

JOB NO.: TCS00694/13

AGREEMENT NO. CE 45/2008 (CE)

LIANTANG/HEUNG YUEN WAI


**BOUNDARY CONTROL POINT AND ASSOCIATED
WORKS**

OPERATIONAL TRAFFIC NOISE MONITORING REPORT

PREPARED FOR

**CIVIL ENGINEERING AND DEVELOPMENT
DEPARTMENT**

Quality Index

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8 March 2024	TCS00694/13/600/R2831v7	 Tam Tak Wing Environmental Team Leader

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Our ref: 7076192/L30707/AG/TK/rw

8 March 2024

AECOM
12/F, Grand Central Plaza, Tower 2
138 Shatin Rural Committee Road
Shatin, N.T.

Attention: Mr Eddie LUK

By Email & Post

Dear Sir

**Agreement No. CE 45/2008 (CE)
Liantang/Heung Yuen Wai Boundary Control Point and Associated Works
Independent Environmental Checker – Investigation
Operational Traffic Noise Monitoring Report**

With reference to the Operational Traffic Noise Monitoring Report (Version 7) certified by the ET Leader and received by us on 8 March 2024, please note that we have no adverse comments on the captioned submission. We herewith verify the captioned submission in accordance with Section 3.2 of the EM&A Manual.

Thank you for your attention and please do not hesitate to contact the undersigned on tel. 3995 8120 or by email to alex.gbaguidi@smec.com; or our Mr Tommy KONG on tel. 3995 8123 or by email to tommy.kong@smec.com.

Yours faithfully

Alex GBAGUIDI
Independent Environmental Checker

cc	CEDD/BCP	-	Mr LU Pei Yu / Mr Yu Wang LAM	by fax: 3547 1659
	AECOM	-	Mr Anthony WONG	by email
	AUES	-	Mr TW TAM	by email

SMEC ASIA LIMITED
27/F Ford Glory Plaza, 37-39 Wing Hong Street
Cheung Sha Wan, Kowloon, Hong Kong
T +852 3995 8100
F +852 3995 8101
E hongkong@smec.com
W www.smec.com



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1. INTRODUCTION

1.1 BACKGROUND

- 1.1.1 Civil Engineering and Development Department (hereinafter “CEDD”) is the Project Proponent and the Permit Holder of Agreement No. CE 45/2008 (CE) Liantang / Heung Yuen Wai Boundary Control Point and Associated Works (hereinafter “the Project”), which is a Designated Project to be implemented under Environmental Permit (EP) no. EP-404/2011/D granted on 20 January 2017. The layout plan of the Project is shown in *Appendix A*.
- 1.1.2 Action-United Environmental Services & Consulting (hereinafter “AUES”) has been commissioned as an Environmental Team (hereinafter “ET”) to implement the relevant Environmental Monitoring & Audit (EM&A) programme for the Project.
- 1.1.3 According to S.3.2.1 of the Environmental Monitoring and Audit Manual (hereinafter “the EM&A Manual”) and S.3.2.1 of the approved Environmental Monitoring and Audit Programme (Rev.7) (hereinafter “approved EM&A Programme (Rev.7)”), the ET Leader shall “prepare and deposit to EPD, at least 6 months before the operation of the works under the Project, a monitoring plan for the purpose of assessing the accuracy of traffic noise predictions by comparing the project noise impact predictions with the actual impacts. The monitoring plan shall contain monitoring locations, monitoring schedules, methodology of noise monitoring including noise measurement procedures, traffic counts and speed checks, and methodology of comparison with the predicted levels. The ET Leader shall implement the monitoring plan in accordance with the deposited monitoring plan unless with prior justification. Monitoring details and results including the comparison between the measured noise levels and the predicted levels shall be recorded in a report to be deposited with EPD within one month of the completion of the monitoring. The report shall be certified by the ET Leader and verified by IEC and agreed with CEDD before deposit with EPD.”
- 1.1.4 The operational traffic noise monitoring should be undertaken twice at 6-month intervals within the first year upon completion of the Project. Monitoring details and results including the comparison between the measured noise levels and the predicted levels shall be recorded in a report to be deposited with EPD within one month of the completion of the monitoring.

1.2 MONITORING PLAN FOR OPERATION NOISE ASSESSMENT

- 1.2.1 An Operational Traffic Noise Monitoring Plan (the Plan) has been prepared to formulate the noise measurement procedures, traffic counts and speed checks, and methodology of comparison with the predicted levels. The updated Plan was submitted to EPD on 4 November 2020 and approved by EPD on 6 January 2021.
- 1.2.2 In the approval letter, it is noted that the operation of Boundary Control Point (BCP) was affected by the COVID-19 situation, and the operational traffic noise monitoring would be commenced after the BCP has resumed normal operation.

1.3 NOISE MODEL TO BE COMPARED

- 1.3.1 On 30 December 2016, Environmental Review Reports (ERR) titled “Environmental Review for Modification of Noise Barriers between Nam Wai Po and Wo Hop Shek” (Ref. C44-04-1) and “Environmental Review for Modification of Noise Barriers between Nga Yiu Ha and Loi Tung” (Ref. C44-05-1) under a cover letter Ref LYL:cfwl:60212563/4.3-2016015546W had been submitted to EPD for reviewing the proposed noise barrier layout. In the ERR, traffic noise for year 2033 has been revised for the NSRs.

- 1.3.2 Subsequently, variations of Environmental Permit (EP-404/2011/C) were applied on 18 January 2017 under a cover letter titled “Application for Variation of Environmental Permit (EP-404/2011/C)” (Ref: LVL:ccn:60212563/4.3-2017000723W). Updated ERR titled “Environmental Review for Modification of Noise Barriers between Nam Wa Po and Wo Hop Shek” (Ref. C44-04a) and “Environmental Review for Modification of Noise Barriers between Nga Yiu Ha and Loi Tung” (Ref. C44-05) had been included in this submission.
- 1.3.3 In April 2019, a Noise Mitigation Plan (NMP) was submitted to EPD under Condition 3.5 of EP-404/2011/D which detailed the proposed changes to the road traffic noise mitigation measures requirements as shown in the EP for the project. The abovementioned ERRs were appended in the NMP as supporting documents. The NMP was approved by EPD on 10 May 2019 and it should be noted that noise mitigation measures as shown in the approved NMP shall be fully implemented before commencement of operation of the Project and properly maintained throughout the operational phase of the Project.
- 1.3.4 Since the predicted traffic noise levels at the assessed Noise Sensitive Receivers (NSRs) during operational phase have been reviewed and updated in the ERRs as appended in the NMP, this monitoring report will make reference to the data and predicted traffic noise levels presented in the ERRs appended in the approved NMP.

2. METHODOLOGY FOR OPERATIONAL TRAFFIC NOISE MONITORING

2.1 MONITORING STATIONS

Updated Monitoring Stations

- 2.1.1 Alternate monitoring stations have been proposed in the monitoring plan due to access availability. “Proposal for Relocation of Operational Noise Monitoring Stations”, pursuant to Condition 5.1 of the EP-404/2011/D, providing justification by ET and verified by IEC had been submitted to EPD and was subsequently approved by EPD on 7 August 2020.
- 2.1.2 The operational traffic noise monitoring stations for operational traffic noise monitoring are summarized *Table 2.1* and illustrated in *Appendix B*.

Table 2.1 Summary of Operational Traffic Noise Monitoring Stations

Station ID	NSR ID in EIA	Description	Protected by Noise Barrier	Works Area
OM1	WKS4	Wo Keng Shan Village House	<ul style="list-style-type: none"> ● NB3-A – 3m vertical high noise barrier ● NB3-B – 2m high vertical noise barrier 	Ping Yeung to Wo Keng Shan
OM4	PY2	Village House, Ping Yeung	<ul style="list-style-type: none"> ● NB1-A – 2.5m vertical high noise barrier ● NB1-B – 2.5m vertical high noise barrier 	Ping Yeung
OM5	ST6	Village House, Shan Tong	<ul style="list-style-type: none"> ● NB6 – 2m vertical high noise barrier 	Sha Tau Kok

2.2 MONITORING PARAMETERS

- 2.2.1 The monitoring parameters covered in the operational traffic noise monitoring and traffic count are as follows:
- a) Operational Traffic Noise
 - One (1) set of 1-hour measurement for L₁₀ in A-weighting during morning and evening traffic peak hours on normal weekdays, with records of L_{eq}, L₉₀ and L_{max} will also be provided as reference.
 - b) Traffic Count
 - Traffic survey of the road segment, including both directions of the road segment
 - Percentage of heavy vehicles during the survey period; and
 - Average vehicle speed estimated for far-side and near-side of the road and the existing road network in the vicinity of each measurement point.

Operational Traffic Noise

- 2.2.2 The traffic noise monitoring and traffic count have been conducted during the morning peak hour around 0700-1000 and evening peak hour around 1600-1900 which defined in Appendix E of the Annual Traffic Census 2019 by Transport Department (TD). The time slots of morning peak and evening peak for traffic noise monitoring have been consulted with TD before the monitoring.

Traffic Count

- 2.2.3 Three monitoring stations for operational traffic noise are shown in **Table 2.1**, corresponding road sections were selected to carry out concurrent survey of traffic count pursuant to EM&A Manual and approved EM&A Programme (Rev.7) S.3.2.5 (c).
- 2.2.4 Concurrent traffic count were conducted at the road segments within proximity of the monitoring stations. If the road segment is two-way traffic flow, both far side and near side of the road segment would be counted.
- 2.2.5 Video recording was conducted at the road segments near the monitoring stations for both traffic count and speed estimation. At existing road surface, video cameras were set at road side using tripods or clamps. At viaduct section, video cameras were installed at potential mounting locations such as the gate type road sign or at the top of the parapet. Necessary arrangement including temporary closing of roads or access for the maintenance entrance have been obtained from relevant department, and other relevant government departments.
- 2.2.6 After the survey, the videos records were viewed by ET and the traffic flowing through the area have been recorded. Information including the number of vehicles for each type of the vehicles were recorded for the time period where noise monitoring had been conducted. Some landmarks have been selected for estimating the vehicle speed before the noise monitoring. The vehicle speed was estimated by the required time for a vehicle to pass the landmarks and the distances between the landmarks. The speed data for each segment were then averaged to obtain an average traffic speed for the censored road. Collected video have been kept for further data verification and potential re-counting in future.
- 2.2.7 The proposed road sections for traffic count are summarized in **Table 2.2** and shown in **Appendix C**. As discussed in **Section 1.3**, the traffic data in the ERR which appended in the NMP would be used instead of the data in the EIA.

Table 2.2 Selection of Road Sections for Traffic Count of ERR

Road Segment ID	Road Description	Traffic Flow at Year 2033 in ERR appended to NMP			Operational Traffic Noise Monitoring Stations
		Speed (km/h)	Total Vehicle	HV %	
20	Proposed Connecting Road (M) NB	80	1216	62.0	OM1
21	Proposed Connecting Road (M) SB	80	1043	76.4	
53	Wo Keng Shan Road (A) NB	50	61	55.7	
54	Wo Keng Shan Road (A) SB	50	84	53.6	
55	Ng Chow Road (A) SB	50	51	49.0	
56	Ng Chow Road (A) NB	50	51	49.0	
57	Ng Chow Road (B) SB	50	51	49.0	
58	Ng Chow Road (B) NB	50	51	49.0	
59	Wo Keng Shan Road (B) NB	50	61	55.7	
60	Wo Keng Shan Road (B) SB	50	68	32.4	
10	Proposed Connecting Road – slip road (H) SB	80	730	86.0	
11	Proposed Connecting Road – slip road (H) SB	50	48	93.8	
12	Proposed Connecting Road – slip road (I) NB	50	85	82.4	
13	Proposed Connecting Road – slip road (I) NB	80	800	66.8	
14	Proposed Connecting Road – slip road (J) NB	50	37	32.4	
15	Proposed Connecting Road – slip road (J) SB	50	32	46.9	
16	Proposed Connecting Road – slip road (K) NB	50	353	58.3	

Road Segment ID	Road Description	Traffic Flow at Year 2033 in ERR appended to NMP			Operational Traffic Noise Monitoring Stations
		Speed (km/h)	Total Vehicle	HV %	
17	Proposed Connecting Road – slip road (K) SB	50	414	55.9	OM5
18	Proposed Connecting Road – slip road (L) NB	50	416	53.0	
19	Proposed Connecting Road – slip road (L) SB	50	313	53.9	
22	Proposed Connecting Road – slip road (N) NB	50	137	31.4	
23	Proposed Connecting Road – slip road (N) SB	50	120	43.3	
26	Proposed Connecting Road (P) NB	80	1081	65.7	
27	Proposed Connecting Road (P) SB	80	924	80.6	
28	Sha Tau Kok Road – Wo Hang (A) WB	50	531	50.5	
29	Sha Tau Kok Road – Wo Hang (A) EB	50	577	56.8	
30	Sha Tau Kok Road – Wo Hang (B) WB	50	639	42.6	
31	Sha Tau Kok Road – Wo Hang (B) EB	50	609	43.5	
32	Proposed Connecting Road – slip road (Q) NB	50	537	36.4	
33	Proposed Connecting Road – slip road (Q) SB	50	525	44.2	
61	Wo Keng Shan Road (C) NB	50	61	55.7	
62	Wo Keng Shan Road (C) SB	50	68	32.4	
75	Loi Tung Roundabout (1-way)	50	844	45.1	

2.2.8 The traffic flow data obtained at the road segments were then be used to update the traffic noise model prepared for the assignment. The detailed evaluation procedure will be discussed in **Section 3**.

2.3 MONITORING FREQUENCY

2.3.1 There are (2) rounds of monitoring within the first year (at 6-month intervals) conducted upon the completion of the project and normal operation of BCP.

2.4 MONITORING EQUIPMENT

2.4.1 The equipment for operational traffic noise monitoring are summarized in **Table 2.3**. Copies of calibration certificates of noise monitoring equipment are shown in **Appendix D**.

Table 2.3 Equipment for Operational Traffic Noise Monitoring

Equipment	Description
Integrating Sound Level Meter	B&K Type 2238 or Rion NL-52
Calibrator	Rion NC-73
Portable Wind Speed Indicator	Testo Anemometer

2.4.2 Sound level meters listed above comply with the International Electrotechnical Commission Publications 651: 1979 (Type 1) and 804: 1985 (Type 1) specifications, as recommended in Technical Memorandum (TM) issued under the Noise Control Ordinance (NCO).

2.5 MONITORING PROCEDURES

- 2.5.1 All noise measurements were performed with the meter set to FAST response and on the L_{10} in A-weighted sound pressure level. L_{10} in one (1) consecutive L_{10} (60min) measurements would be used as the monitoring parameter for the time period between 0700-1000 and 1600-1900 hours on normal weekdays. L_{eq} , L_{90} and L_{max} would also be recorded for reference. The noise level for each second would be recorded for further evaluation.
- 2.5.2 Non traffic noise impact, e.g. barking of dogs, or construction works conducted during the traffic noise monitoring, may occur and affect the traffic noise monitoring results. Monitoring staff would record the occurrence period of these non-traffic noise period, and the noise level recorded during these periods would be checked to verify if the L_{10} recorded had been affected. The recorded noise level spikes, if observed, would be taken out from the data to remove the impact where necessary. To ensure non traffic noise impact are recorded correctly during the 1-hour noise measurement, sound recording would be used to supplement manual record.
- 2.5.3 The sound level meter was mounted on a tripod at a height of 1.2 m. and placed at the assessment point and oriented such that the microphone was pointed to the concerned road segments with the microphone facing perpendicular to the line of sight. Where a measurement was to be carried out at a building, the assessment point would normally be at a position 1 m from the exterior of the building façade. The windshield would be fitted for all measurements. All monitoring stations were measured at 1m from façade.
- 2.5.4 Immediately prior to and following each noise measurement the accuracy of the sound level meter was checked using an acoustic calibrator generating a known sound pressure level at a known frequency. Measurements was accepted as valid only if the calibration level from before and after the noise measurement should within 1.0dB.
- 2.5.5 Noise measurements have not been made in fog, rain, wind with a steady speed exceeding 5m/s or wind with gusts exceeding 10m/s. The wind speed was checked with a portable wind speed meter capable of measuring the wind speed in m/s.
- 2.5.6 Monitoring team would have filled in a field-log sheet to provide on-site records for reference.

2.6 MONITORING SCHEDULE

- 2.6.1 According to the EM&A Manual and approved EM&A Programme (Rev.7) S.3.2.2, the traffic noise levels were measured twice at 6-month intervals within the first year upon completion of the Project. However, traffic noise monitoring was postponed to 2023 due to the BCP not in full operation, resulting a significantly low traffic flow at the road segments.
- 2.6.2 The boundary between Hong Kong and Mainland China was opened on 6 February 2023. Hence the traffic noise monitoring had been conducted accordingly. **Table 2.4** shows the schedule of monitoring conducted at the monitoring stations.

Table 2.4 Proposed Schedule of the Operational Traffic Noise Monitoring

Monitoring Stations	First round of operational traffic noise monitoring	Second round of operational traffic noise monitoring
OM1	9 May 2023	16 November 2023
OM4	10 May 2023	15 November 2023
OM5	11 May 2023	17 November 2023

3. METHODOLOGY OF COMPARISON WITH THE PREDICTED NOISE LEVELS

3.1 ENVIRONMENTAL IMPACT ASSESSMENT (EIA) PREDICTED SCENARIO

- 3.1.1 To assess the accuracy of traffic noise predictions, traffic noise monitoring during the first year of normal operation of the BCP shall be implemented to compare against the traffic noise predictions presented in the approved EIA by comparing the project noise impact prediction with the actual impacts.
- 3.1.2 Traffic noise impact has been predicted at the representative NSRs in the approved EIA. However, as discussed in **Section 1.3**, due to the review of proposed noise barrier layout, traffic noise for year 2033 has been revised for the NSRs.
- 3.1.3 The respective predicted traffic noise levels are presented in the **Table 3.1**. As the operational monitoring will be conducted at the ground floor, only noise prediction at the ground floor is presented.

Table 3.1 Predicted Road Traffic Noise Levels with the Project at the Proposed Traffic Noise Monitoring Stations for Year 2033 (With Mitigation)

NSR	Floor	Predicted Façade Noise Levels, L _{10, 1 hour} , dB(A)
		With the Project (With Mitigation)
OM1 (WKS4)	G/F	69.0
OM4 (PY2)	G/F	67.3
OM5 (ST6)	G/F	66.8

3.2 CORRECTION, RESULT EVALUATION METHODOLOGIES AND DISCUSSION

- 3.2.1 The computer model “RoadNoise” which uses CRTN methodology for traffic noise predictions will be used for the assignment. The traffic noise simulation model submitted in the ERRs appended to the approved Noise Mitigation Plan, i.e. the ERR for Modification of Noise Barriers between Nam Wa Po and Wo Hop Shek (Ref. C44-04-1) and the ERR for Modification of Noise Barriers between Nga You Ha and Loi Tung (Ref. C44-05-1), will be used for the evaluation.
- 3.2.2 To assess the accuracy of the traffic noise predictions made in ERR, the normalized measured noise levels at Year 2023 shall be compared against the traffic noise levels at Year 2033 presented in the ERR.
- The traffic flow data obtained during noise monitoring should first be inputted into the noise model to calculate the modelled noise level at Year 2023 (A);
 - The difference between predicted traffic noise level at Year 2033 presented in the ERR (B) and (A), known as normalization correction (C), should be obtained for further processing;
 - The normalization correction (C) should then be applied to the measured traffic noise level at Year 2023 (D) (obtained during noise monitoring) to calculate the normalized measured noise level at Year 2033 (E);
 - The accuracy of the traffic noise predictions could then be assessed by comparison of (E) against (B);
 - In case discrepancies are observed, explanations should be given to justify the discrepancies.

4. QUALITY ASSURANCE PROCEDURES AND DATA MANAGEMENT

4.1 DOCUMENTATION OF THE MONITORING

4.1.1 Field data including in-situ monitoring results, weather conditions and observation were recorded in corresponding Field Data Sheets, which were signed and dated prior to submission to the monitoring team supervisor for checking and reviewed at the end of the monitoring day.

4.2 DATA MANAGEMENT AND ANALYSIS

4.2.1 All traffic noise monitoring data have been handled by AUES's systematic data recording and management, which complied with in-house Quality Management System. Monitoring results recorded in the monitoring equipment e.g. Noise Meters were downloaded directly from the equipment at the end of the monitoring period. The downloaded monitoring data were input into a computerized database maintained by ET and checked by personnel other than those who input the data.

4.3 QUALITY ASSURANCE PROCEDURES

4.3.1 Appropriate and standard QA/QC measures were adopted for the traffic noise monitoring to ensure the scientific integrity of the data produced. Sources of error in the traffic noise monitoring will be properly controlled with the following QA/QC procedures:

- a) Appropriate field monitoring and sampling techniques, including monitoring equipment; and
- b) Well organized systematic field-data system e.g. all monitoring information, field observation, results and weather conditions, etc. will be recorded in the field monitoring record sheets.

4.4 RECORDS

4.4.1 All traffic noise monitoring data were clearly and systematically documented in both hardware and software format and the software copy would be available upon request. All these documents and data were kept for at least one year after completion of the Project.

4.4.2 Field Data Sheets were used to record the traffic noise monitoring information, field observation, results and weather conditions, etc. would be properly maintained and kept by the ET.

5. MONITORING RESULTS

5.1 RESULT OF THE FIRST ROUND OF MONITORING

5.1.1 The first round of operational traffic noise monitoring for the Project was conducted on 8, 9 and 10 May 2023 and the second round was conducted on 15, 16 and 17 November 2023. The summary the monitoring results are summarized in *Table 5.1 to Table 5.3*. Summary of traffic count and percentage of heavy vehicle are shown in *Appendix E*.

Table 5.1 Calculation of Correction Factor

Monitoring Stations	Receiver	Floor	Date	Time	Model Results, dB(A)		Correction Factor (B) – (A) = (C)
					Predicted traffic noise level at Year 2033 (B)	Modelled noise level at Year 2023 (A)	
OM1	WKS4	G/F	9 May	8:30	69.0	68.6	0.4
				9:00	69.0	69.0	0.0
				16:00	69.0	68.3	0.7
				16:30	69.0	67.9	1.1
			16 Nov	8:30	69.0	69.8	-0.8
				9:00	69.0	70.1	-1.1
				16:00	69.0	69.0	0.0
				16:30	69.0	69.1	-0.1
OM4	PY2	G/F	10 May	8:30	67.3	58.2	9.1
				9:00	67.3	58.6	8.7
				16:00	67.3	58.0	9.3
				16:30	67.3	57.9	9.4
			15 Nov	8:30	67.3	58.9	8.4
				9:00	67.3	59.4	7.9
				16:00	67.3	58.1	9.2
				16:30	67.3	58.4	8.9
OM5	ST6	G/F	11 May	8:30	66.8	65.7	1.1
				9:00	66.8	65.3	1.5
				16:00	66.8	65.3	1.5
				16:30	66.8	65.6	1.2
			17 Nov	8:30	66.8	65.5	1.3
				9:00	66.8	65.8	1.0
				16:00	66.8	65.2	1.6
				16:30	66.8	65.4	1.4

Note: Positive Correction Factor (C) indicates the predicted traffic noise level at Year 2033 is higher than the revised modelled noise level at Year 2023.

Table 5.2 Calculation of Normalized Noise Level at Year 2033

Monitoring Stations	Receiver	Floor	Date	Time	Measurement Results, dB(A) (D)	Correction Factor (C)	Normalized noise level at Year 2033 (D) + (C) = (E)
OM1	WKS4	G/F	9 May	8:30	61.2	0.4	61.6
				9:00	61.6	0.0	61.6
				16:00	61.6	0.7	62.3
				16:30	61.9	1.1	63.0
			16 Nov	8:30	60.2	-0.8	59.4
				9:00	60.8	-1.1	59.7
				16:00	61.3	0.0	61.3
				16:30	61.2	-0.1	61.1
OM4	PY2	G/F	10 May	8:30	55.7	9.1	64.8
				9:00	55.6	8.7	64.3
				16:00	53.6	9.3	62.9
				16:30	54.3	9.4	63.7
			15 Nov	8:30	54.1	8.4	62.5
				9:00	54.6	7.9	62.5
				16:00	57.1	9.2	66.3
				16:30	56.2	8.9	65.1
OM5	ST6	G/F	11 May	8:30	53.3	1.1	54.4
				9:00	53.7	1.5	55.2
				16:00	52.6	1.5	54.1
				16:30	53.1	1.2	54.3
			17 Nov	8:30	52.2	1.3	53.5
				9:00	53.5	1.0	54.5
				16:00	53.5	1.6	55.1
				16:30	52.7	1.4	54.1

Table 5.3 Deviation between the predicted traffic noise level at Year 2033 presented in the ERR and the normalized measured noise level at Year 2033

Monitoring Stations	Receiver	Floor	Date	Time	Predicted traffic noise level at Year 2033 (B)	Normalized noise level at Year 2033 (E)	Deviation, dB(A) (B) - (E)
OM1	WKS4	G/F	9 May	8:30	69.0	61.6	7.4
				9:00	69.0	61.6	7.4
				16:00	69.0	62.3	6.7
				16:30	69.0	63.0	6.0
			16 Nov	8:30	69.0	59.4	9.6
				9:00	69.0	59.7	9.3

Monitoring Stations	Receiver	Floor	Date	Time	Predicted traffic noise level at Year 2033 (B)	Normalized noise level at Year 2033 (E)	Deviation, dB(A) (B) - (E)
OM4	PY2	G/F	10 May	16:00	69.0	61.3	7.7
				16:30	69.0	61.1	7.9
				8:30	67.3	64.8	2.5
				9:00	67.3	64.3	3.0
			15 Nov	16:00	67.3	62.9	4.4
				16:30	67.3	63.7	3.6
				8:30	67.3	62.5	4.8
				9:00	67.3	62.5	4.8
OM5	ST6	G/F	11 May	8:30	66.8	54.4	12.4
				9:00	66.8	55.2	11.6
				16:00	66.8	54.1	12.7
				16:30	66.8	54.3	12.5
			17 Nov	8:30	66.8	53.5	13.3
				9:00	66.8	54.5	12.3
				16:00	66.8	55.1	11.7
				16:30	66.8	54.1	12.7

5.2 DISCUSSION FOR DEVIATION BETWEEN MONITORING AND MODEL

Variation on Traffic Flow and Validity of Monitoring Stations

- 5.2.1 Traffic count collected at OM1 ranges from 18% to 384% of the predicted traffic flow for Year 2033, at OM4, from 6% to 52%, and at OM5, from 19% to 404%. Traffic flow at Wo Keng Shan Road during noise measurement exceeded the predicted scenario, while at other road segments including the project roads, are below the predicted traffic flow.
- 5.2.2 The surveyed traffic at the project roads were found below the predicted traffic flow. This is normal as the predicted traffic flow in Year 2033 is the predicted year with highest traffic flow in the ERR. As such, it is normal that the traffic flow in Year 2023 would lower than the predicted scenario.
- 5.2.3 On the other hand, at Wo Keng Shan Road, the surveyed traffic flow exceeded the predicted traffic flow during the noise measurement. This would due to the construction projects being conducted within the area, inducing additional construction vehicles to the road. This factor is temporary and would disappear after the construction works are completed.
- 5.2.4 As such, at OM1 and OM5, the measured traffic noise impact was not under similar scenario as assumed in the traffic noise model in the ERR. Hence the traffic noise measurement results collected at OM1 and OM5 would not be representable and are considered not appropriate for discussion.

Discussion on the Predicted Traffic Noise Impact and the Actual Impacts

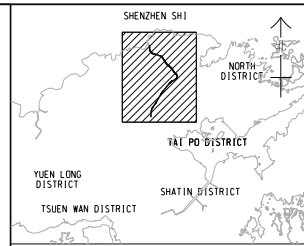
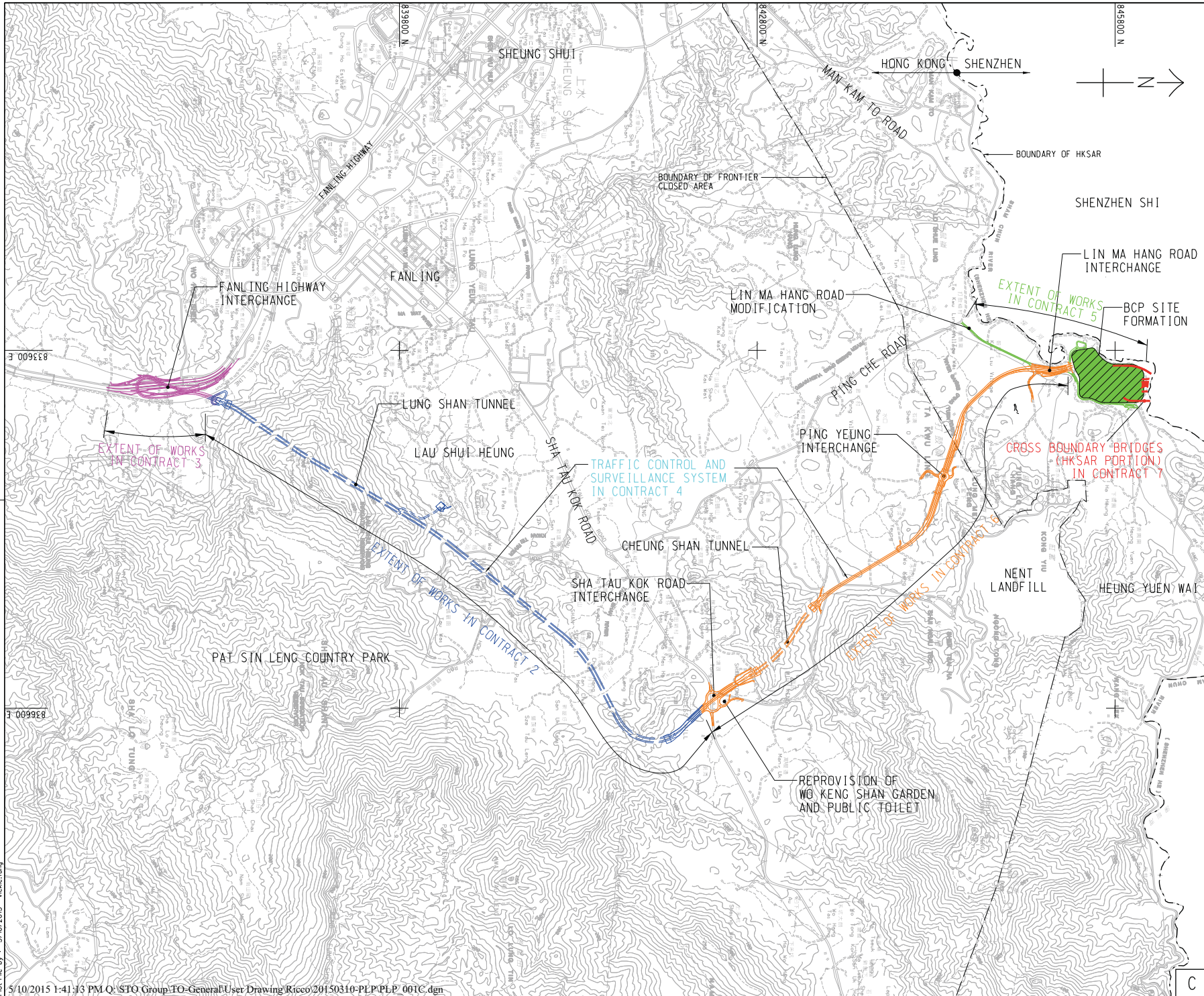
- 5.2.5 Deviation between the predicted traffic noise level at Year 2033 and normalized measured noise level at Year 2033 ranges from above the actual measured traffic noise by 1dB(A) to 4.8dB(A) at OM4. This shows the traffic noise model in the ERR provided predictions similar to the actual scenario.

6. CONCLUSION

- 6.1.1 Operational traffic noise monitoring was conducted in May and November 2023. Traffic count has been conducted concurrently with the traffic noise model.
- 6.1.2 The surveyed traffic at the project roads were found below the predicted traffic flow. This is normal as the predicted traffic flow in Year 2033 is the predicted year with highest traffic flow in the ERR. On the other hand, at Wo Keng Shan Road, the surveyed traffic flow exceeded the predicted traffic flow during the noise measurement. This would be due to the construction projects being conducted within the area, inducing additional construction vehicles to the road.
- 6.1.3 As such, at OM1 and OM5, the measured traffic noise impact was not under similar scenario as assumed in the traffic noise model in the ERR. Hence the traffic noise measurement results collected at OM1 and OM5 would not be representable and are considered not appropriate for discussion.
- 6.1.4 Deviation between the predicted traffic noise level at Year 2033 and normalized measured noise level at Year 2033 ranges from above the actual measured traffic noise by 1dB(A) to 4.8dB(A) at OM4. This shows the traffic noise model in the ERR provided predictions similar to the actual scenario.

APPENDIX A

LAYOUT PLAN OF THE PROJECT



NO.	REVISION	DATE	BY	CHECKED BY

土木工程拓展署
Civil Engineering and Development Department

LIANGTANG/HEUNG YUEN WAI BOUNDARY CONTROL POINT AND ASSOCIATED WORKS (SITE FORMATION AND INFRASTRUCTURES) DESIGN AND CONSTRUCTION

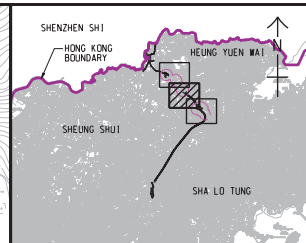
PROJECT LAYOUT PLAN

Plot File by : 5/10/2015 vickie.lung

C

APPENDIX B

LOCATION PLAN OF TRAFFIC NOISE MONITORING STATIONS



KEY PLAN
SCALE 1 : 150000

LEGEND:

- 300m ASSESSMENT AREA
- TENTATIVE WORKS AREA
- TUNNEL SECTION
- PROPOSED TUNNEL VENTILATION BUILDING
- 1m HIGH NOISE BARRIER
- 2m HIGH NOISE BARRIER
- 2.5m HIGH NOISE BARRIER
- 3m HIGH NOISE BARRIER
- 3.5m HIGH NOISE BARRIER
- NOISE SENSITIVE RECEIVERS
- ▶ FACADE FACING

REMARKS:

1. THE SPECIFIED BARRIER HEIGHT IS FROM FINISHED ROAD SURFACE LEVEL UNLESS SPECIFIED OTHERWISE.
2. THE HEIGHT OF THE PARAPET IS 0.8m FROM FINISHED ROAD SURFACE.

Proposed Operational Traffic Noise Monitoring Station

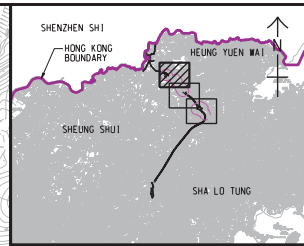
NO.	DESCRIPTION	DATE	BY	CHECKED BY

Agreement No. CE 45/2008 (CE)
Liantang/Heung Yuen Wai Boundary Control Point and Associated Works

Title:
Location Plan of Proposed Operational Traffic Noise Monitoring Station (2/3)



OM4



KEY PLAN
SCALE 1 : 150000

- LEGEND:**
- 300m ASSESSMENT AREA
 - TENTATIVE WORKS AREA
 - 2m HIGH NOISE BARRIER
 - 2.5m HIGH NOISE BARRIER
 - NOISE SENSITIVE RECEIVERS
 - ▶ FACADE FACING

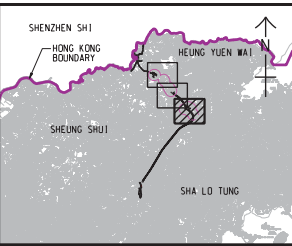
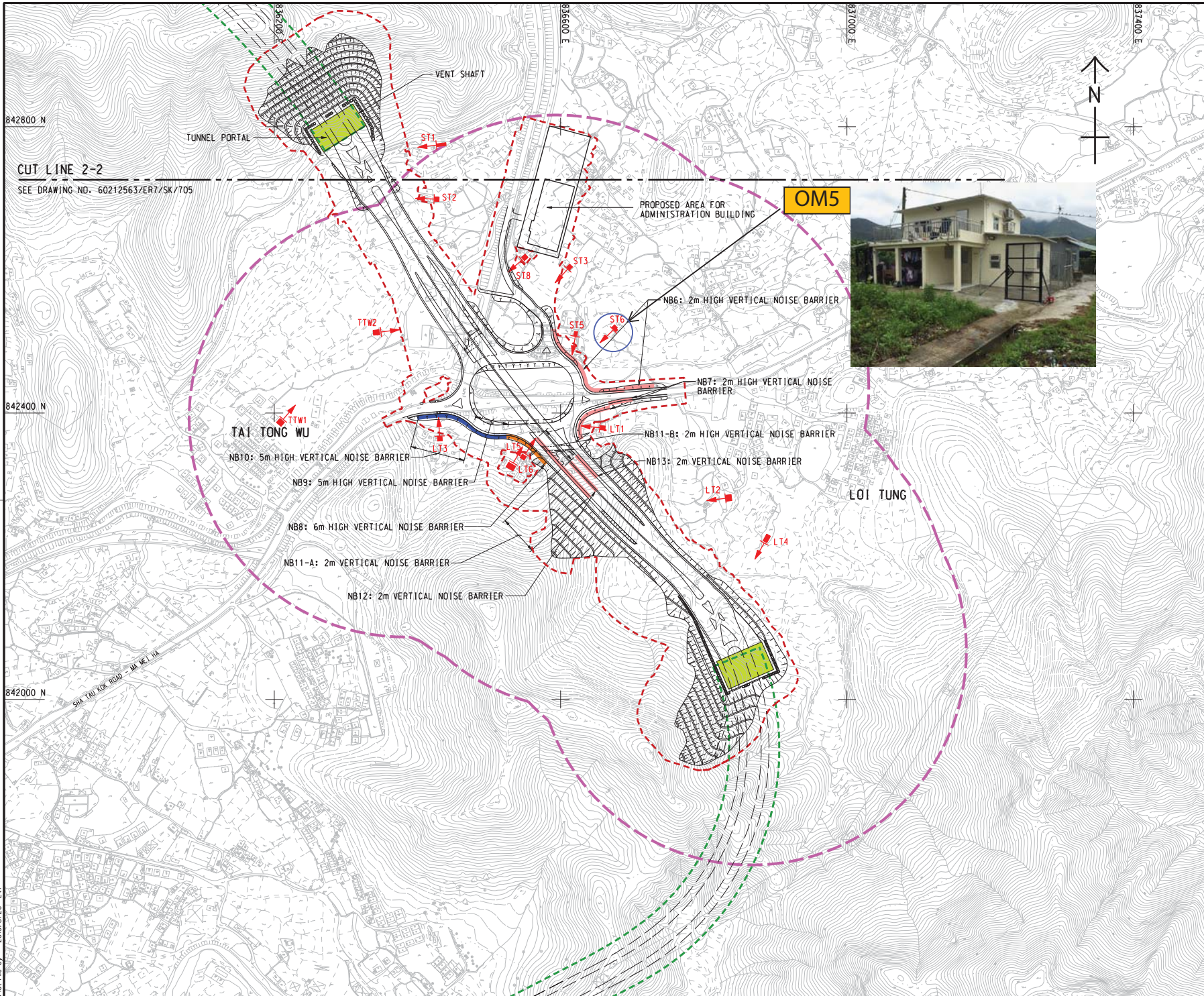
- REMARKS:**
1. THE SPECIFIED BARRIER HEIGHT IS FROM FINISHED ROAD SURFACE LEVEL UNLESS SPECIFIED OTHERWISE.
 2. THE HEIGHT OF THE PARAPET IS 0.8m FROM FINISHED ROAD SURFACE.

Proposed Operational Traffic Noise Monitoring Station

NO.	DESCRIPTION	DATE	BY	CHK

Agreement No. CE 45/2008 (CE)
Liantang/Heung Yuen Wai Boundary Control Point and Associated Works

Title:
Location Plan of Proposed Operational Traffic Noise Monitoring Station (1/3)



KEY PLAN
SCALE 1 : 15000

LEGEND:

- 300m ASSESSMENT AREA
- TENTATIVE WORKS AREA
- TUNNEL SECTION
- PROPOSED TUNNEL VENTILATION BUILDING
- 1.5m HIGH NOISE BARRIER (TO BE DELETED)
- 2m HIGH NOISE BARRIER
- 5m HIGH NOISE BARRIER
- 6m HIGH NOISE BARRIER
- NOISE SENSITIVE RECEIVERS
- FACADE FACING

REMARKS:

1. THE SPECIFIED BARRIER HEIGHT IS FROM FINISHED ROAD SURFACE LEVEL UNLESS SPECIFIED OTHERWISE.
2. THE HEIGHT OF THE PARAPET IS 0.8m FROM FINISHED ROAD SURFACE.

Proposed Operational Traffic Noise Monitoring Station

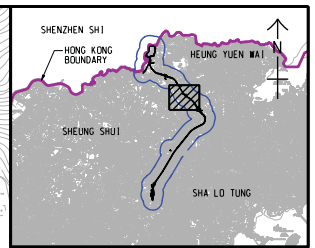
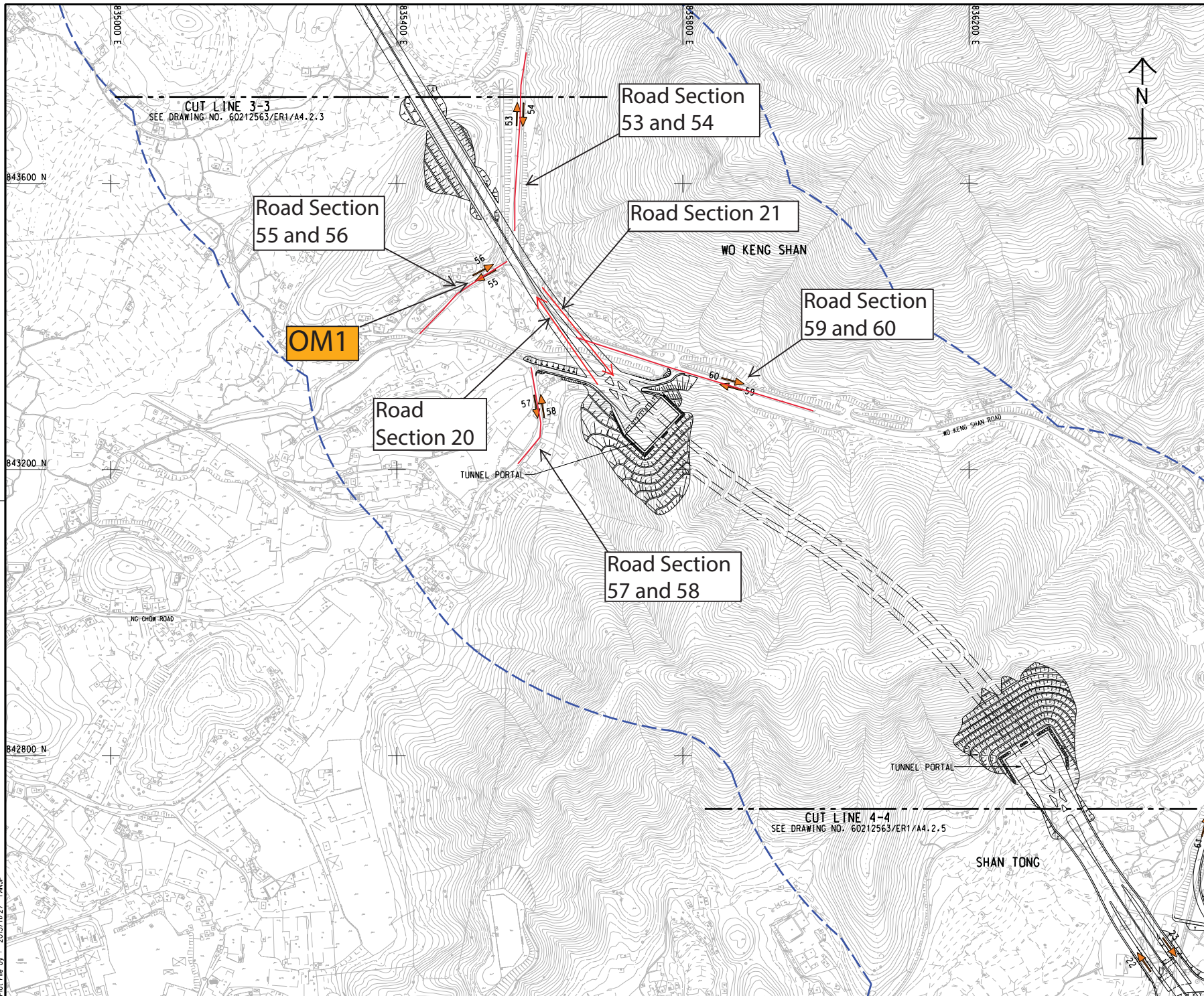
NO.	DESCRIPTION	DATE

Agreement No. CE 45/2008 (CE)
Liantang/Heung Yuen Wai Boundary Control Point and Associated Works

Title:
Location Plan of Proposed Operational Traffic Noise Monitoring Station (3/3)

APPENDIX C

PROPOSED ROAD SECTIONS FOR TRAFFIC COUNT



KEY PLAN
SCALE 1 : 50000

LEGEND:

- 300m ASSESSMENT AREA
- TRAFFIC FLOW DIRECTION

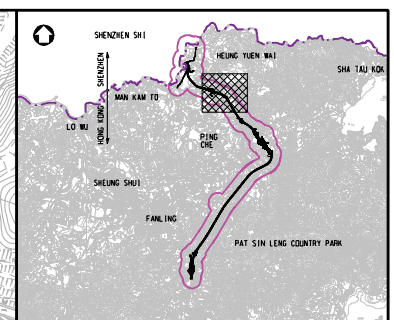
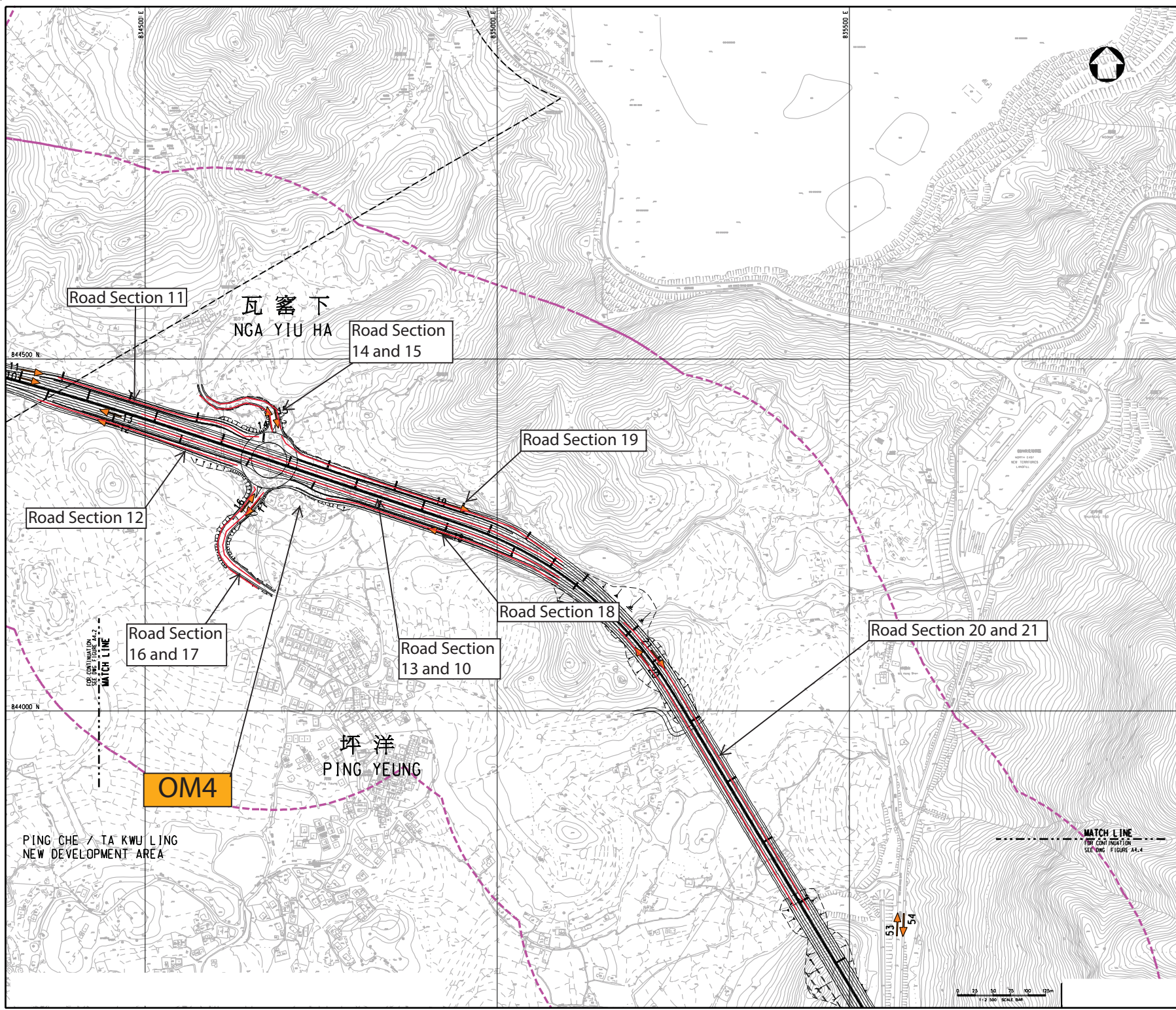
Proposed Operational Traffic Noise Monitoring Station

Road Section

NO.	DESCRIPTION	DATE	BY	CHECKED BY	DATE

Agreement No. CE 45/2008 (CE)
Liantang/Heung Yuen Wai Boundary Control Point and Associated Works

Title:
Proposed road section for traffic count (2/3)

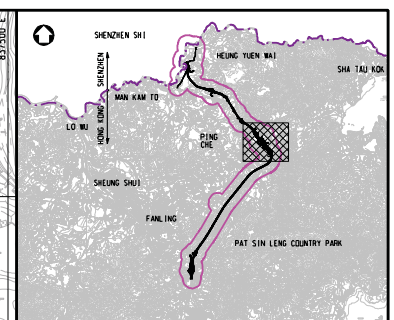
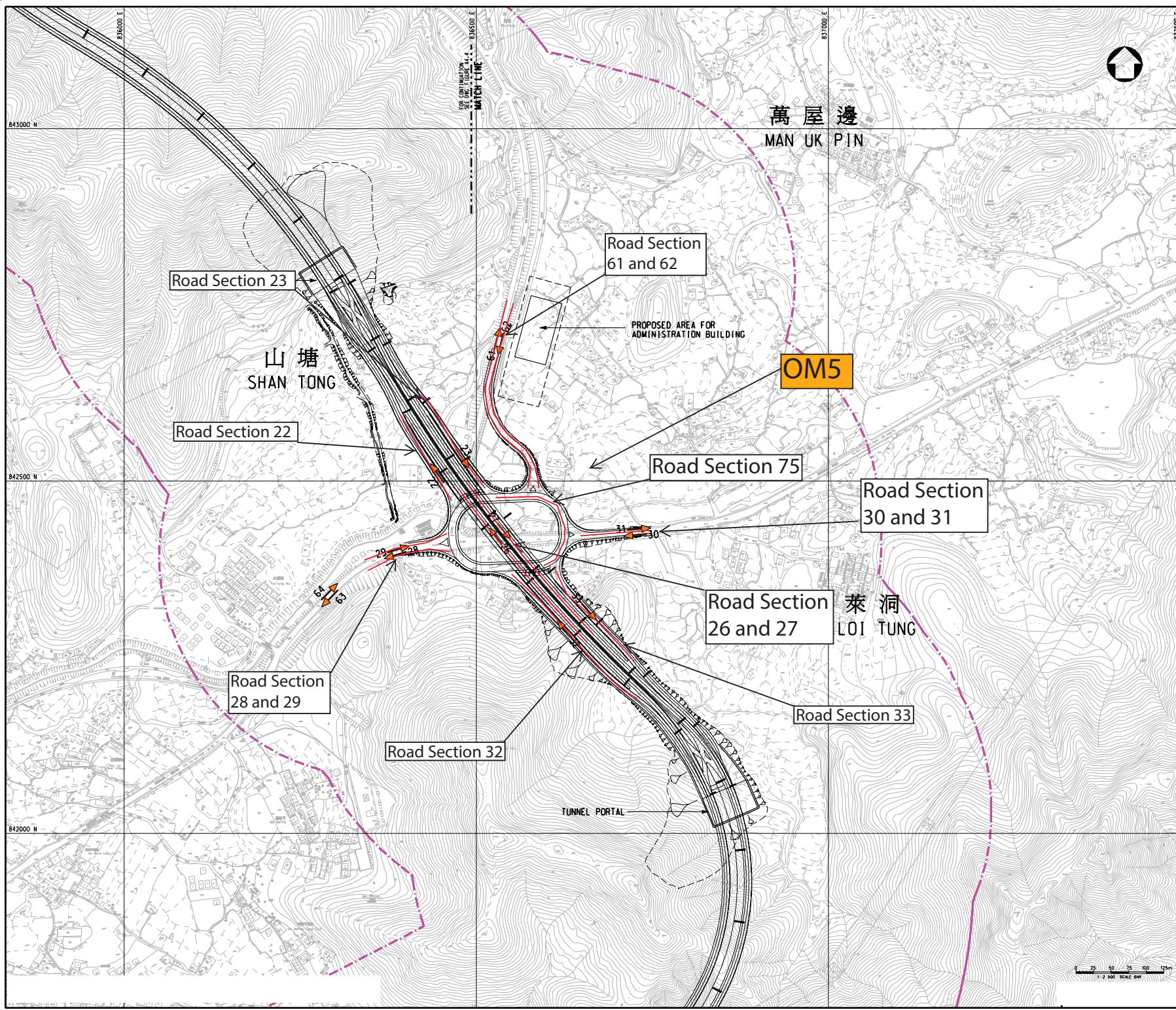


KEY PLAN
SCALE 1:100000

- LEGEND:
- 300m ASSESSMENT AREA
 - TRAFFIC FLOW DIRECTION
 - Proposed Operational Traffic Noise Monitoring Station
 - Road Section

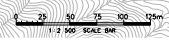
Agreement No. CE 45/2008 (CE)
Liantang/Heung Yuen Wai Boundary
Control Point and Associated Works

Title:
Proposed road section for
traffic count (1/3)



Agreement No. CE 45/2008 (CE)
 Liantang/Heung Yuen Wai Boundary
 Control Point and Associated Works

Title:
 Proposed road section for
 traffic count (3/3)



APPENDIX D

CALIBRATION CERTIFICATES OF NOISE MONITORING EQUIPMENT

Certificate of Calibration

校正證書

Certificate No. : C224784
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC22-1539) Date of Receipt / 收件日期 : 4 August 2022
Description / 儀器名稱 : Integrating Sound Level Meter (EQ009)
Manufacturer / 製造商 : Brüel & Kjær
Model No. / 型號 : 2238
Serial No. / 編號 : 2285722
Supplied By / 委託者 : Action-United Environmental Services and Consulting
Unit A, 20/F., Gold King Industrial Building,
35-41 Tai Lin Pai Road, Kwai Chung, N.T.

TEST CONDITIONS / 測試條件

Temperature / 溫度 : $(23 \pm 2)^{\circ}\text{C}$ Relative Humidity / 相對濕度 : $(50 \pm 25)\%$
Line Voltage / 電壓 : ---

TEST SPECIFICATIONS / 測試規範

Calibration check

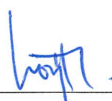
DATE OF TEST / 測試日期 : 20 August 2022

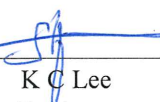
TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.
The results do not exceed manufacturer's specification.
The results are detailed in the subsequent page(s).

The test equipment used for calibration are traceable to National Standards via :

- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory
- Agilent Technologies / Keysight Technologies
- Fluke Everett Service Center, USA

Tested By : 
測試 : _____
H T Wong
Assistant Engineer

Certified By : 
核證 : _____
K C Lee
Engineer

Date of Issue : 23 August 2022
簽發日期

The test equipment used for calibration is traceable to the National Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.

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Certificate of Calibration

校正證書

Certificate No. : C224784
證書編號

- 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.
- Self-calibration using laboratory acoustic calibrator was performed before the test from 6.1.1.2 to 6.4.
- The results presented are the mean of 3 measurements at each calibration point.

4. Test equipment :

Equipment ID	Description	Certificate No.
CL280	40 MHz Arbitrary Waveform Generator	C220381
CL281	Multifunction Acoustic Calibrator	AV210017

5. Test procedure : MA101N.

6. Results :

6.1 Sound Pressure Level

6.1.1 Reference Sound Pressure Level

6.1.1.1 Before Self-calibration

UUT Setting				Applied Value		UUT Reading (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	
50 - 130	L _{AFP}	A	F	94.00	1	93.9

6.1.1.2 After Self-calibration

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
50 - 130	L _{AFP}	A	F	94.00	1	94.0	± 0.7

6.1.2 Linearity

UUT Setting				Applied Value		UUT Reading (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	
50 - 130	L _{AFP}	A	F	94.00	1	94.0 (Ref.)
				104.00		104.1
				114.00		114.2

IEC 60651 Type 1 Spec. : ± 0.4 dB per 10 dB step and ± 0.7 dB for overall different.

The test equipment used for calibration is traceable to the National Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.

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Certificate of Calibration

校正證書

Certificate No. : C224784
證書編號

6.2 Time Weighting

6.2.1 Continuous Signal

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
50 - 130	L _{AFP}	A	F	94.00	1	94.0	Ref.
	L _{ASP}		S			94.0	± 0.1
	L _{AIP}		I			94.1	± 0.1

6.2.2 Tone Burst Signal (2 kHz)

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Burst Duration		
30 - 110	L _{AFP}	A	F	106.0	Continuous	106.0	Ref.
	L _{AFMax}				200 ms	105.0	-1.0 ± 1.0
	L _{ASP}	S	Continuous		106.0	Ref.	
	L _{ASMax}		500 ms		102.0	-4.1 ± 1.0	

6.3 Frequency Weighting

6.3.1 A-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
50 - 130	L _{AFP}	A	F	94.00	31.5 Hz	54.5	-39.4 ± 1.5
					63 Hz	67.9	-26.2 ± 1.5
					125 Hz	77.8	-16.1 ± 1.0
					250 Hz	85.4	-8.6 ± 1.0
					500 Hz	90.8	-3.2 ± 1.0
					1 kHz	94.0	Ref.
					2 kHz	95.2	+1.2 ± 1.0
					4 kHz	95.0	+1.0 ± 1.0
					8 kHz	92.8	-1.1 (+1.5 ; -3.0)
12.5 kHz	89.7	-4.3 (+3.0 ; -6.0)					

The test equipment used for calibration is traceable to the National Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.

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Certificate of Calibration 校正證書

Certificate No. : C231630
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC23-0436) Date of Receipt / 收件日期 : 28 February 2023
Description / 儀器名稱 : Sound Level Meter (EQ018)
Manufacturer / 製造商 : Rion
Model No. / 型號 : NL-52
Serial No. / 編號 : 00809405
Supplied By / 委託者 : Action-United Environmental Services and Consulting
Unit A, 20/F., Gold King Industrial Building,
35-41 Tai Lin Pai Road, Kwai Chung, N.T.

TEST CONDITIONS / 測試條件

Temperature / 溫度 : $(23 \pm 2)^{\circ}\text{C}$ Relative Humidity / 相對濕度 : $(50 \pm 25)\%$
Line Voltage / 電壓 : ---

TEST SPECIFICATIONS / 測試規範


Calibration check

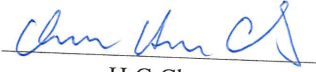
DATE OF TEST / 測試日期 : 21 March 2023

TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.
The results do not exceed specified limits.
These limits refer to manufacturer's published tolerances as requested by the customer.
The results are detailed in the subsequent page(s).

The test equipment used for calibration are traceable to National Standards via :
- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory
- Agilent Technologies / Keysight Technologies
- Fluke Everett Service Center, USA

Tested By : 
測試 : K C Lee
Engineer

Certified By : 
核證 : H C Chan
Engineer

Date of Issue : 21 March 2023
簽發日期

The test equipment used for calibration is traceable to the National Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.
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Certificate of Calibration

校正證書

Certificate No. : C231630

證書編號

- 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.
- Self-calibration was performed before the test.
- The results presented are the mean of 3 measurements at each calibration point.
- Test equipment :

Equipment ID	Description	Certificate No.
CL280	40 MHz Arbitrary Waveform Generator	C230306
CL281	Multifunction Acoustic Calibrator	AV210017

- Test procedure : MA101N.

- Results :

6.1 Sound Pressure Level

6.1.1 Reference Sound Pressure Level

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Limit (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
30 - 130	L _A	A	Fast	94.00	1	93.9	± 1.1

6.1.2 Linearity

UUT Setting				Applied Value		UUT Reading (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	
30 - 130	L _A	A	Fast	94.00	1	93.9 (Ref.)
				104.00		104.0
				114.00		113.9

IEC 61672 Class 1 Limit : ± 0.6 dB per 10 dB step and ± 1.1 dB for overall different.

6.2 Time Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Limit (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
30 - 130	L _A	A	Fast	94.00	1	93.9	Ref.
			Slow			93.9	± 0.3

The test equipment used for calibration is traceable to the National Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.
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Certificate of Calibration

校正證書

Certificate No. : C231630

證書編號

6.3 Frequency Weighting

6.3.1 A-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Limit (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 130	L _A	A	Fast	94.00	63 Hz	67.1	-26.2 ± 1.5
					125 Hz	77.7	-16.1 ± 1.5
					250 Hz	85.2	-8.6 ± 1.4
					500 Hz	90.7	-3.2 ± 1.4
					1 kHz	93.9	Ref.
					2 kHz	95.2	+1.2 ± 1.6
					4 kHz	94.9	+1.0 ± 1.6
					8 kHz	92.9	-1.1 (+2.1 ; -3.1)
					16 kHz	86.0	-6.6 (+3.5 ; -17.0)

6.3.2 C-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Limit (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 130	L _C	C	Fast	94.00	63 Hz	93.1	-0.8 ± 1.5
					125 Hz	93.7	-0.2 ± 1.5
					250 Hz	93.9	0.0 ± 1.4
					500 Hz	94.0	0.0 ± 1.4
					1 kHz	93.9	Ref.
					2 kHz	93.8	-0.2 ± 1.6
					4 kHz	93.1	-0.8 ± 1.6
					8 kHz	91.0	-3.0 (+2.1 ; -3.1)
					16 kHz	84.0	-8.5 (+3.5 ; -17.0)

The test equipment used for calibration is traceable to the National 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。



Certificate of Calibration

校正證書

Certificate No. : C231630
證書編號

- Remarks : - UUT Microphone Model No. : UC-59 & S/N : 16463
- Mfr's Limit : 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 |
| | 16 kHz | : ± 0.70 dB |
| 104 dB | : 1 kHz | : ± 0.10 dB (Ref. 94 dB) |
| 114 dB | : 1 kHz | : ± 0.10 dB (Ref. 94 dB) |
- The uncertainties are for a confidence probability of not less than 95 %.

Note :

Only the original copy or the laboratory's certified true copy is valid.

The values given in this Certificate only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environment changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Sun Creation Engineering Limited shall not be liable for any loss or damage resulting from the use of the equipment.

The test equipment used for calibration is traceable to the National Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.

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Sun Creation Engineering Limited – Calibration & Testing Laboratory

c/o 4/F, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong

輝創工程有限公司 - 校正及檢測實驗室

c/o 香港新界屯門興安里一號四樓

Tel/電話: (852) 2927 2606

Fax/傳真: (852) 2744 8986

E-mail/電郵: callab@suncreation.com

Website/網址: www.suncreation.com



Certificate of Calibration

校正證書

Certificate No. : C224779
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC22-1539) Date of Receipt / 收件日期 : 4 August 2022
Description / 儀器名稱 : Sound Level Calibrator (EQ085)
Manufacturer / 製造商 : Rion
Model No. / 型號 : NC-73
Serial No. / 編號 : 10655561
Supplied By / 委託者 : Action-United Environmental Services and Consulting
Unit A, 20/F., Gold King Industrial Building,
35-41 Tai Lin Pai Road, Kwai Chung, N.T.

TEST CONDITIONS / 測試條件

Temperature / 溫度 : (23 ± 2)°C Relative Humidity / 相對濕度 : (50 ± 25)%
Line Voltage / 電壓 : ---

TEST SPECIFICATIONS / 測試規範

Calibration check


DATE OF TEST / 測試日期 : 20 August 2022

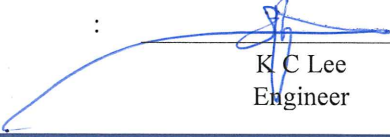
TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.
The results do not exceed manufacturer's specification & user's specified acceptance criteria.
The results are detailed in the subsequent page(s).

The test equipment used for calibration are traceable to National Standards via :

- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory
- Agilent Technologies / Keysight Technologies
- Fluke Everett Service Center, USA

Tested By : 
測試 : _____
H T Wong
Assistant Engineer

Certified By : 
核證 : _____
K C Lee
Engineer

Date of Issue : 23 August 2022
簽發日期

The test equipment used for calibration is traceable to the National Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.

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Certificate of Calibration

校正證書

Certificate No. : C224779

證書編號

- The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 12 hours before the commencement of the test.
- The results presented are the mean of 3 measurements at each calibration point.
- Test equipment :

Equipment ID	Description	Certificate No.
CL130	Universal Counter	C223647
CL281	Multifunction Acoustic Calibrator	AV210017
TST150A	Measuring Amplifier	C221750

- Test procedure : MA100N.

- Results :

5.1 Sound Level Accuracy

UUT Nominal Value	Measured Value (dB)	Mfr's Spec. (dB)	Uncertainty of Measured Value (dB)
94 dB, 1 kHz	94.0	± 0.5	± 0.2

5.2 Frequency Accuracy

UUT Nominal Value (kHz)	Measured Value (kHz)	User's Spec.	Uncertainty of Measured Value (Hz)
1	0.953	1 kHz ± 6 %	± 1

Remarks : - The user's specified acceptance criteria (user's spec.) is a customer pre-defined operating tolerance of the UUT, suitable for one's own intended use.

- The uncertainties are for a confidence probability of not less than 95 %.

Note :

Only the original copy or the laboratory's certified true copy is valid.

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Certificate of Calibration 校正證書

Certificate No. : C235334
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC23-1813) Date of Receipt / 收件日期 : 31 August 2023
Description / 儀器名稱 : Integrating Sound Level Meter (EQ009)
Manufacturer / 製造商 : Brüel & Kjær
Model No. / 型號 : 2238
Serial No. / 編號 : 2285722
Supplied By / 委託者 : Action-United Environmental Services and Consulting
Unit A, 20/F., Gold King Industrial Building,
35-41 Tai Lin Pai Road, Kwai Chung, N.T.

TEST CONDITIONS / 測試條件

Temperature / 溫度 : $(23 \pm 2)^{\circ}\text{C}$ Relative Humidity / 相對濕度 : $(50 \pm 25)\%$
Line Voltage / 電壓 : ---

TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 15 September 2023

TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.
The results do not exceed specified limits.
These limits refer to manufacturer's published tolerances as requested by the customer.
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
- Hottinger Brüel & Kjær Calibration Laboratory, Denmark
- Agilent Technologies / Keysight Technologies
- Fluke Everett Service Center, USA

Tested By : 
測試 : _____
C K Lo
Project Engineer

Certified By : 
核證 : _____
K C Lee
Engineer

Date of Issue : 15 September 2023
簽發日期

The test equipment used for calibration is traceable to the National 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室所書面批准。

Certificate of Calibration

校正證書

Certificate No. : C235334
證書編號

- 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.
- Self-calibration using laboratory acoustic calibrator was performed before the test from 6.1.1.2 to 6.4.
- The results presented are the mean of 3 measurements at each calibration point.
- Test equipment :

Equipment ID	Description	Certificate No.
CL280	40 MHz Arbitrary Waveform Generator	C230306
CL281	Multifunction Acoustic Calibrator	CDK2302738

- Test procedure : MA101N.

- Results :

6.1 Sound Pressure Level

6.1.1 Reference Sound Pressure Level

6.1.1.1 Before Self-calibration

UUT Setting				Applied Value		UUT Reading (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	
52 - 132	L _{AFP}	A	F	94.00	1	94.2

6.1.1.2 After Self-calibration

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Limit (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
52 - 132	L _{AFP}	A	F	94.00	1	94.0	± 0.7

6.1.2 Linearity

UUT Setting				Applied Value		UUT Reading (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	
52 - 132	L _{AFP}	A	F	94.00	1	94.0 (Ref.)
				104.00		104.0
				114.00		113.9

IEC 60651 Type 1 Limit : ± 0.4 dB per 10 dB step and ± 0.7 dB for overall different.

The test equipment used for calibration is traceable to the National 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。

Certificate of Calibration

校正證書

Certificate No. : C235334
證書編號

6.2 Time Weighting

6.2.1 Continuous Signal

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Limit (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
52 - 132	L _{AFP}	A	F	94.00	1	94.0	Ref.
	L _{ASP}		S			94.0	± 0.1
	L _{AIP}		I			94.0	± 0.1

6.2.2 Tone Burst Signal (2 kHz)

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Limit (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Burst Duration		
32 - 112	L _{AFP}	A	F	106.0	Continuous	106.0	Ref.
	L _{AFMax}				200 ms	105.0	-1.0 ± 1.0
	L _{ASP}	S	Continuous		106.0	Ref.	
	L _{ASMax}		500 ms		102.0	-4.1 ± 1.0	

6.3 Frequency Weighting

6.3.1 A-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Limit (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
52 - 132	L _{AFP}	A	F	94.00	31.5 Hz	54.5	-39.4 ± 1.5
					63 Hz	67.8	-26.2 ± 1.5
					125 Hz	77.8	-16.1 ± 1.0
					250 Hz	85.3	-8.6 ± 1.0
					500 Hz	90.7	-3.2 ± 1.0
					1 kHz	94.0	Ref.
					2 kHz	95.2	+1.2 ± 1.0
					4 kHz	95.0	+1.0 ± 1.0
					8 kHz	92.8	-1.1 (+1.5 ; -3.0)
					12.5 kHz	89.7	-4.3 (+3.0 ; -6.0)

The test equipment used for calibration is traceable to the National Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.

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Certificate of Calibration

校正證書

Certificate No. : C235334
證書編號

6.3.2 C-Weighting

Range (dB)	UUT Setting			Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Limit (dB)
	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
52 - 132	L _{CFP}	C	F	94.00	31.5 Hz	90.9	-3.0 ± 1.5
					63 Hz	93.2	-0.8 ± 1.5
					125 Hz	93.8	-0.2 ± 1.0
					250 Hz	94.0	0.0 ± 1.0
					500 Hz	94.0	0.0 ± 1.0
					1 kHz	94.0	Ref.
					2 kHz	93.8	-0.2 ± 1.0
					4 kHz	93.1	-0.8 ± 1.0
					8 kHz	90.9	-3.0 (+1.5 ; -3.0)
					12.5 kHz	87.8	-6.2 (+3.0 ; -6.0)

6.4 Time Averaging

Range (dB)	UUT Setting			Applied Value					UUT Reading (dB)	IEC 60804 Type 1 Limit (dB)
	Parameter	Frequency Weighting	Integrating Time	Frequency (kHz)	Burst Duration (ms)	Burst Duty Factor	Burst Level (dB)	Equivalent Level (dB)		
32 - 112	L _{Acq}	A	10 sec.	4	1	1/10	110.0	100	99.9	± 0.5
								90	89.9	± 0.5
								80	79.3	± 1.0
								70	69.2	± 1.0

Remarks : - UUT Microphone Model No. : 4188 & S/N : 2812706

- Mfr's Limit : IEC 60651 Type 1 & IEC 60804 Type 1

- Uncertainties of Applied Value :

94 dB	31.5 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)
	Burst equivalent level	: ± 0.2 dB (Ref. 110 dB continuous sound level)

- The uncertainties are for a confidence probability of not less than 95 %.

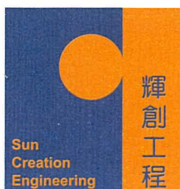
Note :

Only the original copy or the laboratory's certified true copy is valid.

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Certificate of Calibration

校正證書

Certificate No. : C230240
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC23-0006) Date of Receipt / 收件日期 : 4 January 2023
Description / 儀器名稱 : Integrating Sound Level Meter (EQ006)
Manufacturer / 製造商 : Brüel & Kjær
Model No. / 型號 : 2238
Serial No. / 編號 : 2285762
Supplied By / 委託者 : Action-United Environmental Services and Consulting
Unit A, 20/F., Gold King Industrial Building,
35-41 Tai Lin Pai Road, Kwai Chung, N.T.

TEST CONDITIONS / 測試條件

Temperature / 溫度 : (23 ± 2)°C Relative Humidity / 相對濕度 : (50 ± 25)%
Line Voltage / 電壓 : ---

TEST SPECIFICATIONS / 測試規範

Calibration check

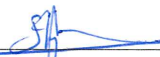
DATE OF TEST / 測試日期 : 18 January 2023


TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.
The results do not exceed specified limits.
These limits refer to manufacturer's published tolerances as requested by the customer.
The results are detailed in the subsequent page(s).

The test equipment used for calibration are traceable to National Standards via :

- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory
- Agilent Technologies / Keysight Technologies
- Fluke Everett Service Center, USA

Tested By : 
測試 : _____
K C Lee
Engineer

Certified By : 
核證 : _____
H C Chan
Engineer

Date of Issue : 19 January 2023
簽發日期

The test equipment used for calibration is traceable to the National Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.

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Certificate of Calibration

校正證書

Certificate No. : C230240
證書編號

- 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.
- Self-calibration using laboratory acoustic calibrator was performed before the test from 6.1.1.2 to 6.4.
- The results presented are the mean of 3 measurements at each calibration point.
- Test equipment :

Equipment ID	Description	Certificate No.
CL280	40 MHz Arbitrary Waveform Generator	C220381
CL281	Multifunction Acoustic Calibrator	AV210017

- Test procedure : MA101N.

- Results :

- 6.1 Sound Pressure Level

- 6.1.1 Reference Sound Pressure Level

- 6.1.1.1 Before Self-calibration

UUT Setting				Applied Value		UUT Reading (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	
50 - 130	L _{AFP}	A	F	94.00	1	94.1

- 6.1.1.2 After Self-calibration

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Limit (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
50 - 130	L _{AFP}	A	F	94.00	1	94.0	± 0.7

- 6.1.2 Linearity

UUT Setting				Applied Value		UUT Reading (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	
50 - 130	L _{AFP}	A	F	94.00	1	94.0 (Ref.)
				104.00		104.0
				114.00		114.0

IEC 60651 Type 1 Limit : ± 0.4 dB per 10 dB step and ± 0.7 dB for overall different.

The test equipment used for calibration is traceable to the National 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。

Certificate of Calibration

校正證書

Certificate No. : C230240

證書編號

6.2 Time Weighting

6.2.1 Continuous Signal

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Limit (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
50 - 130	L _{AFP}	A	F	94.00	1	94.0	Ref.
	L _{ASP}		S			94.0	± 0.1
	L _{AIP}		I			94.1	± 0.1

6.2.2 Tone Burst Signal (2 kHz)

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Limit (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Burst Duration		
30 - 110	L _{AFP}	A	F	106.0	Continuous	106.0	Ref.
	L _{AFMax}				200 ms	105.0	-1.0 ± 1.0
	L _{ASP}	S	Continuous		106.0	Ref.	
	L _{ASMax}		500 ms		102.0	-4.1 ± 1.0	

6.3 Frequency Weighting

6.3.1 A-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Limit (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
50 - 130	L _{AFP}	A	F	94.00	31.5 Hz	55.0	-39.4 ± 1.5
					63 Hz	67.9	-26.2 ± 1.5
					125 Hz	77.8	-16.1 ± 1.0
					250 Hz	85.3	-8.6 ± 1.0
					500 Hz	90.7	-3.2 ± 1.0
					1 kHz	94.0	Ref.
					2 kHz	95.2	+1.2 ± 1.0
					4 kHz	95.0	+1.0 ± 1.0
					8 kHz	92.9	-1.1 (+1.5 ; -3.0)
12.5 kHz	89.8	-4.3 (+3.0 ; -6.0)					

The test equipment used for calibration is traceable to the National 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室書面批准。

Certificate of Calibration

校正證書

Certificate No. : C230240
證書編號

6.3.2 C-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Limit (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
50 - 130	L _{CFP}	C	F	94.00	31.5 Hz	91.4	-3.0 ± 1.5
					63 Hz	93.3	-0.8 ± 1.5
					125 Hz	93.9	-0.2 ± 1.0
					250 Hz	94.0	0.0 ± 1.0
					500 Hz	94.0	0.0 ± 1.0
					1 kHz	94.0	Ref.
					2 kHz	93.8	-0.2 ± 1.0
					4 kHz	93.2	-0.8 ± 1.0
					8 kHz	91.0	-3.0 (+1.5 ; -3.0)
12.5 kHz	87.8	-6.2 (+3.0 ; -6.0)					

6.4 Time Averaging

UUT Setting				Applied Value					UUT Reading (dB)	IEC 60804 Type 1 Limit (dB)
Range (dB)	Parameter	Frequency Weighting	Integrating Time	Frequency (kHz)	Burst Duration (ms)	Burst Duty Factor	Burst Level (dB)	Equivalent Level (dB)		
30 - 110	L _{Acq}	A	10 sec.	4	1	1/10	110.0	100	99.9	± 0.5
			60 sec.					90	89.7	± 0.5
			5 min.					80	79.2	± 1.0
								70	69.6	± 1.0

Remarks : - UUT Microphone Model No. : 4188 & S/N : 2250447

- Mfr's Limit : IEC 60651 Type 1 & IEC 60804 Type 1

- Uncertainties of Applied Value :

94 dB : 31.5 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)
Burst equivalent level	: ± 0.2 dB (Ref. 110 dB continuous sound level)

- The uncertainties are for a confidence probability of not less than 95 %.

Note :

Only the original copy or the laboratory's certified true copy is valid.

The values given in this Certificate only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environment changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Sun Creation Engineering Limited shall not be liable for any loss or damage resulting from the use of the equipment.

The test equipment used for calibration is traceable to the National 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室書面批准。



輝創工程有限公司

Sun Creation Engineering Limited

Calibration & Testing Laboratory

Certificate of Calibration 校正證書

Certificate No. : C235367

證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC23-1813)

Date of Receipt / 收件日期 : 31 August 2023

Description / 儀器名稱 : Sound Level Calibrator (EQ085)

Manufacturer / 製造商 : Rion

Model No. / 型號 : NC-73

Serial No. / 編號 : 10655561

Supplied By / 委託者 : Action-United Environmental Services and Consulting
Unit A, 20/F., Gold King Industrial Building,
35-41 Tai Lin Pai Road, Kwai Chung, N.T.

TEST CONDITIONS / 測試條件

Temperature / 溫度 : $(23 \pm 2)^{\circ}\text{C}$

Relative Humidity / 相對濕度 : $(50 \pm 25)\%$

Line Voltage / 電壓 : ---

TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 13 September 2023

TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.

The results do not exceed specified limits.

These limits refer to manufacturer's published or user's specified tolerances as requested by the customer.

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
- Hottinger Brüel & Kjær Calibration Laboratory, Denmark
- Agilent Technologies / Keysight Technologies
- Fluke Everett Service Center, USA

Tested By

測試

:

K C Lee
Engineer

Certified By

核證

:

K K Wong
Engineer

Date of Issue

簽發日期

:

17 September 2023

The test equipment used for calibration is traceable to the National 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室書面批准。

Sun Creation Engineering Limited – Calibration & Testing Laboratory

c/o 4/F, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong

輝創工程有限公司 - 校正及檢測實驗室

c/o 香港新界屯門興安里一號四樓

Tel/電話: (852) 2927 2606

Fax/傳真: (852) 2744 8986

E-mail/電郵: callab@suncreation.com

Website/網址: www.suncreation.com

Certificate of Calibration

校正證書

Certificate No. : C235367
證書編號

- The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 12 hours before the commencement of the test.
- The results presented are the mean of 3 measurements at each calibration point.
- Test equipment :

<u>Equipment ID</u>	<u>Description</u>	<u>Certificate No.</u>
CL130	Universal Counter	C233799
CL281	Multifunction Acoustic Calibrator	CDK2302738
TST150A	Measuring Amplifier	C221750

- Test procedure : MA100N.

- Results :

5.1 Sound Level Accuracy

UUT Nominal Value	Measured Value (dB)	Mfr's Spec. (dB)	Uncertainty of Measured Value (dB)
94 dB, 1 kHz	94.00	± 0.5	± 0.20

5.2 Frequency Accuracy

UUT Nominal Value (kHz)	Measured Value (kHz)	User's Spec.	Uncertainty of Measured Value (Hz)
1	0.951	1 kHz ± 6 %	± 1

Remarks : - The user's specified acceptance criteria (user's spec.) is a customer pre-defined operating tolerance of the UUT, suitable for one's own intended use.

- The uncertainties are for a confidence probability of not less than 95 %.

Note :

Only the original copy or the laboratory's certified true copy is valid.

The values given in this Certificate only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environment changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Sun Creation Engineering Limited shall not be liable for any loss or damage resulting from the use of the equipment.

The test equipment used for calibration is traceable to the National 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室書面批准。

APPENDIX E

SUMMARY OF TRAFFIC COUNT AND PERCENTAGE OF HEAVY VEHICLE

Summary of Traffic Count and Percentage of Heavy Vehicle

Monitoring Station: OM1

Date: 9 May 2023

Road Segment No.	Road Description	Start Time	End Time	No. of Light Vehicle	No. of Heavy Vehicle	Percentage of Heavy Vehicle	Speed (km/h)
20	Proposed Connecting Road (M) NB	8:30	9:30	164	173	51.3%	80
		9:00	10:00	167	178	51.6%	
		16:00	17:00	117	109	48.2%	
		16:30	17:30	112	105	48.4%	
21	Proposed Connecting Road (M) SB	8:30	9:30	100	109	52.2%	80
		9:00	10:00	98	159	61.9%	
		16:00	17:00	149	136	47.7%	
		16:30	17:30	163	156	48.9%	
53	Wo Keng Shan Road (A) NB	8:30	9:30	33	141	81.0%	50
		9:00	10:00	18	138	88.5%	
		16:00	17:00	11	102	90.3%	
		16:30	17:30	11	107	90.7%	
54	Wo Keng Shan Road (A) SB	8:30	9:30	3	107	97.3%	50
		9:00	10:00	6	143	96.0%	
		16:00	17:00	17	121	87.7%	
		16:30	17:30	34	116	77.3%	
55	Ng Chow Road (A) SB	8:30	9:30	20	10	33.3%	50
		9:00	10:00	16	8	33.3%	
		16:00	17:00	5	15	75.0%	
		16:30	17:30	6	7	53.8%	
56	Ng Chow Road (A) NB	8:30	9:30	7	13	65.0%	50
		9:00	10:00	5	20	80.0%	
		16:00	17:00	9	12	57.1%	
		16:30	17:30	8	12	60.0%	
57	Ng Chow Road (B) SB	8:30	9:30	11	16	59.3%	50
		9:00	10:00	11	7	38.9%	
		16:00	17:00	5	16	76.2%	
		16:30	17:30	5	12	70.6%	
58	Ng Chow Road (B) NB	8:30	9:30	5	11	68.8%	50
		9:00	10:00	2	12	85.7%	
		16:00	17:00	6	8	57.1%	
		16:30	17:30	5	10	66.7%	
59	Wo Keng Shan Road (B) NB	8:30	9:30	53	146	73.4%	50
		9:00	10:00	34	140	80.5%	
		16:00	17:00	16	110	87.3%	
		16:30	17:30	16	106	86.9%	
60	Wo Keng Shan Road (B) SB	8:30	9:30	10	115	92.0%	50
		9:00	10:00	11	157	93.5%	
		16:00	17:00	26	126	82.9%	
		16:30	17:30	41	120	74.5%	

Summary of Traffic Count and Percentage of Heavy Vehicle

Monitoring Station: OM4

Date: 10 May 2023

Road Segment No.	Road Description	Start Time	End Time	No. of Light Vehicle	No. of Heavy Vehicle	Percentage of Heavy Vehicle	Speed (km/h)
10	Proposed Connecting Road - slip road (H) SB	8:30	9:30	78	97	55.4%	80
		9:00	10:00	77	117	60.3%	
		16:00	17:00	140	135	49.1%	
		16:30	17:30	153	126	45.2%	
11	Proposed Connecting Road - slip road (H) SB	8:30	9:30	5	2	28.6%	50
		9:00	10:00	5	0	0.0%	
		16:00	17:00	2	5	71.4%	
		16:30	17:30	8	7	46.7%	
12	Proposed Connecting Road - slip road (I) NB	8:30	9:30	2	7	77.8%	50
		9:00	10:00	8	7	46.7%	
		16:00	17:00	8	5	38.5%	
		16:30	17:30	7	3	30.0%	
13	Proposed Connecting Road - slip road (I) NB	8:30	9:30	151	146	49.2%	80
		9:00	10:00	139	149	51.7%	
		16:00	17:00	121	104	46.2%	
		16:30	17:30	126	100	44.2%	
14	Proposed Connecting Road - slip road (J) NB	8:30	9:30	3	1	25.0%	50
		9:00	10:00	6	0	0.0%	
		16:00	17:00	4	7	63.6%	
		16:30	17:30	6	9	60.0%	
15	Proposed Connecting Road - slip road (J) SB	8:30	9:30	2	1	33.3%	50
		9:00	10:00	3	1	25.0%	
		16:00	17:00	3	4	57.1%	
		16:30	17:30	4	5	55.6%	
16	Proposed Connecting Road - slip road (K) NB	8:30	9:30	31	8	20.5%	50
		9:00	10:00	28	18	39.1%	
		16:00	17:00	25	8	24.2%	
		16:30	17:30	30	9	23.1%	
17	Proposed Connecting Road - slip road (K) SB	8:30	9:30	22	5	18.5%	50
		9:00	10:00	22	5	18.5%	
		16:00	17:00	26	8	23.5%	
		16:30	17:30	25	11	30.6%	
18	Proposed Connecting Road - slip road (L) NB	8:30	9:30	20	9	31.0%	50
		9:00	10:00	24	10	29.4%	
		16:00	17:00	24	10	29.4%	
		16:30	17:30	25	9	26.5%	
19	Proposed Connecting Road - slip road (L) SB	8:30	9:30	35	9	20.5%	50
		9:00	10:00	23	18	43.9%	
		16:00	17:00	24	11	31.4%	
		16:30	17:30	33	12	26.7%	

Summary of Traffic Count and Percentage of Heavy Vehicle

Monitoring Station: OM5

Date: 11 May 2023

Road Segment No.	Road Description	Start Time	End Time	No. of Light Vehicle	No. of Heavy Vehicle	Percentage of Heavy Vehicle	Speed (km/h)
22	Proposed Connecting Road - slip road (N) NB	8:30	9:30	20	14	41.2%	50
		9:00	10:00	20	14	41.2%	
		16:00	17:00	22	11	33.3%	
		16:30	17:30	31	13	29.5%	
23	Proposed Connecting Road - slip road (N) SB	8:30	9:30	40	19	32.2%	50
		9:00	10:00	62	35	36.1%	
		16:00	17:00	46	28	37.8%	
		16:30	17:30	79	43	35.2%	
26	Proposed Connecting Road (P) NB	8:30	9:30	151	203	57.3%	80
		9:00	10:00	138	159	53.5%	
		16:00	17:00	112	91	44.8%	
		16:30	17:30	121	87	41.8%	
27	Proposed Connecting Road (P) SB	8:30	9:30	95	118	55.4%	80
		9:00	10:00	90	129	58.9%	
		16:00	17:00	131	125	48.8%	
		16:30	17:30	148	121	45.0%	
28	Sha Tau Kok Road - Wo Hang (A) WB	8:30	9:30	171	243	58.7%	50
		9:00	10:00	179	232	56.4%	
		16:00	17:00	189	247	56.7%	
		16:30	17:30	217	216	49.9%	
29	Sha Tau Kok Road - Wo Hang (A) EB	8:30	9:30	163	212	56.5%	50
		9:00	10:00	149	210	58.5%	
		16:00	17:00	183	201	52.3%	
		16:30	17:30	253	185	42.2%	
30	Sha Tau Kok Road - Wo Hang (A) EB	8:30	9:30	168	77	31.4%	50
		9:00	10:00	176	64	26.7%	
		16:00	17:00	187	113	37.7%	
		16:30	17:30	209	103	33.0%	
31	Sha Tau Kok Road - Wo Hang (B) EB	8:30	9:30	145	64	30.6%	50
		9:00	10:00	141	67	32.2%	
		16:00	17:00	156	144	48.0%	
		16:30	17:30	168	137	44.9%	
32	Proposed Connecting Road - slip road (Q) NB	8:30	9:30	227	292	56.3%	50
		9:00	10:00	197	309	61.1%	
		16:00	17:00	197	283	59.0%	
		16:30	17:30	205	282	57.9%	
33	Proposed Connecting Road - slip road (Q) SB	8:30	9:30	209	412	66.3%	50
		9:00	10:00	188	360	65.7%	
		16:00	17:00	246	251	50.5%	
		16:30	17:30	267	251	48.5%	
61	Wo Keng Shan Road (C) NB	8:30	9:30	25	186	88.2%	50
		9:00	10:00	47	180	79.3%	
		16:00	17:00	34	146	81.1%	
		16:30	17:30	31	121	79.6%	
62	Wo Keng Shan Road (C) SB	8:30	9:30	37	210	85.0%	50
		9:00	10:00	31	173	84.8%	
		16:00	17:00	42	149	78.0%	
		16:30	17:30	70	205	74.5%	
75	Loi Tung Roundabout (1-way)	8:30	9:30	127	162	56.1%	50
		9:00	10:00	123	158	56.2%	
		16:00	17:00	131	155	54.2%	
		16:30	17:30	163	164	50.2%	

Summary of Traffic Count and Percentage of Heavy Vehicle

Monitoring Station: OM1

Date: 16 November 2023

Road Segment No.	Road Description	Start Time	End Time	No. of Light Vehicle	No. of Heavy Vehicle	Percentage of Heavy Vehicle	Speed (km/h)
20	Proposed Connecting Road (M) NB	8:30	9:30	249	216	46.5%	80
		9:00	10:00	271	252	48.2%	
		16:00	17:00	175	135	43.5%	
		16:30	17:30	191	129	40.3%	
21	Proposed Connecting Road (M) SB	8:30	9:30	125	116	48.1%	80
		9:00	10:00	116	166	58.9%	
		16:00	17:00	212	155	42.2%	
		16:30	17:30	239	158	39.8%	
53	Wo Keng Shan Road (A) NB	8:30	9:30	43	166	79.4%	50
		9:00	10:00	22	171	88.6%	
		16:00	17:00	14	137	90.7%	
		16:30	17:30	19	128	87.1%	
54	Wo Keng Shan Road (A) SB	8:30	9:30	25	147	85.5%	50
		9:00	10:00	16	159	90.9%	
		16:00	17:00	30	138	82.1%	
		16:30	17:30	46	141	75.4%	
55	Ng Chow Road (A) SB	8:30	9:30	9	16	64.0%	50
		9:00	10:00	4	18	81.8%	
		16:00	17:00	5	17	77.3%	
		16:30	17:30	9	18	66.7%	
56	Ng Chow Road (A) NB	8:30	9:30	5	19	79.2%	50
		9:00	10:00	3	21	87.5%	
		16:00	17:00	10	10	50.0%	
		16:30	17:30	8	12	60.0%	
57	Ng Chow Road (B) SB	8:30	9:30	2	18	90.0%	50
		9:00	10:00	1	17	94.4%	
		16:00	17:00	8	6	42.9%	
		16:30	17:30	10	5	33.3%	
58	Ng Chow Road (B) NB	8:30	9:30	6	25	80.6%	50
		9:00	10:00	2	18	90.0%	
		16:00	17:00	7	12	63.2%	
		16:30	17:30	10	10	50.0%	
59	Wo Keng Shan Road (B) NB	8:30	9:30	52	182	77.8%	50
		9:00	10:00	26	189	87.9%	
		16:00	17:00	19	154	89.0%	
		16:30	17:30	28	146	83.9%	
60	Wo Keng Shan Road (B) SB	8:30	9:30	30	166	84.7%	50
		9:00	10:00	19	180	90.5%	
		16:00	17:00	40	148	78.7%	
		16:30	17:30	54	153	73.9%	

Summary of Traffic Count and Percentage of Heavy Vehicle

Monitoring Station: OM4

Date: 15 November 2023

Road Segment No.	Road Description	Start Time	End Time	No. of Light Vehicle	No. of Heavy Vehicle	Percentage of Heavy Vehicle	Speed (km/h)
10	Proposed Connecting Road (H) SB	8:30	9:30	65	96	59.6%	80
		9:00	10:00	71	128	64.3%	
		16:00	17:00	187	124	39.9%	
		16:30	17:30	202	118	36.9%	
11	Proposed Connecting Road - slip road (H) SB	8:30	9:30	3	3	50.0%	50
		9:00	10:00	6	1	14.3%	
		16:00	17:00	5	5	50.0%	
		16:30	17:30	9	6	40.0%	
12	Proposed Connecting Road - slip road (I) NB	8:30	9:30	3	3	50.0%	50
		9:00	10:00	5	4	44.4%	
		16:00	17:00	7	1	12.5%	
		16:30	17:30	9	3	25.0%	
13	Proposed Connecting Road (I) NB	8:30	9:30	218	177	44.8%	80
		9:00	10:00	206	194	48.5%	
		16:00	17:00	119	89	42.8%	
		16:30	17:30	119	101	45.9%	
14	Proposed Connecting Road - slip road (J) NB	8:30	9:30	2	8	80.0%	50
		9:00	10:00	1	7	87.5%	
		16:00	17:00	1	3	75.0%	
		16:30	17:30	5	2	28.6%	
15	Proposed Connecting Road - slip road (J) SB	8:30	9:30	3	3	50.0%	50
		9:00	10:00	3	3	50.0%	
		16:00	17:00	2	5	71.4%	
		16:30	17:30	5	4	44.4%	
16	Proposed Connecting Road - slip road (K) NB	8:30	9:30	33	13	28.3%	50
		9:00	10:00	30	9	23.1%	
		16:00	17:00	23	11	32.4%	
		16:30	17:30	24	14	36.8%	
17	Proposed Connecting Road - slip road (K) SB	8:30	9:30	21	6	22.2%	50
		9:00	10:00	17	7	29.2%	
		16:00	17:00	23	17	42.5%	
		16:30	17:30	30	16	34.8%	
18	Proposed Connecting Road - slip road (L) NB	8:30	9:30	22	10	31.3%	50
		9:00	10:00	19	13	40.6%	
		16:00	17:00	27	20	42.6%	
		16:30	17:30	33	21	38.9%	
19	Proposed Connecting Road - slip road (L) SB	8:30	9:30	38	13	25.5%	50
		9:00	10:00	31	8	20.5%	
		16:00	17:00	24	18	42.9%	
		16:30	17:30	25	19	43.2%	

Summary of Traffic Count and Percentage of Heavy Vehicle

Monitoring Station: OM5

Date: 17 November 2023

Road Segment No.	Road Description	Start Time	End Time	No. of Light Vehicle	No. of Heavy Vehicle	Percentage of Heavy Vehicle	Speed (km/h)
22	Proposed Connecting Road - slip road (N) NB	8:30	9:30	17	13	43.3%	50
		9:00	10:00	27	17	38.6%	
		16:00	17:00	37	14	27.5%	
		16:30	17:30	47	17	26.6%	
23	Proposed Connecting Road - slip road (N) SB	8:30	9:30	18	24	57.1%	50
		9:00	10:00	19	21	52.5%	
		16:00	17:00	38	21	35.6%	
		16:30	17:30	45	20	30.8%	
26	Proposed Connecting Road (P) NB	8:30	9:30	205	178	46.5%	80
		9:00	10:00	229	195	46.0%	
		16:00	17:00	171	111	39.4%	
		16:30	17:30	203	98	32.6%	
27	Proposed Connecting Road (P) SB	8:30	9:30	112	100	47.2%	80
		9:00	10:00	103	142	58.0%	
		16:00	17:00	217	110	33.6%	
		16:30	17:30	237	122	34.0%	
28	Sha Tau Kok Road - Wo Hang (A) WB	8:30	9:30	152	190	55.6%	50
		9:00	10:00	228	231	50.3%	
		16:00	17:00	194	224	53.6%	
		16:30	17:30	218	224	50.7%	
29	Sha Tau Kok Road - Wo Hang (A) EB	8:30	9:30	165	234	58.6%	50
		9:00	10:00	187	262	58.4%	
		16:00	17:00	211	204	49.2%	
		16:30	17:30	263	219	45.4%	
30	Sha Tau Kok Road - Wo Hang (B) WB	8:30	9:30	147	111	43.0%	50
		9:00	10:00	127	105	45.3%	
		16:00	17:00	204	129	38.7%	
		16:30	17:30	225	113	33.4%	
31	Sha Tau Kok Road - Wo Hang (B) EB	8:30	9:30	145	112	43.6%	50
		9:00	10:00	138	93	40.3%	
		16:00	17:00	176	108	38.0%	
		16:30	17:30	184	120	39.5%	
32	Proposed Connecting Road - slip road (Q) NB	8:30	9:30	321	250	43.8%	50
		9:00	10:00	309	273	46.9%	
		16:00	17:00	279	244	46.7%	
		16:30	17:30	258	251	49.3%	
33	Proposed Connecting Road - slip road (Q) SB	8:30	9:30	290	291	50.1%	50
		9:00	10:00	262	316	54.7%	
		16:00	17:00	339	222	39.6%	
		16:30	17:30	405	193	32.3%	
61	Wo Keng Shan Road (C) NB	8:30	9:30	64	170	72.6%	50
		9:00	10:00	38	186	83.0%	
		16:00	17:00	22	144	86.7%	
		16:30	17:30	29	141	82.9%	
62	Wo Keng Shan Road (C) SB	8:30	9:30	33	156	82.5%	50
		9:00	10:00	31	184	85.6%	
		16:00	17:00	40	151	79.1%	
		16:30	17:30	67	164	71.0%	
75	Roundabout	8:30	9:30	137	155	53.1%	50
		9:00	10:00	135	169	55.6%	
		16:00	17:00	154	150	49.3%	
		16:30	17:30	172	153	47.1%	

Summary

Station: OM1
 Date: 9 May 2023

Road Segment No.	Road Description	Speed, km/hr	Predicted Traffic Flow at Year 2033			Start Time											
			Total Flow, veh/hr	% Heavy Vehicle	% of Predicted Traffic Flow	8:30			9:00			16:00			16:30		
						Total Flow, veh/hr	% Heavy Vehicle	% of Predicted Traffic Flow	Total Flow, veh/hr	% Heavy Vehicle	% of Predicted Traffic Flow	Total Flow, veh/hr	% Heavy Vehicle	% of Predicted Traffic Flow	Total Flow, veh/hr	% Heavy Vehicle	% of Predicted Traffic Flow
20	Proposed Connecting Road (M) NB	80	1184	63.0	337	51.3%	28%	345	51.6%	29%	226	48.2%	19%	217	48.4%	18%	
21	Proposed Connecting Road (M) SB	80	1021	78.0	209	52.2%	20%	257	61.9%	25%	285	47.7%	28%	319	48.9%	31%	
53	Wo Keng Shan Road (A) NB	50	61	56.0	174	81.0%	285%	156	88.5%	256%	113	90.3%	185%	118	90.7%	193%	
54	Wo Keng Shan Road (A) SB	50	84	54.0	110	97.3%	131%	149	96.0%	177%	138	87.7%	164%	150	77.3%	179%	
55	Ng Chow Road (A) SB	50	51	49.0	30	33.3%	59%	24	33.3%	47%	20	75.0%	39%	13	53.8%	25%	
56	Ng Chow Road (A) NB	50	51	49.0	20	65.0%	39%	25	80.0%	49%	21	57.1%	41%	20	60.0%	39%	
57	Ng Chow Road (B) SB	50	51	49.0	27	59.3%	53%	18	38.9%	35%	21	76.2%	41%	17	70.6%	33%	
58	Ng Chow Road (B) NB	50	51	49.0	16	68.8%	31%	14	85.7%	27%	14	57.1%	27%	15	66.7%	29%	
59	Wo Keng Shan Road (B) NB	50	61	56.0	199	73.4%	326%	174	80.5%	285%	126	87.3%	207%	122	86.9%	200%	
60	Wo Keng Shan Road (B) SB	50	68	32.0	125	92.0%	184%	168	93.5%	247%	152	82.9%	224%	161	74.5%	237%	

Station: OM1
 Date: 16 Nov 2023

Road Segment No.	Road Description	Speed, km/hr	Predicted Traffic Flow at Year 2033			Start Time											
			Total Flow, veh/hr	% Heavy Vehicle	% of Predicted Traffic Flow	8:30			9:00			16:00			16:30		
						Total Flow, veh/hr	% Heavy Vehicle	% of Predicted Traffic Flow	Total Flow, veh/hr	% Heavy Vehicle	% of Predicted Traffic Flow	Total Flow, veh/hr	% Heavy Vehicle	% of Predicted Traffic Flow	Total Flow, veh/hr	% Heavy Vehicle	% of Predicted Traffic Flow
20	Proposed Connecting Road (M) NB	80	1184	63.0	465	46.5%	39%	523	48.2%	44%	310	43.5%	26%	320	40.3%	27%	
21	Proposed Connecting Road (M) SB	80	1021	78.0	241	48.1%	24%	282	58.9%	28%	367	42.2%	36%	397	39.8%	39%	
53	Wo Keng Shan Road (A) NB	50	61	56.0	209	79.4%	343%	193	88.6%	316%	151	90.7%	248%	147	87.1%	241%	
54	Wo Keng Shan Road (A) SB	50	84	54.0	172	85.5%	205%	175	90.9%	208%	168	82.1%	200%	187	75.4%	223%	
55	Ng Chow Road (A) SB	50	51	49.0	25	64.0%	49%	22	81.8%	43%	22	77.3%	43%	27	66.7%	53%	
56	Ng Chow Road (A) NB	50	51	49.0	24	79.2%	47%	24	87.5%	47%	20	50.0%	39%	20	60.0%	39%	
57	Ng Chow Road (B) SB	50	51	49.0	20	90.0%	39%	18	94.4%	35%	14	42.9%	27%	15	33.3%	29%	
58	Ng Chow Road (B) NB	50	51	49.0	31	80.6%	61%	20	90.0%	39%	19	63.2%	37%	20	50.0%	39%	
59	Wo Keng Shan Road (B) NB	50	61	56.0	234	77.8%	384%	215	87.9%	352%	173	89.0%	284%	174	83.9%	285%	
60	Wo Keng Shan Road (B) SB	50	68	32.0	196	84.7%	288%	199	90.5%	293%	188	78.7%	276%	207	73.9%	304%	

Station: OM4
 Date: 10 May 2023

Road Segment No.	Road Description	Speed, km/hr	Predicted Traffic Flow at Year 2033		Start Time											
			Total Flow, veh/hr	% Heavy Vehicle	8:30			9:00			16:00			16:30		
					Total Flow, veh/hr	% Heavy Vehicle	% of Predicted Traffic Flow	Total Flow, veh/hr	% Heavy Vehicle	% of Predicted Traffic Flow	Total Flow, veh/hr	% Heavy Vehicle	% of Predicted Traffic Flow	Total Flow, veh/hr	% Heavy Vehicle	% of Predicted Traffic Flow
10	Proposed Connecting Road (H) SB	80	708	88.0	175	55.4%	25%	194	60.3%	27%	275	49.1%	39%	279	45.2%	39%
11	Proposed Connecting Road - slip road (H) SB	50	48	94.0	7	28.6%	15%	5	0.0%	10%	7	71.4%	15%	15	46.7%	31%
12	Proposed Connecting Road - slip road (I) NB	50	85	82.0	9	77.8%	11%	15	46.7%	18%	13	38.5%	15%	10	30.0%	12%
13	Proposed Connecting Road (I) NB	80	768	69.0	297	49.2%	39%	288	51.7%	38%	225	46.2%	29%	226	44.2%	29%
14	Proposed Connecting Road - slip road (J) NB	50	37	32.0	4	25.0%	11%	6	0.0%	16%	11	63.6%	30%	15	60.0%	41%
15	Proposed Connecting Road - slip road (J) SB	50	32	47.0	3	33.3%	9%	4	25.0%	13%	7	57.1%	22%	9	55.6%	28%
16	Proposed Connecting Road - slip road (K) NB	50	353	58.0	39	20.5%	11%	46	39.1%	13%	33	24.2%	9%	39	23.1%	11%
17	Proposed Connecting Road - slip road (K) SB	50	414	56.0	27	18.5%	7%	27	18.5%	7%	34	23.5%	8%	36	30.6%	9%
18	Proposed Connecting Road - slip road (L) NB	50	416	53.0	29	31.0%	7%	34	29.4%	8%	34	29.4%	8%	34	26.5%	8%
19	Proposed Connecting Road - slip road (L) SB	50	313	54.0	44	20.5%	14%	41	43.9%	13%	35	31.4%	11%	45	26.7%	14%

Station: OM4
 Date: 15 Nov 2023

Road Segment No.	Road Description	Speed, km/hr	Predicted Traffic Flow at Year 2033		Start Time											
			Total Flow, veh/hr	% Heavy Vehicle	8:30			9:00			16:00			16:30		
					Total Flow, veh/hr	% Heavy Vehicle	% of Predicted Traffic Flow	Total Flow, veh/hr	% Heavy Vehicle	% of Predicted Traffic Flow	Total Flow, veh/hr	% Heavy Vehicle	% of Predicted Traffic Flow	Total Flow, veh/hr	% Heavy Vehicle	% of Predicted Traffic Flow
10	Proposed Connecting Road (H) SB	80	708	88.0	161	59.6%	23%	199	64.3%	28%	311	39.9%	44%	320	36.9%	45%
11	Proposed Connecting Road - slip road (H) SB	50	48	94.0	6	50.0%	13%	7	14.3%	15%	10	50.0%	21%	15	40.0%	31%
12	Proposed Connecting Road - slip road (I) NB	50	85	82.0	6	50.0%	7%	9	44.4%	11%	8	12.5%	9%	12	25.0%	14%
13	Proposed Connecting Road (I) NB	80	768	69.0	395	44.8%	51%	400	48.5%	52%	208	42.8%	27%	220	45.9%	29%
14	Proposed Connecting Road - slip road (J) NB	50	37	32.0	10	80.0%	27%	8	87.5%	22%	4	75.0%	11%	7	28.6%	19%
15	Proposed Connecting Road - slip road (J) SB	50	32	47.0	6	50.0%	19%	6	50.0%	19%	7	71.4%	22%	9	44.4%	28%
16	Proposed Connecting Road - slip road (K) NB	50	353	58.0	46	28.3%	13%	39	23.1%	11%	34	32.4%	10%	38	36.8%	11%
17	Proposed Connecting Road - slip road (K) SB	50	414	56.0	27	22.2%	7%	24	29.2%	6%	40	42.5%	10%	46	34.8%	11%
18	Proposed Connecting Road - slip road (L) NB	50	416	53.0	32	31.3%	8%	32	40.6%	8%	47	42.6%	11%	54	38.9%	13%
19	Proposed Connecting Road - slip road (L) SB	50	313	54.0	51	25.5%	16%	39	20.5%	12%	42	42.9%	13%	44	43.2%	14%

Station: OMS
Date: 11 May 2023

Road Segment No.	Road Description	Speed, km/hr	Predicted Traffic Flow at Year 2033		Start Time											
			Total Flow, veh/hr	% Heavy Vehicle	8:30			9:00			16:00			16:30		
					Total Flow, veh/hr	% Heavy Vehicle	% of Predicted Traffic Flow	Total Flow, veh/hr	% Heavy Vehicle	% of Predicted Traffic Flow	Total Flow, veh/hr	% Heavy Vehicle	% of Predicted Traffic Flow	Total Flow, veh/hr	% Heavy Vehicle	% of Predicted Traffic Flow
22	Proposed Connecting Road – slip road (N) NB	50	133	32.0	34	41.2%	26%	34	41.2%	26%	33	33.3%	25%	44	29.5%	33%
23	Proposed Connecting Road – slip road (N) SB	50	117	44.0	59	32.2%	50%	97	36.1%	83%	74	37.8%	63%	122	35.2%	104%
26	Proposed Connecting Road (P) NB	80	1052	67.0	354	57.3%	34%	297	53.5%	28%	203	44.8%	19%	208	41.8%	20%
27	Proposed Connecting Road (P) SB	80	905	82.0	213	55.4%	24%	219	58.9%	24%	256	48.8%	28%	269	45.0%	30%
28	Sha Tau Kok Road – Wo Hang (A) WB	50	474	53.0	414	58.7%	87%	411	56.4%	87%	436	56.7%	92%	433	49.9%	91%
29	Sha Tau Kok Road – Wo Hang (A) EB	50	522	57.0	375	56.5%	72%	359	58.5%	69%	384	52.3%	74%	438	42.2%	84%
30	Sha Tau Kok Road – Wo Hang (B) WB	50	639	43.0	245	31.4%	38%	240	26.7%	38%	300	37.7%	47%	312	33.0%	49%
31	Sha Tau Kok Road – Wo Hang (B) EB	50	609	44.0	209	30.6%	34%	208	32.2%	34%	300	48.0%	49%	305	44.9%	50%
32	Proposed Connecting Road – slip road (Q) NB	50	537	36.0	519	56.3%	97%	506	61.1%	94%	480	59.0%	89%	487	57.9%	91%
33	Proposed Connecting Road – slip road (Q) SB	50	525	44.0	621	66.3%	118%	548	65.7%	104%	497	50.5%	95%	518	48.5%	99%
61	Wo Keng Shan Road (C) NB	50	61	56.0	211	88.2%	346%	227	79.3%	372%	180	81.1%	295%	152	79.6%	249%
62	Wo Keng Shan Road (C) SB	50	68	32.0	247	85.0%	363%	204	84.8%	300%	191	78.0%	281%	275	74.5%	404%
75	Loi Tung Roundabout	50	844	45.1	289	56.1%	34%	281	56.2%	33%	286	54.2%	34%	327	50.2%	39%

Station: OMS
Date: 17 Nov 2023

Road Segment No.	Road Description	Speed, km/hr	Predicted Traffic Flow at Year 2033		Start Time											
			Total Flow, veh/hr	% Heavy Vehicle	8:30			9:00			16:00			16:30		
					Total Flow, veh/hr	% Heavy Vehicle	% of Predicted Traffic Flow	Total Flow, veh/hr	% Heavy Vehicle	% of Predicted Traffic Flow	Total Flow, veh/hr	% Heavy Vehicle	% of Predicted Traffic Flow	Total Flow, veh/hr	% Heavy Vehicle	% of Predicted Traffic Flow
22	Proposed Connecting Road – slip road (N) NB	50	133	32.0	30	43.3%	23%	44	38.6%	33%	51	27.5%	38%	64	26.6%	48%
23	Proposed Connecting Road – slip road (N) SB	50	117	44.0	42	57.1%	36%	40	52.5%	34%	59	35.6%	50%	65	30.8%	56%
26	Proposed Connecting Road (P) NB	80	1052	67.0	383	46.5%	36%	424	46.0%	40%	282	39.4%	27%	301	32.6%	29%
27	Proposed Connecting Road (P) SB	80	905	82.0	212	47.2%	23%	245	58.0%	27%	327	33.6%	36%	359	34.0%	40%
28	Sha Tau Kok Road – Wo Hang (A) WB	50	474	53.0	342	55.6%	72%	459	50.3%	97%	418	53.6%	88%	442	50.7%	93%
29	Sha Tau Kok Road – Wo Hang (A) EB	50	522	57.0	399	58.6%	76%	449	58.4%	86%	415	49.2%	80%	482	45.4%	92%
30	Sha Tau Kok Road – Wo Hang (B) WB	50	639	43.0	258	43.0%	40%	232	45.3%	36%	333	38.7%	52%	338	33.4%	53%
31	Sha Tau Kok Road – Wo Hang (B) EB	50	609	44.0	257	43.6%	42%	231	40.3%	38%	284	38.0%	47%	304	39.5%	50%
32	Proposed Connecting Road – slip road (Q) NB	50	537	36.0	571	43.8%	106%	582	46.9%	108%	523	46.7%	97%	509	49.3%	95%
33	Proposed Connecting Road – slip road (Q) SB	50	525	44.0	581	50.1%	111%	578	54.7%	110%	561	39.6%	107%	598	32.3%	114%
61	Wo Keng Shan Road (C) NB	50	61	56.0	234	72.6%	384%	224	83.0%	367%	166	86.7%	272%	170	82.9%	279%
62	Wo Keng Shan Road (C) SB	50	68	32.0	189	82.5%	278%	215	85.6%	316%	191	79.1%	281%	231	71.0%	340%
75	Loi Tung Roundabout	50	844	45.1	292	53.1%	35%	304	55.6%	36%	304	49.3%	36%	325	47.1%	39%