where applicable.	To control water quality impact from construction site runoff and general construction activities	MTR / Contractor	All works areas	Construction phase	Implemented
S11.154	Groundwater seepages from uncontaminated area: ▪ In case seepage of uncontaminated groundwater occurs, groundwater should be pumped out from the works areas and discharged into the storm system via silt removal facilities. Uncontaminated groundwater from dewatering process should also be discharged into the storm system via silt traps.	To control water quality impact from groundwater from uncontaminated area	MTR / Contractor	All works areas	Construction phase	Implemented
S11.155	As the proposed WKT is near the Victoria Harbour, high ground water level regime due to both tidal effects and rainwater infiltration is anticipated. A cofferdam wall should be built to limit groundwater inflow to the excavation works areas in the WKT site.	To control water quality impact from groundwater from uncontaminated area	MTR / Contractor	WKT	Construction phase	Implemented

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S11.156	To monitor the tide and groundwater relationship, it is recommended to install groundwater level loggers at the nearest tidal areas (i.e. near Mai Po).	To monitor the groundwater level	MTR / Contractor	Mai Po	Construction phase	Implemented
S11.157 - S11.158	Site Runoff or Groundwater from contaminated areas: ▪ No directly discharge of groundwater from contaminated areas should be adopted. ▪ Prior to any excavation works within the potentially contaminated areas, the baseline groundwater quality in the areas should be reviewed based on the past relevant site investigation data and any additional groundwater quality measurements to be performed with reference to *Guidance Note for Contaminated Land Assessment and Remediation* and the review results should be submitted to EPD for examination. If the review results indicated that the groundwater to be generated from the excavation works would be contaminated, this contaminated groundwater should be either properly treated or properly recharged into the ground in compliance with the requirements of the TM-DSS. ▪ If wastewater treatment is to be deployed for treating the contaminated groundwater, the wastewater treatment unit shall deploy suitable treatment processes (e.g. oil interceptor / activated carbon) to reduce the pollution level to an acceptable standard and remove any prohibited	To control water quality impact from contaminated groundwater	MTR / Contractor	Excavation areas where contaminated ground-water is found	Construction phase	Implemented

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	substances (such as TPH) to an undetectable range. ▪ All treated effluent from the wastewater treatment plant shall meet the requirements as stated in TM-DSS and should be either discharged into the foul sewers or tankered away for proper disposal. ▪ If deployment of wastewater treatment is not feasible for handling the contaminated groundwater, groundwater recharging wells should be installed as appropriate for recharging the contaminated groundwater back into the ground. The recharging wells should be selected at places where the groundwater quality will not be affected by the recharge operation as indicated in section 2.3 of the TM-DSS. The baseline groundwater quality should be determined prior to the selection of the recharge wells, and submit a working plan to EPD for agreement. Pollution levels of groundwater to be recharged shall not be higher than pollutant levels of ambient groundwater at the recharge well. Groundwater monitoring wells should be installed near the recharge points to monitor the effectiveness of the recharge wells and to ensure that no likelihood of increase of groundwater level and transfer of pollutants beyond the site boundary. Prior to recharge, free products should be removed as necessary by installing the petrol interceptor. The Contractor should apply for a discharge licence under the WPCO through					

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	the Regional Office of EPD for groundwater recharge operation or discharge of treated groundwater.					
S11.128 - S11.136, S11.160	Barging points: Mitigation measures for control water quality impact from surface run-off should be applied. The following good site practices should also be adopted: ▪ all vessels should be sized so that adequate clearance is maintained between vessels and the seabed in all tide conditions, to ensure that undue turbidity is not generated by turbulence from vessel movement or propeller wash ▪ all hopper barges should be fitted with tight fitting seals to their bottom openings to prevent leakage of material ▪ construction activities should not cause foam, oil, grease, scum, litter or other objectionable matter to be present on the water within the site ▪ loading of barges and hoppers should be controlled to prevent splashing of material into the surrounding water. Barges or hoppers should not be filled to a level that will cause the overflow of materials or polluted water during loading or transportation	To control water quality impact from barging point	MTR / Contractor	All barging Points	Construction phase	Implemented

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S11.161	Effluent discharge: There is a need to apply to EPD for a discharge licence for discharge of effluent from the construction site under the WPCO. The discharge quality should meet the requirements specified in the discharge licence. Minimum distances of 100 m should be maintained between the discharge points of construction site effluent and the existing seawater intakes. If monitoring of the treated effluent quality from the works areas is required during the construction phase of the Project, the monitoring should be carried out in accordance with the WPCO license which is under the ambit of regional office (RO) of EPD.	To control water quality impact from effluent discharge from construction site	MTR / Contractor	All works areas	Construction phase	Implemented
S11.162	Accidental spillage of chemicals: Contractor should register as a chemical waste producer if chemical wastes would be produced from the construction activities. The Waste Disposal Ordinance (Cap 354) and its subsidiary regulations in particular the Waste Disposal (Chemical Waste) (General) Regulation should be observed and complied with for control of chemical wastes**.**	To control water quality impact from accidental chemical spillage	MTR / Contractor	All works areas	Construction phase	Implemented
S11.163	Any service shop and maintenance facilities should be located on hard standings within a bunded area, and sumps and oil interceptors should be provided. Maintenance of vehicles and equipment involving activities with potential for leakage and spillage should	To control water quality impact from accidental chemical spillage	MTR / Contractor	All works areas	Construction phase	Implemented

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	only be undertaken within the areas appropriately equipped to control these discharges.					
S11.164	Disposal of chemical wastes should be carried out in compliance with the Waste Disposal Ordinance. The Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes published under the Waste Disposal Ordinance details the requirements to deal with chemical wastes. General requirements are given as follows: ▪ Suitable containers should be used to hold the chemical wastes to avoid leakage or spillage during storage, handling and transport. ▪ Chemical waste containers should be suitably labelled, to notify and warn the personnel who are handling the wastes, to avoid accidents. ▪ Storage area should be selected at a safe location on site and adequate space should be allocated to the storage area.	To control water quality impact from accidental chemical spillage	MTR / Contractor	All works areas	Construction phase	Implemented
S11.165	Surface construction works at or in close proximity of watercourses or seafront: ▪ The proposed surface construction works should be carried out in dry season as far as practicable where the flow in the river channel or stream is low. ▪ The use of less or smaller construction plants may	To control water quality impact from construction works at or in close proximity of watercourses or seafront	MTR / Contractor	All works areas	Construction phase	Implemented

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	be specified to reduce the disturbance to the riverbed or pond deposits. ▪ Temporary sewerage system should be designed to prevent wastewater from entering the river, streams and sea. ▪ Temporary storage of materials (e.g. equipment, filling materials, chemicals and fuel) and temporary stockpile of construction materials should be located well away from any water courses during carrying out of the construction works. ▪ Stockpiling of construction materials and dusty materials should be covered and located away from any water courses. ▪ Construction debris and spoil should be covered up and/or disposed of as soon as possible to avoid being washed into the nearby water receivers. ▪ Construction activities, which generate large amount of wastewater, should be carried out in a distance away from the waterfront, where practicable. ▪ Mitigation measures to control site run-off from entering the nearby water environment should be implemented to minimize water quality impacts. Surface channels should be provided along the edge of the waterfront within the work sites to intercept the run-off. ▪ Construction effluent, site run-off and sewage					

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	should be properly collected and/or treated. ▪ Any works site inside the water courses should be temporarily isolated. The water flow should be temporarily diverted to downstream by using PVC pipes, steel arrays in concrete case or similar, restricting the excavation works to be conducted within an enclosed dry section of the channel. This works arrangement would provide a dry zone for excavation works within the river channel and would prevent the conveyance of suspended sediment downstream. Dewatering at works section should be conducted prior to the commencement of works. Further limiting or reducing the works area inside the water courses should be considered during wet season or rainstorm event in order to reduce the area of exposed surface. ▪ Silt curtain should be installed around the construction activities at or near the watercourses to minimize the potential impacts due to accidental spillage of construction wastes and excavated materials. ▪ Proper shoring may need to be erected in order to prevent soil or mud from slipping into the watercourses. ▪ Supervisory staff should be assigned to station on site to closely supervise and monitor the works.					

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S11.166	Surface construction works close to water gathering grounds: ▪ The conditions as specified in WSD guidelines on protection of Water Gathering Ground should be followed or observed where practicable	To control water quality impact from surface construction works close to Water Gathering Ground	MTR / Contractor	Works areas close to water gathering ground	Construction phase	To be implemented as per construction programme
S11.167	Dredging of marine sediments at LKST: ▪ Closed grab dredger should be used to minimize the loss of sediment during the raising of the loaded grabs through the water column. ▪ No more than one closed grab dredger should be operated at any one time. ▪ Double silt curtains should be deployed around the dredging operations as far as practicable. ▪ The descent speed of grabs should be controlled to minimize the seabed impact speed. ▪ Barges should be loaded carefully to avoid splashing of material. ▪ All barges used for the transport of dredged materials should be fitted with tight bottom seals in order to prevent leakage of material during loading and transport. ▪ All barges should be filled to a level which ensures that material does not spill over during loading and transport to the disposal site and that adequate	To minimize the loss of fine sediment to suspension during dredging of marine sediments at LKST	MTR / Contractor	Marine dredging at LKST	Construction phase	To be implemented as per construction programme

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	freeboard is maintained to ensure that the decks are not washed by wave action.					
S11.83 and S11.165	Diversion of watercourse: ▪ The excavation works at the existing stream in Shek Kong/ Kam Tin Nullah should be carried out by approved methods by the Engineer to minimise erosion. Should excavation works be carried out at the designated section of water course, temporary river diversion should be conducted prior to the commencement of works to avoid water flowing into works area. The temporary diversion of water flow should be performed by appropriate means, such as completing the construction of the proposed channel section for carrying diverted flow prior to excavation works, or other similar methods, as approved by the Engineer to suit the works condition. This works arrangement would provide a dry zone for excavation works within the river channel and would prevent the conveyance of suspended sediment downstream. Dewatering at works section should also be conducted prior to the commencement of works. ▪ Mitigation measures for minimizing the water quality impact for surface construction works at or close to the watercourses should also be applied.	To control water quality impact due to diversion of watercourse	MTR / Contractor	Watercourse to be diverted in Shek Kong	Construction phase	Implemented
S.	Hydrogeological Impact:	To control groundwater	MTR/	All works	Construction	Implemented

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11.169 - 11.173	For the cut and cover tunnels and associated excavations for vent buildings and emergency access/escape points, the following measures should be in place in order to mitigate any drawdown effects to the groundwater table during the operation of the temporary dewatering works: ▪ Toe grouting should be applied beneath the toe level of the temporary/permanent cofferdam walls as necessary to lengthen the effective flow path of groundwater from outside and thus control the amount of water inflow to the excavation. ▪ Recharge wells should be installed as necessary outside the excavation areas. Water pumped from the excavation areas should be recharge back into the ground. The bored tunnels should be constructed using a closed face tunnel boring machine to limit water inflow into the excavation face. The cutter head for the machine will be sealed during excavation and therefore the water inflow from the face will be very small. Precast undrained linings should be installed and back grouted behind the tunnel boring machine as it advances along the alignment to minimize the potential inflow of water behind the cutter head. The Contractor should initially adopt suitable water	hydrogeological impact and groundwater drawdown	Contractor	areas	phase	

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	control strategies while undertaking the excavation works. The water control strategies are shown as follow: ▪ Probing Ahead: As normal practice, the Contractor will undertake rigorous probing of the ground ahead of tunnel excavation works to identify zones of significant water inflow. The probe drilling results will be evaluated to determine specific grouting requirements in line with the tunnel advance. In such zones of significant water inflow that could occur as a result of discrete, permeable features, the intent would be to reduce overall inflow by means of cut-off grouting executed ahead of the tunnel advance. ▪ Pre-grouting: Where water inflow quantities are excessive, pre-grouting will be required to reduce the water inflow into the tunnel. The pre-grouting will be achieved via a systematic and carefully specified protocol of grouting. ▪ In principle, the grout pre-treatment would be designed on the basis of probe hole drilling ahead of the tunnel face. In the event of excessive drawdown being observed within the ground water table as a result of the tunnelling works even after incorporation of the water control strategies, post-grouting will be applied as					

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	described below: ▪ Post-grouting: Groundwater drawdown will be most likely due to inflows of water into the tunnel that have not been sufficiently controlled by the pre-grouting measures. Where this occurs post grouting will be undertaken before the lining is cast. Whilst unlikely to be required in significant measure, such a contingency should be allowed for reduction in permeability of the tunnel surround (by grouting) to limit inflow to acceptable levels. A detailed groundwater monitoring programme should be developed in detailed design stage to monitor both the proposed works and the impact of those works on the adjacent area.					
Water Quality Impact (Operation Phase)						
S11.174	Tunnel run-off and drainage: ▪ Track drainage channels discharge should pass through oil/grit interceptors/chambers to remove oil, grease and sediment before being pumped to the foul sewer/holding tank for further disposal. ▪ The silt traps and oil interceptors should be cleaned and maintained regularly. ▪ Oily contents of the oil interceptors should be transferred to an appropriate disposal facility, or to	To control runoff from rail track	MTR / DDC	Tunnels and rail tracks	Operation phase	To be implemented as per construction programme

EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measures	When to implement the measures?	Implementation Status
	be collected for reuse, if possible.					
S11.175 – S11.176	Sewage effluents: ▪ Connection of domestic sewage generated from the Project should be diverted to the foul sewer wherever possible. If public sewer system is not available, sewage tanking away services or on-site sewage treatment facilities should be provided to prevent direct discharge of sewage to the nearby storm system and all the discharge should comply with the requirements stipulated in the TM-DSS. ▪ For handling, treatment and disposal of other operation stage effluent, the practices outlined in ProPECC PN 5/93 should be adopted where applicable.	To control water quality impact from sewage effluent discharge ventilation buildings, SSS and WKT	MTR / DDC	Ventilation buildings, SSS and WKT	Operation phase	To be implemented as per construction programme
S11.177-S11.181	Shek Kong Stabling Sidings (SSS): ▪ All the maintenance areas within the SSS should be housed or covered to prevent generation of contaminated rainwater runoff. All wastewater generated from the maintenance and cleaning activities should be collected and diverted to oil interceptor or other appropriate treatment facilities for proper treatment so that it satisfies the requirements stipulated in the TM-DSS. ▪ In case there is no pubic sewer available for the SSS during the operation phase, all wastewater generated or collected in the SSS should be	To control water quality impacts from the operation of Shek Kong Stabling Sidings	MTR/DDC	SSS	Operation phase	To be implemented as per construction programme

EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measures	When to implement the measures?	Implementation Status
	tankered away for proper disposal to prevent direct discharge of any wastewater to the nearby surface water system. ▪ Oil interceptors should be regularly inspected and cleaned to avoid wash-out of oil during storm conditions. A bypass would be provided to avoid overload of the interceptor's capacity. ▪ All waste oils and fuels should be collected and handled in compliance with the Waste Disposal Ordinance. Site drainage should be well maintained and good management practices should be observed to ensure that oils and chemicals are managed, stored and handled properly and do not enter the nearby water streams. Areas for chemical storage should be securely locked. The storage area should have an impermeable floor and bunding of capacity to accommodate 110% of the volume of the largest container or 20% by volume of the chemical waste stored in that area, whichever is the greatest, to minimize the impacts from any potential accidents. In case of the occurrence of accidental spillage of chemicals, it is required to take immediate actions to control the release of chemicals. ▪ Disposal of chemical wastes should be carried out in compliance with the Waste Disposal Ordinance. The Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes published under					

EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measures	When to implement the measures?	Implementation Status
	the Waste Disposal Ordinance details the requirements to deal with chemical wastes.					
S11.182	For any future maintenance desilting of the newly constructed or diverted watercourses, temporary barrier walls should be used to provide a dry zone for desilting work. Maintenance desilting should be carried out during periods of low flow in the dry season.	To control water quality impact due to maintenance desilting of the newly constructed or diverted watercourses	MTR	Diverted watercourses in Shek Kong	Operation phase	To be implemented as per construction programme
Air Quality (Construction Phase)						
S 12.78	For concrete batching plant, the requirements and mitigation measures stipulated in the *Guidance Note on the Best Practicable Means for Cement Works (Concrete Batching Plant) BPM 3/2(93)* should be followed and implemented.	To minimize dust impacts	MTR / Contractor	Concrete batching plant at works area V	Construction phase	Implemented
Table 12.9 and Table 12.12	The design emission concentration of dust collector for different types of silos for concrete batching plant should be: ▪ Dust collector for each small Cement Silo ≤ 30 mg/m^3 ▪ Dust collector for each Large Capacity Cement Silo ≤ 50mg/m^3 ▪ Dust collector for each PFA Silo ≤ 30 mg/m^3 ▪ Dust collector for each Mixer ≤ 40 mg/m3	To minimize dust impacts	MTR / Contractor	Concrete batching plant at works area V	Construction phase	Implemented

EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measures	When to implement the measures?	Implementation Status
	During operation of concrete batching plant: ▪ The aggregates should be unloaded from the tipper trucks to the receiving hopper equipped with enclosures on 3 sides and top cover, and water spraying system. ▪ The cement and PFA should be directly loaded into the silo via a flexible duct. Dust collectors should be installed at the cement/PFA silo based on the above design emission rates. ▪ The aggregates should be stored in fully enclosed overhead storage bins. The top of overhead storage bins should be covered with cladding. Water spraying system should be installed at the top of storage bins for watering the aggregates, and aggregate storage bins should be fully enclosed. ▪ The whole process of weighing and mixing of cementitious material should be performed in a fully enclosed environment. The mixers shall equip with the dust collectors based on the above design emission rates. ▪ The concrete should be directly loaded from the mixer into the transit mixer of a truck in "wet" form. ▪ Haul road within the site should be paved. Wheel washing pit should be installed at the gate of the concrete batching plant. Water spraying system					

EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measures	When to implement the measures?	Implementation Status
	should be installed along the haul road.					
Table 12.10	(1) Cut & Cover Areas and Stockpiles in the vicinity of adits/shafts: (a) Heavy construction activities at Cut & Cover Areas, Storage of materials at Stockpiles - Active areas for heavy construction activities, loading & unloading materials at stockpiles ▪ The specified requirements for cut & cover areas and stockpiles at Shek Kong, Nam Cheong and West Kowloon works areas are as follows: (i) Shek Kong works area – active area minimized to 15% of total area, watering with complete coverage of active area ten times a day. (ii) Nam Cheong works area – active area minimized to 30% of total area, watering with complete coverage of active stockpile area four times a day. (iii) West Kowloon works area – active area minimized to 15% of total area, watering with complete coverage of active area eight times a day. ▪ For other sites, the active area would be minimized	To minimize dust impacts	MTR / Contractor	All works areas	Construction phase	Implemented

EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measures	When to implement the measures?	Implementation Status
	to 30% of the total area, water spraying system would be applied on the active area and watering with complete coverage of active area four times a day would be required. ▪ The remaining inactive area would be well covered with impervious sheeting at all work sites. (b) Trucks - Transportation of materials ▪ Wheel wash facilities provided at the site exit. The vehicles should be washed before leaving the stockpiles. The spoils should also be well covered before leaving the site in order to minimise generation of dusty materials. ▪ The haul roads within the site should be paved and water spraying would be provided to keep the wet condition. ▪ For the Shek Kong works area, watering paved haul roads once per hour would be provided. (2) Temporary stockpiles within barging facilities: (a) Loading point - Loading of spoils from trucks onto stockpile ▪ Water spraying should be provided at the loading points to suppress the dust impact. (b) Storage of materials - Active area for loading &					

EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measures	When to implement the measures?	Implementation Status
	unloading materials ▪ Water spraying system should be applied on the active area and watering with complete coverage of active area four times a day is required.					
Table 12.11	Barging facilities: (1) Haul road within barging facilities - Transportation of spoils to the barging points ▪ All road surfaces within the barging facilities should be paved and water spraying should be provided to keep the wet condition. For paved haul roads at West Kowloon and Nam Cheong, watering haul road once per hour is required. (2) Unloading of materials - Unloading of spoil materials ▪ The unloading process should be undertaken within enclosed tipping hall. Water spraying and dust curtain should be provided at the discharge point for dust suppression. (3) Trucks - Vehicles leaving the barging facilities ▪ Vehicle wheel washing facilities should be provided at site exit. (4) Transportation of spoils to one of the Nam Cheong Barging Point ▪ Fully enclosed conveyor system should be adopted	To minimize dust impacts	MTR / Contractor	All barging points	Construction phase	Implemented

EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measures	When to implement the measures?	Implementation Status
	for transportation of spoils from shaft to the barging point.					
S 12.78	Dust suppression measures stipulated in the Air Pollution Control (Construction Dust) Regulation and good site practices: ▪ Use of regular watering, with complete coverage, to reduce dust emissions from exposed site surfaces and unpaved roads, particularly during dry weather. ▪ Use of frequent watering for particularly dusty construction areas and areas close to ASRs. ▪ Side enclosure and covering of any aggregate or dusty material storage piles to reduce emissions. Where this is not practicable owing to frequent usage, watering should be applied to aggregate fines. ▪ Open stockpiles should be avoided or covered. Where possible, prevent placing dusty material storage piles near ASRs. ▪ Tarpaulin covering of all dusty vehicle loads transported to, from and between site locations. ▪ Establishment and use of vehicle wheel and body washing facilities at the exit points of the site. ▪ Provision of wind shield and dust extraction units or similar dust mitigation measures at the loading points, and use of water sprinklers at the loading	To minimize dust impacts	MTR / Contractor	All works areas	Construction phase	Implemented

EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measures	When to implement the measures?	Implementation Status
	area where dust generation is likely during the loading process of loose material, particularly in dry seasons/ periods. ▪ Imposition of speed controls for vehicles on unpaved site roads. 8 kilometers per hour is the recommended limit. ▪ Where possible, routing of vehicles and positioning of construction plant should be at the maximum possible distance from ASRs. ▪ Every stock of more than 20 bags of cement or dry pulverised fuel ash (PFA) should be covered entirely by impervious sheeting or placed in an area sheltered on the top and the 3 sides. ▪ Cement or dry PFA delivered in bulk should be stored in a closed silo fitted with an audible high level alarm which is interlocked with the material filling line and no overfilling is allowed. ▪ Loading, unloading, transfer, handling or storage of bulk cement or dry PFA should be carried out in a totally enclosed system or facility, and any vent or exhaust should be fitted with an effective fabric filter or equivalent air pollution control system.					
S12.94	Environmental monitoring and audit for dust emission should be conducted in accordance with EM&A Manual during the construction phase of the Project to check	To monitor dust impact	MTR / Contactor	Proposed monitoring locations	Design and operation phases	Implemented

EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measures	When to implement the measures?	Implementation Status
	compliance with legislative requirements.					
Air Quality (Operation Phase)						
S12.48	The vent shafts of the stations should be designed to be sited at more than 5m from any opening at the adjacent building	To alleviate the adverse air quality impact in the stations	MTR	WKT	Design and operation phases	To be implemented as per construction programme
S12.50	The design of the mechanical air ventilation for PTI should follow EPD's ProPECC PN1/98 Control of Air Pollution in Semi-confined Public Transport Interchanges.	To alleviate the adverse air quality impact in the PTI	MTR	PTI at the ground floor of ventilation building complex at WKT	Design and operation phases	To be implemented as per construction programme
Hazard to Life						
S13.96/ S13.99	Improved truck design to reduce the amount of combustibles in the cabin and fuel carried in the fuel tank should be minimised to reduce the duration of any fire. The truck should be brand new, diesel powered and equipped with fuel and battery isolation switches, front exhaust spark arrester, 1 x 9 kg water based and 1 x 9 kg dry chemical powder fire extinguishers. This should be	To meet the ALARP requirement	MTRC/ Contractor	-	Construction phase	Implemented

EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measures	When to implement the measures?	Implementation Status
	combined with monthly vehicle inspection					
S13.96	The explosive truck accident frequency should be minimized by implementing a dedicated training programme for both the driver and his attendants, including regular briefing sessions, implementation of a defensive driving attitude. In addition, drivers should be selected based on good safety record, and medical checks.	To meet the ALARP requirement	MTRC/ Contractor	-	Construction phase.	Implemented
S13.96	The contractor should as far as practicable combine the explosive deliveries for a given work area.	To meet the ALARP requirement	MTRC/ Contractor	-	Construction phase	Implemented
S13.96	The explosive truck fire involvement frequency should be minimized by implementing a better emergency response and training to make sure the adequate fire extinguishers are used and attempt is made to evacuate the area of the incident or securing the explosive load if possible. All explosive vehicles should also be equipped with bigger capacity AFFF-type extinguishers.	To meet the ALARP requirement	MTRC/ Contractor	-	Construction phase	Implemented
S13.96	A minimum headway between two consecutive truck conveys of at least 10 min is recommended	To meet the ALARP requirement	MTRC/ Contractor	Along explosives transport route.	Construction phase.	Implemented

EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measures	When to implement the measures?	Implementation Status
S13.96/ S13.105	Only the required quantity of explosives for a particular blast should be transported to avoid the return of unused explosives to the magazines. If disposal is required for small quantities, disposal should be made in a controlled and safe manner by a Registered Shotfirer.	To reduce the risk during explosives transport	MTRC/ Contractor	-	Construction phase	Implemented
S13.97	Blasting activities including storage and transport of explosives should be supervised and audited by competent site staff to ensure strict compliance with the blasting permit conditions.	To ensure that the risks from the proposed explosives storage and transport would be acceptable	MTRC / Contractor	Works areas at which explosives would be stored and/or used.	Construction phase	Implemented
S13.97	Emergency plan (ie magazine operational manual) shall be developed to address uncontrolled fire in magazine area and transport. The case of fire near an explosive carrying truck in jammed traffic should also be covered. Drill of the emergency plan should be carried out at regular intervals.	To reduce the risk of fire	MTRC/ Contractor	Explosive Magazine and along explosives transport route.	Construction phase	Implemented
S13.97	Adverse weather working guideline should be developed to clearly define procedure for transport explosives during	To ensure safe transport of explosives	MTRC/ Contractor	Along explosives transport	Construction phase	Implemented

EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measures	When to implement the measures?	Implementation Status
	thunderstorm.			route.		
S13.98	Delivery vehicles shall not be permitted to remain within the secured fenced off magazine store area.	To reduce the risk of fire within the magazine	MTRC / Contractor	Explosive Magazine	Construction phase	Implemented
S13.98	Good house-keeping within and outside of the magazine to ensure that combustible materials (including vegetation) are removed and not allowed to accumulate.	To reduce the risk of fire within the magazine	MTRC / Contractor	Explosive Magazine	Construction phase	Implemented
S13.99/ S13.101	Use only experienced driver(s) with good safety record. Training should be provided to ensure it covers all major safety subjects.	To ensure safe transport of explosives	MTRC/ Contractor	-	Construction phase	Implemented
S13.99	Develop procedure to ensure that parking space on the site is available for the explosive truck. Confirmation of parking space should be communicated to truck drivers before delivery.	To ensure that the risks from the proposed explosives storage and transport would be acceptable	MTRC/ Contractor	Explosive magazine	Construction phase	Implemented
S13.99	Detonators shall not be transported in the same vehicle with other Class 1 explosives	To reduce the risk of explosion during the transport of cartridge emulsion	MTRC / Contractor	-	Construction phase	Implemented
S13.99	During transport of the explosives within the tunnel, hot work should not be permitted in the vicinity of the	To ensure safe transport of explosives	MTRC/ Contractor	Along explosives	Construction phase	Implemented

EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measures	When to implement the measures?	Implementation Status
	explosives offloading or charging activities.			transport route.		
S13.99	Ensure that packaging of detonators remains intact until handed over at blasting site.	To reduce the risk of explosion during the transport of detonator	MTRC/ Contractor	-	Construction phase	Implemented
S13.99	Horizontal fire screen on cargo deck and vertical fire screen mounted at least 150 mm behind the drivers cab and 100 mm from the steel cargo compartment, the vertical screen shall protrude 150 mm in excess of all three (3) sides of the steel cargo compartment.	To reduce the risk during explosives transport	MTRC/ Contractor	-	Construction phase	Implemented
S13.104	Ensure that cartridge emulsion with high water content should be preferred. Also, the emulsion with perchlorate formulation should be avoided.	To ensure safe explosives to be used	MTRC/ Contractor	-	Construction phase	Implemented
Landfill Gas Hazard – Design and Construction Phases						
S14.73 & S14.86	- All personnel who work on site and all visitors to the site should be made aware of the possibility of ignition of gas in the vicinity of excavations. Safety notices should be posted warning of the potential hazards.	Protect the workers from landfill gas hazards	Contractor	XRL tunnels within the NTML Consultation Zone, Barging Point and Nursery	Construction phase	To be implemented as per construction programme

EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measures	When to implement the measures?	Implementation Status
				Site		
S14.73	- Those staff who work in, or have responsibility for "at risk" areas, including all excavation workers, supervisors and engineers working within the Consultation Zone, should receive appropriate training on working in areas susceptible to landfill gas, fire and explosion hazards.	Protect the workers from landfill gas hazards	Contractor	XRL tunnels within the NTML Consultation Zone	Construction phase	To be implemented as per construction programme
S14.73	- During all works, safety procedures will be implemented to minimise the risks of fires and explosions and asphyxiation of workers (especially in confined space).	Protect the workers from landfill gas hazards	Contractor	XRL tunnels within the NTML Consultation Zone	Construction phase	To be implemented as per construction programme
S14.73	- Safety officers, specifically trained with regard to landfill gas related hazards and the appropriate actions to take in adverse circumstances will be present on all worksites throughout the works.	Protect the workers from landfill gas hazards	Contractor	XRL tunnels within the NTML Consultation Zone	Construction phase	To be implemented as per construction programme
S14.73, S14.86, S14.87	- Smoking and naked flames will be prohibited within confined spaces. 'No Smoking' and 'No Naked Flame' notices in Chinese and English will be posted prominently around the construction site. Safety	Protect the workers from landfill gas hazards	Contractor	XRL tunnels within the NTML Consultation	Construction phase	To be implemented as per construction

EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measures	When to implement the measures?	Implementation Status
	notices should be posted warning of the potential hazards.			Zone, Barging Point and Nursery Site		programme
S14.73	- Welding, flame-cutting or other hot works may only be carried out in confined spaces when controlled by a 'permit to work' procedure, properly authorised by the Safety Officer. The permit to work procedure will set down clearly the requirements for continuous monitoring of methane, carbon dioxide and oxygen throughout the period during which the hot works are in progress. The procedure will also require the presence of an appropriately qualified person who shall be responsible for reviewing the gas measurements as they are made, and who shall have executive responsibility for suspending the work in the event of unacceptable or hazardous conditions. Only those workers who are appropriately trained and fully aware of the potentially hazardous conditions which may arise will be permitted to carry out hot works in confined areas.	Protect the workers from landfill gas hazards	Contractor	XRL tunnels within the NTML Consultation Zone	Construction phase	To be implemented as per construction programme

EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measures	When to implement the measures?	Implementation Status
S14.73	- A mechanical ventilation system must be in use at all times during which personnel are engaged in works inside the tunnel or excavation and be evacuated in the event of power outages. Work must not be carried out in the absence of mechanical ventilation and supervision of adequately trained safety personnel. In exceptional case where work is carried out under non-ventilated condition, any electrical equipment used, such as motors and extension cords, should be intrinsically safe.	Protect the workers from landfill gas hazards	Contractor	XRL tunnels within the NTML Consultation Zone	Construction phase	To be implemented as per construction programme
S14.73	- Adequate fire extinguishing equipment, fire-resistant clothing and breathing apparatus sets should be made available on site.	Protect the workers from landfill gas hazards	Contractor	XRL tunnels within the NTML Consultation Zone	Construction phase	To be implemented as per construction programme
S14.86	- Raising the site office 500mm above ground.	Protect the workers from landfill gas hazards	Contractor	Barging Point	Construction phase	Implemented
S14.86	- Utilities services connected to the site office and the annulus around these service entry points should be properly sealed.	Protect the workers from landfill gas hazards	Contractor	Barging Point	Construction phase	Implemented

EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measures	When to implement the measures?	Implementation Status
S14.74	- Construction works to be undertaken in confined space should follow the relevant Regulations under Chapter 59 Factories and Industrial Undertakings Ordinance and Chapter 509 Occupational Health and Safety Ordinance.	Protect the workers from landfill gas hazards	Contractor	XRL tunnels within the NTML Consultation Zone	Construction phase	To be implemented as per construction programme
S14.73	- Monitoring of methane, carbon dioxide and oxygen inside the XRL tunnels.	Protect the workers from landfill gas hazards	Contractor	XRL tunnels within the NTML Consultation Zone	Construction phase	To be implemented as per construction programme
S14.75	- A walkover survey to monitor flammable gas at all joints and cracks, if identified, upon completion of the tunnel work. Rectifications, such as sealing of cracks and inspection of tunnel seals, shall be carried out for any signs of the presence of flammable gas. The survey should be conducted under non-ventilated condition and before starting the work of the day.	Confirm no landfill gas ingress into the XRL tunnels	Contractor	XRL tunnels within the NTML Consultation Zone	Construction phase	To be implemented as per construction programme
S14.76	- Weekly monitoring of methane, carbon dioxide and oxygen in the form of a walkover survey at 20m intervals for section of tunnels under NTML and 50m interval within the NTML Consultation Zone should	Confirm no landfill gas ingress into the XRL tunnels	Contractor	XRL tunnels within the NTML Consultation	Construction phase	To be implemented as per construction

EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measures	When to implement the measures?	Implementation Status
	be conducted after completion of the tunnel construction works and not less than 3 months before commencement of operation. The survey should be conducted under non-ventilated condition and before starting the work of the day.			Zone		programme
S14.77	- A summary of the monitoring results should be submitted to EPD for record before the commencement of operational phase. The results should be reviewed and agreed with EPD before the commencement of operation to determine the monitoring requirements during the operational phase	To review and agree the monitoring requirement during the operational phase	MTR/ Contractor	-	Before operation	To be implemented as per construction programme
S14.78	- Appropriate sealant will be applied to joints to prevent the ingress of groundwater, which will also form a low permeability gas barrier. Good workmanship and adequate construction supervision will be required to ensure the actual works are implemented as per the design requirements. This will be implemented by MTRC's Material and Workmanship Specification.	Protect the XRL tunnels from landfill gas hazards	Design Engineer/ Contractor	XRL tunnels within the NTML Consultation Zone	Design and Construction phases	To be implemented as per construction programme
S14.79	- Adequate ventilation will be needed as part of the tunnel design to act as an active gas control when	Protect the XRL tunnels from landfill gas hazards	Design Engineer	XRL tunnels within the	Design phase	To be implemented

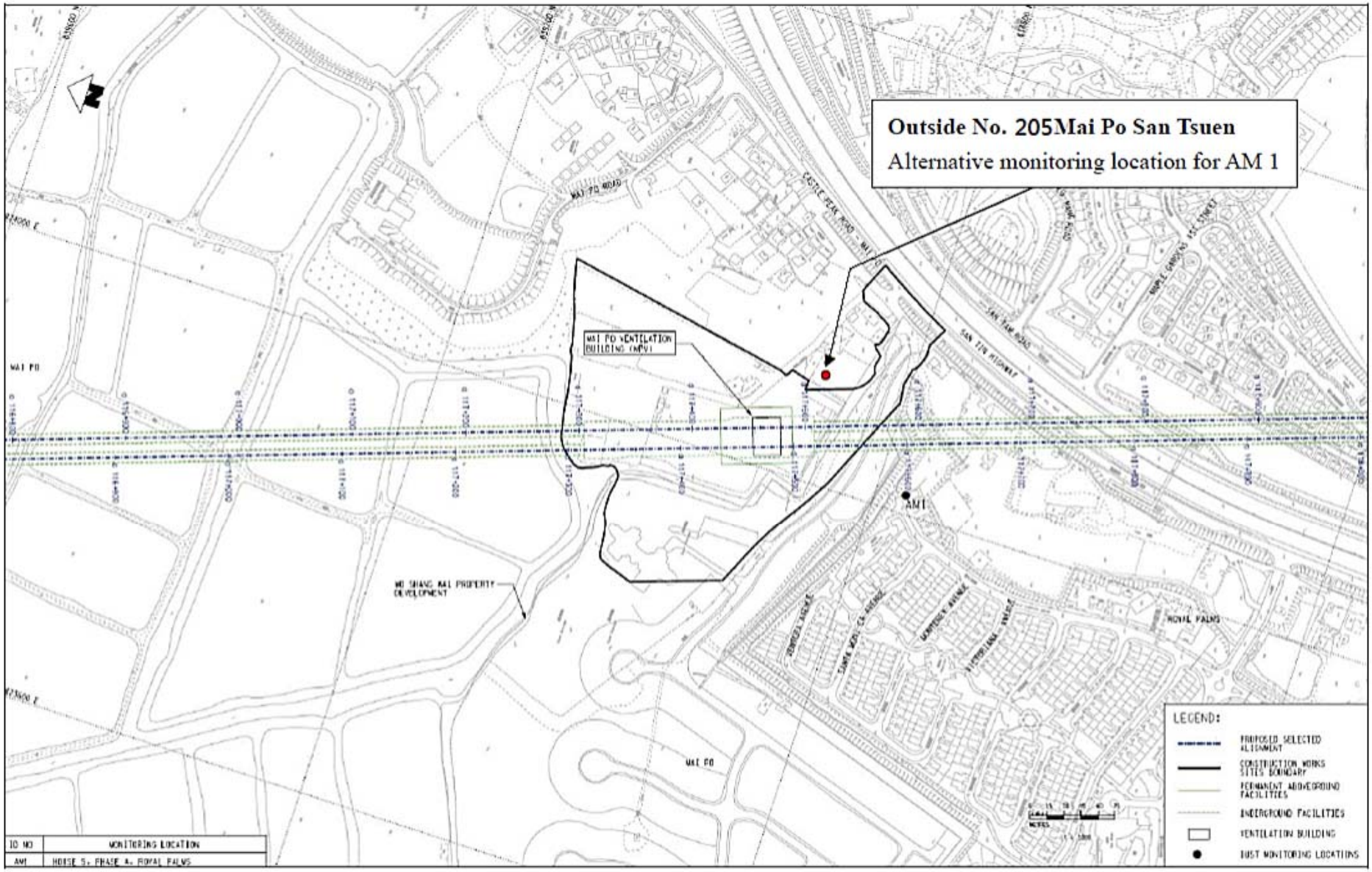
EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measures	When to implement the measures?	Implementation Status
	needed.			NTML Consultation Zone		as per construction programme
S14.80	- Upon completion of the landfill gas protection measures, a report on the implemented landfill gas protection measures with relevant as-built drawings and other detailed information showing that the design measures mentioned in this assessment to protect the tunnels from landfill gas hazard have been properly incorporated should be submitted to EPD.	Ensure landfill gas protection measures have been completed	Contractor	XRL tunnels within the NTML Consultation Zone	Construction phase	To be implemented as per construction programme
Landfill Gas Hazard – Operation Phase						
S14.76	- Ventilation of the tunnels should be switched on for half an hour before the first train is expected (the requirement to implement this measure is subject to findings of the review of landfill gas monitoring data with EPD before the commencement of operation).	Protect the operation of the XRL from landfill gas hazards	MTR	XRL tunnels within the NTML Consultation Zone	Operation phase	To be implemented as per construction programme
S14.76	- All maintenance personnel and station staff working within the tunnels should be educated in the dangers of landfill gas and the signs and symptoms of asphyxia.	Protect the workers from landfill gas hazards	MTR	XRL tunnels within the NTML Consultation Zone	Operation phase	To be implemented as per construction programme

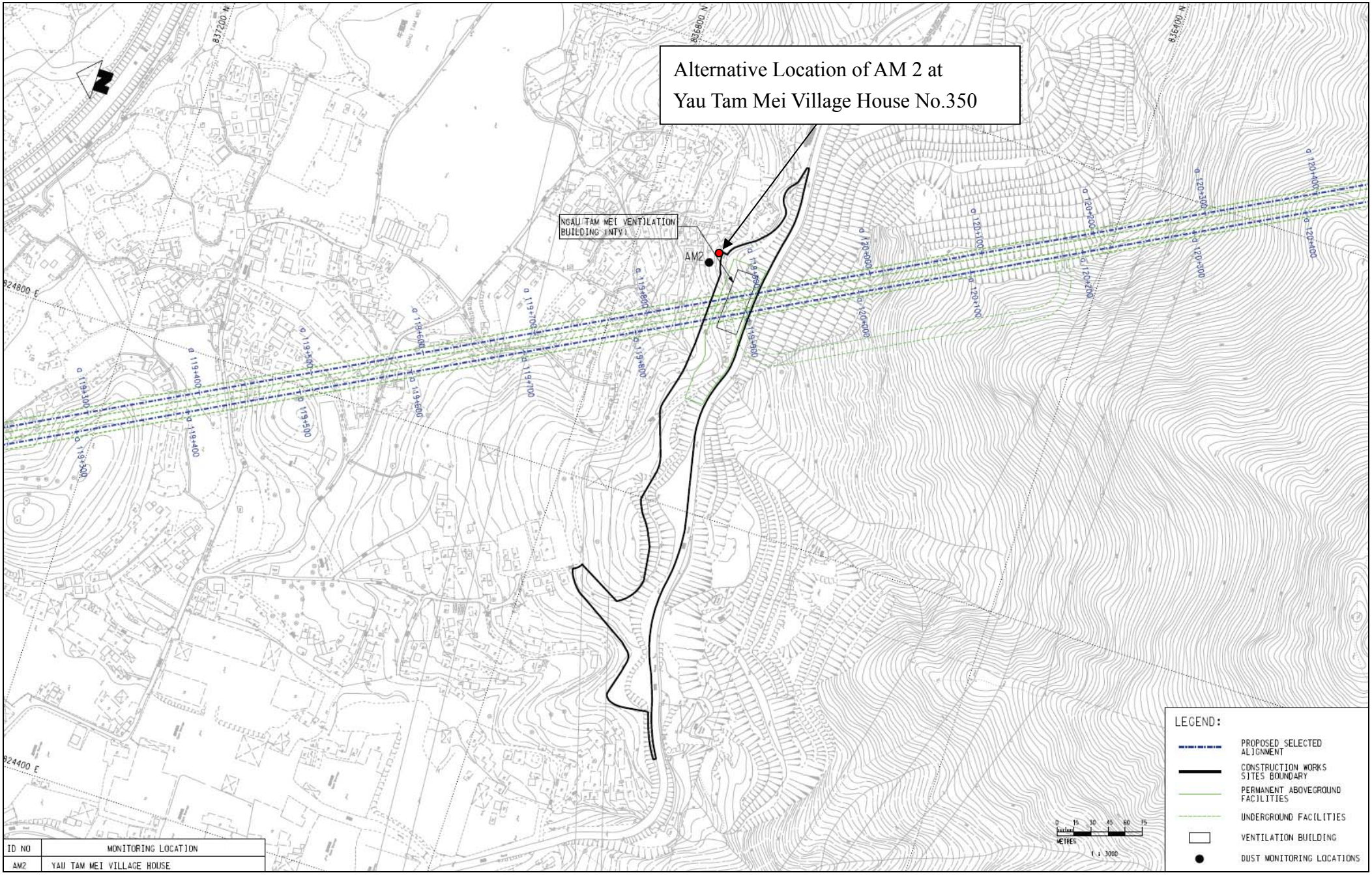
EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measures	When to implement the measures?	Implementation Status
S14.76	- Smoking within the tunnels should be prohibited at all times.	Protect the operation of the XRL and workers from landfill gas hazards	MTR	XRL tunnels within the NTML Consultation Zone	Operation phase	To be implemented as per construction programme
S14.76	- An assumed presence of landfill gas should be adopted at all times by maintenance workers and a strictly regulated "work permit procedure" involving training, ventilation, gas monitoring (as detailed in the Construction recommendations section), safety tracking and communication with maintenance staff, enforcement of the no smoking order.	Protect the workers from landfill gas hazards	MTR	XRL tunnels within the NTML Consultation Zone	Operation phase	To be implemented as per construction programme
S14.82 & S14.83	- The monitoring requirement during the operational phase should be discussed with EPD before the commencement of operation. Weekly monitoring of methane, carbon dioxide and oxygen in the form of a walkover survey at 20m intervals for section of tunnels under NTML and 50m interval within the NTML Consultation Zone is tentatively proposed. The survey should be conducted under non-ventilated condition and before the first train operates and	Confirm no landfill gas ingress into the XRL tunnels	MTR	XRL tunnels within the NTML Consultation Zone	Operation phase	To be implemented as per construction programme

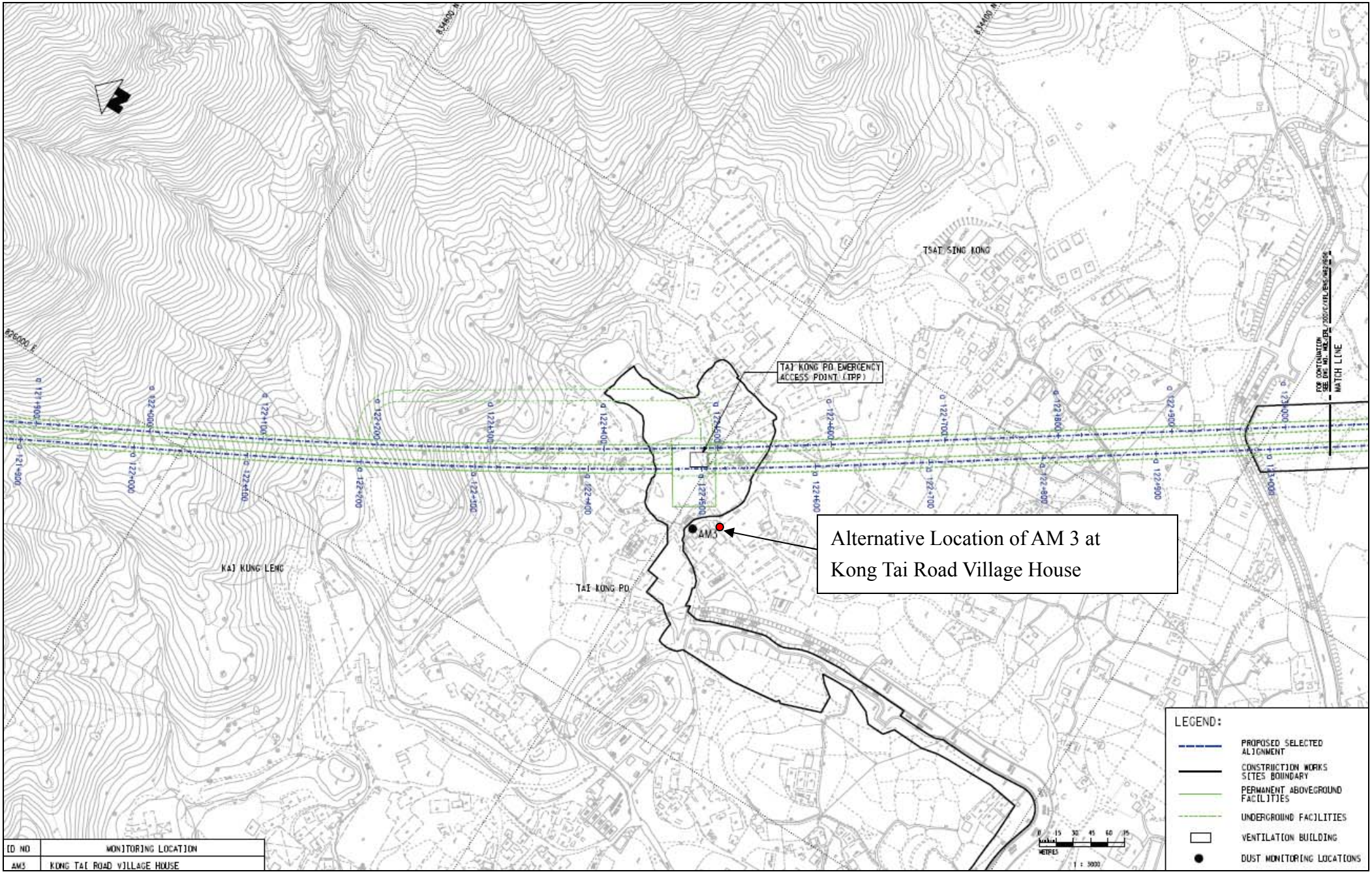
EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measures	When to implement the measures?	Implementation Status
	start-up of ventilation, if applicable. A summary of the monitoring results should be submitted to EPD for record at the end of the monitoring period.					
S14.84	- An annual walkover survey in the tunnels within the Consultation Zone of the NTML should be conducted to test for the presence of flammable gas at joints and cracks, if identified. Rectifications, such as sealing of cracks and inspection of tunnel seals, should be carried out for any signs of presence of flammable gas. The survey should be conducted under non-ventilated condition and before the first train operates and start-up of ventilation, if applicable.	Confirm no landfill gas ingress into the XRL tunnels	MTR	XRL tunnels within the NTML Consultation Zone	Operation phase	To be implemented as per construction programme

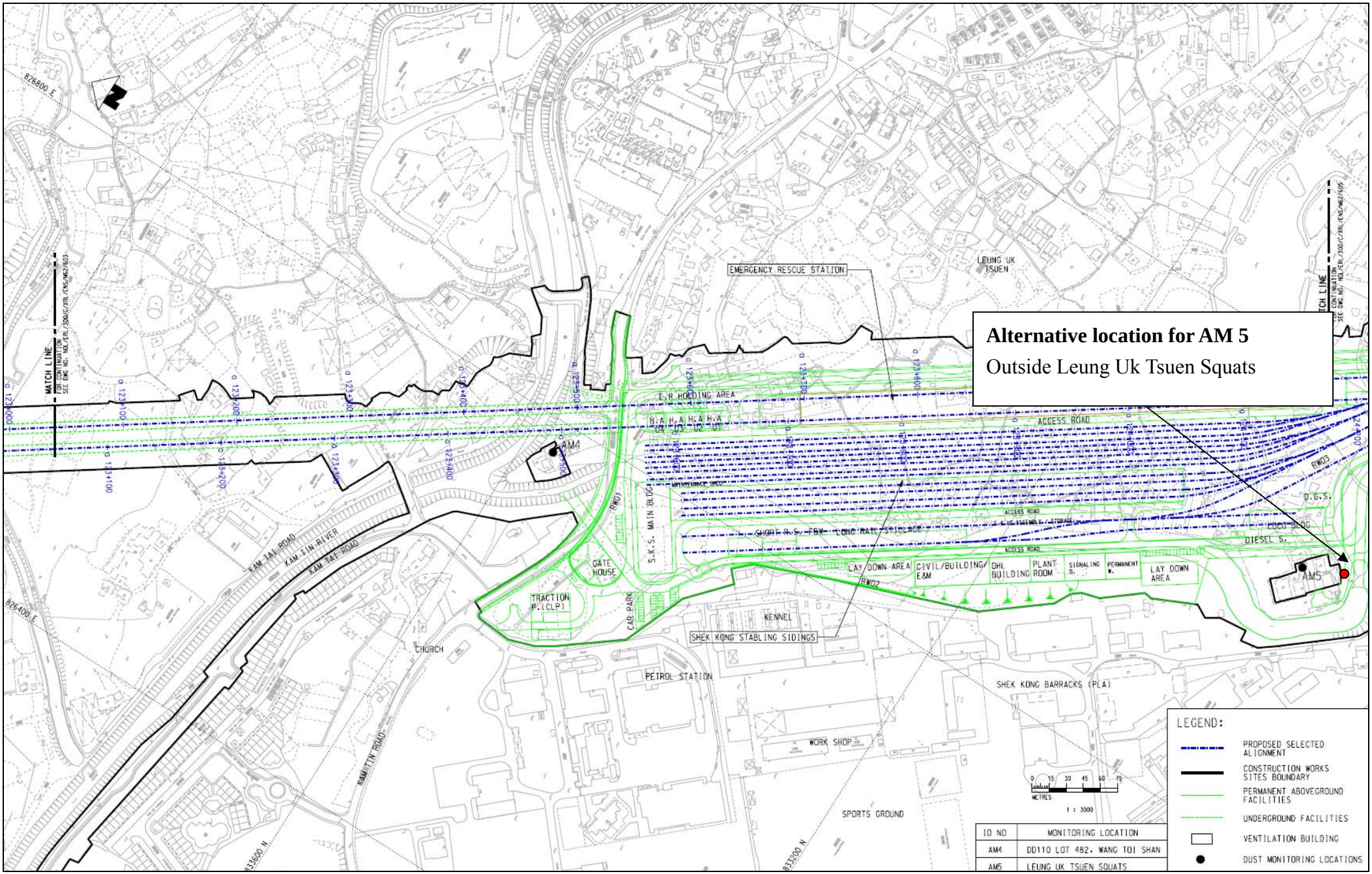
Appendix D

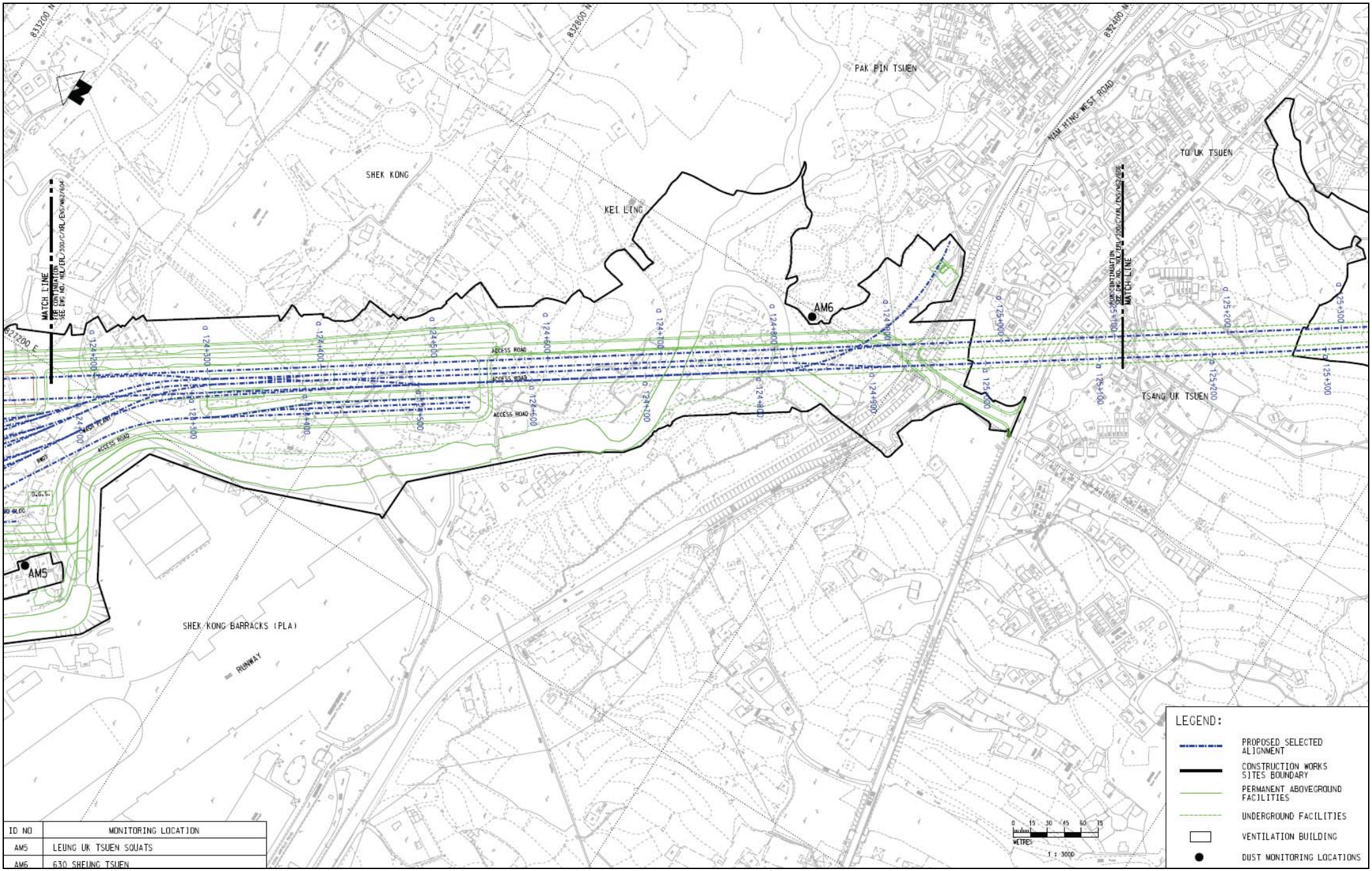
Monitoring Locations


Outside No. 205Mai Po San Tsuen
Alternative monitoring location for AM 1
MAI PO VENTILATION BUILDING (MPV)
MAI PO
CASTLE PEAK ROAD - MAI PO
SAN TIN HIGHWAY
AM1
MO SHANG WAI PROPERTY DEVELOPMENT
ROYAL PALMS
LEGEND:
PROPOSED SELECTED ALIGNMENT
CONSTRUCTION WORKS SITES BOUNDARY
PERMANENT ABOVEGROUND FACILITIES
UNDERGROUND FACILITIES
VENTILATION BUILDING
DUST MONITORING LOCATIONS
ID NO
MONITORING LOCATION
AM1
NOISE S. PHASE A. ROYAL PALMS

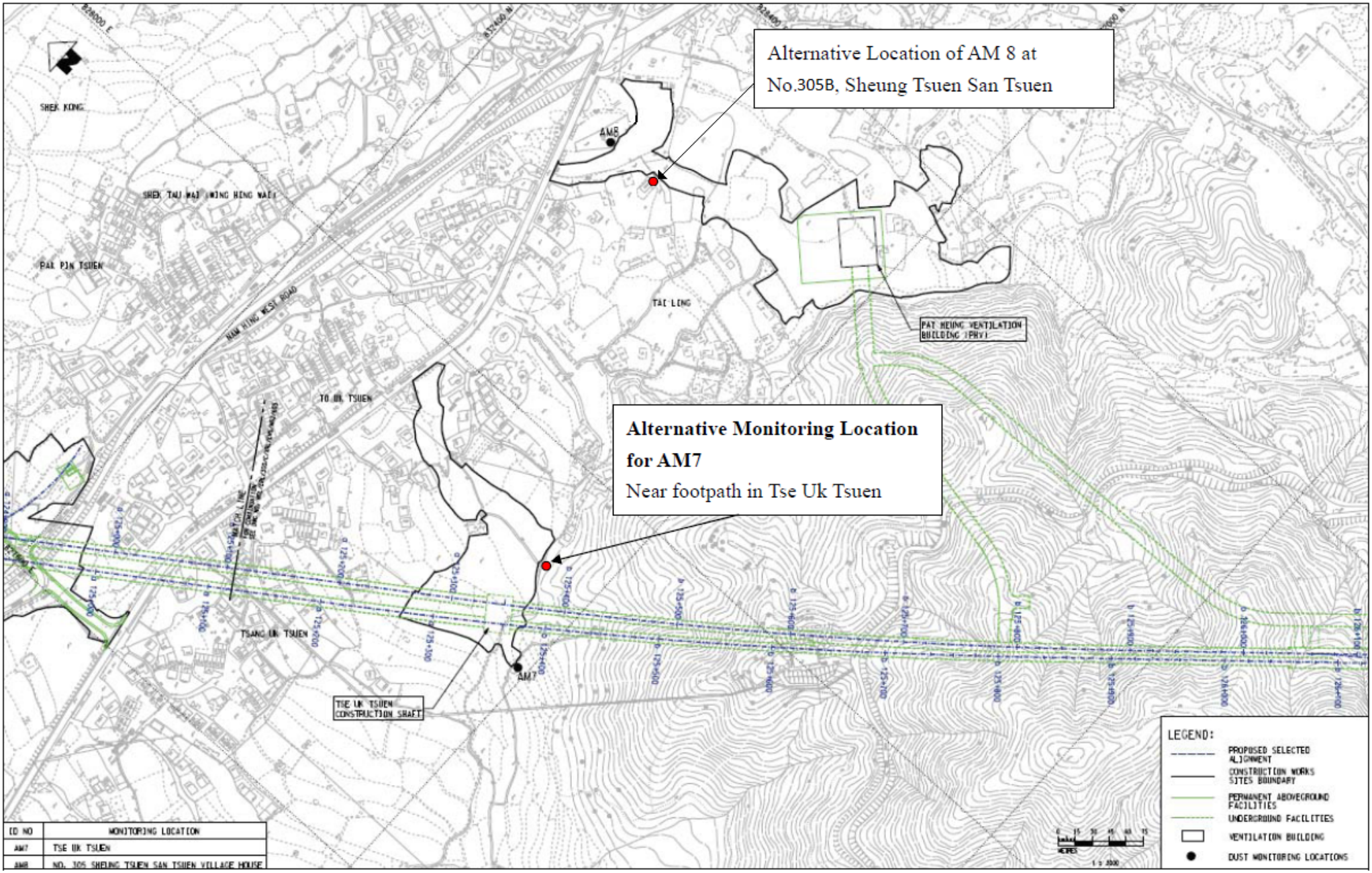

Alternative Location of AM 2 at
Yau Tam Mei Village House No.350
NGAU TAM MEI VENTILATION BUILDING (NTV)
AM2
837200 N
836800 N
836400 N
824800 E
824400 E
LEGEND:
PROPOSED SELECTED ALIGNMENT
CONSTRUCTION WORKS SITES BOUNDARY
PERMANENT ABOVEGROUND FACILITIES
UNDERGROUND FACILITIES
VENTILATION BUILDING
DUST MONITORING LOCATIONS
METRES
1 : 3000
ID NO
MONITORING LOCATION
AM2
YAU TAM MEI VILLAGE HOUSE

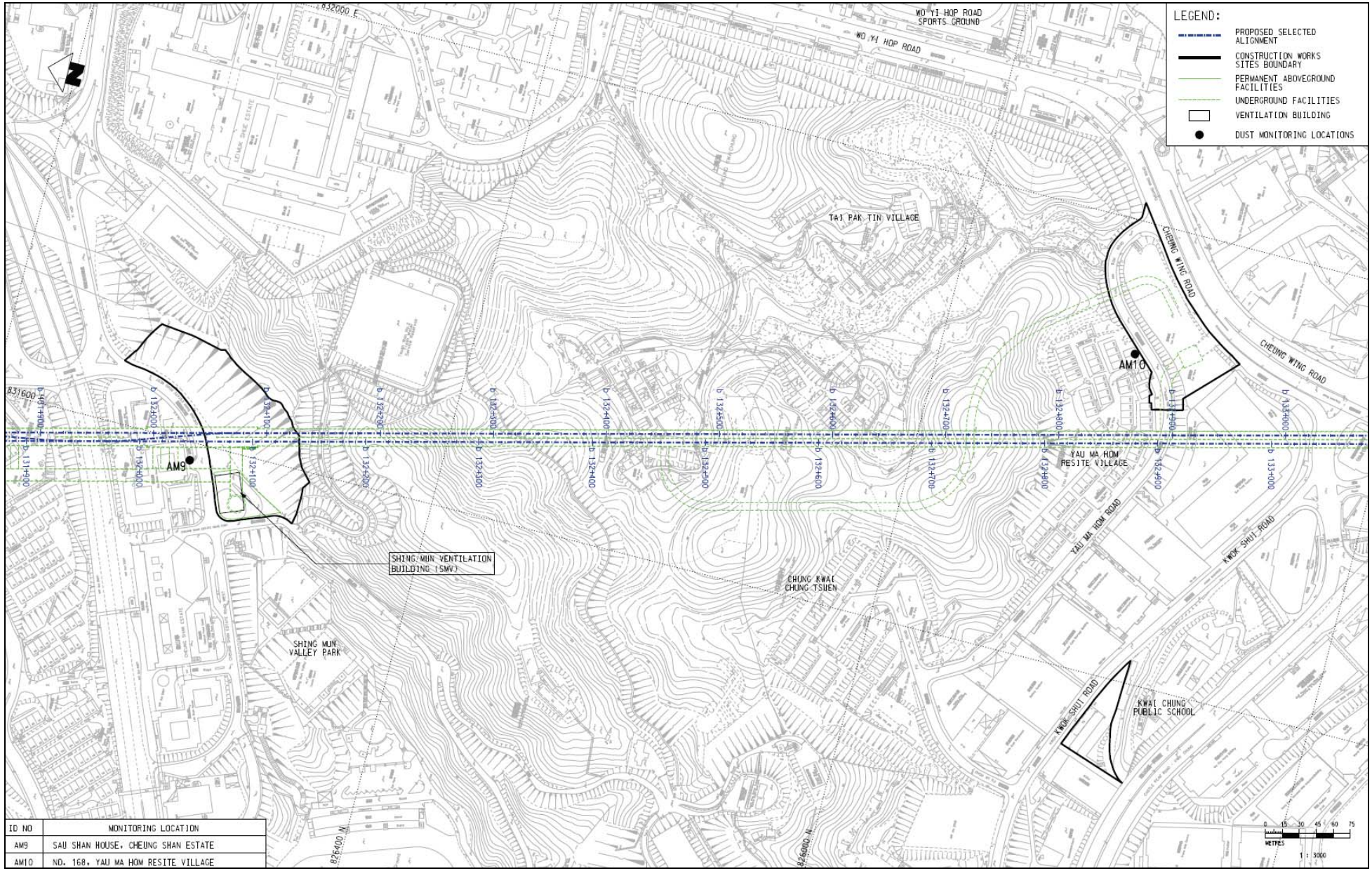

TSAT SING KONG
TAI KONG PO EMERGENCY ACCESS POINT (TPP)
AM3
Alternative Location of AM 3 at Kong Tai Road Village House
KAI KONG LENG
TAI KONG PO
MATCH LINE
LEGEND:
PROPOSED SELECTED ALIGNMENT
CONSTRUCTION WORKS SITES BOUNDARY
PERMANENT ABOVEGROUND FACILITIES
UNDERGROUND FACILITIES
VENTILATION BUILDING
DUST MONITORING LOCATIONS
ID NO
MONITORING LOCATION
AM3
KONG TAI ROAD VILLAGE HOUSE


Alternative location for AM 5
Outside Leung Uk Tsuen Squats
EMERGENCY RESCUE STATION
LEUNG UK TSUEN
MATCH LINE
FOR CONTINUATION SEE DWG NO. NOL/ERL/300/C/KRL/ENS/M&E/603
MATCH LINE
FOR CONTINUATION SEE DWG NO. NOL/ERL/300/C/KRL/ENS/M&E/695
T.R HOEDING AREA
ACCESS ROAD
AM4
AM5
RW01
RW02
RW03
S.K.S. MAIN BLDG.
MAINTENANCE SHED
SHORT R.S.
LONG RAIL STORAGE
D.G.S.
DIESEL S.
LAY DOWN AREA
CIVIL/BUILDING E&M
OHL BUILDING
PLANT ROOM
SIGNALING B.
PERMANENT W.
LAY DOWN AREA
GATE HOUSE
TRACTION P.(CLP)
CAR PARK
KENNEL
SHEK KONG STABLING SIDINGS
CHURCH
PETROL STATION
SHEK KONG BARRACKS (PLA)
WORK SHOP
SPORTS GROUND
KAM TAI ROAD
KAM TIN RIVER
KAM TAI ROAD
KAM TIN ROAD
826800 E
826400 E
833600 N
833200 N
METRES
1 : 3000
LEGEND:
PROPOSED SELECTED ALIGNMENT
CONSTRUCTION WORKS SITES BOUNDARY
PERMANENT ABOVEGROUND FACILITIES
UNDERGROUND FACILITIES
VENTILATION BUILDING
DUST MONITORING LOCATIONS
ID NO
MONITORING LOCATION
AM4
DD110 LOT 482, WANG TOI SHAN
AM5
LEUNG UK TSUEN SQUATS

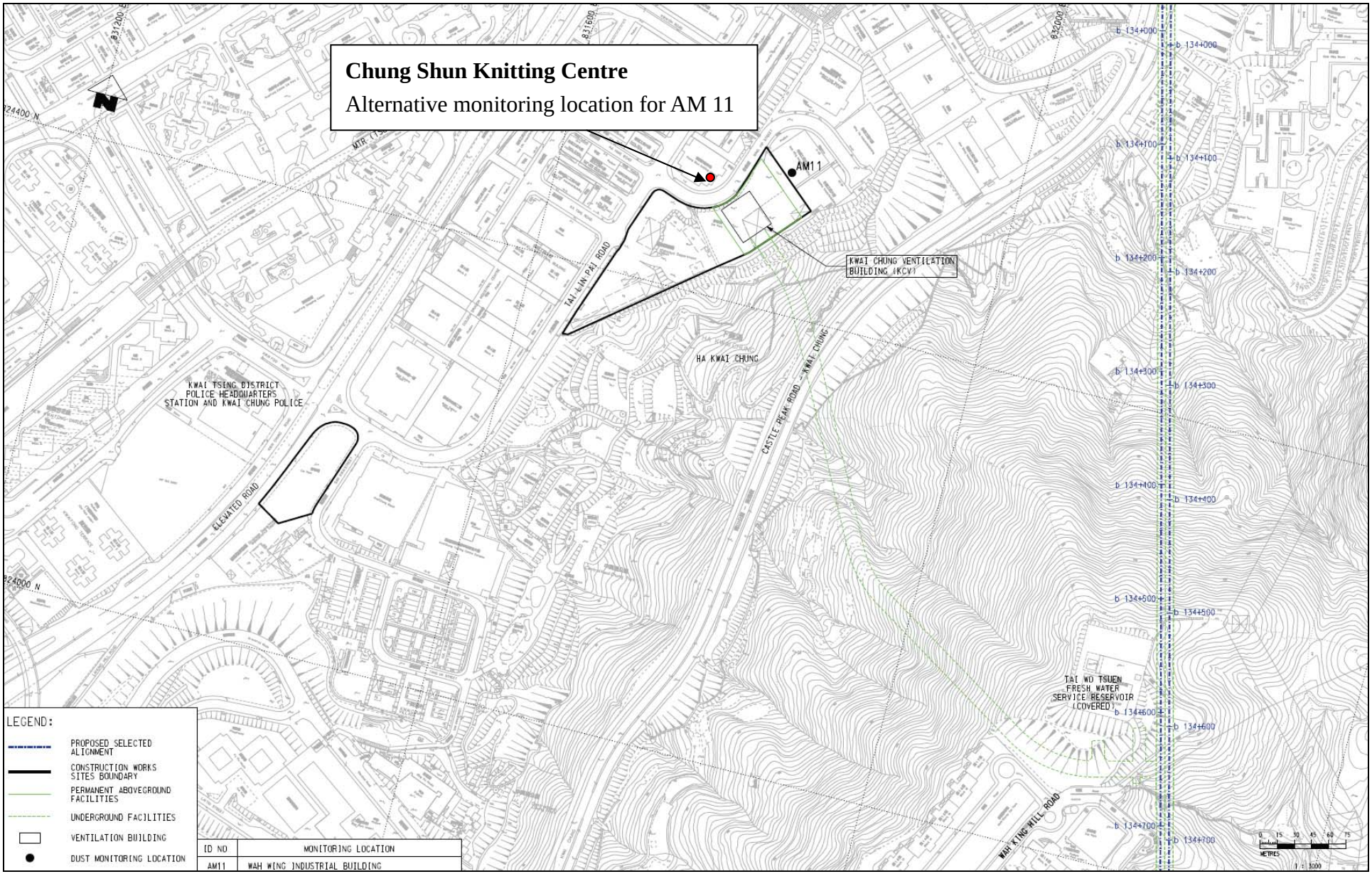


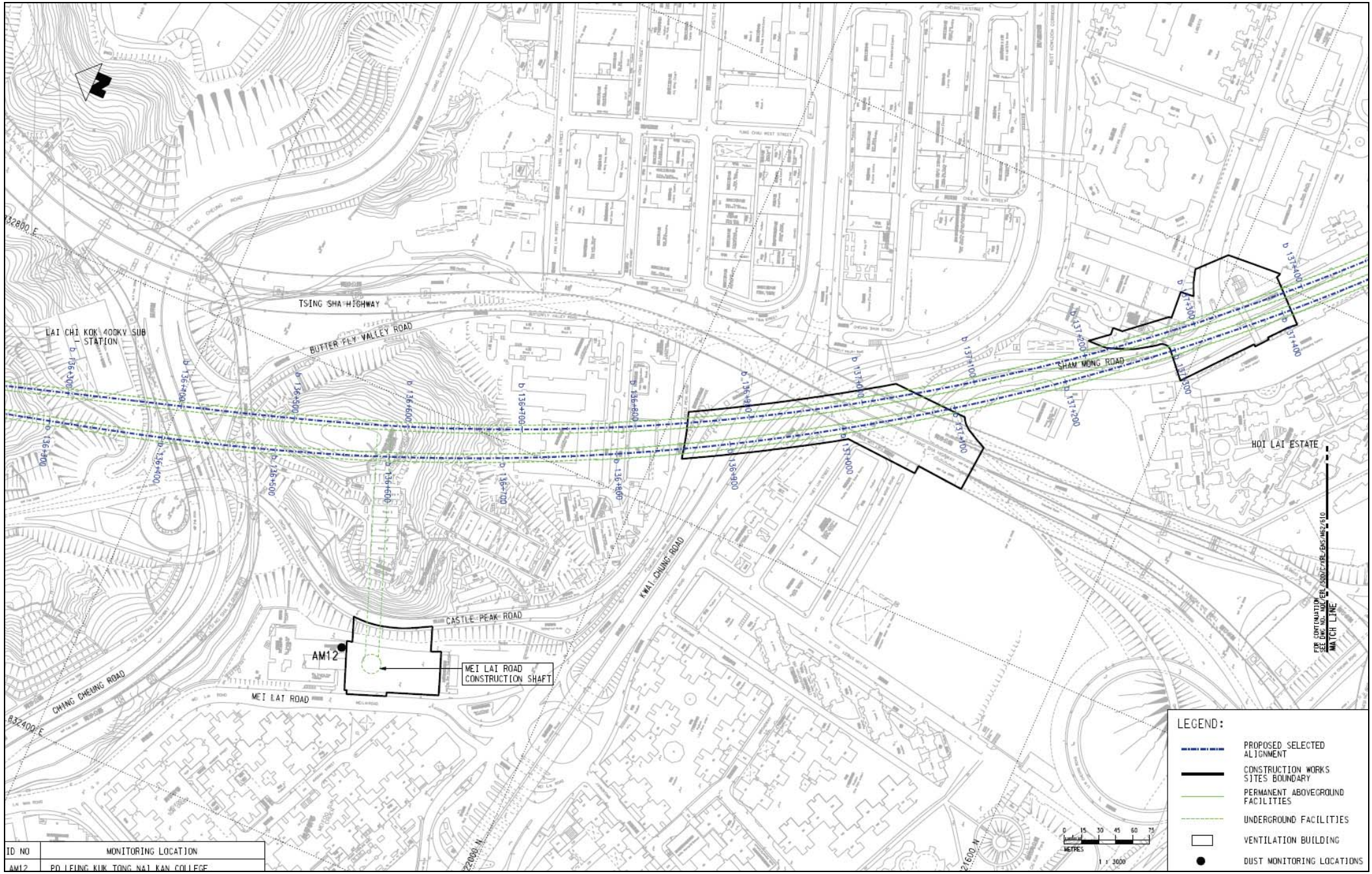
ID NO	MONITORING LOCATION
AM5	LEUNG UK TSUEN SQUATS
AM6	630 SHEUNG TSUEN


Alternative Location of AM 8 at
No.305B, Sheung Tsuen San Tsuen
Alternative Monitoring Location
for AM7
Near footpath in Tse Uk Tsuen
AM8
AM7
SHEK KONG
SHEK TAU WAI
PAK PIN TSUEN
TAI LENG
PAT HEUNG VENTILATION BUILDING (PHV)
TO UK TSUEN
TSANG UK TSUEN
TSE UK TSUEN CONSTRUCTION SHAFT
LEGEND:
PROPOSED SELECTED ALIGNMENT
CONSTRUCTION WORKS SITES BOUNDARY
PERMANENT ABOVEGROUND FACILITIES
UNDERGROUND FACILITIES
VENTILATION BUILDING
DUST MONITORING LOCATIONS
ID NO
MONITORING LOCATION
AM7
TSE UK TSUEN
AM8
NO. 305 SHEUNG TSUEN SAN TSUEN VILLAGE HOUSE

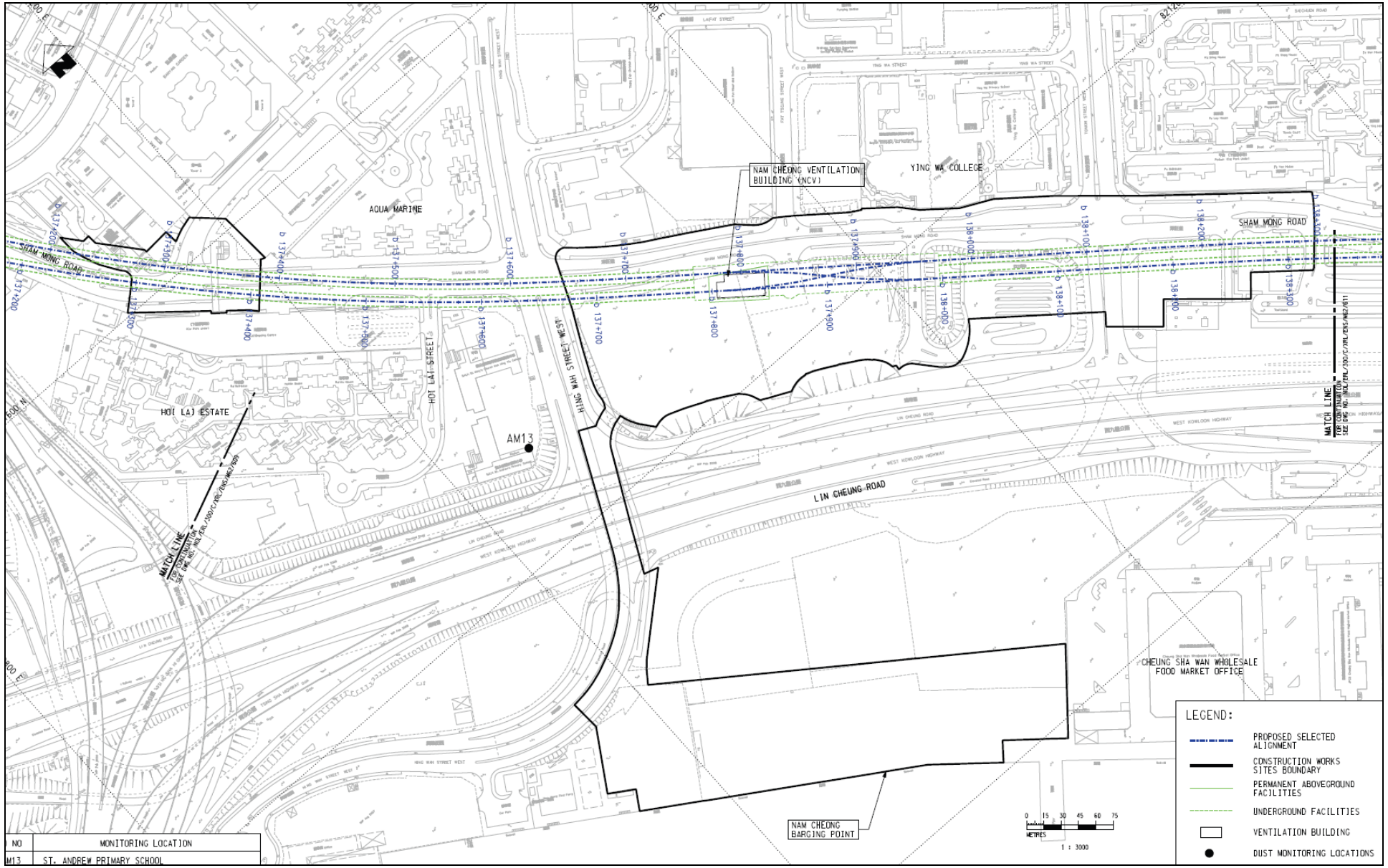


ID NO	MONITORING LOCATION
AM9	SAU SHAN HOUSE, CHEUNG SHAN ESTATE
AM10	NO. 168, YAU MA HOM RESITE VILLAGE

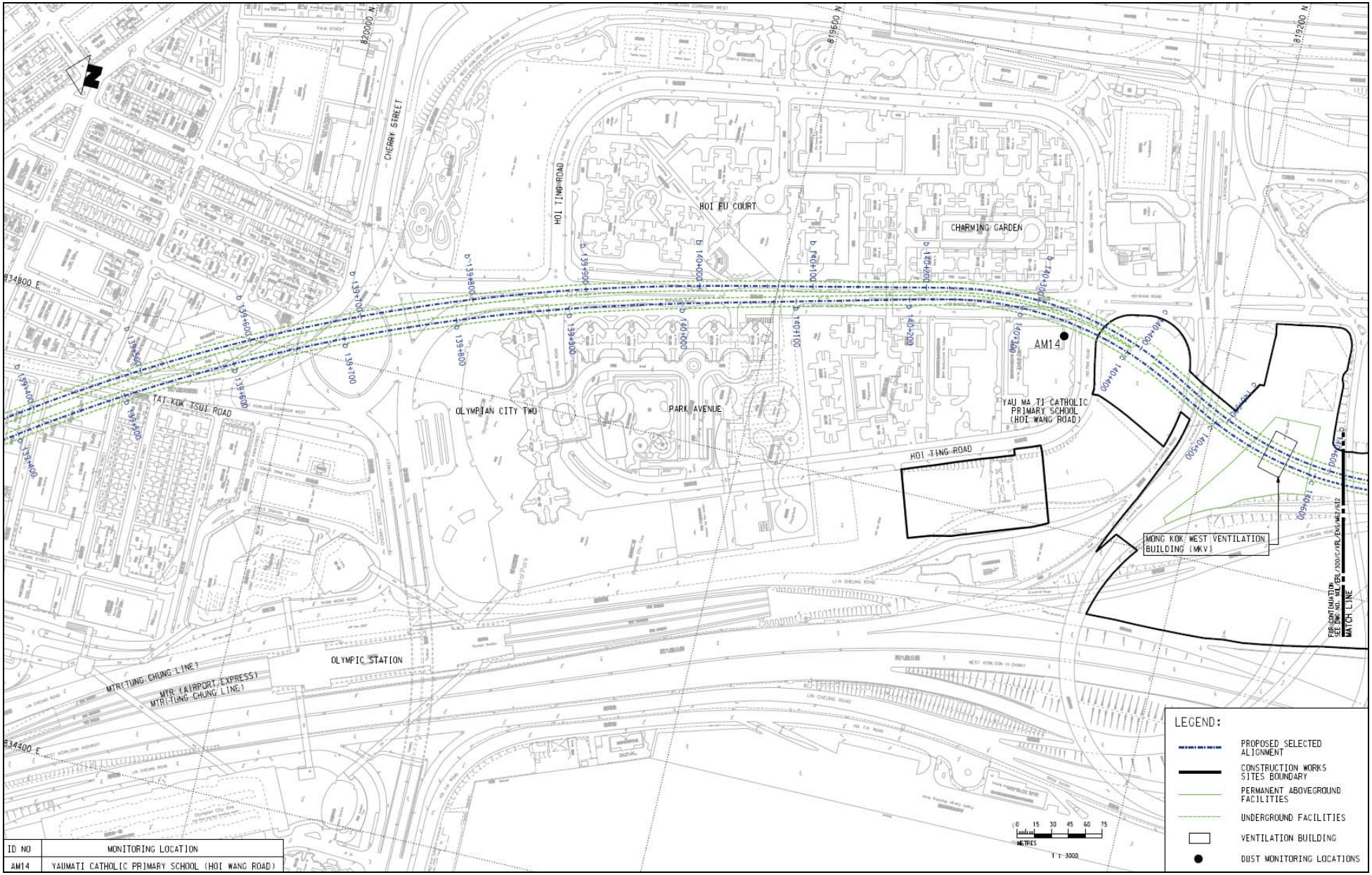

Chung Shun Knitting Centre
Alternative monitoring location for AM 11
AM11
KWAI CHUNG VENTILATION BUILDING (KCV)
TAI KLIN PAI ROAD
HA KWAI CHUNG
CASTLE PEAK ROAD - KWAI CHUNG
KWAI TSING DISTRICT POLICE HEADQUARTERS STATION AND KWAI CHUNG POLICE
ELEVATED ROAD
TAI WO TSUEN FRESH WATER SERVICE RESERVOIR (COVERED)
WAH KING HILL ROAD
LEGEND:
PROPOSED SELECTED ALIGNMENT
CONSTRUCTION WORKS SITES BOUNDARY
PERMANENT ABOVEGROUND FACILITIES
UNDERGROUND FACILITIES
VENTILATION BUILDING
DUST MONITORING LOCATION
ID NO
MONITORING LOCATION
AM11
WAH WING INDUSTRIAL BUILDING



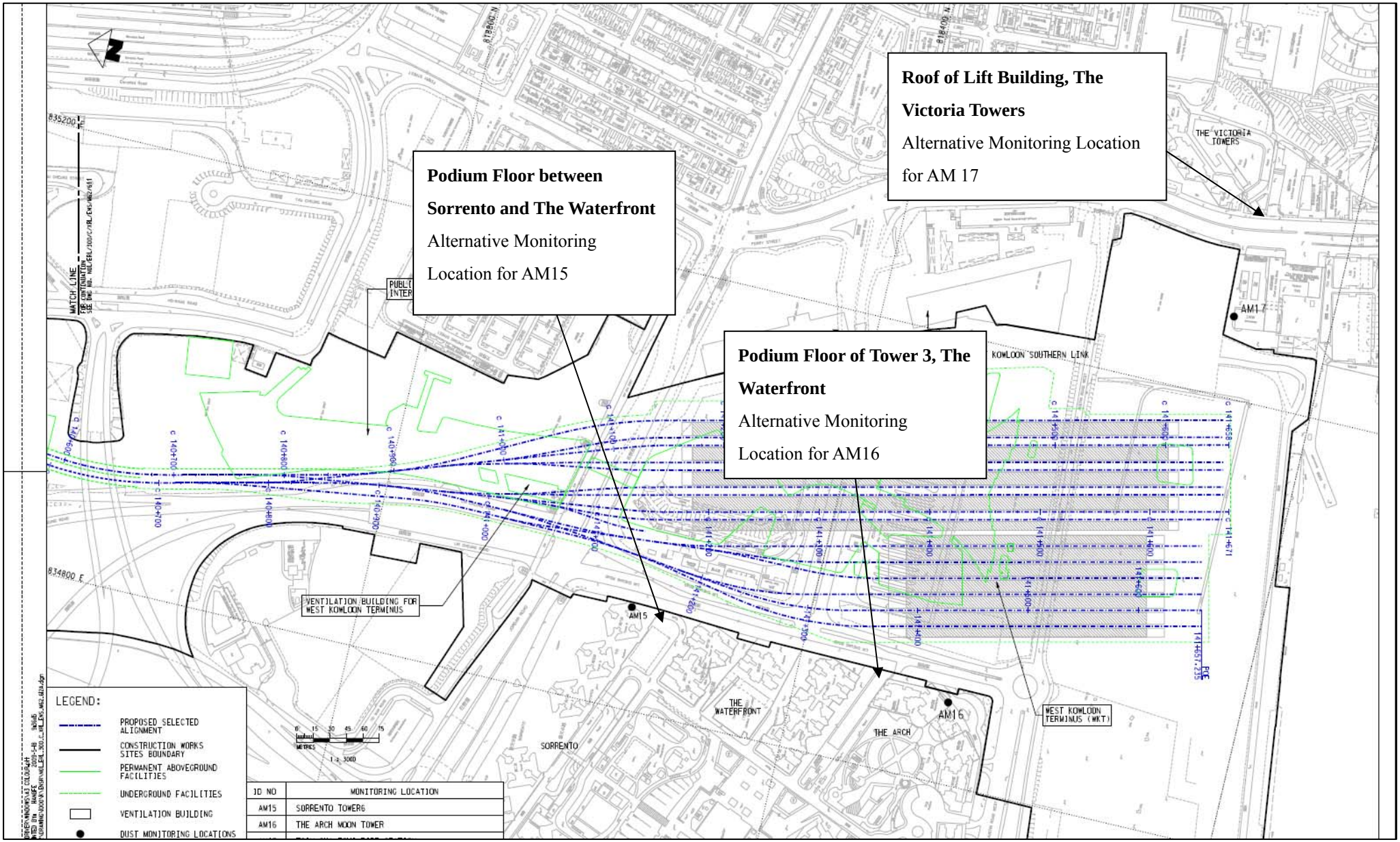
ID NO	MONITORING LOCATION
AM12	PO LEUNG KUK TONG NAI KAN COLLEGE



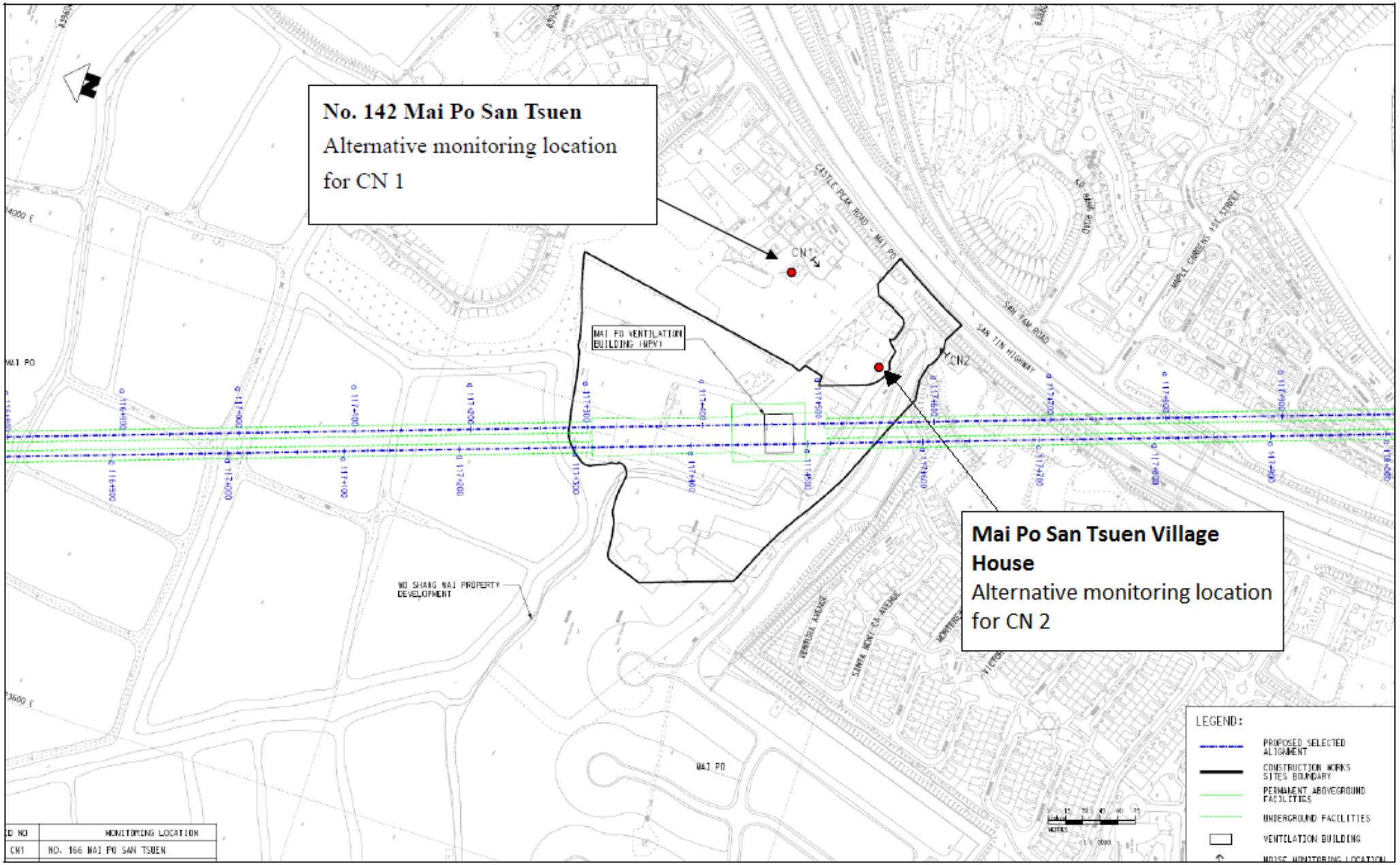
NO	MONITORING LOCATION
M13	ST. ANDREW PRIMARY SCHOOL

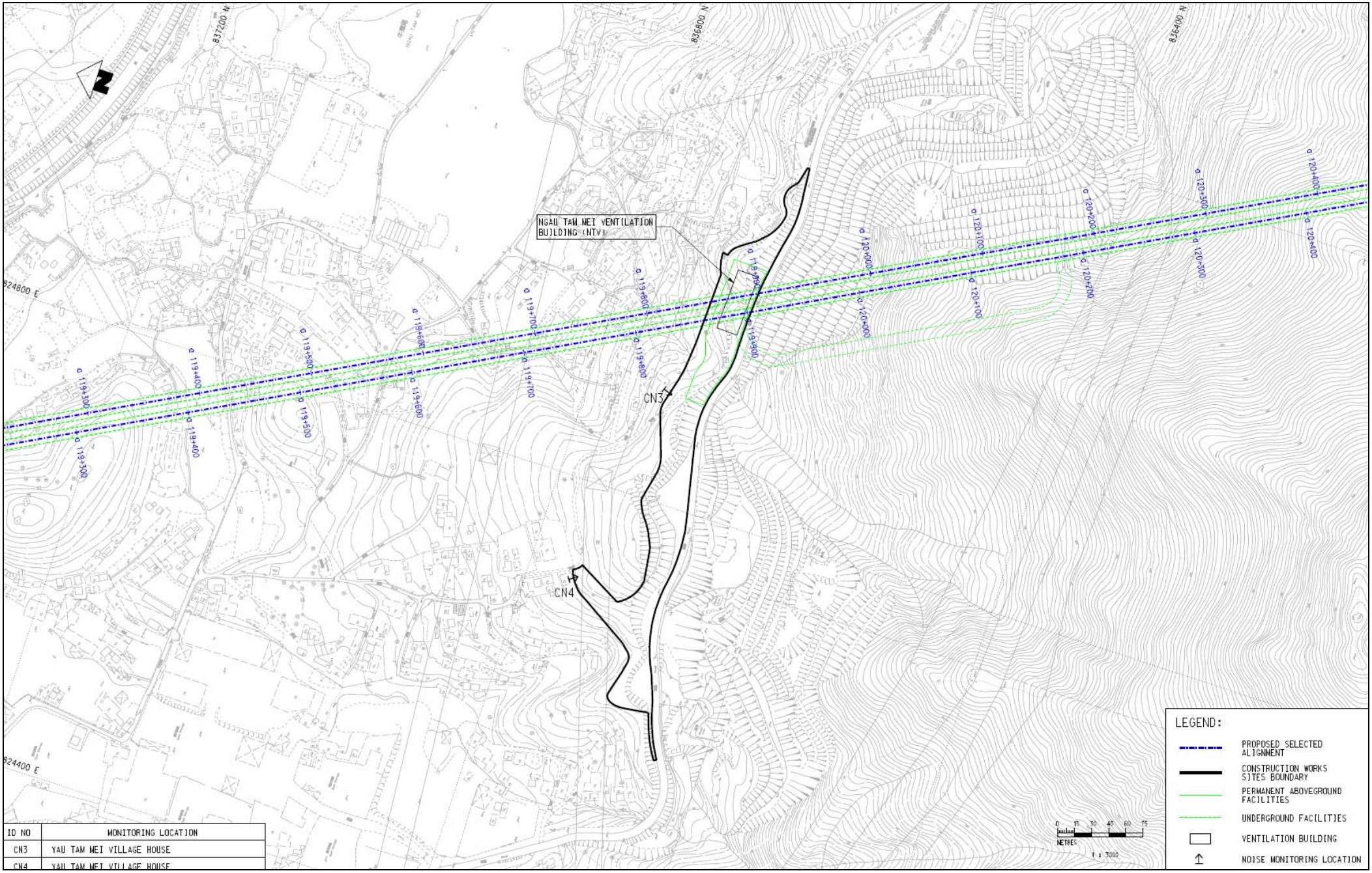


ID NO	MONITORING LOCATION
AM14	YAUMATI CATHOLIC PRIMARY SCHOOL (HOI WANG ROAD)

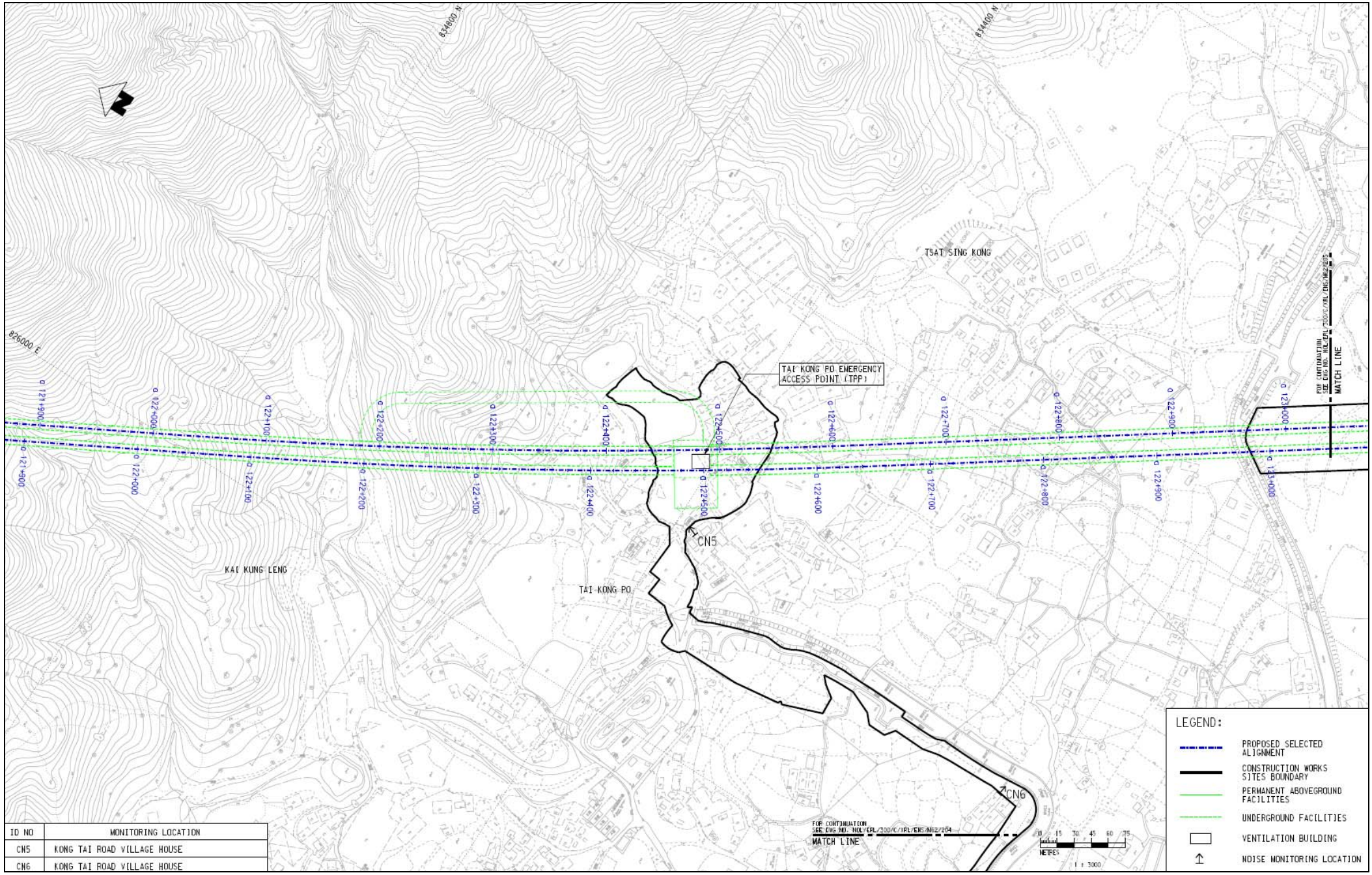


Dust monitoring locations


No. 142 Mai Po San Tsuen
Alternative monitoring location for CN 1
CN1
CN2
MAI PO VENTILATION BUILDING (MPV)
Mai Po San Tsuen Village House
Alternative monitoring location for CN 2
WO SHANG WAI PROPERTY DEVELOPMENT
MAI PO
CASTLE PEAK ROAD - MAI PO
SAN TIN HIGHWAY
SAN TAM ROAD
LEGEND:
PROPOSED SELECTED ALIGNMENT
CONSTRUCTION WORKS SITES BOUNDARY
PERMANENT ABOVEGROUND FACILITIES
UNDERGROUND FACILITIES
VENTILATION BUILDING
NO
MONITORING LOCATION
CN1
NO. 166 MAI PO SAN TSUEN



ID NO	MONITORING LOCATION
CN3	YAU TAM MEI VILLAGE HOUSE
CN4	YAU TAM MEI VILLAGE HOUSE



ID NO	MONITORING LOCATION
CN5	KONG TAI ROAD VILLAGE HOUSE
CN6	KONG TAI ROAD VILLAGE HOUSE

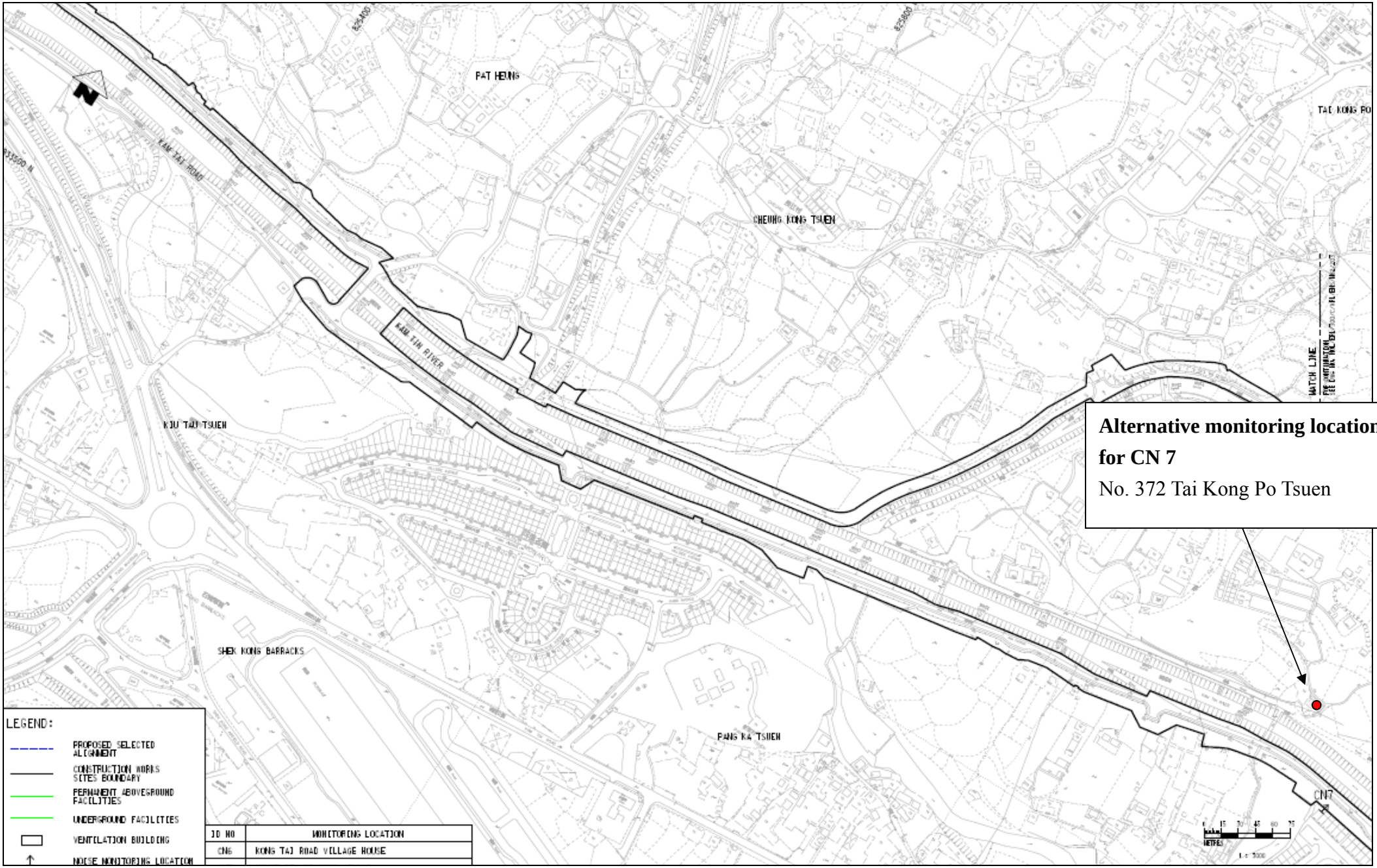
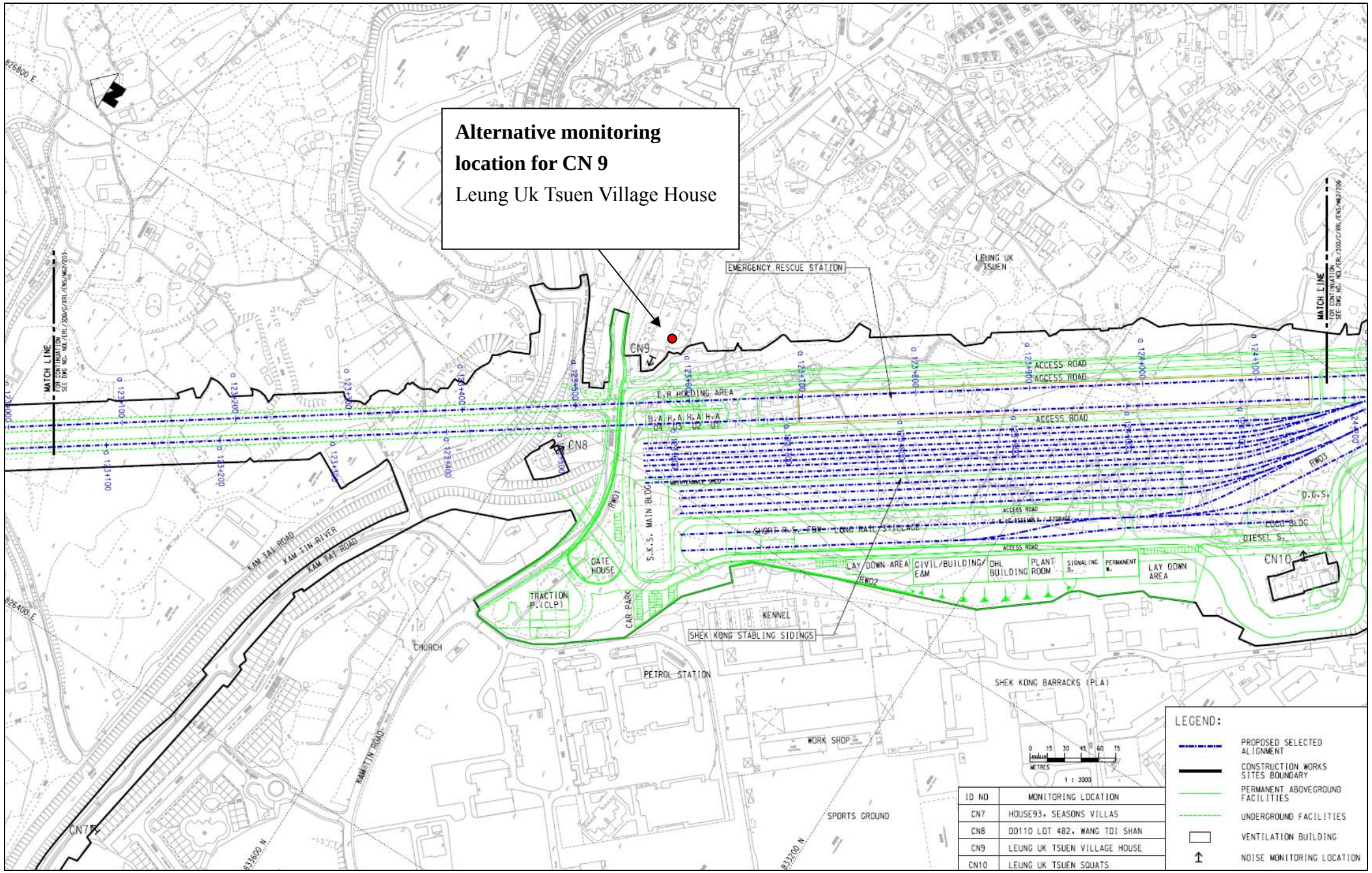
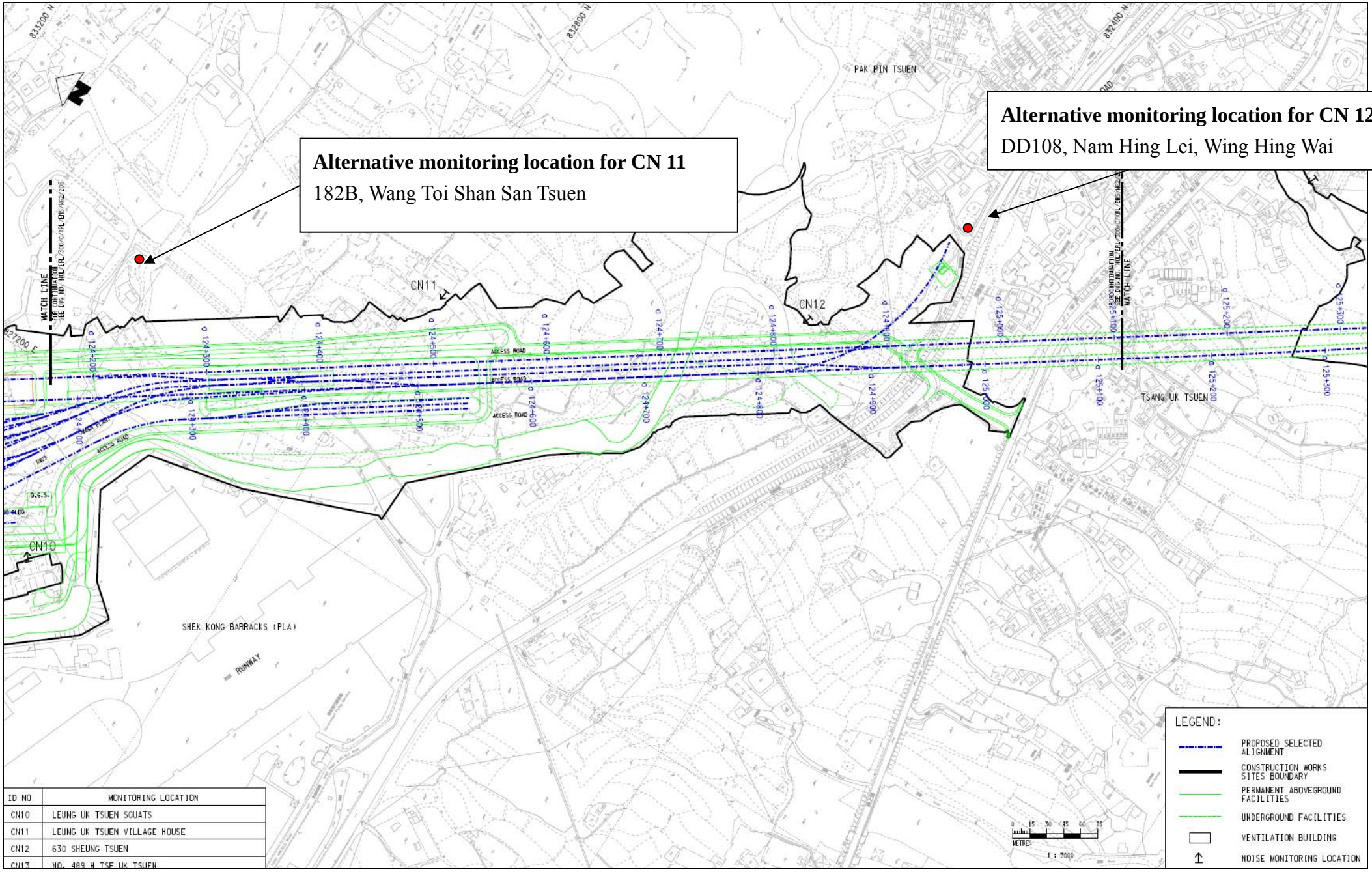
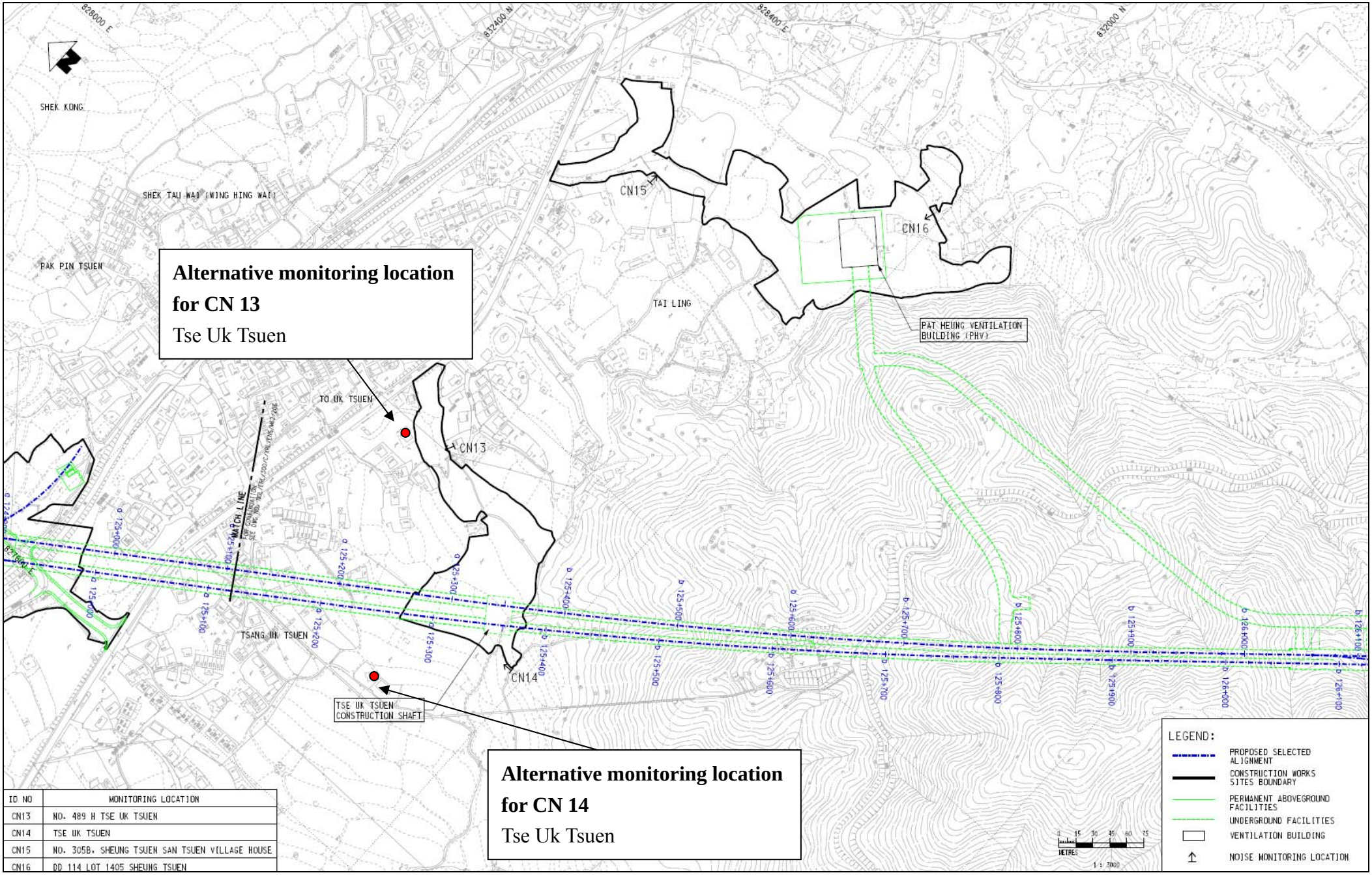


Figure 2 – Noise Monitoring Locations

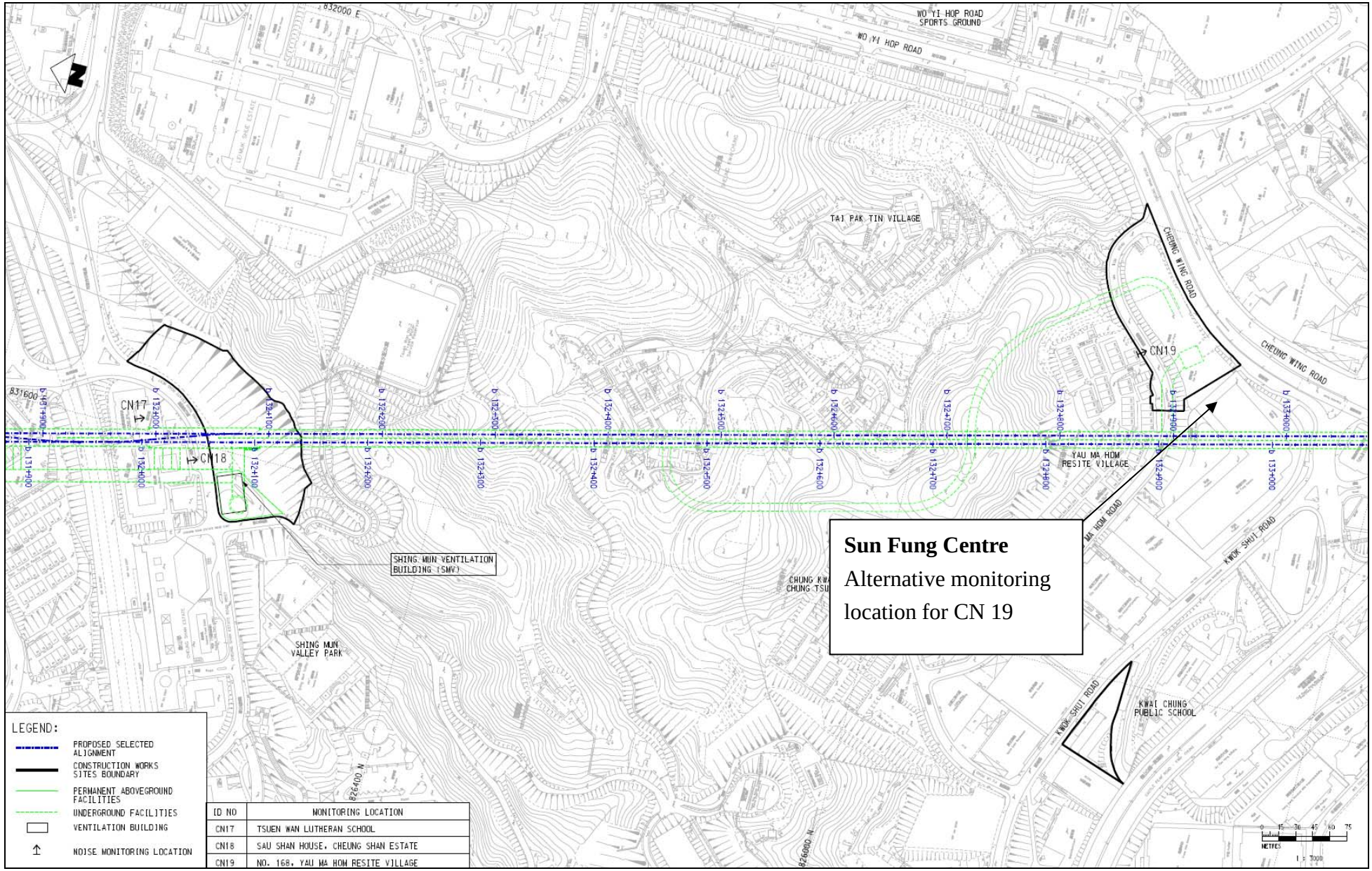

Alternative monitoring location for CN 9
Leung Uk Tsuen Village House
EMERGENCY RESCUE STATION
LEUNG UK TSUEN
CN9
CN8
CN10
CN7
E.R HOLDING AREA
ACCESS ROAD
MAINTENANCE SHED
S.K.S. MAIN BLDG
GATE HOUSE
TRACTION P.(CLP)
CAR PARK
KENNEL
SHEK KONG STABLING SIDINGS
LAY DOWN AREA
CIVIL/BUILDING E&M
OHL BUILDING
PLANT ROOM
SIGNALING B.
PERMANENT W.
LAY DOWN AREA
D.G.S.
COCO BLDG
DIESEL S.
KAM TAI ROAD
KAM TIN RIVER
KAM TIN ROAD
CHURCH
PETROL STATION
WORK SHOP
SHEK KONG BARRACKS (PLA)
SPORTS GROUND
MATCH LINE
826800 E
826400 E
833600 N
833200 N
LEGEND:
PROPOSED SELECTED ALIGNMENT
CONSTRUCTION WORKS SITES BOUNDARY
PERMANENT ABOVEGROUND FACILITIES
UNDERGROUND FACILITIES
VENTILATION BUILDING
NOISE MONITORING LOCATION
METRES
1 : 3000
ID NO | MONITORING LOCATION
CN7 | HOUSE93, SEASONS VILLAS
CN8 | DD110 LOT 482, WANG TOI SHAN
CN9 | LEUNG UK TSUEN VILLAGE HOUSE
CN10 | LEUNG UK TSUEN SQUATS



ID NO	MONITORING LOCATION
CN10	LEUNG UK TSUEN SQUATS
CN11	LEUNG UK TSUEN VILLAGE HOUSE
CN12	630 SHEUNG TSUEN
CN13	NO. 489 H TSE UK TSUEN



ID NO	MONITORING LOCATION
CN13	NO. 489 H TSE UK TSUEN
CN14	TSE UK TSUEN
CN15	NO. 305B, SHEUNG TSUEN SAN TSUEN VILLAGE HOUSE
CN16	DD 114 LOT 1405 SHEUNG TSUEN


832000 E
WO YI HOP ROAD SPORTS GROUND
WO YI HOP ROAD
TAI PAK TIN VILLAGE
CHEUNG WING ROAD
CHEUNG WING ROAD
CN19
CN17
CN18
831600
SHING MUN VENTILATION BUILDING (SMV)
SHING MUN VALLEY PARK
YAU MA HOM RESITE VILLAGE
MA HOM ROAD
KWOK SHUI ROAD
KWOK SHUI ROAD
KWAI CHUNG PUBLIC SCHOOL
826400 N
826000 N
METRES
1 : 7000
Sun Fung Centre
Alternative monitoring location for CN 19
LEGEND:
PROPOSED SELECTED ALIGNMENT
CONSTRUCTION WORKS SITES BOUNDARY
PERMANENT ABOVEGROUND FACILITIES
UNDERGROUND FACILITIES
VENTILATION BUILDING
NOISE MONITORING LOCATION
ID NO | MONITORING LOCATION
CN17 | TSUEN WAN LUTHERAN SCHOOL
CN18 | SAU SHAN HOUSE, CHEUNG SHAN ESTATE
CN19 | NO. 168, YAU MA HOM RESITE VILLAGE

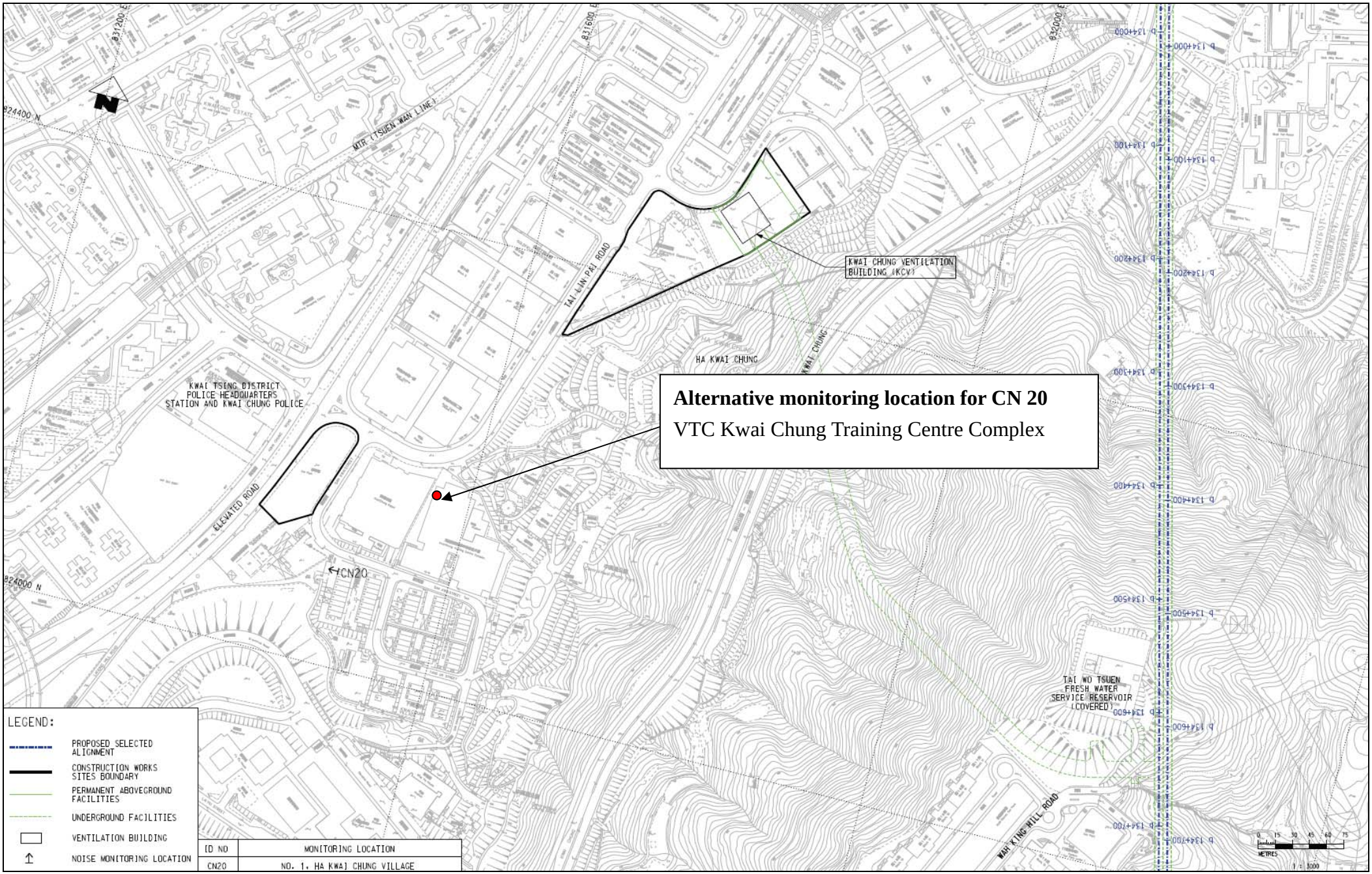
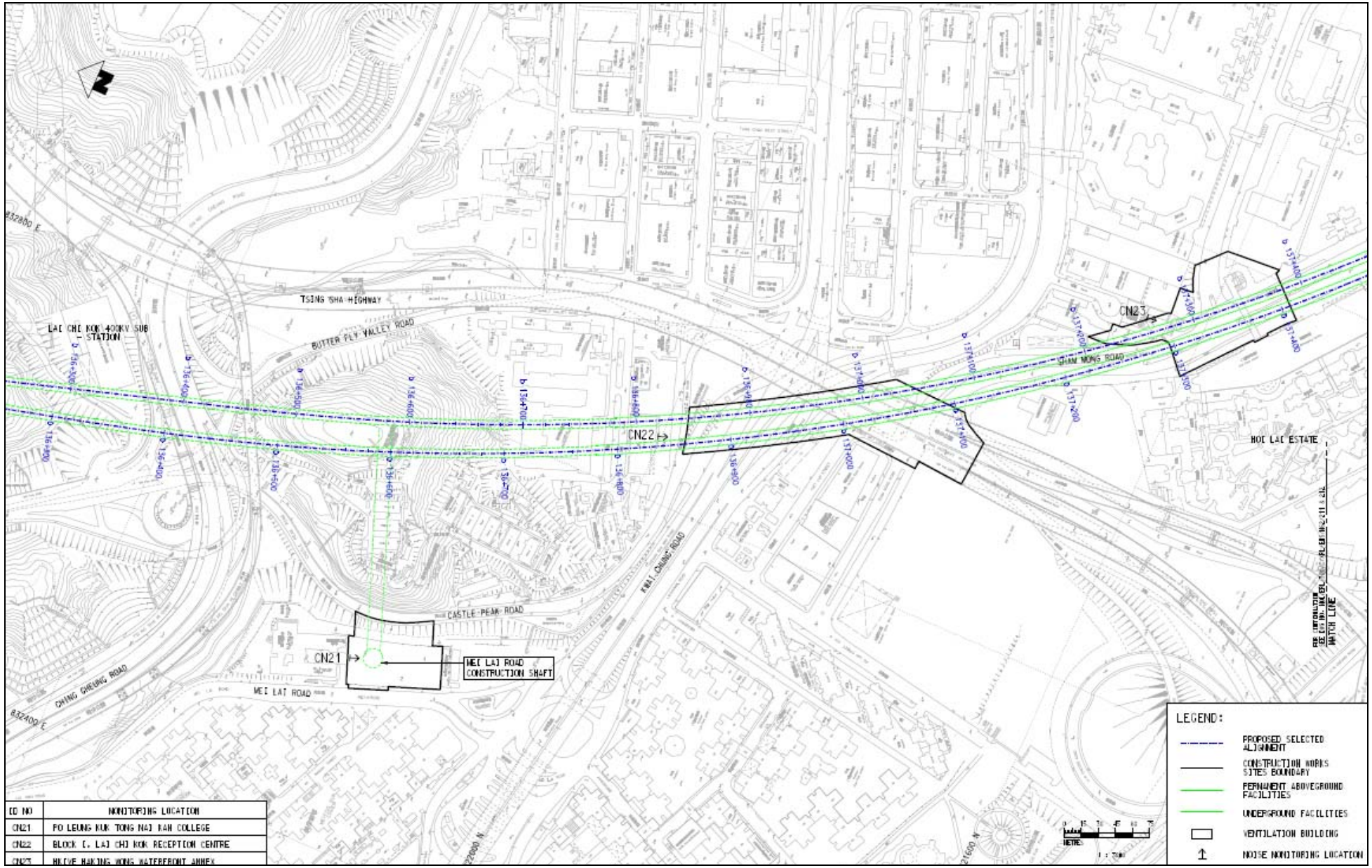
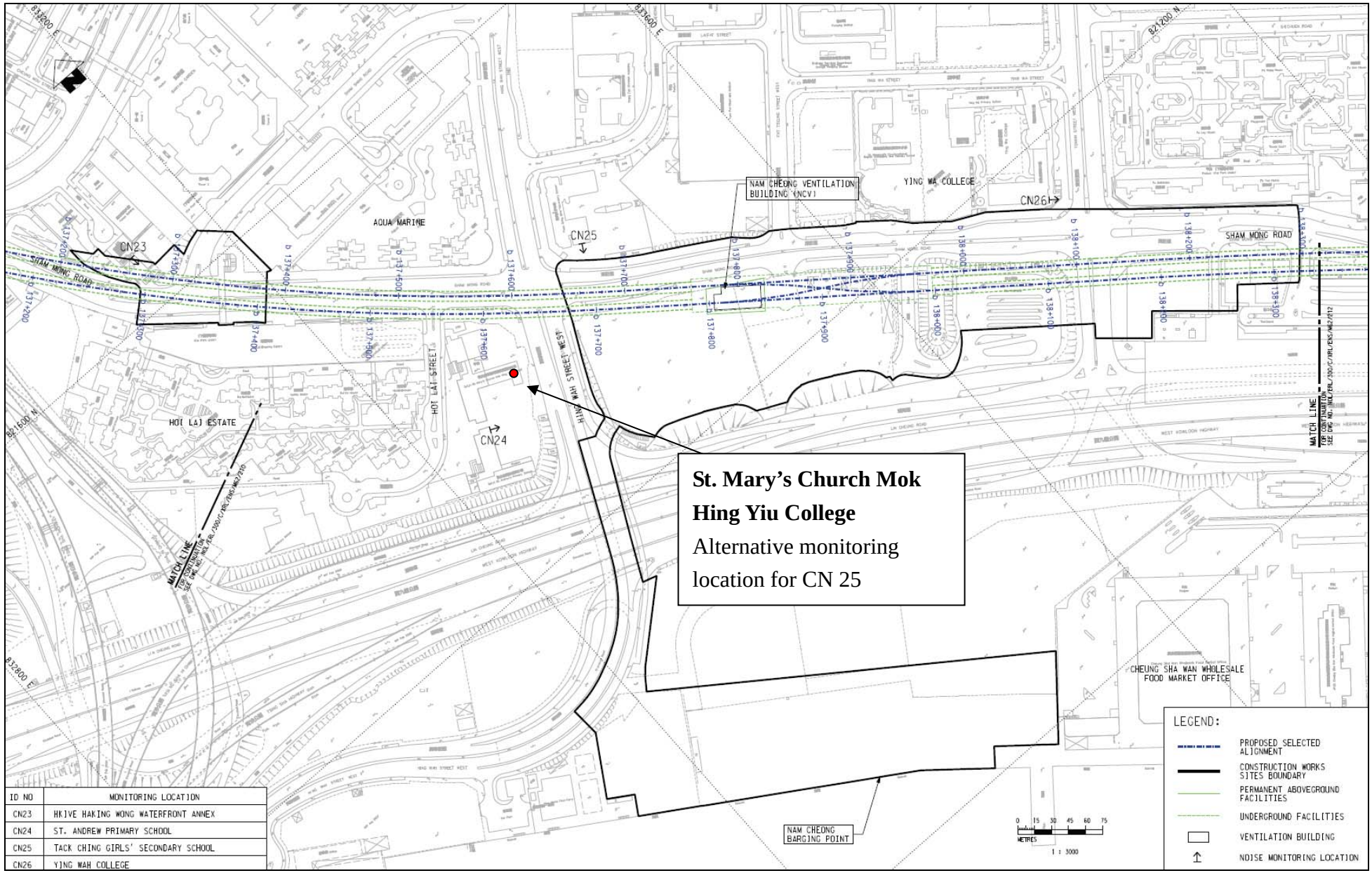


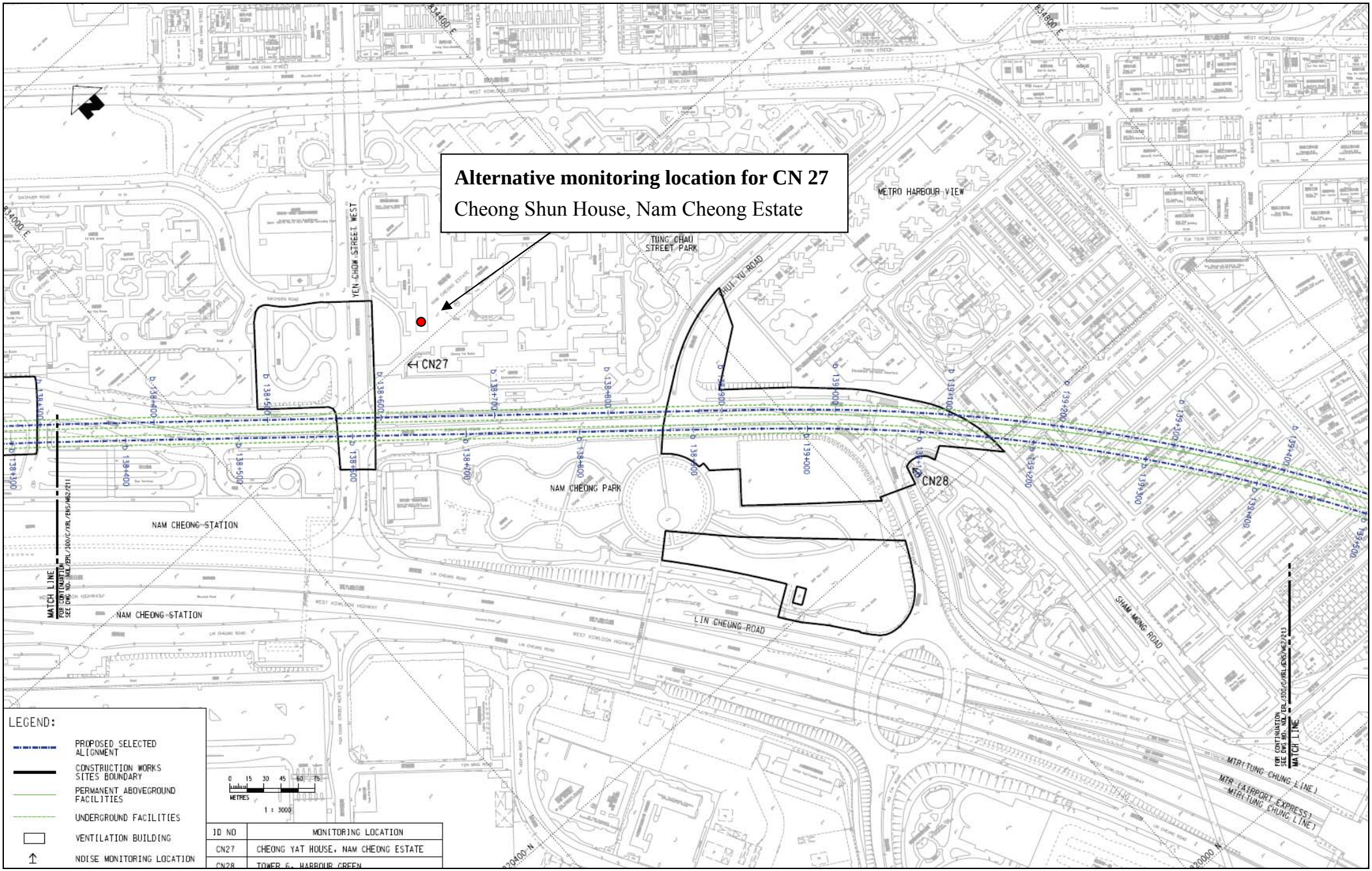
Figure 3 – Noise Monitoring Location

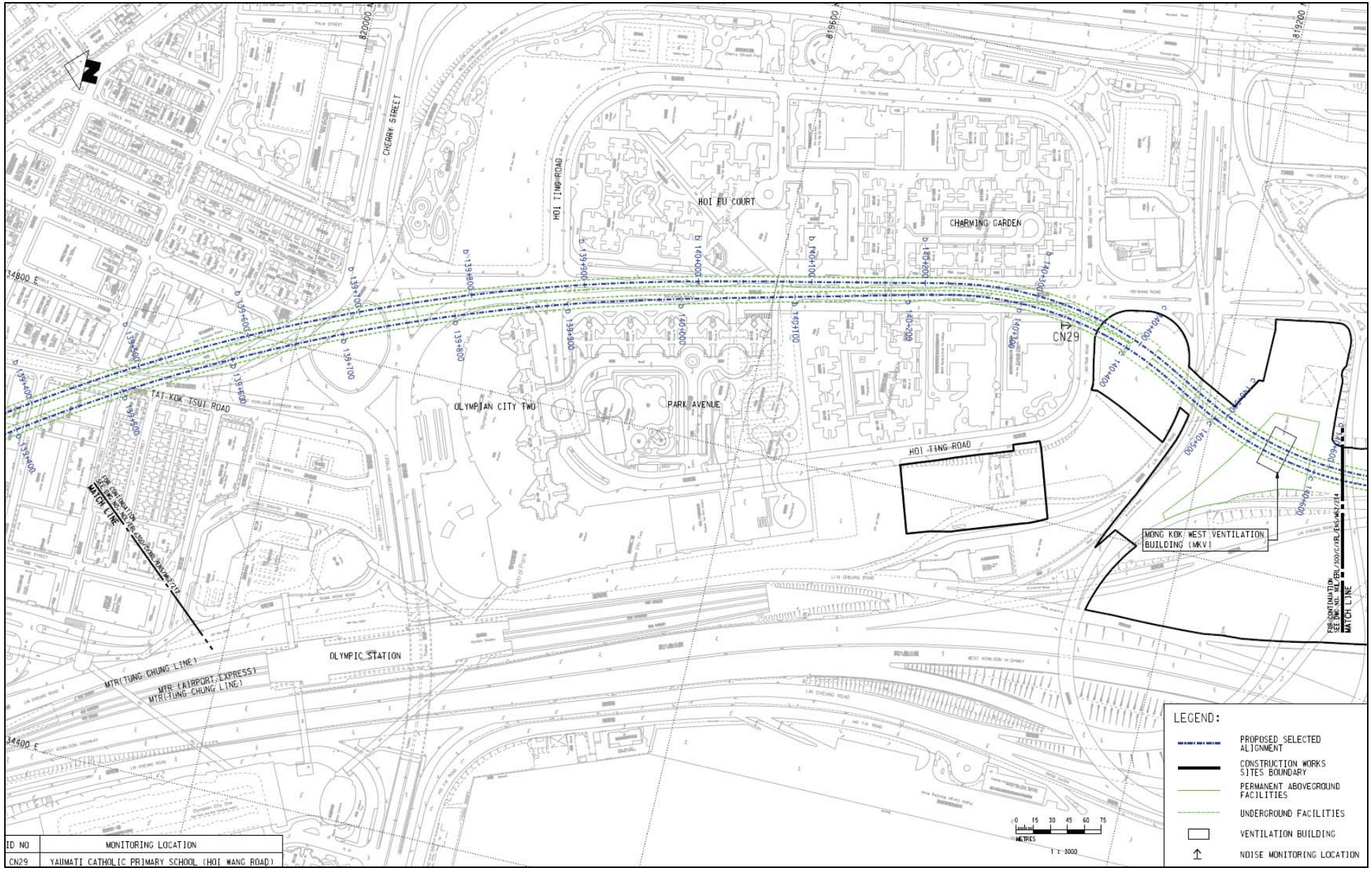


ID NO	MONITORING LOCATION
CN21	PO LEUNG KUK TONG NAI RAN COLLEGE
CN22	BLOCK C, LAI CHI KOK RECEPTION CENTRE
CN23	HOLYE HAKKING WONG WATERFRONT ANNEX

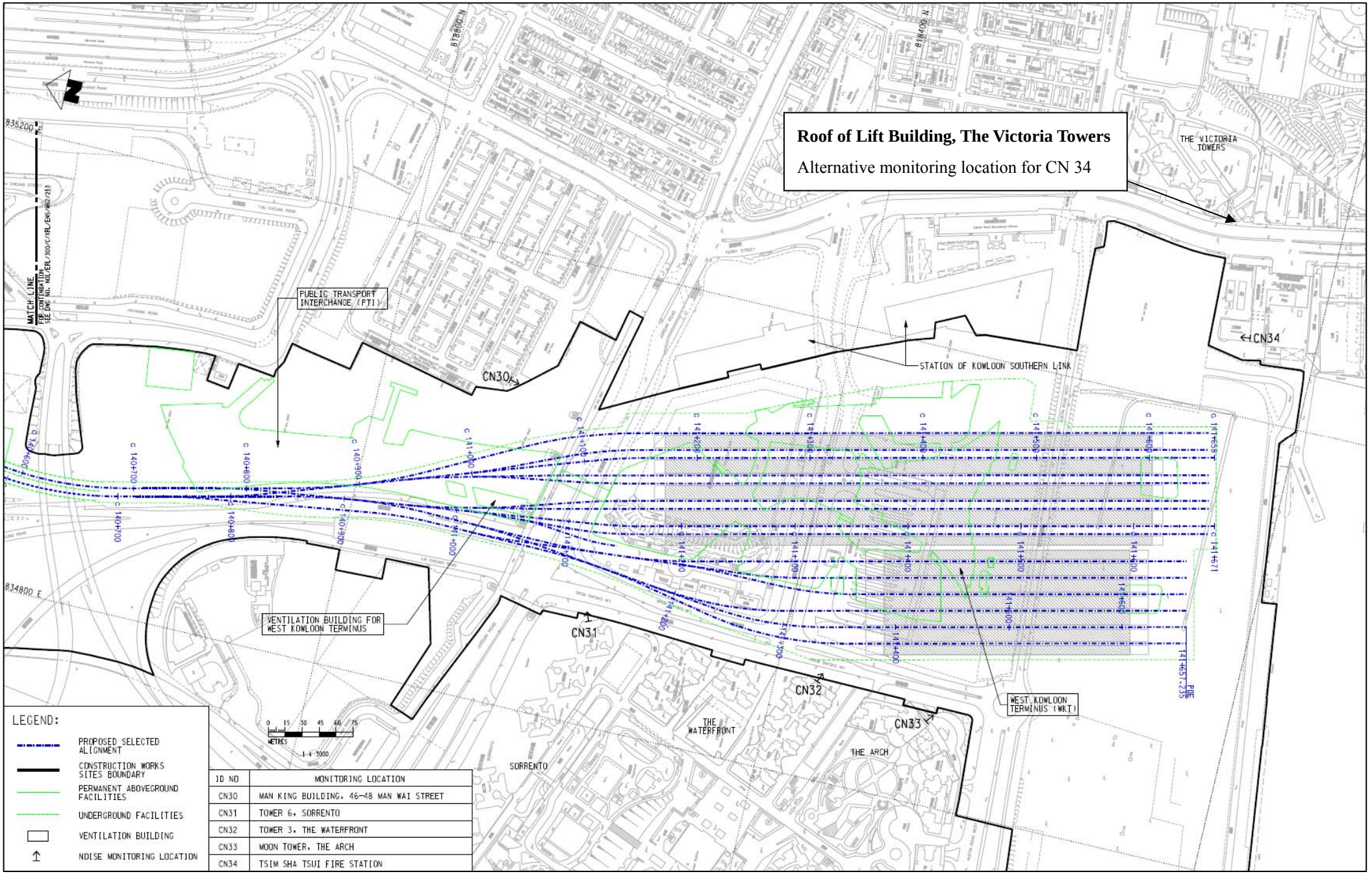


ID NO	MONITORING LOCATION
CN23	HKIVE HAKING WONG WATERFRONT ANNEX
CN24	ST. ANDREW PRIMARY SCHOOL
CN25	TACK CHING GIRLS' SECONDARY SCHOOL
CN26	YING WAH COLLEGE


Alternative monitoring location for CN 27
Cheong Shun House, Nam Cheong Estate
CN27
CN28
METRO HARBOUR VIEW
TUNG CHAU STREET PARK
YEN CHOW STREET WEST
HUI YU ROAD
NAM CHEONG PARK
NAM CHEONG STATION
NAM CHEONG STATION
LIN CHEUNG ROAD
SHAM MONG ROAD
WEST KOWLOON HIGHWAY
MATCH LINE
FOR CONTINUATION SEE DWG NO. MDL/EBL/300/C/XRL/ENS/MW2/2411
MATCH LINE
FOR CONTINUATION SEE DWG NO. MDL/EBL/300/C/XRL/ENS/MW2/2413
MTR (TUNG CHUNG LINE)
MTR (AIRPORT EXPRESS)
MTR (TUNG CHUNG LINE)
LEGEND:
PROPOSED SELECTED ALIGNMENT
CONSTRUCTION WORKS SITES BOUNDARY
PERMANENT ABOVEGROUND FACILITIES
UNDERGROUND FACILITIES
VENTILATION BUILDING
NOISE MONITORING LOCATION
0 15 30 45 60 75
METRES
1 : 3000
ID NO
MONITORING LOCATION
CN27
CHEONG YAT HOUSE, NAM CHEONG ESTATE
CN28
TOWER 6, HARBOUR GREEN

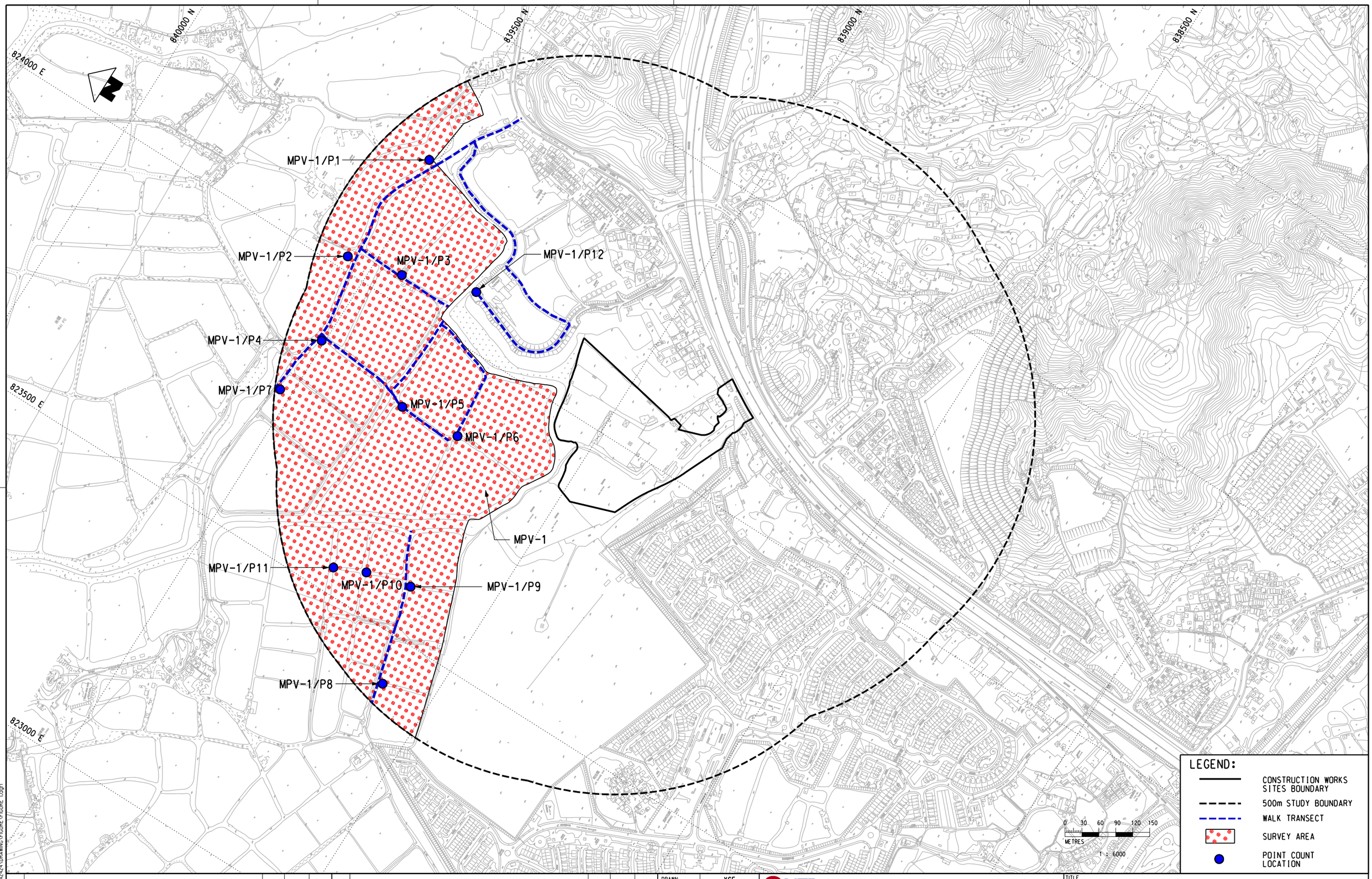


ID NO	MONITORING LOCATION
CN29	YAUMATI CATHOLIC PRIMARY SCHOOL (HOI WANG ROAD)



ID NO	MONITORING LOCATION
CN30	MAN KING BUILDING, 46-48 MAN WAI STREET
CN31	TOWER 6, SORRENTO
CN32	TOWER 3, THE WATERFRONT
CN33	MOON TOWER, THE ARCH
CN34	TSIM SHA TSUI FIRE STATION

Noise monitoring locations



REV	DESCRIPTION	BY	DATE	APPROVED

REV	DESCRIPTION	BY	DATE	APPROVED

DRAWN	XCF
DESIGNED	TWF
CHECKED	KCC
APPROVED	PL
DATE	10/OCT./2008

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MTR

EXPRESS RAIL LINK

ORIGINATOR

AECOM

CADD REF.
FIGURE 1.dgn

TITLE
NOL / ERL-300
BASELINE BIRD SURVEY FOR EIA
PROPOSED SURVEY AREA, POINT COUNT LOCATION AND WALK TRANSECT FOR MPV-1

SCALE	FIGURE NO.	REV.
1 : 6000 (A3)	FIGURE 1	–

PLOT DRV: r:\ustrnset\MTR\PLOTDRVER\WINDOWS\A3 COLOUR.pH
MODELNAME: Default PRINTED BY: CHENYG 2010-2-5
FILENAME: p:\PROJECTS\60042424\DRAWINGS\FIGURE 1.dgn 859947

834500 N
834000 N
833500 N
824000 E
824500 E
825000 E
825500 E

43CD-1
TPP-3/P3
TPP-3/P1
TPP-3/P2
TPP-3
TPP-2/P4
95CD
TPP-2/P3
TPP-2
TPP-2/P2
TPP-2/P1

0 30 60 90 120 150
METRES
1 : 6000

LEGEND:
- CONSTRUCTION WORKS SITES BOUNDARY
- 500m STUDY BOUNDARY
- WALK TRANSECT
- SURVEY AREA
- POINT COUNT LOCATION

PLOT DRV
MODELNAME:
FILENAME: F:\lastmod\WATER\PLOTDRV\ERWINDOWS\AS COLOUR.plt
DEFAULT
DATA\PROJECTS\60412470\DRAWING\FIGURE\FIGURE 2.dgn
PRINTED BY: spmyg
2009-11 13:51:44

REV	DESCRIPTION	BY	DATE	APPROVED	REV	DESCRIPTION	BY	DATE	APPROVED

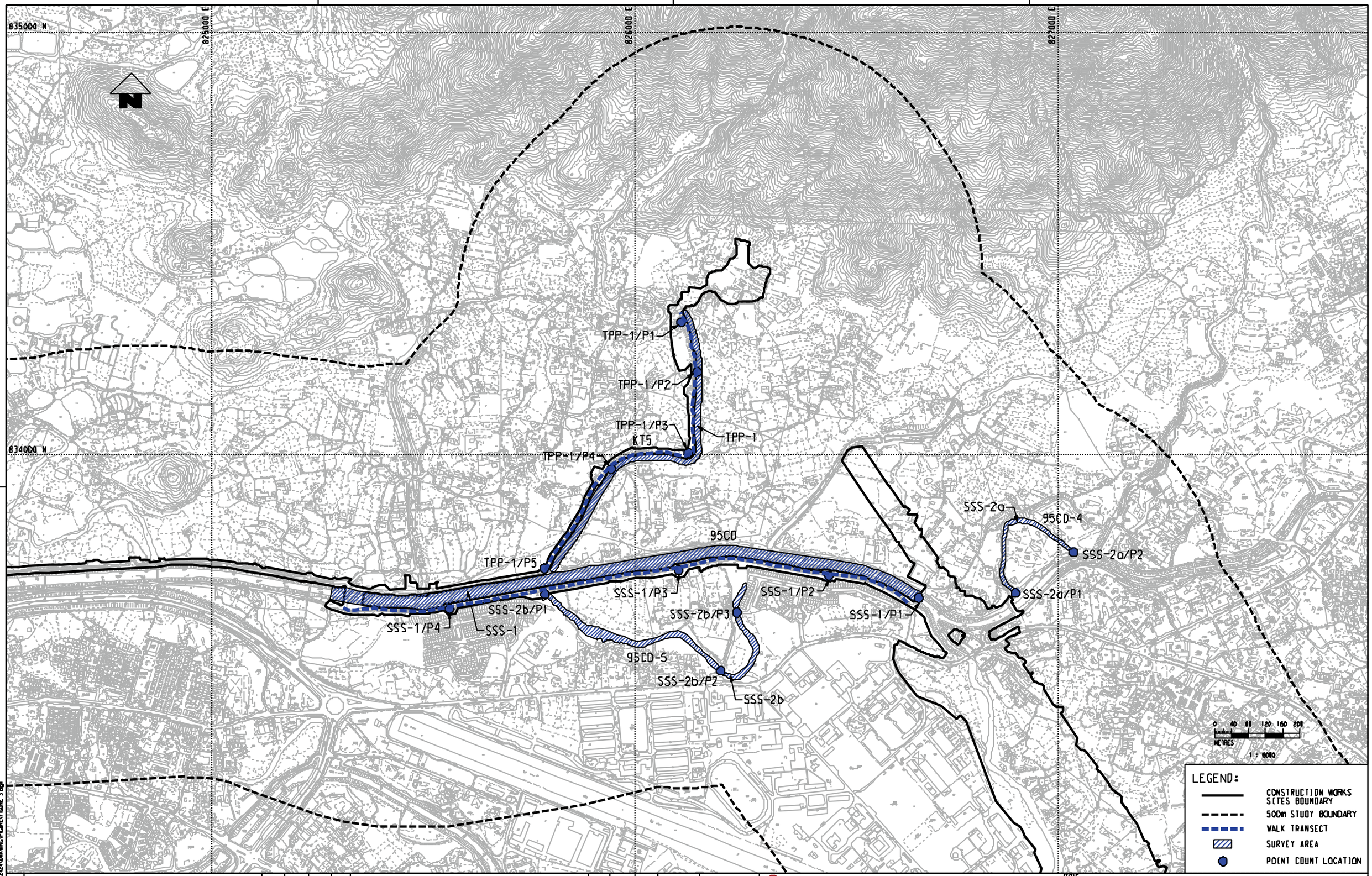
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DESIGNED	TWF
CHECKED	KCC
APPROVED	PL
DATE	14/SEP./2009

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MTR
EXPRESS RAIL LINK
ORIGINATOR
AECOM
CADD REF. FIGURE 2.dgn

TITLE
NOL / ERL-300
BASELINE BIRD SURVEY FOR EIA
PROPOSED SURVEY AREA, POINT COUNT LOCATION AND WALK TRANSECT FOR TPP-2 AND TPP-3

SCALE	FIGURE NO.	REV
1 : 6000 (A3)	FIGURE 2	-



REV	DESCRIPTION	BY	DATE	APPROVED
REV	DESCRIPTION	BY	DATE	APPROVED

DRAWN	Y.JP
DESIGNED	TWF
CHECKED	K.CC
APPROVED	PL
DATE	14/SEP./2009

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MTR

EXPRESS RAIL LINK

ENDORSEMENT

AECOM

CADD REF FIGURE 3.dgn

TITLE

NOL / ERL-300

BASELINE BIRD SURVEY FOR EIA

PROPOSED SURVEY AREA, POINT COUNT LOCATION AND WALK TRANSECT FOR TPP-1, SSS-1,SSS-2a AND SSS-2b

SCALE 1 : 8000 (A3)

FIGURE NO. FIGURE 3

REV. -

PLOT DRW: c:\autocad\MTRYLO\DRIVER\NODEFLAS COLOUR.ctb
ADDED/MODIFIED BY: Cheryl
PLOTTED BY: 204-rm
FILENAME: P:\PROJECTS\60422\DIAGRAMS\FIGURE 3.dgn
19:13:40

827500 E
828000 E
828500 E
827000 E
833500 N
833000 N
832500 N
832000 N
831500 N

SSS-3

SSS-3/P1
SSS-3/P2
SSS-3/P3
SSS-3/P4
SSS-3/P5
SSS-3/P6
SSS-3/P7
SSS-3/P8
SSS-3/P9
SSS-3/P10
SSS-3/P11
SSS-3/P12

LEGEND:

- CONSTRUCTION WORKS SITES BOUNDARY
- 500m STUDY BOUNDARY
- WALK TRANSECT
- POINT COUNT LOCATION
- ACTIVE AGRICULTURE
- INACTIVE AGRICULTURE
- ACTIVE FISHPOND
- INACTIVE FISHPOND/POND
- REEDBED/FRESHWATER MARSH
- WATERCOURSE
- DRAINAGE CHANNEL
- GRASSLAND
- SEASONALLY WET GRASSLAND
- SECONDARY WOODLAND
- SHRUBLAND
- PLANTATION
- DEVELOPED AREA/WASTEGROUND

0 30 60 90 120 150
METRES
1 : 6000

PLOT DRV
MODELNAME
FILENAME: P:\mastmain\MTRPLOTDRIVER\WINDOWS\AS COLOUR.pltPLOTTED BY: CHWIYP 14/8/24
Default DATE: 2009-11
DATA\PROJECTS\60412621\PLOT\MRG\FIGURE\FIGURE 4.dgn

REV	DESCRIPTION	BY	DATE	APPROVED

REV	DESCRIPTION	BY	DATE	APPROVED

DRAWN	YJP
DESIGNED	TWF
CHECKED	KCC
APPROVED	PL
DATE	07/DEC./2009

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ORIGINATOR
AECOM

CADD REF.
FIGURE 4.dgn

TITLE
NOL / ERL-300
BASELINE BIRD SURVEY FOR EIA
PROPOSED SURVEY AREA, POINT COUNT LOCATION AND WALK TRANSECT FOR SSS-3

SCALE	FIGURE NO.	REV
1 : 6000 (A3)	FIGURE 4	-

827500 E
828000 E
828500 E
833500 N
833000 N
832500 N
832000 N
831500 N

TUW-1/P1
TUW-1/P2
TUW-1/P3
TUW-1/P4
TUW-1/P5
TUW-1/P6
TUW-1/P7
TUW-1

LEGEND:

- CONSTRUCTION WORKS SITES BOUNDARY
- 500m STUDY BOUNDARY
- WALK TRANSECT
- POINT COUNT LOCATION
- ACTIVE AGRICULTURE
- INACTIVE AGRICULTURE
- ACTIVE FISHPOND
- INACTIVE FISHPOND/POND
- REEDBED/FRESHWATER MARSH
- WATERCOURSE
- DRAINAGE CHANNEL
- GRASSLAND
- SEASONALLY WET GRASSLAND
- SECONDARY WOODLAND
- SHRUBLAND
- PLANTATION
- DEVELOPED AREA/WASTEGROUND

0 30 60 90 120 150
METRES
1 : 6000

PLOT DRV: P:\ustmaan\MTRPLOTDRIVER\WIN00RSV.AS COLOUR.pltr
MODELNAME: Default
PLTCHANGE: DATA\PROJECTS\60412621\PLOT\MXD\FIGURE 5.MXD
PLOTTED BY: CHWIYU 2009-11 14:54:44

REV	DESCRIPTION	BY	DATE	APPROVED	REV	DESCRIPTION	BY	DATE	APPROVED

DRAWN	YJP
DESIGNED	TWF
CHECKED	KCC
APPROVED	PL
DATE	07/DEC./2009

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EXPRESS RAIL LINK

ORIGINATOR: AECOM

CADD REF.: FIGURE 5.dgn

TITLE
NOL / ERL-300
BASELINE BIRD SURVEY FOR EIA
PROPOSED SURVEY AREA, POINT COUNT LOCATION AND WALK TRANSECT FOR TUW-1

SCALE	FIGURE NO.	REV
1 : 6000 (A3)	FIGURE 5	-

826000 E
827000 E
828000 E
829000 E
832000 N
833000 N
831000 N

TUW-2 and PHV-1/P2

TUW-2 and PHV-1/P1

TUW-2 AND PHV-1

LEGEND:

- CONSTRUCTION WORKS SITES BOUNDARY
- 500m STUDY BOUNDARY
- WALK TRANSECT
- SURVEY AREA
- POINT COUNT LOCATION

0 40 80 120 160 200
METRES
1 : 8000

REV	DESCRIPTION	BY	DATE	APPROVED
REV	DESCRIPTION	BY	DATE	APPROVED

DRAWN	CYG
DESIGNED	TWF
CHECKED	KCC
APPROVED	PL
DATE	07/DEC./2009

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MTR

EXPRESS RAIL LINK

ORIGINATOR

AECOM

CADD REF

FIGURE 6.dgn

TITLE

NOL / ERL-300

BASELINE BIRD SURVEY FOR EIA

PROPOSED SURVEY AREA, POINT COUNT LOCATION AND WALK TRANSECT FOR TUW-2 AND PHV-1

SCALE 1 : 8000 (A3)

FIGURE NO. FIGURE 6

REV. -

PLOT DIN: r:\admin\MTR\PLOTDRIVER\WINDOWS\A3 COLOUR.pltPLOTTED BY: TANGP 2009-12-14:15:04
MODIFIED BY: Darfoon
FILENAME: P:\PROJECTS\60042210\DRAWING\FIGURE\FIGURE 6.dgn

Appendix E

Monitoring Schedule

Actual Construction Dust (24-hr TSP) Impact Monitoring Schedule - March 2017

Note 1: **TSP** denotes Total Suspended Particulate

Mar-2017						
Sunday	**Monday**	**Tuesday**	**Wednesday**	**Thursday**	**Friday**	**Saturday**
			1 AM2, AM9, AM10	2 AM3, AM4, AM5^, AM6, AM7, AM8	3 AM11, AM12, AM13, AM14, AM15, AM16, AM17	4
5	6	7 AM2, AM9, AM10	8 AM3, AM4, AM5, AM6, AM7, AM8	9 AM11, AM12, AM13, AM14, AM15, AM16, AM17	10	11
12	13 AM2, AM9, AM10	14 AM3, AM4, AM5, AM6, AM7, AM8	15 AM11, AM12, AM13, AM14, AM15, AM16, AM17	16	17	18 AM2, AM9, AM10
19	20 AM3, AM4, AM6, AM7, AM8	21 AM11, AM12, AM13, AM14, AM15, AM16, AM17	22	23	24 AM2, AM9, AM10	25 AM3, AM4, AM6, AM7, AM8
26	27 AM12, AM13, AM14, AM15, AM16, AM17	28	29 AM3[$]	30 AM2, AM3[$] , AM9, AM10	31 AM3, AM4, AM5[#], AM6, AM7, AM8	

* 24-hr TSP impact monitoring for AM1 was suspended in March 2017 due to electricity problem.

^ 24-hr TSP impact monitoring for AM5 was suspended in February 2017 due to electricity problem. The 24-hr TSP impact monitoring has been resumed on 2 March 2017.

[#] 24-hr TSP impact monitoring for AM5 was suspended on 20 & 25 March 2017 due to electricity problem. The 24-hr TSP impact monitoring has been resumed on 31 March 2017.

[$] Additional repeat measurement for AM3.

* 24-hr TSP impact monitoring for AM11 was suspended in 27 March 2017 due to electricity problem.

Tentative Construction Dust (24-hr TSP) Impact Monitoring Schedule - April 2017

Note 1: **TSP** denotes Total Suspended Particulate

Apr-2017						
Sunday	**Monday**	**Tuesday**	**Wednesday**	**Thursday**	**Friday**	**Saturday**
						1 AM11, AM13, AM14, AM15, AM16, AM17
2	3	4	5 AM1, AM2, AM9, AM10	6 AM3, AM4, AM6, AM7	7 AM11, AM13, AM14, AM15, AM16, AM17	8 AM1, AM2, AM9, AM10
9	10	11	12 AM3, AM4, AM6, AM7 AM1, AM2, AM9, AM10	13 AM11, AM13, AM14, AM15, AM16, AM17	14	15
16	17	18 AM3, AM4, AM6, AM7 AM1, AM2, AM9, AM10	19 AM11, AM13, AM14, AM15, AM16, AM17	20	21	22 AM1, AM2, AM9, AM10
23	24 AM3, AM4, AM6, AM7	25 AM11, AM13, AM14, AM15, AM16, AM17	26	27 AM1, AM2, AM9, AM10	28 AM3, AM4, AM6, AM7	29 AM11, AM13, AM14, AM15, AM16, AM17
30						

Monitoring Schedule in the Reporting Month (01 March 2017 - 31 March 2017)

	CN1	CN2	CN3	CN4	CN5	CN6	CN7	CN8	CN9	CN10	CN11	CN12	CN13	CN14	CN15	CN16
Date	**No. 142 Mai Po San Tsuen**	**Mai Po San Tsuen Village Hse**	**Yau Tam Mei Village House**	**Yau Tam Mei Village House**	**Kong Tai Road Village House**	**Kong Tai Road Village House**	**House 93, Seasons Villas**	**DD110 LOT 482, Wang Toi Shan**	**Leung Uk Tsuen Village House**	**Leung Uk Tsuen Squats**	**182B, Wang Toi Shan San Tsuen**	**630 Sheung Tsuen**	**No. 489H Tse Uk Tsuen**	**Tse Uk Tsuen**	**305B - Sheung Tsuen San Tsuen Village House**	**DD 114 LOT 1405 Sheung Tsuen**
01-Mar-17		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
02-Mar-17																
03-Mar-17																
04-Mar-17																
05-Mar-17																
06-Mar-17																
07-Mar-17							✓		✓						✓	
08-Mar-17		✓	✓	✓	✓	✓		✓		✓	✓	✓	✓	✓		✓
09-Mar-17																
10-Mar-17																
11-Mar-17																
12-Mar-17																
13-Mar-17																
14-Mar-17						✓	✓								✓	
15-Mar-17		✓	✓	✓	✓			✓	✓	✓	✓	✓	✓	✓		✓
16-Mar-17																
17-Mar-17																
18-Mar-17																
19-Mar-17																
20-Mar-17																
21-Mar-17							✓									
22-Mar-17		✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓
23-Mar-17																
24-Mar-17																
25-Mar-17																
26-Mar-17																
27-Mar-17						✓										
28-Mar-17																
29-Mar-17		✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
30-Mar-17																
31-Mar-17																

- Impact monitoring at No. 142 Mai Po San Tsuen (CN 1) had been temporarily suspended since December 2012 due to house removal. Monitoring at this location will be resumed when an alternative location is determined.

Monitoring Schedule in the Reporting Month (01 March 2017 - 31 March 2017)

	CN18	CN19	CN20	CN21	CN22	CN23	CN24	CN25	CN26	CN27	CN28	CN29	CN30	CN31	CN32	CN33	CN34
Date	**Sau Shan House**	**Sun Fung Centre**	**VTC Kwai Chung**	**Po Leung Kuk Tong Nai Kan College**	**Block I, Lai Chi Kok Reception Centre**	**HKIVE Haking Wong Waterfront Annex**	**St. Andrew Primary School**	**St. Mary's Church Mok Hing Yiu College**	**Ying Wah College**	**Cheong Shun House, Nam Cheong Estate**	**Tower 6, Harbour Green**	**Yaumati Catholic Primary School**	**Man Cheong Street Refuse Collection Point**	**Tower 6, Sorrento**	**Tower 3, The Waterfront**	**Star Tower, The Arch**	**The Victoria Towers**
01-Mar-17	✓	✓	✓	✓	✓		✓	✓	✓		✓	✓	✓		✓	✓	✓
02-Mar-17																	
03-Mar-17																	
04-Mar-17																	
05-Mar-17																	
06-Mar-17																	
07-Mar-17																	
08-Mar-17	✓	✓	✓	✓	✓		✓	✓	✓		✓	✓	✓			✓	✓
09-Mar-17															✓		
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11-Mar-17																	
12-Mar-17																	
13-Mar-17																	✓
14-Mar-17					✓												
15-Mar-17	✓	✓	✓	✓			✓	✓	✓		✓	✓	✓		✓	✓	
16-Mar-17																	
17-Mar-17																	
18-Mar-17																	
19-Mar-17																	
20-Mar-17																	
21-Mar-17																	
22-Mar-17	✓	✓	✓	✓	✓		✓	✓	✓		✓	✓	✓		✓	✓	✓
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27-Mar-17																	
28-Mar-17																	
29-Mar-17	✓	✓	✓	✓	✓		✓	✓	✓		✓	✓	✓		✓	✓	✓
30-Mar-17																	
31-Mar-17																	

- Impact monitoring at HKIVE Haking Wong Waterfront Annex (CN 23) has been suspended from March 2015 due to completion of works at CN23.

'- Due to completion of works in the vicinity at CN27, monitoring at Nam Cheong Estate (CN 27) has be suspended from September 2015.

'- Impact monitoring at Tower 6, Sorrento (CN31) had been temporarily suspended since end of August 2014 due to objection from the OC of Sorrento in August 2014. Monitoring at this location would be resumed when an alternative location is determined.

Monitoring Schedule in the Next Reporting Month (01 April 2017 - 30 April 2017)

	CN1	CN2	CN3	CN4	CN5	CN6	CN7	CN8	CN9	CN10	CN11	CN12	CN13	CN14	CN15	CN16
Date	**No. 142 Mai Po San Tsuen**	**Mai Po San Tsuen Village Hse**	**Yau Tam Mei Village House**	**Yau Tam Mei Village House**	**Kong Tai Road Village House**	**Kong Tai Road Village House**	**House 93, Seasons Villas**	**DD110 LOT 482, Wang Toi Shan**	**Leung Uk Tsuen Village House**	**Leung Uk Tsuen Squats**	**182B, Wang Toi Shan San Tsuen**	**630 Sheung Tsuen**	**No. 489H Tse Uk Tsuen**	**Tse Uk Tsuen**	**No. 305B - Sheung Tsuen San Tsuen Village**	**DD 114 LOT 1405 Sheung Tsuen**
01-Apr-17																
02-Apr-17																
03-Apr-17								✓	✓			✓	✓	✓		
04-Apr-17			✓	✓	✓	✓	✓									
05-Apr-17																
06-Apr-17		✓														
07-Apr-17																
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09-Apr-17																
10-Apr-17								✓	✓			✓	✓	✓		
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28-Apr-17																
29-Apr-17																
30-Apr-17																

- Impact monitoring at No. 142 Mai Po San Tsuen (CN 1) had been temporarily suspended since December 2012 due to house removal. Monitoring at this location will be resumed when an alternative location is determined.
- Impact monitoring at Leung Uk Tsuen Squats (CN10) and 182B Wang To Shan san Tsuen (CN11), No. 305B Sheung Tsuen San Tsuen Village House (CN15) and DD114 Lot 1405 Sheung Tsuen (CN16) will cease since April 2017 as major site activities have been completed and some of the works areas have been handed over to Government.

Monitoring Schedule in the Next Reporting Month (01 April 2017 - 30 April 2017)

	CN18	CN19	CN20	CN21	CN22	CN23	CN24	CN25	CN26	CN27	CN28	CN29	CN30	CN31	CN32	CN33	CN34
Date	**Sau Shan House**	**Sun Fung Centre**	**VTC Kwai Chung**	**Po Leung Kuk Tong Nai Kan College**	**Block I, Lai Chi Kok Reception Centre**	**HKIVE Haking Wong Waterfront Annex**	**St. Andrew Primary School**	**St. Mary's Church Mok Hing Yiu College**	**Ying Wah College**	**Cheong Shun House, Nam Cheong Estate**	**Tower 6, Harbour Green**	**Yaumati Catholic Primary School**	**Man Cheong Street Refuse Collection Point**	**Tower 6, Sorrento**	**Tower 3, The Waterfront**	**Star Tower, The Arch**	**The Victoria Towers**
01-Apr-17																	
02-Apr-17																	
03-Apr-17			✓				✓				✓		✓				
04-Apr-17																	
05-Apr-17																	
06-Apr-17															✓	✓	✓
07-Apr-17	✓	✓		✓													
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11-Apr-17																	
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18-Apr-17			✓				✓				✓		✓				
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21-Apr-17	✓	✓		✓													
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27-Apr-17															✓	✓	✓
28-Apr-17	✓	✓		✓													
29-Apr-17																	
30-Apr-17																	

- Impact monitoring at HKIVE Haking Wong Waterfront Annex (CN 23) has been suspended from March 2015 due to completion of works at CN23.

'- Due to completion of works in the vicinity at CN27, monitoring at Nam Cheong Estate (CN 27) has be suspended from September 2015.

'- Impact monitoring at Tower 6, Sorrento (CN31) had been temporarily suspended since end of August 2014 due to objection from the OC of Sorrento in August 2014. Monitoring at this location would be resumed when an alternative location is determined.

- Impact monitoring at Block 1 Lai Chi Kok Reception Centre (CN22), St Mary Church Mok Hing Yiu College (CN25), Ying Wah College (CN26) and Yaumati Chatholic Primary School (CN29) will cease since April 2017 as major site activities have been completed and some of the works areas have been handed over to Government.

Appendix E Monitoring Schedule

Works Area	Survey Site	Date of Survey in March 2017	Tentative Date of Survey in April 2017
MPV	MPV-1	17 March 2017	12 April 2017
Access road leading to TPP	TPP-1	17 March 2017	12 April 2017
Access road leading to TPP	TPP-2	17 March 2017	12 April 2017
Access road leading to TPP	TPP-3	17 March 2017	12 April 2017
Access road leading to SSS / ERS	SSS-1	17 March 2017	12 April 2017
Access road leading to SSS / ERS	SSS-2a	17 March 2017	12 April 2017
Access road leading to SSS / ERS	SSS-2b	17 March 2017	12 April 2017
Access road leading to SSS / ERS	SSS-3	17 March 2017	12 April 2017
TUW	TUW-1	20 March 2017	12 April 2017
TUW	TUW-2 (grouped with PHV-1 due to overlapping of survey area	20 March 2017	12 April 2017
PHV	PHV-1 (grouped with TUW-2 due to overlapping of survey area)	20 March 2017	12 April 2017

Appendix F

Graphical Plots of Monitoring Results

APPENDIX F: Air Quality Monitoring Results - 24-hour TSP Monitoring

- AM1

Date	24-hour TSP Monitoring Results ($\mu g/m^3$)	Action Level ($\mu g/m^3$)	Limit Level ($\mu g/m^3$)

- AM2

Date	24-hour TSP Monitoring Results ($\mu g/m^3$)	Action Level ($\mu g/m^3$)	Limit Level ($\mu g/m^3$)
2017-03-01	60.1	179.4	260
2017-03-07	57.6	179.4	260
2017-03-13	32.9	179.4	260
2017-03-18	36.4	179.4	260
2017-03-24	36.0	179.4	260
2017-03-30	64.0	179.4	260

- AM3

Date	24-hour TSP Monitoring Results ($\mu g/m^3$)	Action Level ($\mu g/m^3$)	Limit Level ($\mu g/m^3$)
2017-03-02	80.9	154.7	260
2017-03-08	107.2	154.7	260
2017-03-14	56.1	154.7	260
2017-03-20	63.9	154.7	260
2017-03-25	**175.9**	154.7	260
2017-03-29	**181.6**	154.7	260
2017-03-30	68.1	154.7	260
2017-03-31	96.5	154.7	260

- AM4

Date	24-hour TSP Monitoring Results ($\mu g/m^3$)	Action Level ($\mu g/m^3$)	Limit Level ($\mu g/m^3$)
2017-03-02	48.5	148.6	260
2017-03-08	64.1	148.6	260
2017-03-14	39.8	148.6	260
2017-03-20	44.4	148.6	260
2017-03-25	58.5	148.6	260
2017-03-31	56.3	148.6	260

- AM5

Date	24-hour TSP Monitoring Results ($\mu g/m^3$)	Action Level ($\mu g/m^3$)	Limit Level ($\mu g/m^3$)
2017-03-02	38.0	152	260
2017-03-08	14.7	152	260
2017-03-14	36.2	152	260
2017-03-31	35.4	152	260

- AM6

Date	24-hour TSP Monitoring Results ($\mu g/m^3$)	Action Level ($\mu g/m^3$)	Limit Level ($\mu g/m^3$)
2017-03-02	45.6	145.6	260
2017-03-08	50.3	145.6	260
2017-03-14	40.1	145.6	260
2017-03-20	34.4	145.6	260
2017-03-25	67.0	145.6	260
2017-03-31	40.3	145.6	260

- AM7

Date	24-hour TSP Monitoring Results ($\mu g/m^3$)	Action Level ($\mu g/m^3$)	Limit Level ($\mu g/m^3$)
2017-03-02	28.9	149.8	260
2017-03-08	70.7	149.8	260
2017-03-14	36.1	149.8	260
2017-03-20	46.7	149.8	260
2017-03-25	52.7	149.8	260
2017-03-31	78.1	149.8	260

- AM8

Date	24-hour TSP Monitoring Results ($\mu g/m^3$)	Action Level ($\mu g/m^3$)	Limit Level ($\mu g/m^3$)
2017-03-02	45.7	158.2	260
2017-03-08	37.6	158.2	260
2017-03-14	47.4	158.2	260
2017-03-20	43.3	158.2	260
2017-03-25	50.7	158.2	260
2017-03-31	73.9	158.2	260

24-hr TSP impact monitoring for AM1 was suspended in March due to electricity problem.
24-hr TSP impact monitoring for AM5 was suspended on 20 & 25 March 2017 due to electricity problem. The 24-hr TSP impact monitoring has been resumed on 31 March 2017.

APPENDIX F: Air Quality Monitoring Results - 24-hour TSP Monitoring

- AM9

Date	24-hour TSP Monitoring Results ($\mu g/m^3$)	Action Level ($\mu g/m^3$)	Limit Level ($\mu g/m^3$)
2017-03-01	19.1	171.2	260
2017-03-07	32.2	171.2	260
2017-03-13	57.0	171.2	260
2017-03-18	30.9	171.2	260
2017-03-24	32.6	171.2	260
2017-03-30	68.5	171.2	260

- AM10

Date	24-hour TSP Monitoring Results ($\mu g/m^3$)	Action Level ($\mu g/m^3$)	Limit Level ($\mu g/m^3$)
2017-03-01	47.7	174.8	260
2017-03-07	102.0	174.8	260
2017-03-13	9.9	174.8	260
2017-03-18	45.9	174.8	260
2017-03-24	52.4	174.8	260
2017-03-30	53.4	174.8	260

- AM11

Date	24-hour TSP Monitoring Results ($\mu g/m^3$)	Action Level ($\mu g/m^3$)	Limit Level ($\mu g/m^3$)
2017-03-03	97.7	160.3	260
2017-03-09	35.7	160.3	260
2017-03-15	57.2	160.3	260
2017-03-21	110.1	160.3	260

- AM12

Date	24-hour TSP Monitoring Results ($\mu g/m^3$)	Action Level ($\mu g/m^3$)	Limit Level ($\mu g/m^3$)
2017-03-03	113.8	162.5	260
2017-03-09	80.4	162.5	260
2017-03-15	73.0	162.5	260
2017-03-21	55.9	162.5	260
2017-03-27	87.7	162.5	260

- AM13

Date	24-hour TSP Monitoring Results ($\mu g/m^3$)	Action Level ($\mu g/m^3$)	Limit Level ($\mu g/m^3$)
2017-03-03	47.9	180.3	260
2017-03-09	123.3	180.3	260
2017-03-15	121.1	180.3	260
2017-03-21	94.7	180.3	260
2017-03-27	120.6	180.3	260

- AM14

Date	24-hour TSP Monitoring Results ($\mu g/m^3$)	Action Level ($\mu g/m^3$)	Limit Level ($\mu g/m^3$)
2017-03-03	85.6	158.2	260
2017-03-09	54.4	158.2	260
2017-03-15	61.5	158.2	260
2017-03-21	42.4	158.2	260
2017-03-27	92.7	158.2	260

- AM15

Date	24-hour TSP Monitoring Results ($\mu g/m^3$)	Action Level ($\mu g/m^3$)	Limit Level ($\mu g/m^3$)
2017-03-03	14.0	168.8	260
2017-03-09	74.5	168.8	260
2017-03-15	47.1	168.8	260
2017-03-21	49.4	168.8	260
2017-03-27	90.1	168.8	260

- AM16

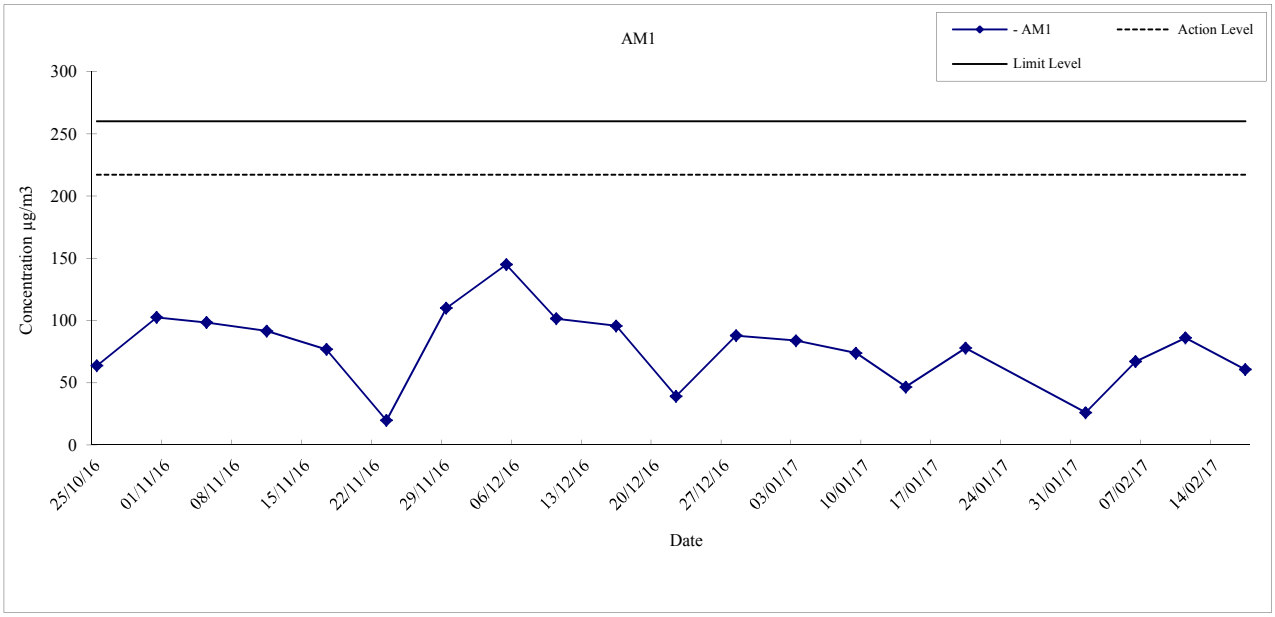
Date	24-hour TSP Monitoring Results ($\mu g/m^3$)	Action Level ($\mu g/m^3$)	Limit Level ($\mu g/m^3$)
2017-03-03	83.6	155.9	260
2017-03-09	56.5	155.9	260
2017-03-15	27.4	155.9	260
2017-03-21	59.4	155.9	260
2017-03-27	93.2	155.9	260

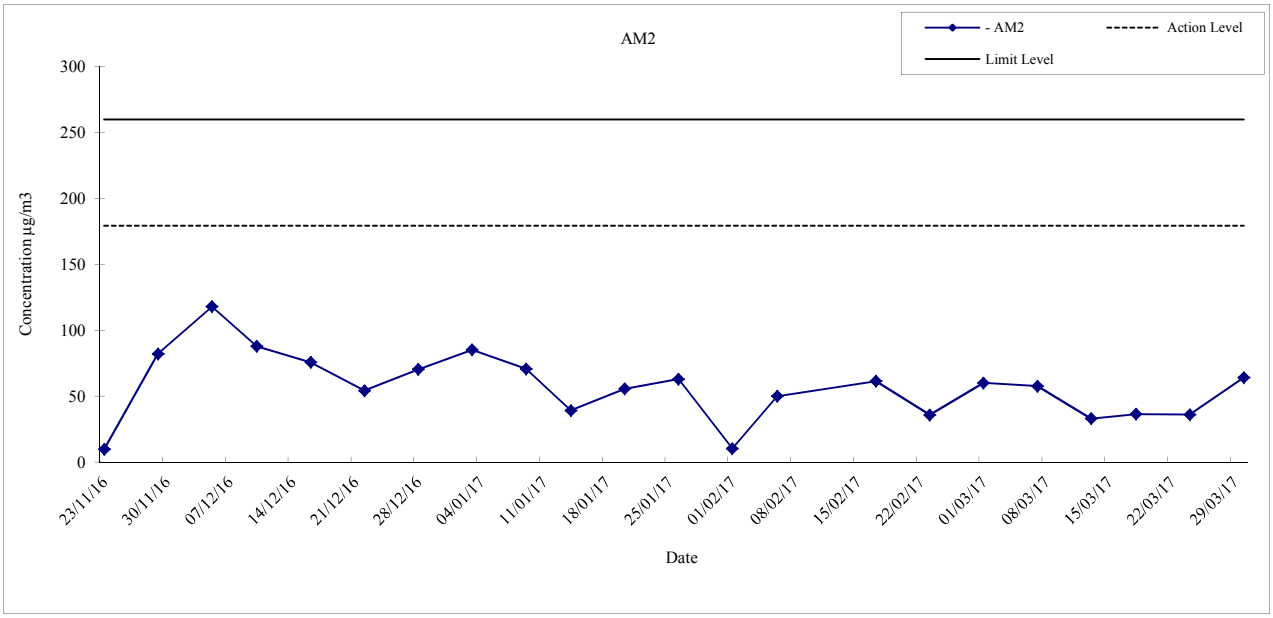
- AM17

Date	24-hour TSP Monitoring Results ($\mu g/m^3$)	Action Level ($\mu g/m^3$)	Limit Level ($\mu g/m^3$)
2017-03-03	61.7	179.3	260
2017-03-09	84.8	179.3	260
2017-03-15	67.7	179.3	260
2017-03-21	49.9	179.3	260
2017-03-27	77.3	179.3	260

Remark: ***Bold value indicated an Action level exceedance***
Bold & Italic value indicated an Limit level exceedance

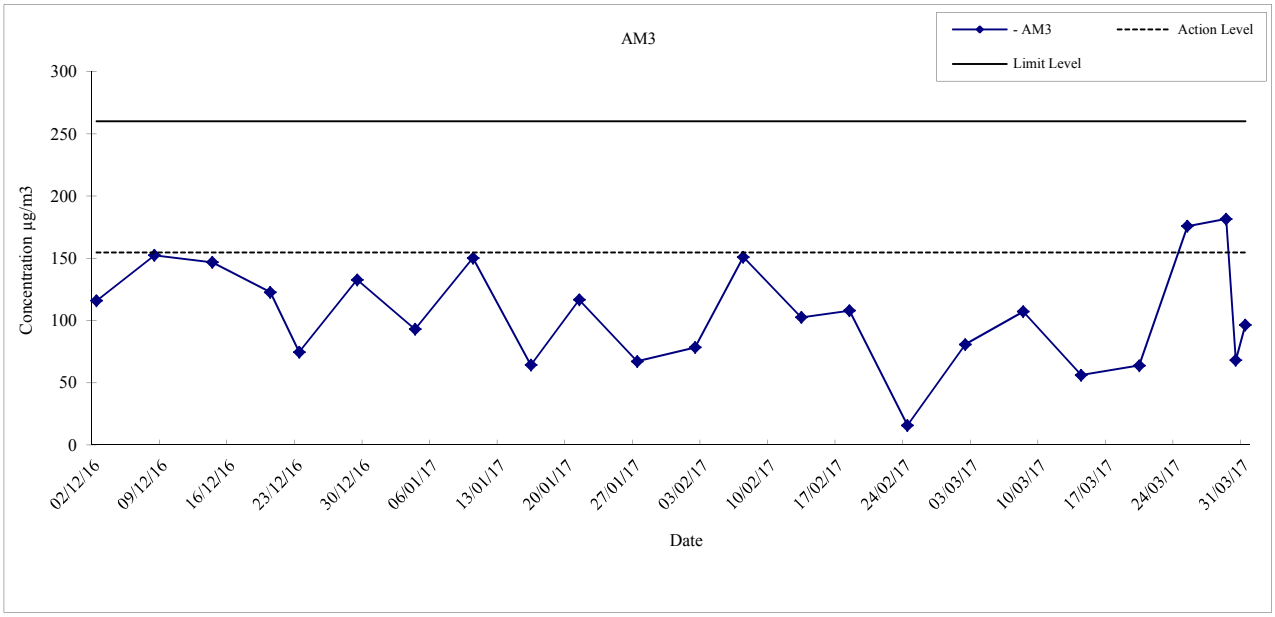
* 24-hr TSP impact monitoring for AM11 was suspended in 27 March 2017 due to electricity problem.

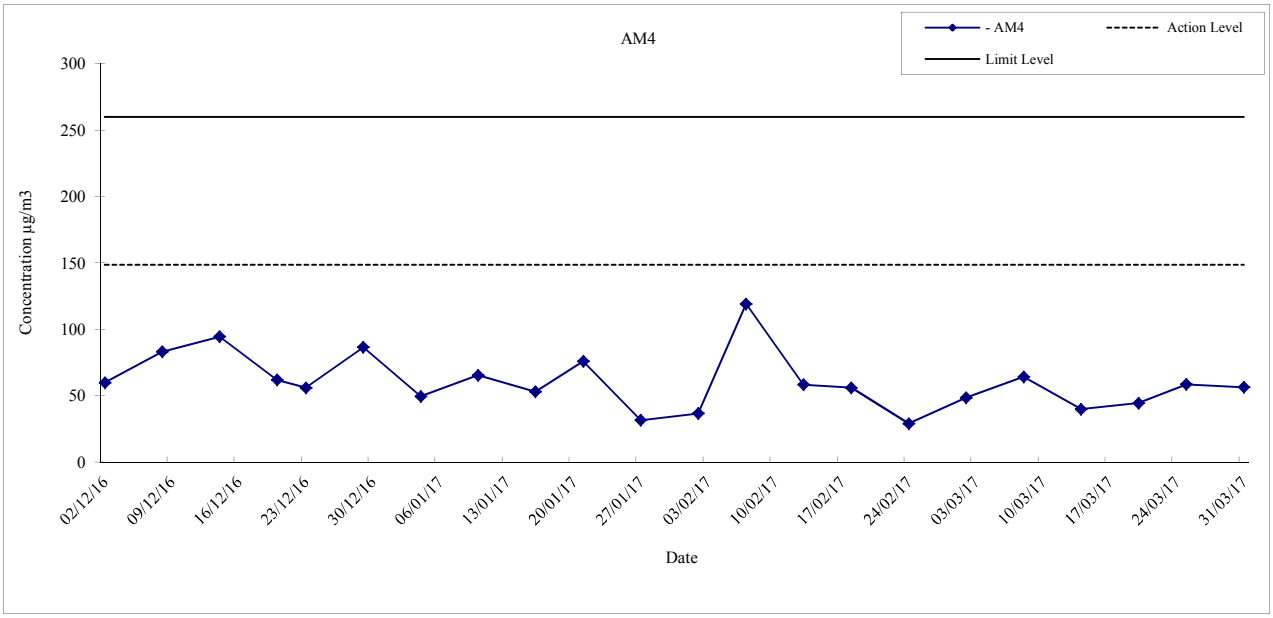




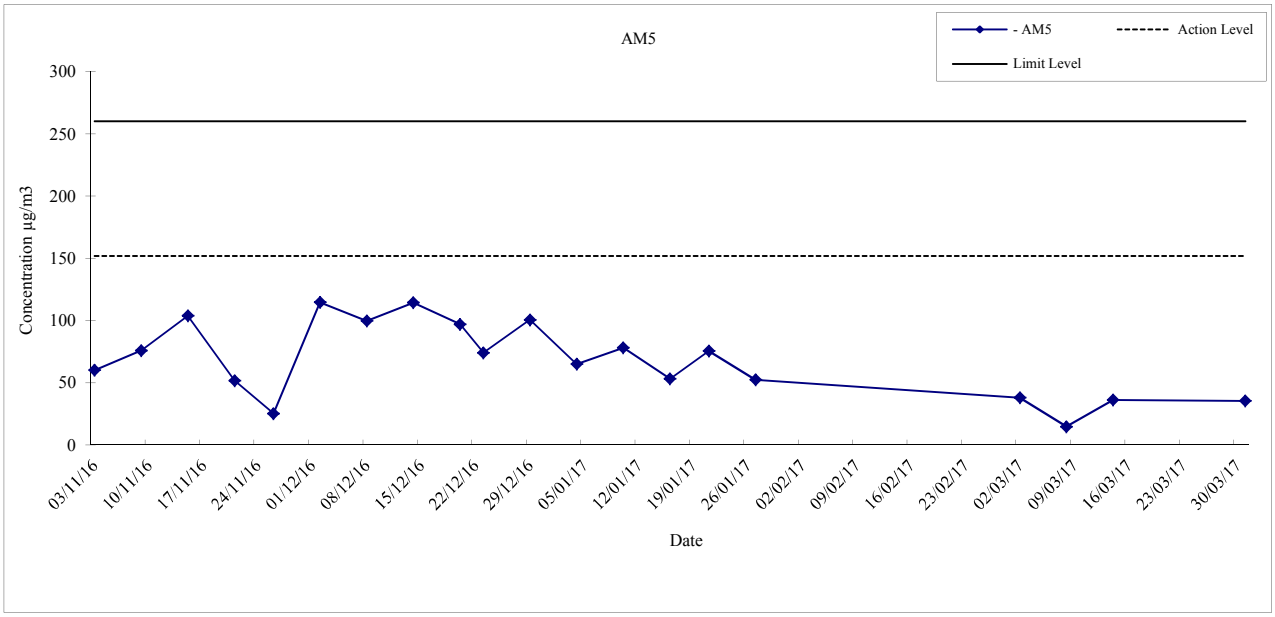
24-hr TSP impact monitoring for AM1 was suspended in March due to electricity problem.

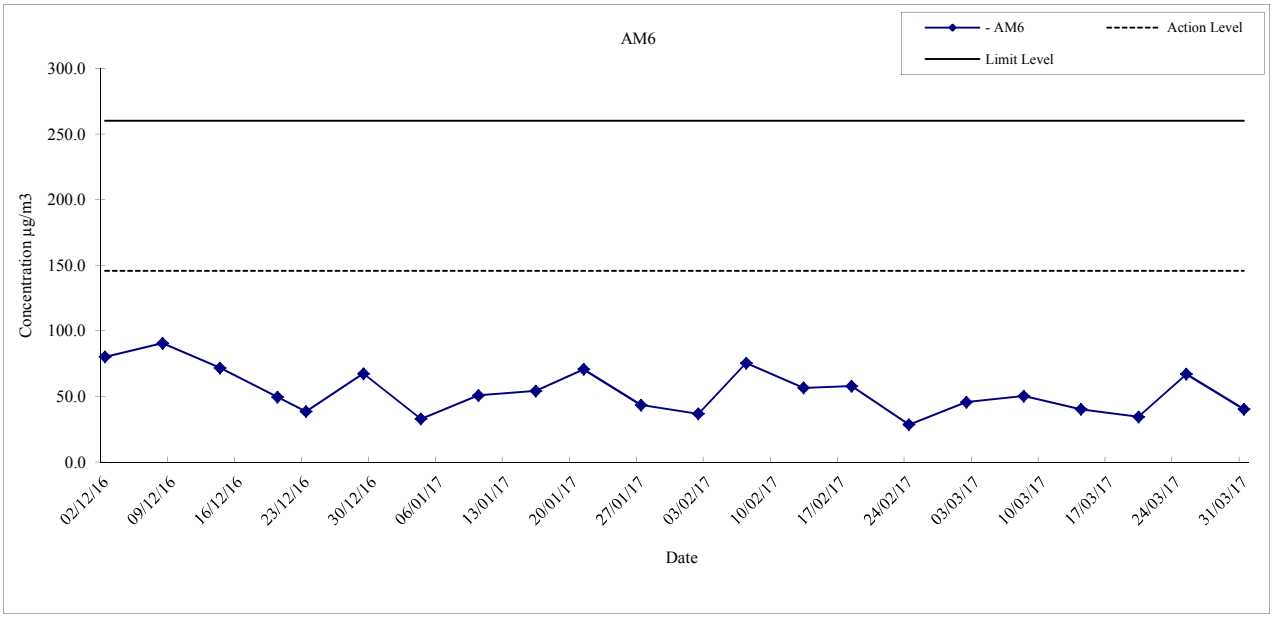
MTR	Hong Kong Section of Guangzhou-Shenzhen-Hong Kong Express Rail Link **Graphical Presentation of 24-hour TSP** **Monitoring Result for Location AM1 and AM2**	**Date**	**2017**
		APPENDIX	**F**





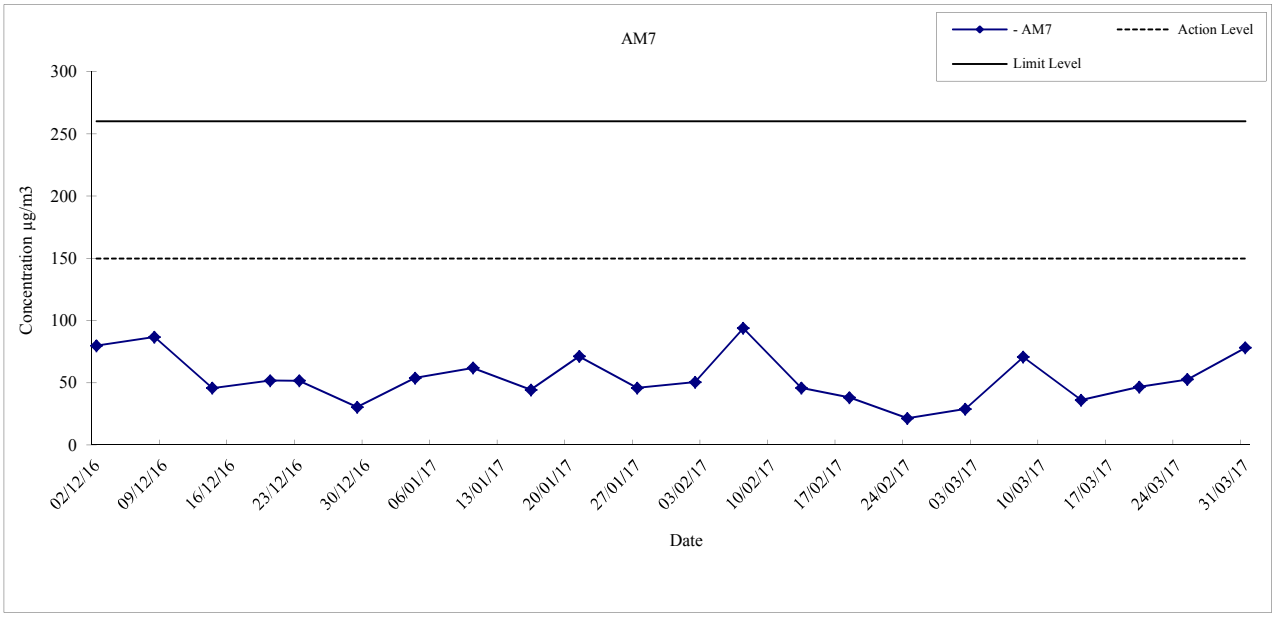
MTR	Hong Kong Section of Guangzhou-Shenzhen-Hong Kong Express Rail Link **Graphical Presentation of 24-hour TSP** **Monitoring Result for Location AM3 and AM4**	**Date**	**2017**
		APPENDIX	**F**

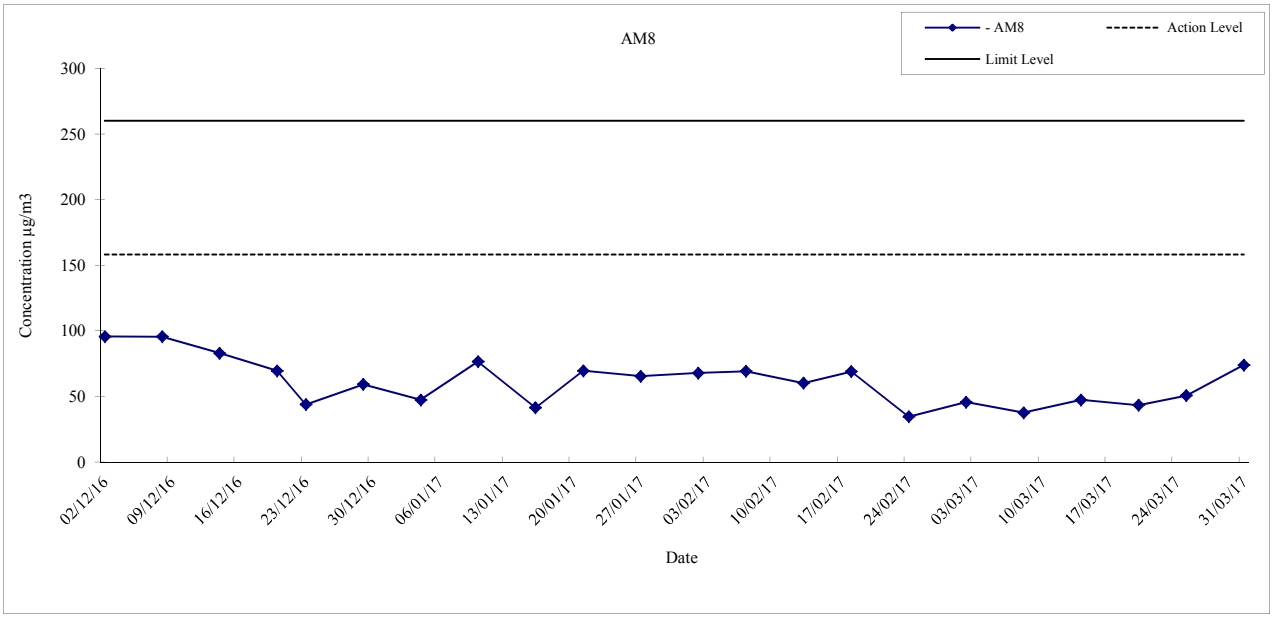




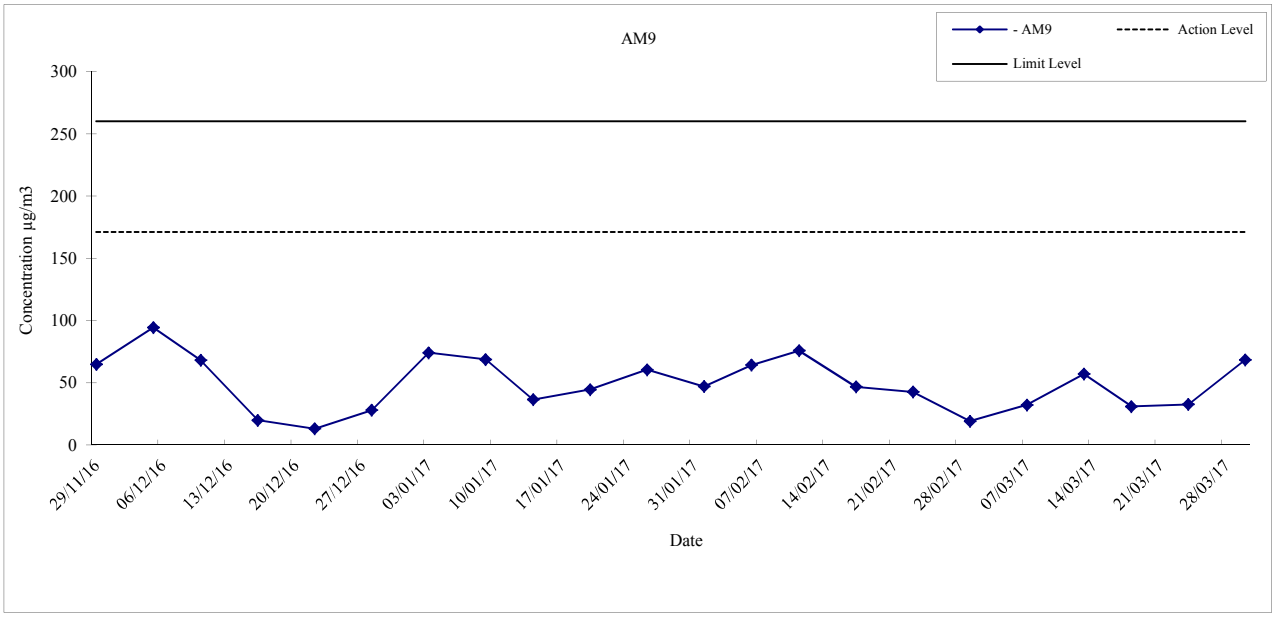
24-hr TSP impact monitoring for AM5 was suspended on 20 & 25 March 2017 due to electricity problem. The 24-hr TSP impact monitoring has been resumed on 31 March 2017.

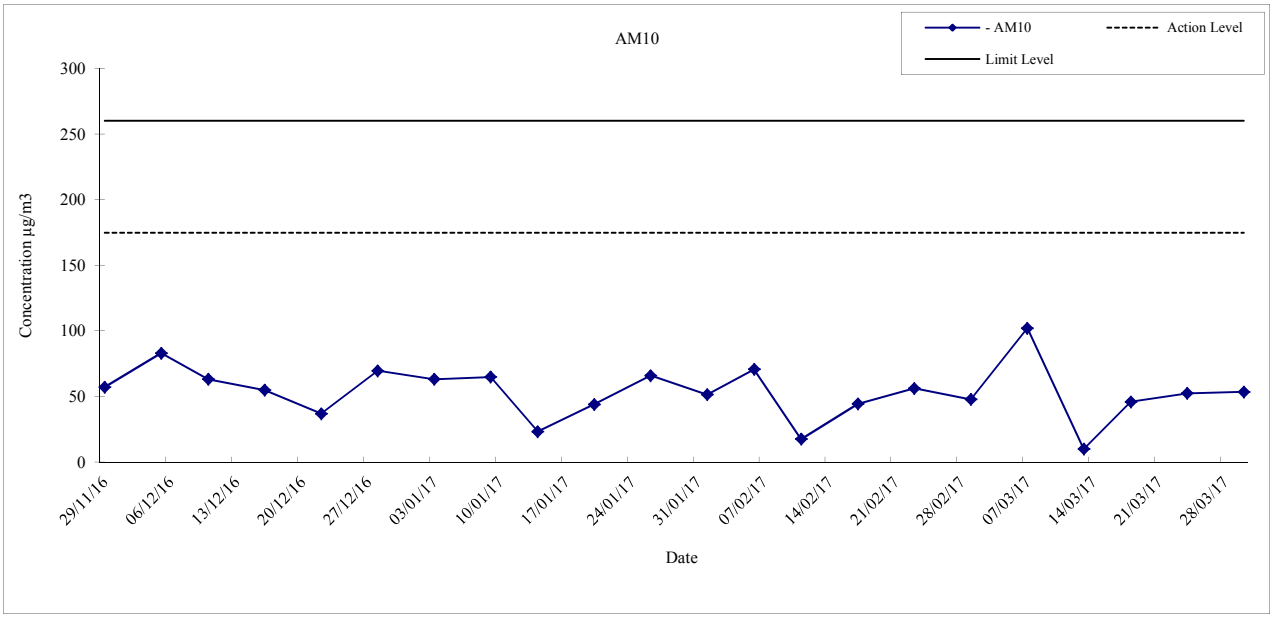
MTR	Hong Kong Section of Guangzhou-Shenzhen-Hong Kong Express Rail Link **Graphical Presentation of 24-hour TSP** **Monitoring Result for Location AM5 and AM6**	**Date**	**2017**
		APPENDIX	**F**



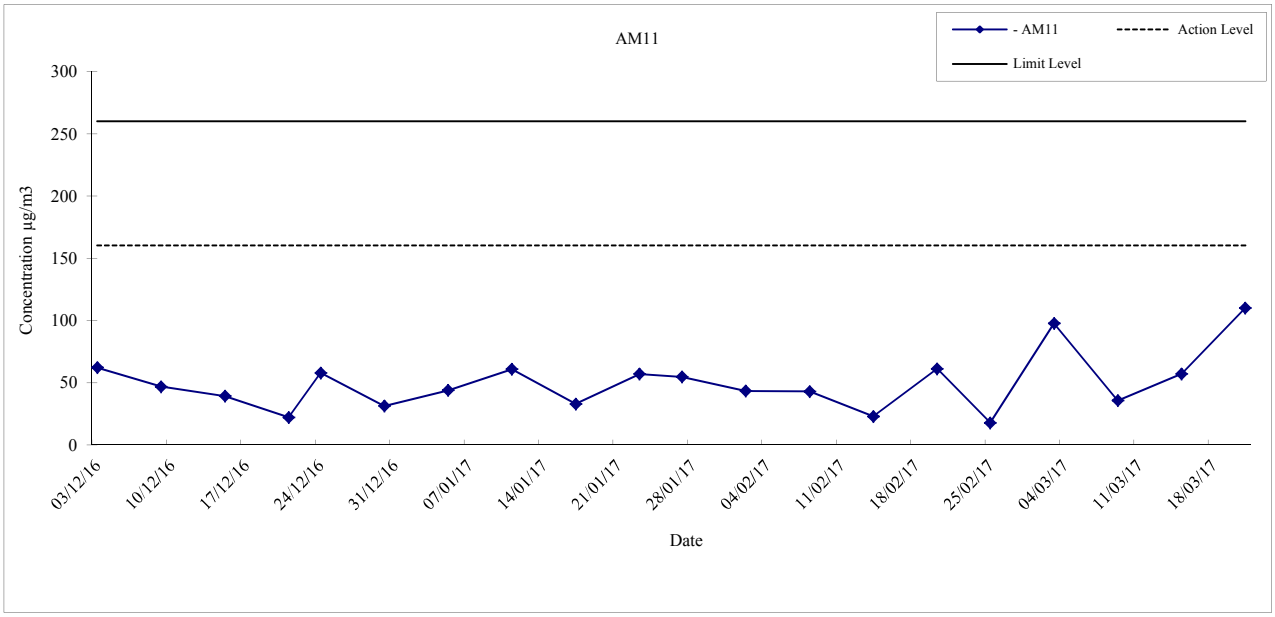


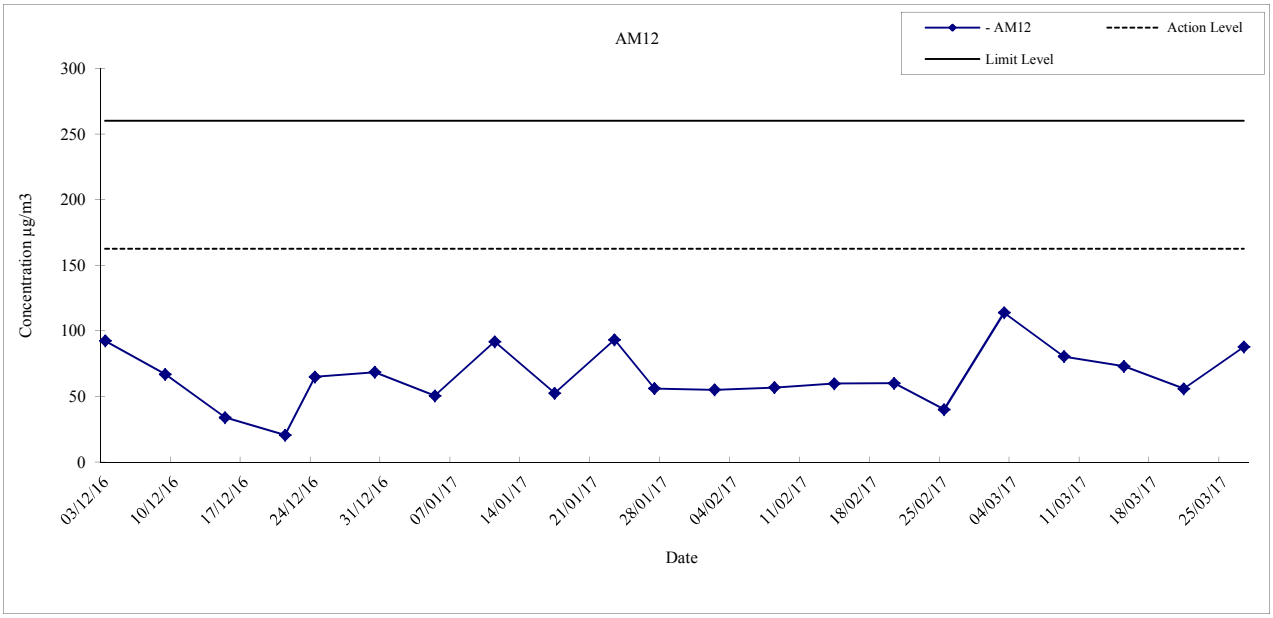
MTR	Hong Kong Section of Guangzhou-Shenzhen-Hong Kong Express Rail Link **Graphical Presentation of 24-hour TSP** **Monitoring Result for Location AM7 and AM8**	**Date**	**2017**
		APPENDIX	**F**





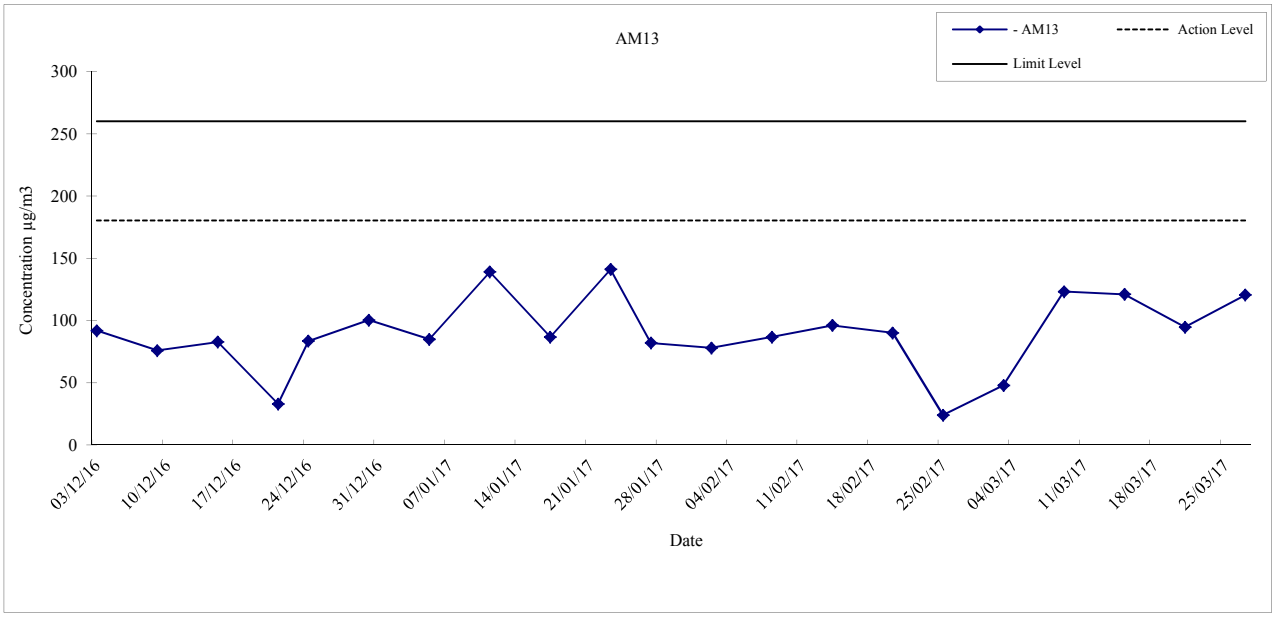
MTR	Hong Kong Section of Guangzhou-Shenzhen-Hong Kong Express Rail Link **Graphical Presentation of 24-hour TSP** **Monitoring Result for Location AM9 and AM10**	**Date**	**2017**
		APPENDIX	**F**

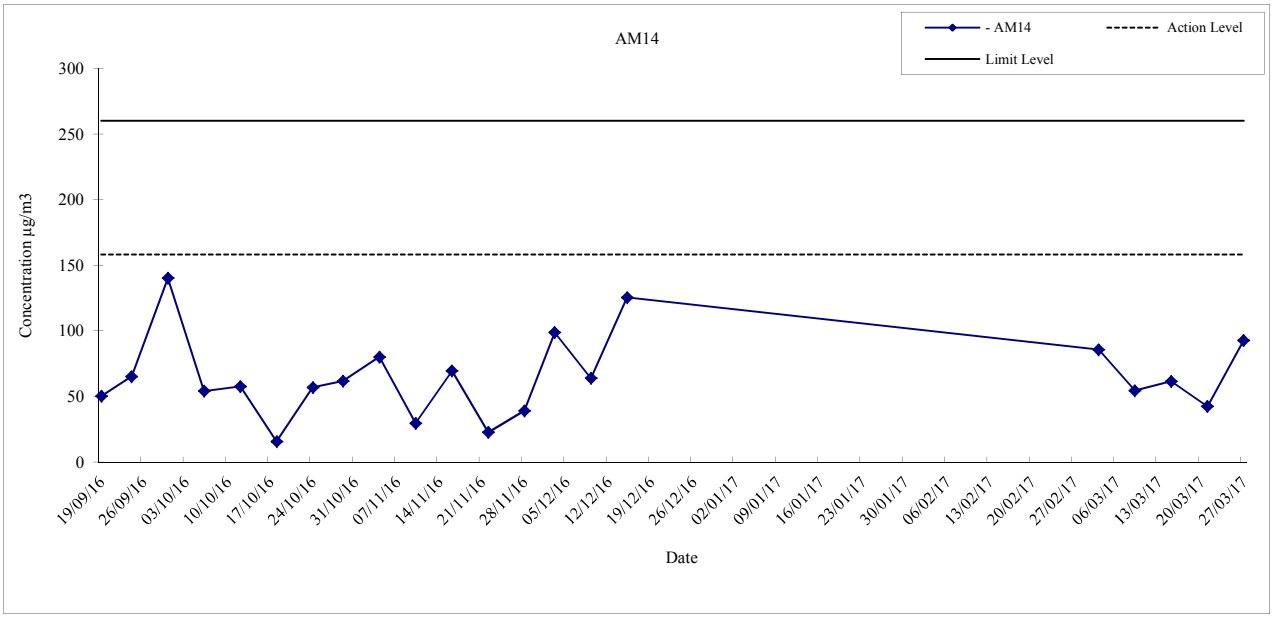




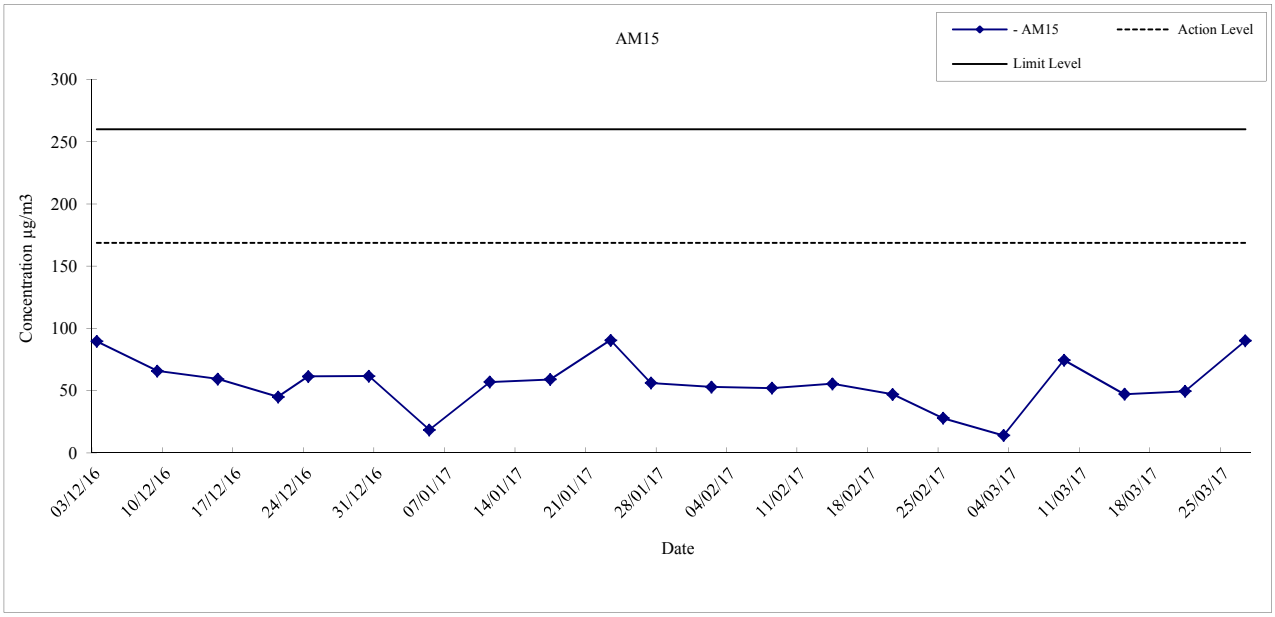
* 24-hr TSP impact monitoring for AM11 was suspended in 27 March 2017 due to electricity problem.

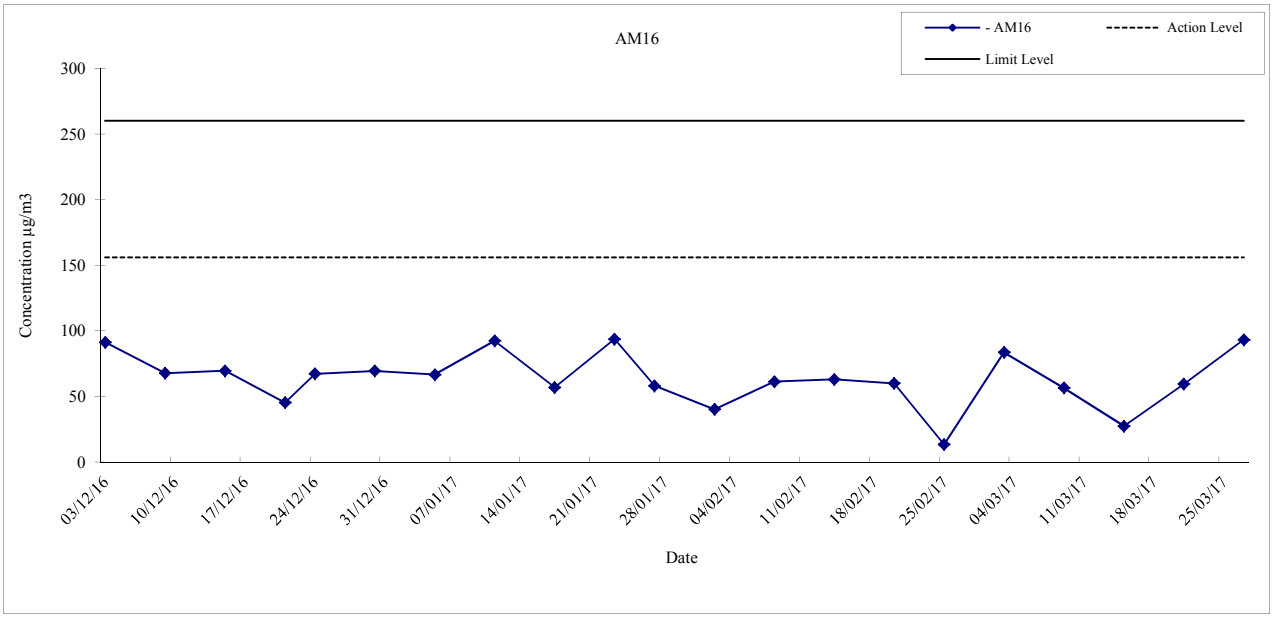
MTR	Hong Kong Section of Guangzhou-Shenzhen-Hong Kong Express Rail Link **Graphical Presentation of 24-hour TSP** **Monitoring Result for Location AM11 and AM12**	**Date**	**2017**
		APPENDIX	**F**



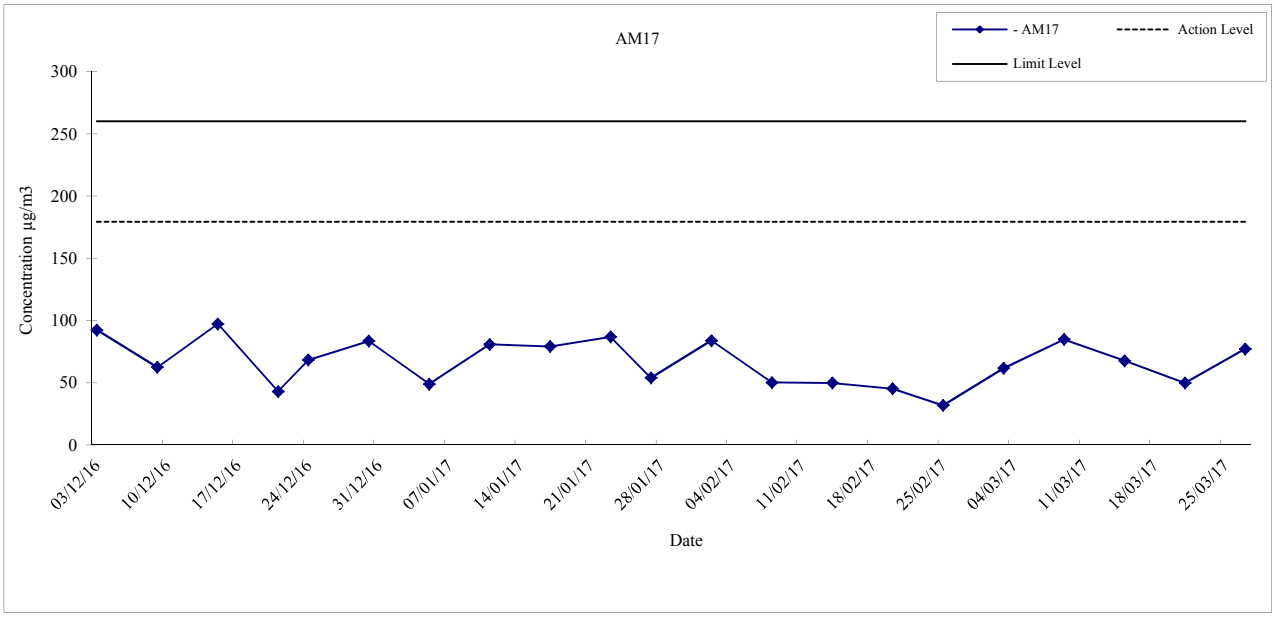


MTR	Hong Kong Section of Guangzhou-Shenzhen-Hong Kong Express Rail Link **Graphical Presentation of 24-hour TSP** **Monitoring Result for Location AM13 and AM14**	**Date**	**2017**
		APPENDIX	**F**





MTR	Hong Kong Section of Guangzhou-Shenzhen-Hong Kong Express Rail Link **Graphical Presentation of 24-hour TSP** **Monitoring Result for Location AM15 and AM16**	**Date**	**2017**
		APPENDIX	**F**



MTR	Hong Kong Section of Guangzhou-Shenzhen-Hong Kong Express Rail Link **Graphical Presentation of 24-hour TSP** **Monitoring Result for Location AM17**	**Date**	**2017**
		APPENDIX	**F**

APPENDIX F: Noise Monitoring Results

- CN1

Date	Noise Monitoring Results	Limit Level	Exceedance?
	Leq, dB(A)	Leq, dB(A)	
N/A			

- CN2

Date	Noise Monitoring Results	Limit Level	Exceedance?
	Leq, dB(A)	Leq, dB(A)	
2017-03-01	57	75	N
2017-03-08	56	75	N
2017-03-15	55	75	N
2017-03-22	71	75	N
2017-03-29	65	75	N

- CN3

Date	Noise Monitoring Results	Limit Level	Exceedance?
	Leq, dB(A)	Leq, dB(A)	
2017-03-01	52	75	N
2017-03-08	52	75	N
2017-03-15	53	75	N
2017-03-22	57	75	N
2017-03-29	55	75	N

- CN4

Date	Noise Monitoring Results	Limit Level	Exceedance?
	Leq, dB(A)	Leq, dB(A)	
2017-03-01	54	75	N
2017-03-08	55	75	N
2017-03-15	56	75	N
2017-03-22	57	75	N
2017-03-29	59	75	N

- CN5

Date	Noise Monitoring Results	Limit Level	Exceedance?
	Leq, dB(A)	Leq, dB(A)	
2017-03-01	58	75	N
2017-03-08	60	75	N
2017-03-15	62	75	N
2017-03-22	66	75	N
2017-03-29	64	75	N

- CN6

Date	Noise Monitoring Results	Limit Level	Exceedance?
	Leq, dB(A)	Leq, dB(A)	
2017-03-01	59	75	N
2017-03-08	67	75	N
2017-03-14	75	75	N
2017-03-22	75	75	N
2017-03-27	61	75	N

- CN7

Date	Noise Monitoring Results	Limit Level	Exceedance?
	Leq, dB(A)	Leq, dB(A)	
2017-03-01	50	75	N
2017-03-07	52	75	N
2017-03-14	62	75	N
2017-03-21	45	75	N
2017-03-29	53	75	N

- CN8

Date	Noise Monitoring Results	Limit Level	Exceedance?
	Leq, dB(A)	Leq, dB(A)	
2017-03-01	75	75	N
2017-03-08	63	75	N
2017-03-15	65	75	N
2017-03-22	63	75	N
2017-03-29	66	75	N

- CN9

Date	Noise Monitoring Results	Limit Level	Exceedance?
	Leq, dB(A)	Leq, dB(A)	
2017-03-01	65	75	N
2017-03-07	59	75	N
2017-03-15	62	75	N
2017-03-22	62	75	N
2017-03-29	66	75	N

- CN10

Date	Noise Monitoring Results	Limit Level	Exceedance?
	Leq, dB(A)	Leq, dB(A)	
2017-03-01	51	75	N
2017-03-08	41	75	N
2017-03-15	44	75	N
2017-03-22	55	75	N
2017-03-29	52	75	N

- CN11

Date	Noise Monitoring Results	Limit Level	Exceedance?
	Leq, dB(A)	Leq, dB(A)	
2017-03-01	58	75	N
2017-03-08	59	75	N
2017-03-15	58	75	N
2017-03-22	57	75	N
2017-03-29	56	75	N

- CN12

Date	Noise Monitoring Results	Limit Level	Exceedance?
	Leq, dB(A)	Leq, dB(A)	
2017-03-01	59	75	N
2017-03-08	61	75	N
2017-03-15	68	75	N
2017-03-22	59	75	N
2017-03-29	67	75	N

Note:
- Impact monitoring at No. 142 Mai Po San Tsuen (CN 1) had been temporarily suspended since December 2012 due to house removal. Monitoring at this location will be resumed when an alternative location is determined.

APPENDIX F: Noise Monitoring Results

- CN13

Date	Noise Monitoring Results	Limit Level	Exceedance?
	Leq, dB(A)	Leq, dB(A)	
2017-03-01	62	75	N
2017-03-08	52	75	N
2017-03-15	65	75	N
2017-03-22	61	75	N
2017-03-29	65	75	N

- CN14

Date	Noise Monitoring Results	Limit Level	Exceedance?
	Leq, dB(A)	Leq, dB(A)	
2017-03-01	55	75	N
2017-03-08	57	75	N
2017-03-15	58	75	N
2017-03-22	58	75	N
2017-03-29	57	75	N

- CN15

Date	Noise Monitoring Results	Limit Level	Exceedance?
	Leq, dB(A)	Leq, dB(A)	
2017-03-01	59	75	N
2017-03-07	64	75	N
2017-03-14	65	75	N
2017-03-22	65	75	N
2017-03-29	64	75	N

- CN16

Date	Noise Monitoring Results	Limit Level	Exceedance?
	Leq, dB(A)	Leq, dB(A)	
2017-03-01	55	75	N
2017-03-08	57	75	N
2017-03-15	58	75	N
2017-03-22	58	75	N
2017-03-29	57	75	N

- CN18

Date	Noise Monitoring Results	Limit Level	Exceedance?
	Leq, dB(A)	Leq, dB(A)	
2017-03-01	62	75	N
2017-03-08	65	75	N
2017-03-15	60	75	N
2017-03-22	60	75	N
2017-03-29	66	75	N

- CN19

Date	Noise Monitoring Results	Limit Level	Exceedance?
	Leq, dB(A)	Leq, dB(A)	
2017-03-01	72	75	N
2017-03-08	75	75	N
2017-03-15	72	75	N
2017-03-22	73	75	N
2017-03-29	74	75	N

- CN20

Date	Noise Monitoring Results	Limit Level	Exceedance?
	Leq, dB(A)	Leq, dB(A)	
2017-03-01	62	70	N
2017-03-08	62	70	N
2017-03-15	63	70	N
2017-03-22	64	70	N
2017-03-29	63	70	N

- CN21

Date	Noise Monitoring Results	Limit Level	Exceedance?
	Leq, dB(A)	Leq, dB(A)	
2017-03-01	67	70	N
2017-03-08	68	70	N
2017-03-15	68	70	N
2017-03-22	67	70	N
2017-03-29	66	70	N

- CN22

Date	Noise Monitoring Results	Limit Level	Exceedance?
	Leq, dB(A)	Leq, dB(A)	
2017-03-01	75	75	N
2017-03-08	74	75	N
2017-03-14	74	75	N
2017-03-22	74	75	N
2017-03-29	73	75	N

- CN23

Date	Noise Monitoring Results	Limit Level	Exceedance?
	Leq, dB(A)	Leq, dB(A)	
N/A			

Note:
- Impact monitoring at Tsuen Wan Lutheran School (CN 17) had been temporarily suspended since December 2010 due to school closure. Monitoring at this location will be resumed subject to confirmation of school operation or other noise sensitive use at CN 17.
- Due to completion of all works at CN23, monitoring at HKIVE Haking Wong Waterfront Annex (CN 23) has been suspended from March 2015.
- A correction factor (-9 dB(A)) has been applied at CN19 to take into account the noise barrier effect. The correction factor was agreed with IEC according to Section 3.11 of the EM&A Manual.
- Noise limit level of CN20, CN21, CN23, CN24, CN25, CN26 & CN29, which are school, is 70dB(A) on normal weekdays and 65dB(A) during examination period.

APPENDIX F: Noise Monitoring Results

- CN24

Date	Noise Monitoring Results	Limit Level	Exceedance?
	Leq, dB(A)	Leq, dB(A)	
2017-03-01	63	70	N
2017-03-08	65	70	N
2017-03-15	66	70	N
2017-03-22	65	70	N
2017-03-29	65	70	N

- CN25

Date	Noise Monitoring Results	Limit Level	Exceedance?
	Leq, dB(A)	Leq, dB(A)	
2017-03-01	69	70	N
2017-03-08	68	70	N
2017-03-15	69	70	N
2017-03-22	69	70	N
2017-03-29	70	70	N

- CN26

Date	Noise Monitoring Results	Limit Level	Exceedance?
	Leq, dB(A)	Leq, dB(A)	
2017-03-01	64	70	N
2017-03-08	70	70	N
2017-03-15	69	70	N
2017-03-22	68	70	N
2017-03-29	69	70	N

- CN27

Date	Noise Monitoring Results	Limit Level	Exceedance?
	Leq, dB(A)	Leq, dB(A)	
N/A			

- CN28

Date	Noise Monitoring Results	Limit Level	Exceedance?
	Leq, dB(A)	Leq, dB(A)	
2017-03-01	59	75	N
2017-03-08	57	75	N
2017-03-15	57	75	N
2017-03-22	55	75	N
2017-03-29	54	75	N

- CN29

Date	Noise Monitoring Results	Limit Level	Exceedance?
	Leq, dB(A)	Leq, dB(A)	
2017-03-01	57	70	N
2017-03-08	56	70	N
2017-03-15	57	70	N
2017-03-22	56	70	N
2017-03-29	55	70	N

- CN30

Date	Noise Monitoring Results	Limit Level	Exceedance?
	Leq, dB(A)	Leq, dB(A)	
2017-03-01	68	75	N
2017-03-08	70	75	N
2017-03-15	68	75	N
2017-03-22	67	75	N
2017-03-29	68	75	N

- CN31

Date	Noise Monitoring Results	Limit Level	Exceedance?
	Leq, dB(A)	Leq, dB(A)	
N/A			

- CN32

Date	Noise Monitoring Results	Limit Level	Exceedance?
	Leq, dB(A)	Leq, dB(A)	
2017-03-01	74	75	N
2017-03-09	75	75	N
2017-03-15	75	75	N
2017-03-22	74	75	N
2017-03-29	74	75	N

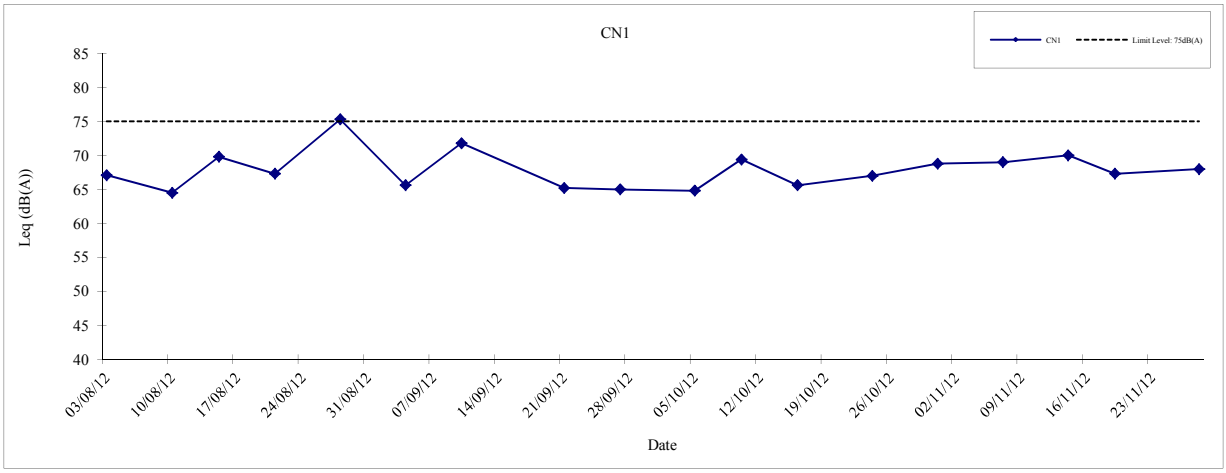
- CN33

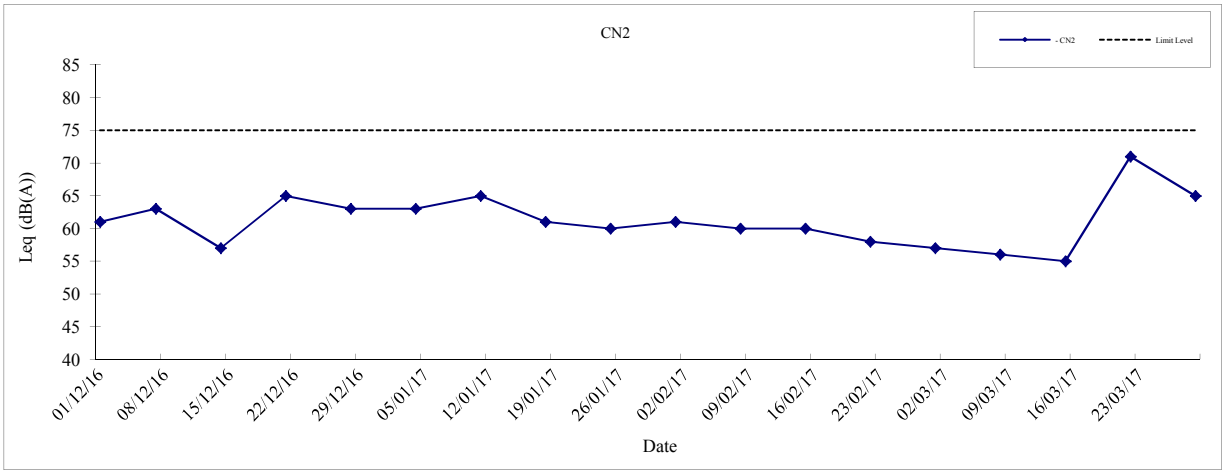
Date	Noise Monitoring Results	Limit Level	Exceedance?
	Leq, dB(A)	Leq, dB(A)	
2017-03-01	65	75	N
2017-03-08	71	75	N
2017-03-15	70	75	N
2017-03-22	71	75	N
2017-03-29	71	75	N

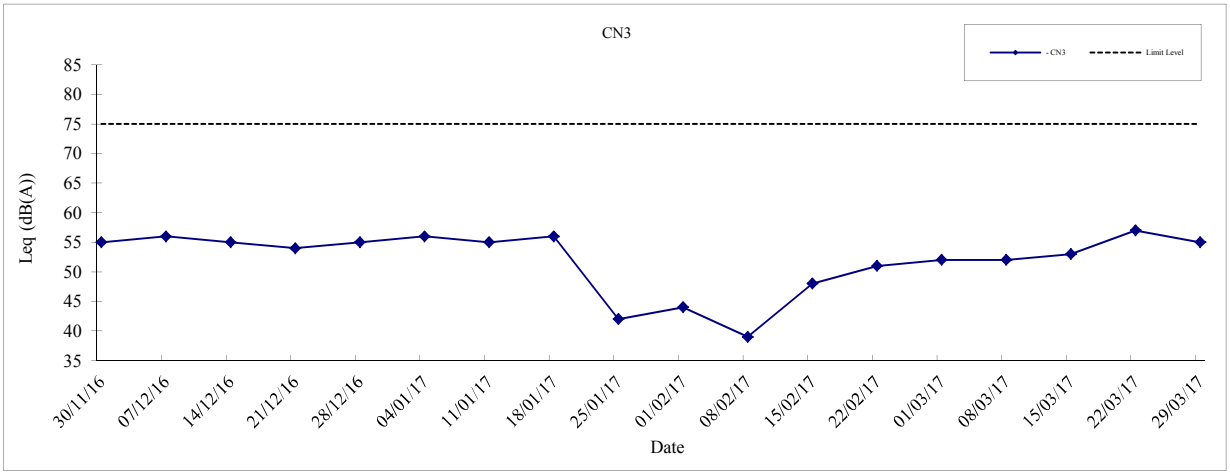
- CN34

Date	Noise Monitoring Results	Limit Level	Exceedance?
	Leq, dB(A)	Leq, dB(A)	
2017-03-01	70	75	N
2017-03-08	72	75	N
2017-03-13	71	75	N
2017-03-22	70	75	N
2017-03-29	69	75	N

Note:
- Noise limit level of CN21, CN23, CN24, CN25, CN26 & CN29, which are school, is 70dB(A) on normal weekdays and 65dB(A) during examination period.
- Due to completion of works in the vicinity at CN27, monitoring at Nam Cheong Estate (CN 27) has be suspended from September 2015.
- Impact monitoring at Tower 6, Sorrento (CN31) had been temporarily suspended since end of August 2014 due to objection from the OC of Sorrento in August 2014. Monitoring at this location would be resumed when an alternative location is determined.

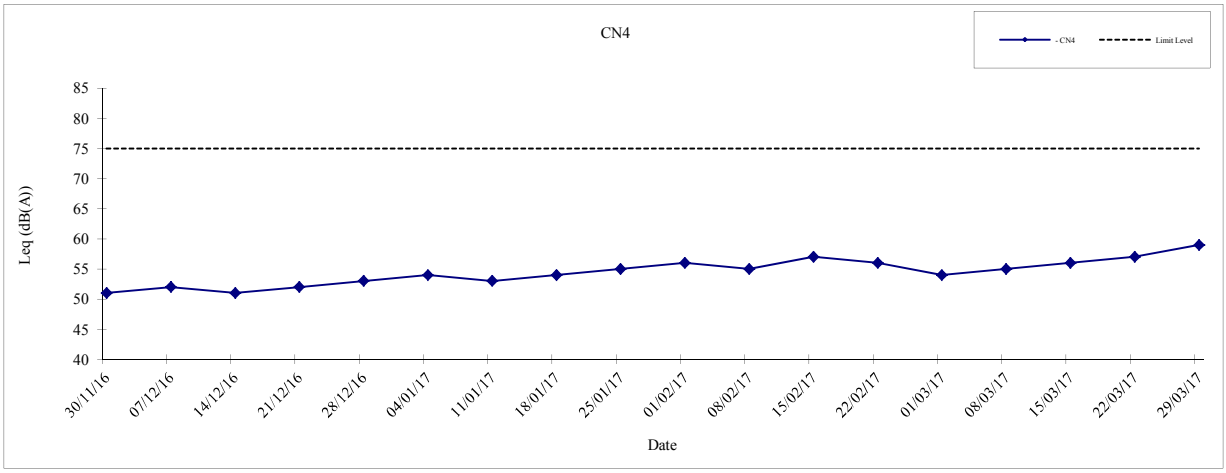


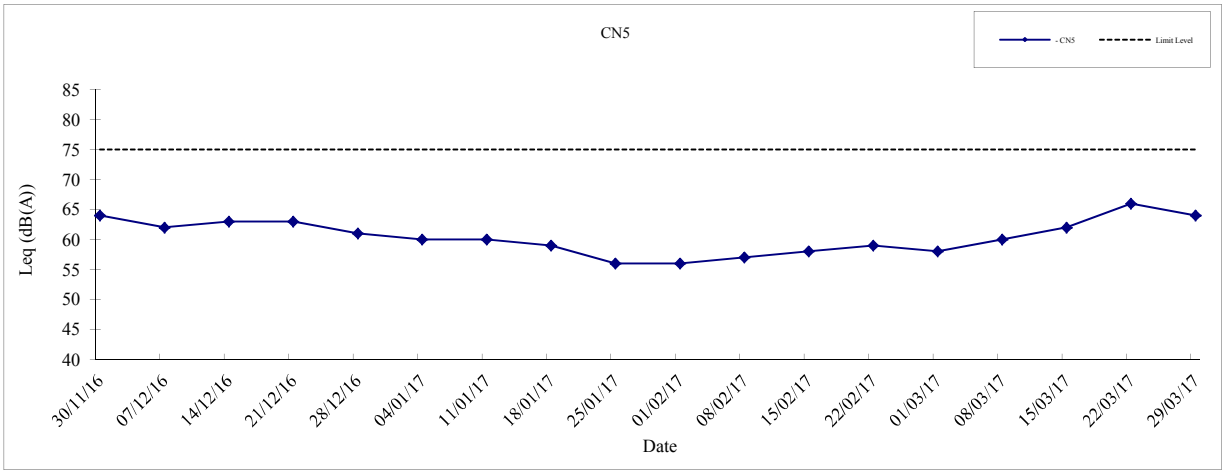


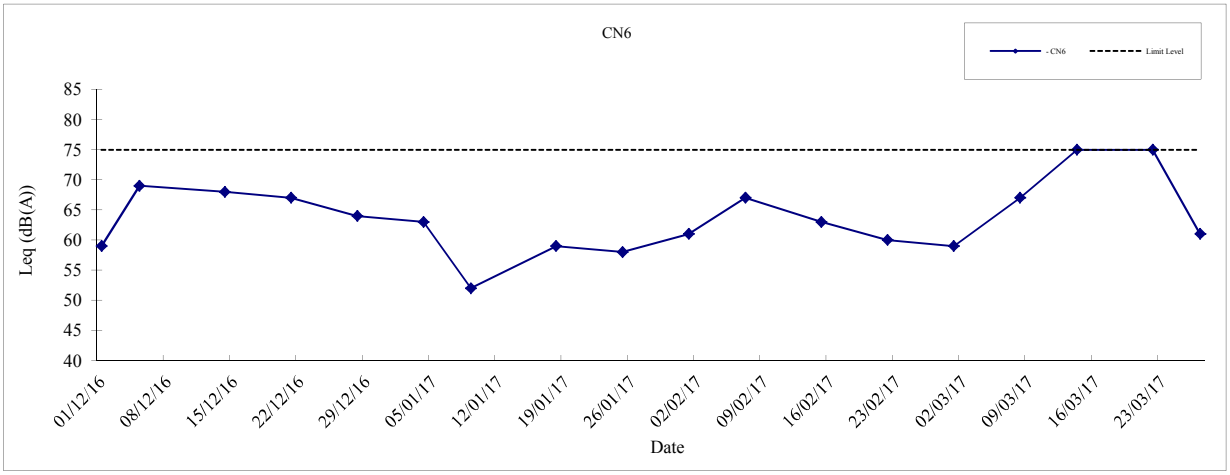


Note - Impact monitoring at No. 142 Mai Po San Tsuen (CN 1) had been temporarily suspended since December 2012 due to house removal. Monitoring at this location will be resumed when an alternative location is determined.

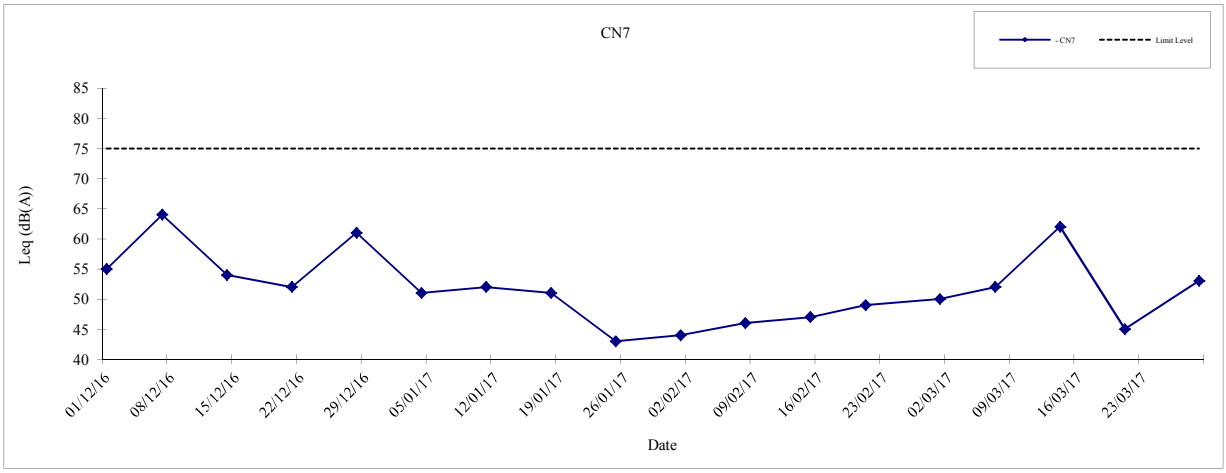
MTR	Hong Kong Section of Guangzhou-Shenzhen-Hong Kong Express Rail Link **Graphical Presentation of Noise** **Monitoring Results for Location CN1, CN2 and CN3**	**Date**	**2017**
		APPENDIX	**F**

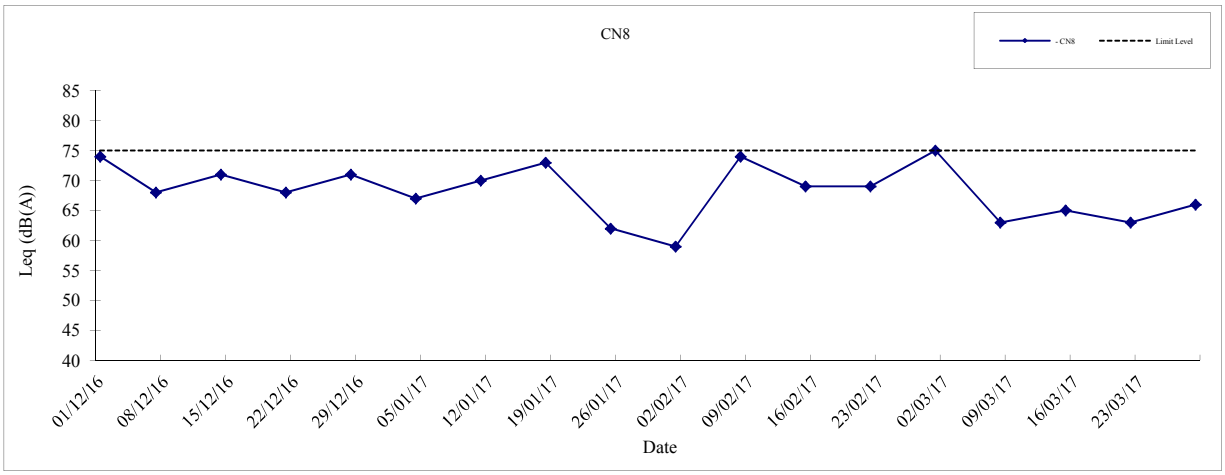


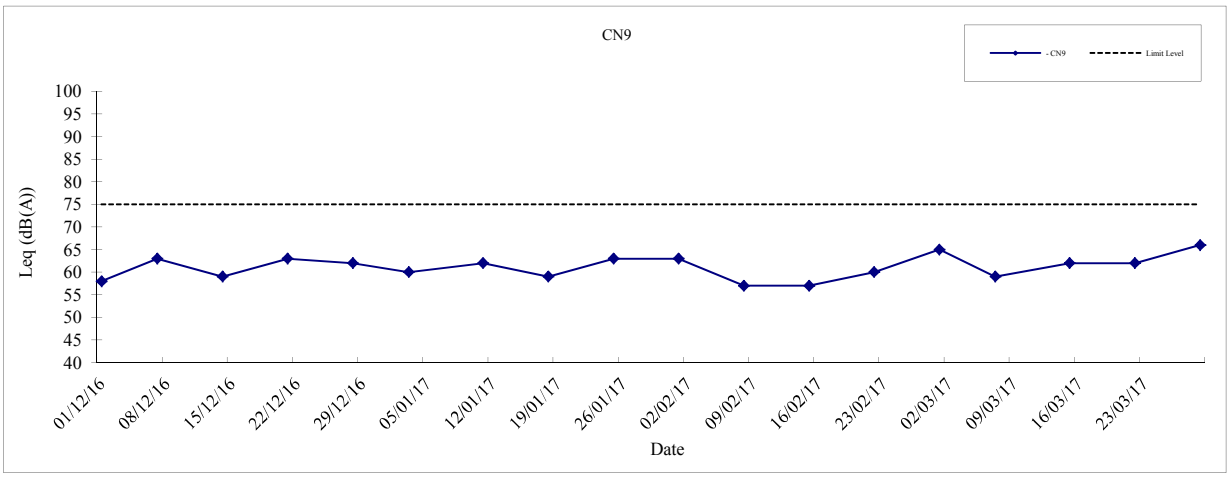




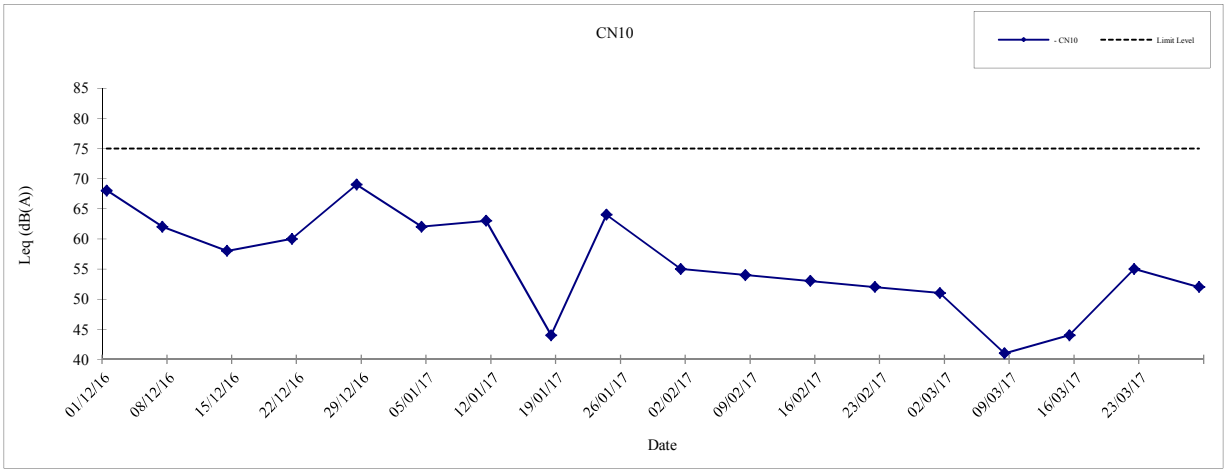
MTR	Hong Kong Section of Guangzhou-Shenzhen-Hong Kong Express Rail Link **Graphical Presentation of Noise** **Monitoring Results for Location CN4, CN5 and CN6**	**Date**	**2017**
		APPENDIX	**F**

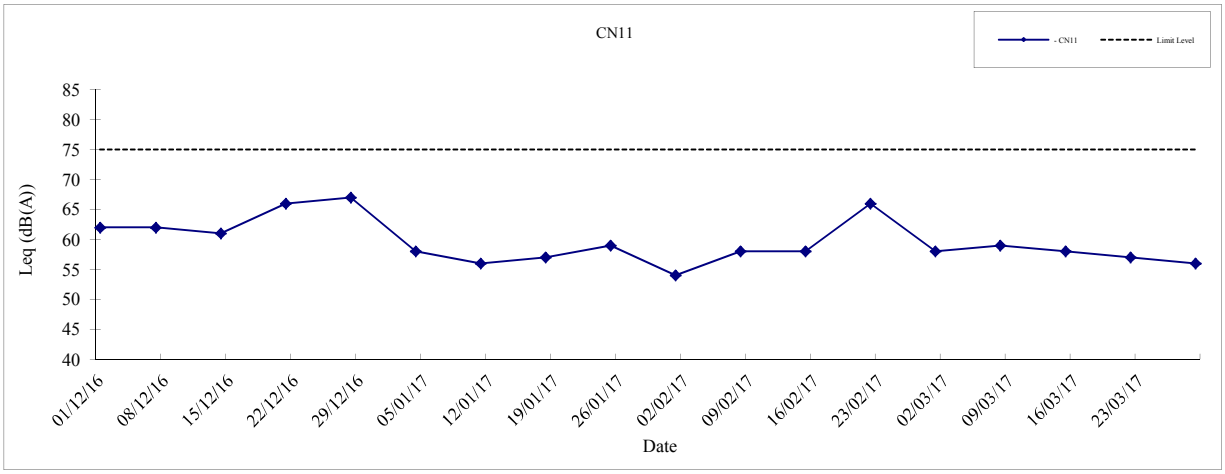


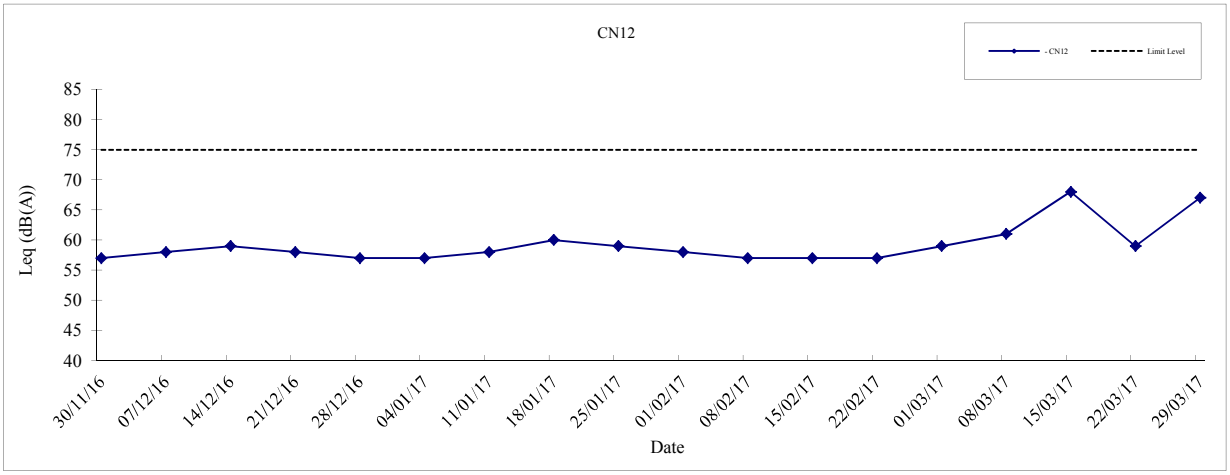




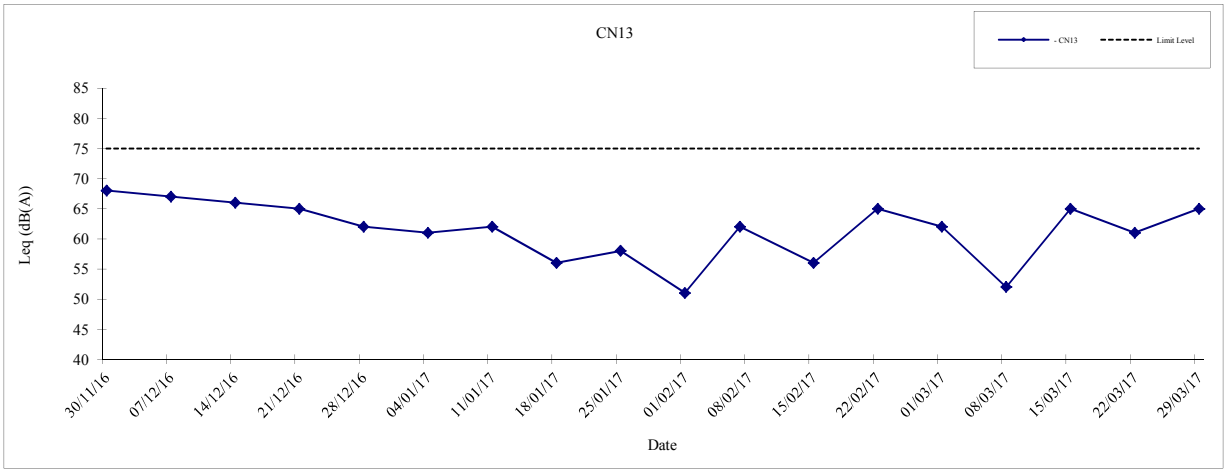
MTR	Hong Kong Section of Guangzhou-Shenzhen-Hong Kong Express Rail Link **Graphical Presentation of Noise** **Monitoring Results for Location CN7, CN8 and CN9**	**Date**	**2017**
		APPENDIX	**F**

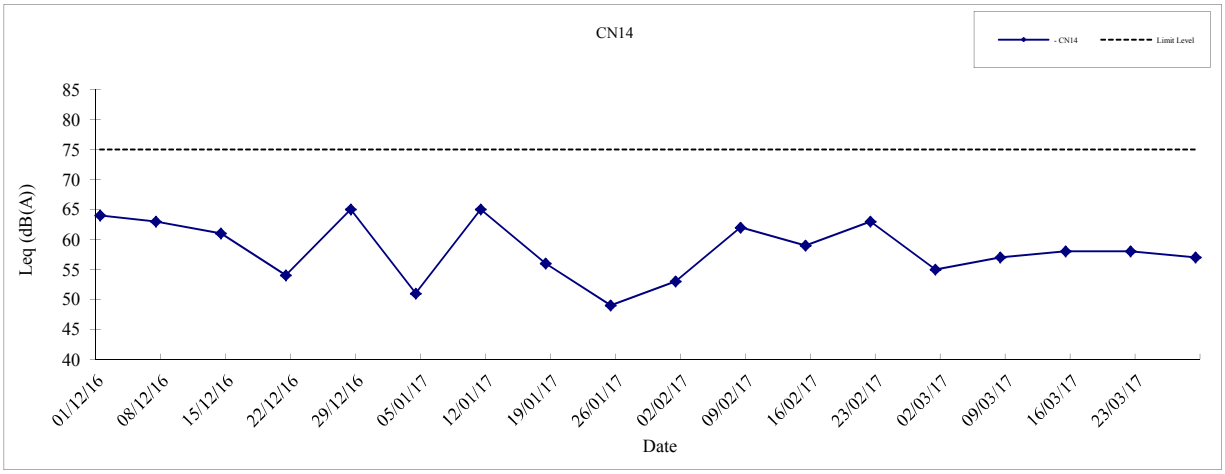


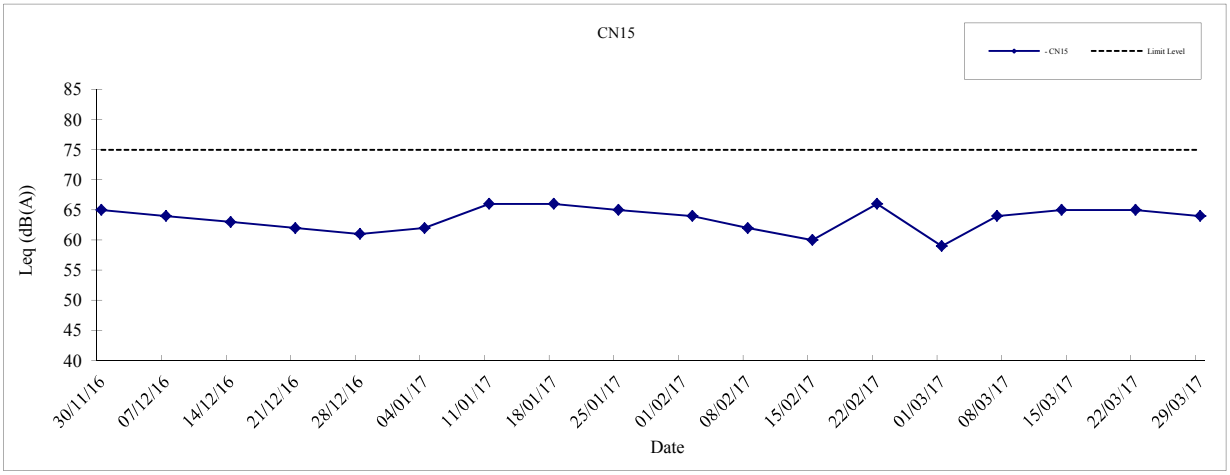




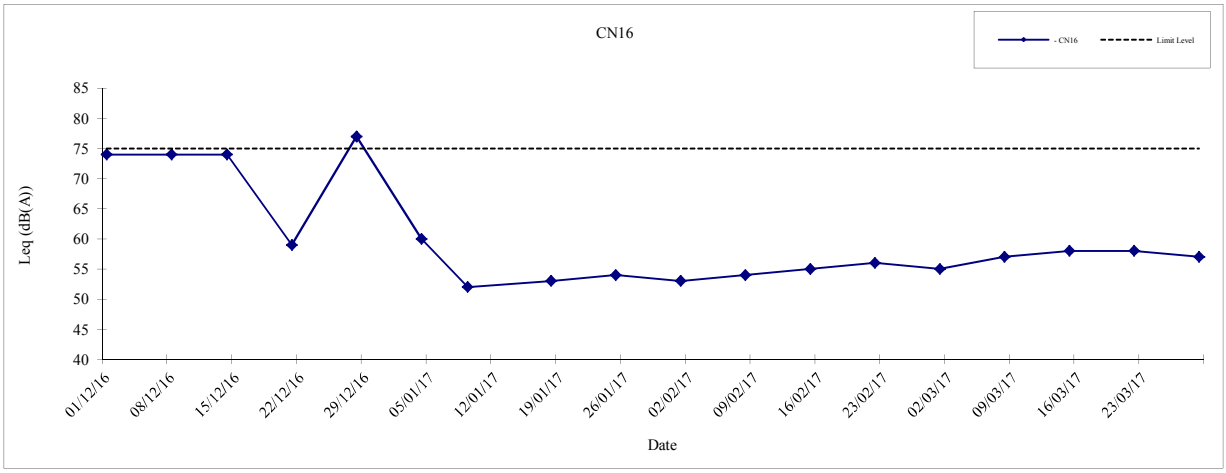
MTR	Hong Kong Section of Guangzhou-Shenzhen-Hong Kong Express Rail Link **Graphical Presentation of Noise** **Monitoring Results for Location CN10, C11 and CN12**	**Date**	**2017**
		APPENDIX	**F**

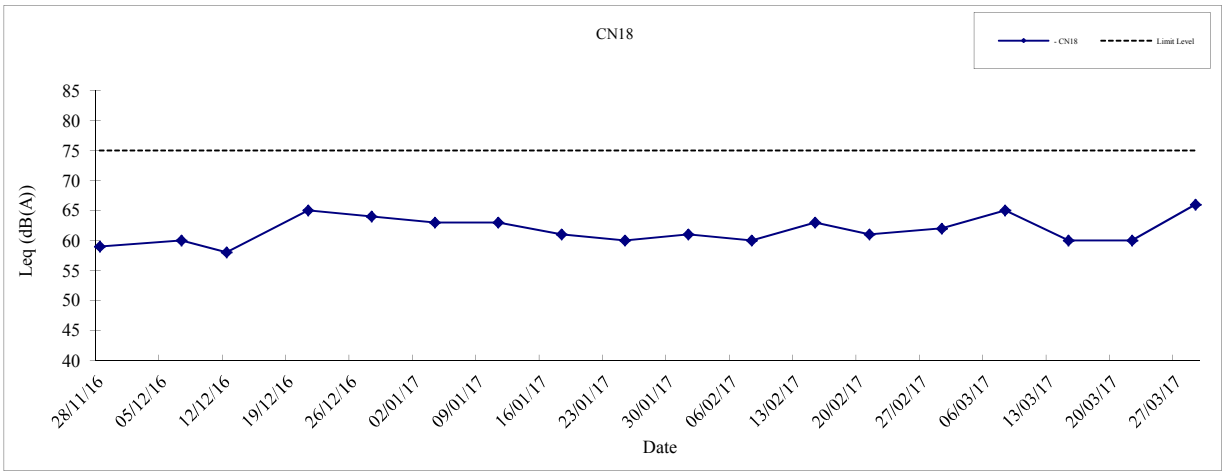


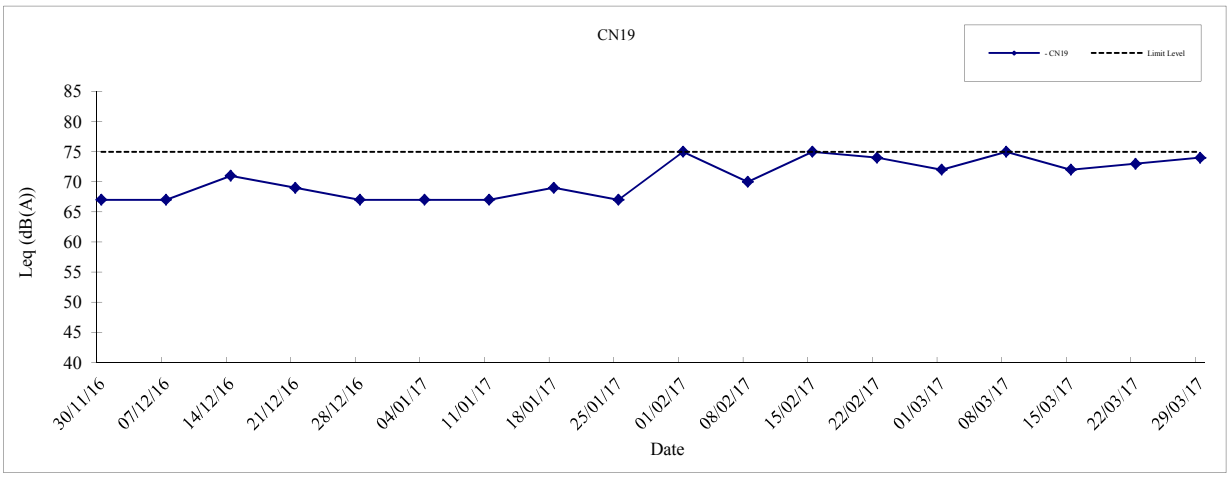




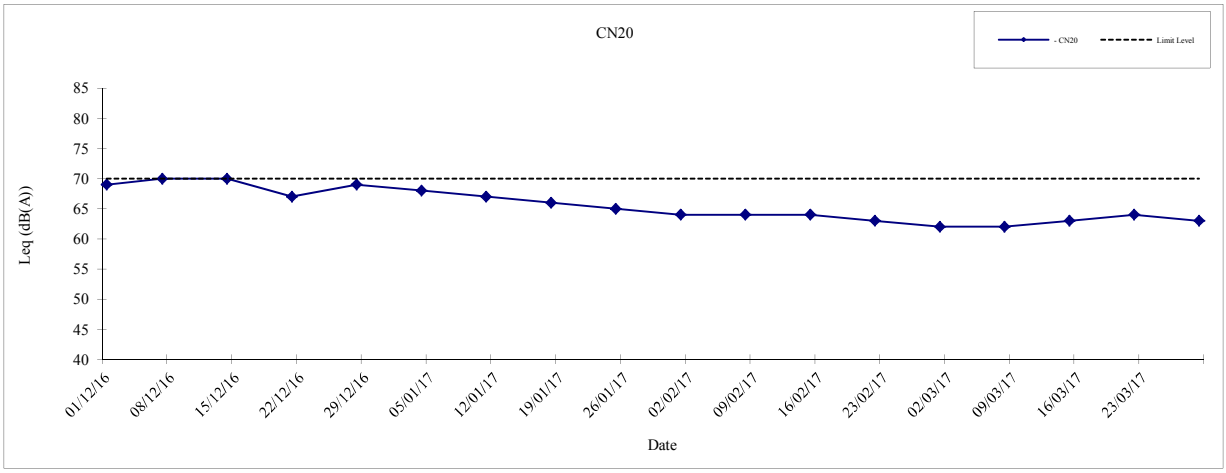
MTR	Hong Kong Section of Guangzhou-Shenzhen-Hong Kong Express Rail Link **Graphical Presentation of Noise** **Monitoring Results for Location CN13, C14 and CN15**	**Date**	**2017**
		APPENDIX	**F**

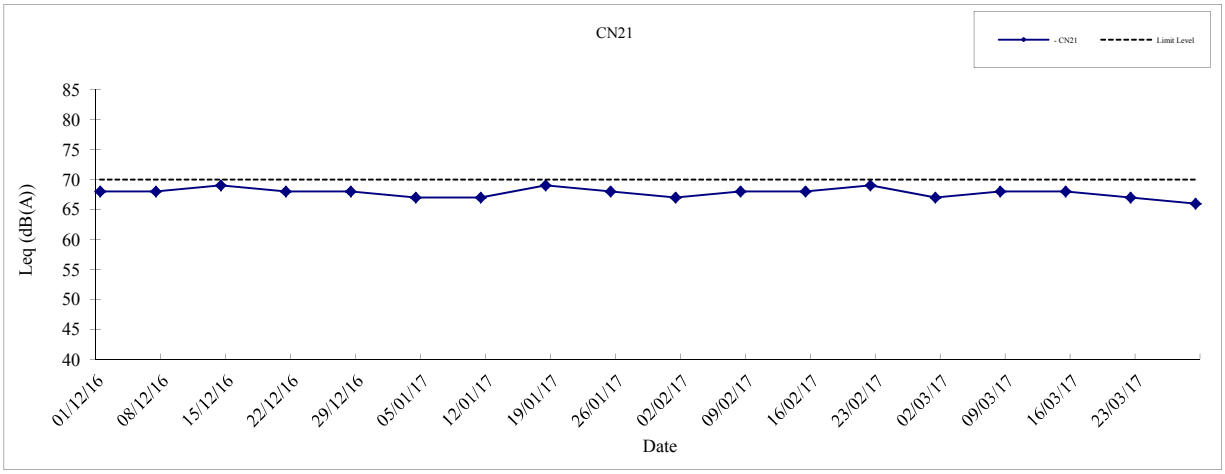


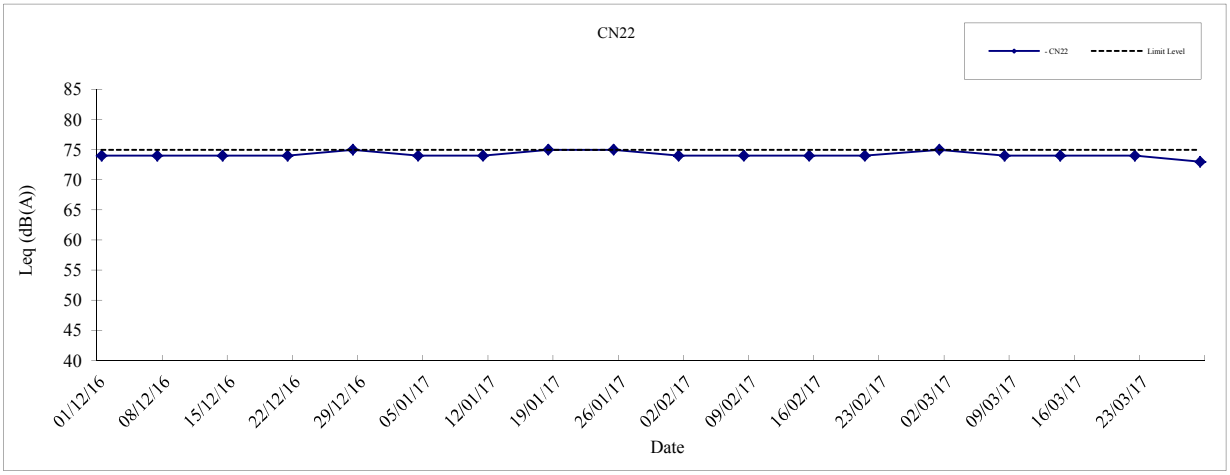




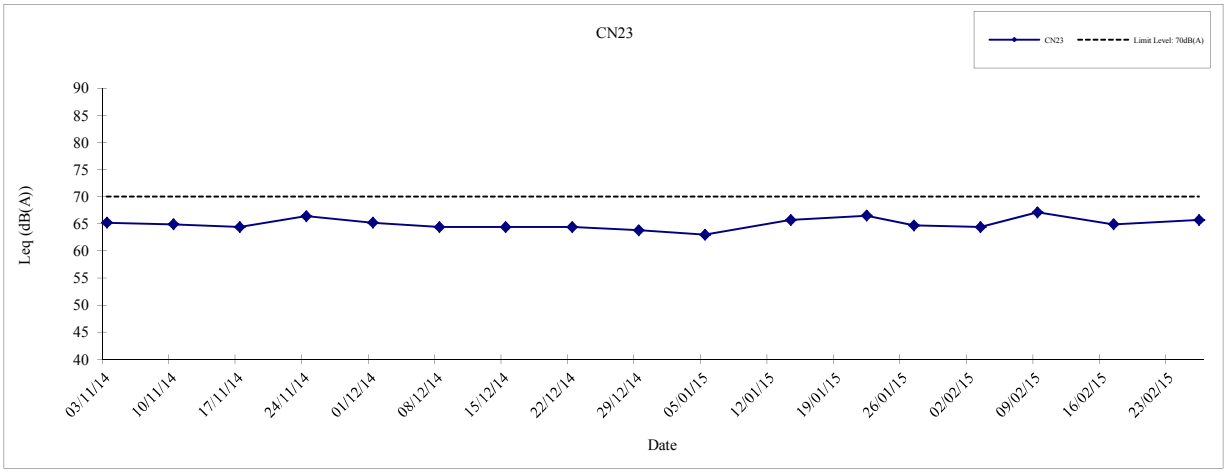
MTR	Hong Kong Section of Guangzhou-Shenzhen-Hong Kong Express Rail Link **Graphical Presentation of Noise** **Monitoring Results for Location CN16, C18 and CN19**	**Date**	**2017**
		APPENDIX	**F**

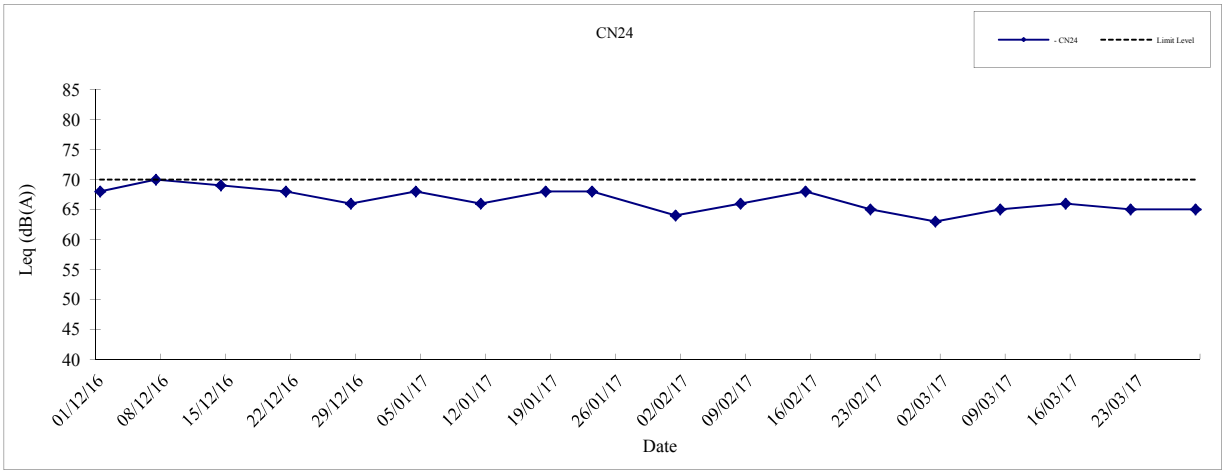


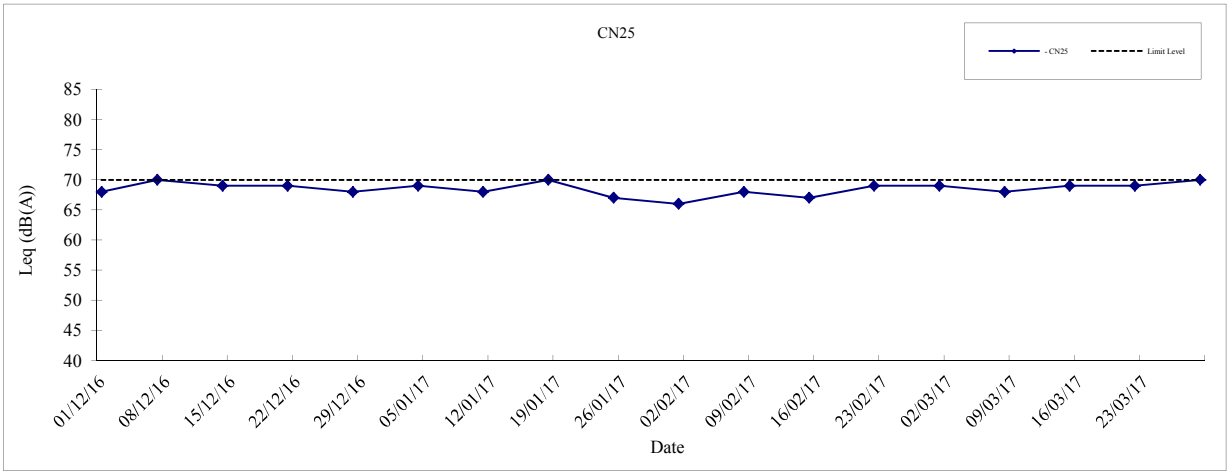




MTR	Hong Kong Section of Guangzhou-Shenzhen-Hong Kong Express Rail Link **Graphical Presentation of Noise** **Monitoring Results for Location CN20, CN21 and CN22**	**Date**	**2017**
		APPENDIX	**F**

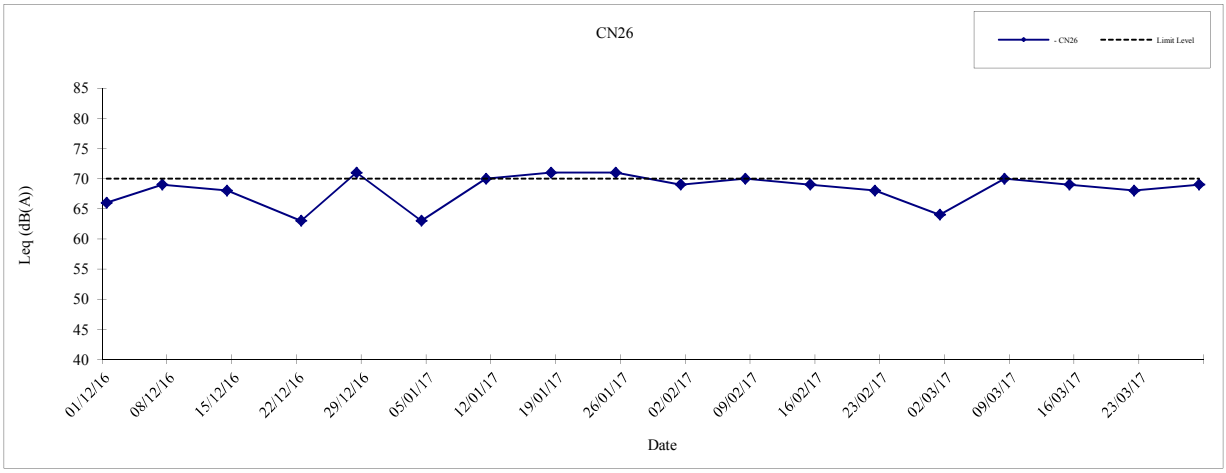


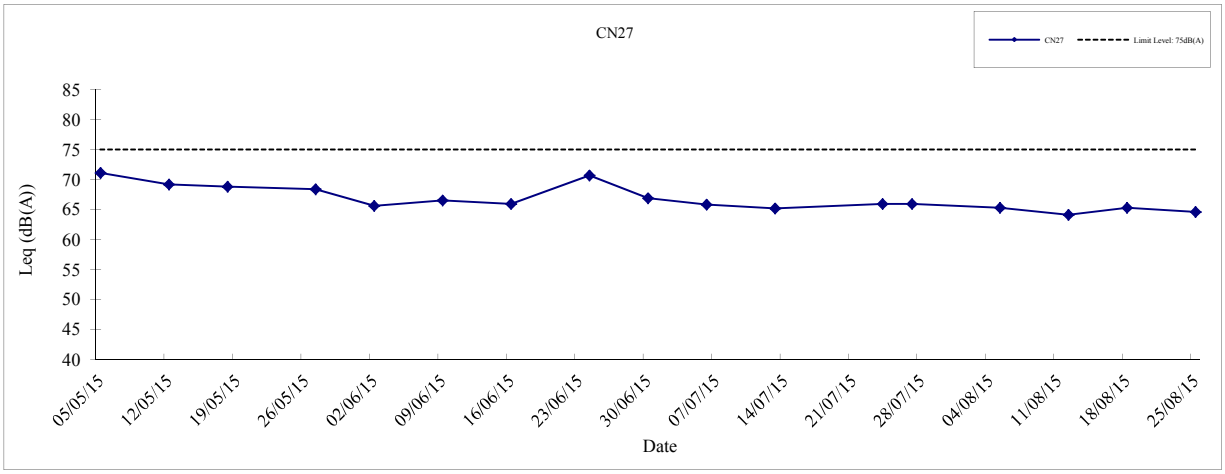


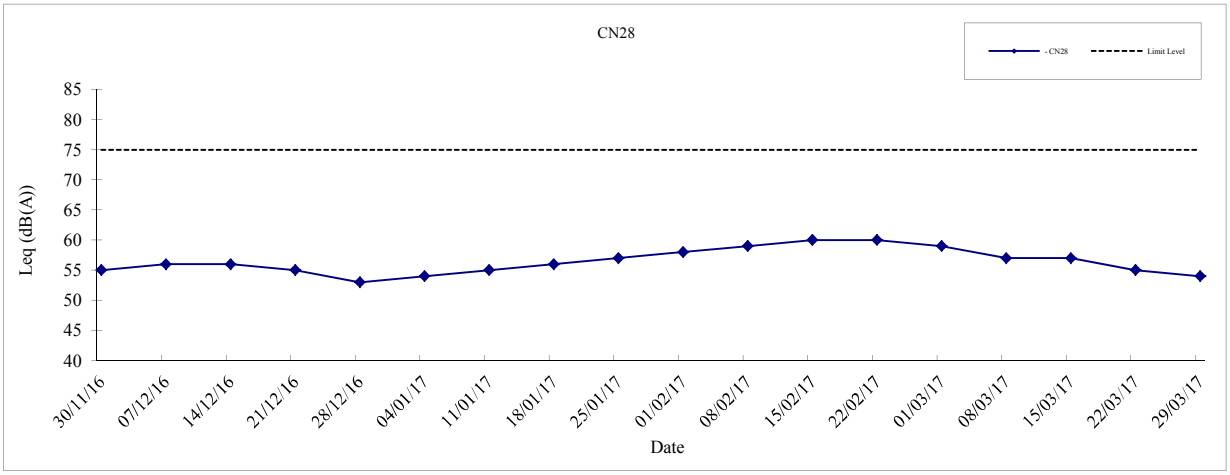


- Due to completion of all works at CN23, monitoring at HKIVE Haking Wong Waterfront Annex (CN 23) has been suspended from March 2015.

MTR	Hong Kong Section of Guangzhou-Shenzhen-Hong Kong Express Rail Link **Graphical Presentation of Noise** **Monitoring Results for Location CN23, CN24 and CN25**	**Date**	**2017**
		APPENDIX	**F**

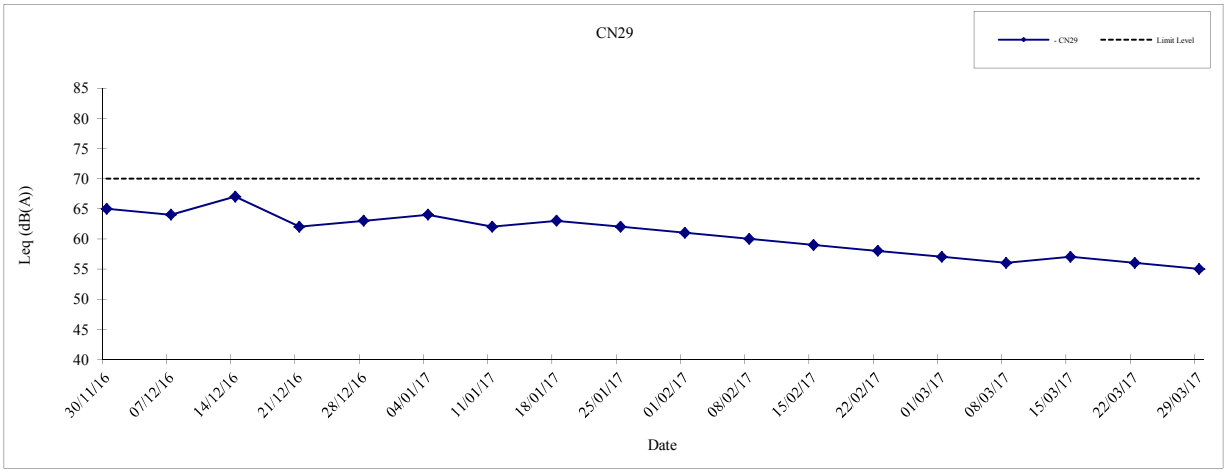


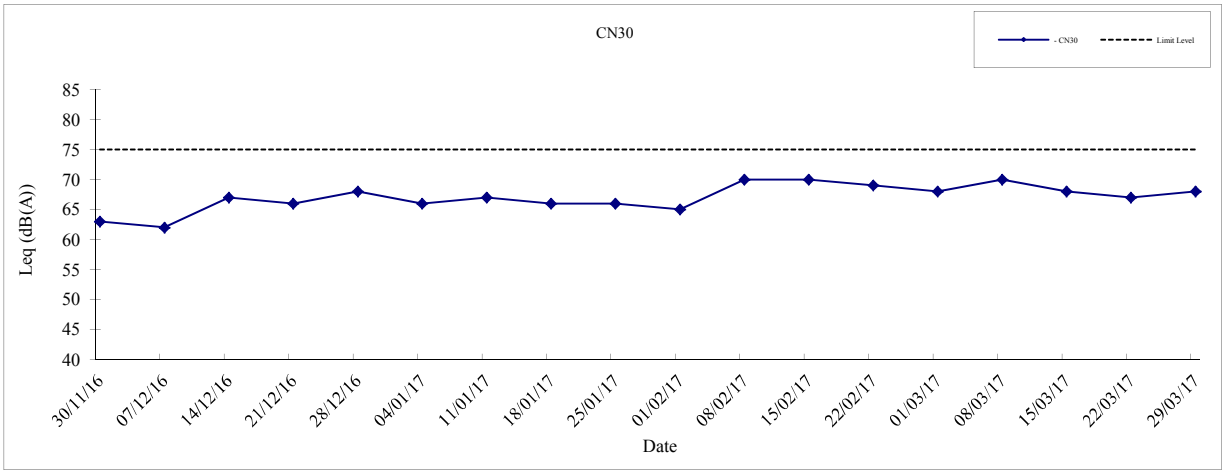


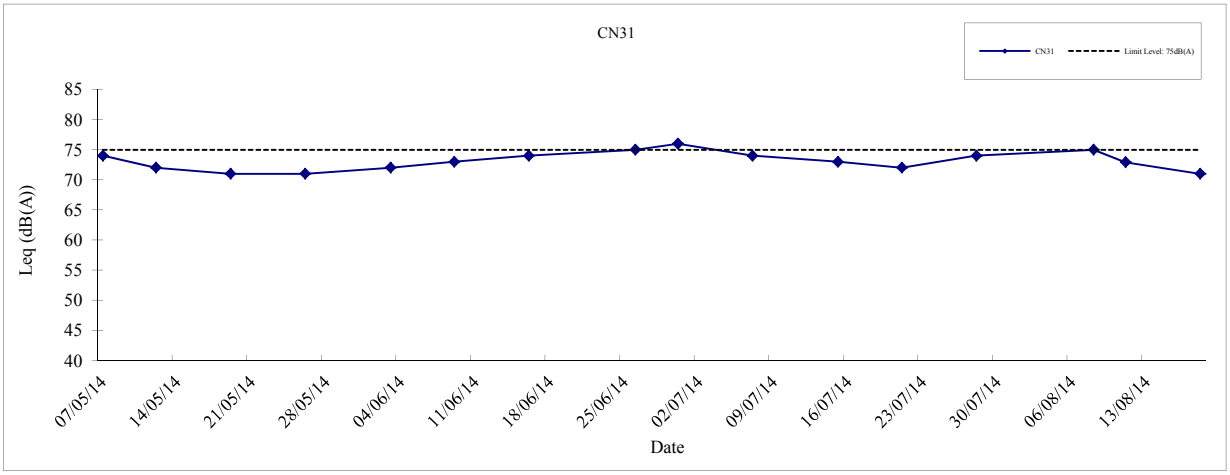


- Due to completion of works in the vicinity at CN27, monitoring at Nam Cheong Estate (CN 27) has be suspended from September 2015.

MTR	Hong Kong Section of Guangzhou-Shenzhen-Hong Kong Express Rail Link **Graphical Presentation of Noise** **Monitoring Results for Location CN26, CN27 and CN28**	**Date**	**2017**
		APPENDIX	**F**

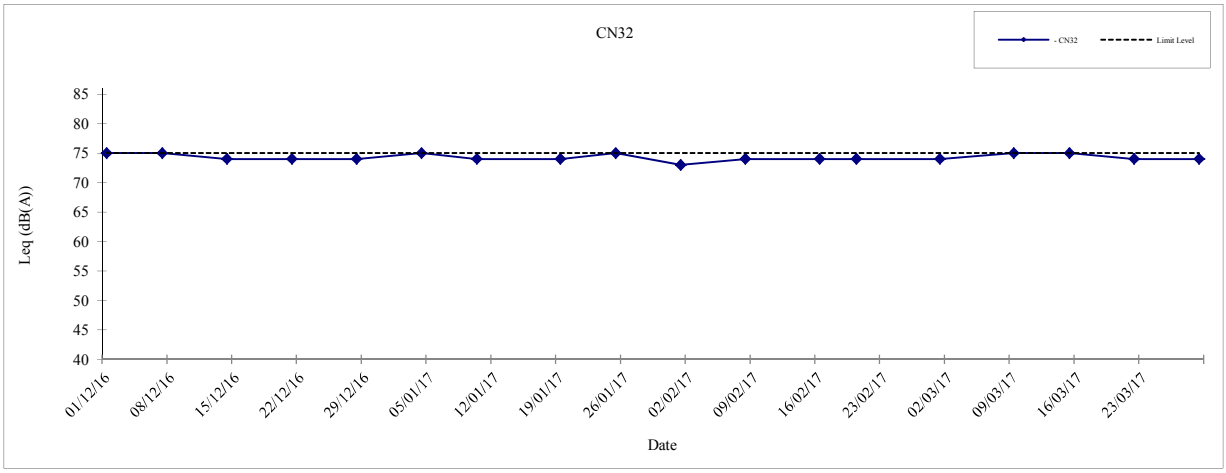


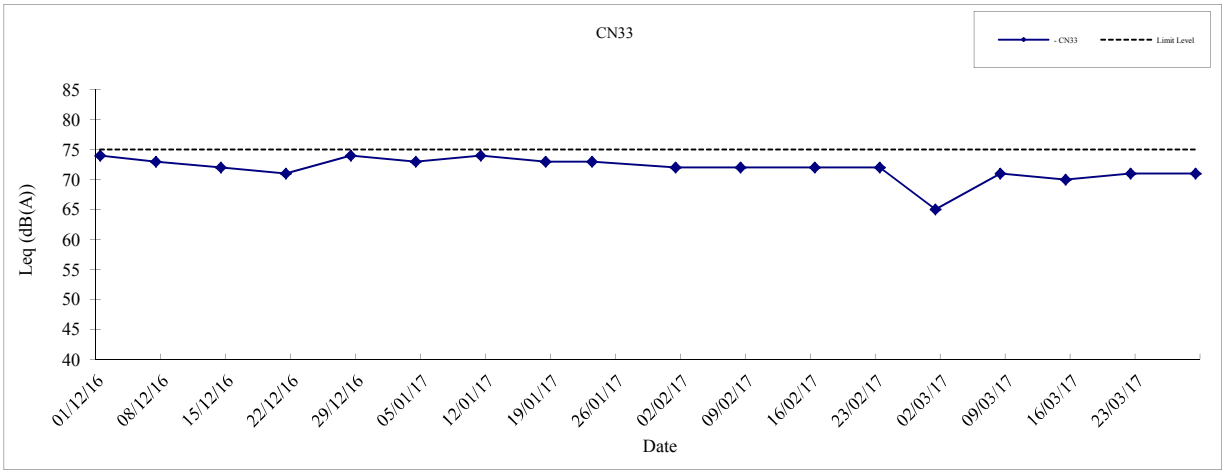


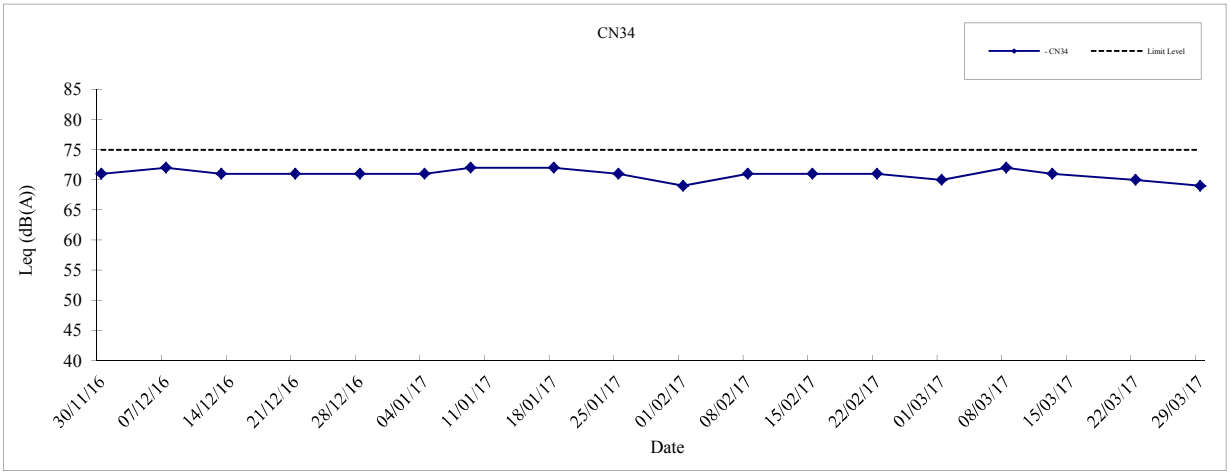


- Impact monitoring at Tower 6, Sorrento (CN31) had been temporarily suspended since end of August 2014 due to objection from the OC of Sorrento in August 2014. Monitoring at this location would be resumed when an alternative location is determined.

MTR	Hong Kong Section of Guangzhou-Shenzhen-Hong Kong Express Rail Link **Graphical Presentation of Noise** **Monitoring Results for Location CN29, CN30 and CN31**	**Date**	**2017**
		APPENDIX	**F**







MTR	Hong Kong Section of Guangzhou-Shenzhen-Hong Kong Express Rail Link **Graphical Presentation of Noise** **Monitoring Results for Location CN32, CN33 and CN34**	**Date**	**2017**
		APPENDIX	**F**

Appendix G

Bird Species and Abundance Recorded during Avifauna Survey

Appendix G Bird Species and Abundance Recorded during the Avifauna Monitoring in March 2017

Works Area: MPV
Survey Site: MPV-1
Survey Date: 17 March 2017

Common Name [1]	Chinese Name	Principal Status [2]	Point Count Location												Sub-total	Walk Transect
			MPV-1/P1	MPV-1/P2	MPV-1/P3	MPV-1/P4	MPV-1/P5	MPV-1/P6	MPV-1/P7	MPV-1/P8	MPV-1/P9	MPV-1/P10	MPV-1/P11	MPV-1/P12		
Little Grebe	**小鸊鹈**	P		1	3					1	1				6	
Great Cormorant	**鸬鹚**	W					12		7	9		5	4		37	√
Grey Heron	**蒼鷺**	W							1						1	√
Great Egret	**大白鷺**	P				1			28						29	
Little Egret	**小白鷺**	P	2	3		1	1	5	8			2			22	√
Cattle Egret	牛背鷺	P						2							2	
Chinese Pond Heron	**池鷺**	P		1	2	1	2	1		1	1	1			10	√
Black-faced Spoonbill	**黑臉琵鷺**	W					1		1						2	√
Tufted Duck	**鳳頭潛鴨**	W			7									2	9	
Black Kite	黑鳶(廉鷹)	W,R													0	√
White-breasted Waterhen	白胸苦惡鳥	R					1								1	√
Common Moorhen	黑水雞	R													0	√
Green Sandpiper	白腰草鷸	W			1										1	
Common Sandpiper	磯鷸	M,W				1					2				3	
Oriental Turtle Dove	山斑鳩	W					2								2	√
Spotted Dove	珠頸斑鳩	R	1			1			1			4			7	√
Pied Kingfisher	斑魚狗	R													0	√
Common Kingfisher	普通翠鳥	AM,P	1								1				2	√
Barn Swallow	家燕	SpM,Su	13		27	5	1	2	16	24		16		1	105	√
Red-rumped Swallow	金腰燕	M										1			1	
Yellow Wagtail	黃鶺鴒	M,W			2					1		1			4	√
White Wagtail	白鶺鴒	W,R			1	2	2				1				6	√
Richard's Pipit	田鷚	W,R			1			1							2	
Olive-backed Pipit	樹鷚	W			4			5							9	√
Red-throated Pipit	**紅喉鷚**	M,W			1										1	
Red-whiskered Bulbul	紅耳鵯	R	1							2					3	√
Chinese Bulbul	白頭鵯	R													0	√
Long-tailed Shrike	棕背伯勞	R													0	√
Oriental Magpie Robin	鵲鴝	R													0	√
Common Stonechat	黑喉石鴴	W,M													0	√
Masked Laughingthrush	黑臉噪鶥	R						1		1		1			3	√
Yellow-bellied Prinia	黃腹山鷦鶯	R	1		1	1			1	2	1				7	√
Plain Prinia	純色山鷦鶯	R			3					2					5	√
Common Tailorbird	長尾縫葉鶯	R													0	√
Scaly-breasted Munia	斑文鳥	R													0	√
Eurasian Tree Sparrow	麻雀	R	1			11				1		1			14	√
Red-billed Starling	**絲光椋鳥**	W							33						33	√
Black-collared Starling	黑領椋鳥	R					1	1	8	1	1				12	√
Crested Myna	八哥	R	9		3	3		3	9						27	√
Common Magpie	喜鵲	R				1									1	√
Large-billed Crow	大嘴烏鴉	R													0	√
No. of Birds at Each Point:			**29**	**5**	**56**	**28**	**23**	**21**	**113**	**45**	**8**	**32**	**4**	**3**		
No. of Birds Recorded from Point Count:			**367**													
No. of Species Recorded from Point Count:			**31**													
Total No. of Species:			**41**													
Total No. of Species of Conservation Interest:			**10**													

Note:
(1) Species in bold represents Species of Conservation Interest.
(2) P=present all year; W=winter visitor; Su=summer visitor; R=resident; M=migrant; SpM=spring migrant; AM=autumn migrant
[Principal status was assessed with reference to Carey *et al* . (2001): The Avifauna of Hong Kong]

Appendix G Bird Species and Abundance Recorded during the Avifauna Monitoring in March 2017

Works Area: Access road leading to TPP
Survey Site: TPP-1
Survey Date: 17 March 2017

Common Name [1]	Chinese Name	Principal Status [2]	Point Count Location					Sub-total	Walk Transect
			TPP-1/P1	TPP-1/P2	TPP-1/P3	TPP-1/P4	TPP-1/P5		
Little Egret	**小白鷺**	P	1	13	1			15	√
Grey Heron	**蒼鷺**	W		1				1	
Chinese Pond Heron	**池鷺**	P	2	4				6	√
White-breasted Waterhen	白胸苦惡鳥	R	1	3	1	1		6	√
Common Moorhen	黑水雞	R		1				1	
Common Snipe	扇尾沙錐	W			2	1		3	√
Little Ringed Plover	金眶鴴(黑領鴴)	W,R		2	1			3	√
Kentish Plover	**環頸鴴**	W			2			2	
Green Sandpiper	白腰草鷸	W		7	4	3		14	√
Wood Sandpiper	**林鷸**	M,W		2	10			12	√
Common Sandpiper	磯鷸	M,W		15	9	2		26	√
Spotted Dove	珠頸斑鳩	R	2		2		1	5	
Common Koel	噪鵑	Su,R	1			1		2	√
Barn Swallow	家燕	SpM,Su		6		4		10	√
White Wagtail	白鶺鴒	W,R		1		1	2	4	
Richard's Pipit	田鷚	W,R				1	1	2	
Red-throated Pipit	**紅喉鷚**	M,W				1		1	√
Red-whiskered Bulbul	紅耳鵯	R	3	4	6	2	4	19	√
Chinese Bulbul	白頭鵯	R		24	14			38	√
Oriental Magpie Robin	鵲鴝	R		2		1		3	
Masked Laughingthrush	黑臉噪鸝	R		3			2	5	√
Yellow-bellied Prinia	黃腹山鶯	R				2		2	
Plain Prinia	純色山鶯	R				1		1	
Common Tailorbird	長尾縫葉鶯	R	2				1	3	√
Dusky Warbler	褐柳鶯	W		1		1	2	4	
Yellow-browed Warbler	黃眉柳鶯	W		1			1	2	√
Scaly-breasted Munia	斑文鳥	R			22		3	25	√
Eurasian Tree Sparrow	麻雀	R	7	3	4		2	16	√
Black-collared Starling	黑領椋鳥	R						0	√
Common Myna	家八哥	R		1			3	4	√
No. of Birds at Each Point:			**19**	**94**	**78**	**22**	**22**		
No. of Birds Recorded from Point Count:			**235**						
No. of Species Recorded from Point Count:			**29**						
Total No. of Species:			**30**						
Total No. of Species of Conservation Interest:			**6**						

Note:
(1) Species in bold represents Species of Conservation Interest.
(2) P=present all year; W=winter visitor; Su=summer visitor; R=resident; M=migrant; SpM=spring migrant.
[Principal status was assessed with reference to Carey *et al* . (2001): The Avifauna of Hong Kong]

Appendix G Bird Species and Abundance Recorded during the Avifauna Monitoring in March 2017

Works Area: Access road leading to TPP
Survey Site: TPP-2
Survey Date: 17 March 2017

Common Name [1]	Chinese Name	Principal Status [2]	Point Count Location				Sub-total	Walk Transect
			TPP-2/P1	TPP-2/P2	TPP-2/P3	TPP-2/P4		
Little Egret	小白**鷺**	P				1	1	
Little Ringed Plover	金眶鴴(黑領鴴)	W,R	2			1	3	√
Kentish Plover	**環頸鴴**	W				1	1	
Green Sandpiper	白腰草鷸	W			1	2	3	√
Common Sandpiper	磯鷸	M,W	2				2	√
Spotted Dove	珠頸斑鳩	R	1		2		3	√
Common Koel	噪鵑	Su,R		1	1	1	3	√
Barn Swallow	家燕	SpM,Su		14	2	3	19	√
White Wagtail	白鶺鴒	W,R	1	1		1	3	√
Scarlet Minivet	赤紅山椒鳥	R					0	√
Red-whiskered Bulbul	紅耳鵯	R			3		3	√
Chinese Bulbul	白頭鵯	R			1	2	3	√
Masked Laughingthrush	黑臉噪鸝	R	1			1	2	√
Plain Prinia	純色山鷦鶯	R		1			1	
Yellow-browed Warbler	黃眉柳鶯	W			2	1	3	√
Japanese White-eye	暗綠繡眼鳥	R,?W					0	√
Scaly-breasted Munia	斑文鳥	R	4				4	
Eurasian Tree Sparrow	麻雀	R		2			2	√
Common Myna	家八哥	R					0	√
No. of Birds at Each Point:			**11**	**19**	**12**	**14**		
No. of Birds Recorded from Point Count:			**56**					
No. of Species Recorded from Point Count:			**16**					
Total No. of Species:			**19**					
Total No. of Species of Conservation Interest:			**2**					

Note:
(1) Species in bold represents Species of Conservation Interest.
(2) P=present all year; W=winter visitor; Su=summer visitor; R=resident; M=migrant; SpM=spring migrant; ?W=the extent of immigration in winter is unclear.
[Principal status was assessed with reference to Carey *et al* . (2001): The Avifauna of Hong Kong]

Appendix G Bird Species and Abundance Recorded during the Avifauna Monitoring in March 2017

Work Area: Access road leading to TPP
Survey Site: TPP-3
Survey Date: 17 March 2017

Common Name [1]	Chinese Name	Principal Status [2]	Point Count Location			Sub-total
			TPP-3/P1	TPP-3/P2	TPP-3/P3	
Spotted Dove	珠頸斑鳩	R	2	1		3
Common Koel	噪鵑	Su,R	1	1		2
White Wagtail	白鶺鴒	W,R		1		1
Red-whiskered Bulbul	紅耳鵯	R	2		1	3
Chinese Bulbul	白頭鵯	R		2		2
Oriental Magpie Robin	鵲鴝	R		1	2	3
Masked Laughingthrush	黑臉噪鶥	R	1		1	2
Common Tailorbird	長尾縫葉鶯	R		1	1	2
Yellow-browed Warbler	黃眉柳鶯	W			1	1
Scarlet-backed Flowerpec	朱背啄花鳥	R		1		1
Japanese White-eye	暗綠繡眼鳥	R,?W	1		2	3
Eurasian Tree Sparrow	麻雀	R		2	4	6
Common Myna	家八哥	R	1		3	4
No. of Birds at Each Point:			8	10	15	
No. of Birds Recorded from Point Count:			**33**			
No. of Species Recorded from Point Count:			**13**			
Total No. of Species:			**13**			
Total No. of Species of Conservation Interest:			**0**			

Note:
(1) P=present all year; Su=summer visitor; R=resident; W=winter visitor; ?W=the extent of immigration in winter is unclear.
[Principal status was assessed with reference to Carey *et al*. (2001): The Avifauna of Hong Kong]

Appendix G Bird Species and Abundance Recorded during the Avifauna Monitoring in March 2017

Works Area: SSS / ERS
Survey Site: SSS-1
Survey Date: 17 March 2017

Common Name [1]	Chinese Name	Principal Status [2]	Point Count Location				Sub-total	Walk Transect
			SSS-1/P1	SSS-1/P2	SSS-1/P3	SSS-1/P4		
White-breasted Waterhen	白胸苦惡鳥	R		1			1	√
Little Ringed Plover	金眶鴴(黑領鴴)	W,R	2	3	2	2	9	√
Green Sandpiper	白腰草鷸	W	1	2			3	√
Wood Sandpiper	**林鷸**	M,W	2	2			4	
Common Sandpiper	磯鷸	M,W	1	6	1	2	10	√
Common Snipe	扇尾沙錐	W	2	1	2		5	
Spotted Dove	珠頸斑鳩	R	1	3		1	5	√
Common Koel	噪鵑	Su,R			2		2	√
Barn Swallow	家燕	SpM,Su					0	√
Yellow Wagtail	黃鶺鴒	M,W	2	1			3	
White Wagtail	白鶺鴒	W,R	3	3	3	1	10	√
Red-whiskered Bulbul	紅耳鵯	R	2		2		4	√
Chinese Bulbul	白頭鵯	R			1		1	√
Oriental Magpie Robin	鵲鴝	R		1			1	√
Masked Laughingthrush	黑臉噪鶥	R	1	3	3	1	8	√
Yellow-bellied Prinia	黃腹山鶯鶯	R					0	√
Yellow-browed Warbler	黃眉柳鶯	W	3	1			4	√
Japanese White-eye	暗綠繡眼鳥	R,?W		1			1	√
Scaly-breasted Munia	斑文鳥	R	6			4	10	√
Eurasian Tree Sparrow	麻雀	R	2	1	2		5	√
Black-collared Starling	黑領椋鳥	R		1	1		2	√
Crested Myna	八哥	R					0	√
No. of Birds at Each Point:			**28**	**30**	**19**	**11**		
No. of Birds Recorded from Point Count:			**88**					
No. of Species Recorded from Point Count:			**19**					
Total No. of Species:			**22**					
Total No. of Species of Conservation Interest:			**1**					

Note:
(1) Species in bold represents Species of Conservation Interest.
(2) R=resident; Su=summer visitor; W=winter visitor; M=migrant; SpM=spring migrant; P=present all year; ?W=the extent of immigration in winter is unclear
[Principal status was assessed with reference to Carey *et al*. (2001): The Avifauna of Hong Kong]

Appendix G Bird Species and Abundance Recorded during the Avifauna Monitoring in March 2017

Works Area: SSS / ERS
Survey Site: SSS-2a
Survey Date: 17 March 2017

Common Name	Chinese Name	Principal Status (1)	Point Count Location		Sub-total
			SSS-2a/P1	SSS-2a/P2	
Common Koel	噪鵑	Su,R		1	1
Barn Swallow	家燕	SpM,Su		1	1
Red-whiskered Bulbul	紅耳鵯	R		1	1
Common Tailorbird	長尾縫葉鶯	R	1	1	2
Yellow-browed Warbler	黃眉柳鶯	W	1	1	2
Japanese White-eye	暗綠繡眼鳥	R,?W		1	1
Eurasian Tree Sparrow	麻雀	R		8	8
No. of Birds at Each Point:			**2**	**14**	
No. of Birds Recorded from Point Count:			**16**		
No. of Species Recorded from Point Count:			**7**		
Total No. of Species:			**7**		
Total No. of Species of Conservation Interest:			**0**		

Note:

(1) R=resident; Su=summer visitor; W=winter visitor; SpM=spring migrant; ?W=the extent of immigration in winter is unclear
[Principal status was assessed with reference to Carey *et al* . (2001): The Avifauna of Hong Kong]

Appendix G Bird Species and Abundance Recorded during the Avifauna Monitoring in March 2017

Works Area: SSS / ERS
Survey Site: SSS-2b
Survey Date: 17 March 2017

Common Name	Chinese Name	Principal Status (1)	Point Count Location			Sub-total
			SSS-2b/P1	SSS-2b/P2	SSS-2b/P3	
Little Egret	小白鷺	P		1		1
White-breasted Waterhen	白胸苦惡鳥	R		1	1	2
Spotted Dove	珠頸斑鳩	R	2	2	2	6
Common Koel	噪鵑	Su,R		1		1
Greater Coucal	褐翅鴉鵑	R			1	1
Yellow Wagtail	黃鶺鴒	M,W			1	1
Red-whiskered Bulbul	紅耳鵯	R	3	1	2	6
Chinese Bulbul	白頭鵯	R		1	1	2
Masked Laughingthrush	黑臉噪鶥	R	1		1	2
Plain Prinia	純色山鶯鶲	R		1	1	2
Dusky Warbler	褐柳鶲	W		1	1	2
Fork-tailed Sunbird	叉尾太陽鳥	R		1		1
Eurasian Tree Sparrow	麻雀	R	2		3	5
Black-collared Starling	黑領椋鳥	R	1			1
Common Magpie	喜鵲	R			1	1
No. of Birds at Each Point:			**9**	**10**	**15**	
No. of Birds Recorded from Point Count:			**34**			
No. of Species Recorded from Point Count:			**15**			
Total No. of Species:			**15**			
Total No. of Species of Conservation Interest:			**1**			

Note:
(1) Species in bold represents Species of Conservation Interest.
(2) R=resident; Su=summer visitor; W=winter visitor; M=migrant; P=present all year.
[Principal status was assessed with reference to Carey *et al* . (2001): The Avifauna of Hong Kong]

Appendix G Bird Species and Abundance Recorded during the Avifauna Monitoring in March 2017

Works Area: SSS / ERS
Survey Site: SSS-3
Survey Date: 17 March 2017

Common Name [1]	Chinese Name	Principal Status [2]	Point Count Location												Sub-total	Walk Transect
			SSS-3/P1	SSS-3/P2	SSS-3/P3	SSS-3/P4	SSS-3/P5	SSS-3/P6	SSS-3/P7	SSS-3/P8	SSS-3/P9	SSS-3/P10	SSS-3/P11	SSS-3/P12		
Little Egret	**小白鷺**	P	1												1	√
Chinese Pond Heron	**池鷺**	P			2			1				1			4	√
White-breasted Waterhen	白胸苦惡鳥	R													0	√
Common Sandpiper	磯鷸	M,W													0	√
Spotted Dove	珠頸斑鳩	R	4	1	2	11	2	4	2	3	2		4	1	36	√
Barn Swallow	家燕	SpM,Su	4						1		1		8	2	16	√
White Wagtail	白鶺鴒	W,R				1								1	2	√
Olive-backed Pipit	樹鷚	W				1						1		1	3	√
Red-whiskered Bulbul	紅耳鵯	R	2	5	2	2	4	2			2	2	4		25	√
Chinese Bulbul	白頭鵯	R		5	2	2				1		1	2		13	√
Oriental Magpie Robin	鵲鴝	R	1	2	1			1						1	6	√
Daurian Redstart	北紅尾鴝	W													0	√
Common Stonechat	黑喉石鴭	W,M				1			1						2	√
Masked Laughingthrush	黑臉噪鶥	R		2					3						5	√
Yellow-bellied Prinia	黃腹山鶯鶯	R				2	1	1			1	1	2	1	9	√
Common Tailorbird	長尾縫葉鶯	R	1			1									2	
Dusky Warbler	褐柳鶯	W				1								1	2	
Yellow-browed Warbler	黃眉柳鶯	W				1									1	
Great Tit	大山雀	R													0	√
Fork-tailed Sunbird	叉尾太陽鳥	R													0	√
Japanese White-eye	暗綠繡眼鳥	R,?W			1	2	1								4	√
Eurasian Tree Sparrow	麻雀	R	2	2	3	4	3				1		10		25	√
Black-collared Starling	黑領椋鳥	R	5		5				15	1	1		1		28	√
Common Myna	家八哥	R		2											2	√
Crested Myna	八哥	R	2	1		5	4					9		2	23	√
Common Magpie	喜鵲	R													0	√
Large-billed Crow	大嘴烏鴉	R												2	2	
Collared Crow	**白頸鴉**	R				1	1								2	√
No. of Birds at Each Point:			**22**	**20**	**18**	**35**	**16**	**9**	**22**	**5**	**8**	**15**	**31**	**12**		
No. of Birds Recorded from Point Count:			**213**													
No. of Species Recorded from Point Count:			**22**													
Total No. of Species:			**28**													
Total No. of Species of Conservation Interest:			**3**													

Note:
(1) Species in bold represents Species of Conservation Interest
(2) P=present all year; W=winter visitor; Su=summer visitor; R=resident; M=migrant; SpM=spring migrant; ?W=the extent of immigration in winter is unclear
[Principal status was assessed with reference to Carey *et al*. (2001): The Avifauna of Hong Kong]

Appendix G Bird Species and Abundance Recorded during the Avifauna Monitoring in March 2017

Works Area: TUW and PHV
Survey Site: TUW-1
Survey Date: 20 March 2017

Common Name (1)	Chinese Name	Principal Status (2)	Point Count Location							Sub-total	Walk Transect
			TUW-1/P1	TUW-1/P2	TUW-1/P3	TUW-1/P4	TUW-1/P5	TUW-1/P6	TUW-1/P7		
Crested Serpent Eagle	蛇鵰	R,M								0	√
White-breasted Waterhen	白胸苦惡鳥	R		1		1		1		3	
Spotted Dove	珠頸斑鳩	R	1	1		1	1		1	5	√
Large Hawk Cuckoo	鷹鵑	Su					1			1	√
Common Koel	噪鵑	Su,R	1							1	√
Barn Swallow	家燕	SpM,Su	6	3	5		1		1	16	√
Richard's Pipit	田鷚	W				1				1	
Red-whiskered Bulbul	紅耳鵯	R	3	3		4			10	20	√
Chinese Bulbul	白頭鵯	R				1				1	
Oriental Magpie Robin	鵲鴝	R	1		1	2			1	5	√
Common Stonechat	黑喉石鴴	W,M							1	1	
Blue Whistling Thrush	紫嘯鶇	W	1							1	
Masked Laughingthrush	黑臉噪鸝	R							1	1	√
Black-throated Laughingthrush	黑喉噪鸝	R	1							1	√
Yellow-bellied Prinia	黃腹山鷦鶯	R			1	2	5	1	3	12	
Common Tailorbird	長尾縫葉鶯	R			1			1		2	√
Dusky Warbler	褐柳鶯	W		2						2	
Japanese White-eye	暗綠繡眼鳥	R,?W	5							5	√
Black-collared Starling	黑領椋鳥	R			1		3			4	√
Crested Myna	八哥	R					1			1	√
No. of Birds at Each Point:			**19**	**10**	**9**	**12**	**12**	**3**	**18**		
No. of Birds Recorded from Point Count:			**83**								
No. of Species Recorded from Point Count:			**19**								
Total No. of Species:			**20**								
Total No. of Species of Conservation Interest:			**0**								

Note:
(1) P=present all year; R=resident; Su=summer visitor; W=winter visitor; M=migrant; ?W=the extent of immigration in winter is unclear.
[Principal status was assessed with reference to Carey *et al* . (2001): The Avifauna of Hong Kong]

Appendix G Bird Species and Abundance Recorded during the Avifauna Monitoring in March 2017

Works Area: TUW and PHV
Survey Site: TUW-2 and PHV-1 (grouped together due to overlapping of survey area)
Survey Date: 20 March 2017

Common Name [1]	Chinese Name	Principal Status [2]	Point Count Location		Sub-total	Walk Transect
			TUW-2 and PHV-1/P1	TUW-2 and PHV-1/P2		
Little Egret	**小白鷺**	P			0	√
Large Hawk Cuckoo	鷹鵑	Su			0	√
Plaintive Cuckoo	八聲杜鵑	Su			0	√
Common Koel	噪鵑	Su,R			0	√
Grey-chinned Minivet	**灰喉山椒鳥**	R,W			0	√
Red-whiskered Bulbul	紅耳鵯	R	3	1	4	√
Chestnut Bulbul	栗背短腳鵯	R,W			0	√
Oriental Magpie Robin	鵲鴝	R	1		1	√
Blue Whistling Thrush	紫嘯鶇	R		1	1	
Rufous-capped Babbler	**紅頭穗鶥**	R		1	1	√
Black-throated Laughingthrush	黑喉噪鶥	R		2	2	
Yellow-bellied Prinia	黃腹山鷦鶯	R			0	√
Common Tailorbird	長尾縫葉鶯	R	2		2	√
Yellow-browed Warbler	黃眉柳鶯	W			0	√
Great Tit	大山雀	R		1	1	√
Fork-tailed Sunbird	叉尾太陽鳥	R		2	2	√
Japanese White-eye	暗綠繡眼鳥	R,?W	2		2	√
		No. of Birds at Each Point:	**8**	**8**		
		No. of Birds Recorded from Point Count:	**16**			
		No. of Species Recorded from Point Count:	**9**			
		Total No. of Species:	**17**			
		Total No. of Species of Conservation Interest:	**3**			

Note:
(1) Species in bold represents Species of Conservation Interest.
(2) R=resident; Su=summer visitor; W=winter visitor; P=present all year; ?W=the extent of immigration in winter is unclear
[Principal status was assessed with reference to Carey *et al*. (2001): The Avifauna of Hong Kong]

Appendix H

Representative Photographs of the Avifauna Monitoring

Appendix H Representative Photographs taken during the Avifauna Monitoring in March 2017



Plate 1 Ardeids observed at Point Count Location MPV-1/P7



Plate 2 Black-faced Spoonbill observed at Point Count Location MPV-1/P5



Plate 3 Tufted Ducks observed at Point Count Location MPV-1/P5

Appendix H Representative Photographs taken during the Avifauna Monitoring in March 2017



Plate 4 Overhead nets were observed at Point Count Location MPV-1/P2



Plate 5 Little Egrets observed at Point Count Location TPP-1/P2



Plate 6 Little Egret, Chinese Pond Herons and White-breasted Waterhen observed at Point Count Location TPP-1/P2

Appendix H Representative Photographs taken during the Avifauna Monitoring in March 2017



Plate 7 Project-related minor road works were observed at Point Count Location TPP-1/P3



Plate 8 Wood Sandpiper observed at Point Count Location TPP-2/P4



Plate 9 Little Ringed Plover observed at Point Count Location TPP-2/P4

Appendix H Representative Photographs taken during the Avifauna Monitoring in March 2017



Plate 10 Dry agriculture at Point Count Location SSS-3/P12



Plate 11 Wet agriculture at Point Count Location SSS-3/P12



Plate 12 Dry agriculture at Point Count Location TUW-1/P3

Appendix I

Certified Arborist Inspection Record

MTR Express Rail Link, Contract 801

Monthly Audit Inspection Record

March 2017

Audit of tree works, including tree protection, pruning work, transplanting work, maintenance works in the temporary holding nursery, and compensation tree planting

Date	Contract	Activity Description	Purpose
20/3/17 (SLS) 20/3/17 (SKW)	Siu Lang Shui (Nursery) So Kwun Wat Nursery	Inspection of trees to be transplanted within the contract	Regular audit of tree works
15/3/17	810A – West Kowloon Terminus Station North Parcel NT-10	Inspection of retained trees and trees to be transplanted within the contract	Regular audit of tree works
15/3/17	810A – WKT station North Ngo Cheung Road, Hoi Wang Road, Lin Cheung Road	Inspection of retained trees and trees to be transplanted within the contract	Regular audit of tree works
15/3/17	810B - Austin Road West	Inspection of retained trees and trees to be transplanted within the contract	Regular audit of tree works
15/3/17	811B – WKT Approach Tunnels – South Parcel 44.1, Lin Cheung Road, and Jordan Road Footpath & Central Divider	Inspection of retained trees and trees to be transplanted within the contract	Regular audit of tree works
15/3/17	816D WRK – Integrated Series Contractors Site Office Private Lot – STT-RDS/KSL-002	Inspection of retained trees and trees to be transplanted within the contract	Regular audit of tree works
15/3/17	821 – Shek Yam to Mei Lai Road Tunnels Parcel NT-9 (slope)	Inspection of retained trees and trees to be transplanted within the contract	Regular audit of tree works
15/3/17	8217 – Shek Yam	Inspection of retained trees and trees to be transplanted within the contract	Regular audit of tree works
14/3/17 (PH) 15/3/17 (KH)	822 – Tse Uk Tsuen to Shek Yam Tunnels Parcels NT-6 (Pat Heung), NT-7, and NT-8, Site Office – San Kwai Street, Kwai Hing, Parcel NT-17 (6.6, 6.9) 822 – Siu Lam FW Service Reservoir	Inspection of retained trees and trees to be transplanted within the contract	Regular audit of tree works
14/3/17	823A – Kam Tin Tunnels Parcels NT-5A, NT-5.1A, and NT-5.3A	Inspection of retained trees and trees to be transplanted within the contract	Regular audit of tree works

14/3/17	823B – SSS and ERS Parcels NT-5.1B, NT-5.2, and NT-5.3B	Inspection of retained trees and trees to be transplanted within the contract	Regular audit of tree works
14/3/17 (TKP)	824 Tai Kong Po Tunnels NT-3, NT-5.1A, NT-4 824 Lung Kwu Sheung Tan	Inspection of retained trees and trees to be transplanted within the contract	Regular audit of tree works
14/3/17	825 Mai Po to Ngau Tam Mei Tunnels	Inspection of retained trees and trees to be transplanted within the contract	Regular audit of tree works
15/3/17	830 – Trackwork and Overhead Line System (Nam Cheong Park) 830 – Yuet Lun Street	Inspection of retained trees and trees to be transplanted within the contract	Regular audit of tree works

Signed by:

Matthew PRYOR (RLA, CA)



Appendix J

Meteorological Data

Date MARCH	Mean Pressure (hPa)	Air Temperature			Mean Dew Point Temperature (deg. C)	Mean Relative Humidity (%)	Mean Amount of Cloud (%)	Total Rainfall (mm)
		Maximum (deg. C)	Mean (deg. C)	Minimum (deg. C)				
1	1019.5	22.9	18.8	15.9	12.3	67	72	-
2	1019.2	23.9	19.4	17.2	6.5	45	12	-
3	1017	20.1	17.4	15.7	11	67	43	-
4	1014.1	21.8	18.7	16.8	13.7	73	76	-
5	1012.4	24	20.7	18.7	17.7	83	80	-
6	1013.7	23.5	20.3	17.9	16.6	80	76	Trace
7	1016.5	20.7	18	17.1	13.5	75	87	Trace
8	1017.5	17.3	16.3	15	13.9	86	89	2.8
9	1015.7	19.6	17	16	12.2	74	88	Trace
10	1012.5	19.2	17.8	16.4	16.1	90	89	Trace
11	1015.1	18.4	17.5	16.7	15.5	88	91	Trace
12	1014.3	19.5	18.4	17	16.8	90	92	1
13	1011.8	24.4	21.7	19.4	20.3	92	86	-
14	1015.8	22	19.1	16.8	18.2	94	93	8.5
15	1018.2	17.9	16.8	16.2	12.4	75	88	Trace
16	1016.4	19	17.8	16.8	13.8	78	88	Trace
17	1017.2	20.4	18.1	17	15.8	86	88	Trace
18	1017.8	20.1	18.9	17.4	17.2	90	91	0.3
19	1017.3	20.6	19.8	18.9	18.9	94	99	10.7
20	1015.1	27.1	21.9	18.6	19.4	86	61	Trace
21	1015	27.6	22.9	19.1	20.2	85	69	0.6
22	1014.1	19.7	18.8	17.6	16.8	88	88	0.9
23	1015	24.6	21.2	19	18.3	84	83	-
24	1016.3	22.4	20.8	18.9	17.9	83	85	Trace
25	1017.2	23.4	20.2	16.5	17.4	84	82	Trace
26	1022	16.9	15.8	13.8	11.6	76	86	1
27	1022.7	21.5	18.9	16.3	9.5	55	73	-
28	1019.2	24.9	20.6	18.1	14.9	70	60	-
29	1018.3	23.7	21.7	20.4	18.8	84	88	0.3
30	1017.3	23.1	21.9	21	19.9	89	88	Trace
31	1015.3	23.7	20.1	15.5	18.8	92	85	21.9
Mean/Total	1016.4	21.7	19.3	17.3	15.7	81	80	48
Normal*	1016	21.4	19.1	17.2	15.7	82	79	82.2

Date MARCH	Number of hours of Reduced Visibility# (hours)	Total Bright Sunshine (hours)	Daily Global Solar Radiation (MJ/m^2)	Total Evaporation (mm)	Prevailing Wind Direction (degrees)	Mean Wind Speed (km/h)
1	7	4.2	13.79	4.1	20	11.3
2	0	10.6	21.54	3.9	10	25.5
3	0	7.6	18.13	3	80	32.8
4	0	6.5	16.28	2.7	50	23.4
5	0	1.9	11.11	1.4	40	15.9
6	1	2.1	10.67	3.1	80	17.3
7	4	2.9	10.93	2.4	80	37.8
8	2	-	3.64	1.2	70	28.5
9	2	0.8	6.43	1.3	70	35.2
10	2	0.8	6.32	1	50	24.3
11	0	-	4.57	1	60	31.7
12	0	-	7.05	0.9	50	27
13	2	2.1	11.59	1.7	40	11.9
14	1	-	3.23	1.6	80	31
15	0	1.4	10.11	2.1	80	44.4
16	0	0.5	8.71	1.5	70	30.9
17	0	1	8.55	1.4	60	34.4
18	2	-	6.93	0.7	60	29
19	5	-	3.2	1.2	50	28.5
20	2	8.5	22.04	2.9	60	16.4
21	7	10.4	22.78	4.4	70	19.5
22	1	-	3.91	1.2	80	34.3
23	6	4	14.57	2.7	50	16.3
24	0	3.4	14.94	2.4	50	28.5
25	2	0.9	6.92	2.5	20	23.1
26	0	0.1	4.77	2.4	10	31.6
27	0	4.3	16.35	3.2	60	30.1
28	0	9.4	22.12	2.8	60	27.6
29	1	0.7	8.68	1.7	60	27.7
30	3	0.4	8.71	1.7	50	22.5
31	0	0.7	3.34	3.2	10	23.9
Mean/Total	50	85.2	10.71	67.3	60	26.5
Normal*	115.3§	90.8	9.96	70.5	60	23
Station	Hong Kong International Airport	King's Park			Waglan Island	

Appendix K
Calibration Certificate

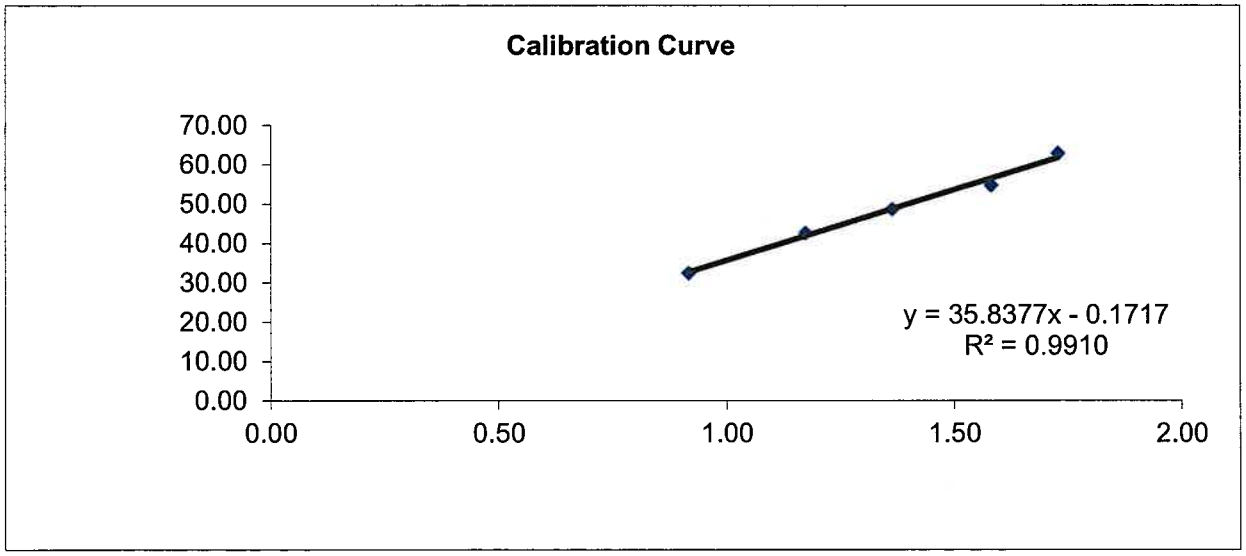
Ove Arup Partners (Hong Kong) Limited

High Volume Air Sampler Calibration Worksheet

Calibration date	3-Mar-17	**Barometric pressure**	762.81 mm Hg
Next Calibration date	30-Aug-17	**Tempature (°C)**	17.4 °C
Sampler location	AM14 - Yaumati Catholic Primary School, Rooftop	**Tempature (K)**	290.4 K
Sampler model	TE-5170	**P_{std}**	760 mm Hg
Sampler serial number	407	**T_{std}**	298 K

Calibrator model	GMW-2535
Calibrator serial number	2421
Slope of the standard curve, m_s	2.00576
Intercept of the standard curve, b_s	0.00519

Resistance Plate No.	Manometer Reading (inch H_2O)	Flow Recorder Reading (CFM)	Calculated Q_{std} (m^3/min)	Continuous Flow Recorder Reading IC (CFM)
5	3.30	32.00	0.92	32.48
7	5.40	42.00	1.17	42.62
10	7.30	48.00	1.36	48.71
13	9.80	54.00	1.58	54.80
18	11.70	62.00	1.73	62.92



Linear Regression

Sampler slope (m) :	**35.8377**
Sampler intercept (b) :	**-0.1717**
Correlation coefficient (R^2) :	**0.9910**

Correlation coefficient is greater than 0.9900 and the calibration result is accepted.

Performed by:		Date:	3 Mar 2017
Checked by:		Date:	3 Mar 2017
Approved by:		Date:	3 Mar 2017

綜合試驗有限公司
SOILS & MATERIALS ENGINEERING CO., LTD.
香港黃竹坑道37號利達中心12樓
12/F., Leader Centre, 37 Wong Chuk Hang Road, Aberdeen, Hong Kong.
E-mail: smec@cigismec.com Website: www.cigismec.com
Tel: (852) 2873 6860
Fax: (852) 2555 7533

CERTIFICATE OF CALIBRATION

Certificate No.: 17CA0228 05 Page 1 of 2

Item tested

Description:	Sound Level Meter (Type 1)	Microphone	Preamp
Manufacturer:	B & K	B & K	B & K
Type/Model No.:	2250-L	4950	ZC0032
Serial/Equipment No.:	2701826	2698648	13409
Adaptors used:	-	-	-

Item submitted by

Customer Name: Anewr Consulting Limited
Address of Customer: Unit 517, 5/F Tower A, Regent Centre, 63 Wo Yip Hop Road, Kwai Chung
Request No.: -
Date of receipt: 28-Feb-2017

Date of test: 07-Mar-2017

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: 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 ±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 responsess 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: 08-Mar-2017 Company Chop:

SOILS & MATERIALS ENGINEERING COMPANY LTD. 綜合試驗有限公司

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.

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SOILS & MATERIALS ENGINEERING CO., LTD.
香港黃竹坑道37號利達中心12樓
12/F., Leader Centre, 37 Wong Chuk Hang Road, Aberdeen, Hong Kong.
E-mail: smec@cigismec.com Website: www.cigismec.com
Tel: (852) 2873 6860
Fax: (852) 2555 7533

CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.: 17CA0228 05 Page 2 of 2

1, Electrical Tests

The electrical tests were perfomed 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	0.8	
	Lin	Pass	1.6	
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	A	Pass	0.3	
	C	Pass	0.3	
	Lin	Pass	0.3	
Time weightings	Single Burst Fast	Pass	0.3	
	Single Burst Slow	Pass	0.3	
Peak response	Single 100μs rectangular pulse	Pass	0.3	
R.M.S. accuracy	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: Fung Chi Yip Date: 07-Mar-2017

Checked by: Lam Tze Wai Date: 08-Mar-2017

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

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SOILS & MATERIALS ENGINEERING CO., LTD.
香港黃竹坑道37號利達中心12樓
12/F., Leader Centre, 37 Wong Chuk Hang Road, Aberdeen, Hong Kong.
E-mail: smec@cigismec.com Website: www.cigismec.com
Tel: (852) 2873 6860
Fax: (852) 2555 7533

SMECLab

Sound level meter type:	2250-L	Serial No.	2701826	Date	07-Mar-2017
Microphone type:	4950	Serial No.	2698648		
Preamp type:	ZC0032	Serial No.	13409	Report:	17CA0228 05

SELF GENERATED NOISE TEST

The noise test is performed in the most sensitive range of the SLM with the microphone replaced by an equivalent impedance.

Noise level in A weighting	14.4	dB
Noise level in C weighting	16.1	dB
Noise level in Lin	22.3	dB

LINEARITY TEST

The linearity is tested relative to the reference sound pressure level using a continuous sinusoidal signal of frequency 4 kHz. The measurement is made on the reference range for indications at 5 dB intervals starting from the 94 dB reference sound pressure level. And until within 5 dB of the upper and lower limits of the reference range, the measurements shall be made at 1 dB intervals.(SLM set to LEQ/SPL)

Reference/Expected level	Actual level		Tolerance	Deviation	
	non-integrated	integrated		non-integrated	integrated
dB	dB	dB	+/- dB	dB	dB
94.0	94.0	94.0	0.7	0.0	0.0
99.0	99.0	99.0	0.7	0.0	0.0
104.0	104.0	104.0	0.7	0.0	0.0
109.0	109.0	109.0	0.7	0.0	0.0
114.0	114.0	114.0	0.7	0.0	0.0
119.0	119.0	119.0	0.7	0.0	0.0
124.0	124.0	124.0	0.7	0.0	0.0
129.0	129.0	129.0	0.7	0.0	0.0
134.0	134.0	134.0	0.7	0.0	0.0
135.0	135.0	135.0	0.7	0.0	0.0
136.0	136.0	136.0	0.7	0.0	0.0
137.0	137.0	137.0	0.7	0.0	0.0
138.0	138.0	138.0	0.7	0.0	0.0
139.0	139.0	139.0	0.7	0.0	0.0
140.0	140.0	140.0	0.7	0.0	0.0
89.0	89.0	89.0	0.7	0.0	0.0
84.0	84.0	84.0	0.7	0.0	0.0
79.0	79.0	79.0	0.7	0.0	0.0
74.0	74.0	74.0	0.7	0.0	0.0
69.0	69.0	69.0	0.7	0.0	0.0
64.0	64.0	64.0	0.7	0.0	0.0
59.0	59.0	59.0	0.7	0.0	0.0
54.0	54.0	54.0	0.7	0.0	0.0
49.0	49.0	49.0	0.7	0.0	0.0
44.0	44.0	44.0	0.7	0.0	0.0
39.0	39.0	39.0	0.7	0.0	0.0

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SOILS & MATERIALS ENGINEERING CO., LTD.
香港黃竹坑道37號利達中心12樓
12/F., Leader Centre, 37 Wong Chuk Hang Road, Aberdeen, Hong Kong.
E-mail: smec@cigismec.com Website: www.cigismec.com
Tel: (852) 2873 6860
Fax: (852) 2555 7533

SMECLab

Sound level meter type:	2250-L	Serial No.	2701826	Date	07-Mar-2017
Microphone type:	4950	Serial No.	2698648		
Preamp type:	ZC0032	Serial No.	13409	Report:	17CA0228 05

34.0	34.0	34.0	0.7	0.0	0.0
33.0	33.0	33.0	0.7	0.0	0.0
32.0	32.0	32.0	0.7	0.0	0.0
31.0	31.0	31.0	0.7	0.0	0.0
30.0	30.0	30.0	0.7	0.0	0.0

Measurements for an indication of the reference SPL on all other ranges which include it

Other ranges	Expected level	Actual level	Tolerance	Deviation
dB	dB	dB	+/- dB	dB
20-140	94.0	94.0	0.7	0.0

Measurements on all level ranges for indications 2 dB below the upper limit and 2 dB above the lower limit

Ranges	Reference/Expected level	Actual level	Tolerance	Deviation
dB	dB	dB	+/- dB	dB
20-140	30.0	30.0	0.7	0.0
	138.0	138.0	0.7	0.0

FREQUENCY WEIGHTING TEST

The frequency response of the weighting netwoks are tested at octave intervals over the frequency ranges 31.5 Hz to 12500 Hz. The signal level at 1000 Hz is set to give an indication of the reference SPL.

Frequency weighting A:

Frequency	Ref. level	Expected level	Correction of electrical response	Actual level	Tolerance(dB)		Deviation *
Hz	dB	dB	dB	dB	+	-	dB
1000.0	94.0	94.0	0.0	94.0	0.0	0.0	0.0
31.6	94.0	54.6	N/A	54.6	1.5	1.5	0.0
63.1	94.0	67.8	0.0	67.8	1.5	1.5	0.0
125.9	94.0	77.9	0.0	77.9	1.0	1.0	0.0
251.2	94.0	85.4	0.0	85.4	1.0	1.0	0.0
501.2	94.0	90.8	0.0	90.8	1.0	1.0	0.0
1995.0	94.0	95.2	0.0	95.2	1.0	1.0	0.0
3981.0	94.0	95.0	-0.1	94.9	1.0	1.0	0.0
7943.0	94.0	92.9	-0.3	92.6	1.5	3.0	0.0
12590.0	94.0	89.7	-0.3	89.4	3.0	6.0	0.0

Frequency weighting C:

Frequency	Ref. level	Expected level	Correction of electrical response	Actual level	Tolerance(dB)		Deviation *
Hz	dB	dB	dB	dB	+	-	dB
1000.0	94.0	94.0	0.0	94.0	0.0	0.0	0.0
31.6	94.0	91.0	N/A	91.1	1.5	1.5	0.1
63.1	94.0	93.2	0.0	93.2	1.5	1.5	0.0
125.9	94.0	93.8	0.0	93.8	1.0	1.0	0.0
251.2	94.0	94.0	0.0	94.0	1.0	1.0	0.0

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香港黃竹坑黃竹坑道37號利達中心19樓
12/F., Leader Centre, 37 Wong Chuk Hang Road, Aberdeen, Hong Kong.
E-mail: smec@cigismec.com Website: www.cigismec.com
Tel: (852) 2873 6860
Fax: (852) 2555 7533

SMECLab

Sound level meter type: 2250-L Serial No. 2701826 Date 07-Mar-2017
Microphone type: 4950 Serial No. 2698648
Preamp type: ZC0032 Serial No. 13409 Report: 17CA0228 05

501.2	94.0	94.0	0.0	94.0	1.0	1.0	0.0
1995.0	94.0	93.8	0.0	93.8	1.0	1.0	0.0
3981.0	94.0	93.2	-0.1	93.1	1.0	1.0	0.0
7943.0	94.0	91.0	-0.3	90.7	1.5	3.0	0.0
12590.0	94.0	87.8	-0.3	87.5	3.0	6.0	0.0

Frequency weighting Lin:

Frequency	Ref. level	Expected level	Correction of electrical response	Actual level	Tolerance(dB)		Deviation *
Hz	dB	dB	dB	dB	+	-	dB
1000.0	94.0	94.0	0.0	94.0	0.0	0.0	0.0
31.6	94.0	94.0	N/A	94.1	1.5	1.5	0.1
63.1	94.0	94.0	0.0	94.0	1.5	1.5	0.0
125.9	94.0	94.0	0.0	94.0	1.0	1.0	0.0
251.2	94.0	94.0	0.0	94.0	1.0	1.0	0.0
501.2	94.0	94.0	0.0	94.0	1.0	1.0	0.0
1995.0	94.0	94.0	0.0	94.0	1.0	1.0	0.0
3981.0	94.0	94.0	-0.1	94.0	1.0	1.0	0.1
7943.0	94.0	94.0	-0.3	93.7	1.5	3.0	0.0
12590.0	94.0	94.0	-0.3	93.7	3.0	6.0	0.0

*Deviation = Actual level - (Expected level + Correction of electrical response)
The correction of electrical response is specified in the Table A.2 of technical documentation of BE 1853-11. The maximum expanded uncertainty of correction of electrical response is 0.3 dB.

TIME WEIGHTING FAST TEST

Time weighting F is tested on the reference range with a single sinusoidal burst of duration 200 ms at a frequency 2000 Hz and an amplitude which produces an indication 4 dB below the upper limit of the primary indicator range when the signal is continuous. (Weight A, Maximum hold)

Ref. level	Expected level	Actual level	Tolerance(dB)		Deviation
dB	dB	dB	+	-	dB
116.0	115.0	115.0	1.0	1.0	0.0

TIME WEIGHTING SLOW TEST

Time weighting S is tested on the reference range with a single sinusoidal burst of duration 500 ms at a frequency 2000 Hz and an amplitude which produces an indication 4 dB oelow the upper limit of the primary indicator range when the signal is continuous. (Weight A, Maximum hold)

Ref. level	Expected level	Actual level	Tolerance(dB)		Deviation
dB	dB	dB	+	-	dB
116.0	111.9	111.9	1.0	1.0	0.0

PEAK RESPONSE TEST

The onset time of the peak detector is tested on the reference range by comparing the response to a 100 us rectangular test pulse with the response to a 10 ms reference pulse of the same amplitude. The amplitude of the 10 ms reference pulse is such as to produce an indication 1 dB below the upper limit of the primary indicator range

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香港黃竹坑道37號利達中心12樓
12/F., Leader Centre, 37 Wong Chuk Hang Road, Aberdeen, Hong Kong.
E-mail: smec@cigismec.com Website: www.cigismec.com
Tel: (852) 2873 6860
Fax: (852) 2555 7533

SMECLab

Sound level meter type:	2250-L	Serial No.	2701826	Date	07-Mar-2017
Microphone type:	4950	Serial No.	2698648		
Preamp type:	ZC0032	Serial No.	13409	Report:	17CA0228 05

Positive polarities: (Weighting L, set the generator signal to single, LLPeak)

Ref. level	Response to 10 ms	Response to 100 us	Tolerance	Deviation
dB	dB	dB	+/- dB	dB
119.0	119.0	118.9	2.0	-0.1

Negative polarities:

Ref. level	Response to 10 ms	Response to 100 us	Tolerance	Deviation
dB	dB	dB	+/- dB	dB
119.0	119.0	119.2	2.0	0.2

RMS ACCURACY TEST

The RMS detector accuracy is tested on the reference range for a crest factor of 3.

Test frequency: 2000 Hz
Amplitude: 2 dB below the upper limit of the primary indicator range.
Burst repetition frequency: 40 Hz
Tone burst signal: 11 cycles of a sine wave of frequency 2000 Hz. (Set to INT)

	Ref. Level	Expected level	Tone burst signal	Tolerance	Deviation
Time wighting	dB	dB	indication(dB)	+/- dB	dB
Slow	118.0+6.6	118.0	118.0	0.5	0.0

TIME WEIGHTING IMPULSE TEST

Time weighting I is tested on the reference range (Set the SLM to LAImax)
Test frequency: 2000 Hz
Amplitude: The upper limit of the primary indicator range.

Single sinusoidal burst of duration 5 ms:

Ref. Level	Single burst indication		Tolerance	Deviation
dB	Expected (dB)	Actual (dB)	+/- dB	dB
120.0	111.2	111.1	2.0	-0.1

Repeated at 100 Hz

Ref. Level	Repeated burst indication		Tolerance	Deviation
dB	Expected (dB)	Actual (dB)	+/- dB	dB
120.0	117.3	117.2	1.0	-0.1

TIME AVERAGING TEST

This test compares the SLM reading for continuous sine signals with readings obtained from a sine tone burst sequence having the same RMS level. The test level is 30 dB below the upper limit of the linearity range and repeated for Type 1 SLM with 40 dB below the upper limit of the lincarity.

Frequency of tone burst: 4000 Hz
Duration of tone burst: 1 ms

Repetition Time	Level of tone burst	Expected I eq	Actual Lec	Tolerance	Deviation	Remarks
msec	dB	dB	dB	+/- dB	dB	
1000	110.0	110.0	109.9	1.0	-0.1	60s integ.
10000	100.0	100.0	100.0	1.0	0.0	6min. integ.

PULSE RANGE AND SOUND EXPOSURE LEVEL TEST

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香港黃竹坑道37號利達中心12樓
12/F., Leader Centre, 37 Wong Chuk Hang Road, Aberdeen, Hong Kong.
E-mail: smec@cigismec.com Website: www.cigismec.com
Tel: (852) 2873 6860
Fax: (852) 2555 7535

SMECLab

Sound level meter	type:	2250-L	Serial No.	2701826	Date	07-Mar-2017
Microphone	type:	4950	Serial No.	2698648		
Preamp	type:	ZC0032	Serial No.	13409	Report:	17CA0228 05

The test tone burst signal is superimposed on a baseline signal corresponding to the lower limit of reference rar

Test frequency: 4000 Hz

Integration time: 10 sec

The integrating sound level meter set to Leq:

Duration	Rms level of	Expected	Actual	Tolerance	Deviation
msec	tone burst (dB)	dB	dB	+/- dB	dB
10	88.0	58.0	58.0	1.7	0.0

The integrating sound level meter set to SEL:

Duration	Rms level of	Expected	Actual	Tolerance	Deviation
msec	tone burst (dB)	dB	dB	+/- dB	dB
10.0	88.0	68.0	68.0	1.7	0.0

OVERLOAD INDICATION TEST

For SLM capable of operating in a non-integrating mode.

Test frequency: 2000 Hz

Amplitude: 2 dB below the upper limit of the primary indicator range.

Burst repetition frequency: 40 Hz

Tone burst signal: 11 cycles of a sine wave of frequency 2000 Hz.

Level	Level reduced by	Further reduced	Difference	Tolerance	Deviation
at overload (dB)	1 dB	3 dB	dB	dB	dB
136.7	135.7	132.7	3.0	1.0	0.0

For integrating SLM, with the instrument indicating Leq.

For integrating SLM, with the instrument indicating Leq and set to the reference range. The test signal as follow
The test tone burst signal is superimposed on a baseline signal corresponding to the lower limit of reference rar

Test frequency: 4000 Hz

Integration time: 10 sec

Single burst duration: 1 msec

Rms level	Level reduced by	Expected level	Actual level	Tolerance	Deviation
at overload (dB)	1 dB	dB	dB	dB	dB
143.4	142.4	102.4	102.3	2.2	-0.1

ACOUSTIC TEST

The acoustic test of the complete SLM is tested at the frequency 125 Hz and 8000 Hz using a B&K type 4226 Multifunction Acoustic Calibrator. The test is performed in A weighting.

Frequency	Expected level	Actual level	Tolerance (dB)		Deviation
Hz	dB	Measured (dB)	+	-	dB
1000	94.0	94.0	0.0	0.0	0.0
125	77.9	77.9	1.0	1.0	0.0
8000	92.9	92.9	1.5	3.0	0.0

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

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SOILS & MATERIALS ENGINEERING CO., LTD.
香港黃竹坑道37號利達中心12樓
12/F., Leader Centre, 37 Wong Chuk Hang Road, Aberdeen, Hong Kong.
E-mail: smec@cigismec.com Website: www.cigismec.com
Tel: (852) 2873 6860
Fax: (852) 2555 7533

HOKLAS 028 CAL

CERTIFICATE OF CALIBRATION

Certificate No.: 17CA0303 02-03 **Page** 1 **of** 2

Item tested

Description:	Sound Level Meter (Type 1)	Microphone	Preamp
Manufacturer:	B & K	B & K	B & K
Type/Model No.:	2250-L	4950	ZC0032
Serial/Equipment No.:	2709426	2678188	12906
Adaptors used:	-	-	-

Item submitted by

Customer Name: Anewr Consulting Limited
Address of Customer: Unit 517, 5/F Tower A, Regent Centre, 63 Wo Yip Hop Road, Kwai Chung
Request No.: -
Date of receipt: 03-Mar-2017

Date of test: 08-Mar-2017

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: 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 ±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 responsess 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-Mar-2017 **Company Chop:** SOILS AND MATERIALS ENGINEERING COMPANY LTD. 綜合試驗有限公司

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.

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SOILS & MATERIALS ENGINEERING CO., LTD.
香港黃竹坑道37號利達中心12樓
12/F., Leader Centre, 37 Wong Chuk Hang Road, Aberdeen, Hong Kong.
E-mail: smec@cigismec.com Website: www.cigismec.com
Tel: (852) 2873 6860
Fax: (852) 2555 7533

HOKLAS 028 CAL

CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.: 17CA0303 02-03 **Page** 2 - **of** 2

1, Electrical Tests

The electrical tests were perfomed 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	0.8	
	Lin	Pass	1.6	
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	A	Pass	0.3	
	C	Pass	0.3	
	Lin	Pass	0.3	
Time weightings	Single Burst Fast	Pass	0.3	
	Single Burst Slow	Pass	0.3	
Peak response	Single 100μs rectangular pulse	Pass	0.3	
R.M.S. accuracy	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: Fung Chi Yip **Date:** 08-Mar-2017

Checked by: Lam Tze Wai **Date:** 09-Mar-2017

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.

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Hong Kong Accreditation Service (HKAS) has accredited this laboratory (Reg. No. 028 - CAL) under the Hong Kong Laboratory Accreditation Scheme (HOKLAS) for specific calibration activities as listed in the HOKLAS Directory of Accredited Laboratories. The results shown in this certificate were determined by this laboratory in accordance with its terms of accreditation. Such terms of accreditation stipulate that the results shall be traceable to the International System of Units (S.I.) or recognised measurement standards. This certificate shall not be reproduced except in full.

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SOILS & MATERIALS ENGINEERING CO., LTD.
香港黃竹坑道37號利達中心12樓
12/F., Leader Centre, 37 Wong Chuk Hang Road, Aberdeen, Hong Kong.
E-mail: smec@cigismec.com Website: www.cigismec.com
Tel: (852) 2873 6860
Fax: (852) 2555 7533

SMECLab

Sound level meter type:	2250-L	Serial No.	2709426	Date	08-Mar-2017
Microphone type:	4950	Serial No.	2678188		
Preamp type:	ZC0032	Serial No.	12906	Report:	17CA0303 02-03

SELF GENERATED NOISE TEST

The noise test is performed in the most sensitive range of the SLM with the microphone replaced by an equivalent impedance.

Noise level in A weighting	14.7	dB
Noise level in C weighting	17.0	dB
Noise level in Lin	23.1	dB

LINEARITY TEST

The linearity is tested relative to the reference sound pressure level using a continuous sinusoidal signal of frequency 4 kHz. The measurement is made on the reference range for indications at 5 dB intervals starting from the 94 dB reference sound pressure level. And until within 5 dB of the upper and lower limits of the reference range, the measurements shall be made at 1 dB intervals.(SLM set to LEQ/SPL)

Reference/Expected level	Actual level		Tolerance	Deviation	
	non-integrated	integrated		non-integrated	integrated
dB	dB	dB	+/- dB	dB	dB
94.0	94.0	94.0	0.7	0.0	0.0
99.0	99.0	99.0	0.7	0.0	0.0
104.0	104.0	104.0	0.7	0.0	0.0
109.0	109.0	109.0	0.7	0.0	0.0
114.0	114.0	114.0	0.7	0.0	0.0
119.0	119.0	119.0	0.7	0.0	0.0
124.0	124.0	124.0	0.7	0.0	0.0
129.0	129.0	129.0	0.7	0.0	0.0
134.0	134.0	134.0	0.7	0.0	0.0
135.0	135.0	135.0	0.7	0.0	0.0
136.0	136.0	136.0	0.7	0.0	0.0
137.0	137.0	137.0	0.7	0.0	0.0
138.0	138.0	138.0	0.7	0.0	0.0
139.0	139.0	139.0	0.7	0.0	0.0
140.0	140.0	140.0	0.7	0.0	0.0
89.0	89.0	89.0	0.7	0.0	0.0
84.0	84.0	84.0	0.7	0.0	0.0
79.0	79.0	79.0	0.7	0.0	0.0
74.0	74.0	74.0	0.7	0.0	0.0
69.0	69.0	69.0	0.7	0.0	0.0
64.0	64.0	64.0	0.7	0.0	0.0
59.0	59.0	59.0	0.7	0.0	0.0
54.0	54.0	54.0	0.7	0.0	0.0
49.0	49.0	49.0	0.7	0.0	0.0
44.0	44.0	44.0	0.7	0.0	0.0
39.0	39.0	39.0	0.7	0.0	0.0

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香港黃竹坑道37號利達中心12樓
12/F., Leader Centre, 37 Wong Chuk Hang Road, Aberdeen, Hong Kong.
E-mail: smec@cigismec.com Website: www.cigismec.com
Tel: (852) 2873 6860
Fax: (852) 2555 7533

SMECLab

Sound level meter type: 2250-L Serial No. 2709426 Date 08-Mar-2017

Microphone type: 4950 Serial No. 2678188

Preamp type: ZC0032 Serial No. 12906 Report: 17CA0303 02-03

34.0	34.1	34.1	0.7	0.1	0.1
33.0	33.0	33.0	0.7	0.0	0.0
32.0	32.1	32.0	0.7	0.1	0.0
31.0	31.1	31.1	0.7	0.1	0.1
30.0	30.0	30.0	0.7	0.0	0.0

Measurements for an indication of the reference SPL on all other ranges which include it

Other ranges	Expected level	Actual level	Tolerance	Deviation
dB	dB	dB	+/- dB	dB
20-140	94.0	94.0	0.7	0.0

Measurements on all level ranges for indications 2 dB below the upper limit and 2 dB above the lower limit

Ranges	Reference/Expected level	Actual level	Tolerance	Deviation
dB	dB	dB	+/- dB	dB
20-140	30.0	30.0	0.7	0.0
	138.0	138.0	0.7	0.0

FREQUENCY WEIGHTING TEST

The frequency response of the weighting netwoks are tested at octave intervals over the frequency ranges 31.5 Hz to 12500 Hz. The signal level at 1000 Hz is set to give an indication of the reference SPL.

Frequency weighting A:

Frequency	Ref. level	Expected level	Correction of electrical response	Actual level	Tolerance(dB)		Deviation *
Hz	dB	dB	dB	dB	+	-	dB
1000.0	94.0	94.0	0.0	94.0	0.0	0.0	0.0
31.6	94.0	54.6	N/A	54.6	1.5	1.5	0.0
63.1	94.0	67.8	0.0	67.8	1.5	1.5	0.0
125.9	94.0	77.9	0.0	77.9	1.0	1.0	0.0
251.2	94.0	85.4	0.0	85.4	1.0	1.0	0.0
501.2	94.0	90.8	0.0	90.8	1.0	1.0	0.0
1995.0	94.0	95.2	0.0	95.2	1.0	1.0	0.0
3981.0	94.0	95.0	-0.1	94.9	1.0	1.0	0.0
7943.0	94.0	92.9	-0.3	92.6	1.5	3.0	0.0
12590.0	94.0	89.7	-0.3	89.4	3.0	6.0	0.0

Frequency weighting C:

Frequency	Ref. level	Expected level	Correction of electrical response	Actual level	Tolerance(dB)		Deviation *
Hz	dB	dB	dB	dB	+	-	dB
1000.0	94.0	94.0	0.0	94.0	0.0	0.0	0.0
31.6	94.0	91.0	N/A	91.1	1.5	1.5	0.1
63.1	94.0	93.2	0.0	93.2	1.5	1.5	0.0
125.9	94.0	93.8	0.0	93.8	1.0	1.0	0.0
251.2	94.0	94.0	0.0	94.0	1.0	1.0	0.0

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香港黃竹坑道37號利達中心12樓
12/F., Leader Centre, 37 Wong Chuk Hang Road, Aberdeen, Hong Kong.
E-mail: smec@cigismec.com Website: www.cigismec.com
Tel: (852) 2873 6860
Fax: (852) 2555 7533

SMECLab

Sound level meter type: 2250-L Serial No. 2709426 Date 08-Mar-2017

Microphone type: 4950 Serial No. 2678188

Preamp type: ZC0032 Serial No. 12906 Report: 17CA0303 02-03

501.2	94.0	94.0	0.0	94.0	1.0	1.0	0.0
1995.0	94.0	93.8	0.0	93.8	1.0	1.0	0.0
3981.0	94.0	93.2	-0.1	93.1	1.0	1.0	0.0
7943.0	94.0	91.0	-0.3	90.7	1.5	3.0	0.0
12590.0	94.0	87.8	-0.3	87.5	3.0	6.0	0.0

Frequency weighting Lin:

Frequency	Ref. level	Expected level	Correction of electrical response	Actual level	Tolerance(dB)		Deviation *
Hz	dB	dB	dB	dB	+	-	dB
1000.0	94.0	94.0	0.0	94.0	0.0	0.0	0.0
31.6	94.0	94.0	N/A	94.1	1.5	1.5	0.1
63.1	94.0	94.0	0.0	94.0	1.5	1.5	0.0
125.9	94.0	94.0	0.0	94.0	1.0	1.0	0.0
251.2	94.0	94.0	0.0	94.0	1.0	1.0	0.0
501.2	94.0	94.0	0.0	94.0	1.0	1.0	0.0
1995.0	94.0	94.0	0.0	94.0	1.0	1.0	0.0
3981.0	94.0	94.0	-0.1	93.9	1.0	1.0	0.0
7943.0	94.0	94.0	-0.3	93.7	1.5	3.0	0.0
12590.0	94.0	94.0	-0.3	93.7	3.0	6.0	0.0

*Deviation = Actual level - (Expected level + Correction of electrical response)

The correction of electrical response is specified in the Table A.2 of technical documentation of BE 1853-11. The maximum expanded uncertainty of correction of electrical response is 0.3 dB.

TIME WEIGHTING FAST TEST

Time weighting F is tested on the reference range with a single sinusoidal burst of duration 200 ms at a frequency 2000 Hz and an amplitude which produces an indication 4 dB below the upper limit of the primary indicator range when the signal is continuous. (Weight A, Maximum hold)

Ref. level	Expected level	Actual level	Tolerance(dB)		Deviation
dB	dB	dB	+	-	dB
116.0	115.0	115.0	1.0	1.0	0.0

TIME WEIGHTING SLOW TEST

Time weighting S is tested on the reference range with a single sinusoidal burst of duration 500 ms at a frequency 2000 Hz and an amplitude which produces an indication 4 dB below the upper limit of the primary indicator range when the signal is continuous. (Weight A, Maximum hold)

Ref. level	Expected level	Actual level	Tolerance(dB)		Deviation
dB	dB	dB	+	-	dB
116.0	111.9	111.9	1.0	1.0	0.0

PEAK RESPONSE TEST

The onset time of the peak detector is tested on the reference range by comparing the response to a 100 us rectangular test pulse with the response to a 10 ms reference pulse of the same amplitude. The amplitude of the 10 ms reference pulse is such as to produce an indication 1 dB below the upper limit of the primary indicator range.

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香港黃竹坑道37號利達中心12樓
12/F., Leader Centre, 37 Wong Chuk Hang Road, Aberdeen, Hong Kong.
E-mail: smec@cigismec.com Website: www.cigismec.com
Tel: (852) 2873 6860
Fax: (852) 2555 7533

SMECLab

Sound level meter type: 2250-L Serial No. 2709426 Date 08-Mar-2017

Microphone type: 4950 Serial No. 2678188

Preamp type: ZC0032 Serial No. 12906 Report: 17CA0303 02-03

Positive polarities: (Weighting L, set the generator signal to single, LLPeak)

Ref. level	Response to 10 ms	Response to 100 us	Tolerance	Deviation
dB	dB	dB	+/- dB	dB
119.0	119.0	119.0	2.0	0.0

Negative polarities:

Ref. level	Response to 10 ms	Response to 100 us	Tolerance	Deviation
dB	dB	dB	+/- dB	dB
119.0	119.0	119.1	2.0	0.1

RMS ACCURACY TEST

The RMS detector accuracy is tested on the reference range for a crest factor of 3.

Test frequency: 2000 Hz
Amplitude: 2 dB below the upper limit of the primary indicator range.
Burst repetition frequency: 40 Hz
Tone burst signal: 11 cycles of a sine wave of frequency 2000 Hz. (Set to INT)

	Ref. Level	Expected level	Tone burst signal	Tolerance	Deviation
Time wighting	dB	dB	indication(dB)	+/- dB	dB
Slow	118.0+6.6	118.0	118.0	0.5	0.0

TIME WEIGHTING IMPULSE TEST

Time weighting I is tested on the reference range (Set the SLM to LAImax)

Test frequency: 2000 Hz
Amplitude: The upper limit of the primary indicator range.

Single sinusoidal burst of duration 5 ms:

Ref. Level	Single burst indication		Tolerance	Deviation
dB	Expected (dB)	Actual (dB)	+/- dB	dB
120.0	111.2	111.1	2.0	-0.1

Repeated at 100 Hz

Ref. Level	Repeated burst indication		Tolerance	Deviation
dB	Expected (dB)	Actual (dB)	+/- dB	dB
120.0	117.3	117.2	1.0	-0.1

TIME AVERAGING TEST

This test compares the SLM reading for continuous sine signals with readings obtained from a sine tone burst sequence having the same RMS level. The test level is 30 dB below the upper limit of the linearity range and repeated for Type 1 SLM with 40 dB below the upper limit of the linearity.

Frequency of tone burst: 4000 Hz

Duration of tone burst: 1 ms

Repetition Time	Level of tone burst	Expected Leq	Actual Leq	Tolerance	Deviation	Remarks
msec	dB	dB	dB	+/- dB	dB	
1000	110.0	110.0	109.9	1.0	-0.1	60s integ.
10000	100.0	100.0	99.9	1.0	-0.1	6min. integ.

PULSE RANGE AND SOUND EXPOSURE LEVEL TEST

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12/F., Leader Centre, 37 Wong Chuk Hang Road, Aberdeen, Hong Kong.
E-mail: smec@cigismec.com Website: www.cigismec.com
Tel: (852) 2873 6860
Fax: (852) 2555 7533

SMECLab

Sound level meter type:	2250-L	Serial No.	2709426	Date	08-Mar-2017
Microphone type:	4950	Serial No.	2678188		
Preamp type:	ZC0032	Serial No.	12906	Report:	17CA0303 02-03

The test tone burst signal is superimposed on a baseline signal corresponding to the lower limit of reference rar

Test frequency: 4000 Hz

Integration time: 10 sec

The integrating sound level meter set to Leq:

Duration	Rms level of	Expected	Actual	Tolerance	Deviation
msec	tone burst (dB)	dB	dB	+/- dB	dB
10	88.0	58.0	57.9	1.7	-0.1

The integrating sound level meter set to SEL:

Duration	Rms level of	Expected	Actual	Tolerance	Deviation
msec	tone burst (dB)	dB	dB	+/- dB	dB
10.0	88.0	68.0	68.0	1.7	0.0

OVERLOAD INDICATION TEST

For SLM capable of operating in a non-integrating mode.

Test frequency: 2000 Hz

Amplitude: 2 dB below the upper limit of the primary indicator range.

Burst repetition frequency: 40 Hz

Tone burst signal: 11 cycles of a sine wave of frequency 2000 Hz.

Level	Level reduced by	Further reduced	Difference	Tolerance	Deviation
at overload (dB)	1 dB	3 dB	dB	dB	dB
137.1	136.1	133.1	3.0	1.0	0.0

For integrating SLM, with the instrument indicating Leq.

For integrating SLM, with the instrument indicating Leq and set to the reference range. The test signal as follow

The test tone burst signal is superimposed on a baseline signal corresponding to the lower limit of reference rar

Test frequency: 4000 Hz

Integration time: 10 sec

Single burst duration: 1 msec

Rms level	Level reduced by	Expected level	Actual level	Tolerance	Deviation
at overload (dB)	1 dB	dB	dB	dB	dB
143.7	142.7	102.7	102.6	2.2	-0.1

ACOUSTIC TEST

The acoustic test of the complete SLM is tested at the frequency 125 Hz and 8000 Hz using a B&K type 4226 Multifunction Acoustic Calibrator. The test is performed in A weighting.

Frequency	Expected level	Actual level	Tolerance (dB)		Deviation
Hz	dB	Measured (dB)	+	-	dB
1000	94.0	94.0	0.0	0.0	0.0
125	77.9	77.8	1.0	1.0	-0.1
8000	92.9	93.7	1.5	3.0	0.8

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

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香港黃竹坑道37號利達中心12樓
12/F., Leader Centre, 37 Wong Chuk Hang Road, Aberdeen, Hong Kong.
E-mail: smec@cigismec.com Website: www.cigismec.com
Tel: (852) 2873 6860
Fax: (852) 2555 7533

HOKLAS 028 CAL

CERTIFICATE OF CALIBRATION

Certificate No.: 17CA0303 02-02 **Page** 1 **of** 2

Item tested

Description:	Sound Level Meter (Type 1)	Microphone	Preamp
Manufacturer:	B & K	B & K	B & K
Type/Model No.:	2250-L	4950	ZC0032
Serial/Equipment No.:	2718887	2827126	13693
Adaptors used:	-	-	-

Item submitted by

Customer Name:	Anewr Consulting Limited
Address of Customer:	Unit 517, 5/F Tower A, Regent Centre, 63 Wo Yip Hop Road, Kwai Chung
Request No.:	-
Date of receipt:	03-Mar-2017

Date of test: 08-Mar-2017

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:	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 ±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 responsess 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-Mar-2017 **Company Chop:**

SOILS & MATERIALS ENGINEERING COMPANY LTD. 綜合試驗有限公司

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.

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SOILS & MATERIALS ENGINEERING CO., LTD.
香港黃竹坑道37號利達中心12樓
12/F., Leader Centre, 37 Wong Chuk Hang Road, Aberdeen, Hong Kong.
E-mail: smec@cigismec.com Website: www.cigismec.com
Tel: (852) 2873 6860
Fax: (852) 2555 7533

HOKLAS 028 CAL

CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.: 17CA0303 02-02 **Page** 2 **of** 2

1, Electrical Tests

The electrical tests were perfomed 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	0.8	
	Lin	Pass	1.6	
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	A	Pass	0.3	
	C	Pass	0.3	
	Lin	Pass	0.3	
Time weightings	Single Burst Fast	Pass	0.3	
	Single Burst Slow	Pass	0.3	
Peak response	Single 100μs rectangular pulse	Pass	0.3	
R.M.S. accuracy	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: Fung Chi Yip **Date:** 08-Mar-2017

Checked by: Lam Tze Wai **Date:** 09-Mar-2017

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.

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SOILS & MATERIALS ENGINEERING CO., LTD.
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12/F., Leader Centre, 37 Wong Chuk Hang Road, Aberdeen, Hong Kong.
E-mail: smec@cigismec.com Website: www.cigismec.com
Tel: (852) 2873 6860
Fax: (852) 2555 7533

SMECLab

Test Data for Sound Level Meter

Sound level meter type:	2250-L	Serial No.	2718887	Date	08-Mar-2017
Microphone type:	4950	Serial No.	2827126		
Preamp type:	ZC0032	Serial No.	13693	Report:	17CA0303 02-02

SELF GENERATED NOISE TEST

The noise test is performed in the most sensitive range of the SLM with the microphone replaced by an equivalent impedance.

Noise level in A weighting	13.5	dB
Noise level in C weighting	14.9	dB
Noise level in Lin	21.3	dB

LINEARITY TEST

The linearity is tested relative to the reference sound pressure level using a continuous sinusoidal signal of frequency 4 kHz. The measurement is made on the reference range for indications at 5 dB intervals starting from the 94 dB reference sound pressure level. And until within 5 dB of the upper and lower limits of the reference range, the measurements shall be made at 1 dB intervals.(SLM set to LEQ/SPL)

Reference/Expected level	Actual level		Tolerance	Deviation	
	non-integrated	integrated		non-integrated	integrated
dB	dB	dB	+/- dB	dB	dB
94.0	94.0	94.0	0.7	0.0	0.0
99.0	99.0	99.0	0.7	0.0	0.0
104.0	104.0	104.0	0.7	0.0	0.0
109.0	109.0	109.0	0.7	0.0	0.0
114.0	114.0	114.0	0.7	0.0	0.0
119.0	119.0	119.0	0.7	0.0	0.0
124.0	124.0	124.0	0.7	0.0	0.0
129.0	129.0	129.0	0.7	0.0	0.0
134.0	134.0	134.0	0.7	0.0	0.0
135.0	135.0	135.0	0.7	0.0	0.0
136.0	136.0	136.0	0.7	0.0	0.0
137.0	137.0	137.0	0.7	0.0	0.0
138.0	138.0	138.0	0.7	0.0	0.0
139.0	139.0	139.0	0.7	0.0	0.0
140.0	140.0	140.0	0.7	0.0	0.0
89.0	89.0	89.0	0.7	0.0	0.0
84.0	84.0	84.0	0.7	0.0	0.0
79.0	79.0	79.0	0.7	0.0	0.0
74.0	74.0	74.0	0.7	0.0	0.0
69.0	69.0	69.0	0.7	0.0	0.0
64.0	64.0	64.0	0.7	0.0	0.0
59.0	59.0	59.0	0.7	0.0	0.0
54.0	54.0	54.0	0.7	0.0	0.0
49.0	49.0	49.0	0.7	0.0	0.0
44.0	44.0	44.0	0.7	0.0	0.0
39.0	39.0	39.0	0.7	0.0	0.0

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香港黃竹坑道37號利達中心12樓
12/F., Leader Centre, 37 Wong Chuk Hang Road, Aberdeen, Hong Kong.
E-mail: smec@cigismec.com Website: www.cigismec.com
Tel: (852) 2873 6860
Fax: (852) 2555 7533

SMECLab

Test Data for Sound Level Meter

Sound level meter type: 2250-L Serial No. 2718887 Date 08-Mar-2017
Microphone type: 4950 Serial No. 2827126
Preamp type: ZC0032 Serial No. 13693 Report: 17CA0303 02-02

34.0	34.0	34.0	0.7	0.0	0.0
33.0	33.0	33.0	0.7	0.0	0.0
32.0	32.0	32.0	0.7	0.0	0.0
31.0	31.0	31.0	0.7	0.0	0.0
30.0	30.1	30.1	0.7	0.1	0.1

Measurements for an indication of the reference SPL on all other ranges which include it

Other ranges	Expected level	Actual level	Tolerance	Deviation
dB	dB	dB	+/- dB	dB
20-140	94.0	94.0	0.7	0.0

Measurements on all level ranges for indications 2 dB below the upper limit and 2 dB above the lower limit

Ranges	Reference/Expected level	Actual level	Tolerance	Deviation
dB	dB	dB	+/- dB	dB
20-140	30.0	30.1	0.7	0.1
	138.0	138.0	0.7	0.0

FREQUENCY WEIGHTING TEST

The frequency response of the weighting netwoks are tested at octave intervals over the frequency ranges 31.5 Hz to 12500 Hz. The signal level at 1000 Hz is set to give an indication of the reference SPL.

Frequency weighting A:

Frequency	Ref. level	Expected level	Correction of electrical response	Actual level	Tolerance(dB)		Deviation *
Hz	dB	dB	dB	dB	+	-	dB
1000.0	94.0	94.0	0.0	94.0	0.0	0.0	0.0
31.6	94.0	54.6	N/A	54.6	1.5	1.5	0.0
63.1	94.0	67.8	0.0	67.8	1.5	1.5	0.0
125.9	94.0	77.9	0.0	77.9	1.0	1.0	0.0
251.2	94.0	85.4	0.0	85.4	1.0	1.0	0.0
501.2	94.0	90.8	0.0	90.7	1.0	1.0	-0.1
1995.0	94.0	95.2	0.0	95.2	1.0	1.0	0.0
3981.0	94.0	95.0	-0.1	94.9	1.0	1.0	0.0
7943.0	94.0	92.9	-0.3	92.6	1.5	3.0	0.0
12590.0	94.0	89.7	-0.3	89.4	3.0	6.0	0.0

Frequency weighting C:

Frequency	Ref. level	Expected level	Correction of electrical response	Actual level	Tolerance(dB)		Deviation *
Hz	dB	dB	dB	dB	+	-	dB
1000.0	94.0	94.0	0.0	94.0	0.0	0.0	0.0
31.6	94.0	91.0	N/A	91.1	1.5	1.5	0.1
63.1	94.0	93.2	0.0	93.2	1.5	1.5	0.0
125.9	94.0	93.8	0.0	93.8	1.0	1.0	0.0
251.2	94.0	94.0	0.0	94.0	1.0	1.0	0.0

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香港黃竹坑道37號利達中心12樓
12/F., Leader Centre, 37 Wong Chuk Hang Road, Aberdeen, Hong Kong.
E-mail: smec@cigismec.com Website: www.cigismec.com
Tel: (852) 2873 6860
Fax: (852) 2555 7533

SMECLab

Test Data for Sound Level Meter

Sound level meter type: 2250-L Serial No. 2718887 Date 08-Mar-2017
Microphone type: 4950 Serial No. 2827126
Preamp type: ZC0032 Serial No. 13693 Report: 17CA0303 02-02

501.2	94.0	94.0	0.0	94.0	1.0	1.0	0.0
1995.0	94.0	93.8	0.0	93.8	1.0	1.0	0.0
3981.0	94.0	93.2	-0.1	93.1	1.0	1.0	0.0
7943.0	94.0	91.0	-0.3	90.7	1.5	3.0	0.0
12590.0	94.0	87.8	-0.3	87.5	3.0	6.0	0.0

Frequency weighting Lin:

Frequency	Ref. level	Expected level	Correction of electrical response	Actual level	Tolerance(dB)		Deviation *
Hz	dB	dB	dB	dB	+	-	dB
1000.0	94.0	94.0	0.0	94.0	0.0	0.0	0.0
31.6	94.0	94.0	N/A	94.1	1.5	1.5	0.1
63.1	94.0	94.0	0.0	94.0	1.5	1.5	0.0
125.9	94.0	94.0	0.0	94.0	1.0	1.0	0.0
251.2	94.0	94.0	0.0	94.0	1.0	1.0	0.0
501.2	94.0	94.0	0.0	94.0	1.0	1.0	0.0
1995.0	94.0	94.0	0.0	94.0	1.0	1.0	0.0
3981.0	94.0	94.0	-0.1	93.9	1.0	1.0	0.0
7943.0	94.0	94.0	-0.3	93.7	1.5	3.0	0.0
12590.0	94.0	94.0	-0.3	93.7	3.0	6.0	0.0

*Deviation = Actual level - (Expected level + Correction of electrical response)
The correction of electrical response is specified in the Table A.2 of technical documentation of BE 1853-11. The maximum expanded uncertainty of correction of electrical response is 0.3 dB.

TIME WEIGHTING FAST TEST

Time weighting F is tested on the reference range with a single sinusoidal burst of duration 200 ms at a frequency 2000 Hz and an amplitude which produces an indication 4 dB below the upper limit of the primary indicator range when the signal is continuous. (Weight A, Maximum hold)

Ref. level	Expected level	Actual level	Tolerance(dB)		Deviation
dB	dB	dB	+	-	dB
116.0	115.0	115.0	1.0	1.0	0.0

TIME WEIGHTING SLOW TEST

Time weighting S is tested on the reference range with a single sinusoidal burst of duration 500 ms at a frequency 2000 Hz and an amplitude which produces an indication 4 dB below the upper limit of the primary indicator range when the signal is continuous. (Weight A, Maximum hold)

Ref. level	Expected level	Actual level	Tolerance(dB)		Deviation
dB	dB	dB	+	-	dB
116.0	111.9	111.9	1.0	1.0	0.0

PEAK RESPONSE TEST

The onset time of the peak detector is tested on the reference range by comparing the response to a 100 us rectangular test pulse with the response to a 10 ms reference pulse of the same amplitude. The amplitude of the 10 ms reference pulse is such as to produce an indication 1 dB below the upper limit of the primary indicator range.

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SOILS & MATERIALS ENGINEERING CO., LTD.
香港黃竹坑道37號利達中心12樓
12/F., Leader Centre, 37 Wong Chuk Hang Road, Aberdeen, Hong Kong.
E-mail: smec@cigismec.com Website: www.cigismec.com
Tel: (852) 2873 6860
Fax: (852) 2555 7533

SMECLab

Test Data for Sound Level Meter

Sound level meter type:	2250-L	Serial No.	2718887	Date	08-Mar-2017
Microphone type:	4950	Serial No.	2827126		
Preamp type:	ZC0032	Serial No.	13693	Report:	17CA0303 02-02

Positive polarities: (Weighting L, set the generator signal to single, LLPeak)

Ref. level	Response to 10 ms	Response to 100 us	Tolerance	Deviation
dB	dB	dB	+/- dB	dB
119.0	119.0	119.1	2.0	0.1

Negative polarities:

Ref. level	Response to 10 ms	Response to 100 us	Tolerance	Deviation
dB	dB	dB	+/- dB	dB
119.0	119.0	119.1	2.0	0.1

RMS ACCURACY TEST

The RMS detector accuracy is tested on the reference range for a crest factor of 3.

Test frequency: 2000 Hz
Amplitude: 2 dB below the upper limit of the primary indicator range.
Burst repetition frequency: 40 Hz
Tone burst signal: 11 cycles of a sine wave of frequency 2000 Hz. (Set to INT)

	Ref. Level	Expected level	Tone burst signal	Tolerance	Deviation
Time wighting	dB	dB	indication(dB)	+/- dB	dB
Slow	118.0+6.6	118.0	118.0	0.5	0.0

TIME WEIGHTING IMPULSE TEST

Time weighting I is tested on the reference range (Set the SLM to LAImax)
Test frequency: 2000 Hz
Amplitude: The upper limit of the primary indicator range.

Single sinusoidal burst of duration 5 ms:

Ref. Level	Single burst indication		Tolerance	Deviation
dB	Expected (dB)	Actual (dB)	+/- dB	dB
120.0	111.2	111.1	2.0	-0.1

Repeated at 100 Hz

Ref. Level	Repeated burst indication		Tolerance	Deviation
dB	Expected (dB)	Actual (dB)	+/- dB	dB
120.0	117.3	117.2	1.0	-0.1

TIME AVERAGING TEST

This test compares the SLM reading for continuous sine signals with readings obtained from a sine tone burst sequence having the same RMS level. The test level is 30 dB below the upper limit of the linearity range and repeated for Type 1 SLM with 40 dB below the upper limit of the linearity.

Frequency of tone burst: 4000 Hz
Duration of tone burst: 1 ms

Repetition Time	Level of tone burst	Expected Leq	Actual Leq	Tolerance	Deviation	Remarks
msec	dB	dB	dB	+/- dB	dB	
1000	110.0	110.0	109.9	1.0	-0.1	60s integ.
10000	100.0	100.0	99.9	1.0	-0.1	6min. integ.

PULSE RANGE AND SOUND EXPOSURE LEVEL TEST

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12/F., Leader Centre, 37 Wong Chuk Hang Road, Aberdeen, Hong Kong.
E-mail: smec@cigismec.com Website: www.cigismec.com
Tel: (852) 2873 6860
Fax: (852) 2555 7533

SMECLab

Sound level meter type:	2250-L	Serial No.	2718887	Date	08-Mar-2017
Microphone type:	4950	Serial No.	2827126		
Preamp type:	ZC0032	Serial No.	13693	Report:	17CA0303 02-02

The test tone burst signal is superimposed on a baseline signal corresponding to the lower limit of reference rar

Test frequency: 4000 Hz

Integration time: 10 sec

The integrating sound level meter set to Leq:

Duration	Rms level of	Expected	Actual	Tolerance	Deviation
msec	tone burst (dB)	dB	dB	+/- dB	dB
10	88.0	58.0	58.0	1.7	0.0

The integrating sound level meter set to SEL:

Duration	Rms level of	Expected	Actual	Tolerance	Deviation
msec	tone burst (dB)	dB	dB	+/- dB	dB
10.0	88.0	68.0	68.0	1.7	0.0

OVERLOAD INDICATION TEST

For SLM capable of operating in a non-integrating mode.

Test frequency: 2000 Hz
Amplitude: 2 dB below the upper limit of the primary indicator range.
Burst repetition frequency: 40 Hz
Tone burst signal: 11 cycles of a sine wave of frequency 2000 Hz.

Level	Level reduced by	Further reduced	Difference	Tolerance	Deviation
at overload (dB)	1 dB	3 dB	dB	dB	dB
135.9	134.9	131.9	3.0	1.0	0.0

For integrating SLM, with the instrument indicating Leq.

For integrating SLM, with the instrument indicating Leq and set to the reference range. The test signal as follow
The test tone burst signal is superimposed on a baseline signal corresponding to the lower limit of reference rar

Test frequency: 4000 Hz
Integration time: 10 sec
Single burst duration: 1 msec

Rms level	Level reduced by	Expected level	Actual level	Tolerance	Deviation
at overload (dB)	1 dB	dB	dB	dB	dB
142.6	141.6	101.6	101.6	2.2	0.0

ACOUSTIC TEST

The acoustic test of the complete SLM is tested at the frequency 125 Hz and 8000 Hz using a B&K type 4226 Multifunction Acoustic Calibrator. The test is performed in A weighting.

Frequency	Expected level	Actual level	Tolerance (dB)		Deviation
Hz	dB	Measured (dB)	+	-	dB
1000	94.0	94.0	0.0	0.0	0.0
125	77.9	78.0	1.0	1.0	0.1
8000	92.9	93.2	1.5	3.0	0.3

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

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Tel: (852) 2873 6860
Fax: (852) 2555 7533

HOKLAS 028 CAL

CERTIFICATE OF CALIBRATION

Certificate No.: 17CA0317 04 **Page** 1 **of** 2

Item tested

Description:	Sound Level Meter (Type 1)	Microphone	Preamp
Manufacturer:	B & K	B & K	B & K
Type/Model No.:	2250-L	4950	ZC0032
Serial/Equipment No.:	2701820	2678778	12982
Adaptors used:	-	-	-

Item submitted by

Customer Name:	Anewr Consulting Limited
Address of Customer:	Unit 517, 5/F Tower A, Regent Centre, 63 Wo Yip Hop Road, Kwai Chung
Request No.:	-
Date of receipt:	17-Mar-2017

Date of test: 22-Mar-2017

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:	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 ±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 responsess 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:** 23-Mar-2017 **Company Chop:** SOILS & MATERIALS ENGINEERING COMPANY LTD. 綜合試驗有限公司

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.

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HOKLAS 028 CAL

CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.: -17CA0317 04 **Page** 2 **of** 2

1, Electrical Tests

The electrical tests were perfomed 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	0.8	
	Lin	Pass	1.6	
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	A	Pass	0.3	
	C	Pass	0.3	
	Lin	Pass	0.3	
Time weightings	Single Burst Fast	Pass	0.3	
	Single Burst Slow	Pass	0.3	
Peak response	Single 100μs rectangular pulse	Pass	0.3	
R.M.S. accuracy	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: Fung Chi Yip **Date:** 22-Mar-2017

Checked by: Lam Tze Wai **Date:** 23-Mar-2017

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.

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SOILS & MATERIALS ENGINEERING CO., LTD.
香港黃竹坑道37號利達中心12樓
12/F., Leader Centre, 37 Wong Chuk Hang Road, Aberdeen, Hong Kong.
E-mail: smec@cigismec.com Website: www.cigismec.com
Tel: (852) 2873 6860
Fax: (852) 2555 7533

SMECLab

Sound level meter type:	2250-L	Serial No.	2701820	Date	22-Mar-2017
Microphone type:	4950	Serial No.	2678778		
Preamp type:	ZC0032	Serial No.	12982	Report:	17CA0317 04

SELF GENERATED NOISE TEST

The noise test is performed in the most sensitive range of the SLM with the microphone replaced by an equivalent impedance.

Noise level in A weighting	13.2	dB
Noise level in C weighting	15.4	dB
Noise level in Lin	22.3	dB

LINEARITY TEST

The linearity is tested relative to the reference sound pressure level using a continuous sinusoidal signal of frequency 4 kHz. The measurement is made on the reference range for indications at 5 dB intervals starting from the 94 dB reference sound pressure level. And until within 5 dB of the upper and lower limits of the reference range, the measurements shall be made at 1 dB intervals.(SLM set to LEQ/SPL)

Reference/Expected level	Actual level		Tolerance	Deviation	
	non-integrated	integrated		non-integrated	integrated
dB	dB	dB	+/- dB	dB	dB
94.0	94.0	94.0	0.7	0.0	0.0
99.0	99.0	99.0	0.7	0.0	0.0
104.0	104.0	104.0	0.7	0.0	0.0
109.0	109.0	109.0	0.7	0.0	0.0
114.0	114.0	114.0	0.7	0.0	0.0
119.0	119.0	119.0	0.7	0.0	0.0
124.0	124.0	124.0	0.7	0.0	0.0
129.0	129.0	129.0	0.7	0.0	0.0
134.0	134.0	134.0	0.7	0.0	0.0
135.0	135.0	135.0	0.7	0.0	0.0
136.0	136.0	136.0	0.7	0.0	0.0
137.0	137.0	137.0	0.7	0.0	0.0
138.0	138.0	138.0	0.7	0.0	0.0
139.0	139.0	139.0	0.7	0.0	0.0
140.0	140.0	140.0	0.7	0.0	0.0
89.0	89.0	89.0	0.7	0.0	0.0
84.0	84.0	84.0	0.7	0.0	0.0
79.0	79.0	79.0	0.7	0.0	0.0
74.0	74.0	74.0	0.7	0.0	0.0
69.0	69.0	69.0	0.7	0.0	0.0
64.0	64.0	64.0	0.7	0.0	0.0
59.0	59.0	59.0	0.7	0.0	0.0
54.0	53.9	53.9	0.7	-0.1	-0.1
49.0	49.0	49.0	0.7	0.0	0.0
44.0	43.9	44.0	0.7	-0.1	0.0
39.0	39.0	39.0	0.7	0.0	0.0

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香港黃竹坑道37號利達中心12樓
12/F., Leader Centre, 37 Wong Chuk Hang Road, Aberdeen, Hong Kong.
E-mail: smec@cigismec.com Website: www.cigismec.com
Tel: (852) 2873 6860
Fax: (852) 2555 7533

SMECLab

Sound level meter type: 2250-L Serial No. 2701820 Date 22-Mar-2017

Microphone type: 4950 Serial No. 2678778

Preamp type: ZC0032 Serial No. 12982 Report: 17CA0317 04

34.0	34.0	34.0	0.7	0.0	0.0
33.0	33.0	33.0	0.7	0.0	0.0
32.0	32.0	32.0	0.7	0.0	0.0
31.0	31.0	31.0	0.7	0.0	0.0
30.0	30.0	30.0	0.7	0.0	0.0

Measurements for an indication of the reference SPL on all other ranges which include it

Other ranges	Expected level	Actual level	Tolerance	Deviation
dB	dB	dB	+/- dB	dB
20-140	94.0	94.0	0.7	0.0

Measurements on all level ranges for indications 2 dB below the upper limit and 2 dB above the lower limit

Ranges	Reference/Expected level	Actual level	Tolerance	Deviation
dB	dB	dB	+/- dB	dB
20-140	30.0	30.0	0.7	0.0
	138.0	138.0	0.7	0.0

FREQUENCY WEIGHTING TEST

The frequency response of the weighting netwoks are tested at octave intervals over the frequency ranges 31.5 Hz to 12500 Hz. The signal level at 1000 Hz is set to give an indication of the reference SPL.

Frequency weighting A:

Frequency	Ref. level	Expected level	Correction of electrical response	Actual level	Tolerance(dB)		Deviation *
Hz	dB	dB	dB	dB	+	-	dB
1000.0	94.0	94.0	0.0	94.0	0.0	0.0	0.0
31.6	94.0	54.6	N/A	54.6	1.5	1.5	0.0
63.1	94.0	67.8	0.0	67.7	1.5	1.5	-0.1
125.9	94.0	77.9	0.0	77.9	1.0	1.0	0.0
251.2	94.0	85.4	0.0	85.4	1.0	1.0	0.0
501.2	94.0	90.8	0.0	90.7	1.0	1.0	-0.1
1995.0	94.0	95.2	0.0	95.2	1.0	1.0	0.0
3981.0	94.0	95.0	-0.1	94.9	1.0	1.0	0.0
7943.0	94.0	92.9	-0.3	92.6	1.5	3.0	0.0
12590.0	94.0	89.7	-0.3	89.4	3.0	6.0	0.0

Frequency weighting C:

Frequency	Ref. level	Expected level	Correction of electrical response	Actual level	Tolerance(dB)		Deviation *
Hz	dB	dB	dB	dB	+	-	dB
1000.0	94.0	94.0	0.0	94.0	0.0	0.0	0.0
31.6	94.0	91.0	N/A	91.1	1.5	1.5	0.1
63.1	94.0	93.2	0.0	93.2	1.5	1.5	0.0
125.9	94.0	93.8	0.0	93.8	1.0	1.0	0.0
251.2	94.0	94.0	0.0	94.0	1.0	1.0	0.0

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12/F., Leader Centre, 37 Wong Chuk Hang Road, Aberdeen, Hong Kong.
E-mail: smec@cigismec.com Website: www.cigismec.com
Tel: (852) 2873 6860
Fax: (852) 2555 7533

SMECLab

Sound level meter type: 2250-L Serial No. 2701820 Date 22-Mar-2017

Microphone type: 4950 Serial No. 2678778

Preamp type: ZC0032 Serial No. 12982 Report: 17CA0317 04

501.2	94.0	94.0	0.0	94.0	1.0	1.0	0.0
1995.0	94.0	93.8	0.0	93.8	1.0	1.0	0.0
3981.0	94.0	93.2	-0.1	93.1	1.0	1.0	0.0
7943.0	94.0	91.0	-0.3	90.7	1.5	3.0	0.0
12590.0	94.0	87.8	-0.3	87.4	3.0	6.0	-0.1

Frequency weighting Lin:

Frequency	Ref. level	Expected level	Correction of electrical response	Actual level	Tolerance(dB)		Deviation *
Hz	dB	dB	dB	dB	+	-	dB
1000.0	94.0	94.0	0.0	94.0	0.0	0.0	0.0
31.6	94.0	94.0	N/A	94.1	1.5	1.5	0.1
63.1	94.0	94.0	0.0	94.0	1.5	1.5	0.0
125.9	94.0	94.0	0.0	94.0	1.0	1.0	0.0
251.2	94.0	94.0	0.0	94.0	1.0	1.0	0.0
501.2	94.0	94.0	0.0	94.0	1.0	1.0	0.0
1995.0	94.0	94.0	0.0	94.0	1.0	1.0	0.0
3981.0	94.0	94.0	-0.1	94.0	1.0	1.0	0.1
7943.0	94.0	94.0	-0.3	93.9	1.5	3.0	0.2
12590.0	94.0	94.0	-0.3	93.7	3.0	6.0	0.0

*Deviation = Actual level - (Expected level + Correction of electrical response)
The correction of electrical response is specified in the Table A.2 of technical documentation of BE 1853-11. The maximum expanded uncertainty of correction of electrical response is 0.3 dB.

TIME WEIGHTING FAST TEST

Time weighting F is tested on the reference range with a single sinusoidal burst of duration 200 ms at a frequency 2000 Hz and an amplitude which produces an indication 4 dB below the upper limit of the primary indicator range when the signal is continuous. (Weight A, Maximum hold)

Ref. level	Expected level	Actual level	Tolerance(dB)		Deviation
dB	dB	dB	+	-	dB
116.0	115.0	115.0	1.0	1.0	0.0

TIME WEIGHTING SLOW TEST

Time weighting S is tested on the reference range with a single sinusoidal burst of duration 500 ms at a frequency 2000 Hz and an amplitude which produces an indication 4 dB below the upper limit of the primary indicator range when the signal is continuous. (Weight A, Maximum hold)

Ref. level	Expected level	Actual level	Tolerance(dB)		Deviation
dB	dB	dB	+	-	dB
116.0	111.9	111.9	1.0	1.0	0.0

PEAK RESPONSE TEST

The onset time of the peak detector is tested on the reference range by comparing the response to a 100 us rectangular test pulse with the response to a 10 ms reference pulse of the same amplitude. The amplitude of the 10 ms reference pulse is such as to produce an indication 1 dB below the upper limit of the primary indicator range.

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香港黃竹坑道37號利達中心12樓
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E-mail: smec@cigismec.com Website: www.cigismec.com
Tel: (852) 2873 6860
Fax: (852) 2555 7533

SMECLab

Sound level meter type:	2250-L	Serial No.	2701820	Date	22-Mar-2017
Microphone type:	4950	Serial No.	2678778		
Preamp type:	ZC0032	Serial No.	12982	Report:	17CA0317 04

Positive polarities: (Weighting L, set the generator signal to single, LLPeak)

Ref. level	Response to 10 ms	Response to 100 us	Tolerance	Deviation
dB	dB	dB	+/- dB	dB
119.0	119.0	118.9	2.0	-0.1

Negative polarities:

Ref. level	Response to 10 ms	Response to 100 us	Tolerance	Deviation
dB	dB	dB	+/- dB	dB
119.0	119.0	118.8	2.0	-0.2

RMS ACCURACY TEST

The RMS detector accuracy is tested on the reference range for a crest factor of 3.

Test frequency: 2000 Hz
Amplitude: 2 dB below the upper limit of the primary indicator range.
Burst repetition frequency: 40 Hz
Tone burst signal: 11 cycles of a sine wave of frequency 2000 Hz. (Set to INT)

	Ref. Level	Expected level	Tone burst signal	Tolerance	Deviation
Time wighting	dB	dB	indication(dB)	+/- dB	dB
Slow	118.0+6.6	118.0	118.0	0.5	0.0

TIME WEIGHTING IMPULSE TEST

Time weighting I is tested on the reference range (Set the SLM to LAImax)
Test frequency: 2000 Hz
Amplitude: The upper limit of the primary indicator range.

Single sinusoidal burst of duration 5 ms:

Ref. Level	Single burst indication		Tolerance	Deviation
dB	Expected (dB)	Actual (dB)	+/- dB	dB
120.0	111.2	111.1	2.0	-0.1

Repeated at 100 Hz

Ref. Level	Repeated burst indication		Tolerance	Deviation
dB	Expected (dB)	Actual (dB)	+/- dB	dB
120.0	117.3	117.2	1.0	-0.1

TIME AVERAGING TEST

This test compares the SLM reading for continuous sine signals with readings obtained from a sine tone burst sequence having the same RMS level. The test level is 30 dB below the upper limit of the linearity range and repeated for Type 1 SLM with 40 dB below the upper limit of the linearity.

Frequency of tone burst: 4000 Hz
Duration of tone burst: 1 ms

Repetition Time	Level of tone burst	Expected Leq	Actual Leq	Tolerance	Deviation	Remarks
msec	dB	dB	dB	+/- dB	dB	
1000	110.0	110.0	109.9	1.0	-0.1	60s integ.
10000	100.0	100.0	99.9	1.0	-0.1	6min. integ.

PULSE RANGE AND SOUND EXPOSURE LEVEL TEST

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E-mail: smec@cigismec.com Website: www.cigismec.com
Tel: (852) 2873 6860
Fax: (852) 2555 7533

SMECLab

Sound level meter type:	2250-L	Serial No.	2701820	Date	22-Mar-2017
Microphone type:	4950	Serial No.	2678778		
Preamp type:	ZC0032	Serial No.	12982	Report:	17CA0317 04

The test tone burst signal is superimposed on a baseline signal corresponding to the lower limit of reference rar

Test frequency: 4000 Hz

Integration time: 10 sec

The integrating sound level meter set to Leq:

Duration	Rms level of	Expected	Actual	Tolerance	Deviation
msec	tone burst (dB)	dB	dB	+/- dB	dB
10	88.0	58.0	57.9	1.7	-0.1

The integrating sound level meter set to SEL:

Duration	Rms level of	Expected	Actual	Tolerance	Deviation
msec	tone burst (dB)	dB	dB	+/- dB	dB
10.0	88.0	68.0	67.9	1.7	-0.1

OVERLOAD INDICATION TEST

For SLM capable of operating in a non-integrating mode.

Test frequency: 2000 Hz
Amplitude: 2 dB below the upper limit of the primary indicator range.
Burst repetition frequency: 40 Hz
Tone burst signal: 11 cycles of a sine wave of frequency 2000 Hz.

Level	Level reduced by	Further reduced	Difference	Tolerance	Deviation
at overload (dB)	1 dB	3 dB	dB	dB	dB
135.5	134.5	131.5	3.0	1.0	0.0

For integrating SLM, with the instrument indicating Leq.

For integrating SLM, with the instrument indicating Leq and set to the reference range. The test signal as follow
The test tone burst signal is superimposed on a baseline signal corresponding to the lower limit of reference rar
Test frequency: 4000 Hz
Integration time: 10 sec
Single burst duration: 1 msec

Rms level	Level reduced by	Expected level	Actual level	Tolerance	Deviation
at overload (dB)	1 dB	dB	dB	dB	dB
142.2	141.2	101.2	101.1	2.2	-0.1

ACOUSTIC TEST

The acoustic test of the complete SLM is tested at the frequency 125 Hz and 8000 Hz using a B&K type 4226 Multifunction Acoustic Calibrator. The test is performed in A weighting.

Frequency	Expected level	Actual level	Tolerance (dB)		Deviation
Hz	dB	Measured (dB)	+	-	dB
1000	94.0	94.0	0.0	0.0	0.0
125	77.9	77.9	1.0	1.0	0.0
8000	92.9	93.4	1.5	3.0	0.5

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

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E-mail: smec@cigismec.com Website: www.cigismec.com
Tel: (852) 2873 6860
Fax: (852) 2555 7533

HOKLAS 028 CAL

CERTIFICATE OF CALIBRATION

Certificate No.: 17CA0217 01-02 **Page** 1 **of** 2

Item tested

Description:	Sound Level Meter (Type 1)	Microphone	Preamp
Manufacturer:	B & K	B & K	B & K
Type/Model No.:	2250-L	4950	ZC0032
Serial/Equipment No.:	2701825	2678783	12531
Adaptors used:	-	-	-

Item submitted by

Customer Name:	Anewr Consulting Limited
Address of Customer:	Unit 517, 5/F Tower A, Regent Centre, 63 Wo Yip Hop Road, Kwai Chung
Request No.:	-
Date of receipt:	17-Feb-2017

Date of test: 18-Feb-2017

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:	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 ±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 responsess 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:** 20-Feb-2017 **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.

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E-mail: smec@cigismec.com Website: www.cigismec.com
Tel: (852) 2873 6860
Fax: (852) 2555 7533

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CERTIFICATE OF CALIBRATION

(Continuation Page)

1, Electrical Tests

The electrical tests were perfomed 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	0.8	
	Lin	Pass	1.6	
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	A	Pass	0.3	
	C	Pass	0.3	
	Lin	Pass	0.3	
Time weightings	Single Burst Fast	Pass	0.3	
	Single Burst Slow	Pass	0.3	
Peak response	Single 100μs rectangular pulse	Pass	0.3	
R.M.S. accuracy	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: Fung Chi Yip **Date:** 18-Feb-2017

Checked by: Lam Tze Wai **Date:** 20-Feb-2017

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.

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Tel: (852) 2873 6860
Fax: (852) 2555 7533

SMECLab

Test Data for Sound Level Meter

Sound level meter type:	2250-L	Serial No.	2701825	Date	18-Feb-2017
Microphone type:	4950	Serial No.	2678783		
Preamp type:	ZC0032	Serial No.	12531	Report:	17CA0217 01-02

SELF GENERATED NOISE TEST

The noise test is performed in the most sensitive range of the SLM with the microphone replaced by an equivalent impedance.

Noise level in A weighting	13.4	dB
Noise level in C weighting	15.4	dB
Noise level in Lin	23.3	dB

LINEARITY TEST

The linearity is tested relative to the reference sound pressure level using a continuous sinusoidal signal of frequency 4 kHz. The measurement is made on the reference range for indications at 5 dB intervals starting from the 94 dB reference sound pressure level. And until within 5 dB of the upper and lower limits of the reference range, the measurements shall be made at 1 dB intervals.(SLM set to LEQ/SPL)

Reference/Expected level	Actual level		Tolerance	Deviation	
	non-integrated	integrated		non-integrated	integrated
dB	dB	dB	+/- dB	dB	dB
94.0	94.0	94.0	0.7	0.0	0.0
99.0	99.0	99.0	0.7	0.0	0.0
104.0	104.0	104.0	0.7	0.0	0.0
109.0	109.0	109.0	0.7	0.0	0.0
114.0	114.0	114.0	0.7	0.0	0.0
119.0	119.0	119.0	0.7	0.0	0.0
124.0	124.0	124.0	0.7	0.0	0.0
129.0	129.0	129.0	0.7	0.0	0.0
134.0	134.0	134.0	0.7	0.0	0.0
135.0	135.0	135.0	0.7	0.0	0.0
136.0	136.0	136.0	0.7	0.0	0.0
137.0	137.0	137.0	0.7	0.0	0.0
138.0	138.0	138.0	0.7	0.0	0.0
139.0	139.0	139.0	0.7	0.0	0.0
140.0	140.0	140.0	0.7	0.0	0.0
89.0	89.0	89.0	0.7	0.0	0.0
84.0	84.0	84.0	0.7	0.0	0.0
79.0	79.0	79.0	0.7	0.0	0.0
74.0	74.0	74.0	0.7	0.0	0.0
69.0	69.0	69.0	0.7	0.0	0.0
64.0	64.0	64.0	0.7	0.0	0.0
59.0	59.0	59.0	0.7	0.0	0.0
54.0	54.0	54.0	0.7	0.0	0.0
49.0	49.0	49.0	0.7	0.0	0.0
44.0	44.0	44.0	0.7	0.0	0.0
39.0	39.0	39.0	0.7	0.0	0.0

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SOILS & MATERIALS ENGINEERING CO., LTD.
香港黃竹坑道37號利達中心12樓
12/F., Leader Centre, 37 Wong Chuk Hang Road, Aberdeen, Hong Kong.
E-mail: smec@cigismec.com Website: www.cigismec.com
Tel: (852) 2873 6860
Fax: (852) 2555 7533

SMECLab

Test Data for Sound Level Meter

Sound level meter type: 2250-L Serial No. 2701825 Date 18-Feb-2017
Microphone type: 4950 Serial No. 2678783
Preamp type: ZC0032 Serial No. 12531 Report: 17CA0217 01-02

34.0	34.0	34.0	0.7	0.0	0.0
33.0	33.0	33.0	0.7	0.0	0.0
32.0	32.0	32.0	0.7	0.0	0.0
31.0	31.0	31.0	0.7	0.0	0.0
30.0	30.0	30.0	0.7	0.0	0.0

Measurements for an indication of the reference SPL on all other ranges which include it

Other ranges	Expected level	Actual level	Tolerance	Deviation
dB	dB	dB	+/- dB	dB
20-140	94.0	94.0	0.7	0.0

Measurements on all level ranges for indications 2 dB below the upper limit and 2 dB above the lower limit

Ranges	Reference/Expected level	Actual level	Tolerance	Deviation
dB	dB	dB	+/- dB	dB
20-140	30.0	30.0	0.7	0.0
	138.0	138.0	0.7	0.0

FREQUENCY WEIGHTING TEST

The frequency response of the weighting netwoks are tested at octave intervals over the frequency ranges 31.5 Hz to 12500 Hz. The signal level at 1000 Hz is set to give an indication of the reference SPL.

Frequency weighting A:

Frequency	Ref. level	Expected level	Correction of electrical response	Actual level	Tolerance(dB)		Deviation *
Hz	dB	dB	dB	dB	+	-	dB
1000.0	94.0	94.0	0.0	94.0	0.0	0.0	0.0
31.6	94.0	54.6	N/A	54.6	1.5	1.5	0.0
63.1	94.0	67.8	0.0	67.8	1.5	1.5	0.0
125.9	94.0	77.9	0.0	77.9	1.0	1.0	0.0
251.2	94.0	85.4	0.0	85.4	1.0	1.0	0.0
501.2	94.0	90.8	0.0	90.8	1.0	1.0	0.0
1995.0	94.0	95.2	0.0	95.2	1.0	1.0	0.0
3981.0	94.0	95.0	-0.1	94.9	1.0	1.0	0.0
7943.0	94.0	92.9	-0.3	92.6	1.5	3.0	0.0
12590.0	94.0	89.7	-0.3	89.4	3.0	6.0	0.0

Frequency weighting C:

Frequency	Ref. level	Expected level	Correction of electrical response	Actual level	Tolerance(dB)		Deviation *
Hz	dB	dB	dB	dB	+	-	dB
1000.0	94.0	94.0	0.0	94.0	0.0	0.0	0.0
31.6	94.0	91.0	N/A	91.0	1.5	1.5	0.0
63.1	94.0	93.2	0.0	93.2	1.5	1.5	0.0
125.9	94.0	93.8	0.0	93.8	1.0	1.0	0.0
251.2	94.0	94.0	0.0	94.0	1.0	1.0	0.0

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香港黃竹坑道37號利達中心12樓
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Tel: (852) 2873 6860
Fax: (852) 2555 7533

SMECLab

Sound level meter type: 2250-L Serial No. 2701825 Date 18-Feb-2017

Microphone type: 4950 Serial No. 2678783

Preamp type: ZC0032 Serial No. 12531 Report: 17CA0217 01-02

501.2	94.0	94.0	0.0	94.0	1.0	1.0	0.0
1995.0	94.0	93.8	0.0	93.8	1.0	1.0	0.0
3981.0	94.0	93.2	-0.1	93.1	1.0	1.0	0.0
7943.0	94.0	91.0	-0.3	90.7	1.5	3.0	0.0
12590.0	94.0	87.8	-0.3	87.4	3.0	6.0	-0.1

Frequency weighting Lin:

Frequency	Ref. level	Expected level	Correction of electrical response	Actual level	Tolerance(dB)		Deviation *
Hz	dB	dB	dB	dB	+	-	dB
1000.0	94.0	94.0	0.0	94.0	0.0	0.0	0.0
31.6	94.0	94.0	N/A	94.1	1.5	1.5	0.1
63.1	94.0	94.0	0.0	94.0	1.5	1.5	0.0
125.9	94.0	94.0	0.0	94.0	1.0	1.0	0.0
251.2	94.0	94.0	0.0	94.0	1.0	1.0	0.0
501.2	94.0	94.0	0.0	94.0	1.0	1.0	0.0
1995.0	94.0	94.0	0.0	94.0	1.0	1.0	0.0
3981.0	94.0	94.0	-0.1	93.9	1.0	1.0	0.0
7943.0	94.0	94.0	-0.3	93.7	1.5	3.0	0.0
12590.0	94.0	94.0	-0.3	93.7	3.0	6.0	0.0

*Deviation = Actual level - (Expected level + Correction of electrical response)
The correction of electrical response is specified in the Table A.2 of technical documentation of BE 1853-11. The maximum expanded uncertainty of correction of electrical response is 0.3 dB.

TIME WEIGHTING FAST TEST

Time weighting F is tested on the reference range with a single sinusoidal burst of duration 200 ms at a frequency 2000 Hz and an amplitude which produces an indication 4 dB below the upper limit of the primary indicator range when the signal is continuous. (Weight A, Maximum hold)

Ref. level	Expected level	Actual level	Tolerance(dB)		Deviation
dB	dB	dB	+	-	dB
116.0	115.0	115.0	1.0	1.0	0.0

TIME WEIGHTING SLOW TEST

Time weighting S is tested on the reference range with a single sinusoidal burst of duration 500 ms at a frequency 2000 Hz and an amplitude which produces an indication 4 dB below the upper limit of the primary indicator range when the signal is continuous. (Weight A, Maximum hold)

Ref. level	Expected level	Actual level	Tolerance(dB)		Deviation
dB	dB	dB	+	-	dB
116.0	111.9	111.9	1.0	1.0	0.0

PEAK RESPONSE TEST

The onset time of the peak detector is tested on the reference range by comparing the response to a 100 us rectangular test pulse with the response to a 10 ms reference pulse of the same amplitude. The amplitude of the 10 ms reference pulse is such as to produce an indication 1 dB below the upper limit of the primary indicator range.

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SOILS & MATERIALS ENGINEERING CO., LTD.
香港黃竹坑道37號利達中心12樓
12/F., Leader Centre, 37 Wong Chuk Hang Road, Aberdeen, Hong Kong.
E-mail: smec@cigismec.com Website: www.cigismec.com
Tel: (852) 2873 6860
Fax: (852) 2555 7533

Test Data for Sound Level Meter

Sound level meter type:	2250-L	Serial No.	2701825	Date	18-Feb-2017
Microphone type:	4950	Serial No.	2678783		
Preamp type:	ZC0032	Serial No.	12531	Report:	17CA0217 01-02

Positive polarities: (Weighting L, set the generator signal to single, LLPeak)

Ref. level	Response to 10 ms	Response to 100 us	Tolerance	Deviation
dB	dB	dB	+/- dB	dB
119.0	119.0	118.9	2.0	-0.1

Negative polarities:

Ref. level	Response to 10 ms	Response to 100 us	Tolerance	Deviation
dB	dB	dB	+/- dB	dB
119.0	119.0	118.9	2.0	-0.1

RMS ACCURACY TEST

The RMS detector accuracy is tested on the reference range for a crest factor of 3.

Test frequency: 2000 Hz
Amplitude: 2 dB below the upper limit of the primary indicator range.
Burst repetition frequency: 40 Hz
Tone burst signal: 11 cycles of a sine wave of frequency 2000 Hz. (Set to INT)

	Ref. Level	Expected level	Tone burst signal	Tolerance	Deviation
Time wighting	dB	dB	indication(dB)	+/- dB	dB
Slow	118.0+6.6	118.0	117.9	0.5	-0.1

TIME WEIGHTING IMPULSE TEST

Time weighting I is tested on the reference range (Set the SLM to LAImax)
Test frequency: 2000 Hz
Amplitude: The upper limit of the primary indicator range.

Single sinusoidal burst of duration 5 ms:

Ref. Level	Single burst indication		Tolerance	Deviation
dB	Expected (dB)	Actual (dB)	+/- dB	dB
120.0	111.2	111.1	2.0	-0.1

Repeated at 100 Hz

Ref. Level	Repeated burst indication		Tolerance	Deviation
dB	Expected (dB)	Actual (dB)	+/- dB	dB
120.0	117.3	117.2	1.0	-0.1

TIME AVERAGING TEST

This test compares the SLM reading for continuous sine signals with readings obtained from a sine tone burst sequence having the same RMS level. The test level is 30 dB below the upper limit of the linearity range and repeated for Type 1 SLM with 40 dB below the upper limit of the linearity.

Frequency of tone burst: 4000 Hz
Duration of tone burst: 1 ms

Repetition Time	Level of tone burst	Expected Leq	Actual Leq	Tolerance	Deviation	Remarks
msec	dB	dB	dB	+/- dB	dB	
1000	110.0	110.0	109.9	1.0	-0.1	60s integ.
10000	100.0	100.0	99.9	1.0	-0.1	6min. integ.

PULSE RANGE AND SOUND EXPOSURE LEVEL TEST

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香港黃竹坑道37號利達中心12樓
12/F., Leader Centre, 37 Wong Chuk Hang Road, Aberdeen, Hong Kong.
E-mail: smec@cigismec.com Website: www.cigismec.com
Tel: (852) 2873 6860
Fax: (852) 2555 7533

SMECLab

Sound level meter type:	2250-L	Serial No.	2701825	Date	18-Feb-2017
Microphone type:	4950	Serial No.	2678783		
Preamp type:	ZC0032	Serial No.	12531	Report:	17CA0217 01-02

The test tone burst signal is superimposed on a baseline signal corresponding to the lower limit of reference rar

Test frequency: 4000 Hz

Integration time: 10 sec

The integrating sound level meter set to Leq:

Duration	Rms level of	Expected	Actual	Tolerance	Deviation
msec	tone burst (dB)	dB	dB	+/- dB	dB
10	120.0	90.0	89.9	1.7	-0.1

The integrating sound level meter set to SEL:

Duration	Rms level of	Expected	Actual	Tolerance	Deviation
msec	tone burst (dB)	dB	dB	+/- dB	dB
10.0	120.0	100.0	99.9	1.7	-0.1

OVERLOAD INDICATION TEST

For SLM capable of operating in a non-integrating mode.

Test frequency: 2000 Hz
Amplitude: 2 dB below the upper limit of the primary indicator range.
Burst repetition frequency: 40 Hz
Tone burst signal: 11 cycles of a sine wave of frequency 2000 Hz.

Level	Level reduced by	Further reduced	Difference	Tolerance	Deviation
at overload (dB)	1 dB	3 dB	dB	dB	dB
135.4	134.4	131.4	3.0	1.0	0.0

For integrating SLM, with the instrument indicating Leq.

For integrating SLM, with the instrument indicating Leq and set to the reference range. The test signal as follow
The test tone burst signal is superimposed on a baseline signal corresponding to the lower limit of reference rar

Test frequency: 4000 Hz
Integration time: 10 sec
Single burst duration: 1 msec

Rms level	Level reduced by	Expected level	Actual level	Tolerance	Deviation
at overload (dB)	1 dB	dB	dB	dB	dB
142.4	141.4	101.4	101.3	2.2	-0.1

ACOUSTIC TEST

The acoustic test of the complete SLM is tested at the frequency 125 Hz and 8000 Hz using a B&K type 4226 Multifunction Acoustic Calibrator. The test is performed in A weighting.

Frequency	Expected level	Actual level	Tolerance (dB)		Deviation
Hz	dB	Measured (dB)	+	-	dB
1000	94.0	94.0	0.0	0.0	0.0
125	77.9	78.1	1.0	1.0	0.2
8000	92.9	93.3	1.5	3.0	0.4

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

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香港黃竹坑道37號利達中心12樓
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E-mail: smec@cigismec.com Website: www.cigismec.com
Tel: (852) 2873 6860
Fax: (852) 2555 7533

HOKLAS 028 CAL

CERTIFICATE OF CALIBRATION

Certificate No.: 17CA0303 02-01 **Page** 1 **of** 2

Item tested

Description:	Sound Level Meter (Type 1)	Microphone	Preamp
Manufacturer:	B & K	B & K	B & K
Type/Model No.:	2250-L	4950	ZC0032
Serial/Equipment No.:	2701822	2678780	12534
Adaptors used:	-	-	-

Item submitted by

Customer Name:	Anewr Consulting Limited
Address of Customer:	Unit 517, 5/F Tower A, Regent Centre, 63 Wo Yip Hop Road, Kwai Chung
Request No.:	-
Date of receipt:	03-Mar-2017

Date of test: 07-Mar-2017

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:	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 ±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 responsess 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-Mar-2017 **Company Chop:** SOILS AND MATERIALS ENGINEERING COMPANY LTD. 綜合試驗有限公司

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.

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SOILS & MATERIALS ENGINEERING CO., LTD.
香港黃竹坑道37號利達中心12樓
12/F., Leader Centre, 37 Wong Chuk Hang Road, Aberdeen, Hong Kong.
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Tel: (852) 2873 6860
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HOKLAS 028 CAL

CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.: 17CA0303 02-01 **Page** 2 **of** 2

1, Electrical Tests

The electrical tests were perfomed 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	0.8	
	Lin	Pass	1.6	
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	A	Pass	0.3	
	C	Pass	0.3	
	Lin	Pass	0.3	
Time weightings	Single Burst Fast	Pass	0.3	
	Single Burst Slow	Pass	0.3	
Peak response	Single 100μs rectangular pulse	Pass	0.3	
R.M.S. accuracy	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: Fung Chi Yip **Date:** 07-Mar-2017

Checked by: Lam Tze Wai **Date:** 09-Mar-2017

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.

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SOILS & MATERIALS ENGINEERING CO., LTD.
香港黃竹坑道37號利達中心12樓
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SMECLab

Test Data for Sound Level Meter

Sound level meter type:	2250-L	Serial No.	2701822	Date	07-Mar-2017
Microphone type:	4950	Serial No.	2678780		
Preamp type:	ZC0032	Serial No.	12534	Report:	17CA0303 02-01

SELF GENERATED NOISE TEST

The noise test is performed in the most sensitive range of the SLM with the microphone replaced by an equivalent impedance.

Noise level in A weighting	13.6	dB
Noise level in C weighting	15.6	dB
Noise level in Lin	22.3	dB

LINEARITY TEST

The linearity is tested relative to the reference sound pressure level using a continuous sinusoidal signal of frequency 4 kHz. The measurement is made on the reference range for indications at 5 dB intervals starting from the 94 dB reference sound pressure level. And until within 5 dB of the upper and lower limits of the reference range, the measurements shall be made at 1 dB intervals.(SLM set to LEQ/SPL)

Reference/Expected level	Actual level		Tolerance	Deviation	
	non-integrated	integrated		non-integrated	integrated
dB	dB	dB	+/- dB	dB	dB
94.0	94.0	94.0	0.7	0.0	0.0
99.0	99.0	99.0	0.7	0.0	0.0
104.0	104.0	104.0	0.7	0.0	0.0
109.0	109.0	109.0	0.7	0.0	0.0
114.0	114.0	114.0	0.7	0.0	0.0
119.0	119.0	119.0	0.7	0.0	0.0
124.0	124.0	124.0	0.7	0.0	0.0
129.0	129.0	129.0	0.7	0.0	0.0
134.0	134.0	134.0	0.7	0.0	0.0
135.0	135.0	135.0	0.7	0.0	0.0
136.0	136.0	136.0	0.7	0.0	0.0
137.0	137.0	137.0	0.7	0.0	0.0
138.0	138.0	138.0	0.7	0.0	0.0
139.0	139.0	139.0	0.7	0.0	0.0
140.0	140.0	140.0	0.7	0.0	0.0
89.0	89.0	89.0	0.7	0.0	0.0
84.0	84.0	84.0	0.7	0.0	0.0
79.0	79.0	79.0	0.7	0.0	0.0
74.0	74.0	74.0	0.7	0.0	0.0
69.0	69.0	69.0	0.7	0.0	0.0
64.0	64.0	64.0	0.7	0.0	0.0
59.0	59.0	59.0	0.7	0.0	0.0
54.0	54.0	54.0	0.7	0.0	0.0
49.0	49.0	49.0	0.7	0.0	0.0
44.0	44.0	44.0	0.7	0.0	0.0
39.0	39.0	39.0	0.7	0.0	0.0

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E-mail: smec@cigismec.com Website: www.cigismec.com
Tel: (852) 2873 6860
Fax: (852) 2555 7533

SMECLab

Test Data for Sound Level Meter

Sound level meter type: 2250-L Serial No. 2701822 Date 07-Mar-2017
Microphone type: 4950 Serial No. 2678780
Preamp type: ZC0032 Serial No. 12534 Report: 17CA0303 02-01

34.0	34.0	34.0	0.7	0.0	0.0
33.0	33.0	33.0	0.7	0.0	0.0
32.0	32.1	32.1	0.7	0.1	0.1
31.0	31.0	31.0	0.7	0.0	0.0
30.0	30.0	30.0	0.7	0.0	0.0

Measurements for an indication of the reference SPL on all other ranges which include it

Other ranges	Expected level	Actual level	Tolerance	Deviation
dB	dB	dB	+/- dB	dB
20-140	94.0	94.0	0.7	0.0

Measurements on all level ranges for indications 2 dB below the upper limit and 2 dB above the lower limit

Ranges	Reference/Expected level	Actual level	Tolerance	Deviation
dB	dB	dB	+/- dB	dB
20-140	30.0	30.0	0.7	0.0
	138.0	138.0	0.7	0.0

FREQUENCY WEIGHTING TEST

The frequency response of the weighting netwoks are tested at octave intervals over the frequency ranges 31.5 Hz to 12500 Hz. The signal level at 1000 Hz is set to give an indication of the reference SPL.

Frequency weighting A:

Frequency	Ref. level	Expected level	Correction of electrical response	Actual level	Tolerance(dB)		Deviation *
Hz	dB	dB	dB	dB	+	-	dB
1000.0	94.0	94.0	0.0	94.0	0.0	0.0	0.0
31.6	94.0	54.6	N/A	54.6	1.5	1.5	0.0
63.1	94.0	67.8	0.0	67.8	1.5	1.5	0.0
125.9	94.0	77.9	0.0	77.9	1.0	1.0	0.0
251.2	94.0	85.4	0.0	85.4	1.0	1.0	0.0
501.2	94.0	90.8	0.0	90.8	1.0	1.0	0.0
1995.0	94.0	95.2	0.0	95.2	1.0	1.0	0.0
3981.0	94.0	95.0	-0.1	94.9	1.0	1.0	0.0
7943.0	94.0	92.9	-0.3	92.6	1.5	3.0	0.0
12590.0	94.0	89.7	-0.3	89.4	3.0	6.0	0.0

Frequency weighting C:

Frequency	Ref. level	Expected level	Correction of electrical response	Actual level	Tolerance(dB)		Deviation *
Hz	dB	dB	dB	dB	+	-	dB
1000.0	94.0	94.0	0.0	94.0	0.0	0.0	0.0
31.6	94.0	91.0	N/A	91.0	1.5	1.5	0.0
63.1	94.0	93.2	0.0	93.2	1.5	1.5	0.0
125.9	94.0	93.8	0.0	93.8	1.0	1.0	0.0
251.2	94.0	94.0	0.0	94.0	1.0	1.0	0.0

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SOILS & MATERIALS ENGINEERING CO., LTD.
香港黃竹坑道37號利達中心12樓
12/F., Leader Centre, 37 Wong Chuk Hang Road, Aberdeen, Hong Kong.
E-mail: smec@cigismec.com Website: www.cigismec.com
Tel: (852) 2873 6860
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SMECLab

Sound level meter type: 2250-L Serial No. 2701822 Date 07-Mar-2017

Microphone type: 4950 Serial No. 2678780

Preamp type: ZC0032 Serial No. 12534 Report: 17CA0303 02-01

501.2	94.0	94.0	0.0	94.0	1.0	1.0	0.0
1995.0	94.0	93.8	0.0	93.8	1.0	1.0	0.0
3981.0	94.0	93.2	-0.1	93.1	1.0	1.0	0.0
7943.0	94.0	91.0	-0.3	90.7	1.5	3.0	0.0
12590.0	94.0	87.8	-0.3	87.5	3.0	6.0	0.0

Frequency weighting Lin:

Frequency	Ref. level	Expected level	Correction of electrical response	Actual level	Tolerance(dB)		Deviation *
Hz	dB	dB	dB	dB	+	-	dB
1000.0	94.0	94.0	0.0	94.0	0.0	0.0	0.0
31.6	94.0	94.0	N/A	94.1	1.5	1.5	0.1
63.1	94.0	94.0	0.0	94.0	1.5	1.5	0.0
125.9	94.0	94.0	0.0	94.0	1.0	1.0	0.0
251.2	94.0	94.0	0.0	94.0	1.0	1.0	0.0
501.2	94.0	94.0	0.0	94.0	1.0	1.0	0.0
1995.0	94.0	94.0	0.0	94.0	1.0	1.0	0.0
3981.0	94.0	94.0	-0.1	93.9	1.0	1.0	0.0
7943.0	94.0	94.0	-0.3	93.7	1.5	3.0	0.0
12590.0	94.0	94.0	-0.3	93.7	3.0	6.0	0.0

*Deviation = Actual level - (Expected level + Correction of electrical response)

The correction of electrical response is specified in the Table A.2 of technical documentation of BE 1853-11. The maximum expanded uncertainty of correction of electrical response is 0.3 dB.

TIME WEIGHTING FAST TEST

Time weighting F is tested on the reference range with a single sinusoidal burst of duration 200 ms at a frequency 2000 Hz and an amplitude which produces an indication 4 dB below the upper limit of the primary indicator range when the signal is continuous. (Weight A, Maximum hold)

Ref. level	Expected level	Actual level	Tolerance(dB)		Deviation
dB	dB	dB	+	-	dB
116.0	115.0	115.0	1.0	1.0	0.0

TIME WEIGHTING SLOW TEST

Time weighting S is tested on the reference range with a single sinusoidal burst of duration 500 ms at a frequency 2000 Hz and an amplitude which produces an indication 4 dB below the upper limit of the primary indicator range when the signal is continuous. (Weight A, Maximum hold)

Ref. level	Expected level	Actual level	Tolerance(dB)		Deviation
dB	dB	dB	+	-	dB
116.0	111.9	111.9	1.0	1.0	0.0

PEAK RESPONSE TEST

The onset time of the peak detector is tested on the reference range by comparing the response to a 100 us rectangular test pulse with the response to a 10 ms reference pulse of the same amplitude. The amplitude of the 10 ms reference pulse is such as to produce an indication 1 dB below the upper limit of the primary indicator range.

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SOILS & MATERIALS ENGINEERING CO., LTD.
香港黃竹坑道37號利達中心12樓
12/F., Leader Centre, 37 Wong Chuk Hang Road, Aberdeen, Hong Kong.
E-mail: smec@cigismec.com Website: www.cigismec.com
Tel: (852) 2873 6860
Fax: (852) 2555 7533

SMECLab

Test Data for Sound Level Meter

Sound level meter type: 2250-L Serial No. 2701822 Date 07-Mar-2017
Microphone type: 4950 Serial No. 2678780
Preamp type: ZC0032 Serial No. 12534 Report: 17CA0303 02-01

Positive polarities: (Weighting L, set the generator signal to single, LLPeak)

Ref. level	Response to 10 ms	Response to 100 us	Tolerance	Deviation
dB	dB	dB	+/- dB	dB
119.0	119.0	119.0	2.0	0.0

Negative polarities:

Ref. level	Response to 10 ms	Response to 100 us	Tolerance	Deviation
dB	dB	dB	+/- dB	dB
119.0	119.0	119.2	2.0	0.2

RMS ACCURACY TEST

The RMS detector accuracy is tested on the reference range for a crest factor of 3.

Test frequency: 2000 Hz
Amplitude: 2 dB below the upper limit of the primary indicator range.
Burst repetition frequency: 40 Hz
Tone burst signal: 11 cycles of a sine wave of frequency 2000 Hz. (Set to INT)

	Ref. Level	Expected level	Tone burst signal	Tolerance	Deviation
Time wighting	dB	dB	indication(dB)	+/- dB	dB
Slow	118.0+6.6	118.0	118.0	0.5	0.0

TIME WEIGHTING IMPULSE TEST

Time weighting I is tested on the reference range (Set the SLM to LAImax)
Test frequency: 2000 Hz
Amplitude: The upper limit of the primary indicator range.

Single sinusoidal burst of duration 5 ms:

Ref. Level	Single burst indication		Tolerance	Deviation
dB	Expected (dB)	Actual (dB)	+/- dB	dB
120.0	111.2	111.1	2.0	-0.1

Repeated at 100 Hz

Ref. Level	Repeated burst indication		Tolerance	Deviation
dB	Expected (dB)	Actual (dB)	+/- dB	dB
120.0	117.3	117.2	1.0	-0.1

TIME AVERAGING TEST

This test compares the SLM reading for continuous sine signals with readings obtained from a sine tone burst sequence having the same RMS level. The test level is 30 dB below the upper limit of the linearity range and repeated for Type 1 SLM with 40 dB below the upper limit of the linearity.

Frequency of tone burst: 4000 Hz
Duration of tone burst: 1 ms

Repetition Time	Level of tone burst	Expected Leq	Actual Leq	Tolerance	Deviation	Remarks
msec	dB	dB	dB	+/- dB	dB	
1000	110.0	110.0	109.9	1.0	-0.1	60s integ.
10000	100.0	100.0	100.0	1.0	0.0	6min. integ.

PULSE RANGE AND SOUND EXPOSURE LEVEL TEST

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香港黃竹坑道37號利達中心12樓
12/F., Leader Centre, 37 Wong Chuk Hang Road, Aberdeen, Hong Kong.
E-mail: smec@cigismec.com Website: www.cigismec.com
Tel: (852) 2873 6860
Fax: (852) 2555 7533

SMECLab

Sound level meter type:	2250-L		Serial No.	2701822	Date 07-Mar-2017
Microphone type:	4950		Serial No.	2678780	
Preamp type:	ZC0032		Serial No.	12534	Report: 17CA0303 02-01

The test tone burst signal is superimposed on a baseline signal corresponding to the lower limit of reference rar

Test frequency: 4000 Hz

Integration time: 10 sec

The integrating sound level meter set to Leq:

Duration	Rms level of	Expected	Actual	Tolerance	Deviation
msec	tone burst (dB)	dB	dB	+/- dB	dB
10	88.0	58.0	57.9	1.7	-0.1

The integrating sound level meter set to SEL:

Duration	Rms level of	Expected	Actual	Tolerance	Deviation
msec	tone burst (dB)	dB	dB	+/- dB	dB
10.0	88.0	68.0	67.9	1.7	-0.1

OVERLOAD INDICATION TEST

For SLM capable of operating in a non-integrating mode.

Test frequency: 2000 Hz
Amplitude: 2 dB below the upper limit of the primary indicator range.
Burst repetition frequency: 40 Hz
Tone burst signal: 11 cycles of a sine wave of frequency 2000 Hz.

Level	Level reduced by	Further reduced	Difference	Tolerance	Deviation
at overload (dB)	1 dB	3 dB	dB	dB	dB
135.5	134.5	131.5	3.0	1.0	0.0

For integrating SLM, with the instrument indicating Leq.

For integrating SLM, with the instrument indicating Leq and set to the reference range. The test signal as follow
The test tone burst signal is superimposed on a baseline signal corresponding to the lower limit of reference rar

Test frequency: 4000 Hz
Integration time: 10 sec
Single burst duration: 1 msec

Rms level	Level reduced by	Expected level	Actual level	Tolerance	Deviation
at overload (dB)	1 dB	dB	dB	dB	dB
142.6	141.6	101.6	101.5	2.2	-0.1

ACOUSTIC TEST

The acoustic test of the complete SLM is tested at the frequency 125 Hz and 8000 Hz using a B&K type 4226 Multifunction Acoustic Calibrator. The test is performed in A weighting.

Frequency	Expected level	Actual level	Tolerance (dB)		Deviation
Hz	dB	Measured (dB)	+	-	dB
1000	94.0	94.0	0.0	0.0	0.0
125	77.9	78.0	1.0	1.0	0.1
8000	92.9	92.5	1.5	3.0	-0.4

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

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

Certificate of Calibration
校正證書

Certificate No. : C170289
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC17-0085) Date of Receipt / 收件日期 : 12 January 2017

Description / 儀器名稱	:	Sound Level Meter
Manufacturer / 製造商	:	Brüel & Kjær
Model No. / 型號	:	2250
Serial No. / 編號	:	3000103
Supplied By / 委託者	:	ANewR Consulting Limited Unit 517, 5/F., Tower A, Regent Centre, 63 Wo Yi Hop Road, Kwai Chung, N.T. Hong Kong

TEST CONDITIONS / 測試條件

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

TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 18 January 2017

TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.
The results do not exceed manufacturer's specification.
The results are detailed in the subsequent page(s).

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

Tested By 測試 : H T Wong, Technical Officer

Certified By 核證 : K C Lee, Project Engineer

Date of Issue 簽發日期 : 18 January 2017

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

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

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Certificate No. : C170289
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1. The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 12 hours, and switched on to warm up for over 10 minutes before the commencement of the test.

2. Self-calibration using laboratory acoustic calibrator was performed before the test 6.1.1.2 to 6.3.2.

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

4. Test equipment :

Equipment ID	Description	Certificate No.
CL280	40 MHz Arbitrary Waveform Generator	C170048
CL281	Multifunction Acoustic Calibrator	PA160023

5. Test procedure : MA101N.

6. Results :

6.1 Sound Pressure Level

6.1.1 Reference Sound Pressure Level

6.1.1.1 Before Self-calibration

UUT Setting		Applied Value		UUT Reading (dB)
Range (dB)	Main	Level (dB)	Freq. (kHz)	
20 - 140	LAF (SPL)	94.00	1	94.2

6.1.1.2 After Self-calibration

UUT Setting		Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Main	Level (dB)	Freq. (kHz)		
20 - 140	LAF (SPL)	94.00	1	94.0	± 1.1

6.1.2 Linearity

UUT Setting		Applied Value		UUT Reading (dB)
Range (dB)	Main	Level (dB)	Freq. (kHz)	
20 - 140	LAF (SPL)	94.00	1	94.0 (Ref.)
		104.00		104.0
		114.00		114.0

IEC 61672 Class 1 Spec. : ± 0.6 dB per 10 dB step and ± 1.1 dB for overall different.

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6.2 Time Weighting

UUT Setting		Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Main	Level (dB)	Freq. (kHz)		
20 - 140	LAF (SPL)	94.00	1	94.0	Ref.
	LAS (SPL)			94.0	± 0.3

6.3 Frequency Weighting

6.3.1 A-Weighting

UUT Setting		Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Main	Level (dB)	Freq.		
20 - 140	LAF (SPL)	94.00	63 Hz	67.8	-26.2 ± 1.5
			125 Hz	77.8	-16.1 ± 1.5
			250 Hz	85.3	-8.6 ± 1.4
			500 Hz	90.7	-3.2 ± 1.4
			1 kHz	94.0	Ref.
			2 kHz	95.2	+1.2 ± 1.6
			4 kHz	94.9	+1.0 ± 1.6
			8 kHz	92.5	-1.1(+2.1 ; -3.1)
			12.5 kHz	89.4	-4.3(+3.0 ; -6.0)

6.3.2 C-Weighting

UUT Setting		Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Main	Level (dB)	Freq.		
20 - 140	LCF (SPL)	94.00	63 Hz	93.2	-0.8 ± 1.5
			125 Hz	93.8	-0.2 ± 1.5
			250 Hz	94.0	0.0 ± 1.4
			500 Hz	94.0	0.0 ± 1.4
			1 kHz	94.0	Ref.
			2 kHz	93.8	-0.2 ± 1.6
			4 kHz	93.1	-0.8 ± 1.6
			8 kHz	90.6	-3.0 (+2.1 ; -3.1)
			12.5 kHz	87.5	-6.2 (+3.0 ; -6.0)

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Certificate of Calibration
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Certificate No. : C170289
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Remarks : - UUT Microphone Model No. : 4950 & S/N : 2706974

- Mfr's Spec. : IEC 61672 Class 1

- Uncertainties of Applied Value :

94 dB	:	63 Hz - 125 Hz	: ± 0.35 dB
		250 Hz - 500 Hz	: ± 0.30 dB
		1 kHz	: ± 0.20 dB
		2 kHz - 4 kHz	: ± 0.35 dB
		8 kHz	: ± 0.45 dB
		12.5 kHz	: ± 0.70 dB
104 dB	:	1 kHz	: ± 0.10 dB (Ref. 94 dB)
114 dB	:	1 kHz	: ± 0.10 dB (Ref. 94 dB)

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

Note :
Only the original copy or the laboratory's certified true copy is valid.

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

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

綜合試驗有限公司
SOILS & MATERIALS ENGINEERING CO., LTD.
香港黃竹坑道37號利達中心12樓
12/F., Leader Centre, 37 Wong Chuk Hang Road, Aberdeen, Hong Kong.
E-mail: smec@cigismec.com Website: www.cigismec.com
Tel: (852) 2873 6860
Fax: (852) 2555 7533

HOKLAS 028
CAL

CERTIFICATE OF CALIBRATION

Certificate No.: 17CA0224 01 **Page** 1 **of** 2

Item tested

Description:	Sound Level Meter (Type 1)	Microphone	Preamp
Manufacturer:	B & K	B & K	B & K
Type/Model No.:	2250-L	4950	ZC0032
Serial/Equipment No.:	2701823	2678781	12533
Adaptors used:	-	-	-

Item submitted by

Customer Name:	Anewr Consulting Limited
Address of Customer:	Unit 517, 5/F Tower A, Regent Centre, 63 Wo Yip Hop Road, Kwai Chung
Request No.:	-
Date of receipt:	24-Feb-2017

Date of test: 06-Mar-2017

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:	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 ±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 responsess 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:** 08-Mar-2017 **Company Chop:** SOILS & MATERIALS ENGINEERING COMPANY LTD. 綜合試驗有限公司

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.

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Hong Kong Accreditation Service (HKAS) has accredited this laboratory (Reg. No. 028 - CAL) under the Hong Kong Laboratory Accreditation Scheme (HOKLAS) for specific calibration activities as listed in the HOKLAS Directory of Accredited Laboratories. The results shown in this certificate were determined by this laboratory in accordance with its terms of accreditation. Such terms of accreditation stipulate that the results shall be traceable to the International System of Units (S.I.) or recognised measurement standards. This certificate shall not be reproduced except in full.

綜合試驗有限公司
SOILS & MATERIALS ENGINEERING CO., LTD.
香港黃竹坑道37號利達中心12樓
12/F., Leader Centre, 37 Wong Chuk Hang Road, Aberdeen, Hong Kong.
E-mail: smec@cigismec.com Website: www.cigismec.com
Tel: (852) 2873 6860
Fax: (852) 2555 7533

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CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.: 17CA0224 01 **Page** 2 **of** 2

1, Electrical Tests

The electrical tests were perfomed 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	0.8	
	Lin	Pass	1.6	
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	A	Pass	0.3	
	C	Pass	0.3	
	Lin	Pass	0.3	
Time weightings	Single Burst Fast	Pass	0.3	
	Single Burst Slow	Pass	0.3	
Peak response	Single 100μs rectangular pulse	Pass	0.3	
R.M.S. accuracy	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: Fung Chi Yip **Date:** 06-Mar-2017

Checked by: Lam Tze Wai **Date:** 08-Mar-2017

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.

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SOILS & MATERIALS ENGINEERING CO., LTD.
香港黃竹坑道37號利達中心12樓
12/F., Leader Centre, 37 Wong Chuk Hang Road, Aberdeen, Hong Kong.
E-mail: smec@cigismec.com Website: www.cigismec.com
Tel: (852) 2873 6860
Fax: (852) 2555 7533

SMECLab

Test Data for Sound Level Meter

Sound level meter type:	2250-L	Serial No.	2701823	Date	06-Mar-2017
Microphone type:	4950	Serial No.	2678781		
Preamp type:	ZC0032	Serial No.	12533	Report:	17CA0224 01

SELF GENERATED NOISE TEST

The noise test is performed in the most sensitive range of the SLM with the microphone replaced by an equivalent impedance.

Noise level in A weighting	13.4	dB
Noise level in C weighting	16.1	dB
Noise level in Lin	22.1	dB

LINEARITY TEST

The linearity is tested relative to the reference sound pressure level using a continuous sinusoidal signal of frequency 4 kHz. The measurement is made on the reference range for indications at 5 dB intervals starting from the 94 dB reference sound pressure level. And until within 5 dB of the upper and lower limits of the reference range, the measurements shall be made at 1 dB intervals.(SLM set to LEQ/SPL)

Reference/Expected level	Actual level		Tolerance	Deviation	
	non-integrated	integrated		non-integrated	integrated
dB	dB	dB	+/- dB	dB	dB
94.0	94.0	94.0	0.7	0.0	0.0
99.0	99.0	99.0	0.7	0.0	0.0
104.0	104.0	104.0	0.7	0.0	0.0
109.0	109.0	109.0	0.7	0.0	0.0
114.0	114.0	114.0	0.7	0.0	0.0
119.0	119.0	119.0	0.7	0.0	0.0
124.0	124.0	124.0	0.7	0.0	0.0
129.0	129.0	129.0	0.7	0.0	0.0
134.0	134.0	134.0	0.7	0.0	0.0
135.0	135.0	135.0	0.7	0.0	0.0
136.0	136.0	136.0	0.7	0.0	0.0
137.0	137.0	137.0	0.7	0.0	0.0
138.0	138.0	138.0	0.7	0.0	0.0
139.0	139.0	139.0	0.7	0.0	0.0
140.0	140.0	140.0	0.7	0.0	0.0
89.0	89.0	89.0	0.7	0.0	0.0
84.0	84.0	84.0	0.7	0.0	0.0
79.0	79.0	79.0	0.7	0.0	0.0
74.0	74.0	74.0	0.7	0.0	0.0
69.0	69.0	69.0	0.7	0.0	0.0
64.0	64.0	64.0	0.7	0.0	0.0
59.0	59.0	59.0	0.7	0.0	0.0
54.0	54.0	53.9	0.7	0.0	-0.1
49.0	49.0	49.0	0.7	0.0	0.0
44.0	44.0	43.9	0.7	0.0	-0.1
39.0	39.0	39.0	0.7	0.0	0.0

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香港黃竹坑道37號利達中心12樓
12/F., Leader Centre, 37 Wong Chuk Hang Road, Aberdeen, Hong Kong.
E-mail: smec@cigismec.com Website: www.cigismec.com
Tel: (852) 2873 6860
Fax: (852) 2555 7533

SMECLab

Sound level meter type: 2250-L Serial No. 2701823 Date 06-Mar-2017

Microphone type: 4950 Serial No. 2678781

Preamp type: ZC0032 Serial No. 12533 Report: 17CA0224 01

34.0	34.0	33.9	0.7	0.0	-0.1
33.0	33.0	33.0	0.7	0.0	0.0
32.0	32.0	31.9	0.7	0.0	-0.1
31.0	31.1	31.0	0.7	0.1	0.0
30.0	30.1	30.0	0.7	0.1	0.0

Measurements for an indication of the reference SPL on all other ranges which include it

Other ranges	Expected level	Actual level	Tolerance	Deviation
dB	dB	dB	+/- dB	dB
20-140	94.0	94.0	0.7	0.0

Measurements on all level ranges for indications 2 dB below the upper limit and 2 dB above the lower limit

Ranges	Reference/Expected level	Actual level	Tolerance	Deviation
dB	dB	dB	+/- dB	dB
20-140	30.0	30.0	0.7	0.0
	138.0	138.0	0.7	0.0

FREQUENCY WEIGHTING TEST

The frequency response of the weighting netwoks are tested at octave intervals over the frequency ranges 31.5 Hz to 12500 Hz. The signal level at 1000 Hz is set to give an indication of the reference SPL.

Frequency weighting A:

Frequency	Ref. level	Expected level	Correction of electrical response	Actual level	Tolerance(dB)		Deviation *
Hz	dB	dB	dB	dB	+	-	dB
1000.0	94.0	94.0	0.0	94.0	0.0	0.0	0.0
31.6	94.0	54.6	N/A	54.6	1.5	1.5	0.0
63.1	94.0	67.8	0.0	67.8	1.5	1.5	0.0
125.9	94.0	77.9	0.0	77.9	1.0	1.0	0.0
251.2	94.0	85.4	0.0	85.4	1.0	1.0	0.0
501.2	94.0	90.8	0.0	90.8	1.0	1.0	0.0
1995.0	94.0	95.2	0.0	95.2	1.0	1.0	0.0
3981.0	94.0	95.0	-0.1	94.9	1.0	1.0	0.0
7943.0	94.0	92.9	-0.3	92.6	1.5	3.0	0.0
12590.0	94.0	89.7	-0.3	89.4	3.0	6.0	0.0

Frequency weighting C:

Frequency	Ref. level	Expected level	Correction of electrical response	Actual level	Tolerance(dB)		Deviation *
Hz	dB	dB	dB	dB	+	-	dB
1000.0	94.0	94.0	0.0	94.0	0.0	0.0	0.0
31.6	94.0	91.0	N/A	91.1	1.5	1.5	0.1
63.1	94.0	93.2	0.0	93.2	1.5	1.5	0.0
125.9	94.0	93.8	0.0	93.8	1.0	1.0	0.0
251.2	94.0	94.0	0.0	94.0	1.0	1.0	0.0

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12/F., Leader Centre, 37 Wong Chuk Hang Road, Aberdeen, Hong Kong.
E-mail: smec@cigismec.com Website: www.cigismec.com
Tel: (852) 2873 6860
Fax: (852) 2555 7533

SMECLab

Sound level meter type: 2250-L Serial No. 2701823 Date 06-Mar-2017

Microphone type: 4950 Serial No. 2678781

Preamp type: ZC0032 Serial No. 12533 Report: 17CA0224 01

501.2	94.0	94.0	0.0	94.0	1.0	1.0	0.0
1995.0	94.0	93.8	0.0	93.8	1.0	1.0	0.0
3981.0	94.0	93.2	-0.1	93.1	1.0	1.0	0.0
7943.0	94.0	91.0	-0.3	90.7	1.5	3.0	0.0
12590.0	94.0	87.8	-0.3	87.5	3.0	6.0	0.0

Frequency weighting Lin:

Frequency	Ref. level	Expected level	Correction of electrical response	Actual level	Tolerance(dB)		Deviation *
Hz	dB	dB	dB	dB	+	-	dB
1000.0	94.0	94.0	0.0	94.0	0.0	0.0	0.0
31.6	94.0	94.0	N/A	94.1	1.5	1.5	0.1
63.1	94.0	94.0	0.0	94.0	1.5	1.5	0.0
125.9	94.0	94.0	0.0	94.0	1.0	1.0	0.0
251.2	94.0	94.0	0.0	94.0	1.0	1.0	0.0
501.2	94.0	94.0	0.0	94.0	1.0	1.0	0.0
1995.0	94.0	94.0	0.0	94.0	1.0	1.0	0.0
3981.0	94.0	94.0	-0.1	93.9	1.0	1.0	0.0
7943.0	94.0	94.0	-0.3	93.7	1.5	3.0	0.0
12590.0	94.0	94.0	-0.3	93.7	3.0	6.0	0.0

*Deviation = Actual level - (Expected level + Correction of electrical response)

The correction of electrical response is specified in the Table A.2 of technical documentation of BE 1853-11. The maximum expanded uncertainty of correction of electrical response is 0.3 dB.

TIME WEIGHTING FAST TEST

Time weighting F is tested on the reference range with a single sinusoidal burst of duration 200 ms at a frequency 2000 Hz and an amplitude which produces an indication 4 dB below the upper limit of the primary indicator range when the signal is continuous. (Weight A, Maximum hold)

Ref. level	Expected level	Actual level	Tolerance(dB)		Deviation
dB	dB	dB	+	-	dB
116.0	115.0	115.0	1.0	1.0	0.0

TIME WEIGHTING SLOW TEST

Time weighting S is tested on the reference range with a single sinusoidal burst of duration 500 ms at a frequency 2000 Hz and an amplitude which produces an indication 4 dB below the upper limit of the primary indicator range when the signal is continuous. (Weight A, Maximum hold)

Ref. level	Expected level	Actual level	Tolerance(dB)		Deviation
dB	dB	dB	+	-	dB
116.0	111.9	111.9	1.0	1.0	0.0

PEAK RESPONSE TEST

The onset time of the peak detector is tested on the reference range by comparing the response to a 100 us rectangular test pulse with the response to a 10 ms reference pulse of the same amplitude. The amplitude of the 10 ms reference pulse is such as to produce an indication 1 dB below the upper limit of the primary indicator range.

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12/F., Leader Centre, 37 Wong Chuk Hang Road, Aberdeen, Hong Kong.
E-mail: smec@cigismec.com Website: www.cigismec.com
Tel: (852) 2873 6860
Fax: (852) 2555 7533

SMECLab

Sound level meter type:	2250-L	Serial No.	2701823	Date	06-Mar-2017
Microphone type:	4950	Serial No.	2678781		
Preamp type:	ZC0032	Serial No.	12533	Report:	17CA0224 01

Positive polarities: (Weighting L, set the generator signal to single, LLPeak)

Ref. level	Response to 10 ms	Response to 100 us	Tolerance	Deviation
dB	dB	dB	+/- dB	dB
119.0	119.0	119.1	2.0	0.1

Negative polarities:

Ref. level	Response to 10 ms	Response to 100 us	Tolerance	Deviation
dB	dB	dB	+/- dB	dB
119.0	119.0	119.1	2.0	0.1

RMS ACCURACY TEST

The RMS detector accuracy is tested on the reference range for a crest factor of 3.

Test frequency: 2000 Hz
Amplitude: 2 dB below the upper limit of the primary indicator range.
Burst repetition frequency: 40 Hz
Tone burst signal: 11 cycles of a sine wave of frequency 2000 Hz. (Set to INT)

	Ref. Level	Expected level	Tone burst signal	Tolerance	Deviation
Time wighting	dB	dB	indication(dB)	+/- dB	dB
Slow	118.0+6.6	118.0	118.0	0.5	0.0

TIME WEIGHTING IMPULSE TEST

Time weighting I is tested on the reference range (Set the SLM to LAImax)
Test frequency: 2000 Hz
Amplitude: The upper limit of the primary indicator range.

Single sinusoidal burst of duration 5 ms:

Ref. Level	Single burst indication		Tolerance	Deviation
dB	Expected (dB)	Actual (dB)	+/- dB	dB
120.0	111.2	111.1	2.0	-0.1

Repeated at 100 Hz

Ref. Level	Repeated burst indication		Tolerance	Deviation
dB	Expected (dB)	Actual (dB)	+/- dB	dB
120.0	117.3	117.2	1.0	-0.1

TIME AVERAGING TEST

This test compares the SLM reading for continuous sine signals with readings obtained from a sine tone burst sequence having the same RMS level. The test level is 30 dB below the upper limit of the linearity range and repeated for Type 1 SLM with 40 dB below the upper limit of the linearity.

Frequency of tone burst: 4000 Hz

Duration of tone burst: 1 ms

Repetition Time	Level of tone burst	Expected Leq	Actual Leq	Tolerance	Deviation	Remarks
msec	dB	dB	dB	+/- dB	dB	
1000	110.0	110.0	109.9	1.0	-0.1	60s integ.
10000	100.0	100.0	100.0	1.0	0.0	6min. integ.

PULSE RANGE AND SOUND EXPOSURE LEVEL TEST

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E-mail: smec@cigismec.com Website: www.cigismec.com
Tel: (852) 2873 6860
Fax: (852) 2555 7533

SMECLab

Sound level meter type:	2250-L	Serial No.	2701823	Date	06-Mar-2017
Microphone type:	4950	Serial No.	2678781		
Preamp type:	ZC0032	Serial No.	12533	Report:	17CA0224 01

The test tone burst signal is superimposed on a baseline signal corresponding to the lower limit of reference rar

Test frequency: 4000 Hz

Integration time: 10 sec

The integrating sound level meter set to Leq:

Duration	Rms level of	Expected	Actual	Tolerance	Deviation
msec	tone burst (dB)	dB	dB	+/- dB	dB
10	88.0	58.0	57.9	1.7	-0.1

The integrating sound level meter set to SEL:

Duration	Rms level of	Expected	Actual	Tolerance	Deviation
msec	tone burst (dB)	dB	dB	+/- dB	dB
10.0	88.0	68.0	67.9	1.7	-0.1

OVERLOAD INDICATION TEST

For SLM capable of operating in a non-integrating mode.

Test frequency: 2000 Hz
Amplitude: 2 dB below the upper limit of the primary indicator range.
Burst repetition frequency: 40 Hz
Tone burst signal: 11 cycles of a sine wave of frequency 2000 Hz.

Level	Level reduced by	Further reduced	Difference	Tolerance	Deviation
at overload (dB)	1 dB	3 dB	dB	dB	dB
135.4	134.4	131.4	3.0	1.0	0.0

For integrating SLM, with the instrument indicating Leq.

For integrating SLM, with the instrument indicating Leq and set to the reference range. The test signal as follow
The test tone burst signal is superimposed on a baseline signal corresponding to the lower limit of reference rar

Test frequency: 4000 Hz
Integration time: 10 sec
Single burst duration: 1 msec

Rms level	Level reduced by	Expected level	Actual level	Tolerance	Deviation
at overload (dB)	1 dB	dB	dB	dB	dB
142.5	141.5	101.5	101.4	2.2	-0.1

ACOUSTIC TEST

The acoustic test of the complete SLM is tested at the frequency 125 Hz and 8000 Hz using a B&K type 4226 Multifunction Acoustic Calibrator. The test is performed in A weighting.

Frequency	Expected level	Actual level	Tolerance (dB)		Deviation
Hz	dB	Measured (dB)	+	-	dB
1000	94.0	94.0	0.0	0.0	0.0
125	77.9	77.9	1.0	1.0	0.0
8000	92.9	93.1	1.5	3.0	0.2

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

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E-mail: smec@cigismec.com Website: www.cigismec.com
Tel: (852) 2873 6860
Fax: (852) 2555 7533

HOKLAS 028
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CERTIFICATE OF CALIBRATION

Certificate No.: 17CA0217 01-01 **Page** 1 **of** 2

Item tested

Description:	Sound Level Meter (Type 1)	Microphone	Preamp
Manufacturer:	B & K	B & K	B & K
Type/Model No.:	2250-L	4950	ZC0032
Serial/Equipment No.:	2701827	2778450	12549
Adaptors used:	-	-	-

Item submitted by

Customer Name:	Anewr Consulting Limited
Address of Customer:	Unit 517, 5/F Tower A, Regent Centre, 63 Wo Yip Hop Road, Kwai Chung
Request No.:	-
Date of receipt:	17-Feb-2017

Date of test: 18-Feb-2017

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:	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 ±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 responsess 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:** 20-Feb-2017 **Company Chop:** SOILS & MATERIALS ENGINEERING COMPANY LTD. 綜合試驗有限公司

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.

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Tel: (852) 2873 6860
Fax: (852) 2555 7533

HOKLAS 028 CAL

CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.: - 17CA0217 01-01 **Page** 2 **of** 2

1, Electrical Tests

The electrical tests were perfomed 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	0.8	
	Lin	Pass	1.6	
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	A	Pass	0.3	
	C	Pass	0.3	
	Lin	Pass	0.3	
Time weightings	Single Burst Fast	Pass	0.3	
	Single Burst Slow	Pass	0.3	
Peak response	Single 100μs rectangular pulse	Pass	0.3	
R.M.S. accuracy	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: Fung Chi Yip **Date:** 18-Feb-2017

Checked by: Lam Tze Wai **Date:** 20-Feb-2017

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.

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Tel: (852) 2873 6860
Fax: (852) 2555 7533

SMECLab

Test Data for Sound Level Meter

Sound level meter type:	2250-L	Serial No.	2701827	Date	18-Feb-2017
Microphone type:	4950	Serial No.	2778450		
Preamp type:	ZC0032	Serial No.	12549	Report:	17CA0217 01-01

SELF GENERATED NOISE TEST

The noise test is performed in the most sensitive range of the SLM with the microphone replaced by an equivalent impedance.

Noise level in A weighting	14.6	dB
Noise level in C weighting	16.5	dB
Noise level in Lin	23.7	dB

LINEARITY TEST

The linearity is tested relative to the reference sound pressure level using a continuous sinusoidal signal of frequency 4 kHz. The measurement is made on the reference range for indications at 5 dB intervals starting from the 94 dB reference sound pressure level. And until within 5 dB of the upper and lower limits of the reference range, the measurements shall be made at 1 dB intervals.(SLM set to LEQ/SPL)

Reference/Expected level	Actual level		Tolerance	Deviation	
	non-integrated	integrated		non-integrated	integrated
dB	dB	dB	+/- dB	dB	dB
94.0	94.0	94.0	0.7	0.0	0.0
99.0	99.0	99.0	0.7	0.0	0.0
104.0	104.0	104.0	0.7	0.0	0.0
109.0	109.0	109.0	0.7	0.0	0.0
114.0	114.0	114.0	0.7	0.0	0.0
119.0	119.0	119.0	0.7	0.0	0.0
124.0	124.0	124.0	0.7	0.0	0.0
129.0	129.0	129.0	0.7	0.0	0.0
134.0	134.0	134.0	0.7	0.0	0.0
135.0	135.0	135.0	0.7	0.0	0.0
136.0	136.0	136.0	0.7	0.0	0.0
137.0	137.0	137.0	0.7	0.0	0.0
138.0	138.0	138.0	0.7	0.0	0.0
139.0	139.0	139.0	0.7	0.0	0.0
140.0	140.0	140.0	0.7	0.0	0.0
89.0	89.0	89.0	0.7	0.0	0.0
84.0	84.0	84.0	0.7	0.0	0.0
79.0	79.0	79.0	0.7	0.0	0.0
74.0	74.0	74.0	0.7	0.0	0.0
69.0	69.0	69.0	0.7	0.0	0.0
64.0	64.0	64.0	0.7	0.0	0.0
59.0	59.0	59.0	0.7	0.0	0.0
54.0	54.0	54.0	0.7	0.0	0.0
49.0	49.0	49.0	0.7	0.0	0.0
44.0	44.0	44.0	0.7	0.0	0.0
39.0	39.0	39.0	0.7	0.0	0.0

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綜合試驗有限公司
SOILS & MATERIALS ENGINEERING CO., LTD.
香港黃竹坑道37號利達中心12樓
12/F., Leader Centre, 37 Wong Chuk Hang Road, Aberdeen, Hong Kong.
E-mail: smec@cigismec.com Website: www.cigismec.com
Tel: (852) 2873 6860
Fax: (852) 2555 7533

SMECLab

Test Data for Sound Level Meter

Sound level meter type:	2250-L	Serial No.	2701827	Date	18-Feb-2017
Microphone type:	4950	Serial No.	2778450		
Preamp type:	ZC0032	Serial No.	12549	Report:	17CA0217 01-01

34.0	34.0	34.0	0.7	0.0	0.0
33.0	33.0	33.0	0.7	0.0	0.0
32.0	32.0	32.0	0.7	0.0	0.0
31.0	31.0	31.0	0.7	0.0	0.0
30.0	30.0	30.0	0.7	0.0	0.0

Measurements for an indication of the reference SPL on all other ranges which include it

Other ranges	Expected level	Actual level	Tolerance	Deviation
dB	dB	dB	+/- dB	dB
20-140	94.0	94.0	0.7	0.0

Measurements on all level ranges for indications 2 dB below the upper limit and 2 dB above the lower limit

Ranges	Reference/Expected level	Actual level	Tolerance	Deviation
dB	dB	dB	+/- dB	dB
20-140	30.0	30.0	0.7	0.0
	138.0	138.0	0.7	0.0

FREQUENCY WEIGHTING TEST

The frequency response of the weighting netwoks are tested at octave intervals over the frequency ranges 31.5 Hz to 12500 Hz. The signal level at 1000 Hz is set to give an indication of the reference SPL.

Frequency weighting A:

Frequency	Ref. level	Expected level	Correction of electrical response	Actual level	Tolerance(dB)		Deviation *
Hz	dB	dB	dB	dB	+	-	dB
1000.0	94.0	94.0	0.0	94.0	0.0	0.0	0.0
31.6	94.0	54.6	N/A	54.6	1.5	1.5	0.0
63.1	94.0	67.8	0.0	67.8	1.5	1.5	0.0
125.9	94.0	77.9	0.0	77.9	1.0	1.0	0.0
251.2	94.0	85.4	0.0	85.4	1.0	1.0	0.0
501.2	94.0	90.8	0.0	90.8	1.0	1.0	0.0
1995.0	94.0	95.2	0.0	95.2	1.0	1.0	0.0
3981.0	94.0	95.0	-0.1	94.9	1.0	1.0	0.0
7943.0	94.0	92.9	-0.3	92.6	1.5	3.0	0.0
12590.0	94.0	89.7	-0.3	89.4	3.0	6.0	0.0

Frequency weighting C:

Frequency	Ref. level	Expected level	Correction of electrical response	Actual level	Tolerance(dB)		Deviation *
Hz	dB	dB	dB	dB	+	-	dB
1000.0	94.0	94.0	0.0	94.0	0.0	0.0	0.0
31.6	94.0	91.0	N/A	91.1	1.5	1.5	0.1
63.1	94.0	93.2	0.0	93.2	1.5	1.5	0.0
125.9	94.0	93.8	0.0	93.8	1.0	1.0	0.0
251.2	94.0	94.0	0.0	94.0	1.0	1.0	0.0

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香港黃竹坑道37號利達中心12樓
12/F., Leader Centre, 37 Wong Chuk Hang Road, Aberdeen, Hong Kong.
E-mail: smec@cigismec.com Website: www.cigismec.com
Tel: (852) 2873 6860
Fax: (852) 2555 7533

SMECLab

Test Data for Sound Level Meter

Sound level meter type: 2250-L Serial No. 2701827 Date 18-Feb-2017
Microphone type: 4950 Serial No. 2778450
Preamp type: ZC0032 Serial No. 12549 Report: 17CA0217 01-01

501.2	94.0	94.0	0.0	94.0	1.0	1.0	0.0
1995.0	94.0	93.8	0.0	93.8	1.0	1.0	0.0
3981.0	94.0	93.2	-0.1	93.1	1.0	1.0	0.0
7943.0	94.0	91.0	-0.3	90.7	1.5	3.0	0.0
12590.0	94.0	87.8	-0.3	87.4	3.0	6.0	-0.1

Frequency weighting Lin:

Frequency	Ref. level	Expected level	Correction of electrical response	Actual level	Tolerance(dB)		Deviation *
Hz	dB	dB	dB	dB	+	-	dB
1000.0	94.0	94.0	0.0	94.0	0.0	0.0	0.0
31.6	94.0	94.0	N/A	94.1	1.5	1.5	0.1
63.1	94.0	94.0	0.0	94.0	1.5	1.5	0.0
125.9	94.0	94.0	0.0	94.0	1.0	1.0	0.0
251.2	94.0	94.0	0.0	94.0	1.0	1.0	0.0
501.2	94.0	94.0	0.0	94.0	1.0	1.0	0.0
1995.0	94.0	94.0	0.0	94.0	1.0	1.0	0.0
3981.0	94.0	94.0	-0.1	93.9	1.0	1.0	0.0
7943.0	94.0	94.0	-0.3	93.7	1.5	3.0	0.0
12590.0	94.0	94.0	-0.3	93.7	3.0	6.0	0.0

*Deviation = Actual level - (Expected level + Correction of electrical response)
The correction of electrical response is specified in the Table A.2 of technical documentation of BE 1853-11. The maximum expanded uncertainty of correction of electrical response is 0.3 dB.

TIME WEIGHTING FAST TEST

Time weighting F is tested on the reference range with a single sinusoidal burst of duration 200 ms at a frequency 2000 Hz and an amplitude which produces an indication 4 dB below the upper limit of the primary indicator range when the signal is continuous. (Weight A, Maximum hold)

Ref. level	Expected level	Actual level	Tolerance(dB)		Deviation
dB	dB	dB	+	-	dB
116.0	115.0	115.0	1.0	1.0	0.0

TIME WEIGHTING SLOW TEST

Time weighting S is tested on the reference range with a single sinusoidal burst of duration 500 ms at a frequency 2000 Hz and an amplitude which produces an indication 4 dB below the upper limit of the primary indicator range when the signal is continuous. (Weight A, Maximum hold)

Ref. level	Expected level	Actual level	Tolerance(dB)		Deviation
dB	dB	dB	+	-	dB
116.0	111.9	111.9	1.0	1.0	0.0

PEAK RESPONSE TEST

The onset time of the peak detector is tested on the reference range by comparing the response to a 100 us rectangular test pulse with the response to a 10 ms reference pulse of the same amplitude. The amplitude of the 10 ms reference pulse is such as to produce an indication 1 dB below the upper limit of the primary indicator range.

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SOILS & MATERIALS ENGINEERING CO., LTD.
香港黃竹坑道37號利達中心12樓
12/F., Leader Centre, 37 Wong Chuk Hang Road, Aberdeen, Hong Kong.
E-mail: smec@cigismec.com Website: www.cigismec.com
Tel: (852) 2873 6860
Fax: (852) 2555 7533

SMECLab

Test Data for Sound Level Meter

Sound level meter type:	2250-L	Serial No.	2701827	Date	18-Feb-2017
Microphone type:	4950	Serial No.	2778450		
Preamp type:	ZC0032	Serial No.	12549	Report:	17CA0217 01-01

Positive polarities: (Weighting L, set the generator signal to single, LLPeak)

Ref. level	Response to 10 ms	Response to 100 us	Tolerance	Deviation
dB	dB	dB	+/- dB	dB
119.0	119.0	118.8	2.0	-0.2

Negative polarities:

Ref. level	Response to 10 ms	Response to 100 us	Tolerance	Deviation
dB	dB	dB	+/- dB	dB
119.0	119.0	118.8	2.0	-0.2

RMS ACCURACY TEST

The RMS detector accuracy is tested on the reference range for a crest factor of 3.

Test frequency: 2000 Hz
Amplitude: 2 dB below the upper limit of the primary indicator range.
Burst repetition frequency: 40 Hz
Tone burst signal: 11 cycles of a sine wave of frequency 2000 Hz. (Set to INT)

	Ref. Level	Expected level	Tone burst signal	Tolerance	Deviation
Time wighting	dB	dB	indication(dB)	+/- dB	dB
Slow	118.0+6.6	118.0	117.9	0.5	-0.1

TIME WEIGHTING IMPULSE TEST

Time weighting I is tested on the reference range (Set the SLM to LAImax)
Test frequency: 2000 Hz
Amplitude: The upper limit of the primary indicator range.

Single sinusoidal burst of duration 5 ms:

Ref. Level	Single burst indication		Tolerance	Deviation
dB	Expected (dB)	Actual (dB)	+/- dB	dB
120.0	111.2	111.1	2.0	-0.1

Repeated at 100 Hz

Ref. Level	Repeated burst indication		Tolerance	Deviation
dB	Expected (dB)	Actual (dB)	+/- dB	dB
120.0	117.3	117.2	1.0	-0.1

TIME AVERAGING TEST

This test compares the SLM reading for continuous sine signals with readings obtained from a sine tone burst sequence having the same RMS level. The test level is 30 dB below the upper limit of the linearity range and repeated for Type 1 SLM with 40 dB below the upper limit of the linearity.

Frequency of tone burst: 4000 Hz
Duration of tone burst: 1 ms

Repetition Time	Level of tone burst	Expected Leq	Actual Leq	Tolerance	Deviation	Remarks
msec	dB	dB	dB	+/- dB	dB	
1000	110.0	110.0	109.9	1.0	-0.1	60s integ.
10000	100.0	100.0	99.9	1.0	-0.1	6min. integ.

PULSE RANGE AND SOUND EXPOSURE LEVEL TEST

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SOILS & MATERIALS ENGINEERING CO., LTD.
香港黃竹坑道37號利達中心12樓
12/F., Leader Centre, 37 Wong Chuk Hang Road, Aberdeen, Hong Kong.
E-mail: smec@cigismec.com Website: www.cigismec.com
Tel: (852) 2873 6860
Fax: (852) 2555 7533

SMECLab

Sound level meter type:	2250-L	Serial No.	2701827	Date	18-Feb-2017
Microphone type:	4950	Serial No.	2778450		
Preamp type:	ZC0032	Serial No.	12549	Report:	17CA0217 01-01

The test tone burst signal is superimposed on a baseline signal corresponding to the lower limit of reference rar

Test frequency: 4000 Hz

Integration time: 10 sec

The integrating sound level meter set to Leq:

Duration	Rms level of	Expected	Actual	Tolerance	Deviation
msec	tone burst (dB)	dB	dB	+/- dB	dB
10	120.0	90.0	89.9	1.7	-0.1

The integrating sound level meter set to SEL:

Duration	Rms level of	Expected	Actual	Tolerance	Deviation
msec	tone burst (dB)	dB	dB	+/- dB	dB
10.0	120.0	100.0	99.9	1.7	-0.1

OVERLOAD INDICATION TEST

For SLM capable of operating in a non-integrating mode.

Test frequency: 2000 Hz
Amplitude: 2 dB below the upper limit of the primary indicator range.
Burst repetition frequency: 40 Hz
Tone burst signal: 11 cycles of a sine wave of frequency 2000 Hz.

Level	Level reduced by	Further reduced	Difference	Tolerance	Deviation
at overload (dB)	1 dB	3 dB	dB	dB	dB
137.0	136.0	133.0	3.0	1.0	0.0

For integrating SLM, with the instrument indicating Leq.

For integrating SLM, with the instrument indicating Leq and set to the reference range. The test signal as follow
The test tone burst signal is superimposed on a baseline signal corresponding to the lower limit of reference rar

Test frequency: 4000 Hz
Integration time: 10 sec
Single burst duration: 1 msec

Rms level	Level reduced by	Expected level	Actual level	Tolerance	Deviation
at overload (dB)	1 dB	dB	dB	dB	dB
143.6	142.6	102.6	102.5	2.2	-0.1

ACOUSTIC TEST

The acoustic test of the complete SLM is tested at the frequency 125 Hz and 8000 Hz using a B&K type 4226 Multifunction Acoustic Calibrator. The test is performed in A weighting.

Frequency	Expected level	Actual level	Tolerance (dB)		Deviation
Hz	dB	Measured (dB)	+	-	dB
1000	94.0	94.0	0.0	0.0	0.0
125	77.9	78.1	1.0	1.0	0.2
8000	92.9	91.7	1.5	3.0	-1.2

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