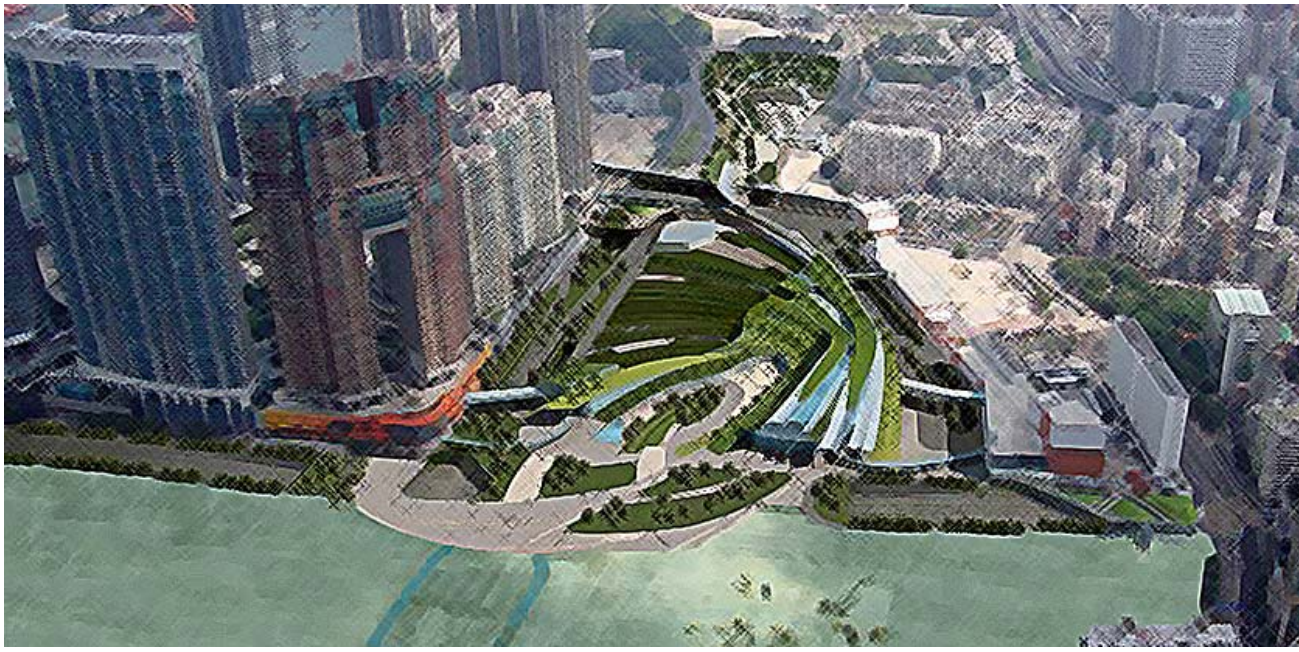
Hong Kong Section of Guangzhou-Shenzhen-Hong Kong Express Rail Link



Environmental Monitoring and Audit Report

December 2014

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. 58 (December 2014)

Certified by: 

Position: Environmental Team Leader

Date: 15 JAN 2015

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. 58 (December 2014)

Verified by: _____

Position: Independent Environmental Checker

Date: 15 January 2015

EXECUTIVE SUMMARY

This is the 58th monthly Environmental Monitoring and Audit (EM&A) Report presenting the EM&A works undertaken during the period from 1 to 31 December 2014 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 I and H), Kwai Chung (Works Area J), Mei Foo (Works Area L), Nam Cheong (Works Area P, Q and R) 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 33 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 I and H), Kwai Chung, (Works Area J and K), Mei Foo (Works Area L), Nam Cheong (Works Area M, N, O, P, Q, R, 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

Ground-borne noise was measured in terms of $L_{eq(30min)}$ dB(A) with L_{10} and L_{90} measurements as reference at 1 ground-borne noise monitoring location when the TBM cutter head was operating in vicinity.

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

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-2a/3), Pat Heung Ventilation Building Works Area (PHV-1) and Tse Uk Tsuen (TUW-1/2). In general, majority of the survey sites demonstrated similar magnitude in the number of species when compared to baseline results, except there was a decrease at TPP-1 survey site, and a slight decrease at SSS-2b survey site. The contractor was recommended to review the construction activities near TPP-1, and provide noise mitigation measures, where applicable, to further reduce noise nuisance in the area. The ET would closely monitor the works and keep in view the upcoming monitoring records. Additional remedial actions would be requested to implement by the contractor if decreasing trend is observed.

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, 810B, 811A and 811B in West Kowloon, 802 and 820 in Nam Cheong, 821 in Kwai Chung, 822 in Pat Heung, Shing Mun, Shek Yam, Tai Shu Ha Road West Magazine Site, So Kwun Wat Nursery and Magazine Site and Tsing Chau Tsai Barging Point, 823A and 823B in Shek Kong, Tse Uk Tsuen, To Kau Wan stockpiling facility and Rambler Channel Barging Point, 824 in Ngau Tam Mei and Tai Kong Po and 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, three environmental complaints were referred from EPD. The environmental complaints received were related to lighting nuisance from construction plant at Ngau Tam Mei site during night time and night time construction noise near the construction sites at Hoi Wang Road and West Kowloon. Complaint investigations are being conducted in accordance with the complaint handling procedure in the EM&A Manual. Details of complaints are contained in Section 7.

Four exceedances of air-borne noise Limit Level were recorded at No. 306 Sheung Tsuen San Tsuen Village House (CN15) on 8 December, Yaumati Catholic Primary School (CN29) on 8 December and Podium next to Tower 3, The Waterfront (CN32) on 8 and 22 December 2014. No air-borne noise action level exceedance was recorded in the reporting month.

In the reporting month, exceedances of ground-borne noise Limit Level were recorded at GN31 (DD110 LOT 482, Wang Toi Shan) on 1, 2 and 3 December.

In the reporting month, two 24-hour TSP Action Level exceedances were recorded at Kong Tai Road Village House (AM 3) and Leung Uk Tsuen Squats (AM 5) on 15 December 2014.

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, N, O, P, Q, R, S, T, U, V1, V2, W, Y, Z, AA, AC, AE, AG, MWS, YY and ARW.

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 **14**
5 MONITORING RESULT **27**
6 SITE INSPECTION **49**
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 Certificate

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 58th monthly Environmental Monitoring and Audit (EM&A) Report presenting the EM&A works undertaken during the period from 1 to 31 December 2014 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 58th month of civil construction in Works Area A, B, C, D, D1, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V1, V2, W, Y, Z, AA, AC, AE AG, MWS, YY and ARW for December 2014. It is anticipated that the civil construction be completed in year 2017. 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	Pile cap construction works including formwork erection, steel fixing and concreting.
805	N,O	Minor site reinstatement
805	S	Minor site reinstatement
West Kowloon		
810A	V1	Excavation and site formation; Pre-bored for sheet piling; Sheet Piling; Slab construction; Column installation; Erection of falsework; Footing and Cruciform column encasement; Strut and bracing installation; Cofferdam construction; Rebar fixing; Welding; Concrete curing; Temp support erection; Wall construction; Water proofing work; Blasting and Ramp construction
810A	Mong Wing Street (MWS)	Material Storage Area
810A	Yick Yuen Site (YY)	Material Storage Area
810A	Austin Road West (ARW)	Material Storage Area

Contract	**Works Area**	**Major Construction Activities**
810B	V1	Preboring, Installation/Dismantling of Strutting, Bored Piling, Sheet piling, 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 ARW Underpass, Construction of Sewerage Pipeline & Manholes, Haul Road Improvement Work, Bottom Up Erection of Formwork, OTE and Platform installation at B4 slab of main station box, Coring / Cutting Openings; Screen Wall Construction at B4 slab of main station box
810B	W	Operation of Barging Facilities
811A	V2	Excavation, strut removal, rebar fixing and concreting for tunnel box and MKV building, EVA road construction, LV room construction, P-way access shaft construction, and backfilling
811A	U	Site Office
811B	V2	Breaking D-wall Construction Joint; Installation of waterproofing to base slab; Casting base slab, walls and overhead ventilation duct (OHVD) of Approach Tunnel and top slab; Removal of temporary shoring; Backfilling to Approach Tunnel; Construct PTI Landscape Deck structures and columns; Removal of interface D-wall; Utilities support removal; Well installation for pumping test; Shoring removal for Lin Cheung Road Underpass; Backfilling for Jordan Road Reinstatement; Casting of Footbridge 4 deck structure
820	V2	Cut and cover tunnel construction
Nam Cheong		
811B	Y	Operation of Nam Cheong Barging Point
820	M	Nil
820	P	Ventilation Building construction Underground utility diversion Cut and cover tunnel construction
820	Q	Road reinstatement
820	R	Road reinstatement

Contract	**Works Area**	**Major Construction Activities**
820	S	Nil
816D	T	Site Office
820	Y	Slurry Treatment Plant dismantling
821	Y	Operation of the barging point, stockpiling, delivery of excavated materials from XRL projects by barge
Mei Foo		
820	L	Nil
Kwai Chung		
821	J	Kwai Chung Ventilation Building external works (utility connection works); Site reinstatement; Provision of cover of the cross ducts in main tunnel
Pat Heung		
822	F	Construction of tunnel and building construction
Shek Yam		
822	H	Tunnel construction
822	I	Storage of equipment and material
822	K	Site Office
Shing Mun		
822	G	Shaft construction, building construction
So Kwun Wat		
822	AC	Nil
Tai Shu Ha Road West Magazine Site		
822	AE	Nil
Tsing Chau Tsai Barging Point		

Contract	Works Area	Major Construction Activities
822	AG	Nil
Shek Kong Stabling Sidings		
823A& 823B	D and D1	Superstructure works for buildings, TBM assembling, maintenance and operation, and river habitat restoration works
Tse Uk Tsuen		
822&823A	E	Tunnel construction, TBM operation and maintenance
Rambler Channel Barging Point		
823B	Z	Nil
Ngau Tam Mei		
824	B	Tunnel and ventilation building construction
Tai Kong Po		
824	C	Tunnel construction and ventilation building construction. EVA road and drainage works.
Mai Po		
825	A	Construction of cross-passage, ventilation building, retaining wall and drainage.
826	A	TBM driving
Siu Lam Barging Point		
825	AA	Nil
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 802 (Works Area Q)			
1	Construction Noise Permit for construction works at Nam Cheong Station Entrance	2 Dec 2014	Permit granted (No. GW-RW0994-14) Valid till 14 Jun 2015
Contract 810A (Works Area V1)			
1	Construction Noise Permit (General Works)	9 Dec 2014	Granted on 18 Dec 2014 Permit No. GW-RE1425-14, valid from 23 Dec 2014 to 31 Mar 2015

Item	Item Description	Application Date	Permit Status
Contract 810B (Works Area V1)			
1	Construction Noise Permit (General Works)	12 Dec 2014	Granted on 24 Dec 2014 Permit No. GW-RE1476-14, valid from 12 Jan 2015 to 18 Feb 2015
Contract 810B (Works Area W)			
1	No updates in the reporting month		
Contract 811A (Works Area V2)			
1	Construction Noise Permit	2 Dec 2014	Permit no. GW-RE1384-14 Date of EPD issued: 9 Dec 2014 From 11 Dec 2014 Valid till 10 June 2015
Contract 811B (Works Area V2 & Y)			
1	Construction Noise Permit (For main site & combined area)	13 Nov 14	Licence no.: GW-RE1366-14 Valid from 4 Dec 2014 to 3 Jun 2015
Contract 820 (Works Area L, M, P, Q, R, S, Y, V)			
1	CNP for dismantling of slurry pipe bridge at Hing Wah Street West	20 Nov 2014	Permit GW-RW0972-14 obtained. Valid until 1 January 2015.
2	CNP for 24 hours PME construction works at Nam Cheong Launching Shaft	19 Dec 2014	Permit GW-RW0004-15 obtained. Valid until 15 July 2015.
Contract 821 (Works Area J, Y)			
1	CNP for construction work at Wing Yip Street, Kwai Chung, N.T.	13 November 2014	CNP GW-RW0919-14 granted Validity: 28 Nov 2014 to 27 May 2015
Contract 822 (Works Area F, G, H, AC, AE and AG)			

Item	Item Description	Application Date	Permit Status
1	**Works Area F** **CNP** for the use of powered mechanical equipment for the purpose of carry out construction works (including de-watering) from 19:00 to 23:00. (Designated).	Approved on 5 January 2015	Licence No. GW-RN0827-14, valid from 19:00 hours, 24 January 2015 to 23:00 hours, 31 March 2015
Contract 823A (Works Areas D, D1 and E)			
1	No updates in the reporting month		
Contract 823B (Works Area D, Z and To Kau Wan Works Area)			
Contract 824 (Works Area B and C)			
1	Construction Noise Permit at Ngau Tam Mei Works Area	28 July 2014	Permit No. GW-RN0495-14 obtained. Valid until 28 February 2015
2	Construction Noise Permit at Tai Kong Po Works Area	21 July 2014	Permit No. GW-RN0484-14 obtained. Valid until 28 February 2015
Contract 825 (Works Area A and AA)			
1	Construction Noise Permit	17 November 2014	Permit No. GW-RN0758-14 obtained. Valid until 13 June 2015
2	Construction Noise Permit	17 November 2014	Permit No. GW-RN0760-14 obtained. Valid until 13 June 2015
Contract 826			
1	Construction Noise Permit	24 October 2014	Permit No. GW-RN0692-14 obtained. Valid until 19 May 2015

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, R, 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	14/11/2014
AM 2	Yau Tam Mei Village House	468	19/9/2014
AM 3	Kong Tai Road Village House	510	18/9/2014
AM 4	DD110 LOT 482, Wang Toi Shan	521	17/11/2014
AM 5	Leung Uk Tsuen Squats	1276	16/12/2014
AM 6	630 Sheung Tsuen	469	16/12/2014
AM 7	Tse Uk Tsuen	1763	16/12/2014
AM 8	No. 305B, Sheung Tsuen San Tsuen Village House	520	18/9/2014
AM 9	Sau Shan House, Cheung Shan Estate	529	14/11/2014
AM 10	Yau Ma Hom Resite Village	509	14/11/2014
AM 11	Chung Shun Knitting Centre	1707	9/7//2014
AM 12	Po Leung Kuk Tong Nai Kan College	520	9/7/2014
AM 13	St. Andrew Primary School	524	18/12/2014
AM 14	Yaumati Catholic Primary School	407	18/12/2014
AM 15	Between Sorrento and The Waterfront	515	19/9/2014
AM 16	Tower 3, The Waterfront	1282	19/9/2014
AM 17	The Victoria Towers	528	23/9/2014

Table 4-1 Calibration details of HVS

Orifice Calibrator	
Serial Number	Last Date of Calibration
0438320	27 January 2014

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.

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:

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	28/1/2014
CN 3	Yau Tam Mei Village House	2718893	14/4/2014
CN 4	Yau Tam Mei Village House	2715360	21/8/2014
CN 5	Kong Tai Road Village House	2718895	14/4/2014
CN 6	Kong Tai Road Village House	2718879	26/5/2014
CN 7	372 Tai Kong Po Tsuen	2718881	28/4/2014
CN 8	DD110 LOT 482, Wang Toi Shan	2718882	26/5/2014
CN 9	Leung Uk Tsuen Village House	2718889	28/4/2014
CN 10	DD110 LOT 482, Wang Toi Shan	2718891	9/6/2014
CN 11	182B, Wang Toi Shan San Tsuen	2718884	26/5/2014
CN 12	DD108, Nam Hing Lei, Wing Hing Wai	2718892	19/5/2014
CN 13	Tse Uk Tsuen	2718883	3/6/2014
CN 14	Tse Uk Tsuen	2718890	3/6/2014

Monitoring Station ID	Noise Monitoring Location	Serial Number	Last Calibration Date
CN 15	No. 305B - Sheung Tsuen San Tsuen Village House	2718885	19/5/2014
CN 16	DD 114 LOT 1405 Sheung Tsuen	2718888	9/6/2014
CN 18	Sau Shan House	2701831	17/12/2014
CN 19	Sun Fung Centre	2701821	17/12/2014
CN 20	VTC Kwai Chung Training Centre Complex	2718894	3/6/2014
CN 21	Po Leung Kuk Tong Nai Kan College	2701820	20/3/2014
CN 22	Block I, Lai Chi Kok Reception Centre	2709427	25/4/2014
CN 23	HKIVE Haking Wong Waterfront Annex	2701818	23/12/2014
CN 24	St. Andrew Primary School	2701825	13/1/2014
CN 25	St. Mary's Church Mok Hing Yiu College	2709428	25/3/2014
CN 26	Ying Wah College	2701822	24/1/2014
CN 27	Cheong Shun House, Nam Cheong Estate	2709426	10/4/2014
CN 28	Tower 6, Harbour Green	2701817	6/2/2014
CN 29	Yaumati Catholic Primary School	2701815	23/12/2014
CN 30	Man Cheong Street Refuse Collection Point	2701816	8/1/2014
CN 31	Tower 6, Sorrento	N/A [4]	N/A [4]
CN 32	Tower 3, The Waterfront	2704792	17/12/2014
CN 33	Star Tower, The Arch	2701827	9/1/2014
CN 34	The Victoria Towers	2701829	13/1/2014
Calibrator			
Serial Number		**Last Calibration Date**	
N674902		24/10/2014	

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.

4.2.3 Monitoring Location

According to the EM&A Manual, noise quality monitoring was carried out at the locations as shown in Table 4-4 above. The monitoring locations are illustrated in Appendix D.

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

4.2.5 Review of baseline at CN20

With reference to Baseline Monitoring Report, the baseline noise level at CN20 would be reviewed regularly once every six months to confirm its validity and the results would be included in the EM&A report. Baseline monitoring was carried out in December 2014 for a consecutive of 14 days. One set of $L_{eq(30min)}$ measurement was taken daily during the hours without any construction works at works area in the

vicinity of CN20. Dominant noise source at CN20 during the time of baseline review measurement was identified to be background traffic noise.

Date	Start time	End time	$L_{eq\ (30min)}$ dB(A)
03/12/2014	12:20	12:50	67
04/12/2014	12:20	12:50	68
05/12/2014	12:20	12:50	68
06/12/2014	Monitoring cancelled due to equipment failure		
07/12/2014	12:20	12:50	63
08/12/2014	12:20	12:50	67
09/12/2014	Monitoring cancelled due to equipment failure		
10/12/2014	12:20	12:50	68
11/12/2014	12:20	12:50	67
12/12/2014	12:20	12:50	67
13/12/2014	Monitoring cancelled due to equipment failure		
14/12/2014	11:20	11:50	64
15/12/2014	Monitoring cancelled due to equipment failure		
16/12/2014	12:20	12:50	67
17/12/2014	12:20	12:50	68
18/12/2014	12:20	12:50	71
19/12/2014	Monitoring cancelled due to rainfall		
20/12/2014	12:25	12:55	66
21/12/2014	12:20	12:50	64
Average $Leq_{(30min)}$, dB(A)			67

Table 4-5: Review of baseline monitoring results at CN 20

The above table showed the revised average daytime baseline noise level at both locations and are comparable with the previously recorded baseline levels (67 dB(A) previously). The revised baseline noise levels would be adopted as reference for impact monitoring in the coming 6 months before the next half-yearly review of baseline noise level.

4.3 Ground-borne Noise

For the second launch of TBM at Tsat Sing Kong since November 2014, ground-borne noise monitoring was conducted at GN31 (DD110 LOT 482, Wang Toi Shan) on 1 to 4 December in the reporting month in accordance with requirements in the EM&A Manual and the Construction Ground-borne Noise Monitoring Plan. However, due to renovation works at GN31 which started on 1 December, the monitoring was then relocated to GN31 Alternative (Village house, Wang Toi Shan near lamp post number“XRL823A0010”) on 4 December. Location of GN31 and

GN31 Alternative could be referred to Appendix D. Ground-borne noise was monitored continuously between 0700 and 1900 hours at logging interval of 30mins on normal workdays at the designated monitoring location when the TBM cutter head was operating within 100m radius from GN31.

Same as airborne noise monitoring, B&K 2250 sound level meter (Serial Number: 2681366, last calibration data: 7/3/2014) and B&K 4231 calibrator (Serial Number: 3006428, last calibration data: 15/4/2014) were adopted in ground-borne noise monitoring.

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. With the hoarding erection completed and construction works at MPV, TPP and PHV commenced, ecological monitoring on monthly basis was commenced accordingly. 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
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-2a 1	• The whole alignment of abandoned meanders of conservation interest 95CD-4	Monthly	• During upgrading and operation of access road for construction phase activities 1
	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

Note: 1. Despite that upgrading of access road leading to SSS has yet commenced, monthly monitoring was commenced due to commencement of construction activities in the vicinity of SSS-2a.

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 construction have not started.

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, two exceedances of 24-hour TSP were recorded. The action level exceedances were recorded at Kong Tai Road Village House (AM 3) and Leung Uk Tsuen Squats (AM 5) on 15 December 2014.

For the 24-hour TSP Action Level exceedance at Kong Tai Road Village House (AM 3) on 15 December 2014, 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, proper dust suppression measure such as water spraying by sprinkler was continuously implemented on site by the Contractor. Repeated monitoring on 19 December 2014 showed no further exceedance.

For the 24-hour TSP Action Level exceedance at Leung Uk Tsuen Squats (AM 5) on 15 December 2014, 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, the TSP exceedance might have been caused by insufficient dust suppression measure on haul road in SSS area. The contractor was reminded to enhance the dust suppression measure such as frequent watering on haul road.

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, four exceedances of air-borne noise Limit Level were recorded at No. 306 Sheung Tsuen San Tsuen Village House (CN15) on 8 December, Yaumati Catholic Primary School (CN29) on 8 December and Podium next to Tower 3, The Waterfront (CN32) on 8 and 22 December 2014.

For the noise exceedance at No. 306 Sheung Tsuen San Tsuen Village House (CN15), 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, the noise exceedance was caused by construction work in Pat Heung. The contractor was reminded to provide sufficient noise mitigation measure for breaking and demolition work.

For the noise exceedance at Yaumati Catholic Primary School (CN29), 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, the potential noise sources maybe from the construction works (breaking and sheet piling) conducting by two XRL contractors together in the vicinity. Noise mitigation measures were proposed by both Contractors to minimize the noise impact at their works fronts.

For the noise exceedances at Podium next to Tower 3, The Waterfront (CN32), 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, that possible noise source may be due to the bore piling works by the Contractor of 810A. Noise mitigation measures proposed by the Contractors were reviewed by IEC and ET and implemented on site to minimize the noise impact. Apart from that, the Contractors were reminded to comply with the statutory requirement and minimize noise nuisance to the nearby NSRs.

There was no noise exceedance of Action Level in the reporting month.

5.2.2 Ground-borne Noise

The ground-borne noise monitoring schedule is shown in Appendix E. Results of the monitoring in terms of L_{eq}(30min) and graphical presentation are presented in Appendix F.

Exceedances of ground-borne noise Limit Level were recorded at GN31 (DD110 LOT 482, Wang Toi Shan) on 1, 2 and 3 December. The noise exceedances were caused by renovation works at GN31. Therefore, ground-borne noise monitoring was relocated to GN31 Alternative on 4 December.

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**
9 December 2014	Sunny	• Ponds were drained at Point Count Locations MPV-1/P1, MPV-1/P5, and MPV-1/P8 (Appendix H refers) • Ponds were partially drained at Point Count Locations MPV-1/P2, MPV-1/P6, and MPV-1/P7 (Appendix H refers) • Pond aeration at Point Count Locations MPV-1/P8, MPV-1/P9 and MPV-1/P10 (Appendix H refers)

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

A total of 458 individuals from 46 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 51, with Red-billed Starling as the dominant species in the recorded avifaunal population. Other recorded waterbird and wetland-dependent species included Little Grebe, Great Cormorant, Black-faced Spoonbill, Northern Shoveler, Tufted Duck, Black Kite, Black-winged Stilt, Pied Avocet, Little Ringed Plover, sandpipers, kingfishers, Zitting Cisticola, Red-billed Starling, Collared Crow, and ardeids. Flocks of Pied Avocet were recorded foraging near the fishponds at Point Count Locations MPV-1/P2 and MPV-1/P5. A flock of Great Cormorant was observed roosting at the bund of fishpond at MPV-1/P2. Flocks of Red-billed Starling were observed foraging near the fishponds at Point Count

Locations MPV-1/P2 and MPV-1/P7. The presence of passage migrant and winter visitor species such as Great Cormorant, Grey Heron, Black-faced Spoonbill and Yellow Wagtail showed a seasonal change in species composition at this survey site. Detailed records of avifauna at MPV-1 survey site are presented in Appendix G.

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 and the number of bird species recorded at Point Count Locations, as well as the total number of bird species (including the number of species of conservation importance) recorded in the MPV-1 survey site were higher than the baseline range (Table 5-2 and Table 5-3 refer).

The monitoring results indicated the fishponds within the survey area were utilized by utilized by winter visitor and passage migrant species of waterbird and wetland-dependent species in the reporting month during the monitoring. Waterbirds were observed foraging along the fishpond bunds during the monitoring. Migrants and winter visitors were recorded in this month. No adverse indirect impacts arising from the Project were identified.

Survey	MPV-1	
	No. of Species	Abundance
9 December 2014	46	458
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]
9 December 2014	51 (15)
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
9 December 2014	Sunny	• Project-related drainage works at Point Count Location TPP-1/P2, TPP-1/P3 and TPP-1/P4 (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 57 individuals from 17 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 during the monitoring was 24. Scaly-breasted Munia was the dominant species in the recorded avifauna population. Recorded waterbird and wetland-dependent species included Little Egret, White-breasted Waterhen, Common Snipe and sandpipers. The presence of winter visitor species such as Green Sandpiper and Grey Wagtail showed a seasonal change in species composition at this survey site. Detailed records of avifauna at TPP-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 of bird species recorded at Point Count Locations, as well as total number of bird species (including the number of species of conservation importance) recorded in the TPP-1 survey site were below the baseline range (Table 5-5 and Table 5-6 refer). The two major causes of the significant decrease in bird abundance and diversity were the absence/decrease of different bird species in large

flocks (e.g. starling), and the absence/decrease of waterbird and wetland-dependent species (e.g. Greater Painted-snipe, Cattle Egret, Chinese Pond Heron, sandpipers).

No starling were recorded in December 2014 monitoring, while there were a range of 70 and 124 individuals of starlings recorded in the baseline surveys between November 2009 and January 2010. These birds are usually disturbance-tolerant and thus the absence may attribute to natural fluctuations at the site. Besides, there is a drop in the records of waterbird species such as ardeids, snipe and sandpipers. A range of 29 and 127 individuals of snipe and sandpipers were recorded in the baseline surveys whilst 11 were recorded in the December 2014 monitoring; a range of 18 and 64 individuals of ardeids were recorded in the baseline survey whilst 1 individual was recorded in the December 2014 monitoring. These species are more sensitive to disturbance and human occurrence.

Project-related drainage works were observed at Point Count Location TPP-1/P2, TPP-1/P3 and TPP-1/P4. The works were being conducted with proper mitigation measures in place according to the EIA recommendation including the erection of 2.4 m hoardings. The contractor was recommended to review the construction activities, and provide noise mitigation measures, where applicable, to further reduce noise nuisance in the area. Moreover, noisy works should be avoided during the breeding season of Greater Painted-snipe (i.e. April to July). Although no other notable human activities or changes in environment was observed at the time of survey, there may be human passage along the channel (i.e. the point count locations) prior to the survey driving the waterbirds fleeing away considering their sensitivity. The drop in bird count may also be related to disturbances from the drainage works. The ET would closely monitor the drainage work carried out near TPP-1 and keep in view the upcoming monitoring records. Additional remedial actions would be requested to implement by the contractor if decreasing trend is observed.

The monitoring results indicated the main drainage channel within the survey site was utilized by winter visitor and passage migrant waterbird species and generalists in the reporting month during the monitoring. The reduction in waterbirds abundance and diversity may be attributed to drainage works, though natural fluctuation leading to absence of birds in large flocks (e.g. starling) also contributed a decrease in overall bird abundance and diversity

Survey Period	**TPP-1 Survey Site**

	No. of Bird Species	**Abundance of Bird Species**
9 December 2014	17	57
November 2009 to January 2010 [1]	24 - 31	228 - 476

Note:

1. Seasonal range obtained from baseline bird survey.

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]**
9 December 2014	24 (2)
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**
9 December 2014	Sunny	Non Project-related excavation work near TPP-2/P1 (Appendix H refers)

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 51 individuals from 12 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 Little Ringed Plover as the dominant species in the recorded avifaunal population. Recorded waterbird and wetland-dependent species included Little Egret, Black-winged Stilt, Little Ringed Plover, Common Snipe and sandpipers. The presence of winter visitor species such as Black-winged Stilt, Green Sandpiper and Common Snipe showed a seasonal change in species composition at this survey site. Detailed records of avifauna at TPP-2 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 number of bird species recorded at Point Count Locations were within the baseline range, while the total number of species (including the number of species of conservation importance) recorded in the TPP-2 survey site were 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 winter visitor and passage migrant waterbird species and generalist 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**
9 December 2014	12	51
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]**
9 December 2014	19 (3)

November 2009 to January 2010 [3]	16 - 18 (2)

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**
9 December 2014	Sunny	• No construction works being conducted in the vicinity

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 12 avifauna species were recorded from the Point Count Locations at TPP-3 in the reporting month (Table 5-11 refers). A total of 12 bird species were recorded during the monitoring, with Scaly-breasted Munia as the dominant species. Little Egret was the only waterbird species recorded this month. 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 abundance of birds and the number of bird species recorded from the Point Count Locations as well

as the total number of species (including the number of species of conservation importance) recorded from TPP-3 survey site were within 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 (e.g. Red-whiskered Bulbul, Eurasian Tree Sparrow) in the reporting month during the monitoring. No adverse indirect impacts arising from the Project were identified.

Survey Period	**TPP-3 Survey Site**	
	No. of Bird Species	**Abundance of Bird Species**
9 December 2014	12	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]**
9 December 2014	12 (1)
November 2009 to January 2010 [3]	10 - 16 (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 5-12 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-2a)

Monthly avifauna monitoring at SSS-2a was conducted during the construction work in the vicinity of SSS-2a. Construction in the vicinity of SSS-1/2b was yet commenced and ecological monitoring would be conducted according to the

construction programme. SSS-2a survey site is an abandoned meander (95CD-4) of conservation interest located in the north of Wan Toi Shan. 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 5-13

Date of Monitoring	**Weather Condition**	**Noticeable Activities Observed in the vicinity of SSS-2a Survey Site**
9 December 2014	Sunny	• Project-related construction works in the vicinity of Point Count Location SSS-2a/P1

Table 5-13 Weather Condition and Noticeable Activities Observed in the SSS-2a Survey Site during the Monitoring in the Reporting Month.

A total of 12 individuals from 7 avifauna species were recorded from the Point Count Locations at SSS-2a in the reporting month (Table 5-14 refers). A total of 7 species were recorded during the monitoring. No waterbird species was recorded. Japanese White-eye was recorded as the dominant species. The presence of winter visitor species such as Grey Wagtail and Daurian Redstart showed a seasonal change in species composition at this survey site. 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 and the number of bird species recorded at Point Count Locations as well as 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 5-14 and Table 5-15 refer).

The monitoring results indicated the abandoned meander within the survey area was utilized by winter visitor and resident 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**
9 December 2014	7	12

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

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-2a Survey Site

Survey Period	Total Number of Bird Species Recorded [1,2]
9 December 2014	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 5-15 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-3)

Construction in the vicinity of SSS-1/2b was yet commenced and ecological monitoring would be conducted according to the construction programme. 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. The farmland in SSS-3 survey site displayed a distinctive seasonal crop rotation pattern between wet agriculture (*Ipomoea aquatic*) in summer season and dry agriculture (seasonal flowers such as *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

Date of Monitoring	Weather Condition	Noticeable Activities Observed in the vicinity of SSS-3 Survey Site
9 December 2014	Sunny	• Farmer was observed sowing at SSS-3/P5 (Appendix H refers) • Dry agricultural activities such as farming Peach (*Prunus persica*) and Banana (*Musa* x *paradisiaca*) was observed near SSS-3/P3 and SSS-3/P7, respectively

Table 5-16 Weather Condition and Noticeable Activities Observed in the SSS-3 Survey Site during the Monitoring in the Reporting Month

A total of 216 individuals from 26 avifauna species were recorded from the Point Count Locations at SSS-3 in the reporting month (Table 5-17 refers). A total of 29 species were recorded during the monitoring. The avifauna population was dominated by Red-whiskered Bulbul. Recorded waterbird species included White-breasted Waterhen and ardeids. The presence of winter visitor species such as Daurian Redstart and Dusky Warbler showed a seasonal change in species composition at this survey site. Detailed records of avifauna at SSS-3 are presented in Appendix G.

During the monitoring, it was observed that the survey site SSS-3 was dominated by dry agricultural lands. Occasional dry agricultural lands were also observed at Point Count Locations SSS-3/P3 and SSS-3/P7. Dry agricultural lands were observed at Point Count Locations SSS-3/P4, SSS-3/P10 and SSS-3/P12. Wet agricultural lands were observed at Point Count Locations SSS-3/P12. Seeding activities were observed at SSS 3/P5.

The monitoring results in December 2014 were compared against the dry season data from November 2009 to January 2010. The abundance of birds and the number of bird species recorded at Point Count Locations, as well as the total number of bird species recorded (including the number of species of conservation importance) from the SSS-3 survey site were within the baseline range (Table 5-17 and Table 5-18 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 significant fluctuation in the abundance of birds was recorded at the Point Count Locations and in the SSS-3 survey site. No adverse indirect impacts arising from the Project were identified.

Survey Period	SSS-3 Survey Site	
	No. of Bird Species	Abundance of Bird Species
9 December 2014	26	216
November 2009 to January 2010 [1]	26 - 32	211 - 296

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-3 Survey Site

Survey Period	Total Number of Bird Species Recorded [1,2]
9 December 2014	29 (2)
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 5-18 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 5-19. 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

Date of Monitoring	Weather Condition	Noticeable Activities Observed in the vicinity of TUW-1 Survey Site
9 December 2014	Sunny	• Non Project-related works observed near Point Count Location TUW-1/P2 (Appendix H refers)

Table 5-19 Weather Condition and Noticeable Activities Observed in the TUW-1 Survey Site during the Monitoring in the Reporting Month

A total of 114 individuals from 21 avifauna species were recorded from the Point Count Locations at TUW-1 in the reporting month (Table 5-20 refers). The total number of species recorded during the monitoring was 27. The population of the avifauna recorded was dominated by Red-whiskered Bulbul and Japanese White-eye. Recorded waterbirds and wetland-dependent species included Chinese Pond Heron, Common Buzzard and Zitting Cisticola. The presence of passage migrant and winter visitor species such as Grey Wagtail and Daurian Redstart showed a seasonal change in species composition at this survey site. Detailed records of avifauna at TUW-1 are presented in Appendix G.

The monitoring results in December 2014 were compared against the dry season data from November 2009 to January 2010. The abundance of birds and the number of bird species recorded at Point Count Locations as well as the number of species of conservation importance recorded from the TUW-1 survey site were within the baseline range, while the total number of bird species recorded from the TUW-1 survey site was above the baseline range (Table 5-20 and Table 5-21 refer).

The monitoring results indicated the agricultural lands within the survey site were utilized by generalist and waterbirds 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
9 December 2014	21	114
November 2009 to January 2010 [1]	19 - 25	98 - 197

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 TUW-1 Survey Site

Survey Period	Total Number of Bird Species Recorded [1,2]
9 December 2014	27 (2)
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 5-21 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 5-22. 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
9 December 2014	Sunny	No construction works being conducted in the vicinity

Table 5-22 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 21 individuals from 8 avifauna species were recorded from the Point Count Locations at TUW-2 and PHV-1 in the reporting month (Table 5-23 refers). The total number of species recorded during the monitoring was 15. The population of the avifauna recorded was dominated by Red-whiskered Bulbul and Japanese White-eye. The presence of winter visitor species such as Dusky Warbler and Yellow-browed Warbler showed a seasonal change in species composition at this survey site. 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 abundance of birds and the number of bird species recorded at Point Count Locations, as well as the total number of bird species recorded from the TUW-2 and PHV-1 survey site were within the baseline range while the number of species of conservation importance recorded was slightly above the baseline range (Table 5-23 and Table 5-24 refer).

The monitoring results indicated the woodland within the survey site was utilized by typical forest birds in the reporting month 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**
9 December 2014	8	21
November 2009 to January 2010 [1]	8	15 - 21

Note:

1. Seasonal range obtained from baseline bird survey.

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 TUW-2 and PHV-1 Survey Site

Survey Period	**Total Number of Bird Species Recorded [1,2]**
9 December 2014	15 (1)
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 5-24 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)
03/12/2014	54
10/12/2014	54
17/12/2014	54
24/12/2014	54
31/12/2014	58

Table 5-25 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, 14] Materials (tonnes)	Non-inert C&D [2] Materials (tonnes)	Chemical Waste (Litre)
Contract 802[3]			
October 2014	7,896	5	0
November 2014	1,402	1	0
December 2014	502	2	0
Contract 805			
October 2014	0	0	0
November 2014	0	0	0
December 2014	0	0	0
Contract 810A[4]			
October 2014	73,093.49 {44,233.77}	961.70	0
November 2014	8,492.63 {26,205.00}	804.00	0
December 2014	33,507.62 {15,154.32}	738.90	216
Contract 810B[5]			
October 2014	23,363.65 {0.00}	470.60	0
November 2014	27,090.64 {0.00}	419.80	1,000
December 2014	5,484.79 {0.00}	436.60	200
Contract 811A [13]			

Reporting Month	Inert C&D [1, 14] Materials (tonnes)	Non-inert C&D [2] Materials (tonnes)	Chemical Waste (Litre)
October 2014	0	128.46	0
November 2014	157.50	139.89	400
December 2014	506.60	114.67	0
Contract 811B[6]			
October 2014	2,475.20 {13,409.31}	194.15	0
November 2014	17,213.79{13,633.63}	214.56	0
December 2014	4,455.26 {1,476.19}	266.60	0
Contract 820[7]			
October 2014	2,430.01	241.67	0
November 2014	516.81	204.71	0
December 2014	1,306.85	228.69	1,200
Contract 821			
October 2014	64.36	9.38	0
November 2014	32.19	9.31	0
December 2014	0	5.44	0
Contract 822[8]			
October 2014	6,261.70	313.07	2,000
November 2014	1,641.60	340.13	800
December 2014	1.804.86	335.03	400
Contract 823A[9]			
October 2014	144.60	47.56	0
November 2014	15,747.03	26.80	0
December 2014	20,984.39	29.63	0
Contract 823B[10]			
October 2014	1,880.42	173.00	0
November 2014	2,638.91	176.90	0
December 2014	5,557.81	142.67	0
Contract 824[11]			
October 2014	53,881.10	30.50	0
November 2014	61,919.80	32.30	0
December 2014	69,745.90	28.80	0
Contract 825[12]			
October 2014	8,336	156.30	200 (kg)
November 2014	6,217	135.60	0
December 2014	4,930	125.70	0
Contract 826			
October 2014	106.90	0	0
November 2014	0	0	0
December 2014	0	0	0

Table 5-26 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.

3. Alternative disposal site for inert C&D Material from 802 include SENT landfill (re-used as cover material), Sai Kung Tai Po Tsai and Nam Cheong Station Property Development Projects.

4. Alternative disposal sites for inert C&D material from 810A include SENT Landfill, 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. Alternative disposal sites for inert C&D Material from Contract 822 include Lam Tei Quarry, WENT landfill, New School Campus in Sai Kung for Hong Kong Academv, Proposed Comprehensive Development at STTL 502 Lok Wo Sha Ma On Shan And HY/2008/12 Bus-bus interchanges on Tuen Mun Road, Drainage Services Department Contract No. DC/2010102 Drainage Improvement Works in Shuen Wan and Shek Wu Wai, Highways Department, Project No. HY/2009/18, Central – Wan Chai Bypass – Central Itnerchange, and contract no. HY/2012/09, Drainage Service Department project no. DC/2007/24 Harbour area Treatment Scheme Stage 2A Construction of Sewage Conveyance System from Aberdeen to Sai Ying Pun.

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 WENT landfill and recycle vendor at Lung Kwu Sheung Tan for re-use/recycle.

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

13. Solid waste such as waste battery and paint cans are reported in kilograms (kg) and liquid chemical waste such as lube and paint are reported in litres (l). Alternative disposal sites for inert C&D Material from 811A include Central-Wan Chai Bypass (Typhoon Shelter and HKCEC) and Zhongshan Torch Hi-Tech Zone.

14 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)**	**Chemical Waste (Litre)**	**Chemical Waste (Kg)**
19,703,586.22	1,609,718.41	72,420.76	315,648.00	8,652.00

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
Regular arboricultural maintenance work, e.g. weedings, spraying of fungicides and insecticides and watering were implemented in two nursery sites.

Tree Protection Work 802
Broken branches should be removed.

Tree Protection Work 811A
Tree branches that were damaged / broken during the typhoon shall be removed.

Tree Protection Work 811B
No major observations.

Tree Protection Work 816D
The tree T032 has been uprooted, the contractor was reminded to take mitigation measure. Tree branches that were damaged / broken during the typhoon shall be removed. Area around a large *Leucaena leucocephala* should be fenced off.

Tree Protection Work 820
Tree branches that were damaged / broken during the typhoon shall be removed.
Contractor was reminded to maintain tree protection zone to prevent damage on trees.

Tree Protection Work 821

Condition of T6612 remains unchanged, close monitoring continues.

Tree Protection Work 822

Tree protection zone shall be established. Area around a dead tree shall be fenced off as safety precaution.

Tree Protection Work 823A

Dead trees T1696 and T1697 shall be removed.

Tree Protection Work 823B

Some tree protection zones were not properly maintained. T3837 are uprooted and shall be removed. Status of leaning tree T3596 and T3597 remained unchanged and close monitoring shall continue. Damaged tree branches observed on T14640 were pruned back.

Tree Protection Work 824

No major observation

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 802 in Nam Cheong, 810A/B and 811A/B in West Kowloon, 820/821 in Nam Cheong, 822 in Shing Mun, Shek Yam and So Kwun Wat, Tsing Chau Tsai and Tai Shu Ha Road West, 823A/B in Shek Kong Stabling Sidings, 824 in Tai Kong Po and Ngau Tam Mei, 825 in Mai Po and Siu Lam Barging Point 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 17 December 2014 for 802; 10 December 2014 for 810A; 3 December 2014 for 810B; 15 December 2014 for 811A; 1 December 2014 for 811B; 18 December 2014 for 820; 9 December 2014 for 821, 3 December 2014 for 822; 8 December 2014 for 823A; 8 December 2014 for 823B; 5 December 2014 for 824 and 11 December 2014 for 825.

Contract	**Date of Site Inspections**
802	1/12, 10/12, 17/12, 24/12 and 29/12
810A	4/12, 10/12, 17/12 and 24/12
810B	3/12, 12/12, 17/12 and 24/12
811A	2/12, 9/12, 15/12, 23/12 and 30/12
811B	1/12, 9/12, 16/12, 23/12 and 30/12
820	2/12, 9/12, 18/12, 23/12 and 30/12
821	1/12, 9/12, 15/12, 23/12 and 30/12
822	3/12, 11/12, 18/12, 22/12 & 29/12
823A	3/12, 8/12, 16/12, 22/12 and 31/12
823B	2/12, 8/12, 16/12, 23/12 and 30/12.
824	5/12, 9/12, 17/12, 23/12 and 30/12
825	4/12, 11/12, 19/12 and 23/12
826 [1]	Nil

Table 6-1: Date of site inspection

Note:

1. The grouting works at MPV area by Contract 826 completed in mid-Oct and the area was reinstated. Therefore no site inspection was conducted after 13/10.

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 802		
1	Nil observation	
Contract 810A		
1	Dust was observed emitting when drilling work was in progress at the blasting zone of main station box.	Watering has been enhanced when drilling work is in place.
Contract 810B		
1	The concrete pump door was opened when the plant was in use at the works area underneath the Austin Rad West steel bridge.	The frontline has been reminded to close the door of the pump when concreting is in place.
Contract 811A		
1	No wheel washing facility was provided to temporary site exit.	Wheel washing has been provided.
2	Exposed slope and idling stockpile were found without dust suppression measures.	Water spraying was applied regularly on the exposed surfaces.
3	Tree protection zone for the retained trees of future EVA opening was found incomplete.	Fencing has been fixed.
Contract 811B		
1	Dark smoke was observed emitting from the loader using at B3 slab of the main station box.	Maintenance and checking has been provided to the concerned plant.
Contract 820		

Item	Description	Contractor's Follow-up Action(s) Undertaken
1	Accumulation of mud was found at the sedimentation tank.	The sedimentation tank were cleaned up and monitored closely.
2	Oil drums were placed on the bare ground without spillage preventive measures.	Oil drums were moved to the designated storage area.
Contract 821		
1	Oil drums were found placing on the bare ground without drip trays.	Oil drums were removed from the site.
2	Potential spoil debris runoff from the site to the sea.	The spoil debris was removed.
Contract 822		
1	Construction runoff was not properly controlled.	Drainage channel was kept clear.
Contract 823A		
1	Loaded truck leaving site was found uncovered.	Trucks were properly covered.
2	Sump pit was found overflowed.	Sump pit has been desludged.
3	No dust suppression measure was provided to stockpile.	Stockpiles have been covered tarpaulin.
4	Insufficient measure was provided to the exposed slope.	Water spraying has be applied to concrete breaking.
Contract 823B		
1	Dust suppression measure on haul road was insufficient.	Frequent watering on haul road was implemented.
2	Dusty stockpiles were not properly covered.	Dusty stockpiles were covered by tarpaulin sheet.
Contract 824		
1	Debris was observed not collected properly.	Debris was removed and designated location was provided for waste collection.
2	Oil stain was observed.	Oil stain was cleared.
Contract 825		
1	Haul road was observed muddy.	Road cleaning was conducted.
2	Some drains were blocked due to backfilling works.	Temporary pumping was provided.

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

6.2 Other Site Inspection

Other site inspections by the project team reported air bubbles were observed at some fish ponds at Mai Po Area during the reporting period. Groundwater level monitoring in accordance with the Groundwater Monitoring and Contingency Plan for Contract 826 is being implemented. There were no Alert, Action and Alarm (AAA) Levels triggered. Nonetheless, an enhanced monitoring strategy, i.e. a 24-hour patrol team is being deployed to closely monitor and report any incidents for immediate follow-up. Continuous liaison with fishponds cultivators is on-going.

7 NON-COMPLIANCE AND DEFICIENCY

7.1 Summary of Complaint

For this reporting month, three environmental complaints were referred from EPD. There are a total of 205 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.

A complaint was referred from EPD on 1 December 2014 regarding lighting nuisance from construction plant at Ngau Tam Mei site during night time. The complaint handling procedures in accordance with the EM&A Manual have been undertaken. Investigation showed that the lighting at tower crane is necessary for a safety reason. Nonetheless, the Contractor was reminded to avoid turning the arm of tower crane to side of village houses as far as possible to minimise disturbance to neighbourhoods.

A complaint was referred from EPD on 11 December 2014 regarding night time construction noise from construction sites in Hoi Wang Road. The complaint handling procedures in accordance with the EM&A Manual have been undertaken. Investigation showed no complaint's mentioned construction works was conducted during the complaint time slot. Nevertheless, the Contractor was reminded to ensure full compliance of the Noise Control Ordinance for any construction activities conducting on site.

A complaint was referred from EPD on 22 December 2014 regarding night time construction noise from West Kowloon Terminus construction sites on 27 Nov 2014. The complaint handling procedures in accordance with the EM&A Manual have been undertaken. Investigation showed that there was a one-off extraordinary blast at the concerned time due to inaccuracy in drilling and charging delay. The decision on continuation of carrying out blasting was made by CEDD based on safety concern. Nonetheless, the Contractor was reminded to enhance the control to avoid reoccurrence of similar incident.

7.2 Summary of Exceedance

In the reporting month, four exceedances of air-borne noise Limit Level were recorded at No. 306 Sheung Tsuen San Tsuen Village House (CN15) on 8 December, Yaumati Catholic Primary School (CN29) on 8 December and Podium next to Tower 3, The Waterfront (CN32) on 8 and 22 December 2014.

In the reporting month, exceedances of ground-borne noise monitoring were recorded on 1, 2 and 3 December at GN31. The exceedances were caused by renovation works of GN31 which is non-project related and monitoring was relocated to GN31 Alternative.

In the reporting month, two exceedance of 24-hour TSP action level were recorded at Kong Tai Road Village House (AM 3) and Leung Uk Tsuen Squats (AM 5) on 15 December 2014.

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)
Sheet pile extraction, pre-drilling for new bored pile, bored pile construction
Contract 805 (Works Area N & O)
Minor site reinstatement and landscaping
Contract 805 (Works Area S)
Site reinstatement
Contract 810A (Works Area V1)
Excavation and site formation; Sheet Piling; Slab construction; Column installation; Erection and dismantling of falsework and formwork; Cruciform column encasement; Strut and bracing installation; Rebar fixing; Welding; Concrete curing; Temp support erection; Water proofing work; Blasting; Dismantling traveller; Blinding; Cleaning Construction Joint (CJ) and welding coupler; Rebar fixing to column and forming column drop; Ramp construction and Concreting
Contract 810B (Works Area V1)
Preboring, Installation/Dismantling of Strutting, Bored Piling, Sheet piling, 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 ARW Underpass, Construction of Sewerage Pipeline & Manholes, Haul Road Improvement Work, Bottom Up Erection of Formwork, OTE and Platform installation at B4 slab of main station box, Coring / Cutting Openings; Screen Wall Construction at B4 slab of main station box
Contract 810B (Works Area W)

Operation of Barging Facilities
Contract 811A (Works Area V2)
Construction of MKV building and tunnel box, LV room construction, pump room and water tank room construction, strut removal and backfilling.
Contract 811A (Works Area U)
Site Office
Contract 811B (Works Area V2 & Y)
D wall construction joint (CJ) breaking; Installation of waterproofing to base slab; Casting slab of Approach Tunnel, walls and OHVD and top slab; Removal of temporary shoring in Approach Tunnel; Backfilling to Approach Tunnel; Construct PTI Landscape Deck columns and deck structures; Removal of interface D wall; Utilities support removal; Shoring removal for LCR Underpass and Operation of Nam Cheong Barging Point
Contract 820 (Works Area L)
Nil
Contract 820 (Works Area M)
Nil
Contract 820 (Works Area P)
Ventilation Building construction Underground utility diversion Cut and cover tunnel construction
Contract 820 (Works Area Q)
Road reinstatement
Contract 820 (Works Area R)
Road reinstatement
Contract 820 (Works Area S)
Nil

Contract 816D (Works Area T)
Site Office
Contract 820 (Works Area Y)
Material stockpiling
Contract 820 (Works Area V2)
Cut and cover tunnel construction
Contract 821 (Works Area J)
Associated underground utility laying and landscaping works for Kwai Chung Ventilation Building; installation of underground utilities at Wing Yip Street, Kwai Chung
Contract 821 (Works Area Y)
Operation of the barging point, inert waste sorting and stockpiling, delivery of excavated materials from XRL projects by barge
Contract 822 (Works Area F)
Tunnel construction, building construction
Contract 822 (Works Area G)
Shaft construction and building construction
Contract 822 (Works Area H)
Tunnel construction.
Contract 822 (Works Area I)
Storage of equipment and material
Contract 822 (Works Area K)
Site Office
Contract 822 (Works Area AC)
Nil

Contract 822 (Works Area AE)
Nil
Contract 822 (Works Area AG)
Nil
Contract 823A and 823B (Works Areas D and D1)
Superstructure works for buildings, cut and cover tunnel excavation, TBM operation, river habitat restoration works, concrete batching plant demolition.
Contract 823A and 822(Works Area E)
TBM operation, Tunnel construction
Contract 823B (To Kau Wan Works Areas)
Nil
Contract 823B (Works Areas Z)
Nil
Contract 824 (Works Area B)
Tunnel and road construction Construction of ventilation building
Contract 824 (Works Area C)
Tunnel construction and EVA road construction Construction of ventilation building
Contract 824 (Works Area AF)
Nil
Contract 825 (Works Area A)
Retaining wall and drainage construction Construction of ventilation building Backfilling
Contract 825 (Works Area AA)

Nil
Contract 826 (Works Area A)
TBM drive

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

According to the latest programme, TBM tunnelling will be conducted in following month near GN31 Alternative. The tentative schedule of TSP, noise, ground-borne 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 December 2014. 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. Four exceedances of air-borne noise Limit Level were recorded at No. 306 Sheung Tsuen San Tsuen Village House (CN15) on 8 December, Yaumati Catholic Primary School (CN29) on 8 December and Podium next to Tower 3, The Waterfront (CN32) on 8 and 22 December 2014. No air-borne noise action level exceedance was recorded in the reporting month. In the reporting month, ground-borne noise exceedances were recorded at GN31 on 1, 2 and 3 December. In the reporting month, two 24-hour TSP action level exceedances were recorded Kong Tai Road Village House (AM 3) and Leung Uk Tsuen Squats (AM 5) on 15 December 2014. For the ecological monitoring, the decrease of bird abundance at SSS-2b survey site may due to non Project-related excavation works. The decreases of the abundance of birds in TPP-1 survey site was possibly attributed to Project-related drainage works near the Point Count Locations and absence of birds in large flocks owing to natural fluctuation. The contractor was recommended to review the construction activities near TPP-1, and provide noise mitigation measures, where applicable, to further reduce noise nuisance in the area. The ET would closely monitor the works and keep in view the upcoming monitoring records. Additional remedial actions would be requested to implement by the contractor if decreasing trend is observed. No notification of summons, non-compliance and prosecution was received during the reporting period.

For the reporting month, three environmental complaints were referred from EPD. The environmental complaints received were related to lighting nuisance from construction plant at Ngau Tam Mei site during night time and night time construction noise near the construction sites at Hoi Wang Road and West Kowloon. 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

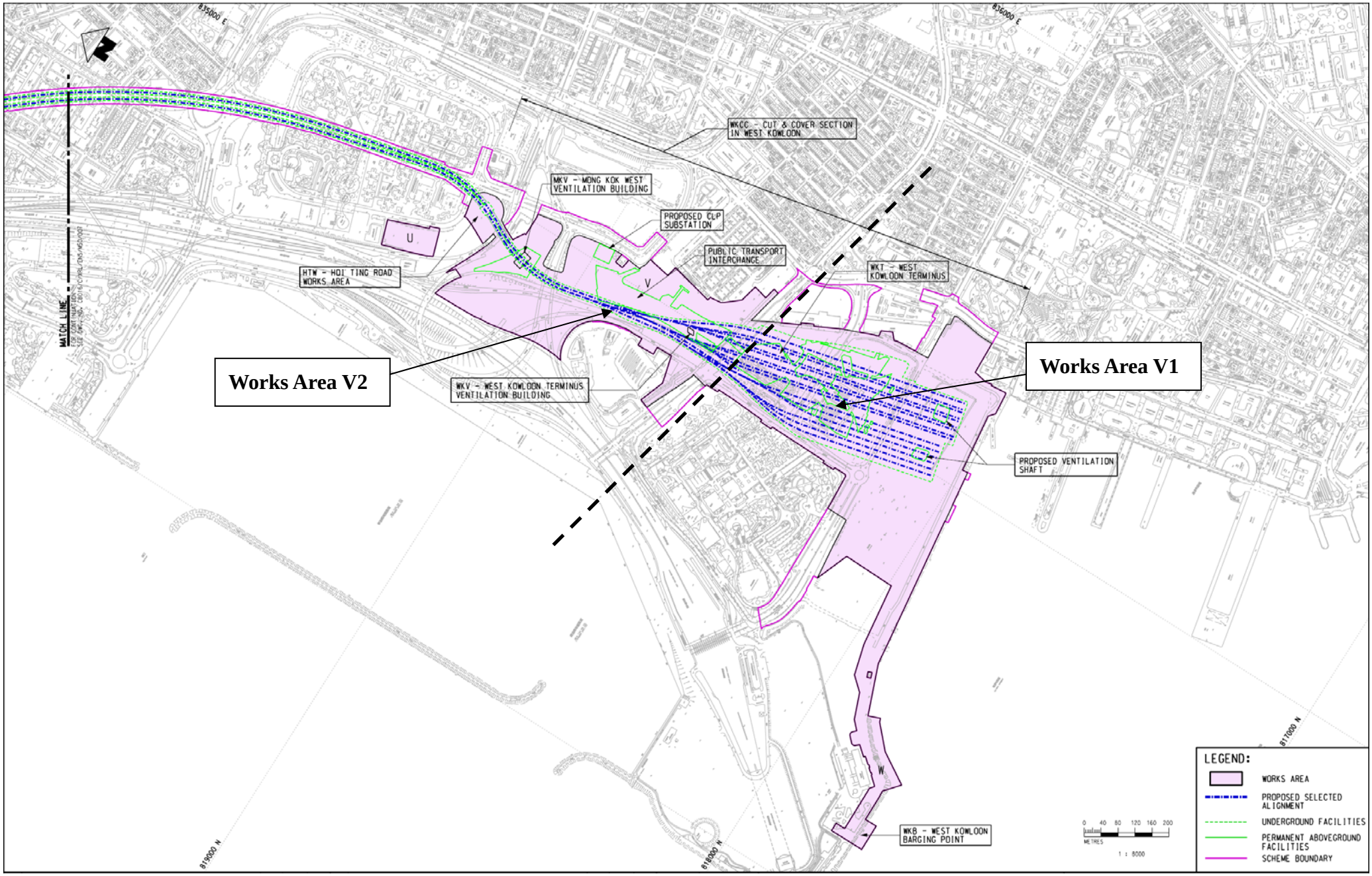
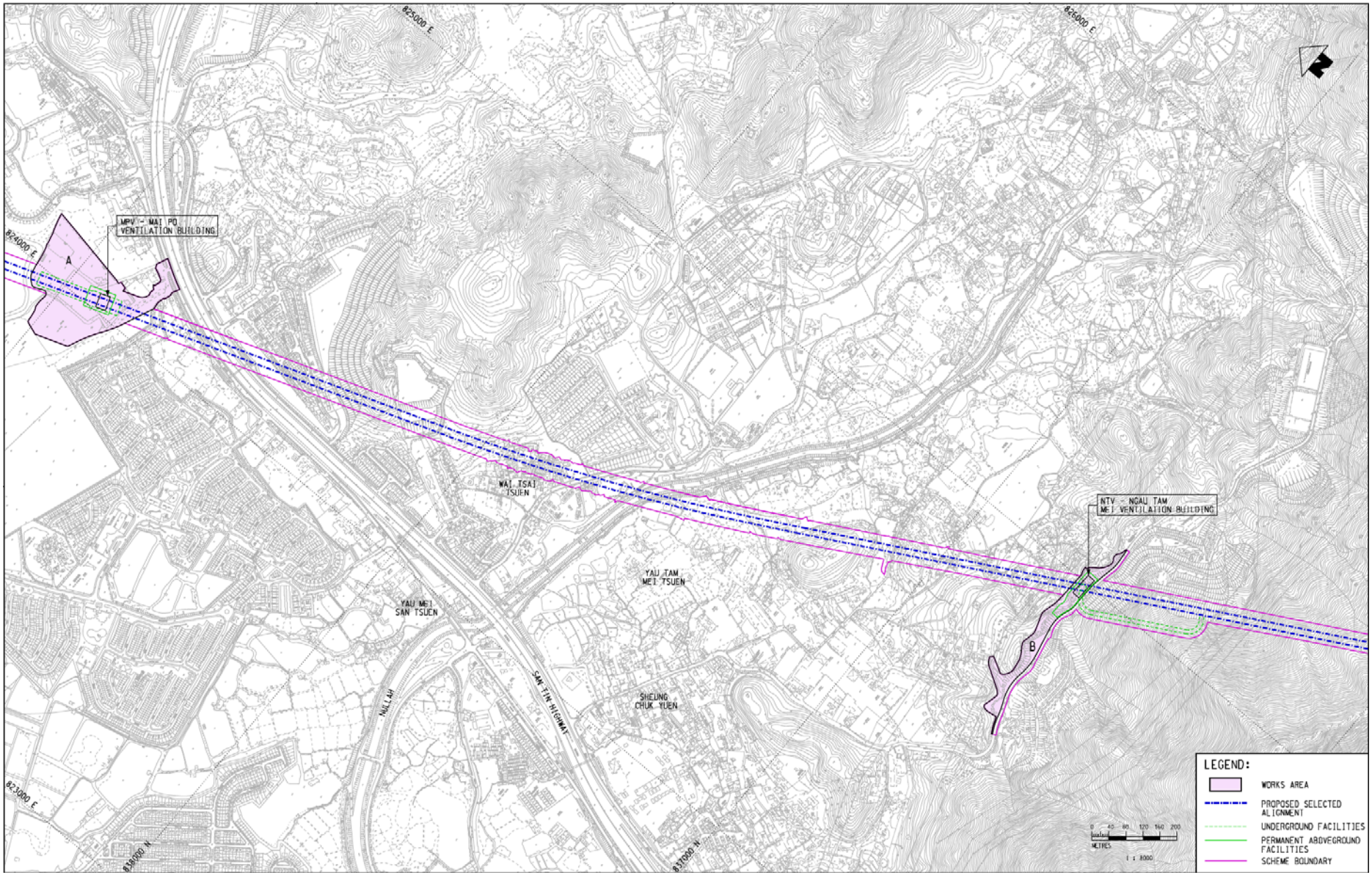
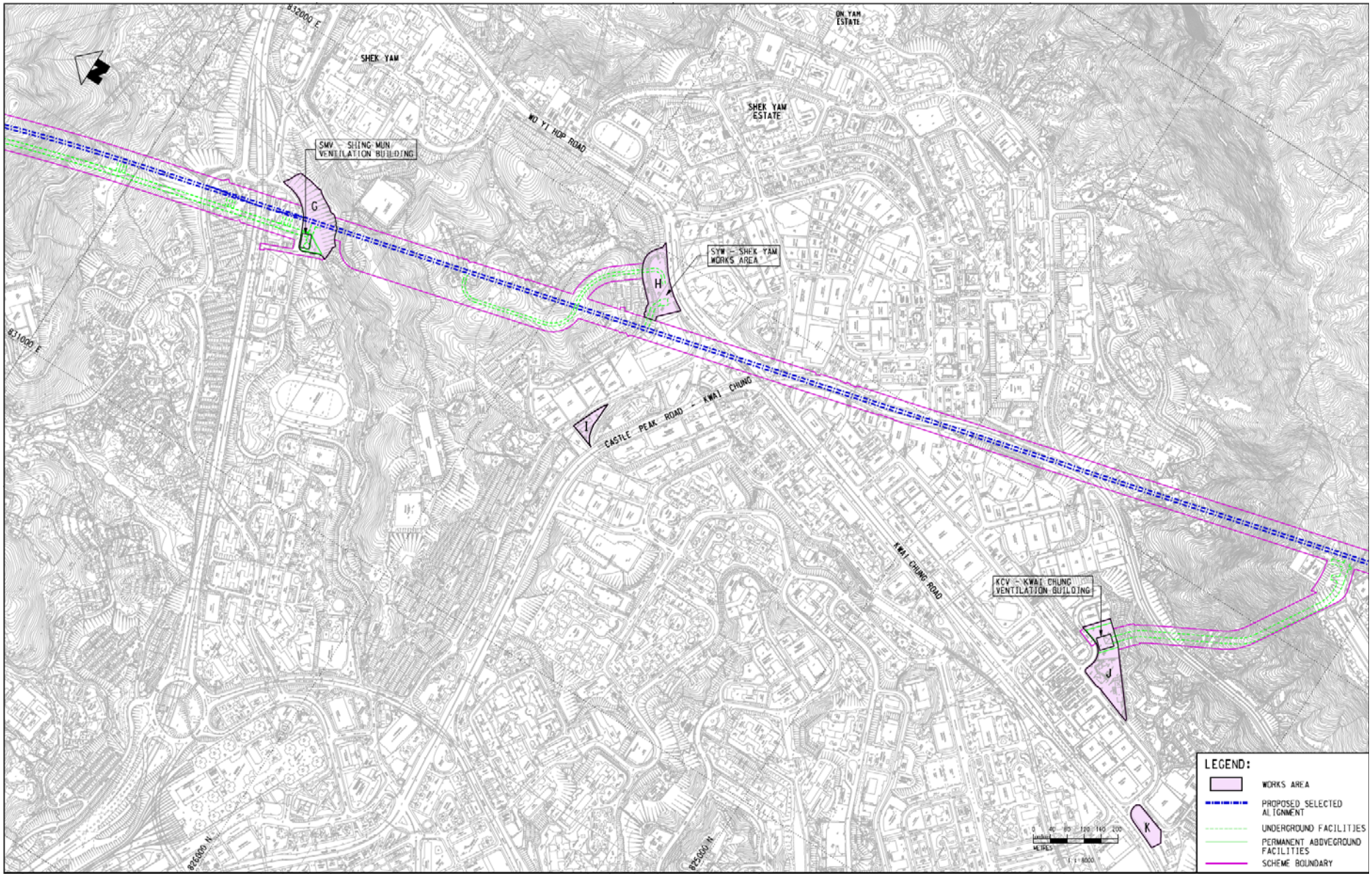
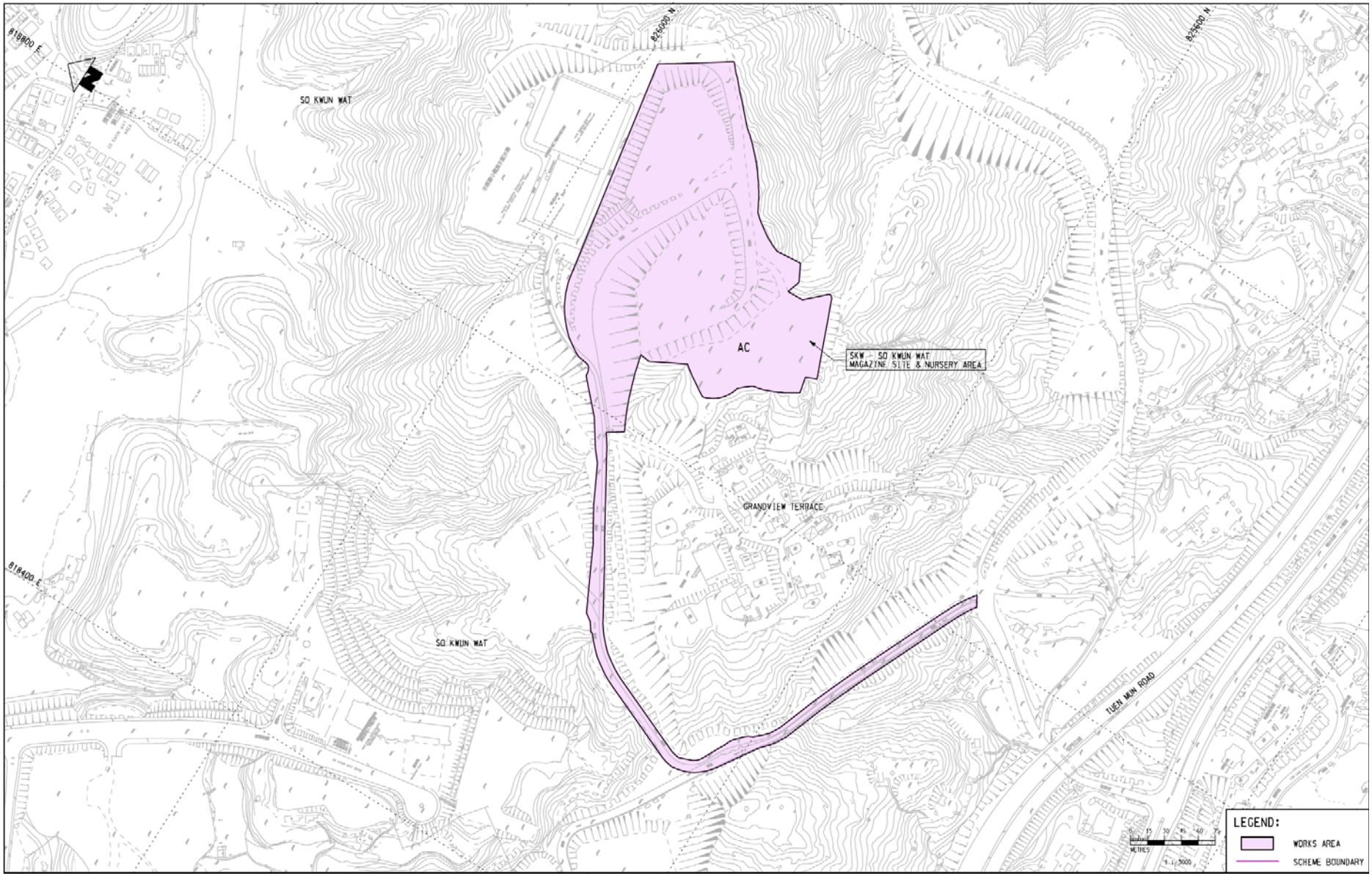
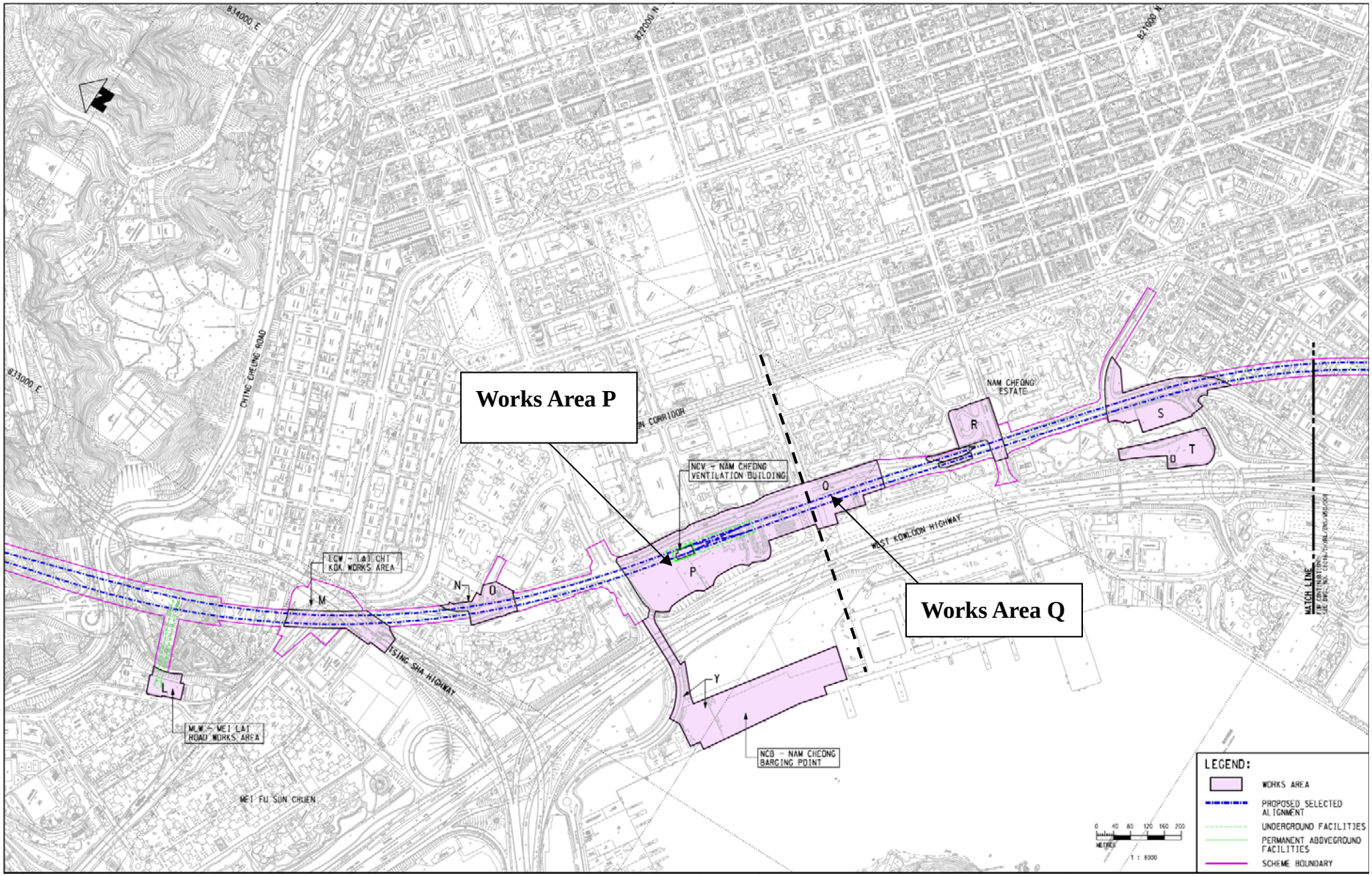


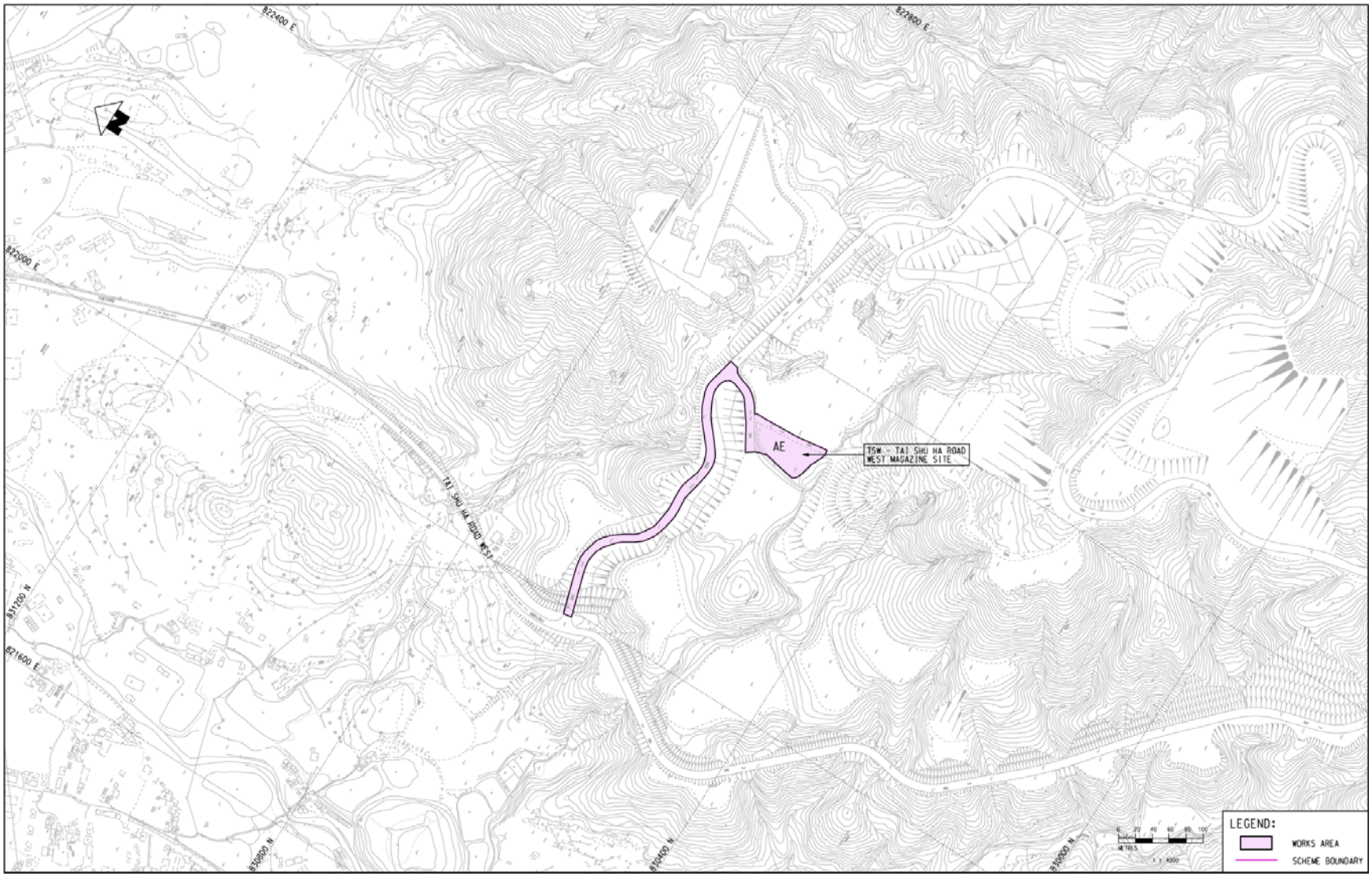
Figure 1 – Works Area

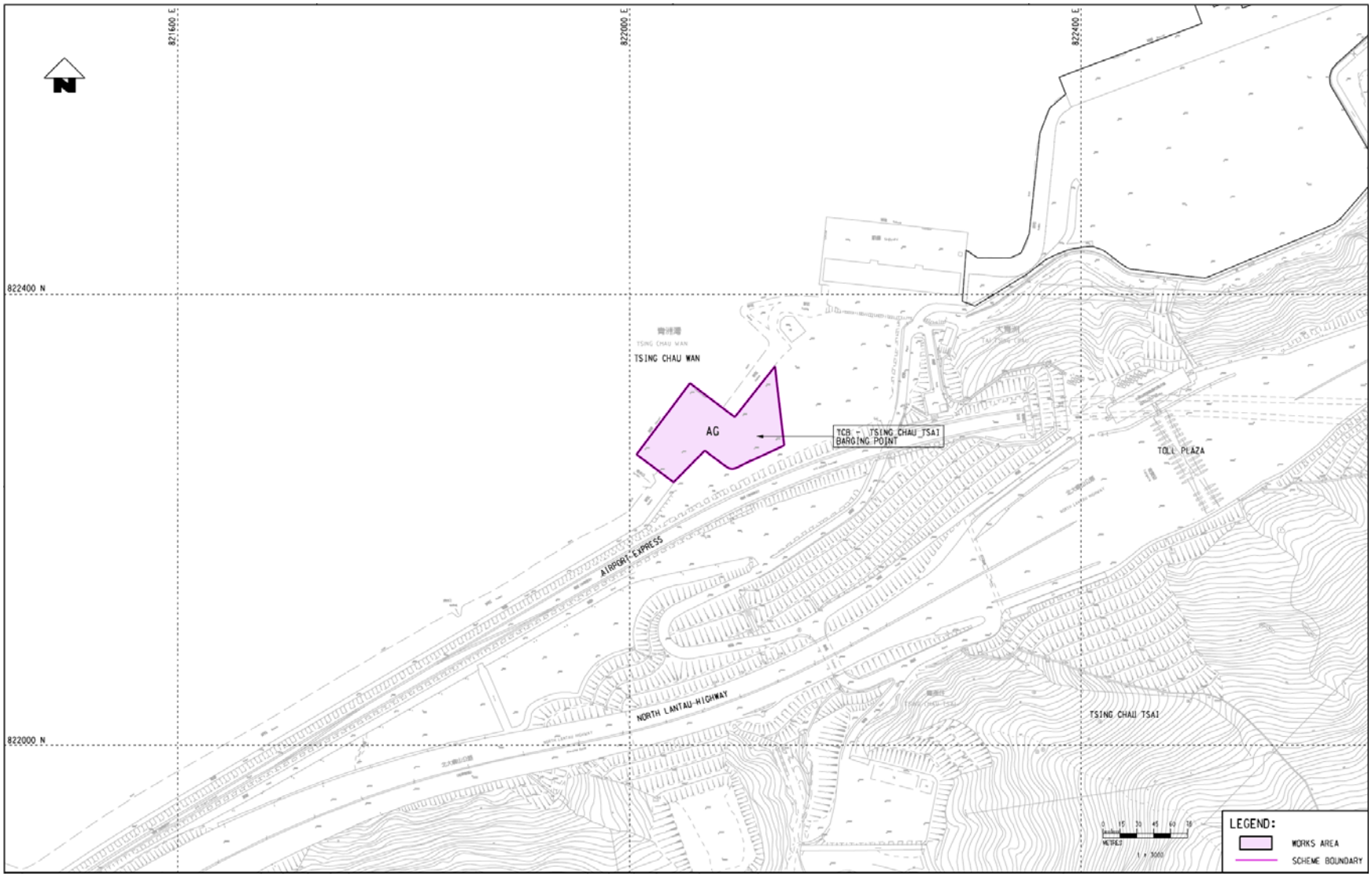

824000 E
825000 E
826000 E
821000 E
838000 N
837000 N
MPV - MAI PO VENTILATION BUILDING
A
NTV - NGAU TAM MEI VENTILATION BUILDING
B
WAI TSAI TSUEN
YAU TAM MEI TSUEN
YAU MEI SAN TSUEN
SHEUNG CHUK YUEN
NULLAH
SAN TIN HIGHWAY
LEGEND:
WORKS AREA
PROPOSED SELECTED ALIGNMENT
UNDERGROUND FACILITIES
PERMANENT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

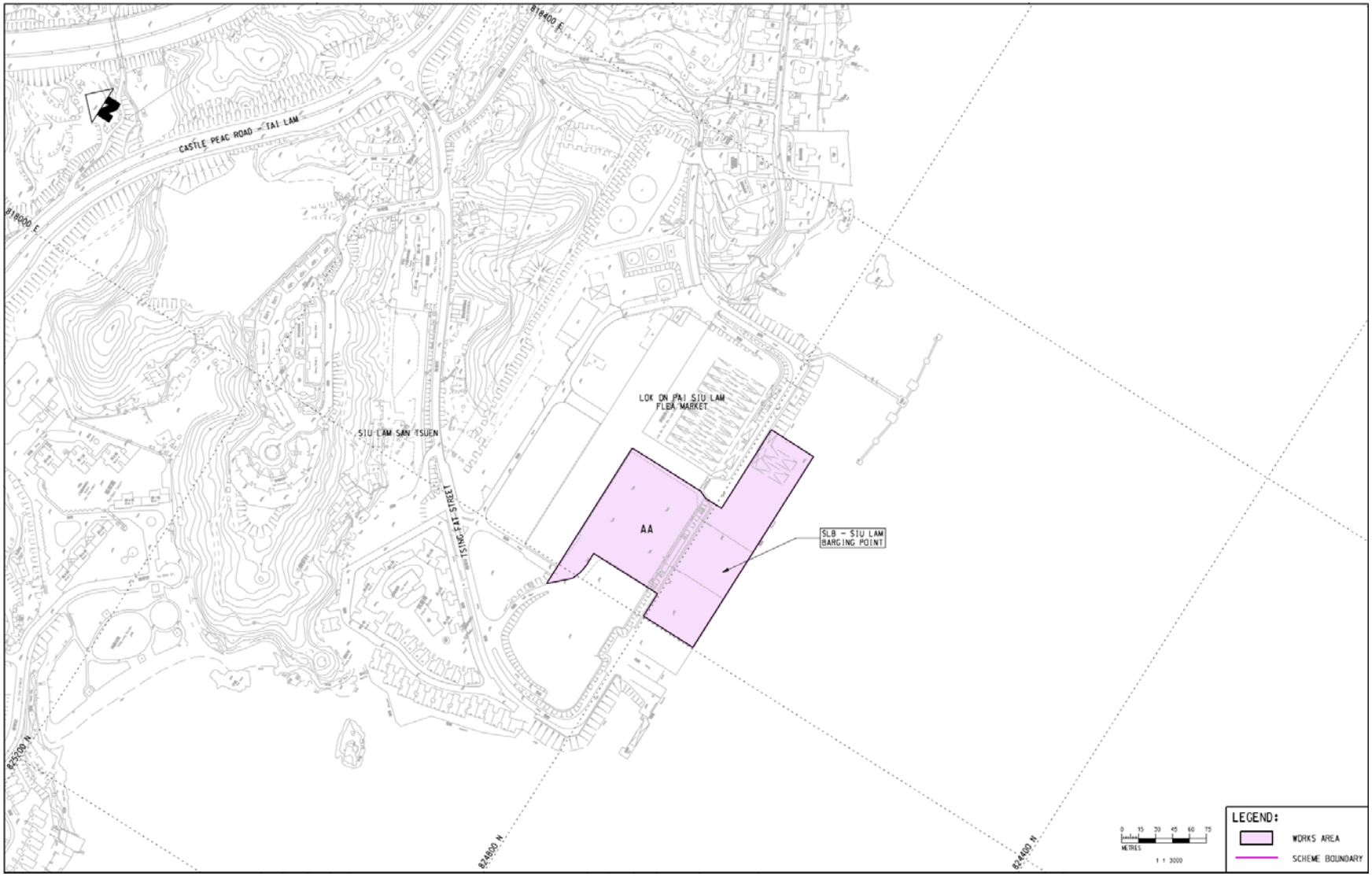

812000 E
831000 E
825600 N
825000 N
SHEK YAM
ON YAM ESTATE
SHEK YAM ESTATE
WO YI HOP ROAD
SMV - SHING MUN VENTILATION BUILDING
SYW - SHEK YAM WORKS AREA
CASTLE PEAK ROAD - KWAI CHUNG
KWAI CHUNG ROAD
KCV - KWAI CHUNG VENTILATION BUILDING
G
H
I
J
K
LEGEND:
WORKS AREA
PROPOSED SELECTED ALIGNMENT
UNDERGROUND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

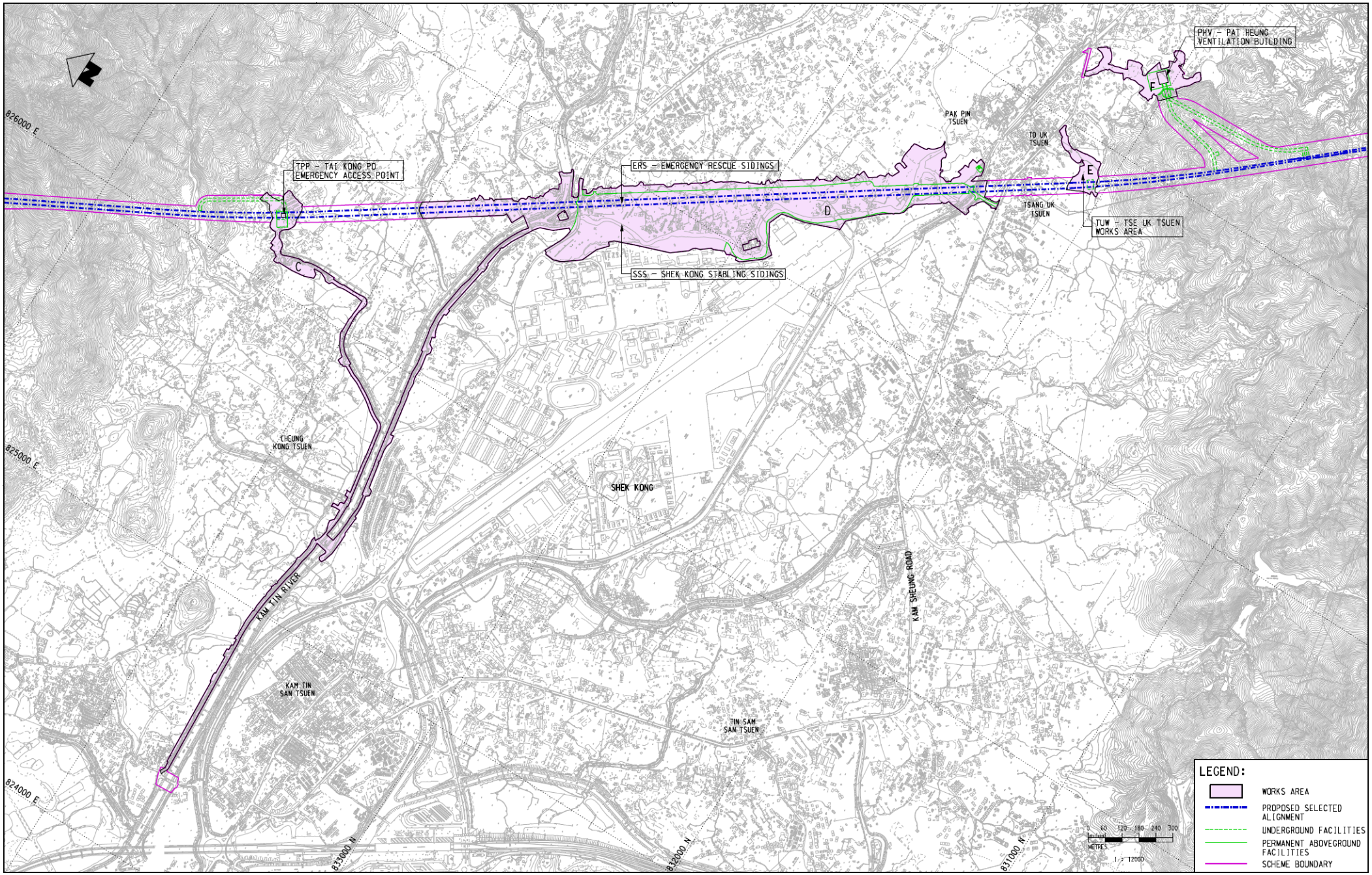

818800 E
818400 E
825600 N
825600 N
SO KWUN WAT
SO KWUN WAT
SO KWUN WAT
AC
SKW – SO KWUN WAT
MAGAZINE SITE & NURSERY AREA
GRANDVIEW TERRACE
TUEN MUN ROAD
METRES
1 : 5000
LEGEND:
WORKS AREA
SCHEME BOUNDARY

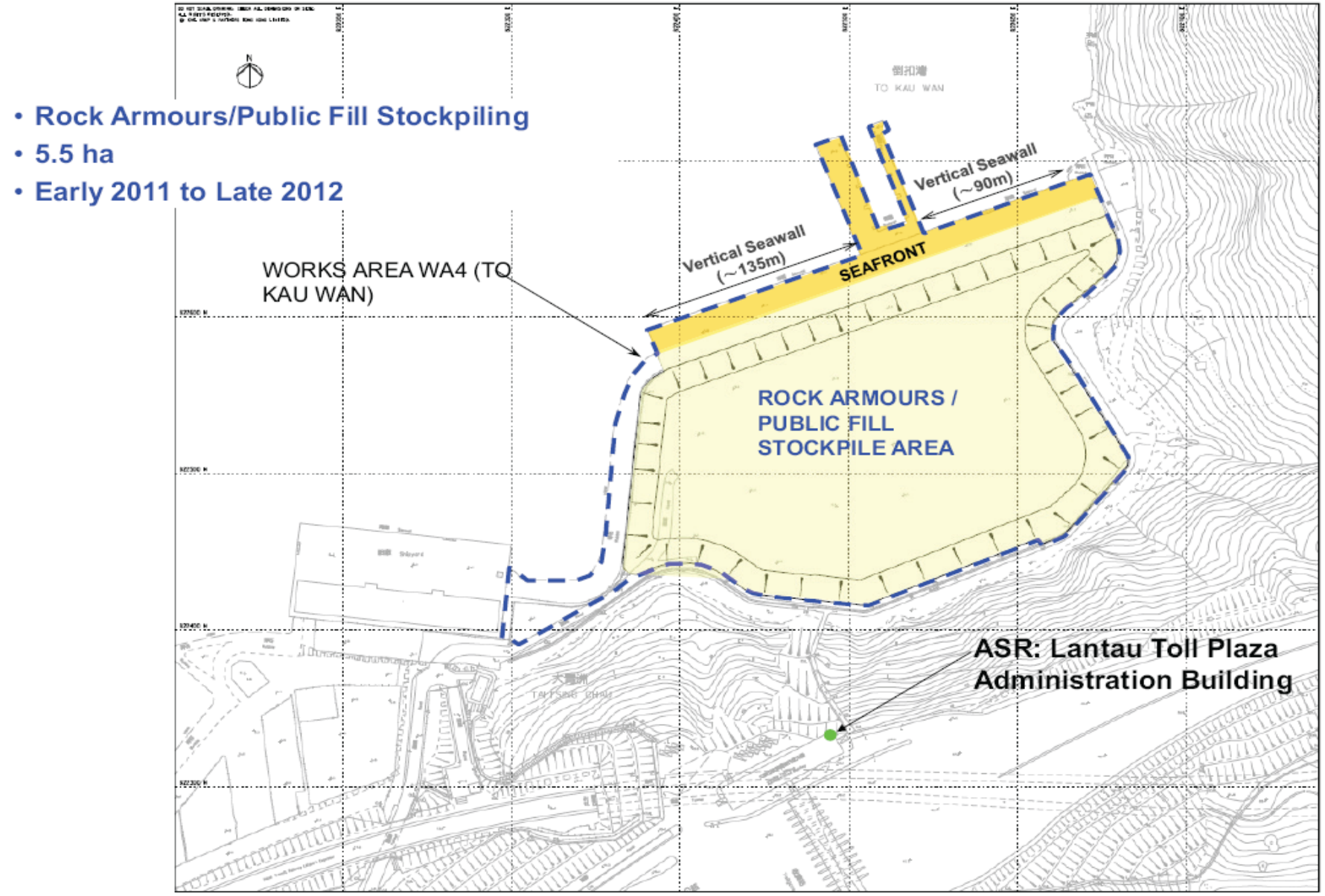

Works Area P
Works Area Q
834000 E
833000 E
822000 N
821000 N
CHING CHEUNG ROAD
NAM CHEONG ESTATE
NCV - NAM CHEONG VENTILATION BUILDING
WEST KOWLOON HIGHWAY
LCW - LAI CHI KOK WORKS AREA
MLW - MEI LAI ROAD WORKS AREA
TSING SHA HIGHWAY
MEI FU SUN CHUEN
NCB - NAM CHEONG BARGING POINT
MATCH LINE
LEGEND:
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

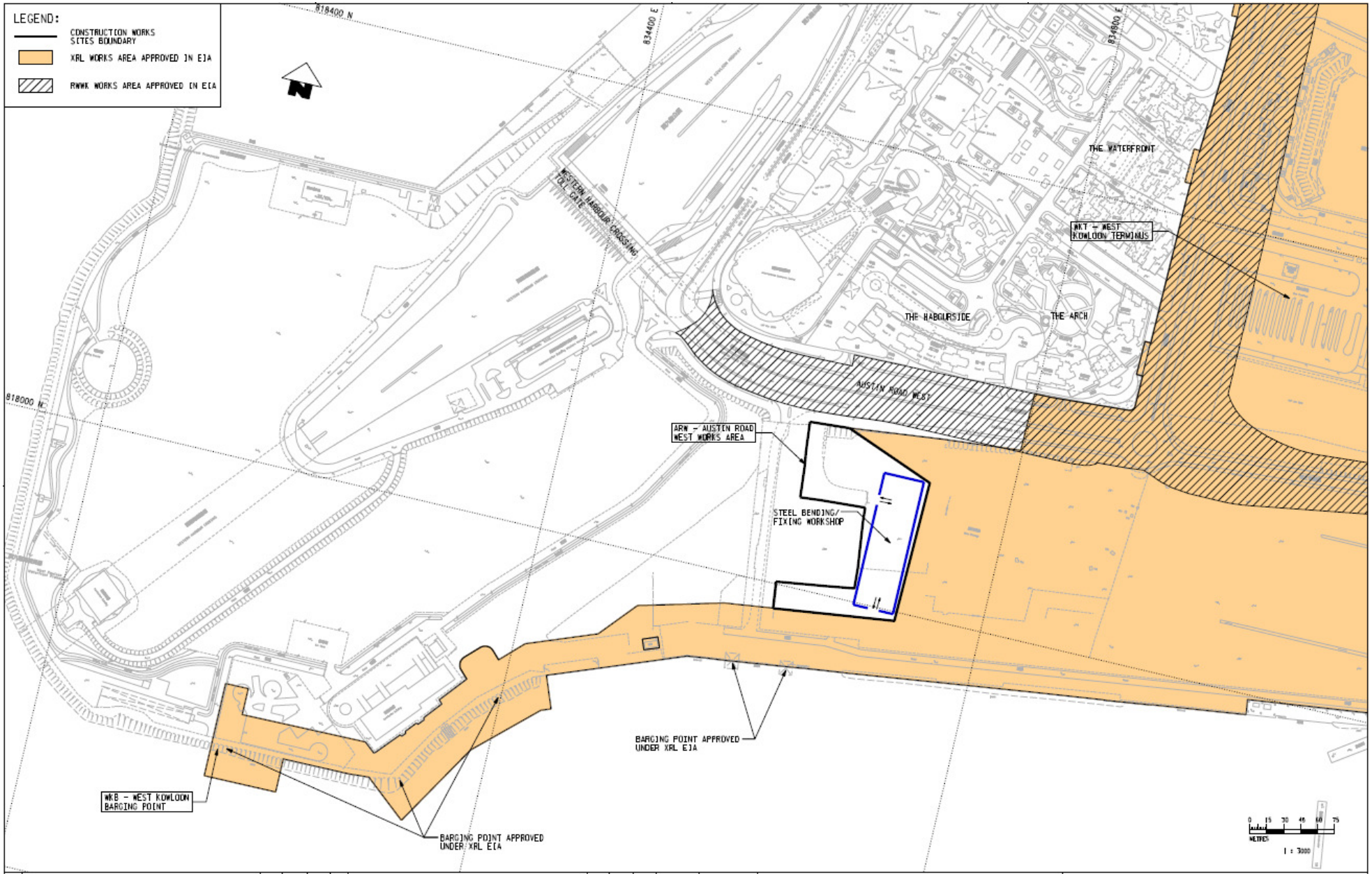

821600 E
822000 E
822400 E
822400 N
822000 N
TSING CHAU WAN
AG
TCB - TSING CHAU TSAI BARGING POINT
TOLL PLAZA
AIRPORT EXPRESS
NORTH LANTAU HIGHWAY
TSING CHAU TSAI
LEGEND:
WORKS AREA
SCHEME BOUNDARY

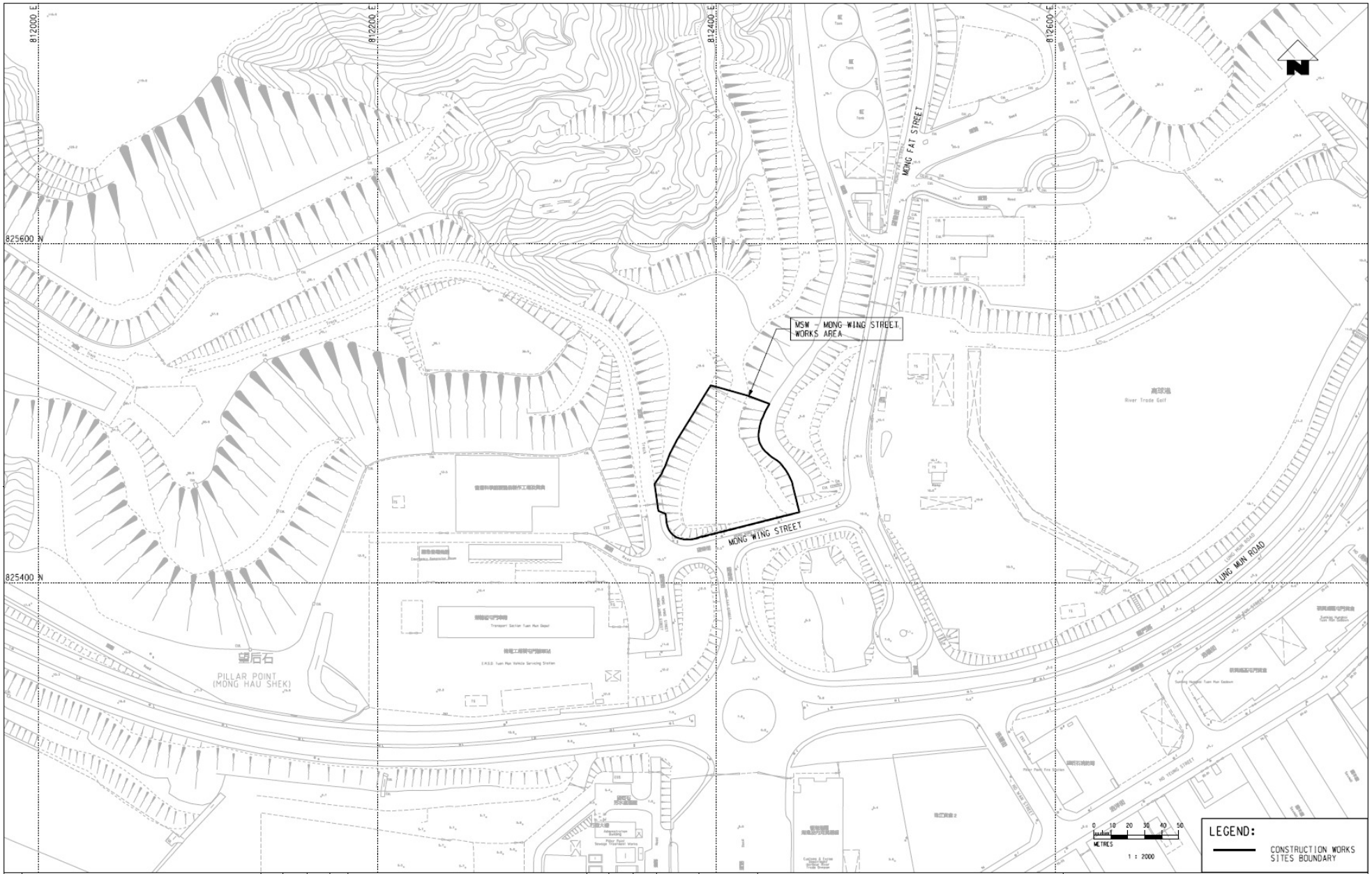

818400 E
CASTLE PEAK ROAD - TAI LAM
818000 E
LOK ON PAI SIU LAM
FLEA MARKET
SIU LAM SAN TSUEN
TSING FAT STREET
AA
SLB - SIU LAM
BARGING POINT
822200 N
824800 N
824400 N
0 15 30 45 60 75
METRES
1 : 3000
LEGEND:
WORKS AREA
SCHEME BOUNDARY

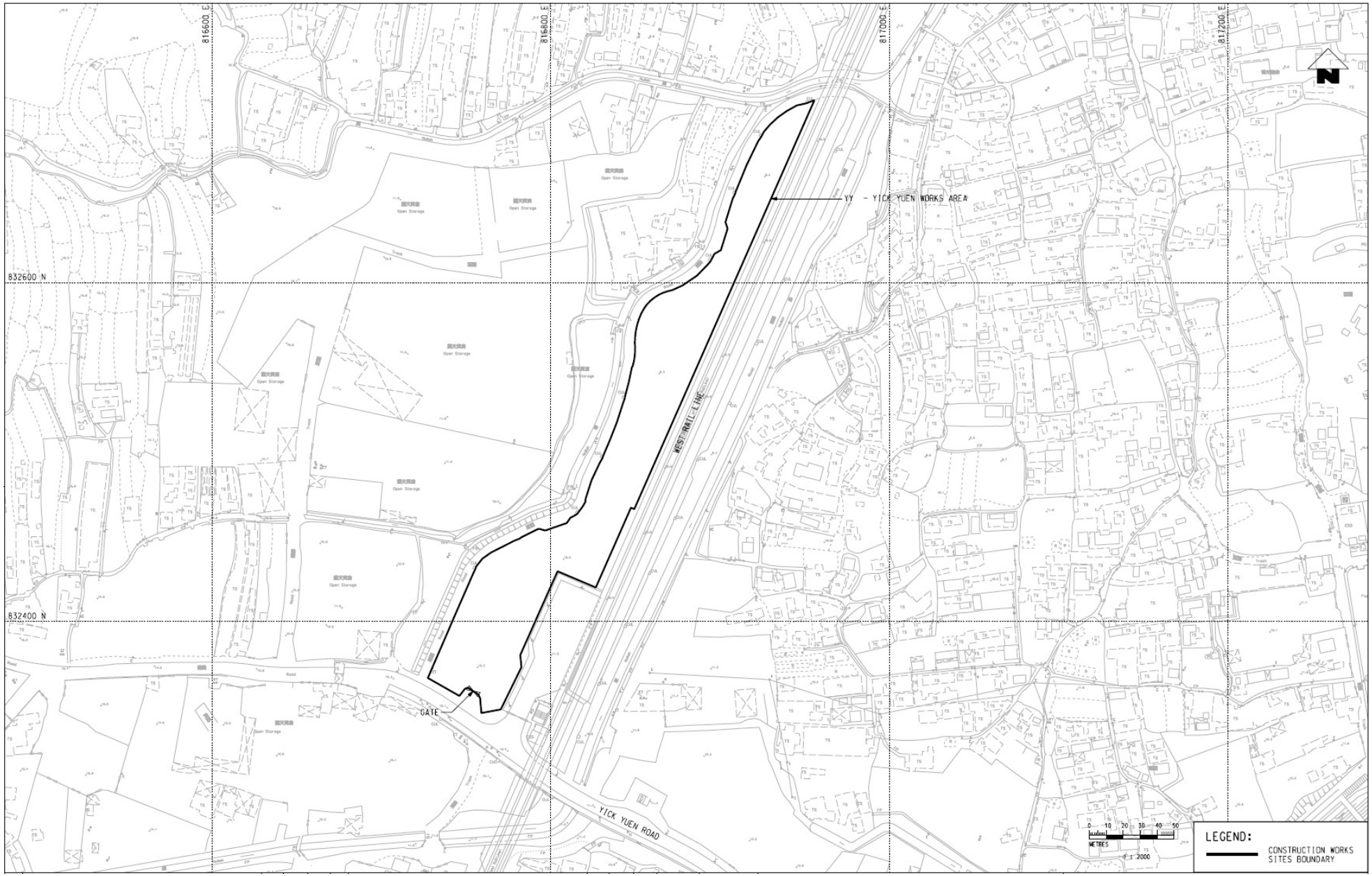

PHV – PAT HEUNG VENTILATION BUILDING
F
PAK PIN TSUEN
TO UK TSUEN
E
TSANG UK TSUEN
TUW – TSE UK TSUEN WORKS AREA
TPP – TAI KONG PO EMERGENCY ACCESS POINT
ERS – EMERGENCY RESCUE SIDINGS
D
SSS – SHEK KONG STABLING SIDINGS
C
826000 E
825000 E
824000 E
CHEUNG KONG TSUEN
SHEK KONG
KAM TIN RIVER
KAM TIN SAN 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. Stephen Boreman	2926 9170
Construction Manager (810B)	Mr. KS Lim	2926 9098
Construction Manager (810A & 811B)	Mr. Albert Lam	2164 2988
Construction Manager (811A)	Ms. Lesly Leung	2164 2930
Construction Manager (802, 805, 820, 821 & 822)	Mr. Kristian Murfitt	3519 4195
Construction Manager (823A, 823B & 824)	Mr. Charles Lau	3441 2111
Construction Manager (Acting) (825 & 826)	Mr. Eric Chan	2262 4788
Independent Environmental Checker		
Divisional Manager	Dr. Anne Kerr	2828 5793
Environmental Team		
Environmental Team Leader	Mr. Richard Kwan	2688 1179
Contractor		
Contract 802 Contractor		
Project Manager	Mr. Frankie Lam	6021 2602
Environmental Officer	Ms. Diana Lee	9317 1219
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. Wes Jones	6468 7678
Senior Environmental Officer	Mr. Dominic Fung	6040 1089

Title	Name	Telephone
Environmental Officer	Ms. Shirley Lui	9664 2544
Contract 810B Contractor		
Project Director	Mr. Jeremy Matterson	6629 4430
Environmental Manger	Mr. Calvin Sze	9205 9277
Environmental Officer	Ms. Cheese Poon	9640 4925
Contract 811A Contractor		
Project Director	Mr. Mark Challis	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. Chris Williams	2269 1518
Project Quality and Environmental Manager	Mr. Michael Leney	2269 1505
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)	Mr. Marcus Cheung	2215 6632
Contract 822 Contractor		
Project Director	Tony Pink	35522117
Environmental Manager / Officer	Mr. Brian Pickering	6323 5753
Contract 823A & B Contractor		
Project Manager	Mr. Philip Davies	2411 7600

Title	Name	Telephone
Environmental Officer	Mr. Erwin Regalado	2411 7608
Contract 824 Contractor		
Works Manager	Mr. Ian Sweeney	9759 8192
Environmental Officer	Mr. Alex Gbaguidi	5313 7021
Contract 825 Contractor		
Project Manager	Mr. Nakayama	2482 8101
Environmental Officer	Ms. Cecilia Choi	9228 7705
Contract 826 Contractor		
Project Manager	Mr. Steven Meredith	2774 9886
Environmental Officer	Mr. Pan Fong	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	MTR/ Contractor	Areas Infeasible for On-Site Inspection	After land resumption and prior to the 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
	(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	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.		and Site Investigation and WSW	works commencement at respective sites	

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

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
S10.126	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

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
	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

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
S10.137	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

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
	(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

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
	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

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
	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

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
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

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
	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					

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 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

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
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

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
	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

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 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.					

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
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

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
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	

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
	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					

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
	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

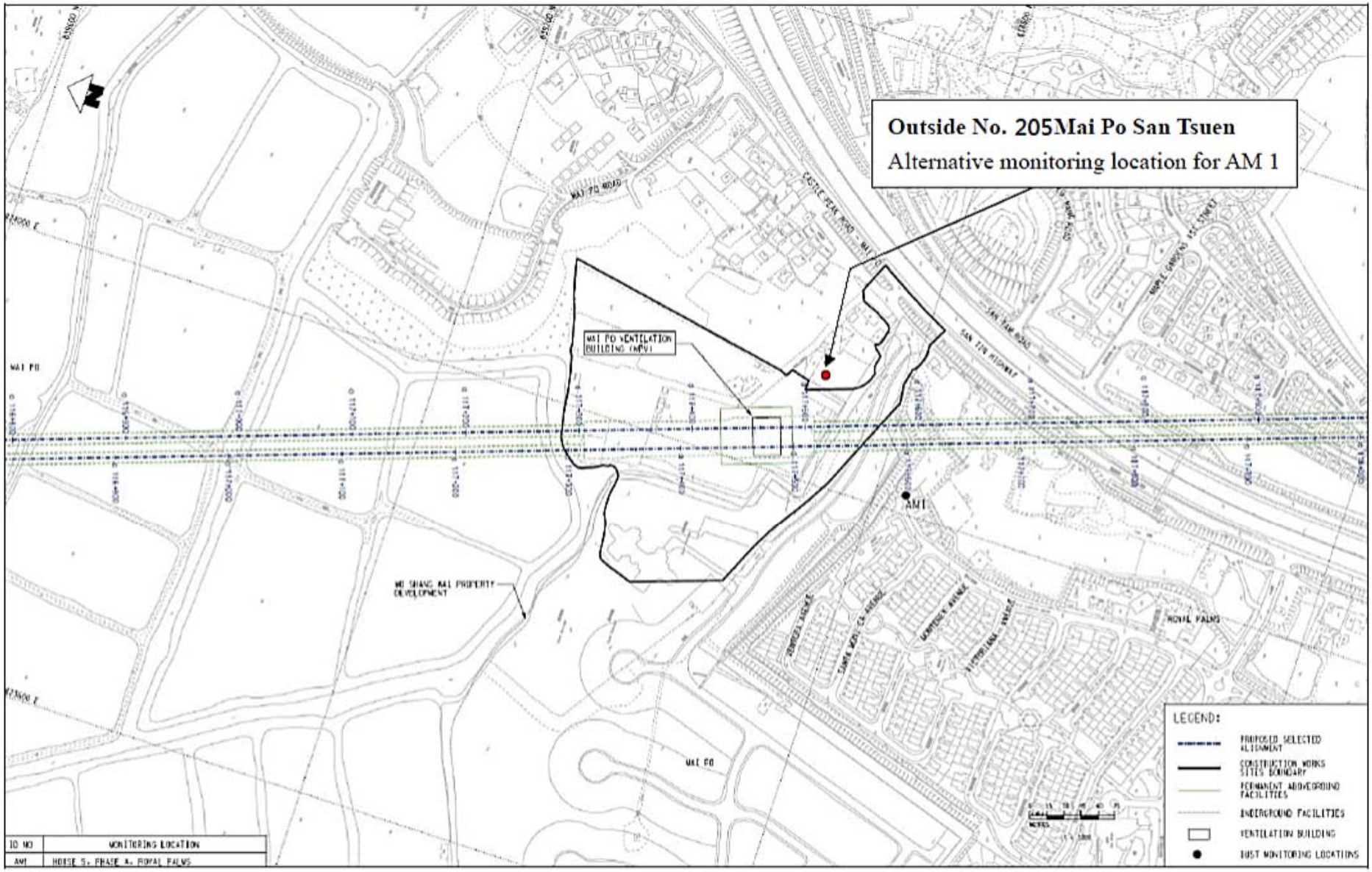
EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measures	When to implement the measures?	Implementation Status
	needed.			NTML Consultation Zone		as per construction programme
S14.80	- Upon completion 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

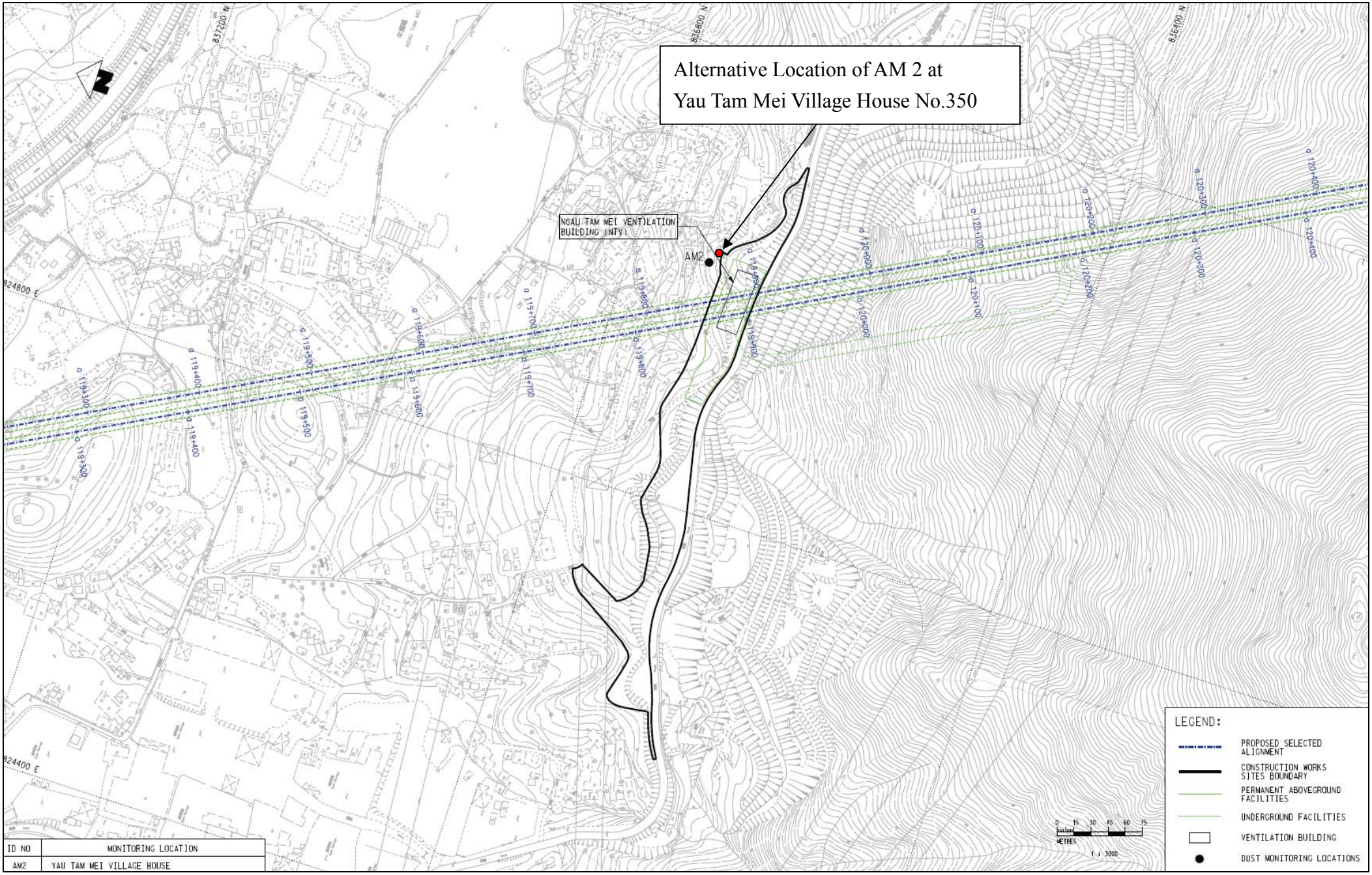
EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measures	When to implement the measures?	Implementation Status
S14.76	- Smoking within the tunnels should be prohibited at all times.	Protect the operation 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

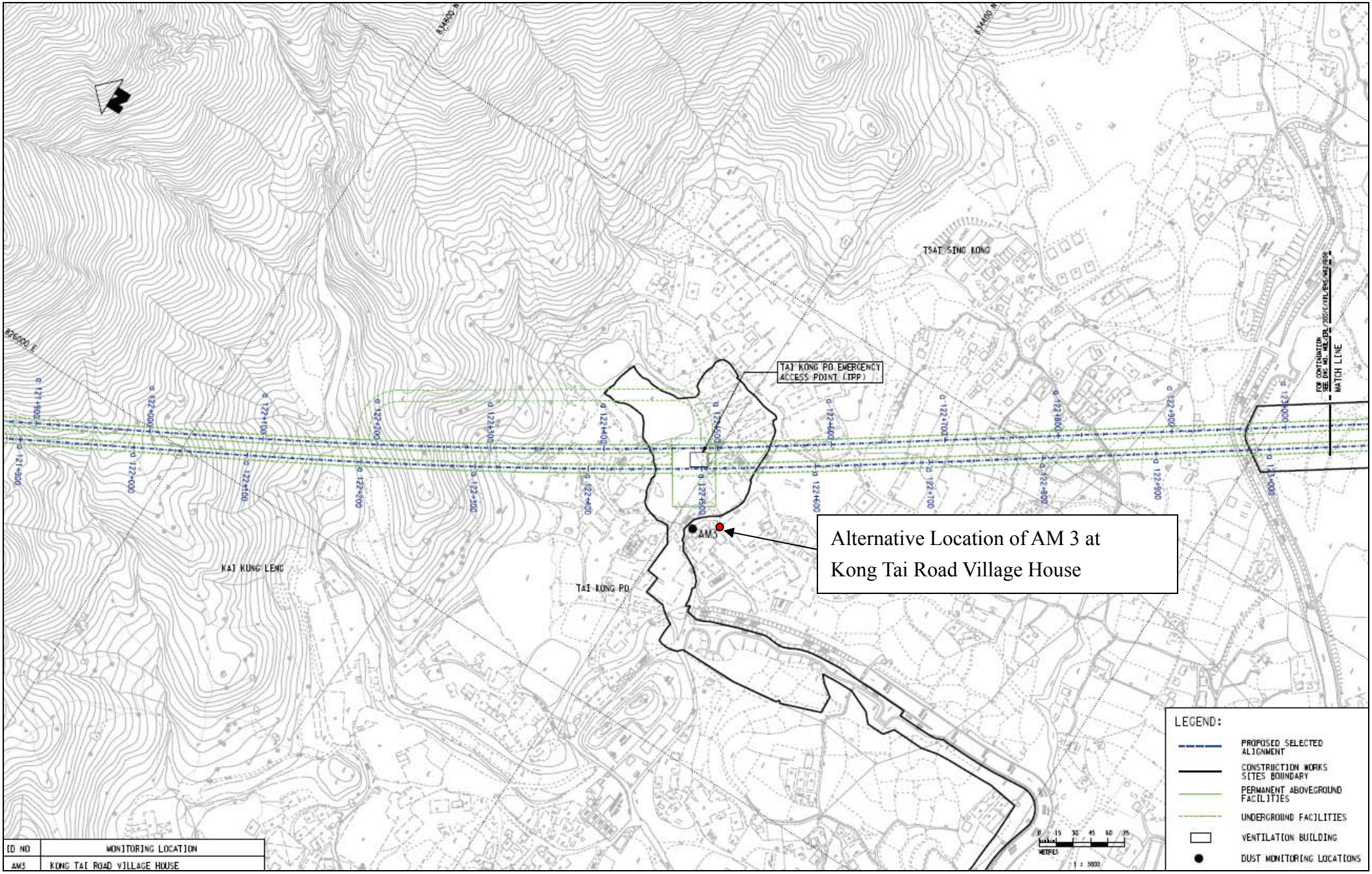
EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measures	When to implement the measures?	Implementation Status
	start-up of ventilation, if applicable. A summary of the monitoring results should be 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

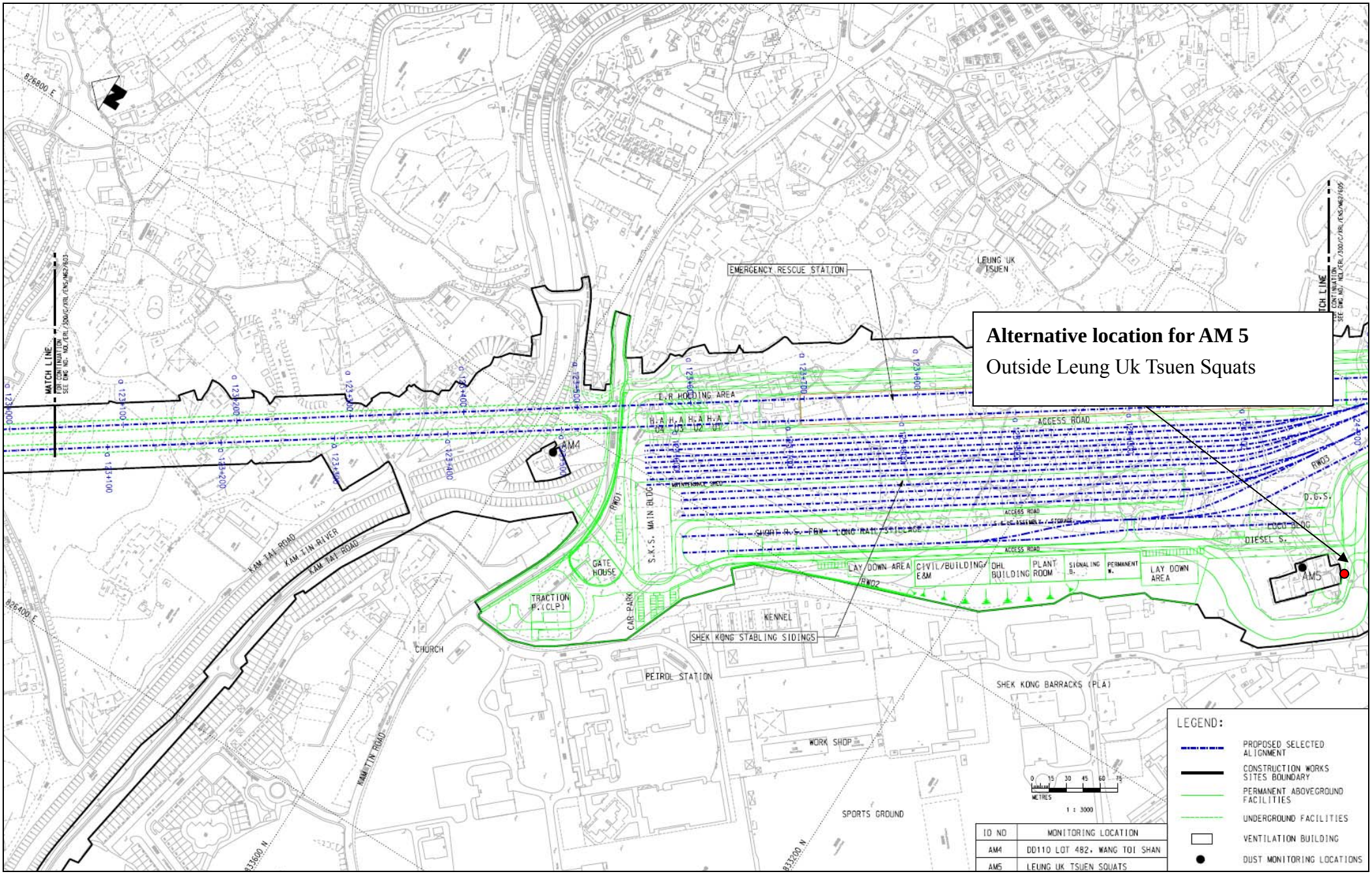
Appendix D

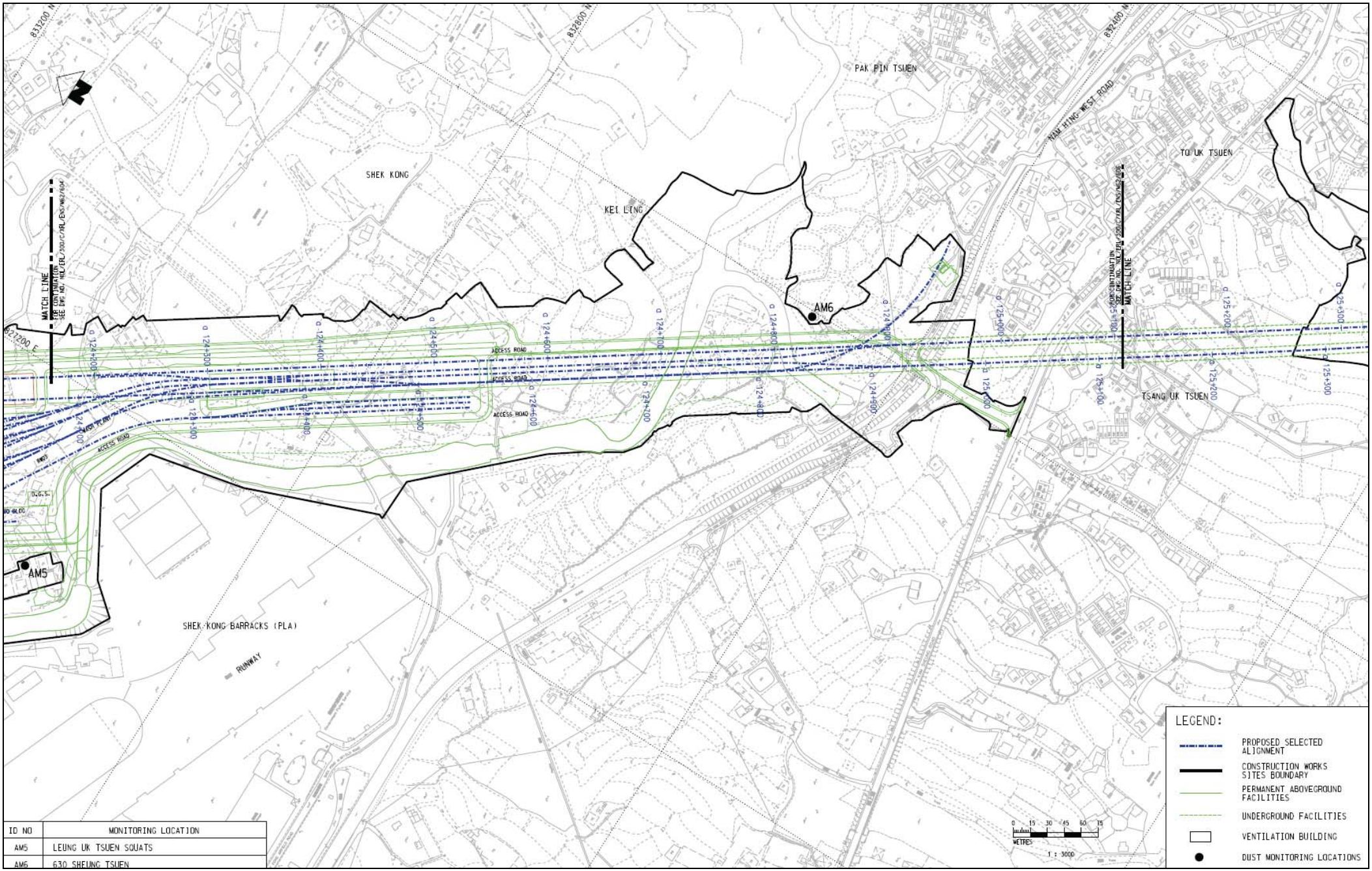
Monitoring Locations


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

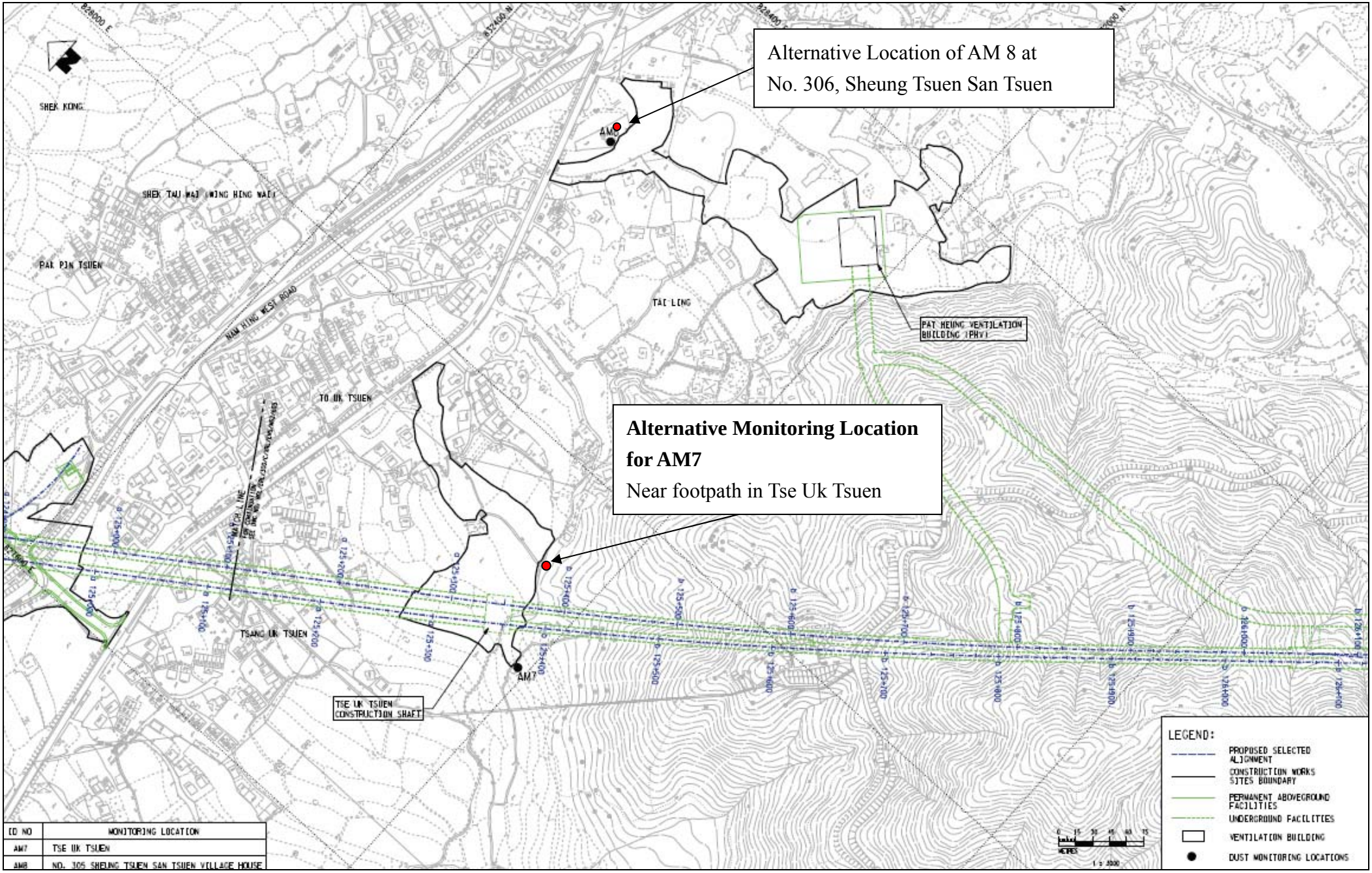

Alternative Location of AM 2 at
Yau Tam Mei Village House No.350
NGAU TAM MEI VENTILATION BUILDING (NTV)
AM2
837200 N
836800 N
836400 N
824800 E
824400 E
LEGEND:
PROPOSED SELECTED ALIGNMENT
CONSTRUCTION WORKS SITES BOUNDARY
PERMANENT ABOVEGROUND FACILITIES
UNDERGROUND FACILITIES
VENTILATION BUILDING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

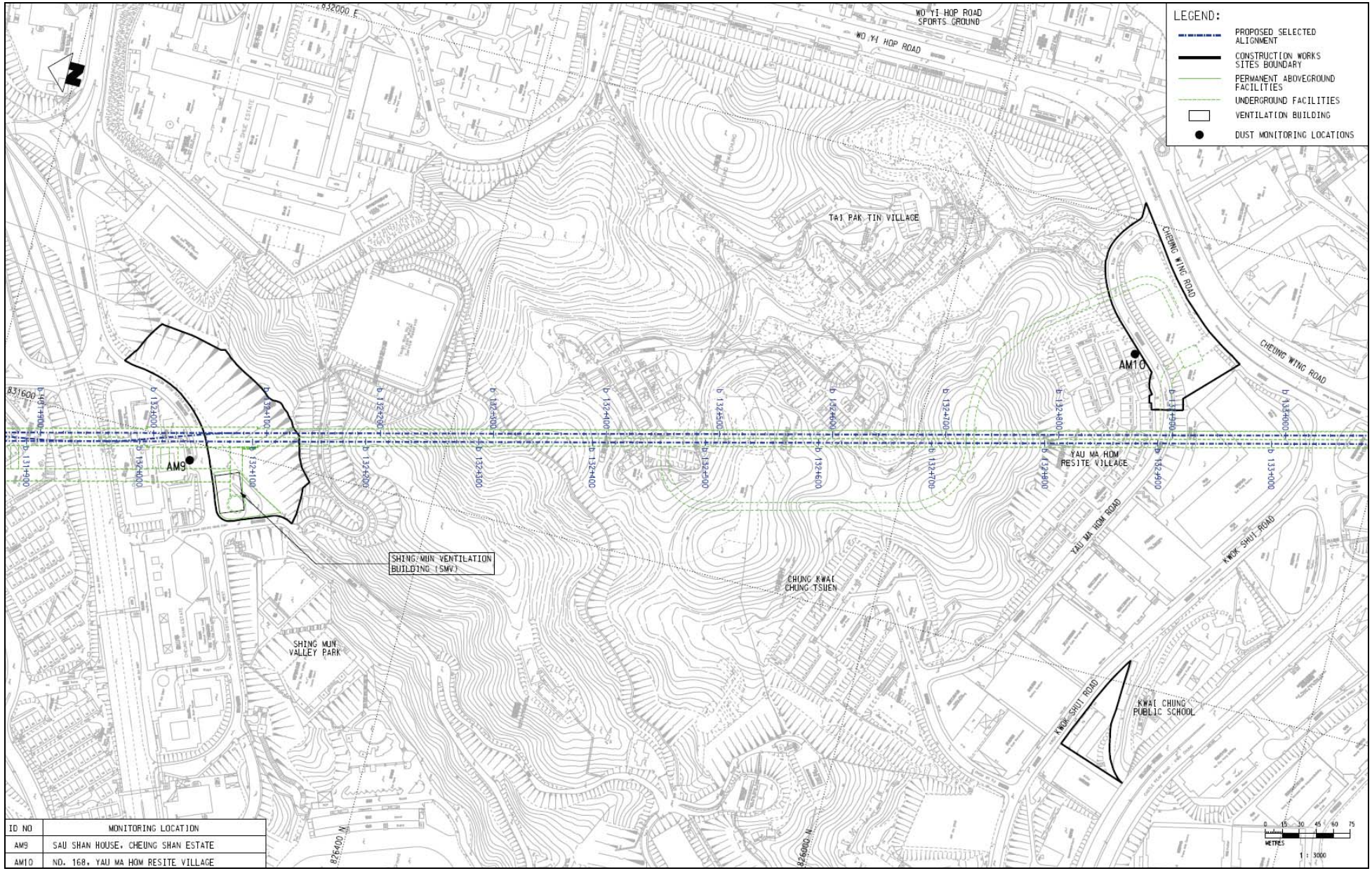

TSAT SING KONG
TAI KONG PO EMERGENCY ACCESS POINT (TPP)
AM3
Alternative Location of AM 3 at Kong Tai Road Village House
KAI KONG LENG
TAI KONG PO
MATCH LINE
LEGEND:
PROPOSED SELECTED ALIGNMENT
CONSTRUCTION WORKS SITES BOUNDARY
PERMANENT ABOVEGROUND FACILITIES
UNDERGROUND FACILITIES
VENTILATION BUILDING
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

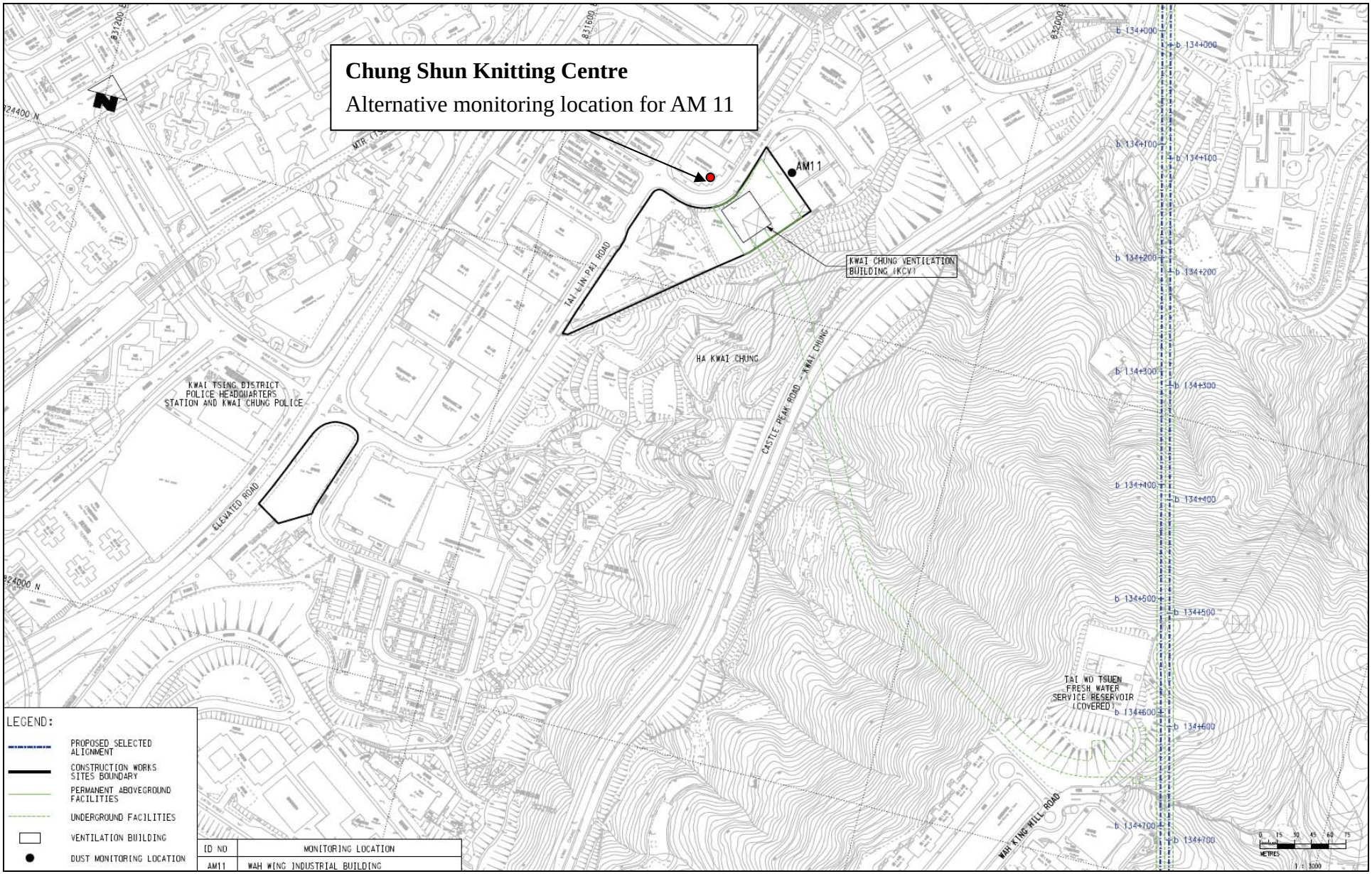


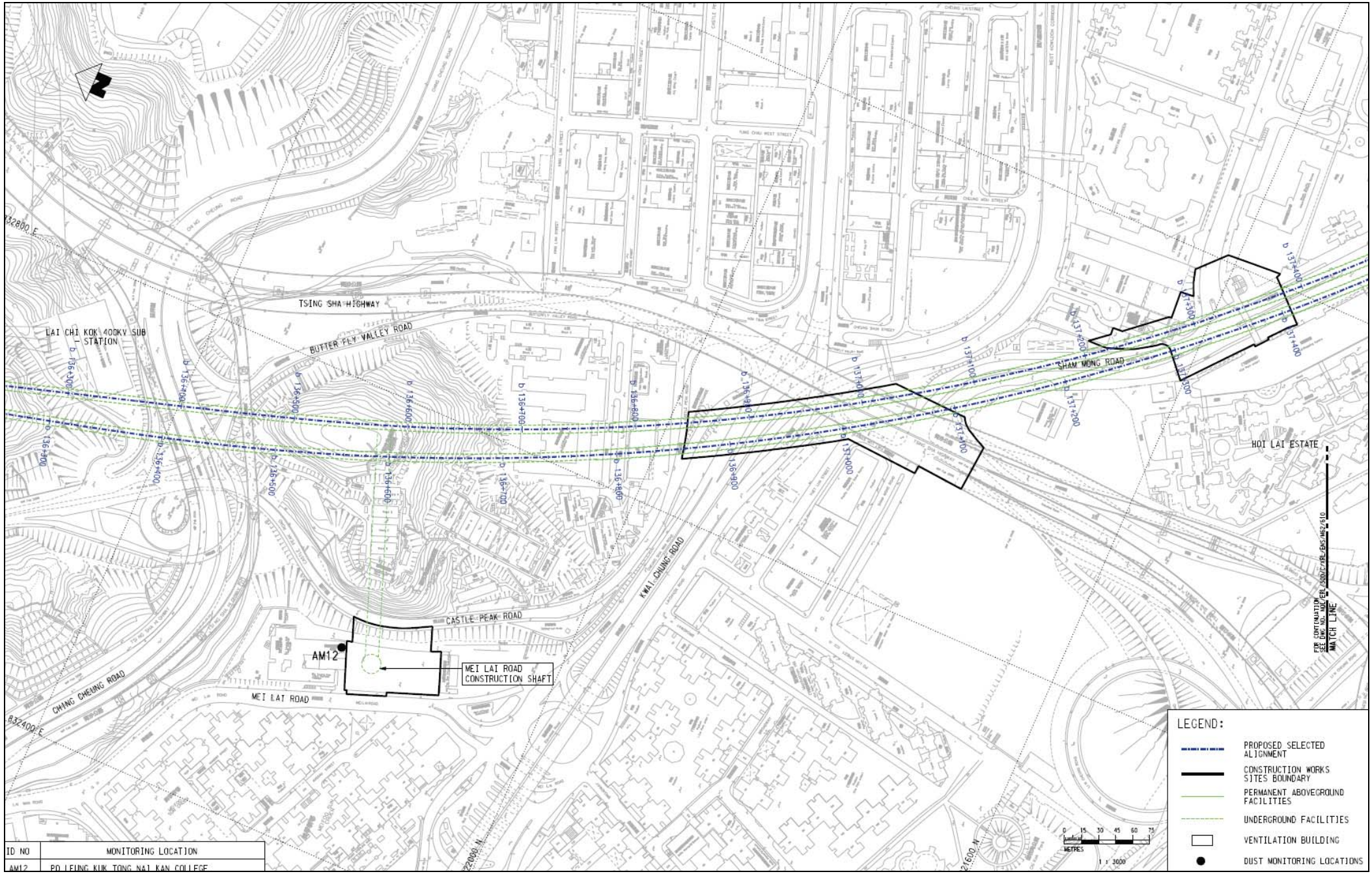
ID NO	MONITORING LOCATION
AM5	LEUNG UK TSUEN SQUATS
AM6	630 SHEUNG TSUEN


Alternative Location of AM 8 at
No. 306, Sheung Tsuen San Tsuen
Alternative Monitoring Location for AM7
Near footpath in Tse Uk Tsuen
AM8
AM7
SHEK KONG
SHEK TAU WAI (WING HING WAI)
PAK PIN TSUEN
WANG HING WEST ROAD
TAI LONG
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

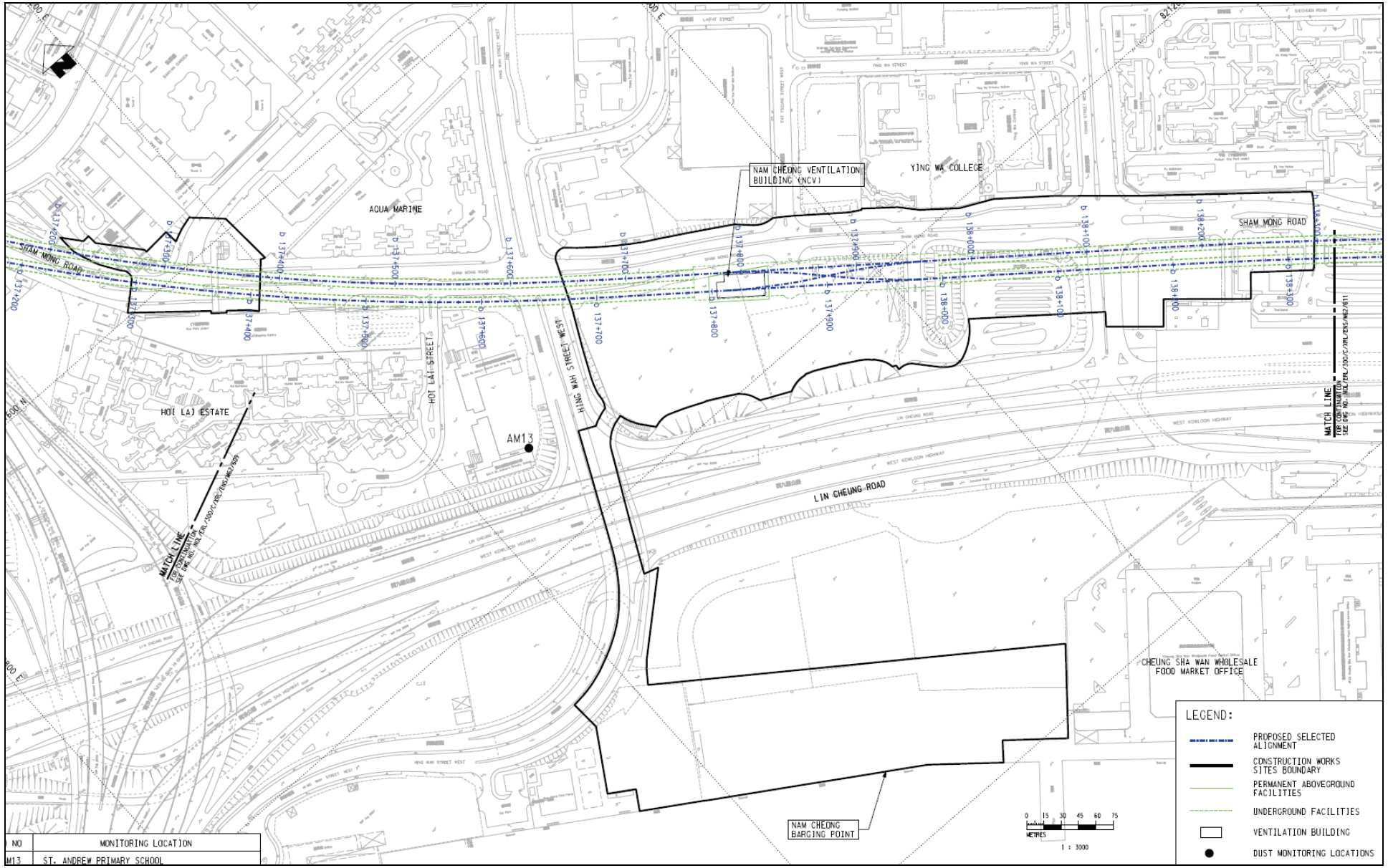


ID NO	MONITORING LOCATION
AM9	SAU SHAN HOUSE, CHEUNG SHAN ESTATE
AM10	NO. 168, YAU MA HOM RESITE VILLAGE

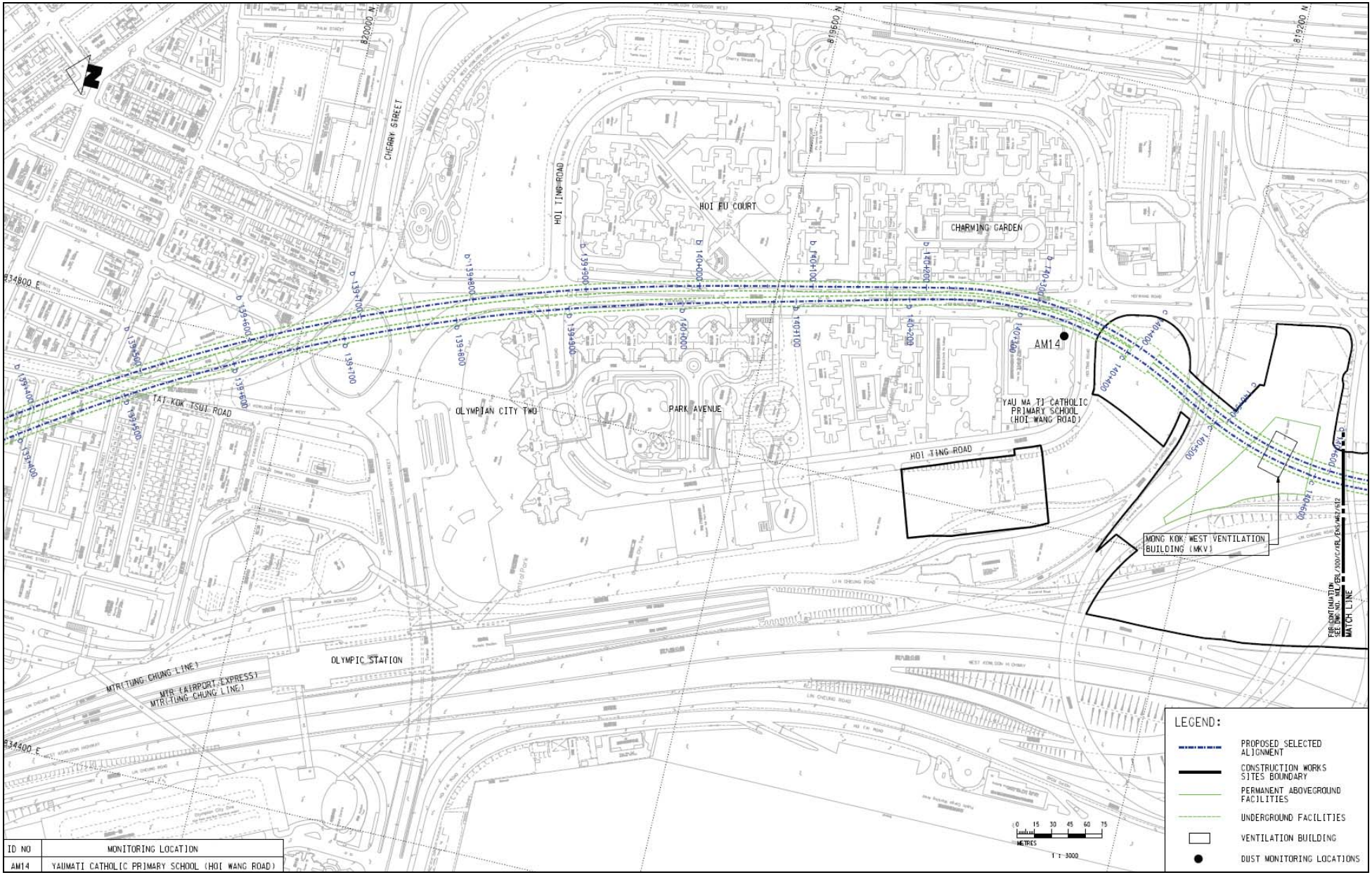

Chung Shun Knitting Centre
Alternative monitoring location for AM 11
AM11
KWAI CHUNG VENTILATION BUILDING (KCV)
TAI KLIN PAI ROAD
HA KWAI CHUNG
CASTLE PEAK ROAD - KWAI CHUNG
KWAI TSING DISTRICT POLICE HEADQUARTERS STATION AND KWAI CHUNG POLICE
ELEVATED ROAD
TAI WO TSUEN FRESH WATER SERVICE RESERVOIR (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



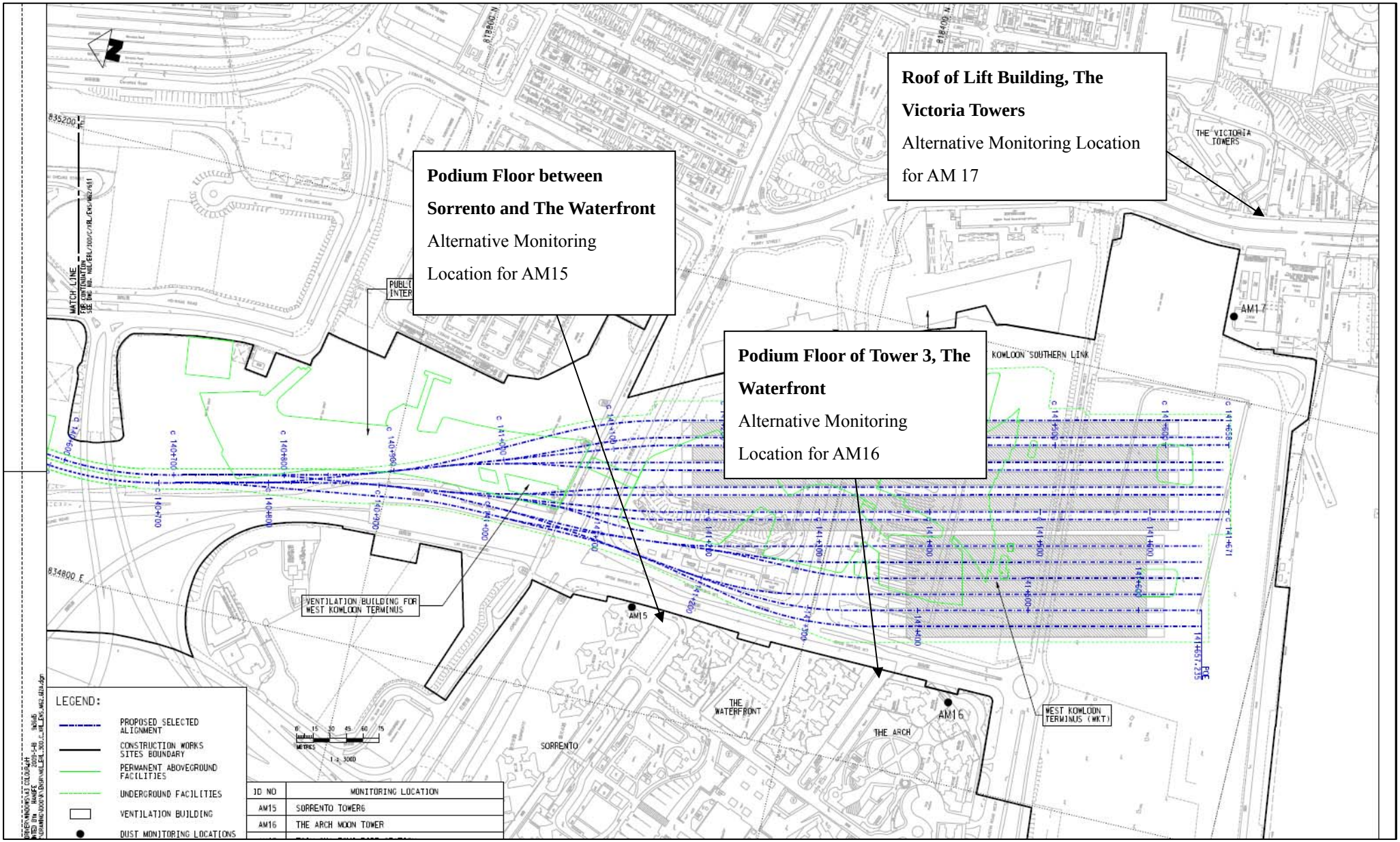
ID NO	MONITORING LOCATION
AM12	PO LEUNG KUK TONG NAI KAN COLLEGE



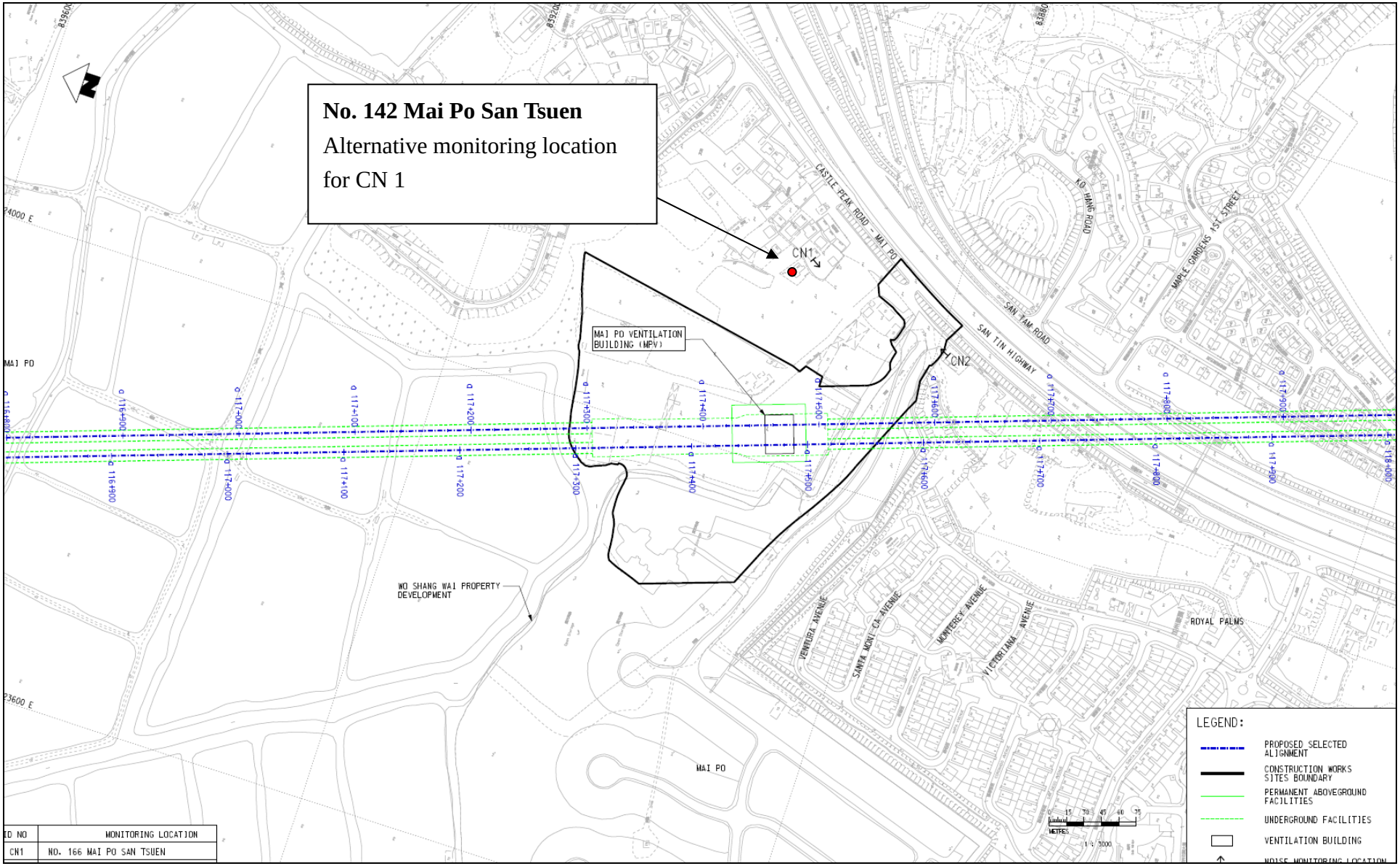
NO	MONITORING LOCATION
M13	ST. ANDREW PRIMARY SCHOOL

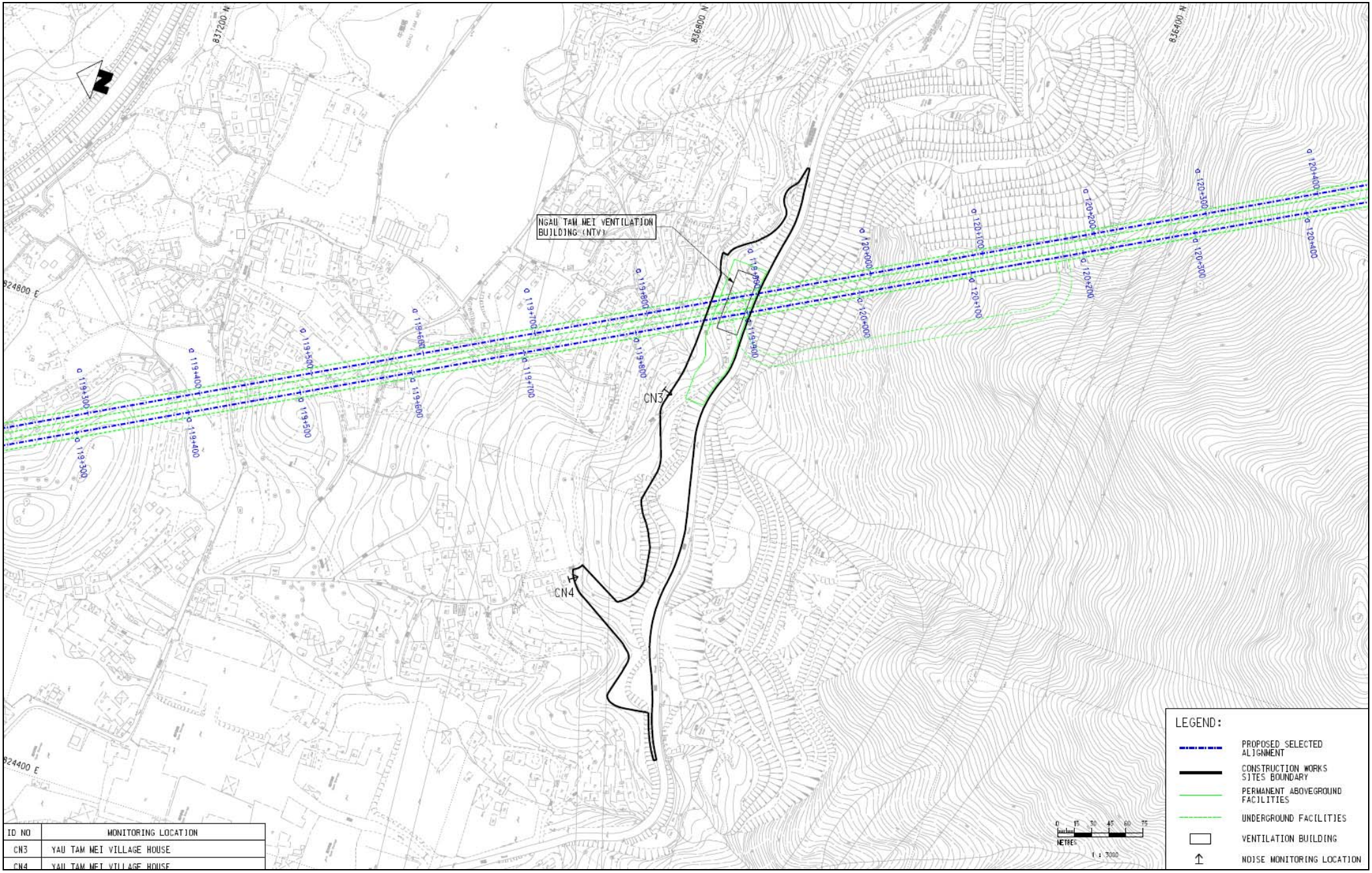


ID NO	MONITORING LOCATION
AM14	YAUMATI CATHOLIC PRIMARY SCHOOL (HOI WANG ROAD)

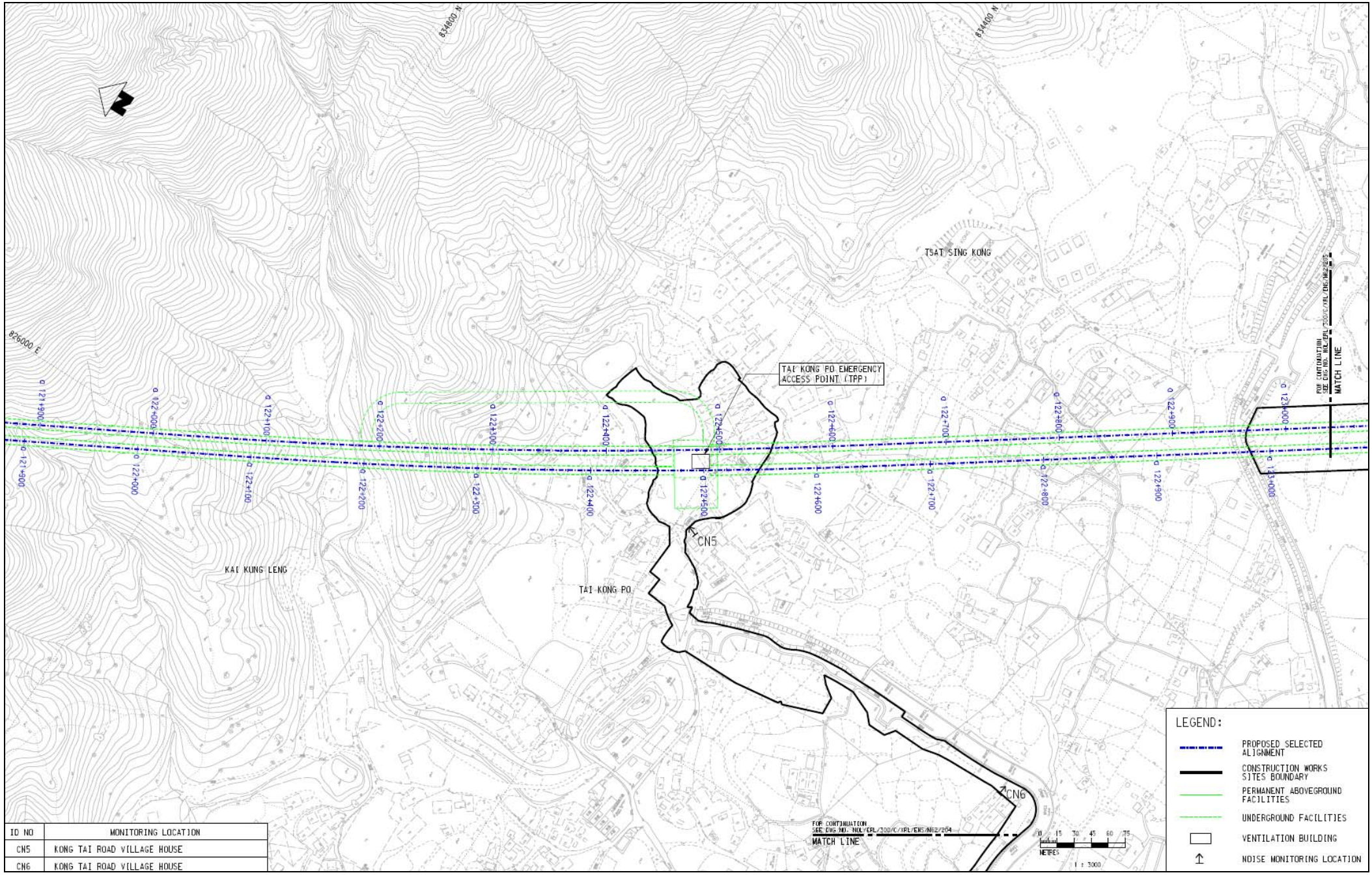


Dust monitoring locations


No. 142 Mai Po San Tsuen
Alternative monitoring location for CN 1
CN1
CN2
MAI PO VENTILATION BUILDING (MPV)
WO SHANG WAI PROPERTY DEVELOPMENT
MAI PO
CASTLE PEAK ROAD - MAI PO
KO HANG ROAD
MAPLE GARDENS
1ST STREET
SAN TAM ROAD
SAN TIN HIGHWAY
VENTURA AVENUE
SANTA MONICA AVENUE
MONTEREY AVENUE
VICTORIANA AVENUE
ROYAL PALMS
24000 E
23600 E
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
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

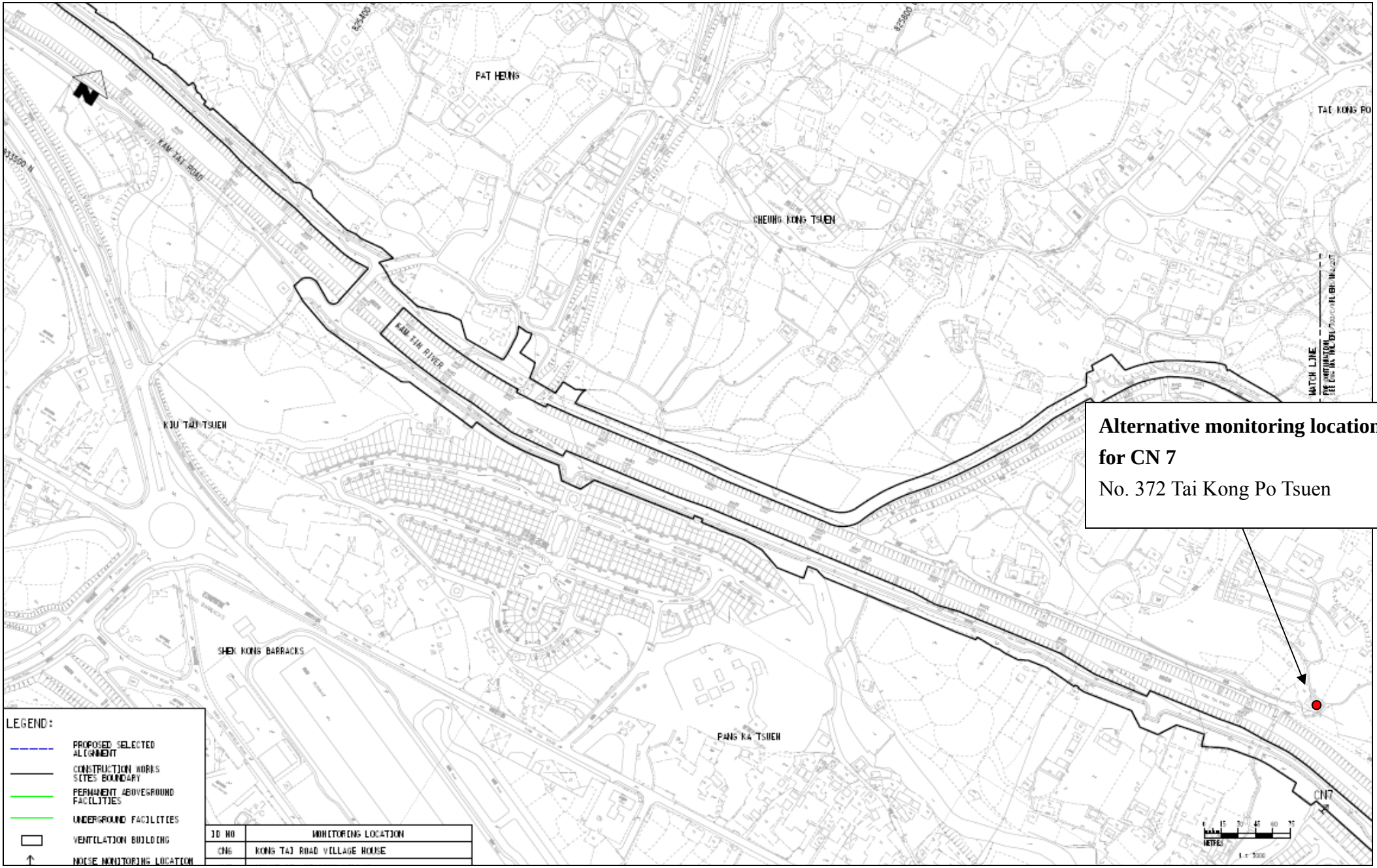
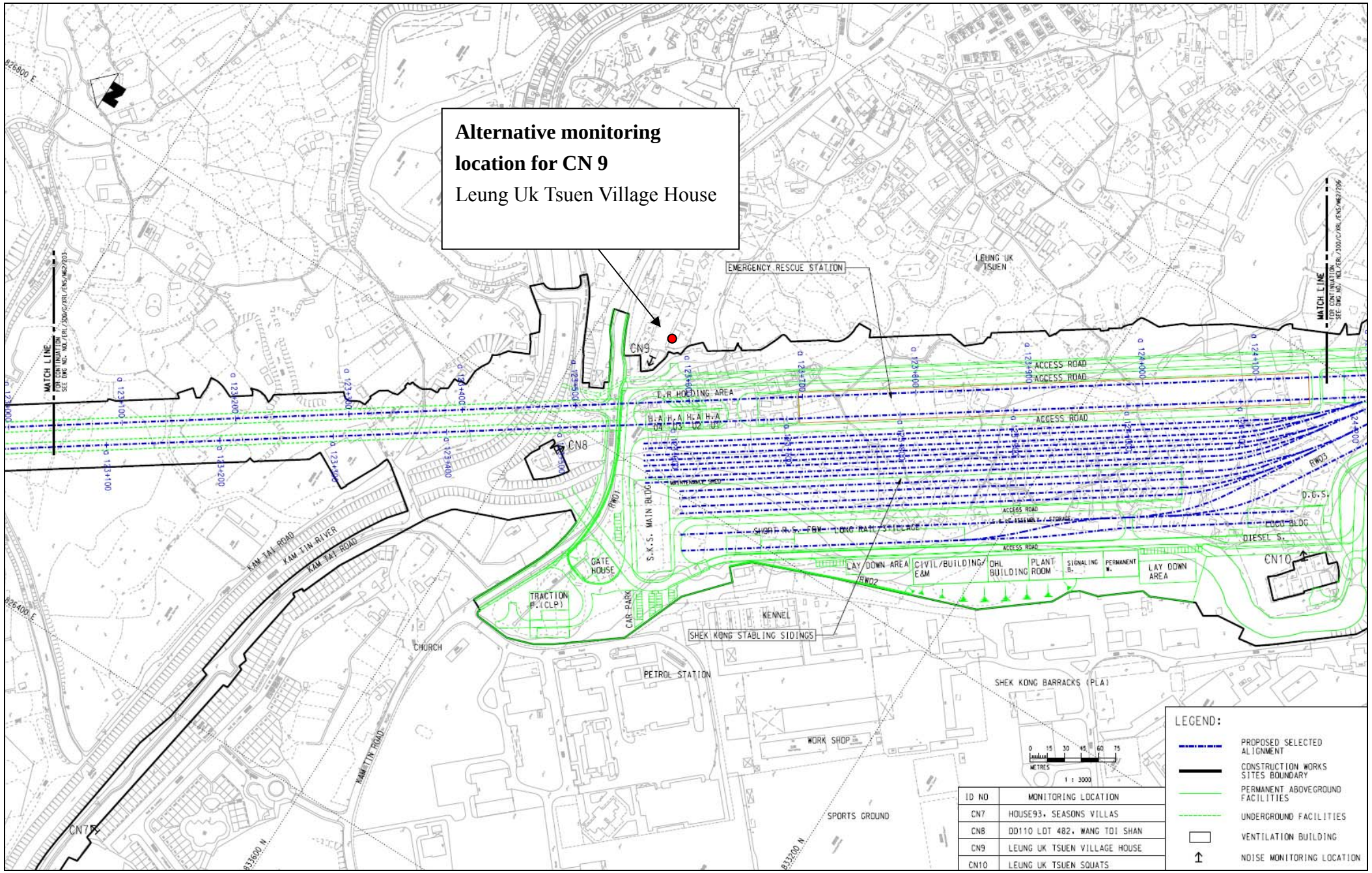
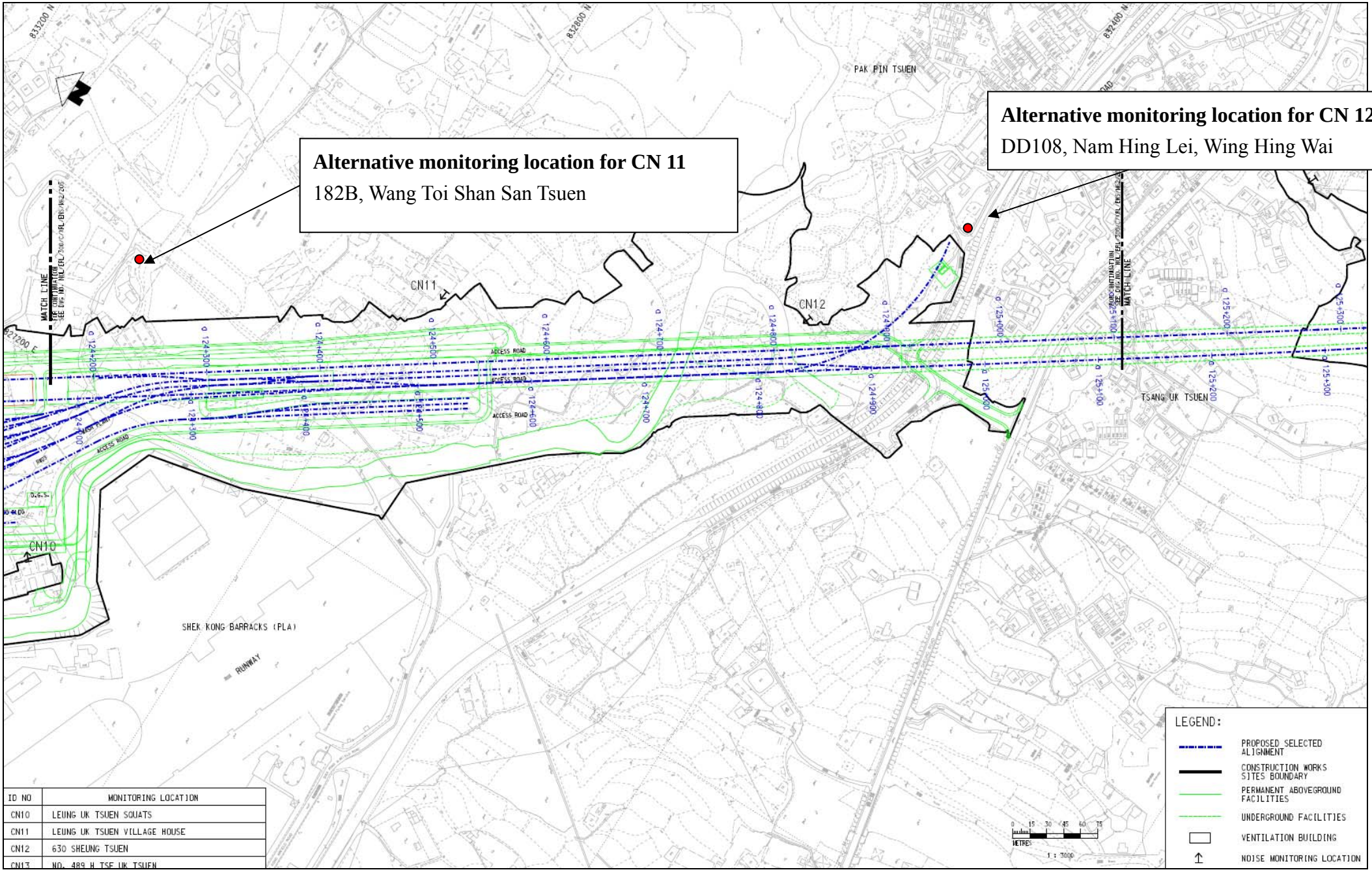
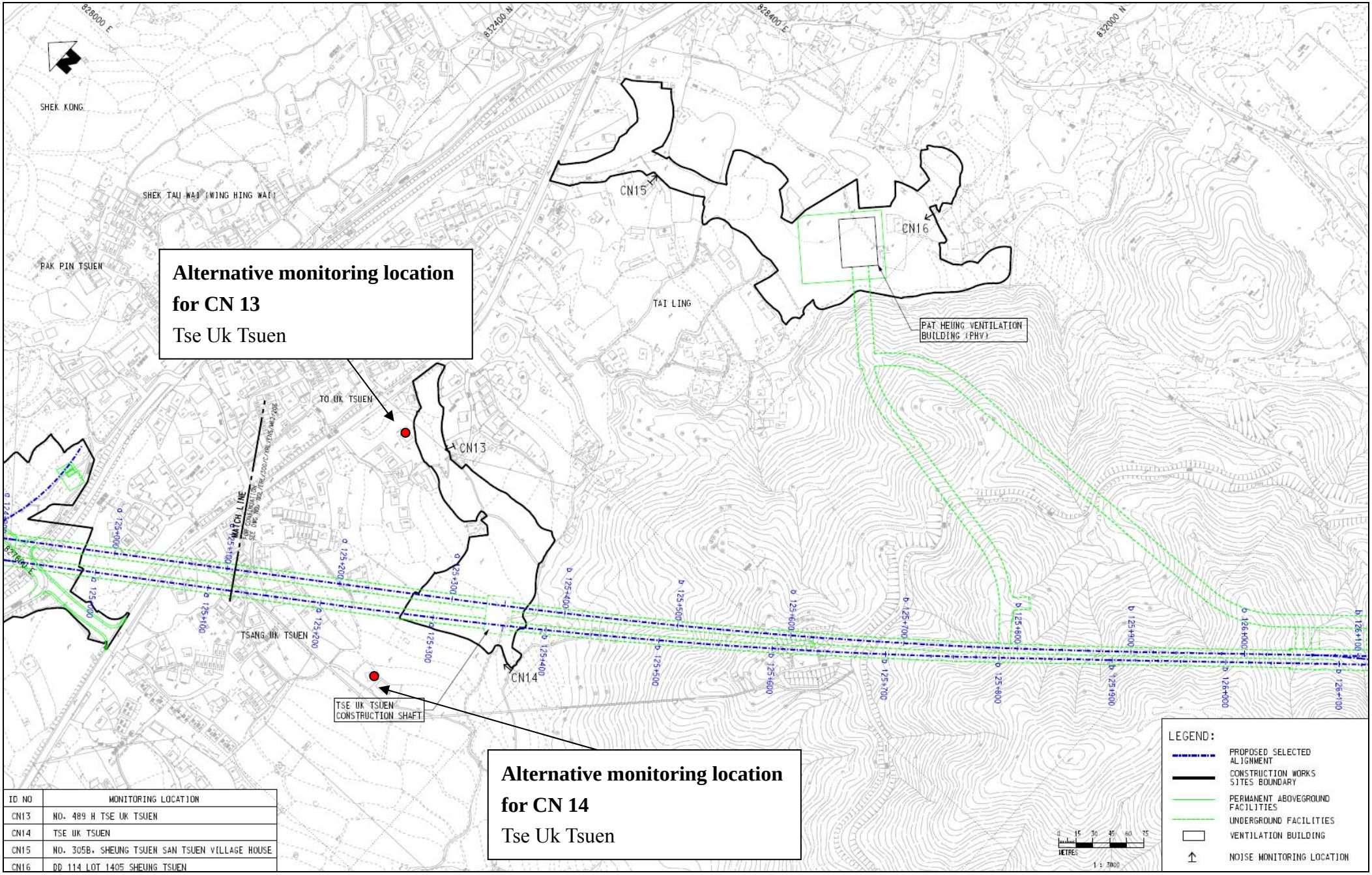


Figure 2 – Noise Monitoring Locations

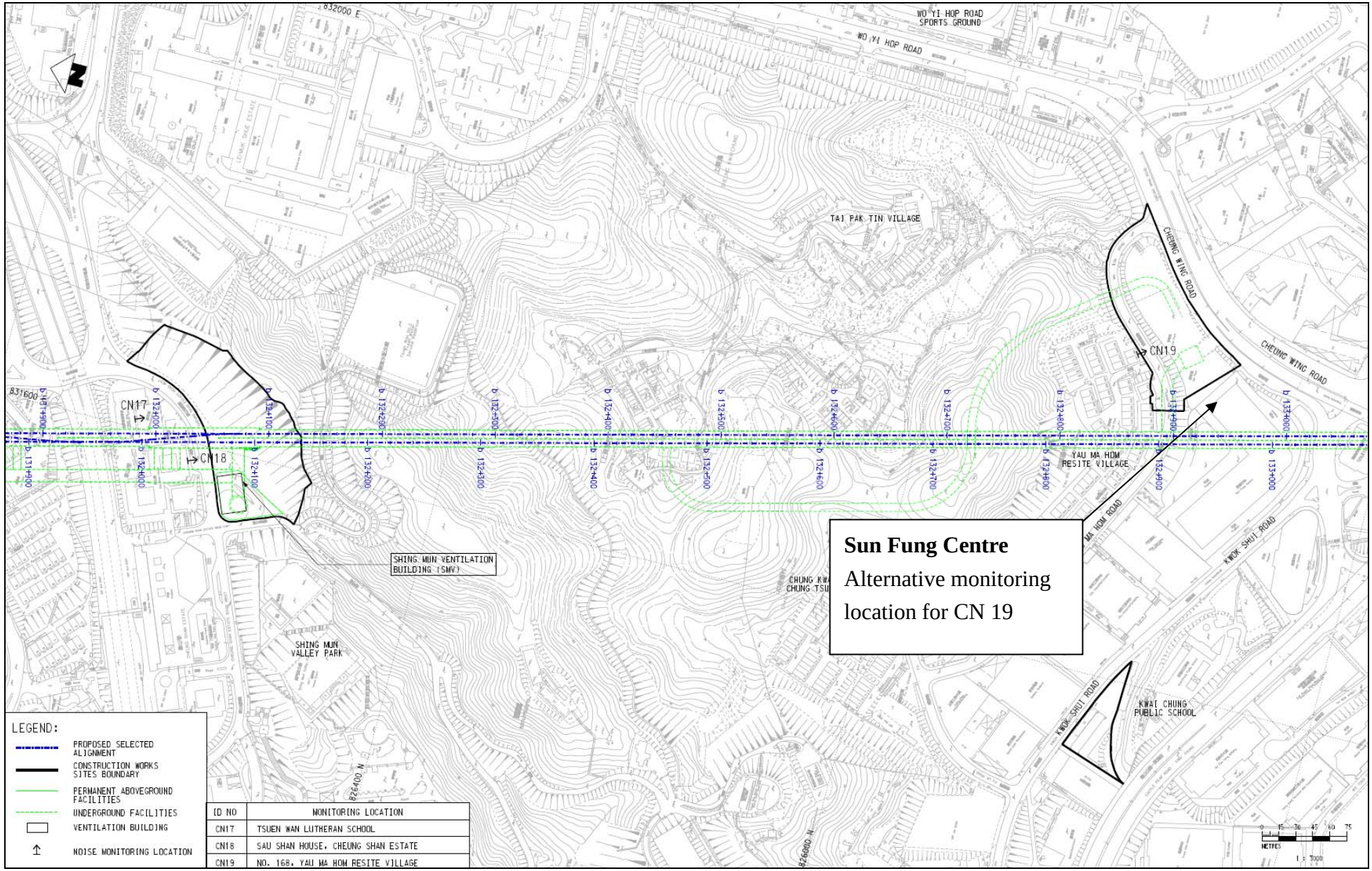

Alternative monitoring location for CN 9
Leung Uk Tsuen Village House
EMERGENCY RESCUE STATION
LEUNG UK TSUEN
CN9
CN8
CN10
CN7
E.R HOLDING AREA
ACCESS ROAD
MAINTENANCE SHED
S.K.S. MAIN BLDG
GATE HOUSE
TRACTION P.(CLP)
CAR PARK
KENNEL
SHEK KONG STABLING SIDINGS
LAY DOWN AREA
CIVIL/BUILDING E&M
OHL BUILDING
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

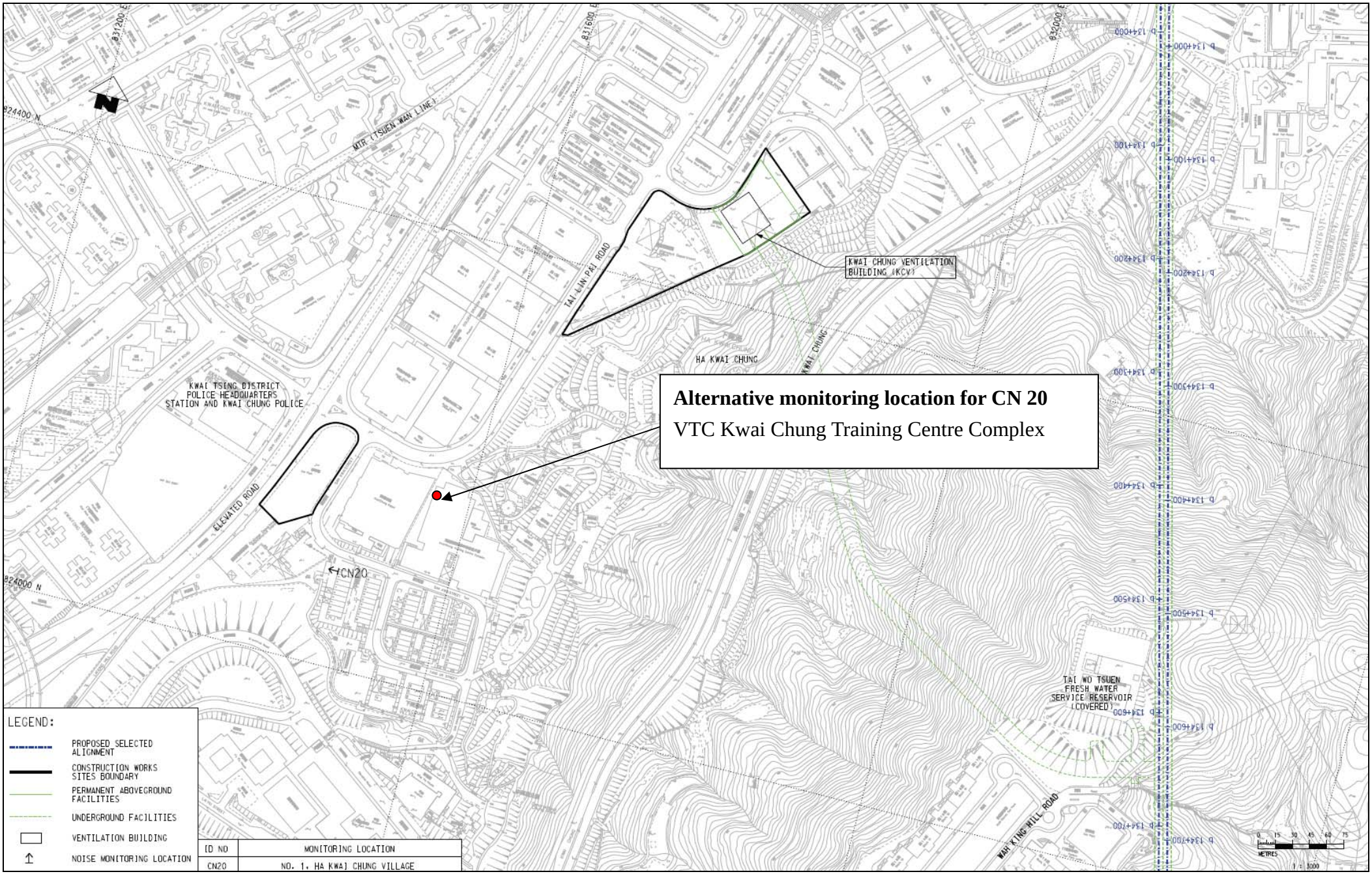
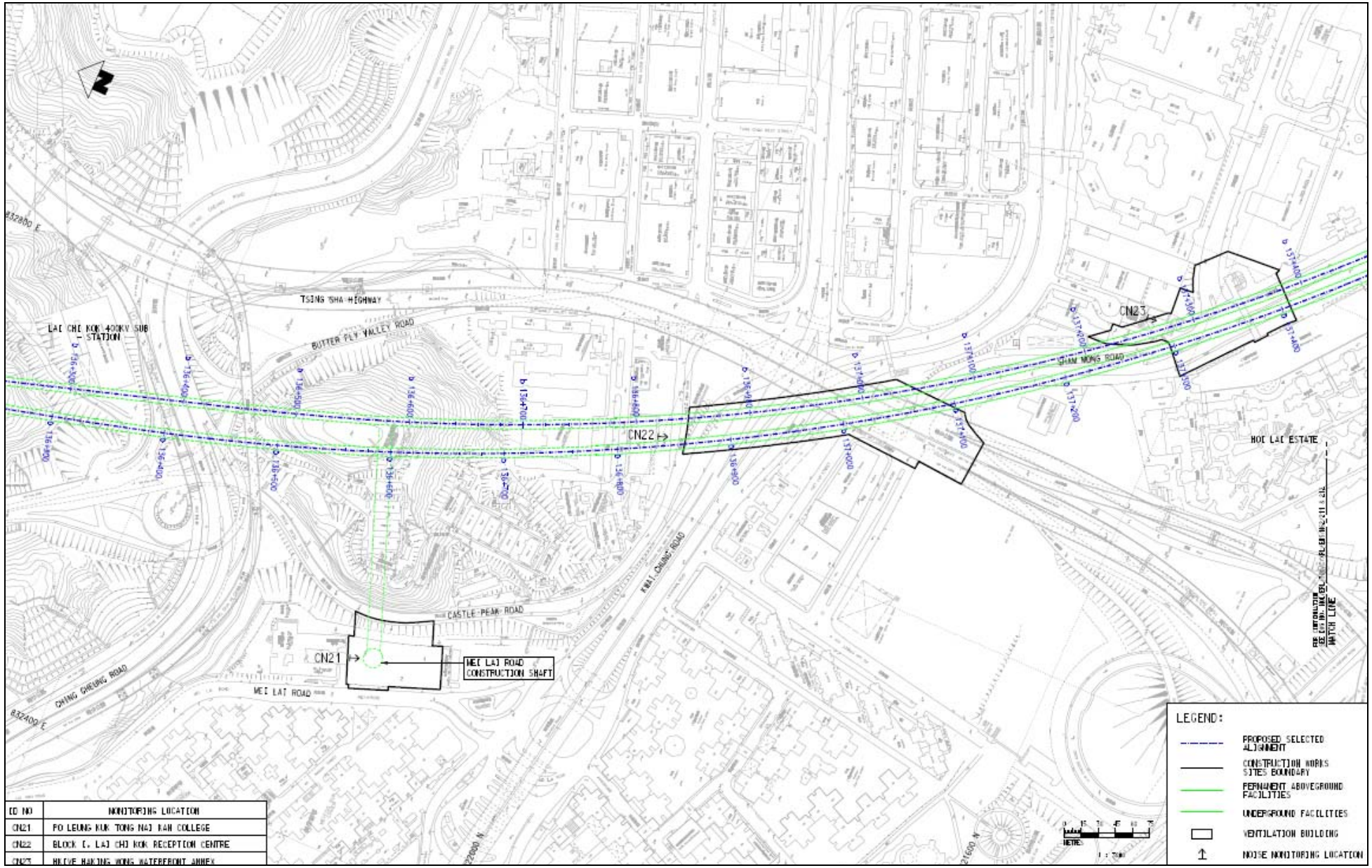
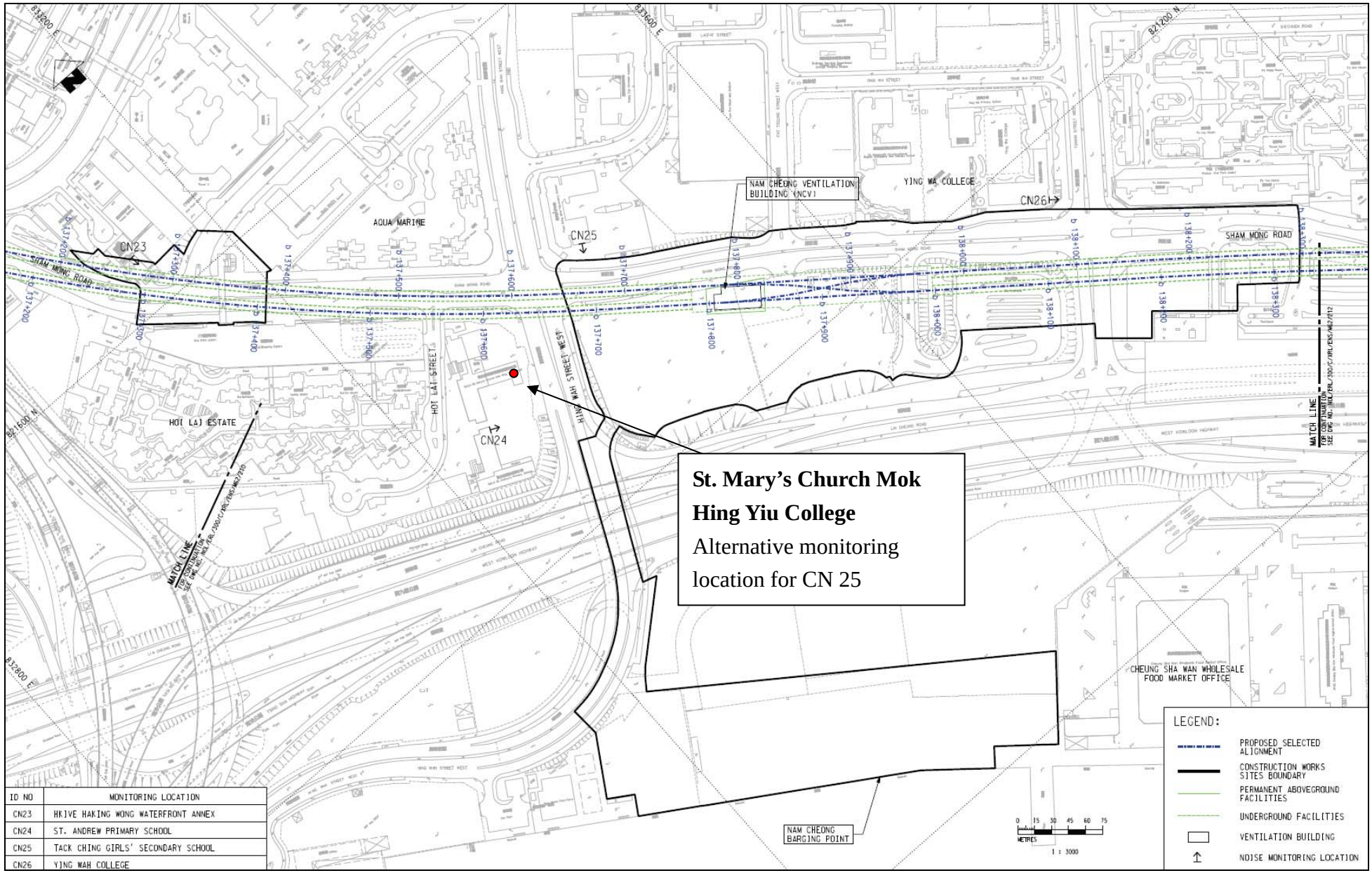


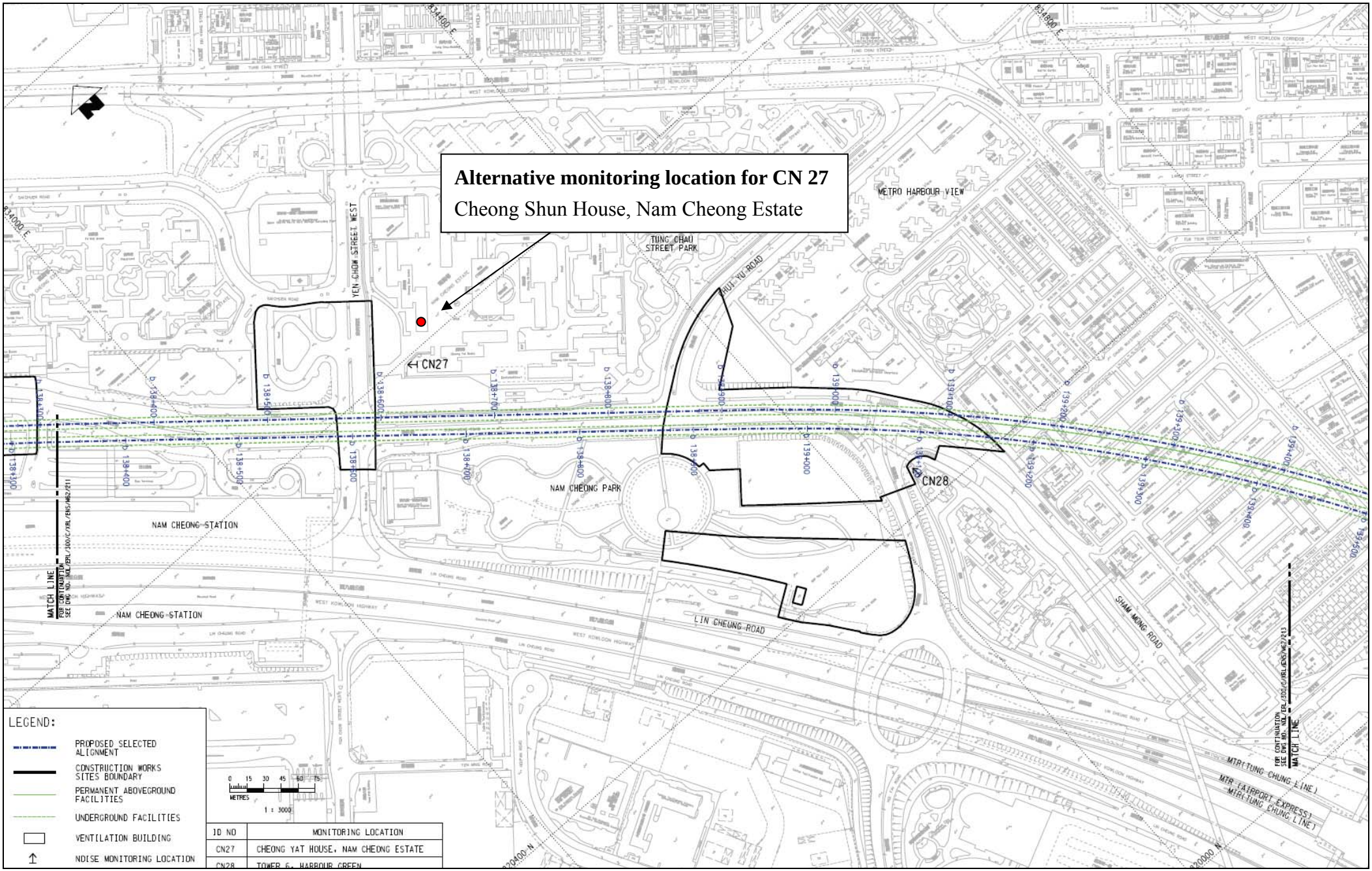
Figure 3 – Noise Monitoring Location

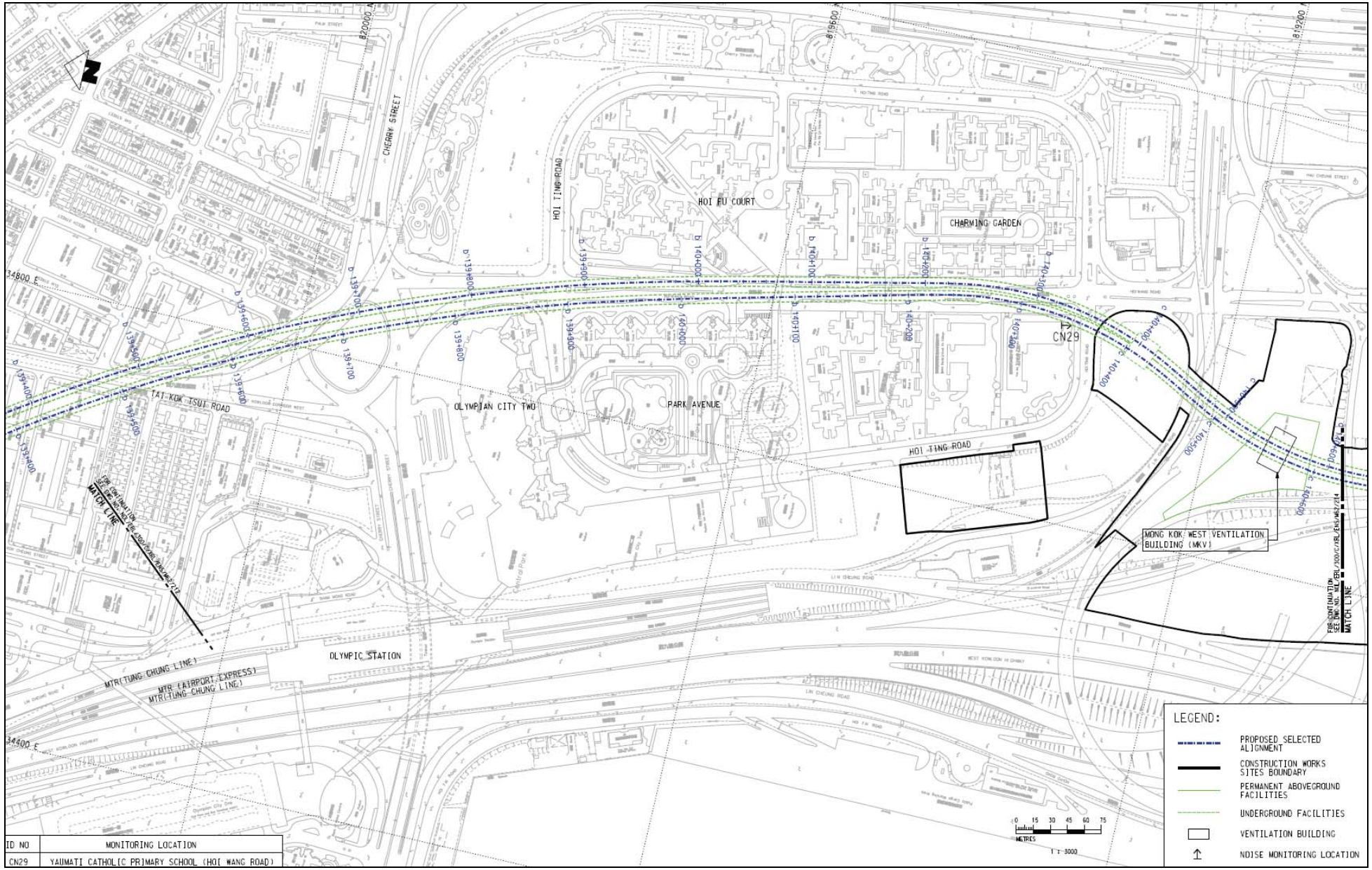


ID NO	MONITORING LOCATION
CN21	PO LEUNG KUK TONG NAI RAN COLLEGE
CN22	BLOCK C, LAI CHI KOK RECEPTION CENTRE
CN23	HOLYE HAKKING WONG WATERFRONT ANNEX

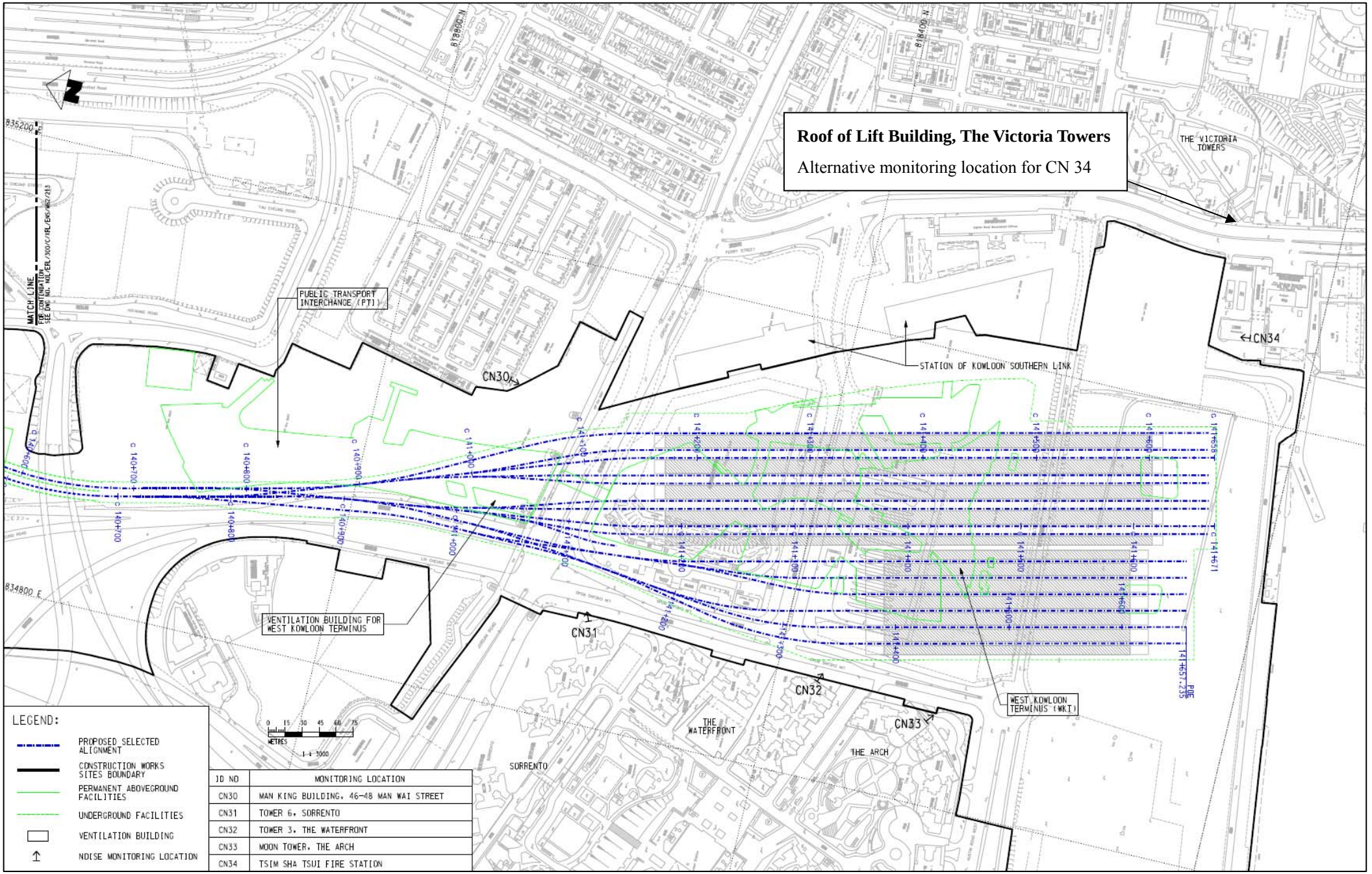


ID NO	MONITORING LOCATION
CN23	HKIVE HAKING WONG WATERFRONT ANNEX
CN24	ST. ANDREW PRIMARY SCHOOL
CN25	TACK CHING GIRLS' SECONDARY SCHOOL
CN26	YING WAH COLLEGE


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

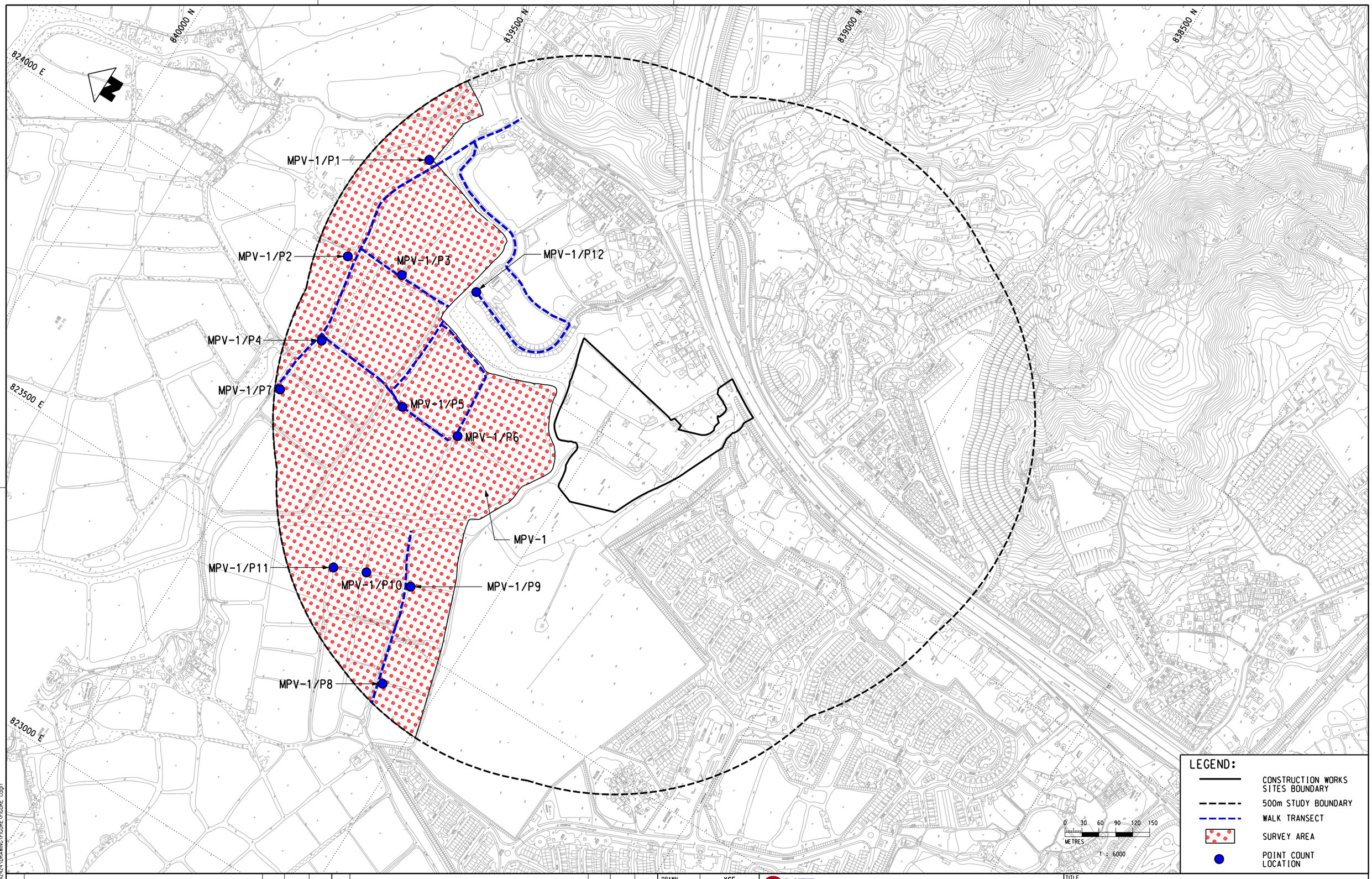


ID NO	MONITORING LOCATION
CN29	YAUMATI CATHOLIC PRIMARY SCHOOL (HOI WANG ROAD)



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

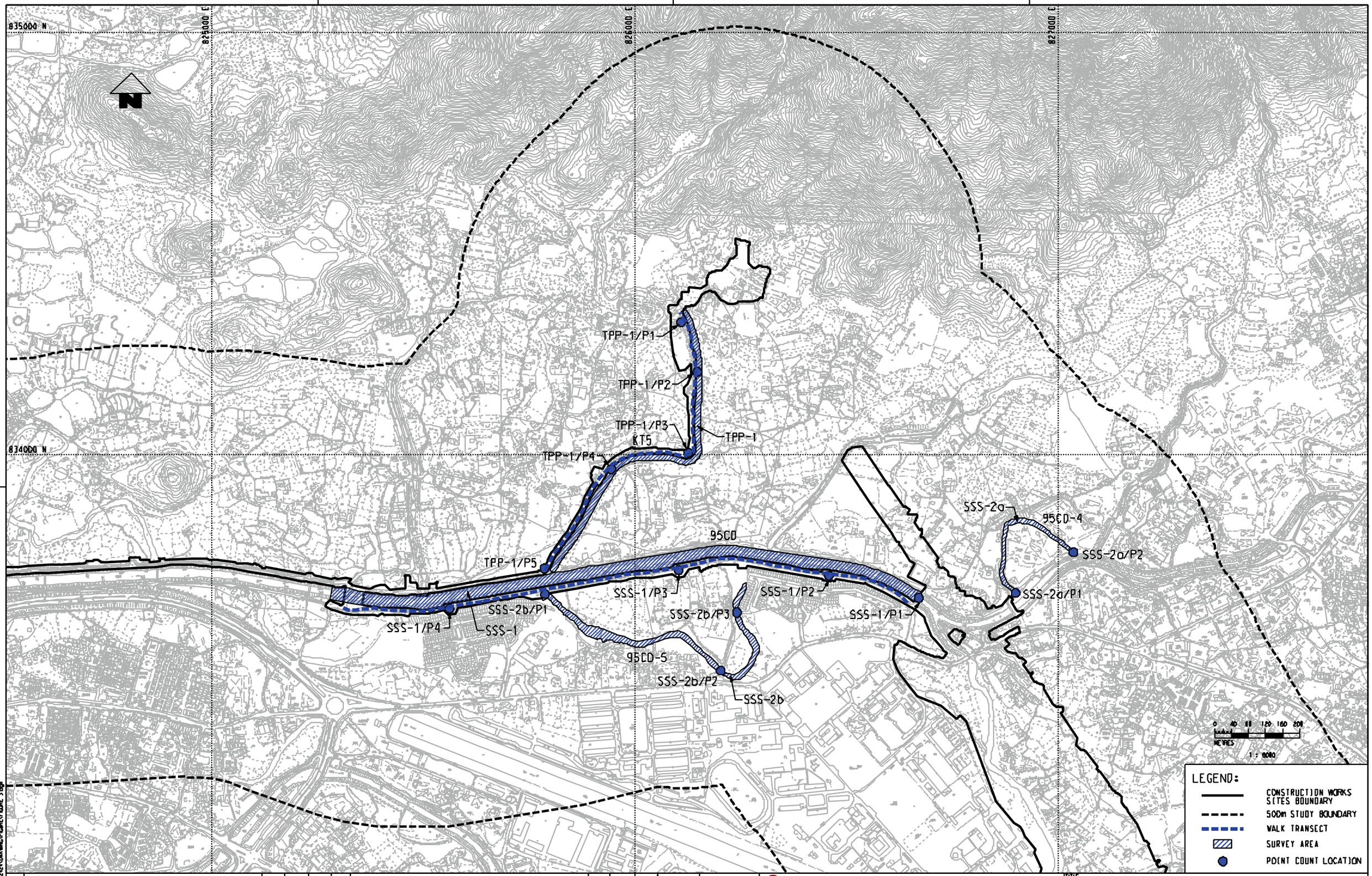
DRAWN	YJP
DESIGNED	TWF
CHECKED	KCC
APPROVED	PL
DATE	14/SEP./2009

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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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EXPRESS RAIL LINK

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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MTR

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

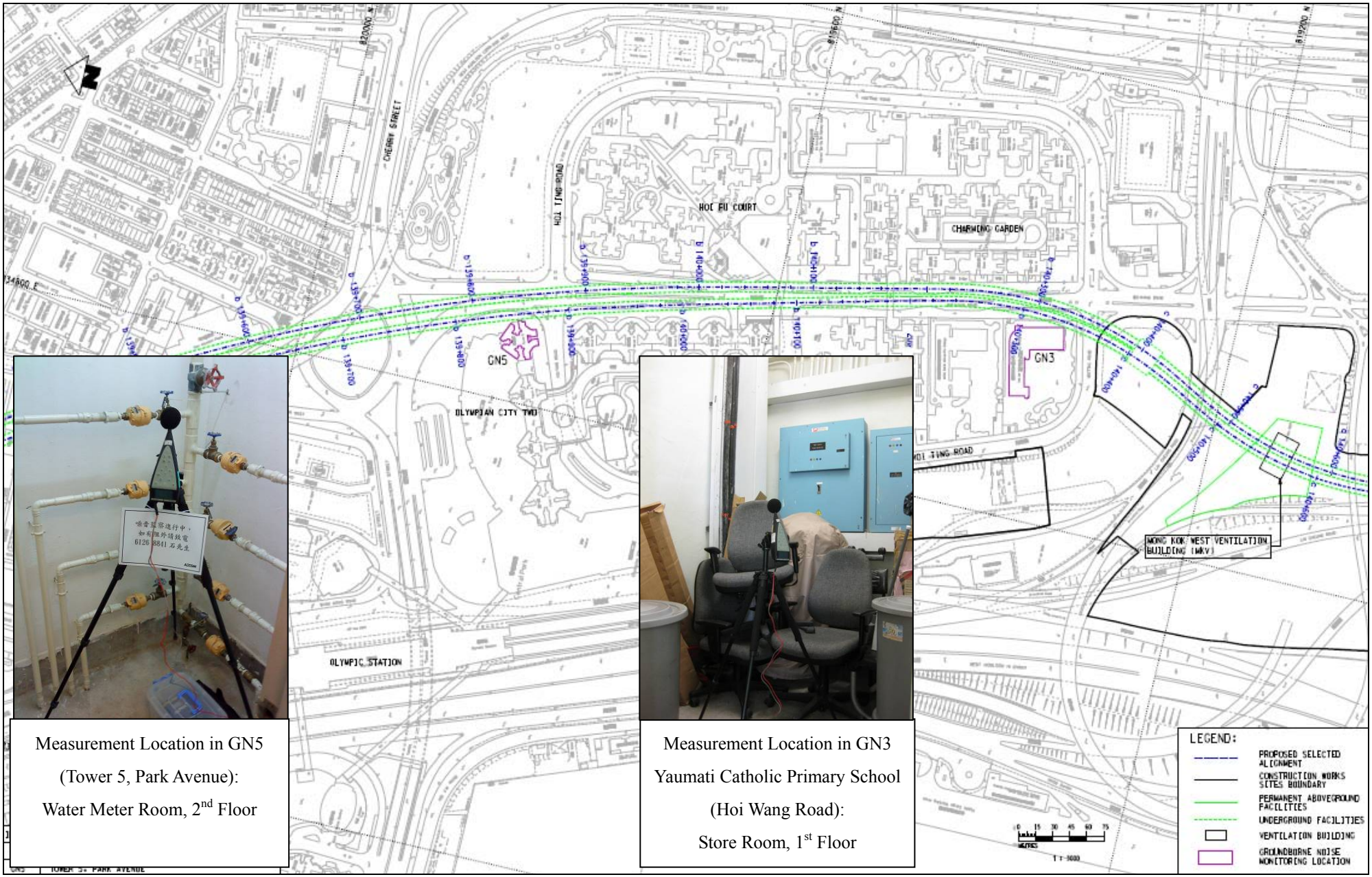
PROPOSED SURVEY AREA, POINT COUNT LOCATION AND WALK TRANSECT FOR TUW-2 AND PHV-1

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



Measurement Location in GN5

(Tower 5, Park Avenue):

Water Meter Room, 2nd Floor

Measurement Location in GN3

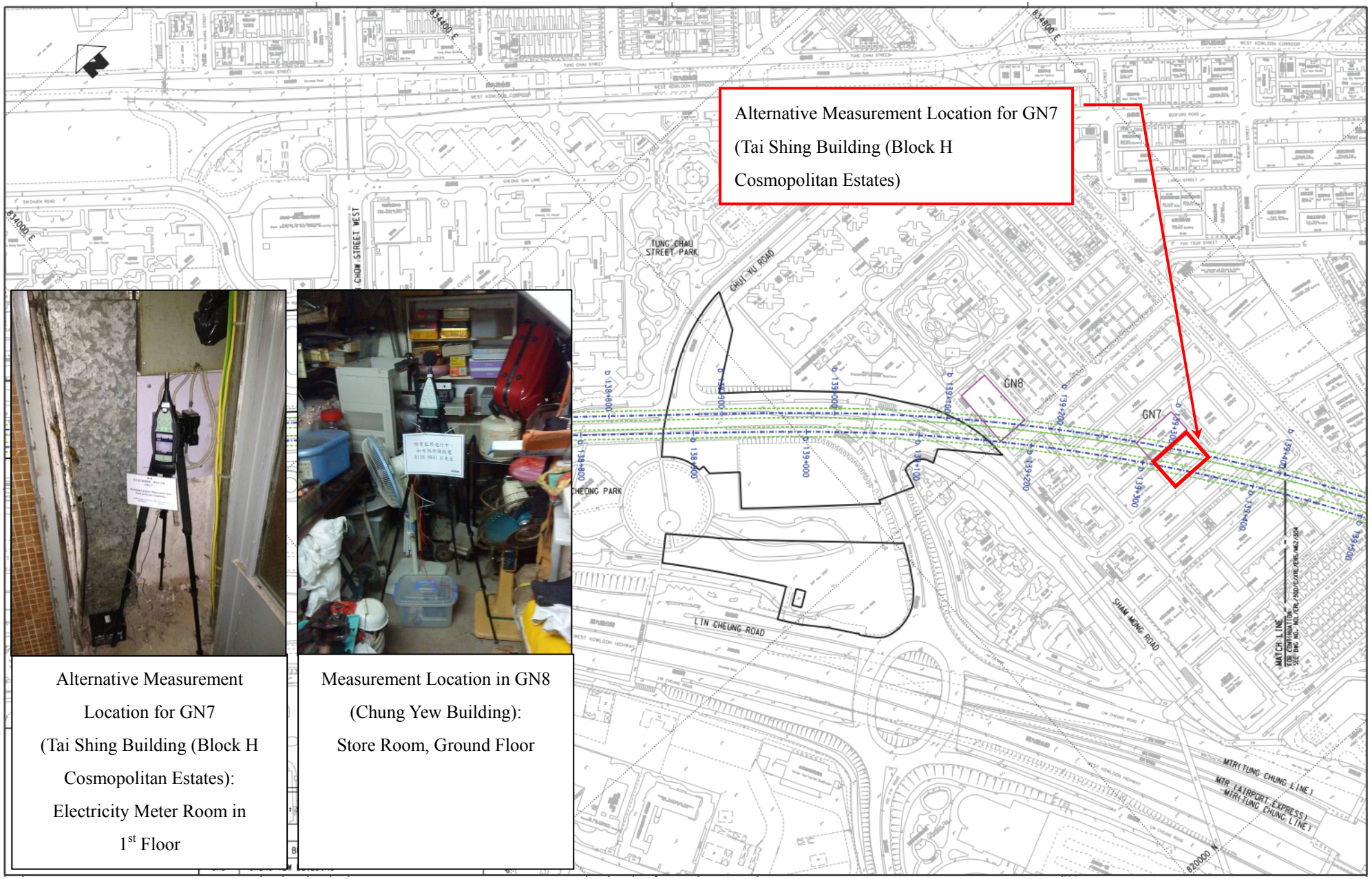
Yaumati Catholic Primary School

(Hoi Wang Road):

Store Room, 1st Floor

Appendix D - Ground-borne Noise Monitoring Locations

Remarks: All measurement location are located approximately at the centre of the room.

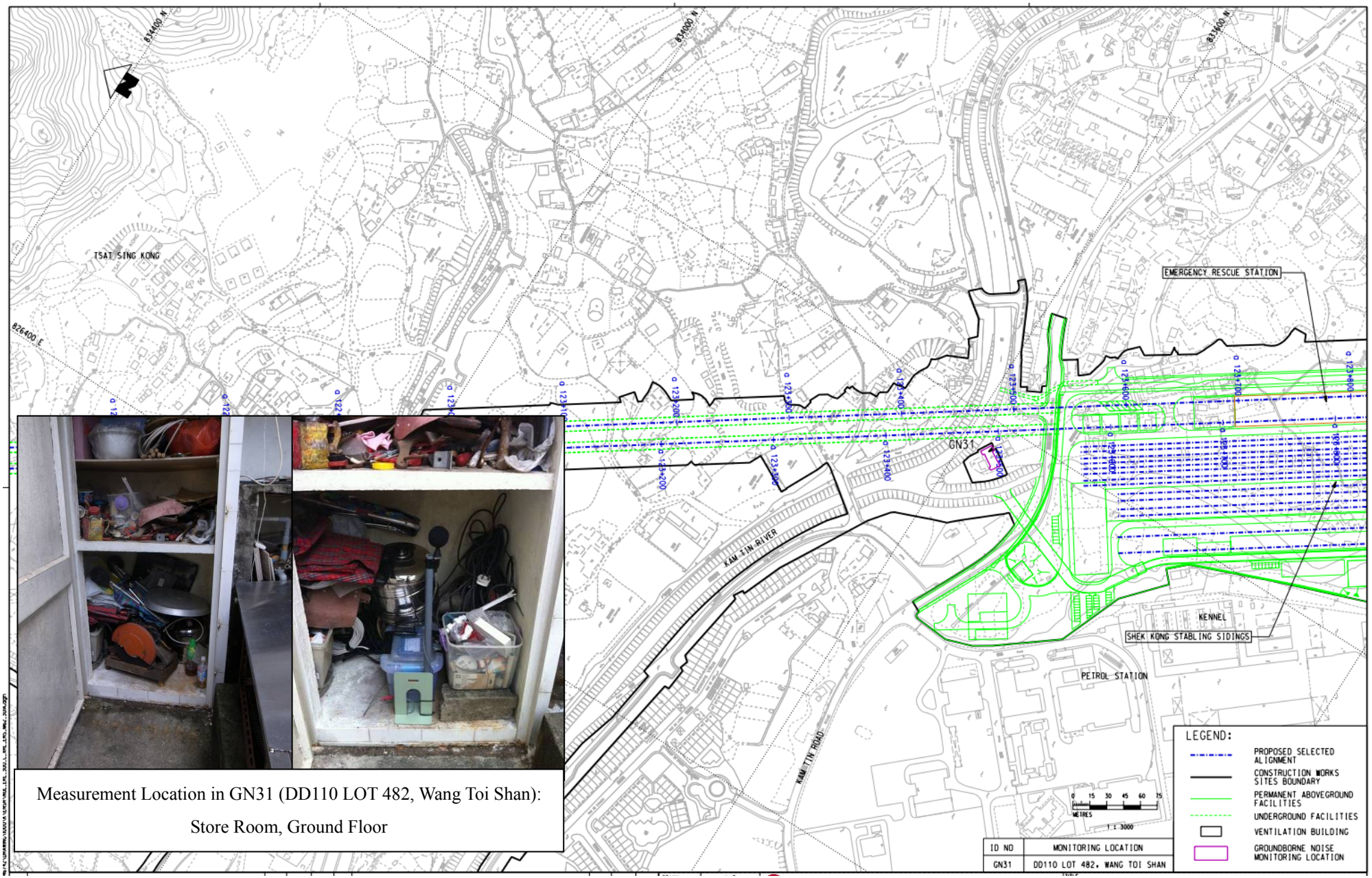


Alternative Measurement Location for GN7 (Tai Shing Building (Block H Cosmopolitan Estates): Electricity Meter Room in 1st Floor

Measurement Location in GN8 (Chung Yew Building): Store Room, Ground Floor

Appendix D - Ground-borne Noise Monitoring Locations

Remarks: All measurement location are located approximately at the centre of the room.

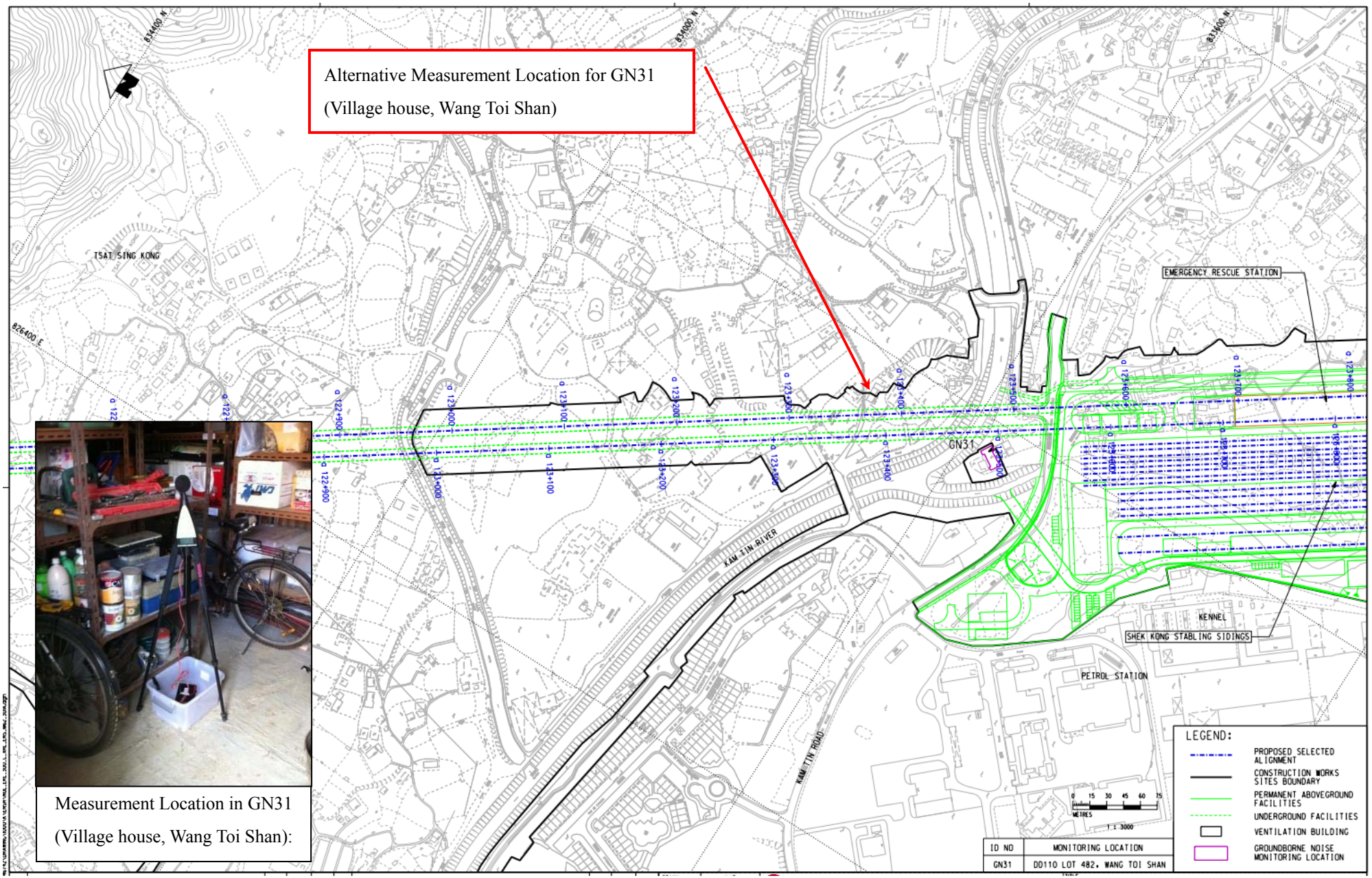


Measurement Location in GN31 (DD110 LOT 482, Wang Toi Shan):

Store Room, Ground Floor

Appendix D - **Ground-borne Noise Monitoring Locations**

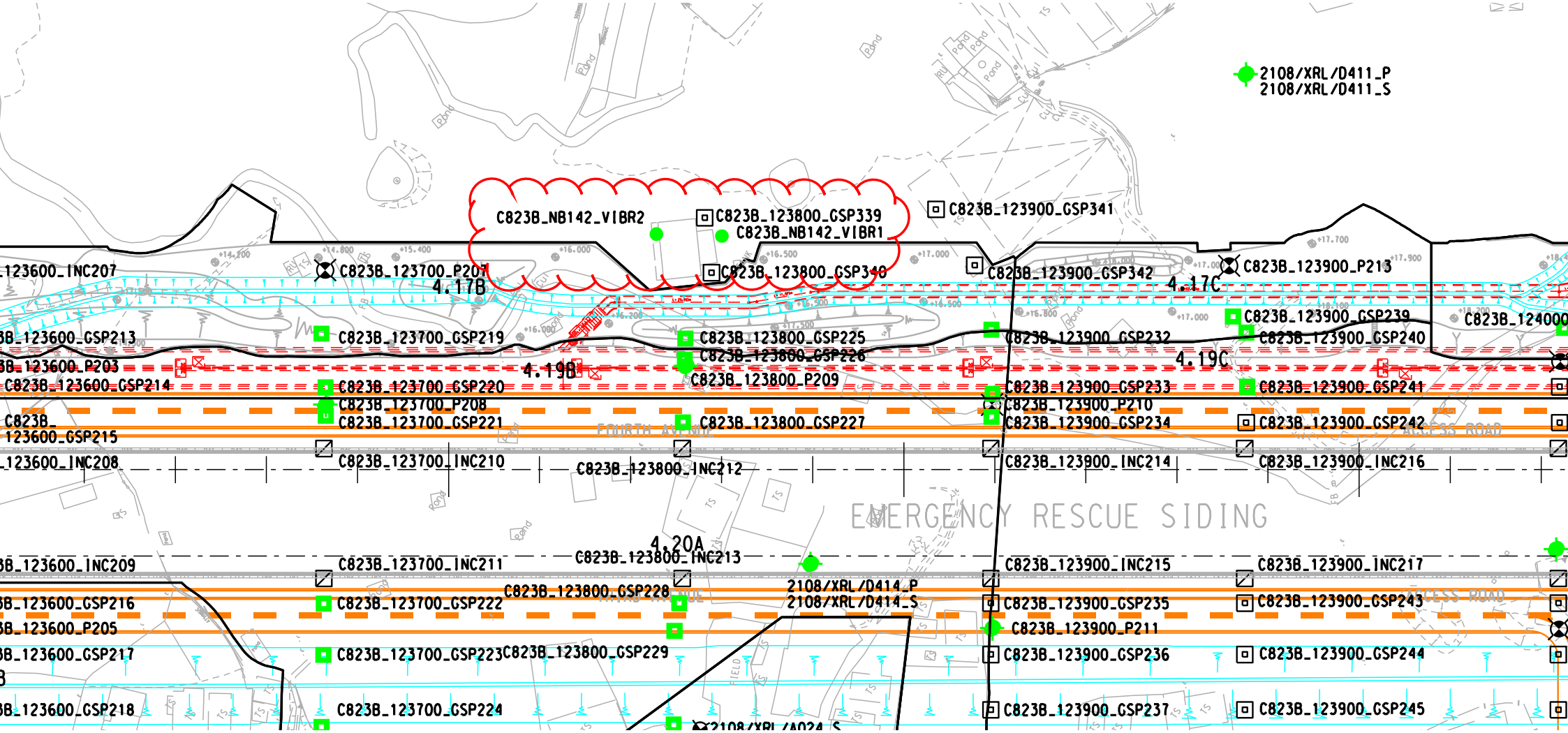
Remarks: All measurement location are located approximately at the centre of the room.



Measurement Location in GN31
(Village house, Wang Toi Shan):

Appendix D - Ground-borne Noise Monitoring Locations

Remarks: All measurement location are located approximately at the centre of the room.


2108/XRL/D411_P
2108/XRL/D411_S
C823B_NB142_VIBR2
C823B_123800_GSP339
C823B_NB142_VIBR1
C823B_123900_GSP341
C823B_123800_GSP340
C823B_123900_GSP342
C823B_123700_P207
4.17B
4.17C
C823B_123900_P213
C823B_123900_GSP239
C823B_124000
C823B_123700_GSP219
C823B_123800_GSP225
C823B_123800_GSP226
C823B_123900_GSP232
C823B_123900_GSP240
4.19B
4.19C
C823B_123800_P209
C823B_123600_GSP214
C823B_123700_GSP220
C823B_123900_GSP233
C823B_123900_GSP241
C823B_123700_P208
C823B_123900_P210
C823B_123700_GSP221
C823B_123800_GSP227
C823B_123900_GSP234
C823B_123900_GSP242
C823B_123600_GSP215
FOURTH AVENUE
ACCESS ROAD
C823B_123700_INC210
C823B_123800_INC212
C823B_123900_INC214
C823B_123900_INC216
EMERGENCY RESCUE SIDING
4.20A
C823B_123800_INC213
C823B_123700_INC211
C823B_123900_INC215
C823B_123900_INC217
C823B_123800_GSP228
2108/XRL/D414_P
2108/XRL/D414_S
C823B_123700_GSP222
C823B_123900_GSP235
C823B_123900_GSP243
C823B_123900_P211
C823B_123700_GSP223
C823B_123800_GSP229
C823B_123900_GSP236
C823B_123900_GSP244
C823B_123700_GSP224
C823B_123900_GSP237
C823B_123900_GSP245

Appendix E

Monitoring Schedule

Actual Construction Dust (24-hr TSP) Impact Monitoring Schedule - December 2014

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

Dec-2014						
Sunday	**Monday**	**Tuesday**	**Wednesday**	**Thursday**	**Friday**	**Saturday**
	1 AM1, AM2, AM9, AM10	2	3 AM3, AM4, AM5, AM6, AM7, AM8	4	5 AM11, AM12, AM13, AM14, AM15, AM16, AM17	6 AM1, AM2, AM9, AM10
7	8	9 AM3, AM4, AM5, AM6, AM7, AM8	10	11 AM11, AM12, AM13, AM14, AM15, AM16, AM17	12 AM1, AM2, AM9, AM10	13
14	15 AM3, AM5, AM6, AM7, AM8	16	17 AM11, AM12, AM13, AM14, AM15, AM16, AM17	18 AM1, AM2, AM4[#], AM9, AM10	19 AM3, AM4, AM5, AM6, AM7, AM8	20
21	22 AM11, AM12, AM13, AM14, AM15, AM16, AM17	23 AM1, AM2, AM9, AM10	24 AM3, AM4, AM5, AM6, AM7, AM8	25	26	27 AM11, AM12, AM13, AM14, AM15, AM16, AM17
28	29 AM1, AM2, AM9, AM10	30 AM3, AM4, AM5, AM6, AM7, AM8	31			

[#] 24-hr TSP impact monitoring for AM4 was suspended on 15 December 2014 due to power supply shortage. The 24-hr TSP impact monitoring has been resumed on 18 December 2014.

Tentative Construction Dust (24-hr TSP) Impact Monitoring Schedule - January 2015

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

Jan-2015						
Sunday	**Monday**	**Tuesday**	**Wednesday**	**Thursday**	**Friday**	**Saturday**
				1	2 AM11, AM12, AM13, AM14, AM15, AM16, AM17	3 AM1, AM2, AM9, AM10
4	5 AM3, AM4, AM5, AM6, AM7, AM8	6	7 AM11, AM12, AM13, AM14, AM15, AM16, AM17	8 AM1, AM2, AM9, AM10	9	10 AM3, AM4, AM5, AM6, AM7, AM8
11	12	13 AM11, AM12, AM13, AM14, AM15, AM16, AM17	14 AM1, AM2, AM9, AM10	15	16 AM3, AM4, AM5, AM6, AM7, AM8	17
18	19 AM11, AM12, AM13, AM14, AM15, AM16, AM17	20 AM1, AM2, AM9, AM10	21	22 AM3, AM4, AM5, AM6, AM7, AM8	23	24 AM11, AM12, AM13, AM14, AM15, AM16, AM17
25	26 AM1, AM2, AM9, AM10	27	28 AM3, AM4, AM5, AM6, AM7, AM8	29	30 AM11, AM12, AM13, AM14, AM15, AM16, AM17	31 AM1, AM2, AM9, AM10

Monitoring Schedule in the Reporting Month (01 December 2014 - 31 December 2014)

	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-Dec-14		✓	✓	✓	✓	✓	✓			✓	✓	✓	✓	✓	✓	✓
02-Dec-14								✓	✓							
03-Dec-14																
04-Dec-14																
05-Dec-14																
06-Dec-14																
07-Dec-14																
08-Dec-14		✓	✓	✓	✓			✓	✓	✓		✓		✓	✓	✓
09-Dec-14						✓	✓				✓		✓			
10-Dec-14																
11-Dec-14																
12-Dec-14																
13-Dec-14																
14-Dec-14																
15-Dec-14		✓	✓	✓	✓		✓	✓	✓		✓		✓	✓	✓	
16-Dec-14						✓				✓		✓				
17-Dec-14																✓
18-Dec-14																
19-Dec-14																
20-Dec-14																
21-Dec-14																
22-Dec-14		✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
23-Dec-14					✓											
24-Dec-14																
25-Dec-14																
26-Dec-14																
27-Dec-14																
28-Dec-14																
29-Dec-14		✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
30-Dec-14					✓											
31-Dec-14																

- 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 December 2014 - 31 December 2014)

	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-Dec-14	✓	✓	✓	✓	✓	✓	✓		✓		✓	✓	✓		✓		✓
02-Dec-14								✓		✓						✓	
03-Dec-14																	
04-Dec-14																	
05-Dec-14																	
06-Dec-14																	
07-Dec-14																	
08-Dec-14	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	
09-Dec-14																	✓
10-Dec-14																	
11-Dec-14																	
12-Dec-14																	
13-Dec-14																	
14-Dec-14																	
15-Dec-14			✓	✓	✓	✓	✓	✓	✓	✓						✓	✓
16-Dec-14	✓	✓									✓	✓	✓				
17-Dec-14															✓		
18-Dec-14																	
19-Dec-14																	
20-Dec-14																	
21-Dec-14																	
22-Dec-14	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓
23-Dec-14			✓														
24-Dec-14																	
25-Dec-14																	
26-Dec-14																	
27-Dec-14																	
28-Dec-14																	
29-Dec-14	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓				✓	✓
30-Dec-14													✓		✓		
31-Dec-14			✓														

- 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 January 2015 - 31 January 2015)

	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-Jan-15																
02-Jan-15																
03-Jan-15																
04-Jan-15																
05-Jan-15								✓	✓	✓	✓	✓	✓	✓	✓	✓
06-Jan-15																
07-Jan-15		✓				✓										
08-Jan-15																
09-Jan-15			✓	✓	✓		✓									
10-Jan-15																
11-Jan-15																
12-Jan-15								✓	✓	✓	✓	✓	✓	✓	✓	✓
13-Jan-15			✓	✓	✓	✓	✓									
14-Jan-15																
15-Jan-15		✓														
16-Jan-15																
17-Jan-15																
18-Jan-15																
19-Jan-15								✓	✓	✓	✓	✓	✓	✓	✓	✓
20-Jan-15			✓	✓	✓	✓	✓									
21-Jan-15																
22-Jan-15		✓														
23-Jan-15																
24-Jan-15																
25-Jan-15																
26-Jan-15								✓	✓	✓	✓	✓	✓	✓	✓	✓
27-Jan-15			✓	✓	✓	✓	✓									
28-Jan-15																
29-Jan-15		✓														
30-Jan-15																
31-Jan-15																

- 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 Next Reporting Month (01 January 2015 - 31 January 2015)

	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-Jan-15																	
02-Jan-15																	
03-Jan-15																	
04-Jan-15																	
05-Jan-15	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓						
06-Jan-15							✓					✓	✓				
07-Jan-15																	✓
08-Jan-15															✓	✓	
09-Jan-15																	
10-Jan-15																	
11-Jan-15																	
12-Jan-15	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓						
13-Jan-15							✓					✓	✓				
14-Jan-15																	✓
15-Jan-15															✓	✓	
16-Jan-15																	
17-Jan-15																	
18-Jan-15																	
19-Jan-15	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓						
20-Jan-15							✓					✓	✓				
21-Jan-15																	✓
22-Jan-15															✓	✓	
23-Jan-15																	
24-Jan-15																	
25-Jan-15																	
26-Jan-15	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓						
27-Jan-15							✓					✓	✓				
28-Jan-15																	✓
29-Jan-15															✓	✓	
30-Jan-15																	
31-Jan-15																	

- 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.

Ground-borne Noise Monitoring Schedule in the Reporting Month (01 December 2014 - 31 December 2014)

	GN3	GN5	GN7	GN8	GN31
Date	Yaumati Catholic Primary School (Hoi Wang Road)	Tower 5, Park Avenue	Tai Shing Building (Block H) Cosmopolitan Estates	Chung Yew Building	DD110 LOT 482, Wang Toi Shan
01-Dec-14					√
02-Dec-14					√
03-Dec-14					√
04-Dec-14					√
05-Dec-14					√
06-Dec-14					√
07-Dec-14					
08-Dec-14					√
09-Dec-14					√
10-Dec-14					√
11-Dec-14					√
12-Dec-14					√
13-Dec-14					√
14-Dec-14					
15-Dec-14					√
16-Dec-14					√
17-Dec-14					√
18-Dec-14					√
19-Dec-14					√
20-Dec-14					√
21-Dec-14					
22-Dec-14					√
23-Dec-14					√
24-Dec-14					√
25-Dec-14					
26-Dec-14					
27-Dec-14					√
28-Dec-14					
29-Dec-14					√
30-Dec-14					√
30-Dec-14					√

Ground-borne Noise Monitoring Schedule in the Next Reporting Month (01 January 2015 - 31 January 2015)

	GN3	GN5	GN7	GN8	GN31
Date	Yaumati Catholic Primary School (Hoi Wang Road)	Tower 5, Park Avenue	Tai Shing Building (Block H) Cosmopolitan Estates	Chung Yew Building	Village House at Wang Toi Shan
01-Jan-15					
02-Jan-15					√
03-Jan-15					√
04-Jan-15					
05-Jan-15					√
06-Jan-15					√
07-Jan-15					√
08-Jan-15					√
09-Jan-15					√
10-Jan-15					√
11-Jan-15					
12-Jan-15					
13-Jan-15					
14-Jan-15					
15-Jan-15					
16-Jan-15					
17-Jan-15					
18-Jan-15					
19-Jan-15					
20-Jan-15					
21-Jan-15					
22-Jan-15					
23-Jan-15					
24-Jan-15					
25-Jan-15					
26-Jan-15					
27-Jan-15					
28-Jan-15					
29-Jan-15					
30-Jan-15					
31-Jan-15					

Appendix E Monitoring Schedule

Works Area	Survey Site	Date of Survey in Dec 2014	Tentative Date of Survey in Jan 2015
MPV	MPV-1	09 Dec 2014	09Jan 2015
Access road leading to TPP	TPP-1	09 Dec 2014	12 Jan 2015
Access road leading to TPP	TPP-2	09 Dec 2014	12 Jan 2015
Access road leading to TPP	TPP-3	09 Dec 2014	12 Jan 2015
Access road leading to SSS / ERS	SSS-2a	09 Dec 2014	12 Jan 2015
Access road leading to SSS / ERS	SSS-3	09 Dec 2014	09Jan 2015
TUW	TUW-1	09 Dec 2014	09Jan 2015
TUW	TUW-2 (grouped with PHV-1 due to overlapping of survey area	09 Dec 2014	09Jan 2015
PHV	PHV-1 (grouped with TUW-2 due to overlapping of survey area)	09 Dec 2014	09Jan 2015

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 ($\mu g/m^3$)
2014-12-01	31.8	217.3	260
2014-12-06	59.1	217.3	260
2014-12-12	198.3	217.3	260
2014-12-18	158.1	217.3	260
2014-12-23	153.6	217.3	260
2014-12-29	110.3	217.3	260

- AM2

Date	24-hour TSP Monitoring Results ($\mu g/m^3$)	Action Level ($\mu g/m^3$)	Limit Level ($\mu g/m^3$)
2014-12-01	39.8	179.4	260
2014-12-06	72.9	179.4	260
2014-12-12	113.9	179.4	260
2014-12-18	101.1	179.4	260
2014-12-23	62.0	179.4	260
2014-12-29	87.1	179.4	260

- AM3

Date	24-hour TSP Monitoring Results ($\mu g/m^3$)	Action Level ($\mu g/m^3$)	Limit Level ($\mu g/m^3$)
2014-12-03	75.1	154.7	260
2014-12-09	148.0	154.7	260
2014-12-15	**180.0**	154.7	260
2014-12-19	101.1	154.7	260
2014-12-24	111.9	154.7	260
2014-12-30	109.1	154.7	260

- AM4

Date	24-hour TSP Monitoring Results ($\mu g/m^3$)	Action Level ($\mu g/m^3$)	Limit Level ($\mu g/m^3$)
2014-12-03	68.1	148.6	260
2014-12-09	84.0	148.6	260
2014-12-18	102.4	148.6	260
2014-12-19	60.1	148.6	260
2014-12-24	70.2	148.6	260
2014-12-30	70.3	148.6	260

- AM5

Date	24-hour TSP Monitoring Results ($\mu g/m^3$)	Action Level ($\mu g/m^3$)	Limit Level ($\mu g/m^3$)
2014-12-03	73.9	152	260
2014-12-09	75.4	152	260
2014-12-15	**182.1**	152	260
2014-12-19	80.9	152	260
2014-12-24	66.3	152	260
2014-12-30	54.2	152	260

- AM6

Date	24-hour TSP Monitoring Results ($\mu g/m^3$)	Action Level ($\mu g/m^3$)	Limit Level ($\mu g/m^3$)
2014-12-03	65.6	145.6	260
2014-12-09	73.1	145.6	260
2014-12-15	133.7	145.6	260
2014-12-19	76.5	145.6	260
2014-12-24	68.5	145.6	260
2014-12-30	45.5	145.6	260

- AM7

Date	24-hour TSP Monitoring Results ($\mu g/m^3$)	Action Level ($\mu g/m^3$)	Limit Level ($\mu g/m^3$)
2014-12-03	56.9	149.8	260
2014-12-09	62.5	149.8	260
2014-12-15	89.8	149.8	260
2014-12-19	66.3	149.8	260
2014-12-24	45.3	149.8	260
2014-12-30	27.8	149.8	260

- AM8

Date	24-hour TSP Monitoring Results ($\mu g/m^3$)	Action Level ($\mu g/m^3$)	Limit Level ($\mu g/m^3$)
2014-12-03	65.6	158.2	260
2014-12-09	93.9	158.2	260
2014-12-15	109.8	158.2	260
2014-12-19	69.3	158.2	260
2014-12-24	63.6	158.2	260
2014-12-30	56.3	158.2	260

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 ($\mu g/m^3$)
2014-12-01	36.6	171.2	260
2014-12-06	73.4	171.2	260
2014-12-12	98.0	171.2	260
2014-12-18	81.2	171.2	260
2014-12-23	91.0	171.2	260
2014-12-29	47.3	171.2	260

- AM10

Date	24-hour TSP Monitoring Results ($\mu g/m^3$)	Action Level ($\mu g/m^3$)	Limit Level ($\mu g/m^3$)
2014-12-01	40.4	174.8	260
2014-12-06	67.4	174.8	260
2014-12-12	113.0	174.8	260
2014-12-18	78.5	174.8	260
2014-12-23	69.9	174.8	260
2014-12-29	26.3	174.8	260

- AM11

Date	24-hour TSP Monitoring Results ($\mu g/m^3$)	Action Level ($\mu g/m^3$)	Limit Level ($\mu g/m^3$)
2014-12-05	45.8	160.3	260
2014-12-11	103.0	160.3	260
2014-12-17	100.6	160.3	260
2014-12-22	92.7	160.3	260
2014-12-27	44.1	160.3	260

- AM12

Date	24-hour TSP Monitoring Results ($\mu g/m^3$)	Action Level ($\mu g/m^3$)	Limit Level ($\mu g/m^3$)
2014-12-05	50.1	162.5	260
2014-12-11	116.0	162.5	260
2014-12-17	104.5	162.5	260
2014-12-22	99.1	162.5	260
2014-12-27	49.1	162.5	260

- AM13

Date	24-hour TSP Monitoring Results ($\mu g/m^3$)	Action Level ($\mu g/m^3$)	Limit Level ($\mu g/m^3$)
2014-12-05	52.5	180.3	260
2014-12-11	92.1	180.3	260
2014-12-17	99.1	180.3	260
2014-12-22	95.3	180.3	260
2014-12-27	44.7	180.3	260

- AM14

Date	24-hour TSP Monitoring Results ($\mu g/m^3$)	Action Level ($\mu g/m^3$)	Limit Level ($\mu g/m^3$)
2014-12-05	75.1	158.2	260
2014-12-11	99.6	158.2	260
2014-12-17	96.2	158.2	260
2014-12-22	92.2	158.2	260
2014-12-27	44.5	158.2	260

- AM15

Date	24-hour TSP Monitoring Results ($\mu g/m^3$)	Action Level ($\mu g/m^3$)	Limit Level ($\mu g/m^3$)
2014-12-05	56.0	168.8	260
2014-12-11	109.0	168.8	260
2014-12-17	107.3	168.8	260
2014-12-22	108.5	168.8	260
2014-12-27	55.7	168.8	260

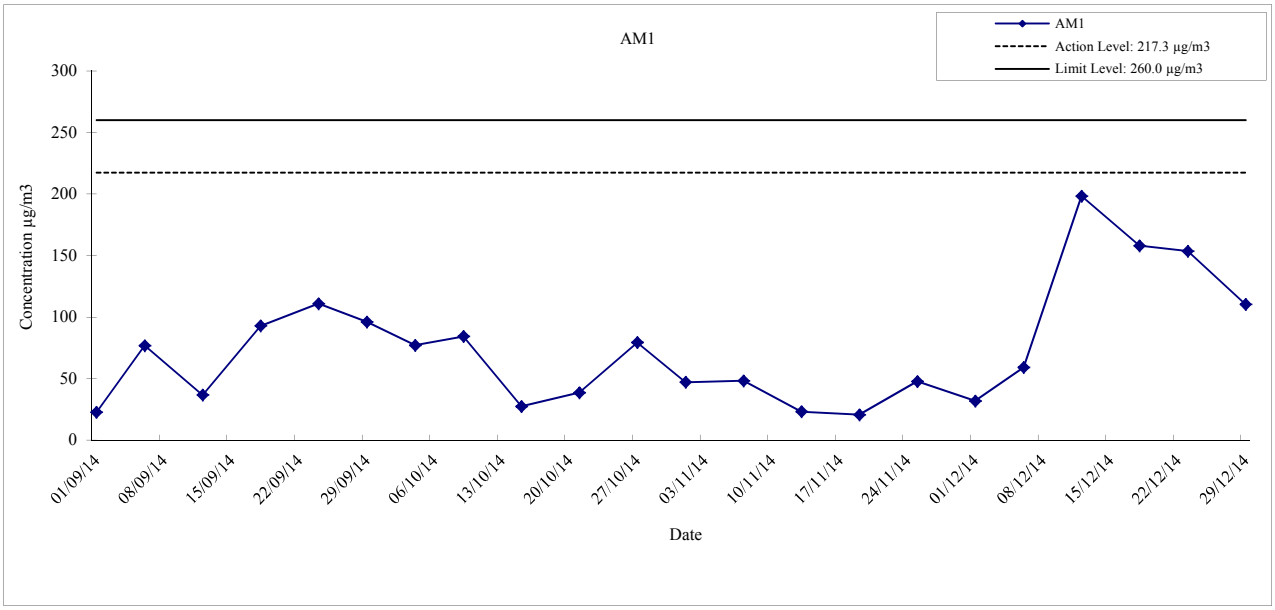
- AM16

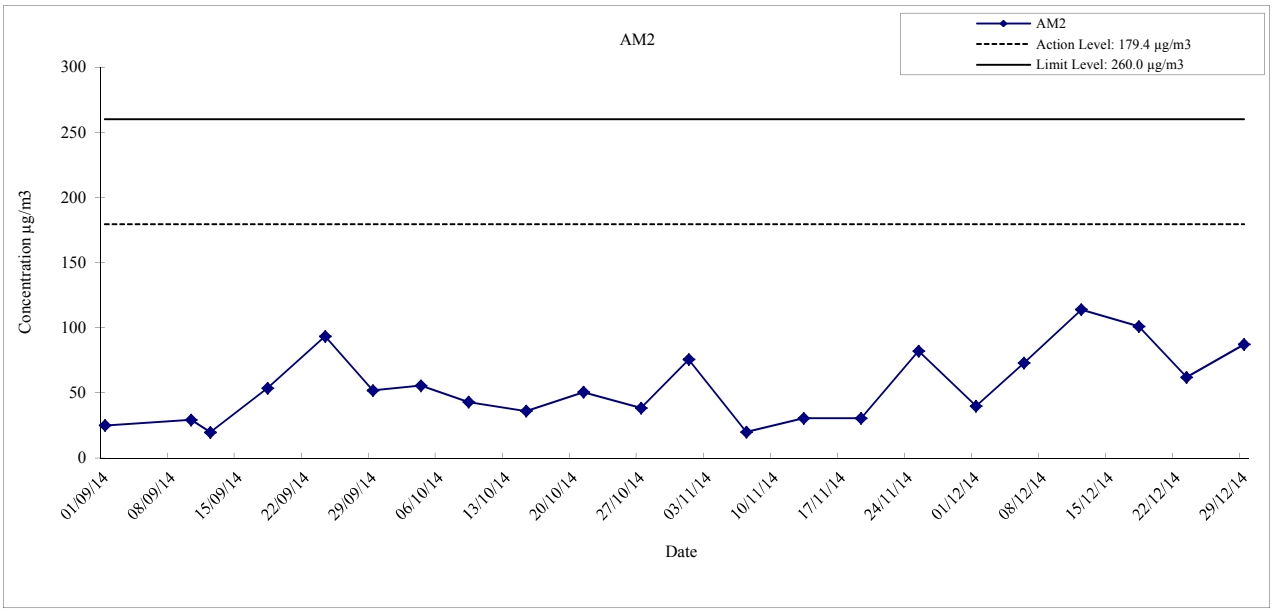
Date	24-hour TSP Monitoring Results ($\mu g/m^3$)	Action Level ($\mu g/m^3$)	Limit Level ($\mu g/m^3$)
2014-12-05	61.8	155.9	260
2014-12-11	127.4	155.9	260
2014-12-17	115.6	155.9	260
2014-12-22	102.8	155.9	260
2014-12-27	58.9	155.9	260

- AM17

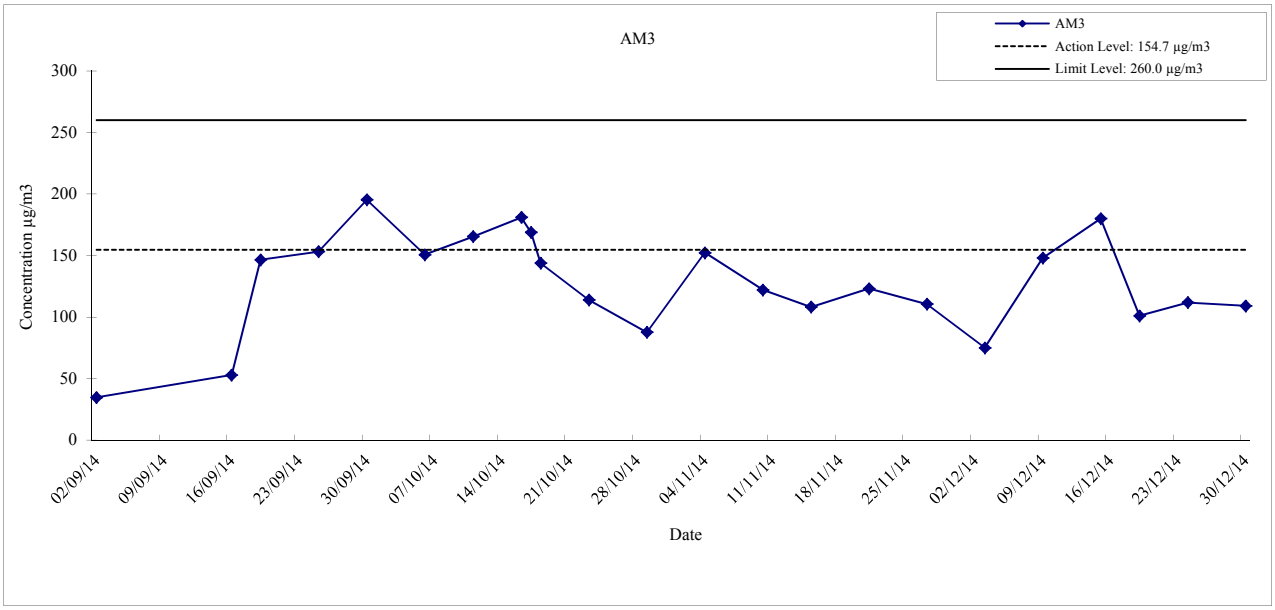
Date	24-hour TSP Monitoring Results ($\mu g/m^3$)	Action Level ($\mu g/m^3$)	Limit Level ($\mu g/m^3$)
2014-12-05	55.7	179.3	260
2014-12-11	115.7	179.3	260
2014-12-17	121.0	179.3	260
2014-12-22	101.9	179.3	260
2014-12-27	51.9	179.3	260

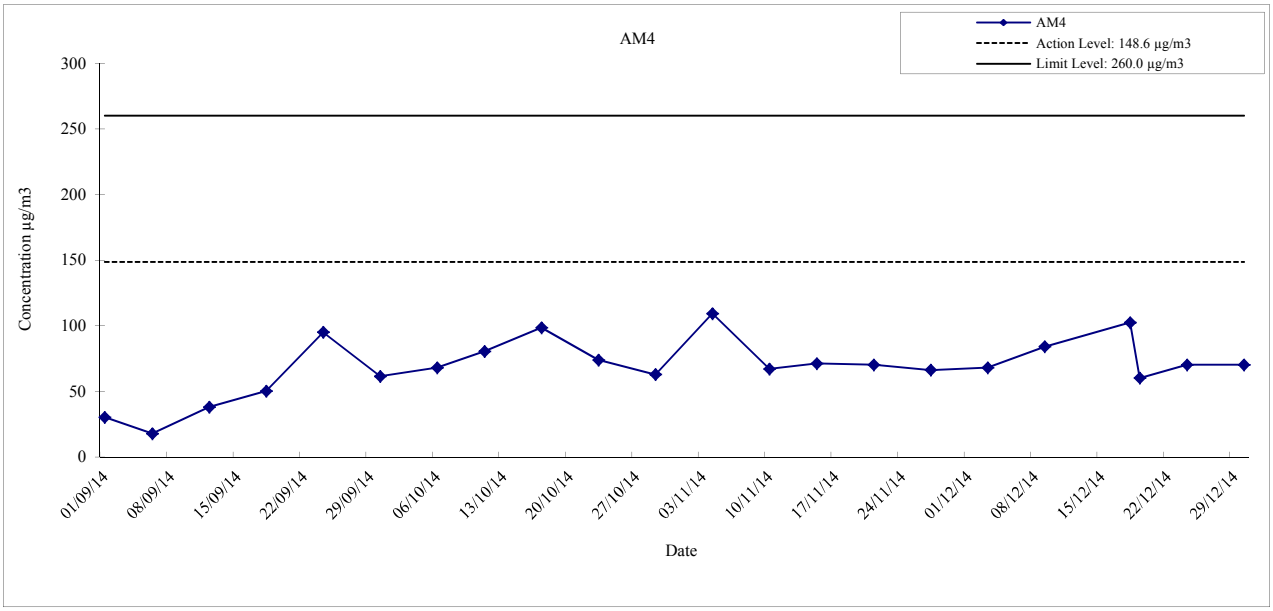
Remark: Bold value indicated an Action level exceedance
Bold & Italic value indicated an Limit level exceedance



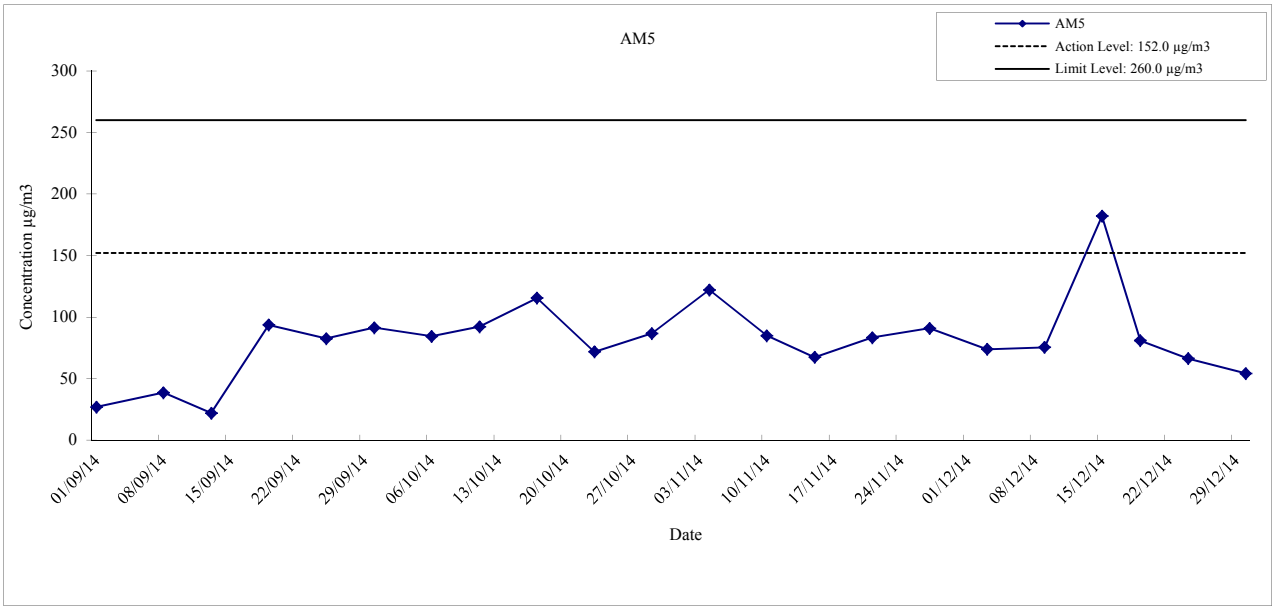


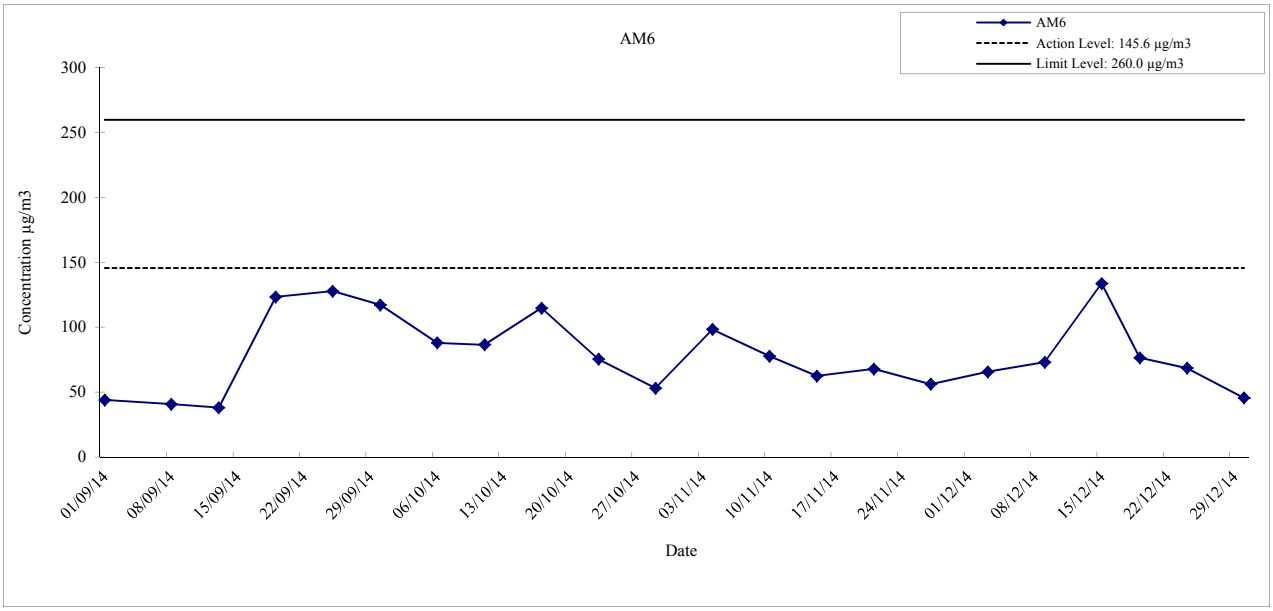
MTR	Hong Kong Section of Guangzhou-Shenzhen-Hong Kong Express Rail Link **Graphical Presentation of 24-hour TSP** **Monitoring Result for Location AM1 and AM2**	**Date**	**2014**
		APPENDIX	**F**



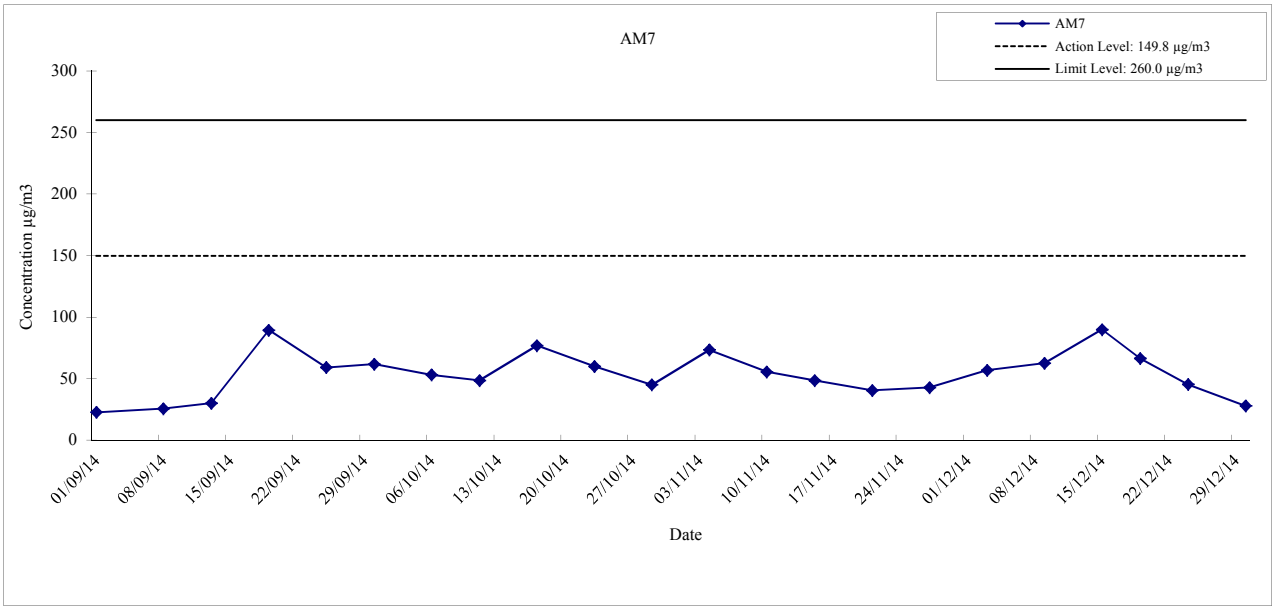


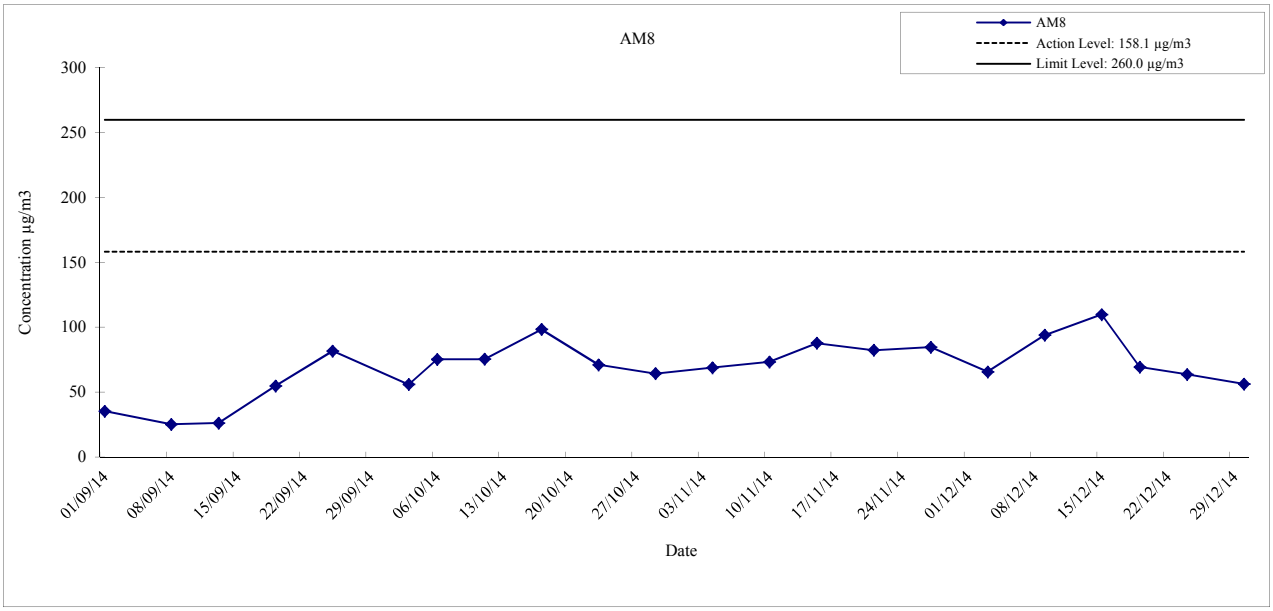
MTR	Hong Kong Section of Guangzhou-Shenzhen-Hong Kong Express Rail Link **Graphical Presentation of 24-hour TSP** **Monitoring Result for Location AM3 and AM4**	**Date**	**2014**
		APPENDIX	**F**



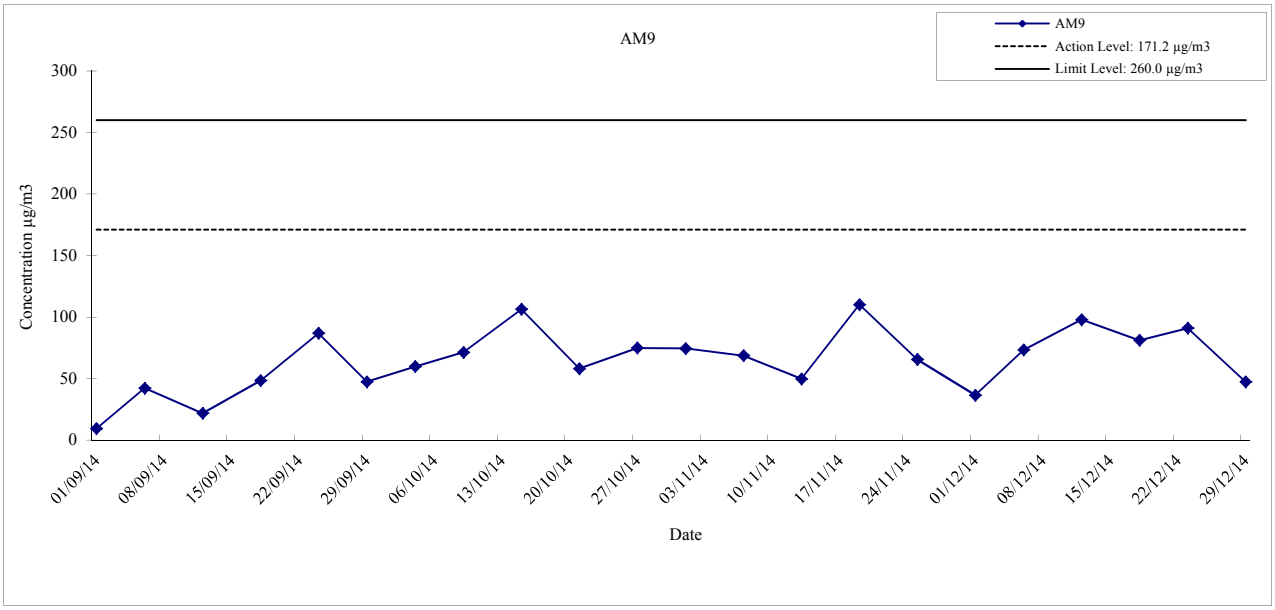


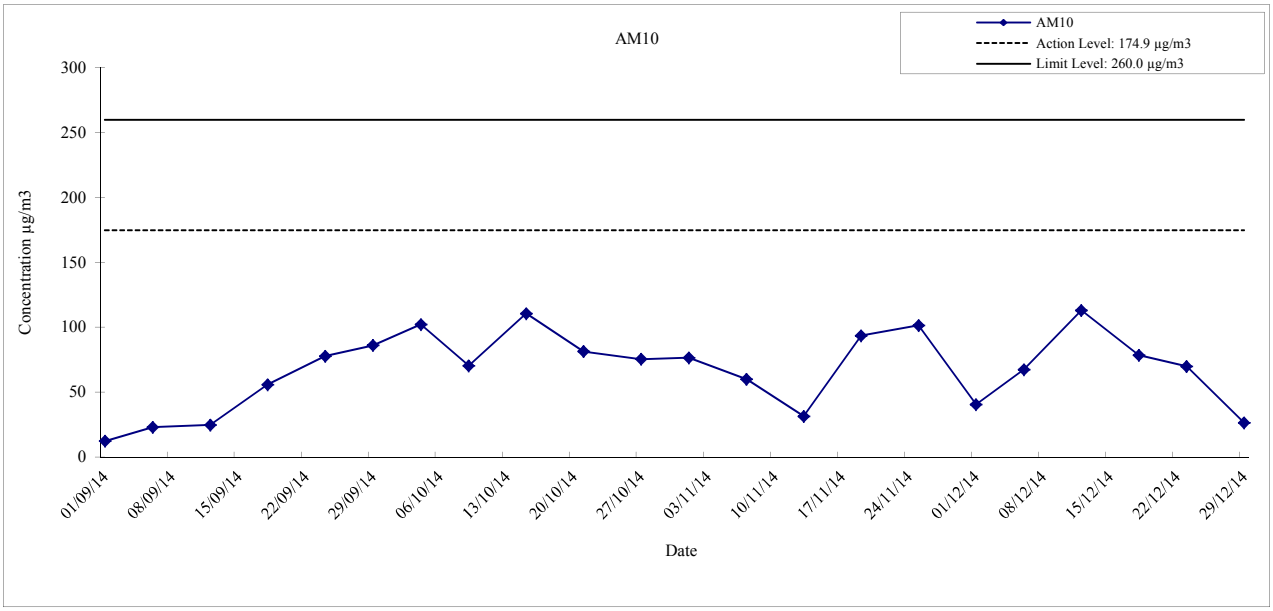
MTR	Hong Kong Section of Guangzhou-Shenzhen-Hong Kong Express Rail Link **Graphical Presentation of 24-hour TSP** **Monitoring Result for Location AM5 and AM6**	**Date**	**2014**
		APPENDIX	**F**



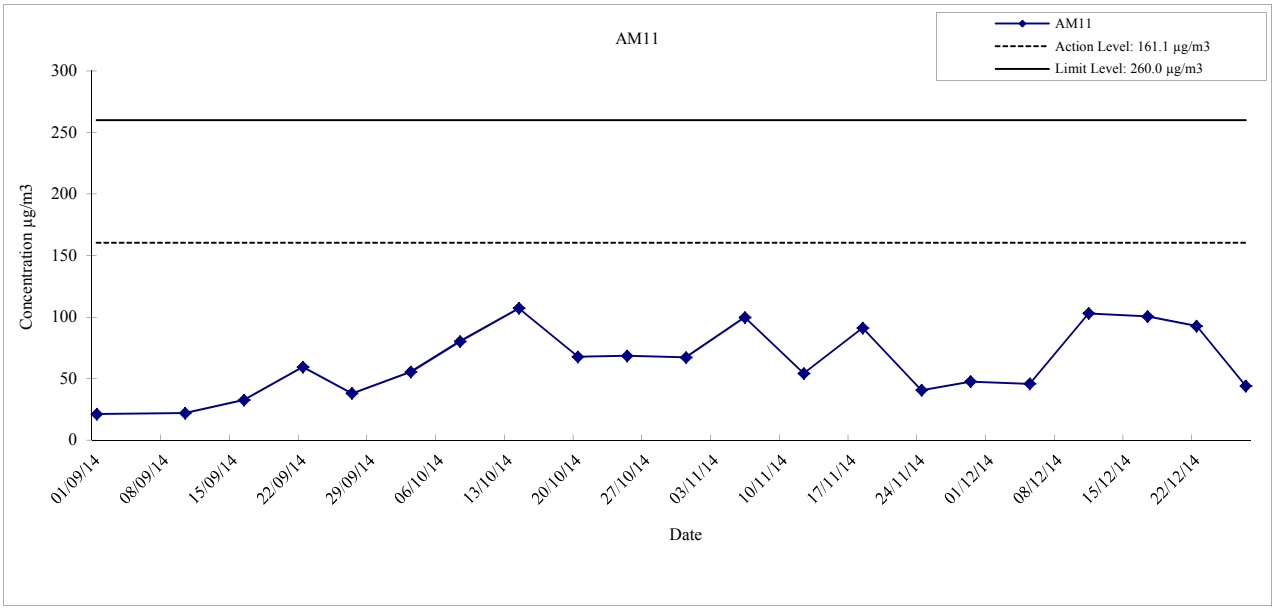


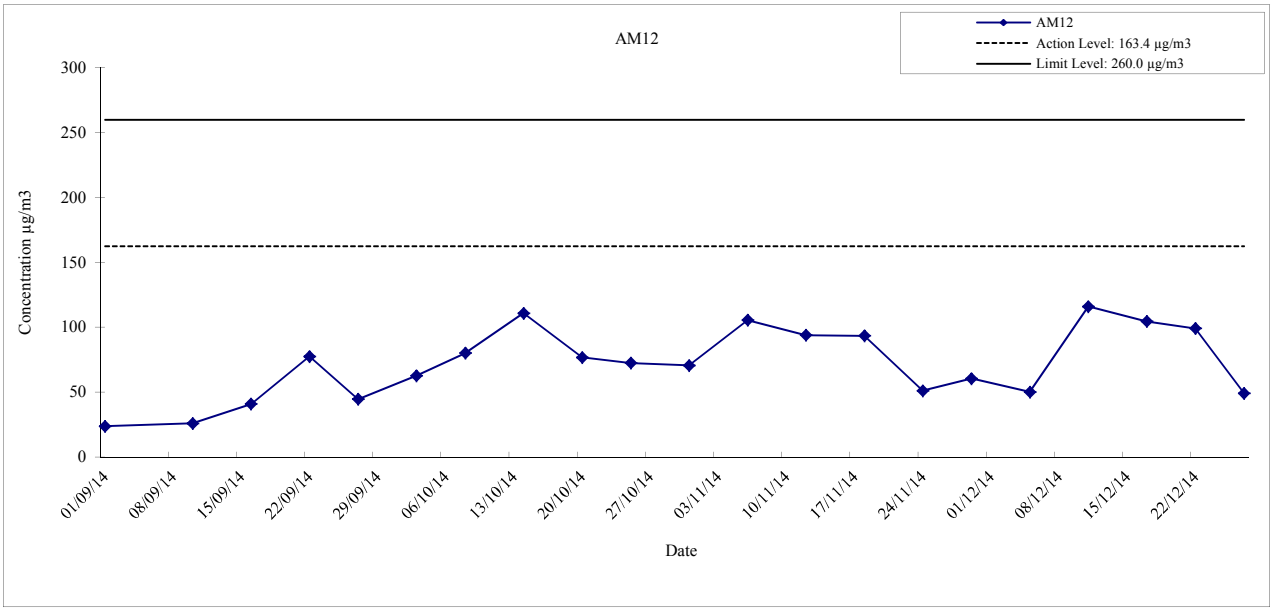
MTR	Hong Kong Section of Guangzhou-Shenzhen-Hong Kong Express Rail Link **Graphical Presentation of 24-hour TSP** **Monitoring Result for Location AM7 and AM8**	**Date**	**2014**
		APPENDIX	**F**



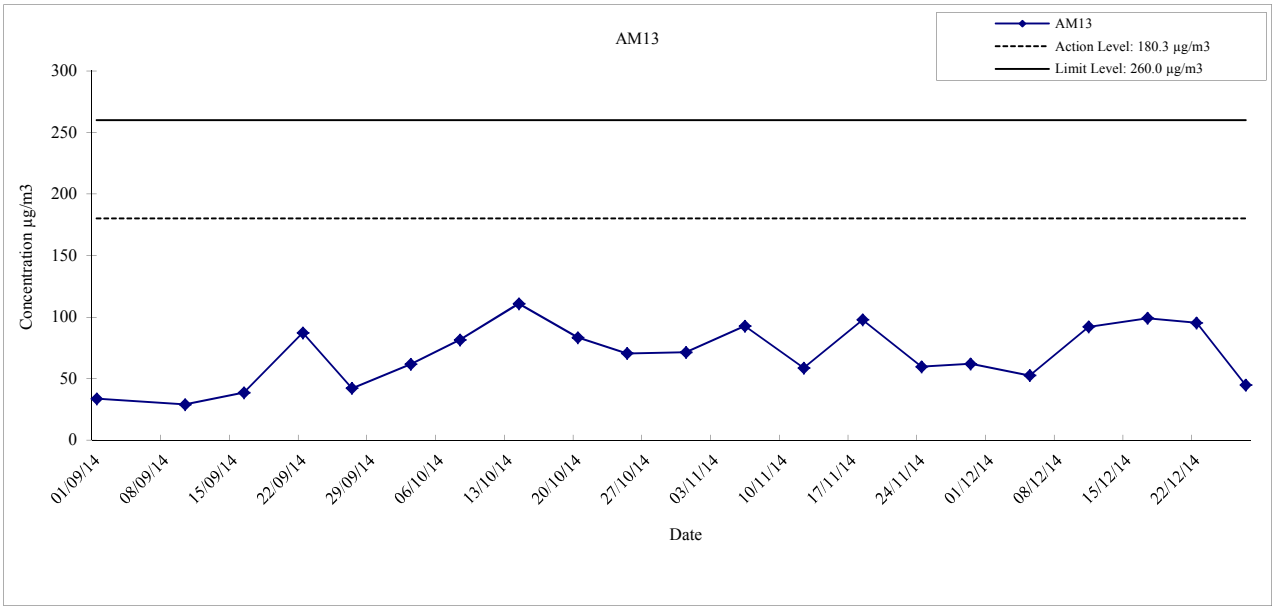


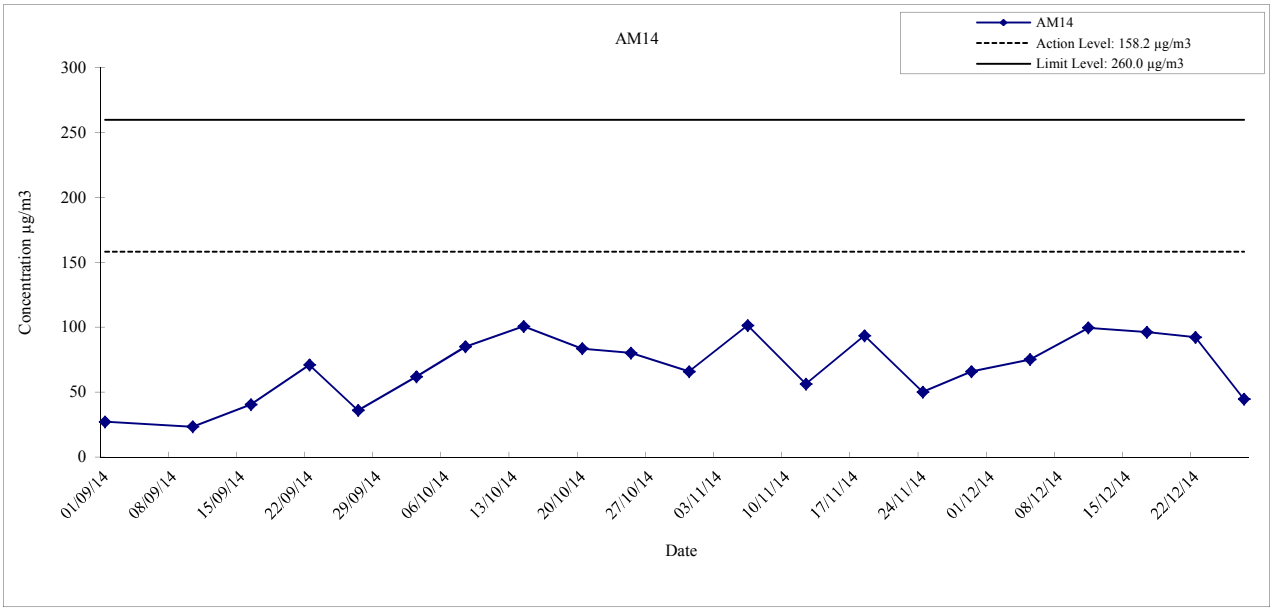
MTR	Hong Kong Section of Guangzhou-Shenzhen-Hong Kong Express Rail Link **Graphical Presentation of 24-hour TSP** **Monitoring Result for Location AM9 and AM10**	**Date**	**2014**
		APPENDIX	**F**



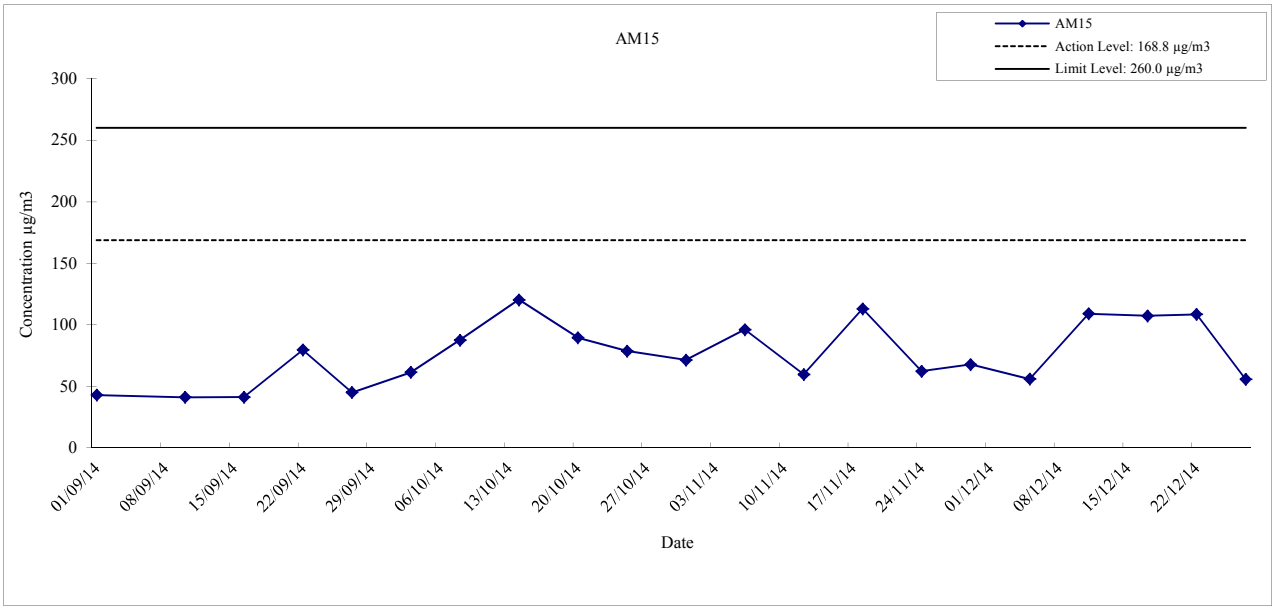


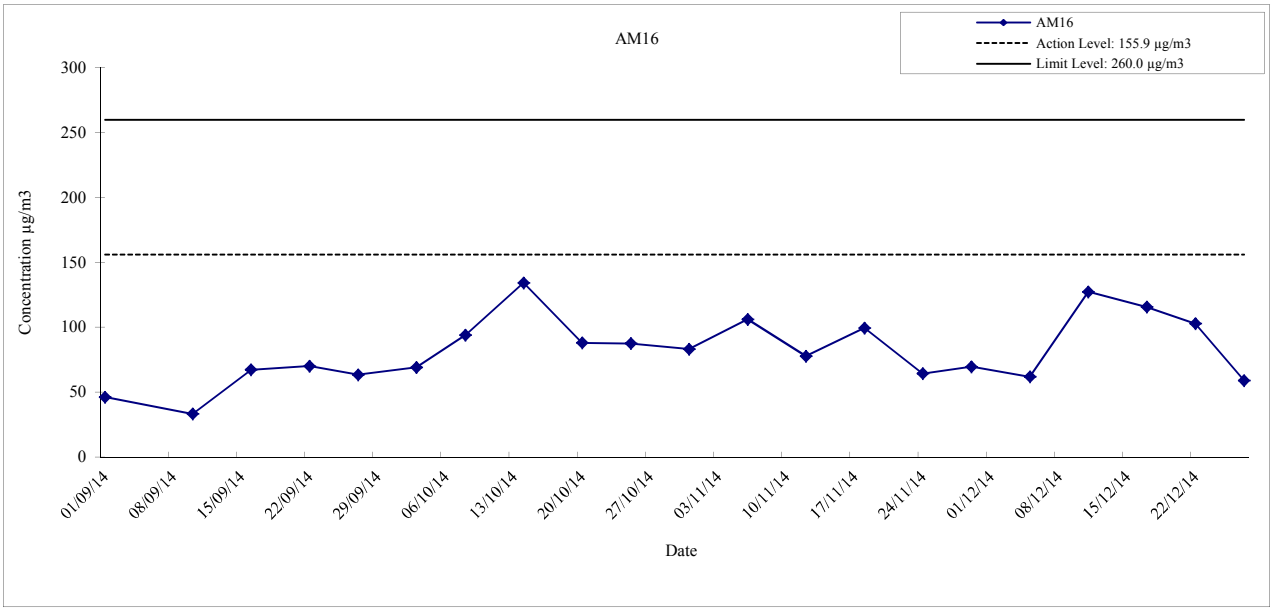
MTR	Hong Kong Section of Guangzhou-Shenzhen-Hong Kong Express Rail Link **Graphical Presentation of 24-hour TSP** **Monitoring Result for Location AM11 and AM12**	**Date**	**2014**
		APPENDIX	**F**



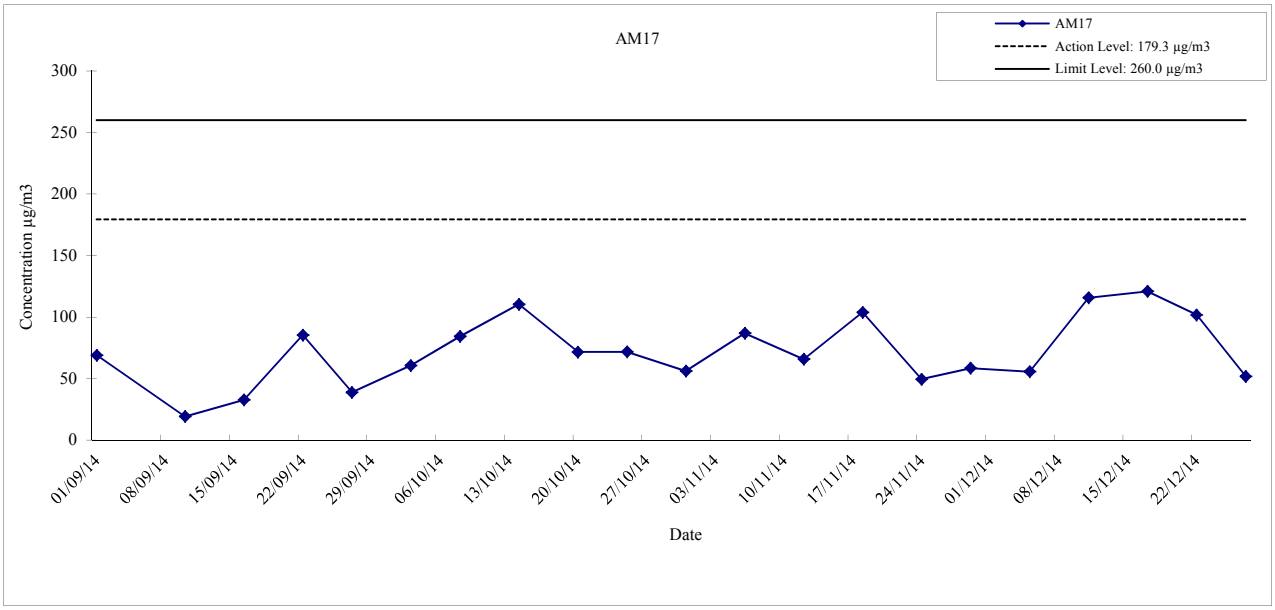


MTR	Hong Kong Section of Guangzhou-Shenzhen-Hong Kong Express Rail Link **Graphical Presentation of 24-hour TSP** **Monitoring Result for Location AM13 and AM14**	**Date**	**2014**
		APPENDIX	**F**





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**	**2014**
		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**	**2014**
		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)	
2014-12-01	75	75	N
2014-12-08	74	75	N
2014-12-15	73	75	N
2014-12-22	70	75	N
2014-12-29	70	75	N

- CN3

Date	Noise Monitoring Results	Limit Level	Exceedance?
	Leq, dB(A)	Leq, dB(A)	
2014-12-01	54	75	N
2014-12-08	53	75	N
2014-12-15	66	75	N
2014-12-22	52	75	N
2014-12-29	53	75	N

- CN4

Date	Noise Monitoring Results	Limit Level	Exceedance?
	Leq, dB(A)	Leq, dB(A)	
2014-12-01	60	75	N
2014-12-08	56	75	N
2014-12-15	57	75	N
2014-12-22	52	75	N
2014-12-29	52	75	N

- CN5

Date	Noise Monitoring Results	Limit Level	Exceedance?
	Leq, dB(A)	Leq, dB(A)	
2014-12-01	61	75	N
2014-12-08	58	75	N
2014-12-15	63	75	N
2014-12-23	64	75	N
2014-12-30	69	75	N

- CN6

Date	Noise Monitoring Results	Limit Level	Exceedance?
	Leq, dB(A)	Leq, dB(A)	
2014-12-01	62	75	N
2014-12-09	60	75	N
2014-12-16	66	75	N
2014-12-22	60	75	N
2014-12-29	66	75	N

- CN7

Date	Noise Monitoring Results	Limit Level	Exceedance?
	Leq, dB(A)	Leq, dB(A)	
2014-12-01	68	75	N
2014-12-09	70	75	N
2014-12-15	66	75	N
2014-12-22	71	75	N
2014-12-29	60	75	N

- CN8

Date	Noise Monitoring Results	Limit Level	Exceedance?
	Leq, dB(A)	Leq, dB(A)	
2014-12-02	69	75	N
2014-12-08	69	75	N
2014-12-15	68	75	N
2014-12-22	67	75	N
2014-12-29	66	75	N

- CN9

Date	Noise Monitoring Results	Limit Level	Exceedance?
	Leq, dB(A)	Leq, dB(A)	
2014-12-02	60	75	N
2014-12-08	66	75	N
2014-12-15	64	75	N
2014-12-22	59	75	N
2014-12-29	59	75	N

- CN10

Date	Noise Monitoring Results	Limit Level	Exceedance?
	Leq, dB(A)	Leq, dB(A)	
2014-12-01	55	75	N
2014-12-08	63	75	N
2014-12-16	59	75	N
2014-12-22	55	75	N
2014-12-29	57	75	N

- CN11

Date	Noise Monitoring Results	Limit Level	Exceedance?
	Leq, dB(A)	Leq, dB(A)	
2014-12-01	61	75	N
2014-12-09	64	75	N
2014-12-15	56	75	N
2014-12-22	55	75	N
2014-12-29	63	75	N

- CN12

Date	Noise Monitoring Results	Limit Level	Exceedance?
	Leq, dB(A)	Leq, dB(A)	
2014-12-01	65	75	N
2014-12-08	56	75	N
2014-12-16	60	75	N
2014-12-22	59	75	N
2014-12-29	58	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)	
2014-12-01	55	75	N
2014-12-09	50	75	N
2014-12-15	57	75	N
2014-12-22	59	75	N
2014-12-29	57	75	N

- CN14

Date	Noise Monitoring Results	Limit Level	Exceedance?
	Leq, dB(A)	Leq, dB(A)	
2014-12-01	63	75	N
2014-12-08	50	75	N
2014-12-15	50	75	N
2014-12-22	52	75	N
2014-12-29	54	75	N

- CN15

Date	Noise Monitoring Results	Limit Level	Exceedance?
	Leq, dB(A)	Leq, dB(A)	
2014-12-01	72	75	N
2014-12-08	***79***	75	Y
2014-12-15	68	75	N
2014-12-22	63	75	N
2014-12-29	64	75	N

- CN16

Date	Noise Monitoring Results	Limit Level	Exceedance?
	Leq, dB(A)	Leq, dB(A)	
2014-12-01	57	75	N
2014-12-08	66	75	N
2014-12-17	53	75	N
2014-12-22	53	75	N
2014-12-29	52	75	N

- CN18

Date	Noise Monitoring Results	Limit Level	Exceedance?
	Leq, dB(A)	Leq, dB(A)	
2014-12-01	59	75	N
2014-12-08	58	75	N
2014-12-16	61	75	N
2014-12-22	61	75	N
2014-12-29	58	75	N

- CN19

Date	Noise Monitoring Results	Limit Level	Exceedance?
	Leq, dB(A)	Leq, dB(A)	
2014-12-01	58	75	N
2014-12-08	68	75	N
2014-12-16	65	75	N
2014-12-22	65	75	N
2014-12-29	59	75	N

- CN20

Date	Noise Monitoring Results	Limit Level	Exceedance?
	Leq, dB(A)	Leq, dB(A)	
2014-12-01	69	70	N
2014-12-08	69	70	N
2014-12-15	68	70	N
2014-12-23	69	70	N
2014-12-31	69	70	N

- CN21

Date	Noise Monitoring Results	Limit Level	Exceedance?
	Leq, dB(A)	Leq, dB(A)	
2014-12-01	68	70	N
2014-12-08	68	70	N
2014-12-15	69	70	N
2014-12-22	67	70	N
2014-12-29	68	70	N

- CN22

Date	Noise Monitoring Results	Limit Level	Exceedance?
	Leq, dB(A)	Leq, dB(A)	
2014-12-01	72	75	N
2014-12-08	72	75	N
2014-12-15	72	75	N
2014-12-22	72	75	N
2014-12-29	72	75	N

- CN23

Date	Noise Monitoring Results	Limit Level	Exceedance?
	Leq, dB(A)	Leq, dB(A)	
2014-12-01	65	70	N
2014-12-08	64	70	N
2014-12-15	64	70	N
2014-12-22	64	70	N
2014-12-29	64	70	N

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.
- 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)	
2014-12-01	65	70	N
2014-12-08	70	70	N
2014-12-15	69	70	N
2014-12-22	65	70	N
2014-12-29	65	70	N

- CN25

Date	Noise Monitoring Results	Limit Level	Exceedance?
	Leq, dB(A)	Leq, dB(A)	
2014-12-02	68	70	N
2014-12-08	68	70	N
2014-12-15	68	70	N
2014-12-22	70	70	N
2014-12-29	68	70	N

- CN26

Date	Noise Monitoring Results	Limit Level	Exceedance?
	Leq, dB(A)	Leq, dB(A)	
2014-12-01	70	70	N
2014-12-08	66	70	N
2014-12-15	66	70	N
2014-12-22	70	70	N
2014-12-29	69	70	N

- CN27

Date	Noise Monitoring Results	Limit Level	Exceedance?
	Leq, dB(A)	Leq, dB(A)	
2014-12-02	64	75	N
2014-12-08	66	75	N
2014-12-15	64	75	N
2014-12-22	64	75	N
2014-12-29	64	75	N

- CN28

Date	Noise Monitoring Results	Limit Level	Exceedance?
	Leq, dB(A)	Leq, dB(A)	
2014-12-01	70	75	N
2014-12-08	70	75	N
2014-12-16	70	75	N
2014-12-22	69	75	N
2014-12-29	69	75	N

- CN29

Date	Noise Monitoring Results	Limit Level	Exceedance?
	Leq, dB(A)	Leq, dB(A)	
2014-12-01	69	70	N
2014-12-08	***79***	70	Y
2014-12-16	70	70	N
2014-12-22	65	70	N
2014-12-29	64	70	N

- CN30

Date	Noise Monitoring Results	Limit Level	Exceedance?
	Leq, dB(A)	Leq, dB(A)	
2014-12-01	65	75	N
2014-12-08	64	75	N
2014-12-16	66	75	N
2014-12-22	63	75	N
2014-12-30	66	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)	
2014-12-01	75	75	N
2014-12-08	***76***	75	Y
2014-12-17	74	75	N
2014-12-22	***76***	75	Y
2014-12-30	75	75	N

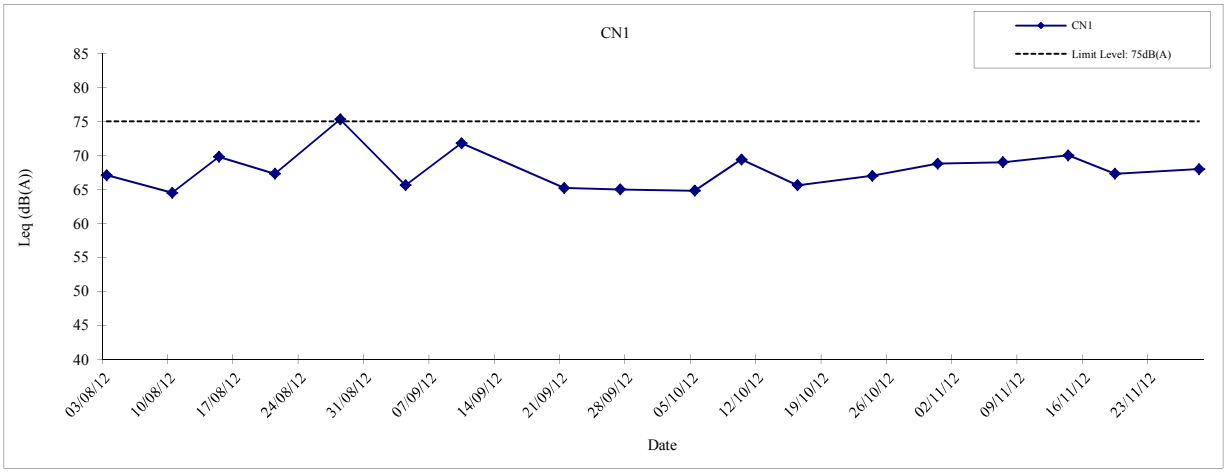
- CN33

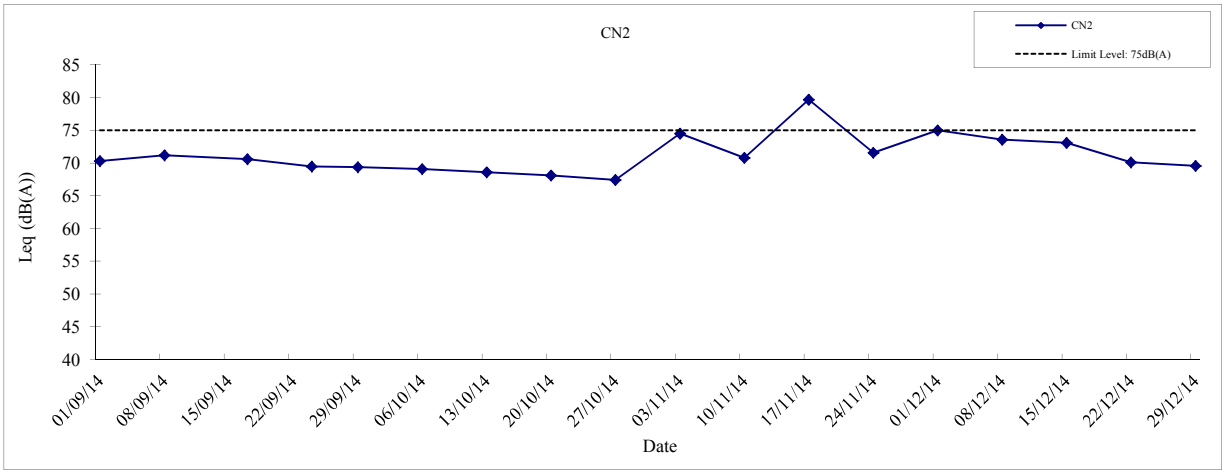
Date	Noise Monitoring Results	Limit Level	Exceedance?
	Leq, dB(A)	Leq, dB(A)	
2014-12-02	73	75	N
2014-12-08	67	75	N
2014-12-15	64	75	N
2014-12-22	65	75	N
2014-12-29	65	75	N

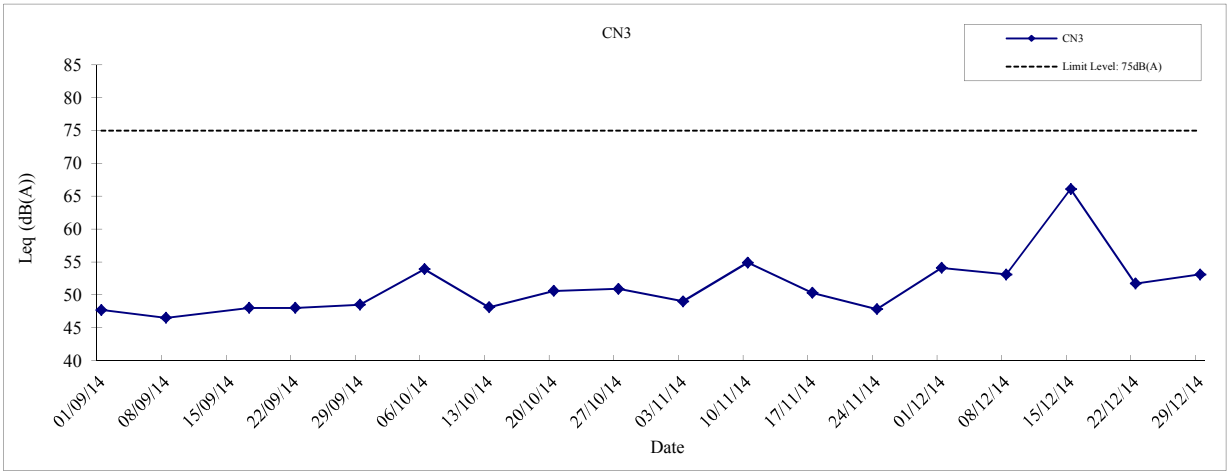
- CN34

Date	Noise Monitoring Results	Limit Level	Exceedance?
	Leq, dB(A)	Leq, dB(A)	
2014-12-01	71	75	N
2014-12-09	69	75	N
2014-12-15	72	75	N
2014-12-22	72	75	N
2014-12-29	71	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.
- 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.

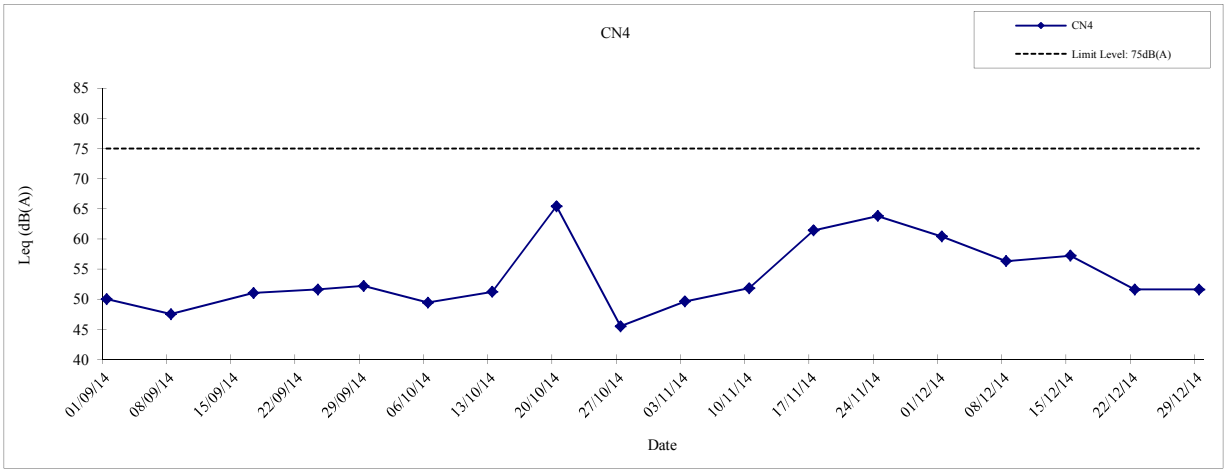


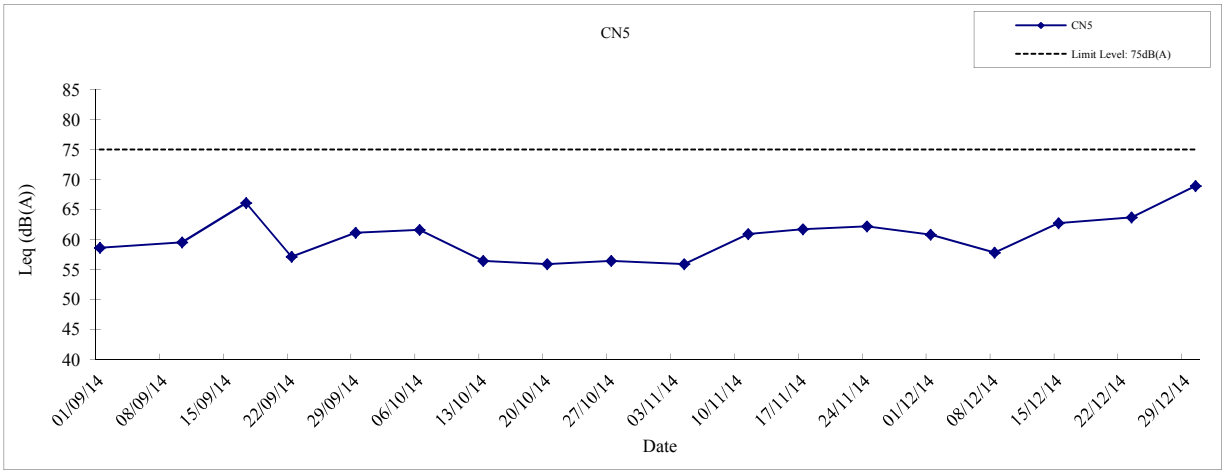


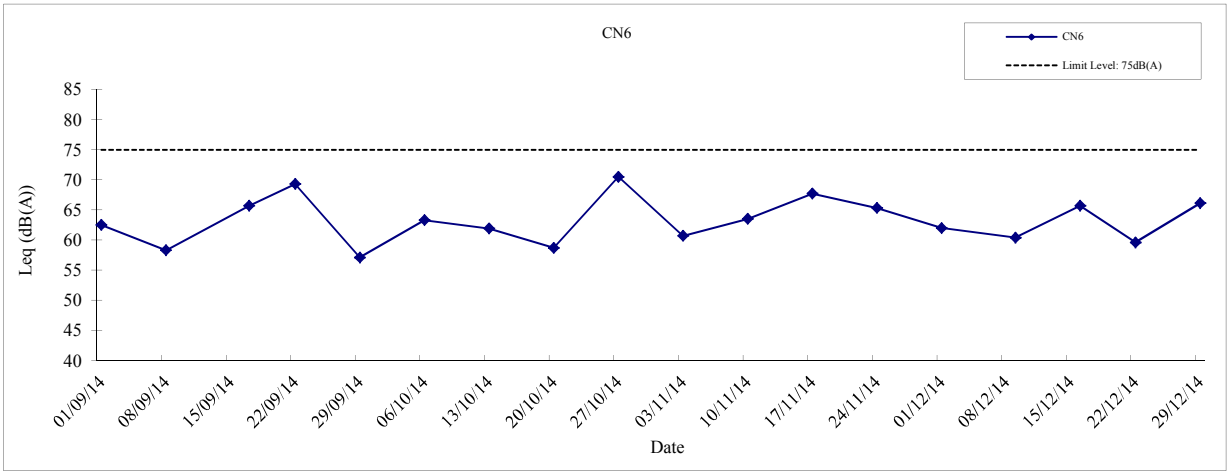


Note - Impact monitoring at No. 142 Mai Po San Tsuen (CN 1) had been temporarily suspended since December 2012 due to house removal. Monitoring at this location will be resumed when an alternative location is determined.

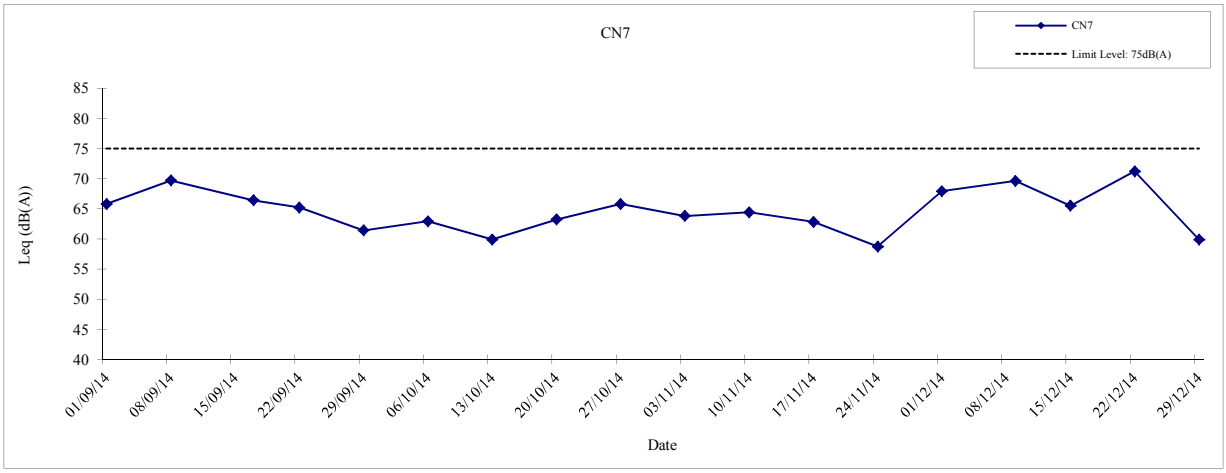
MTR	Hong Kong Section of Guangzhou-Shenzhen-Hong Kong Express Rail Link **Graphical Presentation of Noise** **Monitoring Results for Location CN1, CN2 and CN3**	**Date**	**2014**
		APPENDIX	**F**

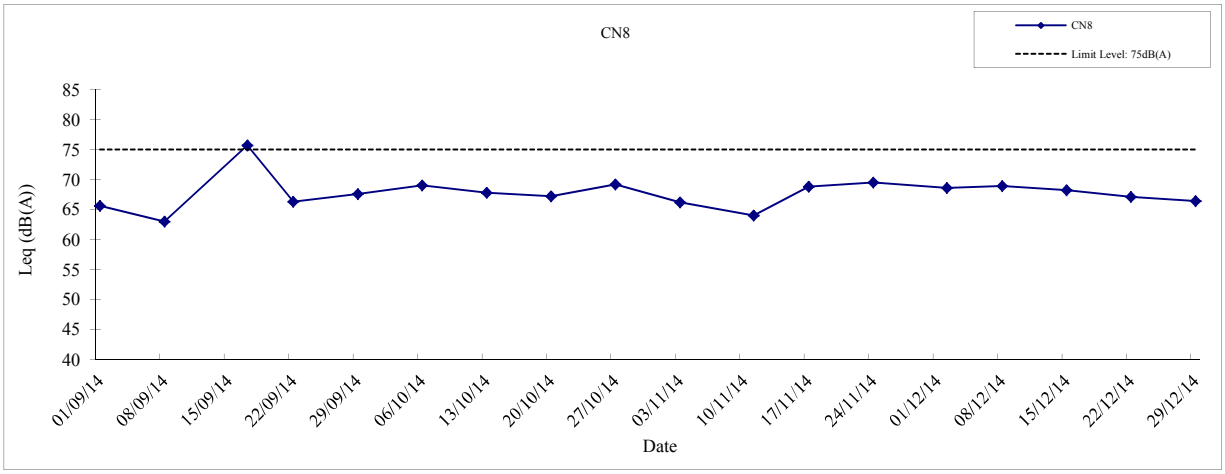


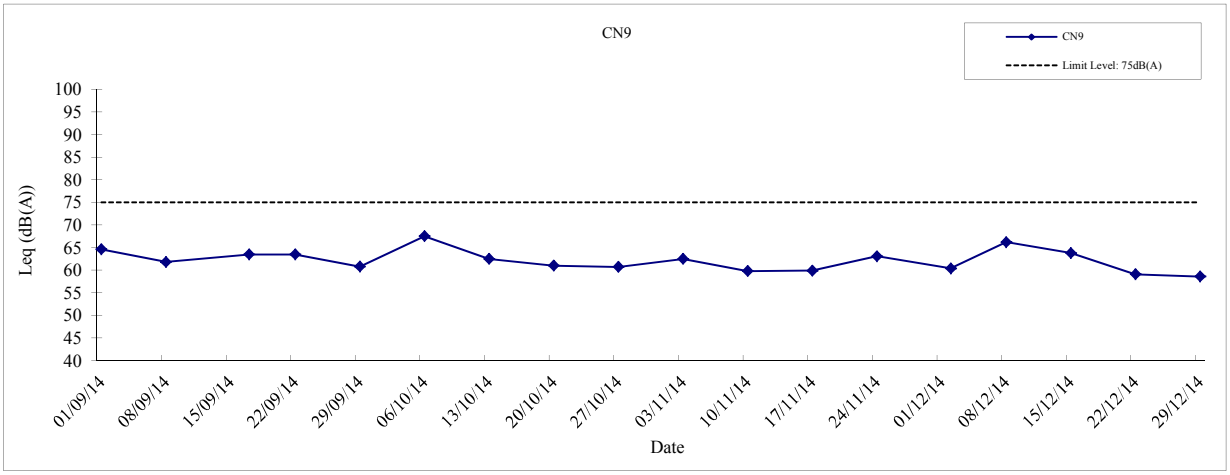




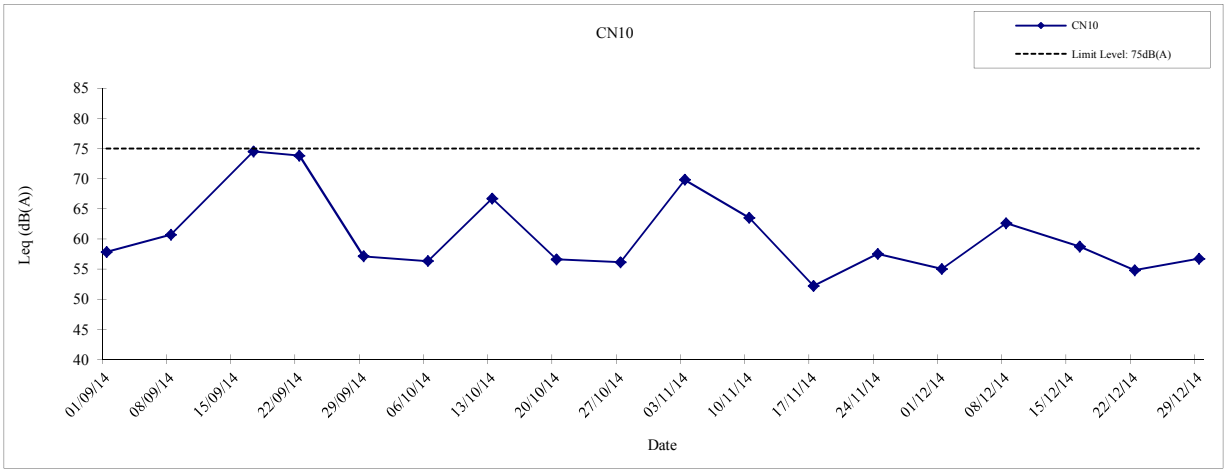
MTR	Hong Kong Section of Guangzhou-Shenzhen-Hong Kong Express Rail Link **Graphical Presentation of Noise** **Monitoring Results for Location CN4, CN5 and CN6**	**Date**	**2014**
		APPENDIX	**F**

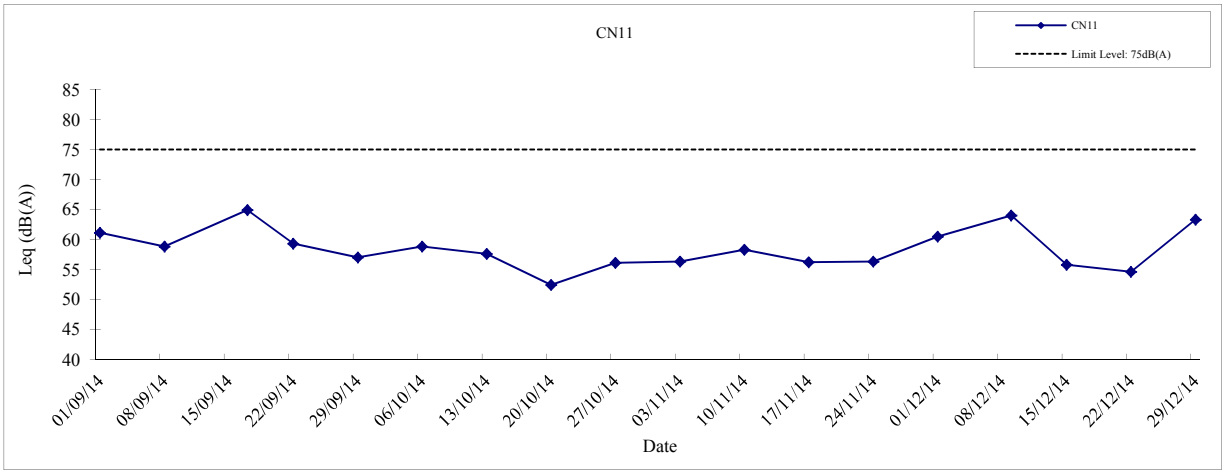


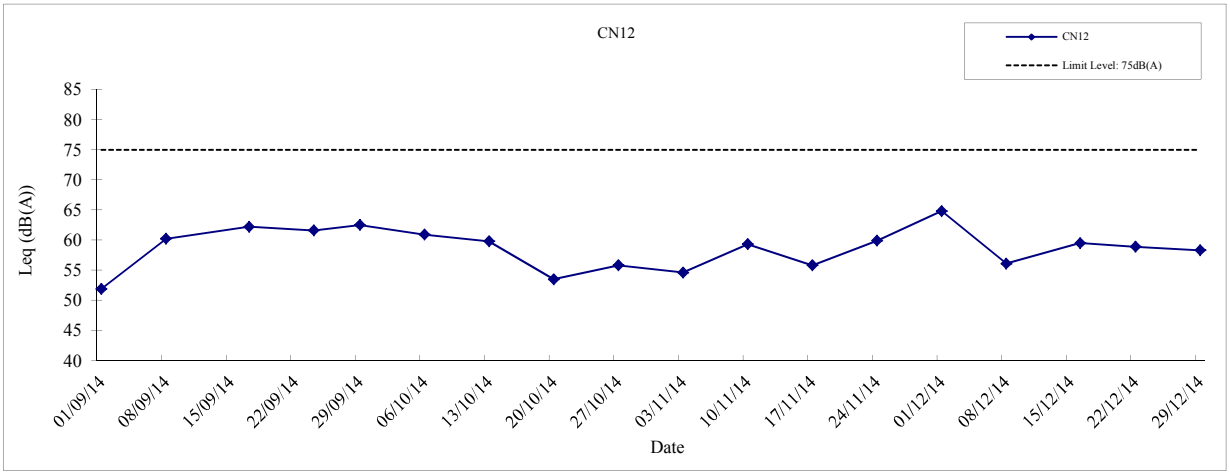




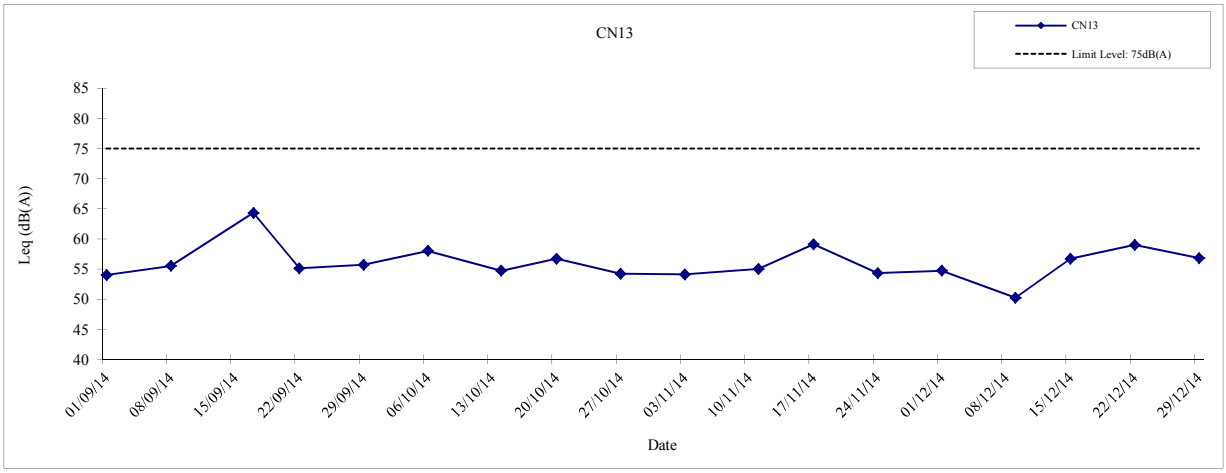
MTR	Hong Kong Section of Guangzhou-Shenzhen-Hong Kong Express Rail Link **Graphical Presentation of Noise** **Monitoring Results for Location CN7, CN8 and CN9**	**Date**	**2014**
		APPENDIX	**F**

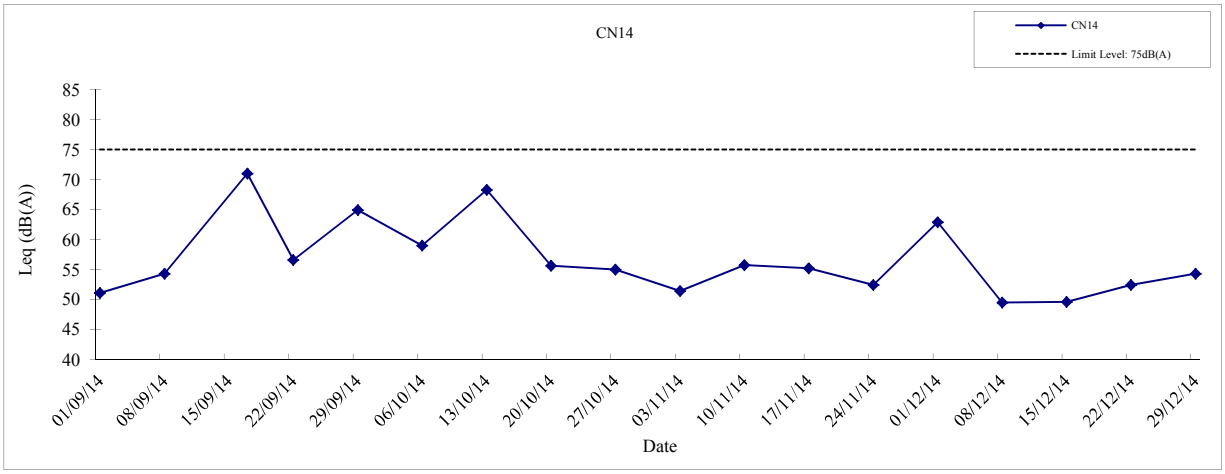


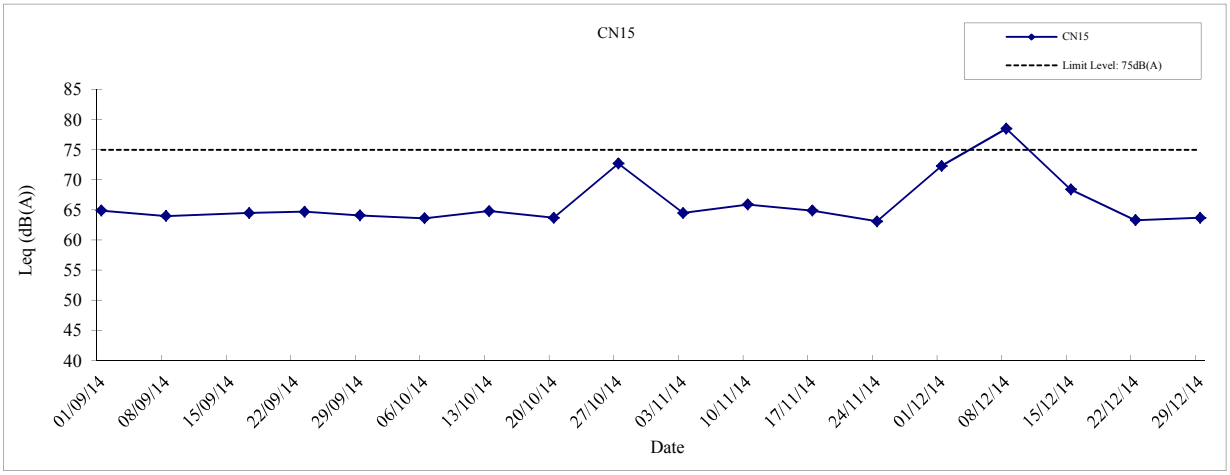




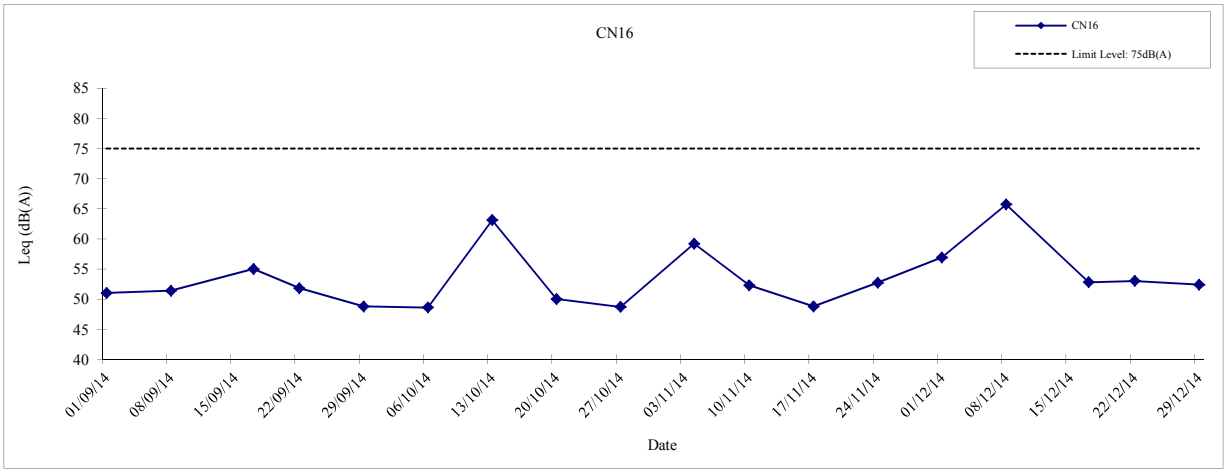
MTR	Hong Kong Section of Guangzhou-Shenzhen-Hong Kong Express Rail Link **Graphical Presentation of Noise** **Monitoring Results for Location CN10, C11 and CN12**	**Date**	**2014**
		APPENDIX	**F**

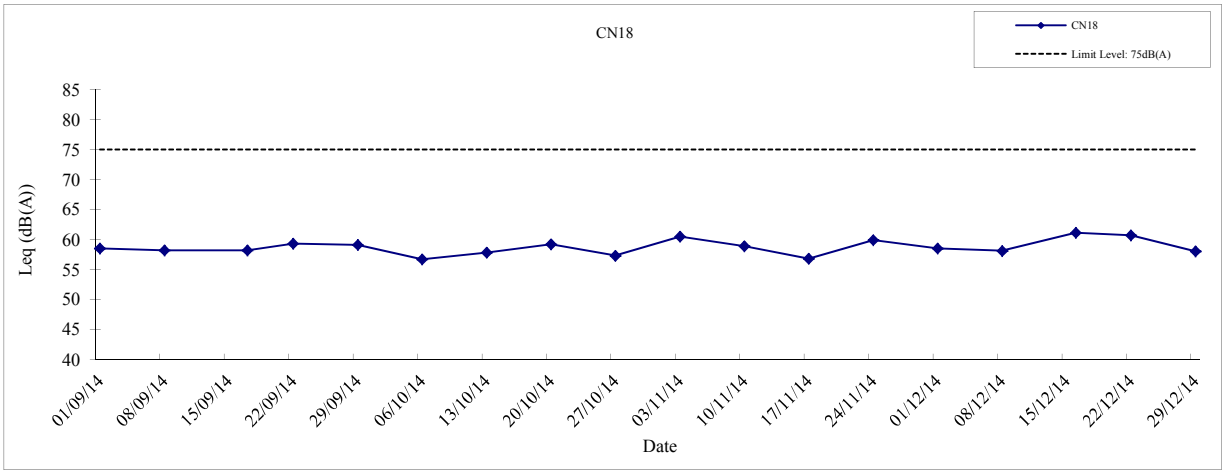


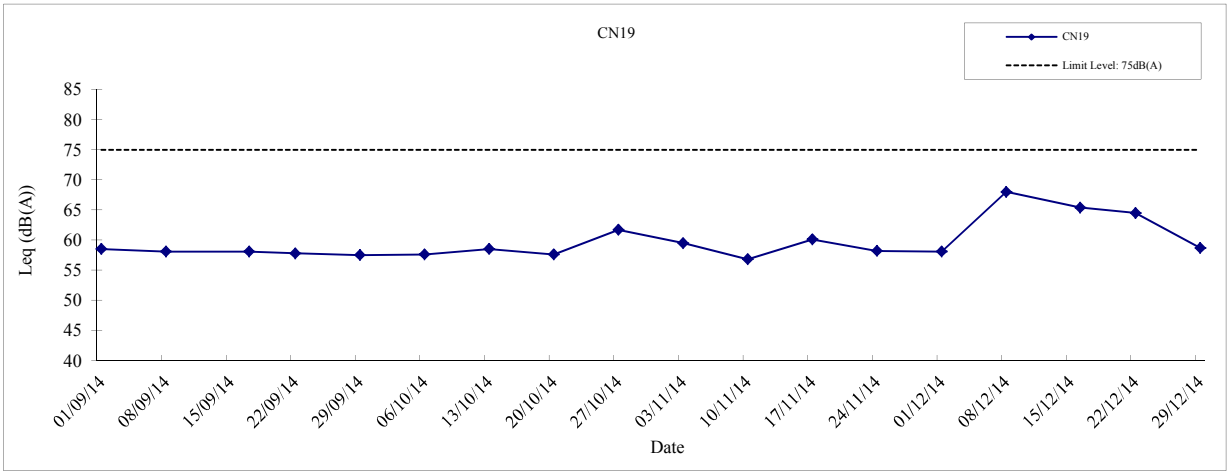




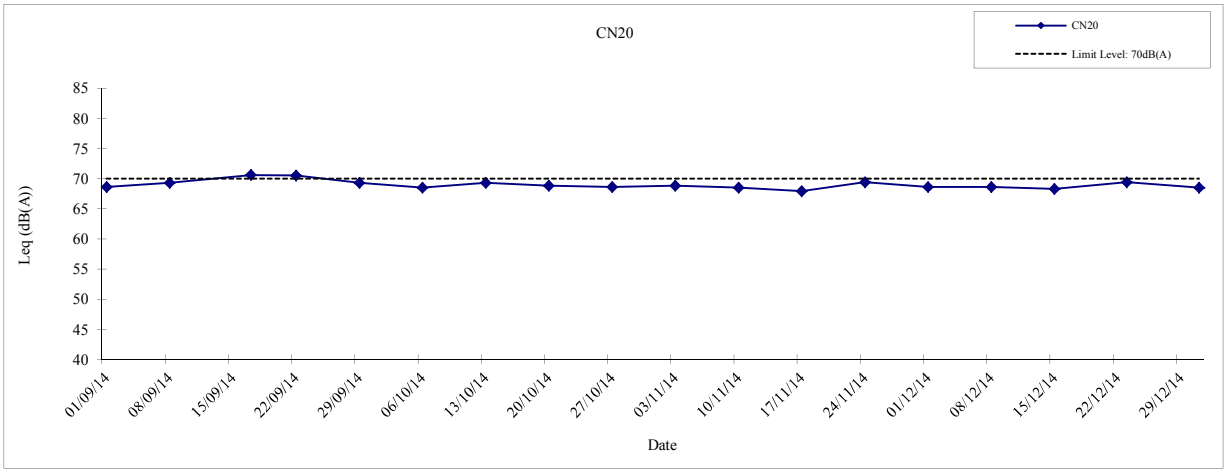
MTR	Hong Kong Section of Guangzhou-Shenzhen-Hong Kong Express Rail Link **Graphical Presentation of Noise** **Monitoring Results for Location CN13, C14 and CN15**	**Date**	**2014**
		APPENDIX	**F**

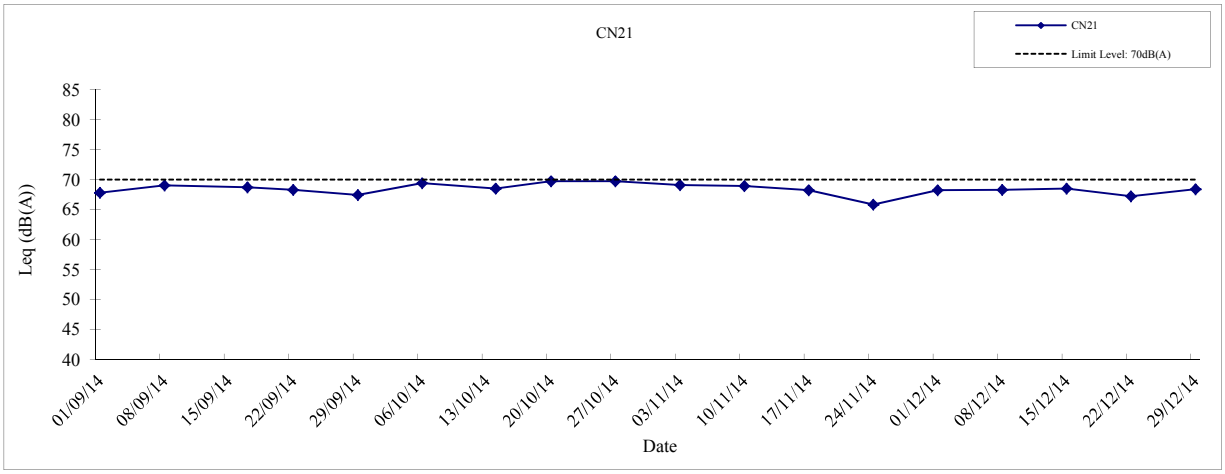


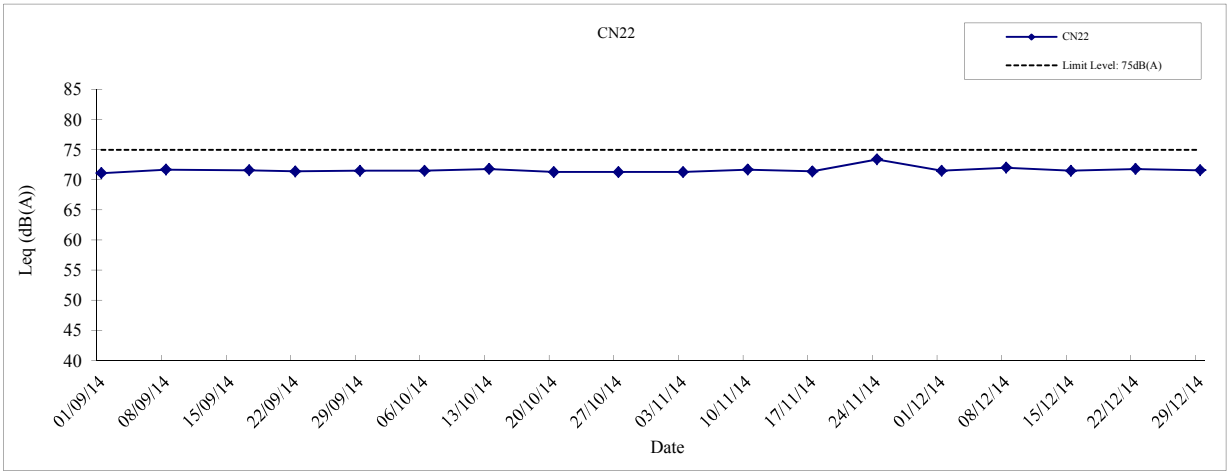




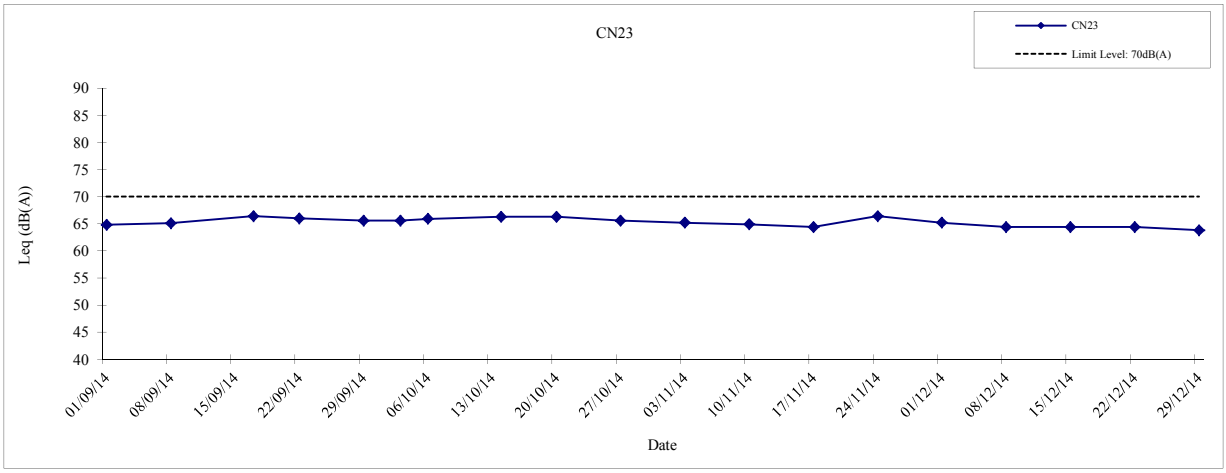
MTR	Hong Kong Section of Guangzhou-Shenzhen-Hong Kong Express Rail Link **Graphical Presentation of Noise** **Monitoring Results for Location CN16, C18 and CN19**	**Date**	**2014**
		APPENDIX	**F**

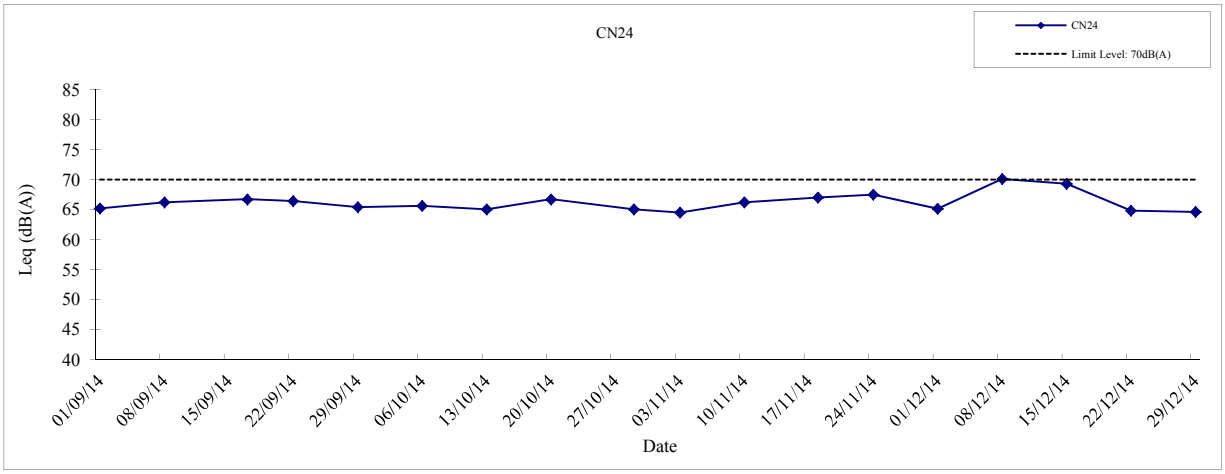


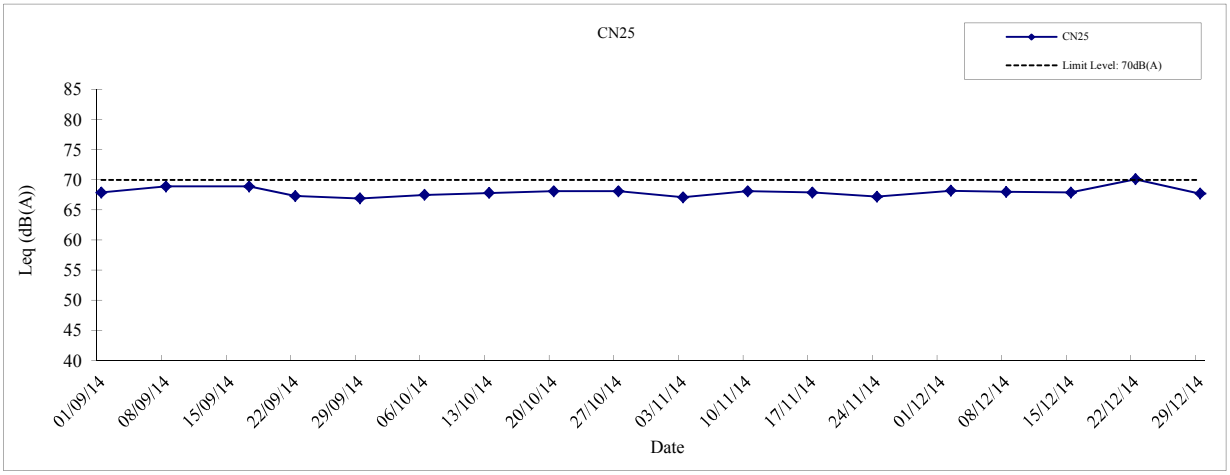




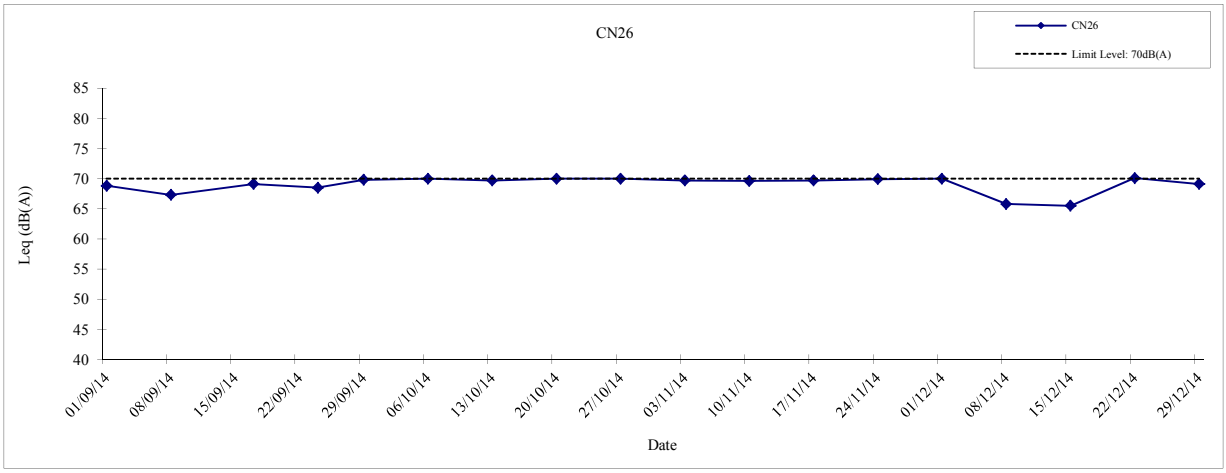
MTR	Hong Kong Section of Guangzhou-Shenzhen-Hong Kong Express Rail Link **Graphical Presentation of Noise** **Monitoring Results for Location CN20, CN21 and CN22**	**Date**	**2014**
		APPENDIX	**F**

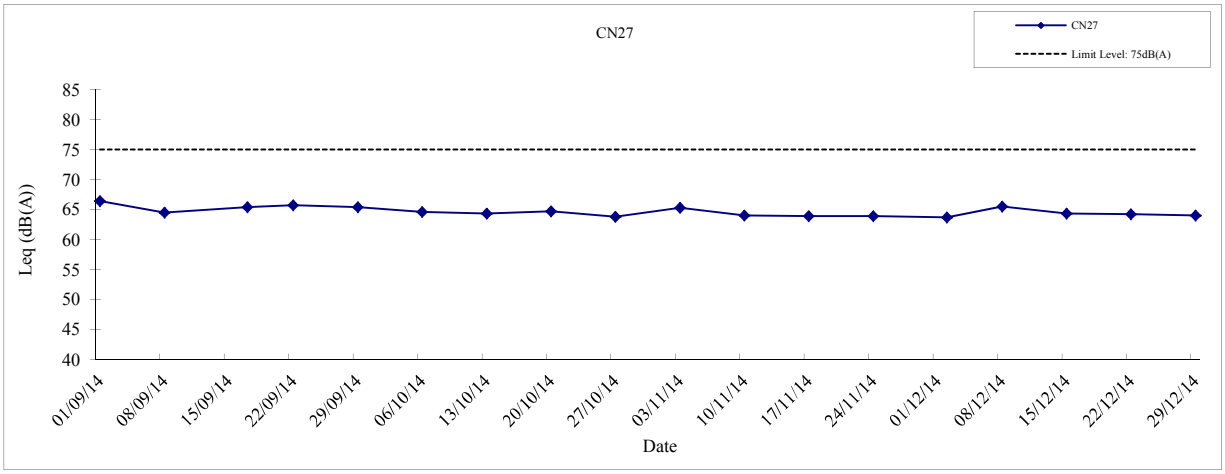


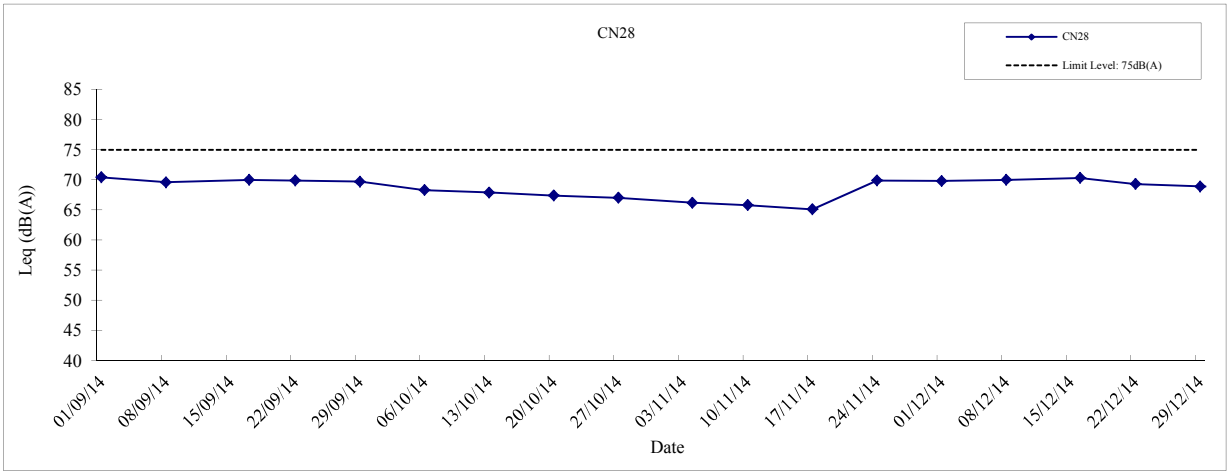




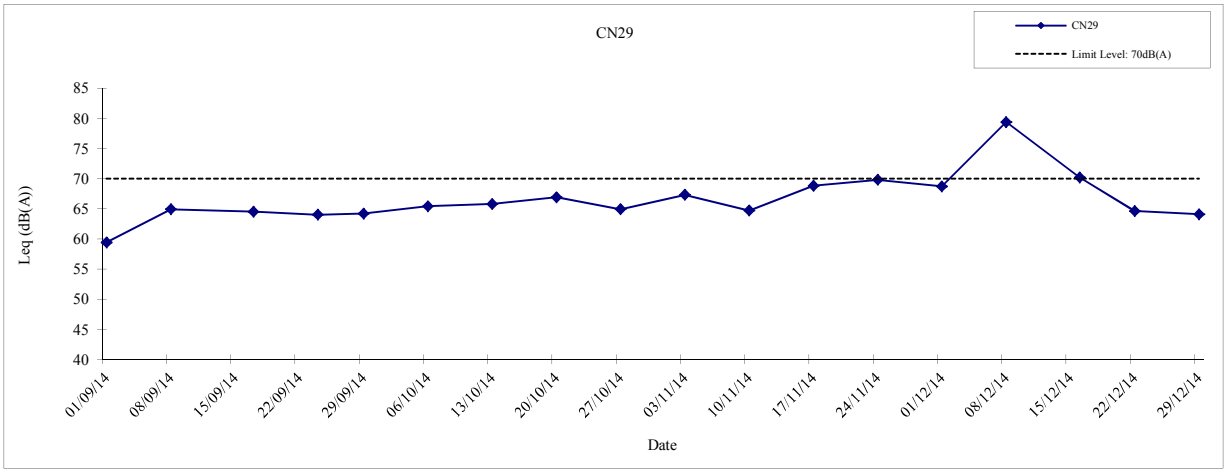
MTR	Hong Kong Section of Guangzhou-Shenzhen-Hong Kong Express Rail Link **Graphical Presentation of Noise** **Monitoring Results for Location CN23, CN24 and CN25**	**Date**	**2014**
		APPENDIX	**F**

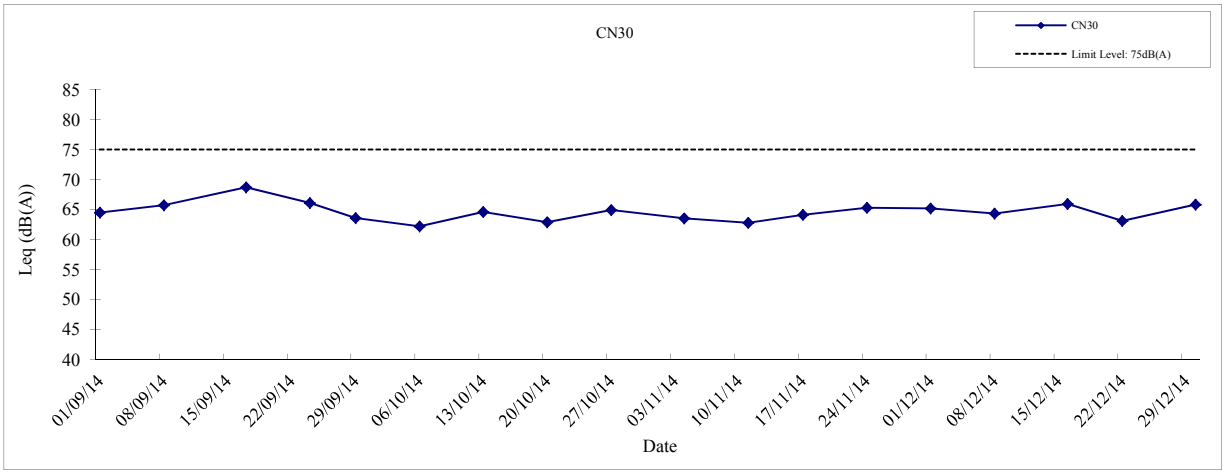


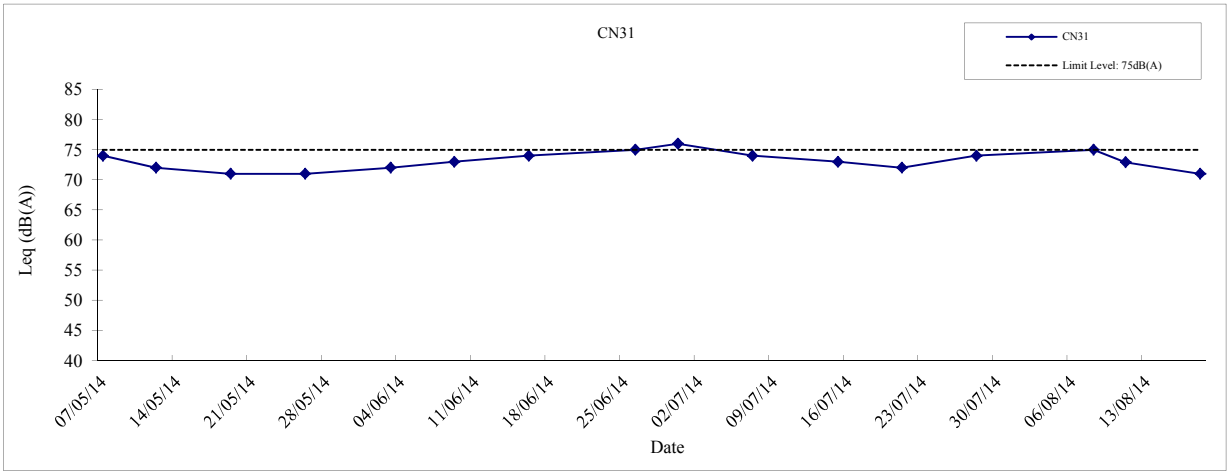




MTR	Hong Kong Section of Guangzhou-Shenzhen-Hong Kong Express Rail Link **Graphical Presentation of Noise** **Monitoring Results for Location CN26, CN27 and CN28**	**Date**	**2014**
		APPENDIX	**F**

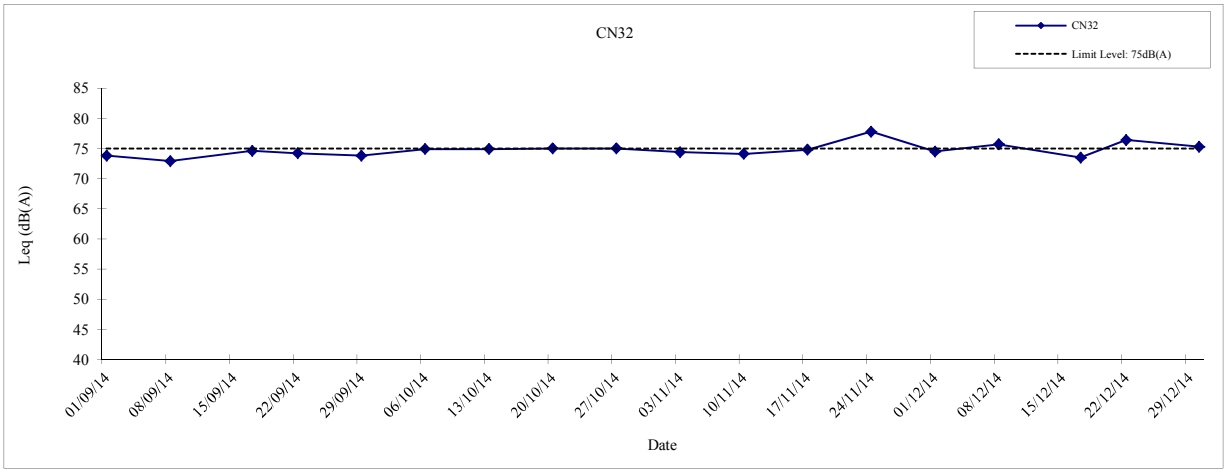


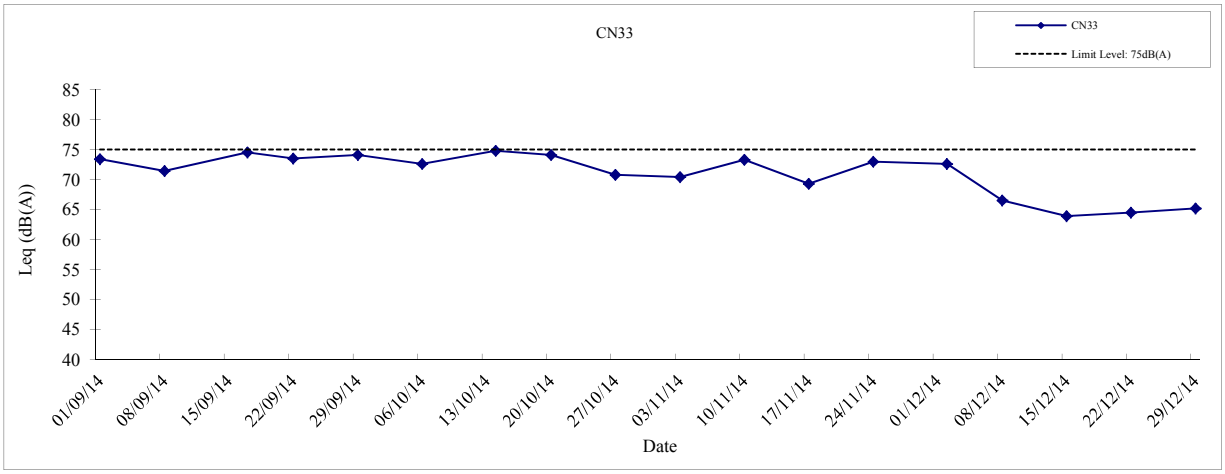


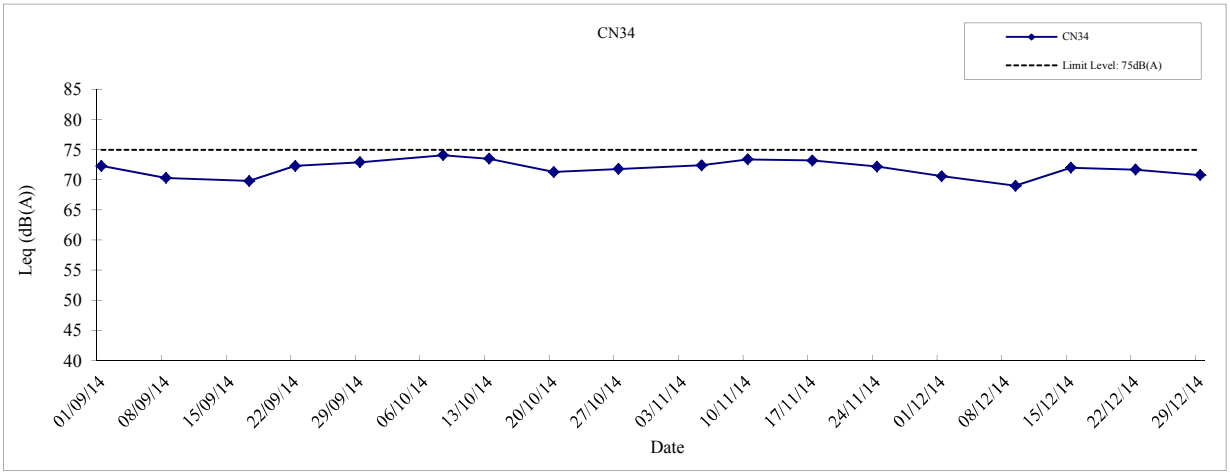


- Impact monitoring at Tower 6, Sorrento (CN31) had been temporarily suspended since end of August 2014 due to objection from the OC of Sorrento in August 2014. Monitoring at this location would be resumed when an alternative location is determined.

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** **APPENDIX**	**2014** **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**	**2014**
		APPENDIX	**F**

APPENDIX F: Ground-borne Noise Monitoring Results

Weekdays Daytime Ground-borne Noise Level, dB(A) - GN 31

0700 – 1900 (Daytime, Normal weekday) Ground-borne Noise Monitoring Limit Level: 65 dB(A)

Time slot	01/12/2014 Leq, dB(A)	02/12/2014 Leq, dB(A)	03/12/2014 Leq, dB(A)	04/12/2014 Leq, dB(A)
07:00-07:30	49.5	47.9	47.6	48.8
07:30-08:00	49.0	49.8	49.9	51.8
08:00-08:30	52.2	51.2	52.3	53.2
08:30-09:00	55.1	53.7	55.5	55.5
09:00-09:30	56.1	54.3	58.9	55.9
09:30-10:00	54.2	56.5	59.4	
10:00-10:30	***69.9***	54.5	59.0	
10:30-11:00	60.3	56.8	60.2	
11:00-11:30	***65.5***	55.7	59.1	
11:30-12:00	55.9	52.7	63.7	
12:00-12:30	51.7	50.4	56.3	
12:30-13:00	50.3	50.8	49.5	
13:00-13:30	55.6	52.4	***67.2***	
13:30-14:00	53.9	59.9	***68.0***	
14:00-14:30	60.0	***71.0***	61.4	
14:30-15:00	54.7	***65.2***	59.6	
15:00-15:30	61.0	***66.0***	***77.7***	
15:30-16:00	63.5	***66.3***	***76.2***	
16:00-16:30	56.5	***78.1***	***79.6***	
16:30-17:00	55.4	57.1	***73.7***	
17:00-17:30	60.8	57.9	64.7	
17:30-18:00	53.5	54.9	54.7	
18:00-18:30	54.3	56.1	53.7	
18:30-19:00	50.7	52.0	50.9	
Average	56.2	57.1	60.8	53.0
Max	69.9	78.1	79.6	55.9
Min	49.0	47.9	47.6	48.8

* Bold and italic indicates the exceedance of noise criteria.

*Due to relocation of Sound level meter to alternative location, no data for 4 Dec 14 from 9:30~10:30

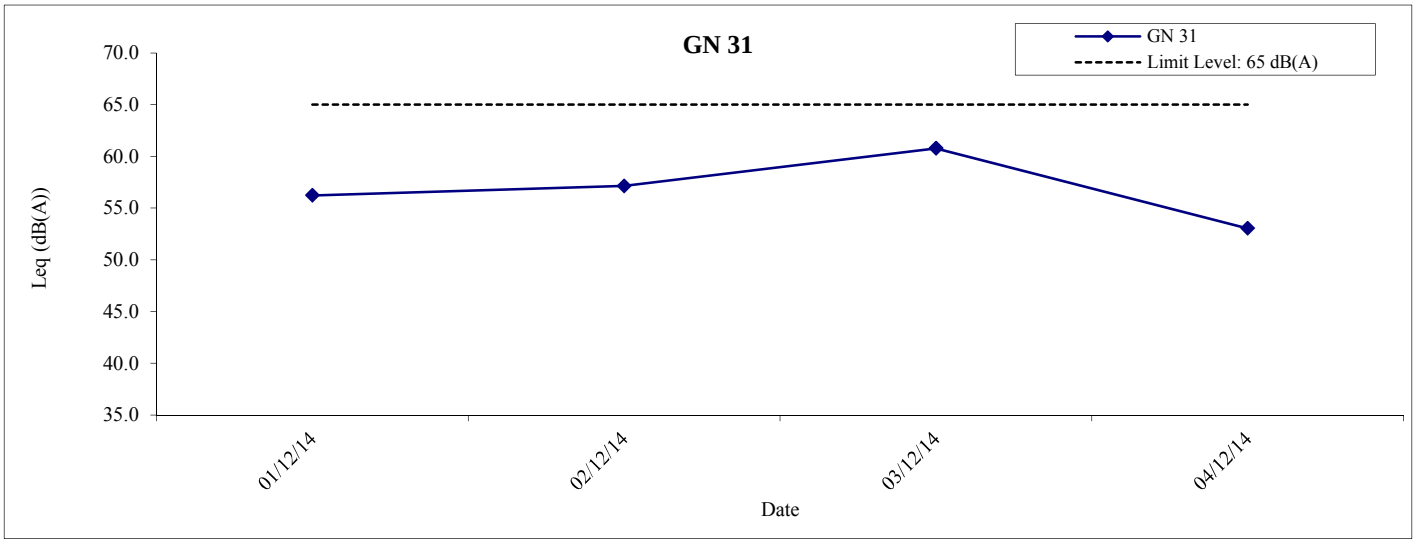
APPENDIX F: Ground-borne Noise Monitoring Results

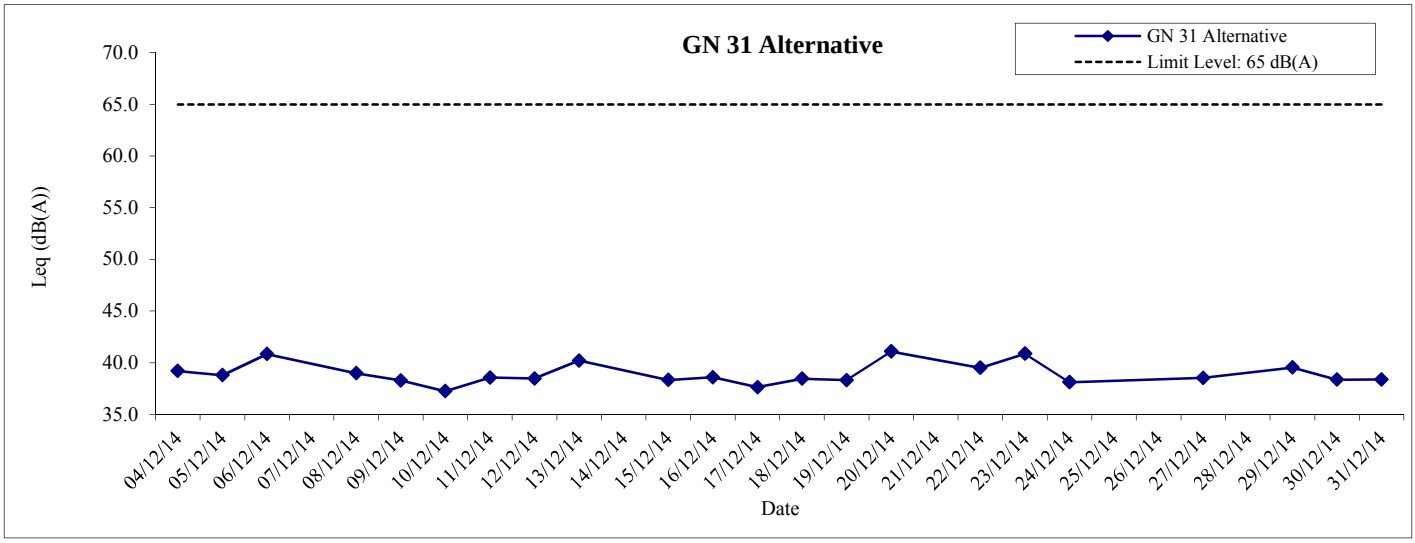
Weekdays Daytime Ground-borne Noise Level, dB(A) - GN 31 Alternative

0700 – 1900 (Daytime, Normal weekday) Ground-borne Noise Monitoring Limit Level: 65 dB(A)

Time slot	04/12/2014 Leq, dB(A)	05/12/2014 Leq, dB(A)	06/12/2014 Leq, dB(A)	08/12/2014 Leq, dB(A)	09/12/2014 Leq, dB(A)	10/12/2014 Leq, dB(A)	11/12/2014 Leq, dB(A)	12/12/2014 Leq, dB(A)	13/12/2014 Leq, dB(A)	15/12/2014 Leq, dB(A)	16/12/2014 Leq, dB(A)	17/12/2014 Leq, dB(A)	18/12/2014 Leq, dB(A)	19/12/2014 Leq, dB(A)	20/12/2014 Leq, dB(A)	22/12/2014 Leq, dB(A)	23/12/2014 Leq, dB(A)	24/12/2014 Leq, dB(A)	27/12/2014 Leq, dB(A)	29/12/2014 Leq, dB(A)	30/12/2014 Leq, dB(A)	31/12/2014 Leq, dB(A)
07:00-07:30		32.5	33.0	32.7	31.8	31.3	33.9	33.7	32.3	32.5	34.2	33.9	31.9	33.5	31.7	32.1	30.8	30.9	29.8	32.2	33.5	33.0
07:30-08:00		34.2	33.8	32.7	36.1	32.8	34.3	34.4	34.5	33.7	35.9	35.7	34.6	34.3	33.2	33.9	32.9	31.8	33.3	34.3	35.9	34.8
08:00-08:30		39.3	36.9	36.8	37.8	35.6	37.2	38.6	37.7	37.4	41.3	39.1	36.7	37.0	38.5	37.9	36.8	37.7	35.9	37.9	38.0	38.6
08:30-09:00		41.5	40.8	40.9	40.1	41.1	40.8	41.7	40.3	40.6	42.4	39.5	41.3	41.3	40.9	37.8	40.6	39.7	41.1	42.0	41.9	41.9
09:00-09:30		38.2	40.1	37.0	38.0	37.4	43.0	38.6	39.5	47.1	40.3	38.9	40.9	38.9	41.2	36.9	38.6	37.0	39.2	41.5	39.7	37.7
09:30-10:00		38.3	44.1	40.6	41.4	35.8	40.8	38.4	40.9	37.7	39.0	38.1	38.0	38.6	44.7	37.4	39.8	37.6	39.9	44.4	39.7	38.3
10:00-10:30		38.5	40.2	37.2	39.8	38.1	39.5	38.8	42.4	40.0	38.6	38.6		40.7	40.9	39.7		39.6	39.8	45.3	39.5	39.0
10:30-11:00	47.2	38.3	41.9	38.9	40.3	37.7	39.5	42.9	41.3	36.6	39.3	38.2	42.5	37.5	42.8	35.3	39.3	40.1	41.4	45.3	40.9	40.1
11:00-11:30	39.8	39.1	40.7	38.1	37.7	37.9	39.8	40.5		38.8	38.2	38.8	39.6	39.6	40.0	37.5	39.0	40.1	41.1	44.3	38.6	38.3
11:30-12:00	39.2	39.2	38.5	36.6	37.3	37.0	37.0	37.6	47.3	36.1	37.8	35.9	36.6	36.3	39.2	34.8	38.7	37.9	37.5	42.4	35.6	38.2
12:00-12:30	37.6	36.7	41.9	38.2	36.4	36.9	36.9	38.7	38.9	35.1	36.2	36.9	35.9	37.8	40.6	34.2	42.1	36.8	38.8	38.7	33.8	35.3
12:30-13:00	37.1	36.6	41.2	36.2	36.8	34.7	36.3	37.4	40.0	35.5	36.8	34.6	35.5	35.8	40.9	34.2	40.4	37.1	37.6	40.7	35.0	37.2
13:00-13:30	41.7	38.1	41.6	37.0	38.1	36.4	37.9	38.5	39.3	37.8	36.9	39.3	38.3	36.4	39.0	35.9	43.7	38.7	41.1	36.8	37.9	39.7
13:30-14:00	39.4	40.1	41.8	37.6	43.1	38.5	38.4	38.0	41.0	39.3	38.1	36.9	39.1	36.9	40.0	38.8	42.0	37.5	41.2	37.4	39.6	39.2
14:00-14:30	38.8	38.5	53.0	38.8	39.1	37.9	39.2	39.4	42.4	39.0	39.5	37.3	40.6	38.9	43.0	46.7	42.9	38.6	41.3	37.1		39.7
14:30-15:00	39.2	40.5	40.1	39.1	40.1	39.6	39.6	39.3	39.0	40.3	37.9	38.3	39.2	39.8	47.2	47.7	48.4	39.4	38.6	39.3	44.6	40.3
15:00-15:30	39.4	40.5	44.1	41.8	38.4	38.8	41.4	39.6	42.8	39.7	38.2	37.6	39.8	39.5	43.3	45.4	46.6	46.1	39.3	41.0	40.1	42.0
15:30-16:00	39.2	42.5	42.2	46.0	39.4	38.8	39.6	38.2	41.7	38.1	38.4	38.5	41.1	40.3	47.0	49.4	47.8	39.9	38.8	37.5	38.4	37.3
16:00-16:30	41.1	49.6	50.8	43.6	39.4	39.3	40.9	39.7	40.4	38.7	39.3	38.7	40.4	41.3	45.6	49.3	43.8	39.7	38.7	39.2	40.3	39.5
16:30-17:00	38.6	40.3	40.9	41.8	38.8	39.3	41.0	38.1	40.5	39.1	42.6	39.3	39.0	40.8	47.0	43.4	44.8	37.9	37.7	39.1	38.8	41.2
17:00-17:30	38.8	40.1	39.5	41.6	38.7	39.8	39.5	40.0	40.6	40.2	42.2	41.1	41.0	38.8	44.7	41.0	44.1	39.9	36.8	38.6	38.7	37.6
17:30-18:00	38.7	37.8	41.6	38.6	39.0	40.1	37.5	39.0	36.4	41.8	37.7	37.2	38.7	38.2	43.4	40.3	45.2	37.3	36.0	41.1	39.9	39.8
18:00-18:30	36.0	36.5	35.8	37.3	37.0	35.6	35.9	35.2	41.6	36.8	38.9	36.1	38.6	40.7	37.6	41.8	36.0	35.4	36.7	37.6	36.1	37.8
18:30-19:00	34.4	34.4	35.5	46.2	34.2	33.7	35.5	36.5	43.9	38.3	36.7	34.6	35.1	36.7	33.6	36.7	35.5	38.0	42.9	35.1	36.0	34.2
Average	39.2	38.8	40.8	39.0	38.3	37.2	38.6	38.5	40.2	38.3	38.6	37.6	38.4	38.3	41.1	39.5	40.9	38.1	38.5	39.5	38.4	38.4
Max	47.2	49.6	53.0	46.2	43.1	41.1	43.0	42.9	47.3	47.1	42.6	41.1	42.5	41.3	47.2	49.4	48.4	46.1	42.9	45.3	44.6	42.0
Min	34.4	32.5	33.0	32.7	31.8	31.3	33.9	33.7	32.3	32.5	34.2	33.9	31.9	33.5	31.7	32.1	30.8	30.9	29.8	32.2	33.5	33.0

* Cell in grey represent no data was recorded during the period due to relocating to alternative location (on 4 Dec 14) and data downloading.





Note: Ground-borne Noise Monitoring is not required for Sunday and Public Holiday.

MTR	Hong Kong Section of Guangzhou-Shenzhen-Hong Kong Express Rail Link **Graphical Presentation of Ground-borne Noise Monitoring Results for Location GN 31 and GN 31 Alternative**	**Date**	**Dec-14**
		APPENDIX	**F**

Appendix G

Bird Species and Abundance Recorded during Avifauna Survey

Appendix G Bird Species and Abundance Recorded during the Avifauna Monitoring in December 2014

Works Area: MPV
Survey Site: MPV-1
Survey Date: 9 December 2014

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	**小鸊鷉**	P			1			1		2				1	5	
Great Cormorant	**鸕鷀**	W		17		1	6			1					25	√
Grey Heron	**蒼鷺**	W		4						1		3			8	√
Great Egret	**大白鷺**	P				1		1							2	√
Little Egret	**小白鷺**	P		5	2	1		2	1	1			1		13	√
Cattle Egret	牛背鷺	P		1			5								6	
Chinese Pond Heron	**池鷺**	P		2	3	3		5	3			1			17	√
Black-faced Spoonbill	**黑臉琵鷺**	W													0	√
Northern Shoveler	**琵嘴鴨**	W								2	5				7	
Tufted Duck	**鳳頭潛鴨**	W			23										23	
Black Kite	黑鳶(麻鷹)	W,R													0	√
Black-winged Stilt	**黑翅長腳鷸**	W							10						10	
Pied Avocet	**反嘴鷸**	W		19			23	2		1					45	√
Little Ringed Plover	金眶鴴(黑領鴴)	W,R	7	8						2					17	
Green Sandpiper	白腰草鷸	W							2			2			4	
Wood Sandpiper	**林鷸**	M,W		1					3						4	
Common Sandpiper	磯鷸	M,W		14											14	
Spotted Dove	珠頸斑鳩	R	1	1	1										3	√
Eurasian Collared Dove	灰斑鳩	Category IIB*		3											3	
Greater Coucal	褐翅鴉鵑	R										2			2	
Common Kingfisher	普通翠鳥	AM,P			1		2		1	2	1				7	
White-throated Kingfisher	白胸翡翠	AM,P		1	1										2	
Barn Swallow	家燕	SpM,Su							2						2	
Yellow Wagtail	黃鶺鴒	M,W	1	1		1	3	1	1	2		2			12	√
White Wagtail	白鶺鴒	W,R	9	3	1		5	2	7	1	1	4			33	√
Richard's Pipit	田鷚	W,R			3	1									4	√
Red-whiskered Bulbul	紅耳鵯	R	2				5								7	√
Chinese Bulbul	白頭鵯	R					5								5	√
Long-tailed Shrike	棕背伯勞	R				1			1	1					3	
Oriental Magpie Robin	鵲鴝	R							1						1	
Daurian Redstart	北紅尾鴝	W									1				1	√
Common Stonechat	黑喉石鴝	W,M			1									1	2	√
Masked Laughingthrush	黑臉噪鸝	R			1					1					2	√
Zitting Cisticola	**棕扇尾鶯**	W				2									2	
Yellow-bellied Prinia	黃腹山鶯鶯	R	1		4					2					7	√
Plain Prinia	純色山鶯鶯	R			2					1					3	
Common Tailorbird	長尾縫葉鶯	R													0	√
Dusky Warbler	褐柳鶯	W		1											1	
Pallas's Leaf Warbler	黃腰柳鶯	W													0	√
Yellow-browed Warbler	黃眉柳鶯	W		1	1		1			1					4	
Japanese White-eye	暗綠繡眼鳥	R,?W			1										1	
White-rumped Munia	白腰文鳥	R													0	√
Scaly-breasted Munia	斑文鳥	R					5								5	
Eurasian Tree Sparrow	麻雀	R					3	1		5					9	√
Red-billed Starling	**絲光椋鳥**	W	2	30	9				40						81	√
Black-collared Starling	黑領椋鳥	R	1	2			1	3						1	8	√
Common Myna	家八哥	R	1												1	
Crested Myna	八哥	R		5	7	8			1	4					25	√
Common Magpie	喜鵲	R			2										2	
Collared Crow	**白頸鴉**	R		2		3	1		1						7	√
Azure-winged Magpie	灰喜鵲	Category I*	11	2											13	√
No. of Birds at Each Point:			**36**	**123**	**64**	**22**	**65**	**18**	**74**	**30**	**8**	**14**	**1**	**3**		
No. of Birds Recorded from Point Count:			**458**													
No. of Species Recorded from Point Count:			**46**													
Total No. of Species:			**51**													
Total No. of Species of Conservation Interest:			**15**													

Note:
(1) Species in bold represents Species of Conservation Interest.
(2) R=resident; Su=summer visitor; A=autumn; Sp=spring; W=winter visitor; M=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]
* Category I: Species for which all published Hong Kong records are considered likely to relate to birds that have escaped or have been released from captivity and do not possess a Principal Status
Category IIB: Extralimital species that, although originally introduced to HK by man, maintain a regular feral breeding stock without necessary recourse to further introduction.

Appendix G Bird Species and Abundance Recorded during the Avifauna Monitoring in December 2014

Works Area: Access road leading to TPP
Survey Site: TPP-1
Survey Date: 9 December 2014

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**		1	
White-breasted Waterhen	白胸苦惡鳥	R		1	1			2	
Green Sandpiper	白腰草鷸	W	**2**	2	3	**1**		8	√
Wood Sandpiper	**林鷸**	M,W			1			1	√
Common Sandpiper	磯鷸	M,W	1					1	√
Common Snipe	扇尾沙錐	W		1				1	
Spotted Dove	珠頸斑鳩	R						0	√
Yellow Wagtail	黃鶺鴒	M,W			1			1	
Grey Wagtail	灰鶺鴒	W						0	√
White Wagtail	白鶺鴒	W,R	4	2	1	2	1	10	√
Olive-backed Pipit	樹鷚	W						0	√
Red-whiskered Bulbul	紅耳鵯	R	1					1	√
Chinese Bulbul	白頭鵯	R						0	√
Long-tailed Shrike	棕背伯勞	R				1		1	√
Oriental Magpie Robin	鵲鴝	R			1	1		2	√
Yellow-bellied Prinia	黃腹山鷦鶯	R			1			1	√
Plain Prinia	純色山鷦鶯	R						0	√
Yellow-browed Warbler	黃眉柳鶯	W						0	√
Japanese White-eye	暗綠繡眼鳥	R,?W						0	√
Scaly-breasted Munia	斑文鳥	R			5	10		15	√
Eurasian Tree Sparrow	麻雀	R			3			3	√
Common Myna	家八哥	R		6				6	√
Crested Myna	八哥	R		1				1	√
Common Magpie	喜鵲	R	2					2	
No. of Birds at Each Point:			**10**	**13**	**17**	**16**	**1**		
No. of Birds Recorded from Point Count:			**57**						
No. of Species Recorded from Point Count:			**17**						
Total No. of Species:			**24**						
Total No. of Species of Conservation Interest:			**2**						

Note:
(1) Species in bold represents Species of Conservation Interest.
(2) R=resident; W=winter visitor; M=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 December 2014

Works Area: Access road leading to TPP
Survey Site: TPP-2
Survey Date: 9 December 2014

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	
Black-winged Stilt	**黑翅長腳鷸**	W			2		2	
Little Ringed Plover	金眶鴴(黑領鴴)	W,R	6	1	3	6	16	√
Green Sandpiper	白腰草鷸	W	1		2		3	√
Wood Sandpiper	**林鷸**	M,W	1		2		3	√
Common Sandpiper	磯鷸	M,W	1		2	1	4	
Common Snipe	扇尾沙錐	W		1			1	
Spotted Dove	珠頸斑鳩	R					0	√
Grey Wagtail	灰鶺鴒	W		3			3	√
White Wagtail	白鶺鴒	W,R	4	2	3	2	11	√
Red-whiskered Bulbul	紅耳鵯	R					0	√
Common Stonechat	黑喉石鴭	W,M		1	1		2	
Yellow-bellied Prinia	黃腹山鷦鶯	R					0	√
Common Tailorbird	長尾縫葉鶯	R					0	√
Yellow-browed Warbler	黃眉柳鶯	W		1		1	2	√
Japanese White-eye	暗綠繡眼鳥	R,?W					0	√
Eurasian Tree Sparrow	麻雀	R					0	√
Common Myna	家八哥	R		1	2		3	√
Crested Myna	八哥	R					0	√
No. of Birds at Each Point:			**13**	**10**	**17**	**11**		
No. of Birds Recorded from Point Count:			**51**					
No. of Species Recorded from Point Count:			**12**					
Total No. of Species:			**19**					
Total No. of Species of Conservation Interest:			**3**					

Note:
(1) Species in bold represents Species of Conservation Interest.
(2) R=resident; W=winter visitor; M=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 December 2014

Work Area: Access road leading to TPP
Survey Site: TPP-3
Survey Date: 9 December 2014

Common Name	Chinese Name	Principal Status (1)	Point Count Location			Sub-total
			TPP-3/P1	TPP-3/P2	TPP-3/P3	
Little Egret	小白鷺	P	1			1
Spotted Dove	珠頸斑鳩	R			2	2
Red-whiskered Bulbul	紅耳鵯	R	2	3		5
Chinese Bulbul	白頭鵯	R		4		4
Oriental Magpie Robin	鵲鴝	R	1			1
Masked Laughingthrush	黑臉噪鶥	R			4	4
Yellow-bellied Prinia	黃腹山鷦鶯	R			2	2
Common Tailorbird	長尾縫葉鶯	R			1	1
Japanese White-eye	暗綠繡眼鳥	R,?W		2		2
Scaly-breasted Munia	斑文鳥	R			8	8
Eurasian Tree Sparrow	麻雀	R	2			2
Oriental Magpie Robin	鵲鴝	R		1		1
No. of Birds at Each Point:			**6**	**10**	**17**	
No. of Birds Recorded from Point Count:			**33**			
No. of Species Recorded from Point Count:			**12**			
Total No. of Species:			**12**			
Total No. of Species of Conservation Interest:			**1**			

Note:
(1) Species in bold represents Species of Conservation Interest.
(2) 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 December 2014

Works Area: SSS / ERS
Survey Site: SSS-2a
Survey Date: 9 December 2014

Common Name	Chinese Name	Principal Status [1]	Point Count Location		Sub-total
			SSS-2a/P1	SSS-2a/P2	
Grey Wagtail	灰鶺鴒	W		1	1
Red-whiskered Bulbul	紅耳鵯	R	1	1	2
Daurian Redstart	北紅尾鴝	W	1		1
Yellow-bellied Prinia	黃腹山鷦鶯	R	1	1	2
Common Tailorbird	長尾縫葉鶯	R		2	2
Pallas's Leaf Warbler	黃腰柳鶯	W	1		1
Japanese White-eye	暗綠繡眼鳥	R,?W	3		3
No. of Birds at Each Point:			**7**	**5**	
No. of Birds Recorded from Point Count:			**12**		
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; 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 December 2014

Works Area: SSS / ERS
Survey Site: SSS-3
Survey Date: 9 December 2014

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													0	√
Chinese Pond Heron	**池鷺**	P						2							2	
White-breasted Waterhen	白胸苦惡鳥	R								1					1	√
Spotted Dove	珠頸斑鳩	R		2	3	1	4	2	3	1	2	3	4		25	√
Yellow Wagtail	黃鶺鴒	M,W													0	√
Grey Wagtail	灰鶺鴒	W										1			1	√
White Wagtail	白鶺鴒	W,R		2	3		2		2			6			15	√
Olive-backed Pipit	樹鷚	W											3	2	5	√
Red-whiskered Bulbul	紅耳鵯	R	2	4	8		3	2	5	3	7		4	3	41	√
Chinese Bulbul	白頭鵯	R		8	1	2			3		3	2	4	6	29	√
Sooty-headed Bulbul	白喉紅臀鵯	R		2											2	√
Long-tailed Shrike	棕背伯勞	R									1				1	√
Oriental Magpie Robin	鵲鴝	R	1			1				2					4	√
Daurian Redstart	北紅尾鴝	W									2		2		4	√
Common Stonechat	黑喉石鵲	W,M									1				1	√
Masked Laughingthrush	黑臉噪鶥	R							3						3	√
Yellow-bellied Prinia	黃腹山鶯鶯	R					3				1		1	1	6	√
Common Tailorbird	長尾縫葉鶯	R	1	4	1						2		1		9	√
Dusky Warbler	褐柳鶯	W							1				2		3	√
Yellow-browed Warbler	黃眉柳鶯	W	2		1	3	2		1	1	1		1	1	13	√
Great Tit	大山雀	R		2											2	
Fork-tailed Sunbird	叉尾太陽鳥	R		1			1								2	√
Japanese White-eye	暗綠繡眼鳥	R,?W	1	2					2	3	1	1	1	1	12	√
Scaly-breasted Munia	斑文鳥	R					2					4		3	9	√
Eurasian Tree Sparrow	麻雀	R				2		3					4		9	√
Black-collared Starling	黑領椋鳥	R			3		3				4				10	√
Common Myna	家八哥	R													0	√
Crested Myna	八哥	R				4								2	6	√
Black Drongo	黑卷尾	M,Su			1										1	
No. of Birds at Each Point:			**7**	**27**	**21**	**13**	**20**	**9**	**20**	**11**	**25**	**17**	**27**	**19**		
No. of Birds Recorded from Point Count:			**216**													
No. of Species Recorded from Point Count:			**26**													
Total No. of Species:			**29**													
Total No. of Species of Conservation Interest:			**2**													

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; ?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 December 2014

Works Area: TUW and PHV
Survey Site: TUW-1
Survey Date: 9 December 2014

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		
Chinese Pond Heron	**池鷺**	P								0	√
Common Buzzard	普通鵟	W								0	√
Spotted Dove	珠頸斑鳩	R		2	1		2		3	8	√
Common Koel	噪鵑	Su,R			1					1	
Yellow Wagtail	黃鶺鴒	M,W								0	√
Grey Wagtail	灰鶺鴒	W			1	1				2	
White Wagtail	白鶺鴒	W,R		1						1	√
Richard's Pipit	田鷚	W,R			2					2	
Red-whiskered Bulbul	紅耳鵯	R	3	8	1	4		5	5	26	√
Chinese Bulbul	白頭鵯	R								0	√
Sooty-headed Bulbul	白喉紅臀鵯	R			4					4	
Long-tailed Shrike	棕背伯勞	R			1					1	
Oriental Magpie Robin	鵲鴝	R	1	2	3					6	√
Daurian Redstart	北紅尾鴝	W		1		1				2	√
Common Stonechat	黑喉石鴴	W,M								0	√
Masked Laughingthrush	黑臉噪鶥	R		1			1			2	√
Zitting Cisticola	**棕扇尾鶯**	W						2		2	
Yellow-bellied Prinia	黃腹山鷦鶯	R		2		1		3		6	√
Plain Prinia	純色山鷦鶯	R						1	2	3	
Common Tailorbird	長尾縫葉鶯	R	3	1		2				6	√
Dusky Warbler	褐柳鶯	W			1					1	√
Yellow-browed Warbler	黃眉柳鶯	W	2							2	√
Great Tit	大山雀	R				2				2	
Japanese White-eye	暗綠繡眼鳥	R,?W		9		5	6	6		26	√
Scaly-breasted Munia	斑文鳥	R								0	√
Eurasian Tree Sparrow	麻雀	R	1	4	3					8	√
Black-collared Starling	黑領椋鳥	R			2				1	3	√
No. of Birds at Each Point:			**10**	**31**	**20**	**16**	**9**	**17**	**11**		
No. of Birds Recorded from Point Count:			**114**								
No. of Species Recorded from Point Count:			**21**								
Total No. of Species:			**27**								
Total No. of Species of Conservation Interest:			**2**								

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; ?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 December 2014

Works Area: TUW and PHV
Survey Site: TUW-2 and PHV-1 (grouped together due to overlapping of survey area)
Survey Date: 9 December 2014

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		
Spotted Dove	珠頸斑鳩	R			0	√
Grey Wagtail	灰鶺鴒	W			0	√
Grey-chinned Minivet	**灰喉山椒鳥**	R,W			0	√
Red-whiskered Bulbul	紅耳鵯	R	3	4	7	√
Chinese Bulbul	白頭鵯	R	1		1	√
Oriental Magpie Robin	鵲鴝	R		1	1	√
Masked Laughingthrush	黑臉噪鸝	R			0	√
Blue-winged Minla	藍翅希鸝	R			0	√
Common Tailorbird	長尾縫葉鶯	R	1		1	√
Dusky Warbler	褐柳鶯	W	1		1	√
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	2		2	√
Japanese White-eye	暗綠繡眼鳥	R,?W	5	2	7	√
Large-billed Crow	大嘴烏鴉	R			0	√
No. of Birds at Each Point:			**13**	**8**		
No. of Birds Recorded from Point Count:			**21**			
No. of Species Recorded from Point Count:			**8**			
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; ?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 December 2014



Plate 1 Pond was drained at Point Count Location MPV-1/P1



Plate 2 Pond was partially drained at Point Count Location MPV-1/P2



Plate 3 Aeration of pond at Point Count Location MPV-1/P10

Appendix H Representative Photographs taken during the Avifauna Monitoring in December 2014



Plate 4 Northern Shoveler observed at MPV-1 survey site



Plate 5 Project-related ground works at Point Count Location TPP-1/P3



Plate 6 Non Project-related excavation work near Point Count Location TPP-2/P1

Appendix H Representative Photographs taken during the Avifauna Monitoring in December 2014



Plate 7 Farmer was observed sowing at SSS-3/P5



Plate 8 Non Project-related works observed near Point Count Location TUW-1/P2

Appendix I

Certified Arborist Inspection Record

MTR Express Rail Link, Contract 801

Monthly Audit Inspection Record

December 2014

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
27/12/14 (SLS) 27/12/14 (SKW)	801 – Siu Lang Shui (Nursery) So Kwun Wat Nursery	Inspection of trees to be transplanted within the contract	Regular audit of tree works
29/12/14	802 - Nam Cheong Property Parcel 40.2, and Sham Mong Rd Footpath, Private Lot NKIL6436	Inspection of retained trees and trees to be transplanted within the contract	Regular audit of tree works
29/12/14	811A—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
29/12/14	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
29/12/14	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
29/12/14	820 - Mei Lai Road to Hoi Ting Road Tunnels Parcel 37.2, 37.3, Kwai Chung Road (Footpath near 37.5) Sham Mong Road & Hing Wah Street West Footpath Parcel 39.1, 40.4, Sham Mong Road (Nam Cheong Park) Private Lot STT-KX2382, Private Lot STT-KX2416	Inspection of retained trees and trees to be transplanted within the contract	Regular audit of tree works

29/12/14	821—Shek Yam to Mei Lai Road Tunnels Parcel NT-9 (slope) NT-10	Inspection of retained trees and trees to be transplanted within the contract	Regular audit of tree works
23/12/14 (PH) 29/12/14 (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
23/12/14	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
23/12/14	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
23/12/14 (TKP)	824 Tai Kong Po Tunnels NT-3, NT-5.1A, NT-4	Inspection of retained trees and trees to be transplanted within the contract	Regular audit of tree works
29/12/14	830 - Trackwork and Overhead Line System (Nam Cheong Park)	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 DECEMBER	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	1016.3	23.9	19.7	15.5	15.7	78	88	3.1
2	1019.5	17.6	16.4	14.5	13.9	86	88	4.5
3	1017.4	19.3	18.3	16.7	16	86	88	1.7
4	1020.9	18.7	14.8	13.5	11.3	80	94	5.4
5	1022.3	16.8	15.1	12.9	8.5	65	83	0.5
6	1020.1	18.8	17.6	15.9	11.9	69	85	Trace
7	1019.3	18.7	17.8	17	11.7	68	88	0.1
8	1020.5	20.7	18.3	15.7	12.8	70	73	0.1
9	1021.5	20.8	19.4	17.6	13.7	70	51	-
10	1019.5	21	19.6	17.9	15.6	78	88	2.1
11	1019.6	21.5	19.5	17.7	12	62	89	Trace
12	1024.2	17.7	15.5	14.4	5.8	53	85	-
13	1025.6	17.6	14.6	12.1	4.8	52	41	-
14	1023.5	18.9	16	13.3	8.6	62	29	-
15	1020.9	20.1	18.6	17	12	66	84	-
16	1024.6	19	16.8	13.9	4.7	46	43	-
17	1027.1	15.2	13.3	10.8	-4.3	29	21	-
18	1026.4	15.8	14	11.9	2.5	47	80	0.1
19	1024	14.7	13	10.7	10.3	84	90	14.3
20	1020.8	17.7	14.7	10.8	8.2	66	39	0.2
21	1023.2	18.8	16.3	13.5	7.3	57	33	-
22	1024.3	15.5	13.6	10.9	3.8	52	44	-
23	1021.7	16.3	15.4	14.5	9.3	67	90	Trace
24	1021.4	21.4	18.7	15.8	13.6	73	88	-
25	1020.8	19.1	16.9	15.3	12.8	78	94	6.7
26	1020.7	17	16.2	15	14.1	88	100	2.2
27	1021.6	17.7	16.6	15.3	13.5	82	95	0.5
28	1022.6	16.1	14.5	12.3	11.5	83	72	3.2
29	1020.6	17.9	14	11	6.3	61	10	-
30	1019.8	18.4	14.9	12.8	8.1	65	9	-
31	1021.7	20.4	16.4	13.2	9.9	67	19	-
Mean/Total	1021.7	18.5	16.3	14.2	9.9	67	67	44.7
Normal*	1020.5	20.2	17.9	15.9	11.9	69	52	26.8

Date DECEMBER	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	0	-	2.31	2	30	37.3
2	10	-	2.47	0.6	70	35
3	13	-	2.47	1.8	90	35.9
4	0	-	4.42	1.7	30	42.4
5	0	0.5	6.9	2	40	26.8
6	0	2.3	9.93	3	90	40.1
7	0	-	4.08	1.8	90	34.4
8	9	5.3	12.97	2.5	30	30.5
9	0	9.3	15.62	2.9	80	38.7
10	11	-	4.86	2.4	50	21.7
11	12	0.5	8.78	4.3	20	26.2
12	2	1.7	9.74	4	10	39.3
13	0	9.5	15.73	3.9	20	25.8
14	0	9.5	15.59	3.6	80	25.7
15	4	0.1	5.28	2.9	50	22
16	5	8.5	14.62	6.7	20	44.5
17	0	9.3	16.85	5.7	20	39.8
18	0	0.3	6.68	3.9	30	27.8
19	1	-	2.87	1.3	20	29.3
20	0	9.3	16.79	2.7	20	26.6
21	0	8.1	14.96	5.1	20	36.2
22	0	9.1	15.3	5.1	60	31.4
23	8	0.1	3.67	1.2	30	25.8
24	17	1.2	9.18	0.8	20	17.8
25	0	-	4.13	1.3	60	39.9
26	1	-	3.15	0.1	70	42.2
27	3	-	2.99	3	60	30.2
28	2	2.3	8.17	1.5	10	26.1
29	8	9.4	17.51	2.4	20	21.3
30	2	9.5	17.6	2.6	20	14.3
31	7	9.5	16.11	3	50	10.5
Mean/Total	115	115.3	9.41	85.8	20	30.5
Normal*	238.6§	172.2	10.89	83.7	70	26
Station	Hong Kong International Airport	King's Park			Waglan Island	

Appendix K
Calibration Certificate

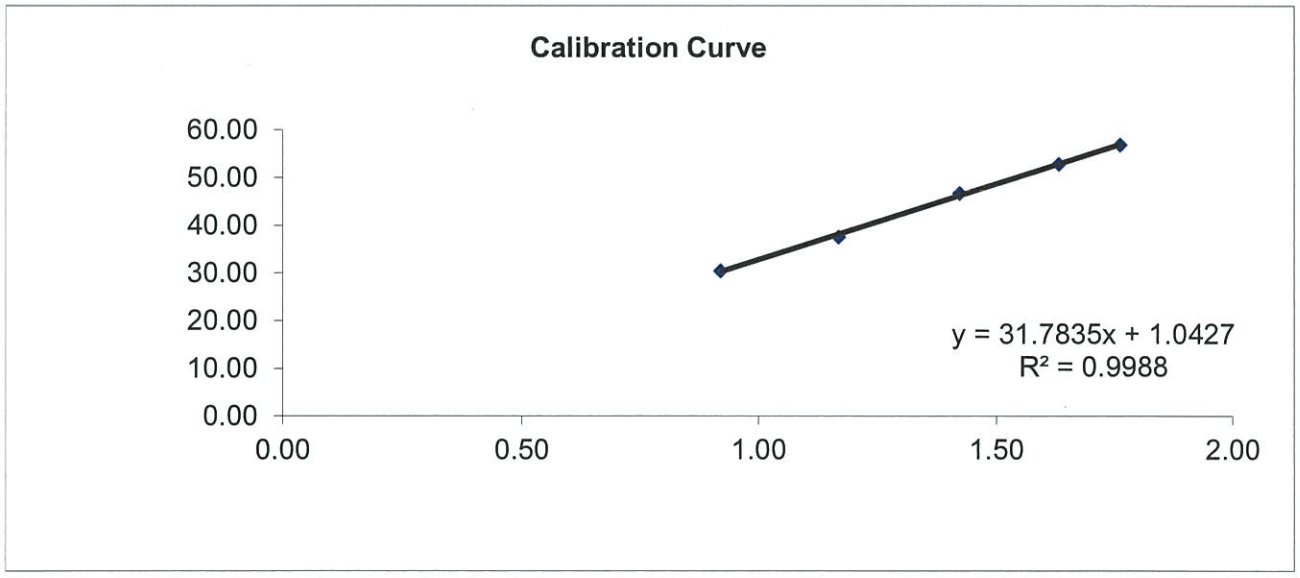
Ove Arup Partners (Hong Kong) Limited

High Volume Air Sampler Calibration Worksheet

Calibration date	16-Dec-14	**Barometric pressure**	765.8 mm Hg
Next Calibration date	14-Jun-15	**Tempature (°C)**	17.7 °C
Sampler location	AM5 - Leung Uk Tsuen Squats	**Tempature (K)**	290.7 K
Sampler model	TE-5170	**P_{std}**	760 mm Hg
Sampler serial number	1276	**T_{std}**	298 K

Calibrator model	GMW-2535
Calibrator serial number	2421
Slope of the standard curve, m_s	2.06238
Intercept of the standard curve, b_s	-0.02415

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	3.40	30.00	0.92	30.49
7	5.50	37.00	1.17	37.60
10	8.20	46.00	1.42	46.75
13	10.80	52.00	1.63	52.85
18	12.60	56.00	1.76	56.91



Linear Regression

Sampler slope (m) :	**31.7835**
Sampler intercept (b) :	**1.0427**
Correlation coefficient (R^2) :	**0.9988**

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

Performed by:		Date:	16 Dec 2014
Checked by:		Date:	16 Dec 2014
Approved by:		Date:	17 Dec 2014

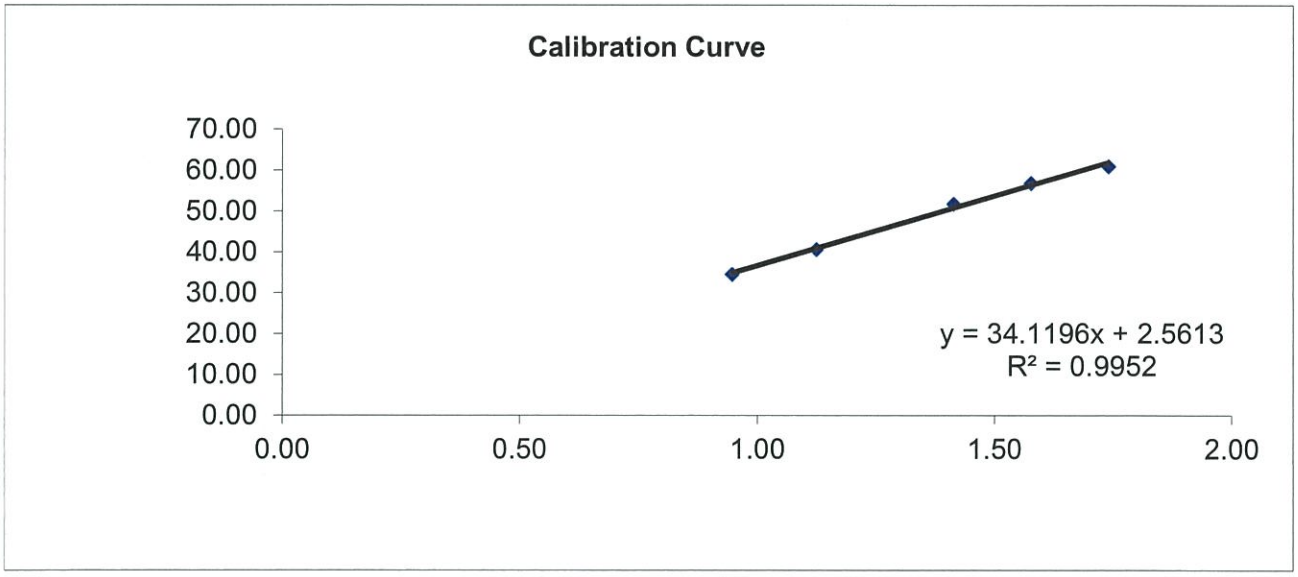
Ove Arup Partners (Hong Kong) Limited

High Volume Air Sampler Calibration Worksheet

Calibration date	16-Dec-14	**Barometric pressure**	765.8 mm Hg
Next Calibration date	14-Jun-15	**Tempature (°C)**	17.7 °C
Sampler location	AM6 - 630 Sheung Tsuen	**Tempature (K)**	290.7 K
Sampler model	TE-5170	**P_{std}**	760 mm Hg
Sampler serial number	469	**T_{std}**	298 K

Calibrator model	GMW-2535
Calibrator serial number	2421
Slope of the standard curve, m_s	2.06238
Intercept of the standard curve, b_s	-0.02415

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	3.60	34.00	0.95	34.56
7	5.10	40.00	1.12	40.65
10	8.10	51.00	1.41	51.83
13	10.10	56.00	1.58	56.91
18	12.30	60.00	1.74	60.98



Linear Regression

Sampler slope (m) :	**34.1196**
Sampler intercept (b) :	**2.5613**
Correlation coefficient (R^2) :	**0.9952**

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

Performed by: _____ Date: 16 Dec 2014

Checked by: _____ Date: 16 Dec 2014

Approved by: _____ Date: 17 Dec 2014

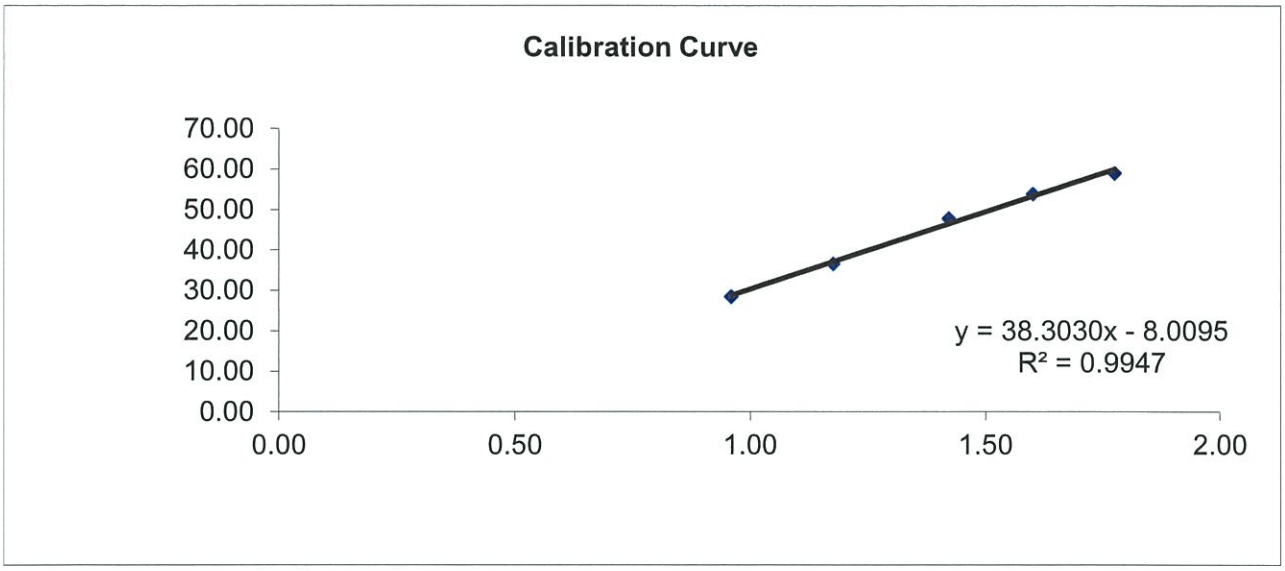
Ove Arup Partners (Hong Kong) Limited

High Volume Air Sampler Calibration Worksheet

Calibration date	16-Dec-14	**Barometric pressure**	765.8 mm Hg
Next Calibration date	14-Jun-15	**Tempature (°C)**	17.7 °C
Sampler location	AM7 - Tse Uk Tsuen	**Tempature (K)**	290.7 K
Sampler model	TE-5170	**P_{std}**	760 mm Hg
Sampler serial number	1763	**T_{std}**	298 K

Calibrator model	GMW-2535
Calibrator serial number	2421
Slope of the standard curve, m_s	2.06238
Intercept of the standard curve, b_s	-0.02415

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	3.70	28.00	0.96	28.46
7	5.60	36.00	1.18	36.59
10	8.20	47.00	1.42	47.77
13	10.40	53.00	1.60	53.87
18	12.80	58.00	1.77	58.95



Linear Regression

Sampler slope (m) :	**38.3030**
Sampler intercept (b) :	**-8.0095**
Correlation coefficient (R^2) :	**0.9947**

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

Performed by:		Date:	16 Dec 2014
Checked by:		Date:	16 Dec 2014
Approved by:		Date:	17 Dec 2014

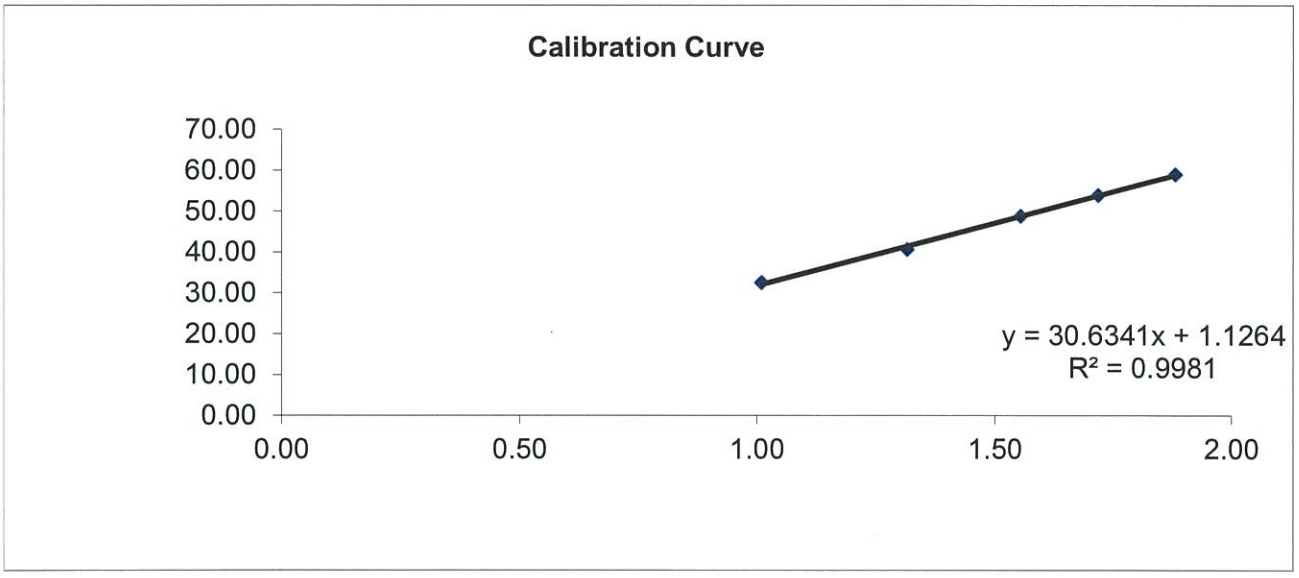
Ove Arup Partners (Hong Kong) Limited

High Volume Air Sampler Calibration Worksheet

Calibration date	18-Dec-14	**Barometric pressure**	765.9 mm Hg
Next Calibration date	16-Jun-15	**Tempature (°C)**	17.5 °C
Sampler location	AM13 - St.Andrew Primary School	**Tempature (K)**	290.5 K
Sampler model	TE-5170	**P_{std}**	760 mm Hg
Sampler serial number	524	**T_{std}**	298 K

Calibrator model	GMW-2535
Calibrator serial number	2421
Slope of the standard curve, m_s	2.06238
Intercept of the standard curve, b_s	-0.02415

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	4.10	32.00	1.01	32.54
7	7.00	40.00	1.32	40.67
10	9.80	48.00	1.56	48.80
13	12.00	53.00	1.72	53.89
18	14.40	58.00	1.88	58.97



Linear Regression

Sampler slope (m) :	**30.6341**
Sampler intercept (b) :	**1.1264**
Correlation coefficient (R^2) :	**0.9981**

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

Performed by: _____ Date: 18 Dec 2014

Checked by: _____ Date: 18 Dec 2014

Approved by: _____ Date: 19 Dec 2014

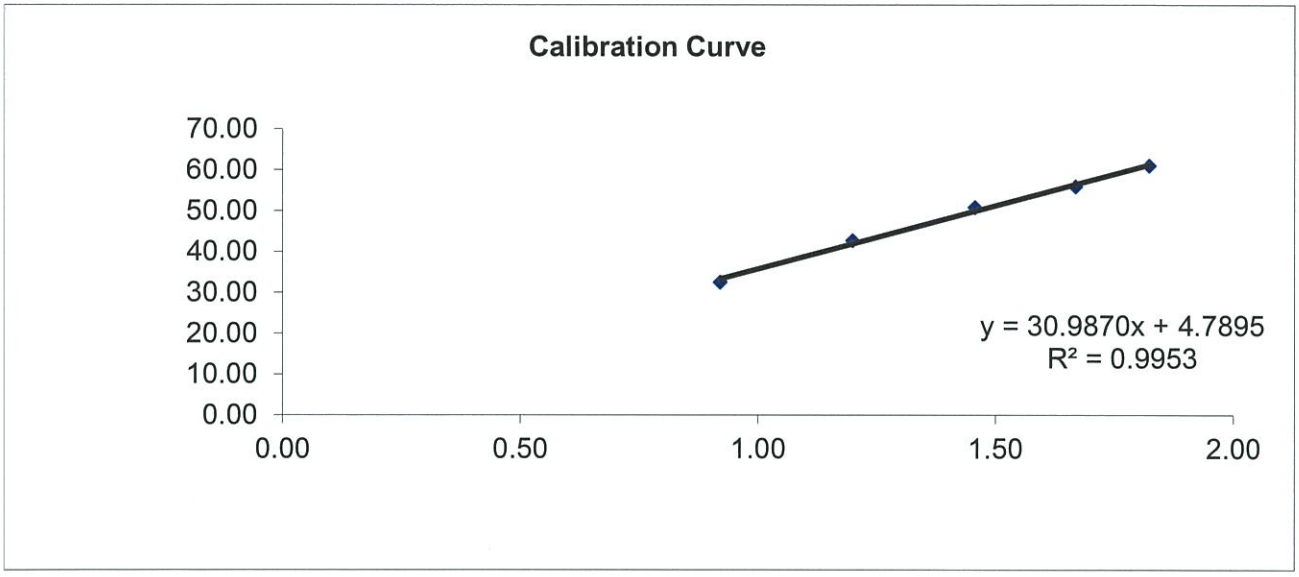
Ove Arup Partners (Hong Kong) Limited

High Volume Air Sampler Calibration Worksheet

Calibration date	18-Dec-14	**Barometric pressure**	765.9 mm Hg
Next Calibration date	16-Jun-15	**Tempature (°C)**	17.5 °C
Sampler location	AM14 - Yaumati Catholic Primary School, Rooftop	**Tempature (K)**	290.5 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	2.06238
Intercept of the standard curve, b_s	-0.02415

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	3.40	32.00	0.92	32.54
7	5.80	42.00	1.20	42.70
10	8.60	50.00	1.46	50.84
13	11.30	55.00	1.67	55.92
18	13.50	60.00	1.82	61.01



Linear Regression

Sampler slope (m) :	**30.9870**
Sampler intercept (b) :	**4.7895**
Correlation coefficient (R^2) :	**0.9953**

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

Performed by:		Date:	18 Dec 2014
Checked by:		Date:	18 Dec 2014
Approved by:		Date:	19 Dec 2014

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CERTIFICATE OF CALIBRATION

Certificate No.: 14CA1215 03-03 Page 1 of 2

Item tested

Description:	Sound Level Meter (Type 1)	,	Microphone
Manufacturer:	B & K	,	B & K
Type/Model No.:	2250	,	4950
Serial/Equipment No.:	2701831 / CN18	,	2678789
Adaptors used:	-	,	-

Item submitted by

Customer Name:	Anewr Consulting Limited
Address of Customer:	-
Request No.:	-
Date of receipt:	15-Dec-2014

Date of test: 17-Dec-2014

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Multi function sound calibrator	B&K 4226	2288444	20-Jun-2015	CIGISMEC
Signal generator	DS 360	33873	09-Apr-2015	CEPREI
Signal generator	DS 360	61227	09-Apr-2015	CEPREI

Ambient conditions

Temperature:	21 ± 1 °C
Relative humidity:	60 ± 5 %
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:** 19-Dec-2014 **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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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	2.1
	Lin	Pass	1.6	2.2
Linearity range for Leq	At reference range , Step 5 dB at 4 kHz	Pass	0.3	
	Reference SPL on all other ranges	Pass	0.3	
	2 dB below upper limit of each range	Pass	0.3	
	2 dB above lower limit of each range	Pass	0.3	
Linearity range for SPL	At reference range , Step 5 dB at 4 kHz	Pass	0.3	
Frequency weightings	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	N/A	N/A	
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: 17-Dec-2014

Checked by: Lam Tze Wai Date: 19-Dec-2014

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
CIGISMEC
A CIGIS GROUP COMPANY

Sound level meter type: 2250 Serial No. 2701831 / CN18 Date 17-Dec-2014
Microphone type: 4950 Serial No. 2678789
Report: 14CA1215 03-03

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	13	dB
Noise level in C weighting	18.0	dB
Noise level in Lin	29.2	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

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Test Data for Sound Level Meter

Sound level meter type: 2250 Serial No. 2701831 / CN18 Date 17-Dec-2014
Microphone type: 4950 Serial No. 2678789
Report: 14CA1215 03-03

44.0	44.0	44.0	0.7	0.0	0.0
39.0	39.0	39.0	0.7	0.0	0.0
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	Actual level	Tolerance(dB)		Deviation
Hz	dB	dB	dB	+	-	dB
1000.0	94.0	94.0	94.0	0.0	0.0	0.0
31.6	94.0	54.6	54.6	1.5	1.5	0.0
63.1	94.0	67.8	67.8	1.5	1.5	0.0
125.9	94.0	77.9	77.9	1.0	1.0	0.0
251.2	94.0	85.4	85.4	1.0	1.0	0.0
501.2	94.0	90.8	90.8	1.0	1.0	0.0
1995.0	94.0	95.2	95.2	1.0	1.0	0.0
3981.0	94.0	95.0	94.9	1.0	1.0	-0.1
7943.0	94.0	92.9	92.6	1.5	3.0	-0.3
12590.0	94.0	89.7	89.4	3.0	6.0	-0.3

Frequency weighting C:

Frequency	Ref. level	Expected level	Actual level	Tolerance(dB)		Deviation
Hz	dB	dB	dB	+	-	dB
1000.0	94.0	94.0	94.0	0.0	0.0	0.0
31.6	94.0	91.0	91.1	1.5	1.5	0.1

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Sound level meter type: 2250 Serial No. 2701831 / CN18 Date 17-Dec-2014
Microphone type: 4950 Serial No. 2678789
Report: 14CA1215 03-03

63.1	94.0	93.2	93.2	1.5	1.5	0.0
125.9	94.0	93.8	93.9	1.0	1.0	0.1
251.2	94.0	94.0	94.0	1.0	1.0	0.0
501.2	94.0	94.0	94.1	1.0	1.0	0.1
1995.0	94.0	93.8	93.8	1.0	1.0	0.0
3981.0	94.0	93.2	93.1	1.0	1.0	-0.1
7943.0	94.0	91.0	90.7	1.5	3.0	-0.3
12590.0	94.0	87.8	87.5	3.0	6.0	-0.3

Frequency weighting Lin:

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

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

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)

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Sound level meter type: 2250 Serial No. 2701831 / CN18 Date 17-Dec-2014
Microphone type: 4950 Serial No. 2678789
Report: 14CA1215 03-03

	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

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

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CIGISMEC
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Sound level meter type: 2250 Serial No. 2701831 / CN18 Date 17-Dec-2014
Microphone type: 4950 Serial No. 2678789
Report: 14CA1215 03-03

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
142.0	141.0	101.0	100.9	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	93.0	1.5	3.0	0.1

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

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Tel : (852) 2873 6860
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CERTIFICATE OF CALIBRATION

Certificate No.: 14CA1215 03-02

Item tested

Description:	Sound Level Meter (Type 1)	,	Microphone
Manufacturer:	B & K	,	B & K
Type/Model No.:	2250	,	4950
Serial/Equipment No.:	2701821 / CN19	,	2678779
Adaptors used:	-	,	-

Item submitted by

Customer Name:	Anewr Consulting Limited
Address of Customer:	-
Request No.:	-
Date of receipt:	15-Dec-2014

Date of test: 17-Dec-2014

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Multi function sound calibrator	B&K 4226	2288444	20-Jun-2015	CIGISMEC
Signal generator	DS 360	33873	09-Apr-2015	CEPREI
Signal generator	DS 360	61227	09-Apr-2015	CEPREI

Ambient conditions

Temperature:	21 ± 1 °C
Relative humidity:	60 ± 5 %
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:** 19-Dec-2014 **Company Chop:** 綜合試驗有限公司 SOILS & MATERIALS ENGINEERING COMPANY LTD.

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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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	2.1
	Lin	Pass	1.6	2.2
Linearity range for Leq	At reference range , Step 5 dB at 4 kHz	Pass	0.3	
	Reference SPL on all other ranges	Pass	0.3	
	2 dB below upper limit of each range	Pass	0.3	
	2 dB above lower limit of each range	Pass	0.3	
Linearity range for SPL	At reference range , Step 5 dB at 4 kHz	Pass	0.3	
Frequency weightings	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	N/A	N/A	
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: 17-Dec-2014

Checked by: Lam Tze Wai Date: 19-Dec-2014

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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CIGISMEC
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Sound level meter type: 2250 Serial No. 2701821 / CN19 Date 17-Dec-2014
Microphone type: 4950 Serial No. 2678779
Report: 14CA1215 03-02

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	13.6	dB
Noise level in C weighting	15.7	dB
Noise level in Lin	22.4	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

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Test Data for Sound Level Meter

Sound level meter type: 2250 Serial No. 2701821 / CN19 Date 17-Dec-2014
Microphone type: 4950 Serial No. 2678779
Report: 14CA1215 03-02

44.0	44.0	44.0	0.7	0.0	0.0
39.0	39.0	39.0	0.7	0.0	0.0
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	Actual level	Tolerance(dB)		Deviation
Hz	dB	dB	dB	+	-	dB
1000.0	94.0	94.0	94.0	0.0	0.0	0.0
31.6	94.0	54.6	54.6	1.5	1.5	0.0
63.1	94.0	67.8	67.8	1.5	1.5	0.0
125.9	94.0	77.9	77.9	1.0	1.0	0.0
251.2	94.0	85.4	85.4	1.0	1.0	0.0
501.2	94.0	90.8	90.8	1.0	1.0	0.0
1995.0	94.0	95.2	95.2	1.0	1.0	0.0
3981.0	94.0	95.0	94.9	1.0	1.0	-0.1
7943.0	94.0	92.9	92.6	1.5	3.0	-0.3
12590.0	94.0	89.7	89.4	3.0	6.0	-0.3

Frequency weighting C:

Frequency	Ref. level	Expected level	Actual level	Tolerance(dB)		Deviation
Hz	dB	dB	dB	+	-	dB
1000.0	94.0	94.0	94.0	0.0	0.0	0.0
31.6	94.0	91.0	91.1	1.5	1.5	0.1

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CIGISMEC
A CIGIS GROUP COMPANY

Sound level meter type: 2250 Serial No. 2701821 / CN19 Date 17-Dec-2014
Microphone type: 4950 Serial No. 2678779
Report: 14CA1215 03-02

63.1	94.0	93.2	93.2	1.5	1.5	0.0
125.9	94.0	93.8	93.9	1.0	1.0	0.1
251.2	94.0	94.0	94.0	1.0	1.0	0.0
501.2	94.0	94.0	94.1	1.0	1.0	0.1
1995.0	94.0	93.8	93.8	1.0	1.0	0.0
3981.0	94.0	93.2	93.1	1.0	1.0	-0.1
7943.0	94.0	91.0	90.7	1.5	3.0	-0.3
12590.0	94.0	87.8	87.5	3.0	6.0	-0.3

Frequency weighting Lin:

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

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

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)

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Sound level meter type: 2250 Serial No. 2701821 / CN19 Date 17-Dec-2014
Microphone type: 4950 Serial No. 2678779
Report: 14CA1215 03-02

	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

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

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Sound level meter type: 2250 Serial No. 2701821 / CN19 Date 17-Dec-2014
Microphone type: 4950 Serial No. 2678779
Report: 14CA1215 03-02

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
136.2	135.2	132.2	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
142.8	141.8	101.8	101.7	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	93.4	1.5	3.0	0.5

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

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CERTIFICATE OF CALIBRATION

Item tested

Description:	Sound Level Meter (Type 1)	,	Microphone
Manufacturer:	B & K	,	B & K
Type/Model No.:	2250	,	4950
Serial/Equipment No.:	2701818 / CN23	,	2678776
Adaptors used:	-	,	-

Item submitted by

Customer Name:	Anewr Consulting Limited
Address of Customer:	-
Request No.:	-
Date of receipt:	22-Dec-2014

Date of test: 23-Dec-2014

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Multi function sound calibrator	B&K 4226	2288444	20-Jun-2015	CIGISMEC
Signal generator	DS 360	33873	09-Apr-2015	CEPREI
Signal generator	DS 360	61227	09-Apr-2015	CEPREI

Ambient conditions

Temperature:	21 ± 1 °C
Relative humidity:	60 ± 5 %
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-Dec-2014 **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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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	2.1
	Lin	Pass	1.6	2.2
Linearity range for Leq	At reference range , Step 5 dB at 4 kHz	Pass	0.3	
	Reference SPL on all other ranges	Pass	0.3	
	2 dB below upper limit of each range	Pass	0.3	
	2 dB above lower limit of each range	Pass	0.3	
Linearity range for SPL	At reference range , Step 5 dB at 4 kHz	Pass	0.3	
Frequency weightings	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	N/A	N/A	
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: 23-Dec-2014

Checked by: Lam Tze Wai Date: 23-Dec-2014

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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CIGISMEC
A CIGIS GROUP COMPANY

Sound level meter type: 2250 Serial No. 2701818 / CN23 Date 23-Dec-2014
Microphone type: 4950 Serial No. 2678776
Report: 14CA1222 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	14.2	dB
Noise level in C weighting	16.0	dB
Noise level in Lin	22.6	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

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Test Data for Sound Level Meter

Sound level meter type: 2250 Serial No. 2701818 / CN23 Date 23-Dec-2014
Microphone type: 4950 Serial No. 2678776
Report: 14CA1222 01-02

44.0	44.0	44.0	0.7	0.0	0.0
39.0	39.0	39.0	0.7	0.0	0.0
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	Actual level	Tolerance(dB)		Deviation
Hz	dB	dB	dB	+	-	dB
1000.0	94.0	94.0	94.0	0.0	0.0	0.0
31.6	94.0	54.6	54.6	1.5	1.5	0.0
63.1	94.0	67.8	67.8	1.5	1.5	0.0
125.9	94.0	77.9	77.9	1.0	1.0	0.0
251.2	94.0	85.4	85.4	1.0	1.0	0.0
501.2	94.0	90.8	90.8	1.0	1.0	0.0
1995.0	94.0	95.2	95.2	1.0	1.0	0.0
3981.0	94.0	95.0	94.9	1.0	1.0	-0.1
7943.0	94.0	92.9	92.6	1.5	3.0	-0.3
12590.0	94.0	89.7	89.4	3.0	6.0	-0.3

Frequency weighting C:

Frequency	Ref. level	Expected level	Actual level	Tolerance(dB)		Deviation
Hz	dB	dB	dB	+	-	dB
1000.0	94.0	94.0	94.0	0.0	0.0	0.0
31.6	94.0	91.0	91.1	1.5	1.5	0.1

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Sound level meter type: 2250 Serial No. 2701818 / CN23 Date 23-Dec-2014
Microphone type: 4950 Serial No. 2678776
Report: 14CA1222 01-02

63.1	94.0	93.2	93.2	1.5	1.5	0.0
125.9	94.0	93.8	93.8	1.0	1.0	0.0
251.2	94.0	94.0	94.0	1.0	1.0	0.0
501.2	94.0	94.0	94.0	1.0	1.0	0.0
1995.0	94.0	93.8	93.8	1.0	1.0	0.0
3981.0	94.0	93.2	93.1	1.0	1.0	-0.1
7943.0	94.0	91.0	90.7	1.5	3.0	-0.3
12590.0	94.0	87.8	87.5	3.0	6.0	-0.3

Frequency weighting Lin:

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

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

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)

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Test Data for Sound Level Meter

Sound level meter type: 2250 Serial No. 2701818 / CN23 Date 23-Dec-2014
Microphone type: 4950 Serial No. 2678776
Report: 14CA1222 01-02

Time wighting	Ref. Level dB	Expected level dB	Tone burst signal indication(dB)	Tolerance +/- dB	Deviation 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

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

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Sound level meter type: 2250 Serial No. 2701818 / CN23 Date 23-Dec-2014
Microphone type: 4950 Serial No. 2678776
Report: 14CA1222 01-02

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
136.6	135.6	132.6	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	78.1	1.0	1.0	0.2
8000	92.9	94.0	1.5	3.0	1.1

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

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HKAS 028 CAL

CERTIFICATE OF CALIBRATION

Certificate No.: 14CA1222 01-01 Page 1 of 2

Item tested

Description:	Sound Level Meter (Type 1)	,	Microphone
Manufacturer:	B & K	,	B & K
Type/Model No.:	2250	,	4950
Serial/Equipment No.:	2701815 / CN29	,	2678773
Adaptors used:	-	,	-

Item submitted by

Customer Name:	Anewr Consulting Limited
Address of Customer:	-
Request No.:	-
Date of receipt:	22-Dec-2014

Date of test: 23-Dec-2014

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Multi function sound calibrator	B&K 4226	2288444	20-Jun-2015	CIGISMEC
Signal generator	DS 360	33873	09-Apr-2015	CEPREI
Signal generator	DS 360	61227	09-Apr-2015	CEPREI

Ambient conditions

Temperature:	21 ± 1 °C
Relative humidity:	60 ± 5 %
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-Dec-2014 **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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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	2.1
	Lin	Pass	1.6	2.2
Linearity range for Leq	At reference range , Step 5 dB at 4 kHz	Pass	0.3	
	Reference SPL on all other ranges	Pass	0.3	
	2 dB below upper limit of each range	Pass	0.3	
	2 dB above lower limit of each range	Pass	0.3	
Linearity range for SPL	At reference range , Step 5 dB at 4 kHz	Pass	0.3	
Frequency weightings	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	N/A	N/A	
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: 23-Dec-2014

Checked by: Lam Tze Wai Date: 23-Dec-2014

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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CIGISMEC
A CIGIS GROUP COMPANY

Test Data for Sound Level Meter

Sound level meter type: 2250 Serial No. 2701815 / CN29 Date 23-Dec-2014
Microphone type: 4950 Serial No. 2678773
Report: 14CA1222 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	13.0	dB
Noise level in C weighting	15.2	dB
Noise level in Lin	22.0	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

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Test Data for Sound Level Meter

Sound level meter type: 2250 Serial No. 2701815 / CN29 Date 23-Dec-2014
Microphone type: 4950 Serial No. 2678773
Report: 14CA1222 01-01

44.0	44.0	44.0	0.7	0.0	0.0
39.0	39.0	39.0	0.7	0.0	0.0
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	31.1	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	Actual level	Tolerance(dB)		Deviation
Hz	dB	dB	dB	+	-	dB
1000.0	94.0	94.0	94.0	0.0	0.0	0.0
31.6	94.0	54.6	54.6	1.5	1.5	0.0
63.1	94.0	67.8	67.8	1.5	1.5	0.0
125.9	94.0	77.9	77.9	1.0	1.0	0.0
251.2	94.0	85.4	85.4	1.0	1.0	0.0
501.2	94.0	90.8	90.8	1.0	1.0	0.0
1995.0	94.0	95.2	95.2	1.0	1.0	0.0
3981.0	94.0	95.0	94.9	1.0	1.0	-0.1
7943.0	94.0	92.9	92.6	1.5	3.0	-0.3
12590.0	94.0	89.7	89.4	3.0	6.0	-0.3

Frequency weighting C:

Frequency	Ref. level	Expected level	Actual level	Tolerance(dB)		Deviation
Hz	dB	dB	dB	+	-	dB
1000.0	94.0	94.0	94.0	0.0	0.0	0.0
31.6	94.0	91.0	91.1	1.5	1.5	0.1

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Tel : (852) 2873 6860
Fax : (852) 2555 7533
CIGISMEC
A CIGIS GROUP COMPANY

Sound level meter type: 2250 Serial No. 2701815 / CN29 Date 23-Dec-2014
Microphone type: 4950 Serial No. 2678773
Report: 14CA1222 01-01

63.1	94.0	93.2	93.2	1.5	1.5	0.0
125.9	94.0	93.8	93.8	1.0	1.0	0.0
251.2	94.0	94.0	94.0	1.0	1.0	0.0
501.2	94.0	94.0	94.0	1.0	1.0	0.0
1995.0	94.0	93.8	93.8	1.0	1.0	0.0
3981.0	94.0	93.2	93.1	1.0	1.0	-0.1
7943.0	94.0	91.0	90.7	1.5	3.0	-0.3
12590.0	94.0	87.8	87.5	3.0	6.0	-0.3

Frequency weighting Lin:

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

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

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)

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Test Data for Sound Level Meter

Sound level meter type: 2250 Serial No. 2701815 / CN29 Date 23-Dec-2014
Microphone type: 4950 Serial No. 2678773
Report: 14CA1222 01-01

	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

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

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Sound level meter type: 2250 Serial No. 2701815 / CN29 Date 23-Dec-2014
Microphone type: 4950 Serial No. 2678773
Report: 14CA1222 01-01

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
135.6	134.6	131.6	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	78.1	1.0	1.0	0.2
8000	92.9	93.2	1.5	3.0	0.3

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

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CERTIFICATE OF CALIBRATION

Certificate No.: 14CA1215 03-04

Item tested

Description:	Sound Level Meter (Type 1)	,	Microphone
Manufacturer:	B & K	,	B & K
Type/Model No.:	2250	,	4189
Serial/Equipment No.:	2704792	,	2161042
Adaptors used:	-	,	-

Item submitted by

Customer Name:	Anewr Consulting Limited
Address of Customer:	-
Request No.:	-
Date of receipt:	15-Dec-2014

Date of test: 17-Dec-2014

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Multi function sound calibrator	B&K 4226	2288444	20-Jun-2015	CIGISMEC
Signal generator	DS 360	33873	09-Apr-2015	CEPREI
Signal generator	DS 360	61227	09-Apr-2015	CEPREI

Ambient conditions

Temperature:	21 ± 1 °C
Relative humidity:	60 ± 5 %
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:** 19-Dec-2014 **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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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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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	2.1
	Lin	Pass	1.6	2.2
Linearity range for Leq	At reference range , Step 5 dB at 4 kHz	Pass	0.3	
	Reference SPL on all other ranges	Pass	0.3	
	2 dB below upper limit of each range	Pass	0.3	
	2 dB above lower limit of each range	Pass	0.3	
Linearity range for SPL	At reference range , Step 5 dB at 4 kHz	Pass	0.3	
Frequency weightings	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	N/A	N/A	
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: 17-Dec-2014

Checked by: Lam Tze Wai Date: 19-Dec-2014

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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CIGISMEC
A CIGIS GROUP COMPANY

Sound level meter type: 2250 Serial No. 2704792 Date 17-Dec-2014
Microphone type: 4189 Serial No. 2161042
Report: 14CA1215 03-04

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	14.5	dB
Noise level in C weighting	15.4	dB
Noise level in Lin	21.9	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

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Sound level meter type: 2250 Serial No. 2704792 Date 17-Dec-2014
Microphone type: 4189 Serial No. 2161042
Report: 14CA1215 03-04

44.0	43.9	43.9	0.7	-0.1	-0.1
39.0	38.9	38.9	0.7	-0.1	-0.1
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	Actual level	Tolerance(dB)		Deviation
Hz	dB	dB	dB	+	-	dB
1000.0	94.0	94.0	94.0	0.0	0.0	0.0
31.6	94.0	54.6	54.6	1.5	1.5	0.0
63.1	94.0	67.8	67.8	1.5	1.5	0.0
125.9	94.0	77.9	77.9	1.0	1.0	0.0
251.2	94.0	85.4	85.4	1.0	1.0	0.0
501.2	94.0	90.8	90.7	1.0	1.0	-0.1
1995.0	94.0	95.2	95.2	1.0	1.0	0.0
3981.0	94.0	95.0	95.0	1.0	1.0	0.0
7943.0	94.0	92.9	92.9	1.5	3.0	0.0
12590.0	94.0	89.7	89.2	3.0	6.0	-0.5

Frequency weighting C:

Frequency	Ref. level	Expected level	Actual level	Tolerance(dB)		Deviation
Hz	dB	dB	dB	+	-	dB
1000.0	94.0	94.0	94.0	0.0	0.0	0.0
31.6	94.0	91.0	91.1	1.5	1.5	0.1

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Sound level meter type: 2250 Serial No. 2704792 Date 17-Dec-2014
Microphone type: 4189 Serial No. 2161042
Report: 14CA1215 03-04

63.1	94.0	93.2	93.1	1.5	1.5	-0.1
125.9	94.0	93.8	93.8	1.0	1.0	0.0
251.2	94.0	94.0	94.0	1.0	1.0	0.0
501.2	94.0	94.0	94.0	1.0	1.0	0.0
1995.0	94.0	93.8	93.8	1.0	1.0	0.0
3981.0	94.0	93.2	93.2	1.0	1.0	0.0
7943.0	94.0	91.0	91.0	1.5	3.0	0.0
12590.0	94.0	87.8	87.3	3.0	6.0	-0.5

Frequency weighting Lin:

Frequency	Ref. level	Expected level	Actual level	Tolerance(dB)		Deviation
Hz	dB	dB	dB	+	-	dB
1000.0	94.0	94.0	94.0	0.0	0.0	0.0
31.6	94.0	94.0	94.1	1.5	1.5	0.1
63.1	94.0	94.0	94.0	1.5	1.5	0.0
125.9	94.0	94.0	94.0	1.0	1.0	0.0
251.2	94.0	94.0	94.0	1.0	1.0	0.0
501.2	94.0	94.0	94.0	1.0	1.0	0.0
1995.0	94.0	94.0	94.0	1.0	1.0	0.0
3981.0	94.0	94.0	94.0	1.0	1.0	0.0
7943.0	94.0	94.0	94.0	1.5	3.0	0.0
12590.0	94.0	94.0	93.5	3.0	6.0	-0.5

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

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)

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CIGISMEC
A CIGIS GROUP COMPANY

Sound level meter type: 2250 Serial No. 2704792 Date 17-Dec-2014
Microphone type: 4189 Serial No. 2161042
Report: 14CA1215 03-04

	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

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

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CIGISMEC
A CIGIS GROUP COMPANY

Sound level meter type: 2250 Serial No. 2704792 Date 17-Dec-2014
Microphone type: 4189 Serial No. 2161042
Report: 14CA1215 03-04

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
136.5	135.5	132.5	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
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	78.0	1.0	1.0	0.1
8000	92.9	93.7	1.5	3.0	0.8

----------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. : C140582
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC14-0073) Date of Receipt / 收件日期 : 25 January 2014

Description / 儀器名稱 : Sound Level Meter
Manufacturer / 製造商 : Brüel & Kjær
Model No. / 型號 : 2250-L
Serial No. / 編號 : 2701826
Supplied By / 委託者 : EDMS Consulting Ltd.
Unit 1C, 24/F., World Wide House, 19 Des Voeux Road Central,
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 : 28 January 2014

TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.
All results are within 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
- Rohde & Schwarz Laboratory, Germany
- Fluke Everett Service Center, USA
- Agilent Technologies, USA

Tested By 測試 : K C Lee
Project Engineer

Certified By 核證 : K M Wu
Engineer

Date of Issue 簽發日期 : 28 January 2014

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。

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Certificate of Calibration
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Certificate No. : C140582
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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. The results presented are the mean of 3 measurements at each calibration point.

3. Test equipment :

Equipment ID	Description	Certificate No.
CL280	40 MHz Arbitrary Waveform Generator	C140016
CL281	Multifunction Acoustic Calibrator	DC130171

4. Test procedure : MA101N.

5. Results :

5.1 Sound Pressure Level

5.1.1 Reference Sound Pressure Level

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

5.1.2 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.

5.2 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

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5.3 Frequency Weighting

5.3.1 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	95.1	+1.2 ± 1.6
			4 kHz	94.8	+1.0 ± 1.6
			8 kHz	92.5	-1.1(+2.1 ; -3.1)
			12.5 kHz	89.3	-4.3(+3.0 ; -6.0)

5.3.2 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	93.0	-0.8 ± 1.6
			8 kHz	90.6	-3.0 (+2.1 ; -3.1)
			12.5 kHz	87.4	-6.2 (+3.0 ; -6.0)

Remarks : - UUT Microphone Model No. : 4950 & S/N : 2678784

- 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 :
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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