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Appendices

4 Noise Impact

4.1 Legislation, Standards, and Guidelines

4.1.1 General

4.1.1.1 The relevant legislation and associated guidance applicable to present the study for the assessment of noise impacts include:

- Noise Control Ordinance (NCO) (Cap.400);
- Technical Memorandum (TM) on Noise from Construction Work other than Percussive Piling (GW-TM);
- TM on Noise from Percussive Piling (PP-TM);
- TM on Noise on Construction Work in Designated Areas (DA-TM);
- TM for the Assessment of Noise from Places other than Domestic Premises, Public Places or Construction Sites (IND-TM); and
- Environmental Impact Assessment Ordinance (EIAO) (Cap. 499) and EIAO-TM.

4.1.2 Construction Noise

Airborne Construction Noise During Non-restricted Hours

4.1.2.1 The NCO provides the statutory framework for noise control in Hong Kong. Assessment procedures and standards are set out in the respective TM promulgated under NCO.

4.1.2.2 For general construction works of using Powered Mechanical Equipment (PME) other than percussive piling works, there is no statutory limit on construction noise during non-restricted hours (i.e. 07:00 – 19:00 on any day not being a Sunday or general holiday) under the NCO and related TMs. There is a Construction Noise Permit (CNP) control system on construction noise between the hours 1900 and 0700 from Monday to Saturday and at any time on general holidays (including Sundays) under the NCO. To ensure a better environment, the EIAO-TM promulgated under the EIAO has imposed more stringent criteria. Daytime general construction works (excluding percussive piling) during non-restricted hours is controlled under the EIAO. The EIAO-TM stipulates criteria of 65 to75dB(A) for daytime construction activities, as shown in **Table 4.1**.

Table 4.1 Noise Standards for Daytime Construction Activities

Uses	**Noise Standards[1], [2], Leq (30min) dB(A)**
	0700 – 1900 hours on any day not being a Sunday or general holiday
• All domestic premises; • Temporary housing accommodation; • Hostels; • Convalescent homes; and • Homes for the aged	75
• Places of public worship; • Courts of law; and • Hospitals and medical clinics	70
Educational institutions (including kindergartens and nurseries)	70 65 (During examination)

Notes:

[1] The above standards apply to uses that rely on opened windows for ventilation and are assessed at 1m from the external facade.

[2] A CNP shall be required for the carrying out of the construction work during restricted hours under the NCO. In case the applicant would like to evaluate whether construction works in the restricted hours as defined under the NCO is feasible or not in the context of programming construction works, reference should be made to relevant technical memoranda issued under the NCO.

4.1.2.3 In addition, reference has been made to EIAO Guidance Note No. 09/2010 on "Preparation of Construction Noise Impact Assessment under the Environmental Impact Assessment Ordinance".

Airborne Construction Noise during Restricted Hours

4.1.2.4 The NCO also provides statutory control on general construction works during restricted hours. The use of PME for construction works during restricted hours would require a CNP. The GW-TM details the procedures for assessing such application. The granting of a CNP is subject to the contemporary conditions and it may be revoked at any time for failure to comply with the permit conditions.

4.1.2.5 In addition to the general controls on the use of PME during restricted hours, the use of Specified Powered Mechanical Equipment (SPME) and the undertaking of Prescribed Construction Work (PCW) during the restricted hours in a designated area are also controlled by the DA-TM. Construction plant or equipment classified as SPME under the DA-TM includes hand-held breakers, bulldozers, concrete lorry mixers, dump trucks and vibratory pokers. The PCW includes the erection or dismantling of formwork or scaffolding, hammering, loading, unloading or handling of rubble, wooden boards, steel bars, wood or scaffolding material.

4.1.2.6 The DA-TM details the procedures that are adopted by the Noise Control Authority for assessing the use of SPME that are adopted during restricted hours and for determining whether a CNP could be issued.

4.1.2.7 Noise from construction activities during restricted hours at the most affected Noise Sensitive Receivers (NSRs) are controlled under the TMs and shall not generally be exceeded the specified Acceptable Noise Levels (ANLs). These ANLs are stipulated in

accordance with the Area Sensitivity Ratings established for the NSRs. The ANLs for construction works in Designated Areas are more stringent than those given in the GW-TM and summarised in **Table 4.2**.

Table 4.2 ANLs for Construction During Restricted Hours

Time Period	ANLs for Area Sensitive Ratings [1], dB(A)		
	A	B	C
All weekdays during the evening (1900 to 2300 hours), and general holidays (including Sundays) during the day and evening (0700 to 2300 hours)	60 (45)	65 (50)	70 (55)
All days during the night-time (2300 to 0700 hours)	45 (30)	50 (35)	55 (40)

Note:

[1] Figures in brackets are ANLs for SPME construction work in designated areas.

4.1.2.8 As defined in the Noise Control (Construction Work Designated Areas) Notice Plan Nos. EPD/AN/NT-01 and EPD/AN/NT-03, Lam Tei areas such as Tsoi Yuen Tsuen and Fuk Hang Tsuen; So Kwun Wat areas such as The Royale and So Kwun Wat Tsuen; Siu Lam Area such as Grand Pacific Heights; Tai Lam areas such as Tai Lam Chung Tsuen; and Tsing Lung Tau areas such as Hong Kong Garden, etc.; are within the Designated Area (DA).

4.1.2.9 Despite any description made in this report, there is no guarantee that a CNP will be issued for the project construction. The Noise Control Authority will consider a well-justified CNP application, once filed, for construction works within restricted hours as guided by the relevant TMs issued under the NCO. The Noise Control Authority will take into account contemporary conditions / situations of adjoining land uses and any previous complaints against construction activities at the site before making a decision in granting a CNP. Nothing in the report shall bind the Noise Control Authority in making a decision. If a CNP is to be issued, the Noise Control Authority shall include in it any conditions as appropriate. Failure to comply with any such conditions will lead to cancellation of the CNP and prosecution under the NCO.

Blasting

4.1.2.10 The administrative and procedural control of all blasting operations in Hong Kong is vested in the Mines Division of the Civil Engineering and Development Department (CEDD). The Dangerous Goods Regulations, Chapter 295 also stipulates that no person shall carry out blasting unless he possesses a valid mine blasting certificate to be issued by the Mines Division of CEDD. The Superintendent of Mines will review the application on a case-by-case basis before issuing the Mine Blasting Certificate. Although there is no statutory noise level for blasting, the noise associated with the removal of debris and rocks are controlled under the EIAO-TM.

Groundborne Construction Noise during Non-restricted Hours

4.1.2.11 Noise arising from general construction works that may generate groundborne noise during normal working hours is governed by the EIAO-TM under the EIAO and summarized in **Table 4.1**. The IND-TM under the NCO stipulates that noise transmitted primarily through the structural elements of building, or buildings, shall be 10 dB(A) less than the relevant ANLs.

4.1.2.12 Based on the same principle for the groundborne noise criteria (i.e. ANL-10 dB(A) under the IND-TM), the groundborne construction noise levels inside domestic premises and

schools shall be limited to 65 dB(A) and 60 dB(A) respectively when compared to the EIAO-TM. A summary of groundborne construction noise criteria during normal working days is given in **Table 4.3**.

Table 4.3 Groundborne Construction Noise Criteria

Uses	**Noise Criteria, dB(A)**
	0700 to 1900 hours **on any day not being a Sunday or general holiday**
• All domestic premises; • Temporary housing accommodation. • Hostels; • Convalescent homes; and • Homes for the aged	65
• Places of public worship; • Courts of law; and • Hospitals and medical clinics	60
Educational institutions (including kindergartens and nurseries)	60 55 (During examination)

Groundborne Construction Noise During Restricted Hours

4.1.2.13 Similar to airborne construction noise during restricted hours, NCO also provides statutory control of construction work for goundborne noise during restricted hours. As discussed in the above section, same principle for groundborne noise criteria (i.e. ANL-10dB(A) under the IND-TM) shall be adopted. Therefore, table below summarizes the groundborne construction noise criteria during restricted hours.

Table 4.4 Construction Groundborne Noise Criteria During Restricted Hours

Time Period	**Noise Criteria, dB(A) for Area Sensitivity Ratings, dB(A)**		
	A	**B**	**C**
All weekdays during the evening (1900 to 2300 hours), and general holidays (including Sundays) during the day and evening (0700 to 2300 hours)	50	55	60
All days during the night-time (2300 to 0700 hours)	35	40	45

4.1.3 Operational Noise

4.1.3.1 The EIAO-TM (Annex 5 of TM) has stipulated the noise standards for various noise sources as shown in the following **Table 4.5**. It should, however, be noted that the following noise criteria are only applicable to uses that rely on opened windows for ventilation.

Table 4.5 Noise Standards For Operational Phase

Common Uses	Noise Standards [1], [2]	
	Road Traffic Noise L10 (1hour) dB(A)	Fixed Noise Sources
• All domestic premises; • Temporary housing accommodation; • Hostels; • Convalescent homes; and • Homes for the aged	70	(a) 5dB(A) below the appropriate ANLs shown in the Technical Memorandum for the Assessment of Noise from Places Other than Domestic Premises, Public Places or Construction Sites, or (b) the prevailing background noise levels (For quiet areas with noise level 5 dB(A) below the ANL)
• Educational institutions (including kindergartens and nurseries); • Places of public worship; and • Courts of law	65	
Hospitals and medical clinics	55	

Notes:

[1] The above standards, or equivalent, apply to uses that rely on opened windows for ventilation and are assessed at 1m from the external façade.

Road Traffic Noise

4.1.3.2 The criteria for assessing road traffic noise are given in the EIAO-TM and tabulated in **Table 4.5**. For domestic premises, temporary housing accommodation, hostels, convalescent homes and homes for the aged, the criterion is 70dB(A). For educational institutes, places of worship and courts of law, the criterion is 65dB(A). For hospitals and medical clinics, a more stringent criterion of 55dB(A) is stipulated. It should be noted that all these criteria only apply to NSRs that rely on opened windows for ventilation. In addition, reference has been made on EIAO Guidance Note No. 12/2010 on "Road Traffic Noise Impact Assessment under the Environmental Impact Assessment Ordinance".

Fixed Noise Sources

4.1.3.3 Operational noise from fixed noise sources is controlled under the IND-TM. To plan for a better environment, the EIAO-TM has specified the following requirements for the planned fixed noise sources, whichever is more stringent.

- 5dB(A) below the appropriate ANLs in the IND-TM; or
- the prevailing background noise levels.

4.1.3.4 The ANLs for different Area Sensitivity Ratings during different periods are summarised in the **Table 4.6**.

Table 4.6 ANLs for Fixed Noise Sources

Time Period	ANL, dB(A)		
	Area Sensitivity Rating A	Area Sensitivity Rating B	Area Sensitivity Rating C
Day (0700 to 1900 hours)	60	65	70
Evening (1900 to 2300 hours)	60	65	70
Night (2300 to 0700 hours)	50	55	60

4.1.3.5 For assessing fixed noise sources, the Area Sensitivity Ratings at the NSRs are defined in accordance with the relevant TMs.

4.2 Baseline Conditions

4.2.1 Description of Noise Environment

4.2.1.1 As discussed in **Section 2**, the Project will have a total length of approximately 12km, covering areas in Lam Tei, So Kwun Wat, Tai Lam, Tsing Lung Tau and North Lantau.

4.2.1.2 Lam Tei Quarry Interchange and Lam Tei Tunnel will be constructed at Lam Tei. The areas are mainly comprised of villages, residential areas and greenbelts. The noise climate at Lam Tei is dictated by the road traffic noise from Yuen Long Highway (YLH), Kong Sham Western Highway (KSWH) and Castle Peak Road and railway noise from the Light Rail.

4.2.1.3 So Kwun Wat Link Road, So Kwun Wat Interchange and So Kwun Wat – Siu Lam Open Road Section will be constructed at So Kwun Wat. The areas are mainly comprised of villages, residential areas and greenbelts. The noise climate at So Kwun Wat is dictated by the road traffic noise from Tuen Mun Road (TMR).

4.2.1.4 Tai Lam Chung Tunnel will be constructed at Tai Lam. The areas are mainly comprised of Government Institution or Community (GIC) facilities, villages and greenbelts. The noise climate at Tai Lam is dictated by local roads.

4.2.1.5 Tai Lam Chung Interchange and northern end of Tsing Lung Bridge will be constructed at Tsing Lung Tau. The areas are mainly comprised of residential areas and greenbelts. The noise climate at Tsing Lung Tau is dictated by TMR and Castle Peak Road.

4.2.1.6 Southern end of Tsing Lung Bridge and North Lantau Interchange will be constructed at North Lantau. The areas are mainly greenbelt. The noise climate at North Lantau is dictated by North Lantau Highway.

4.2.2 Prevailing Noise Measurements

4.2.2.1 Prevailing noise measurements have been conducted at Lam Tei, So Kwun Wat, Tai Lam and Tsing Lung Tau in order to capture the existing noise environment near ventilation shaft for tunnel. The prevailing noise measurements were conducted between October 2022 and December 2022 and the measurements locations are shown in **Figure 4.1**. $L_{90(1hr)}$ was used as the parameter to establish the corresponding noise criteria according to HKPSG stated in **Section 4.6.2**. A summary of the results is given in **Table 4.7**. These prevailing noise measurement results are adopted to establish the fixed noise sources impact assessment criteria. **Appendix 4.1** shows the detailed prevailing noise measurement results.

Table 4.7 Prevailing Noise Level Measurements

Measurement Points		Prevailing Noise Levels (L_{90}) [1], dB(A)		
ID	**Location**	**Day [2]**	**Evening [2]**	**Night [2]**
Lam Tei				
PNM-LT	Fu Tei Ha Tsuen, Lam Tei	52-58	50-55	45-53
So Kwun Wat				
PNM-SKW1	MacLehose Trail Section 10 near So Kwun Wat Tsuen	55-58	55-56	47-54
PNM-SKW2	So Kwun Wat Tsuen	59-62	58-60	50-59

Measurement Points		Prevailing Noise Levels (L_{90}) [1], dB(A)		
ID	**Location**	**Day [2]**	**Evening [2]**	**Night [2]**
PNM-SKS	So Kwun Wat San Tsuen	37-42	37-40	37-41
Tai Lam				
PNM-TLC	Tai Lam Correctional Institution	50-55	49-51	49-53
PNM-TAI	Tai Lam Chung Tsuen	39-47	37-44	35-42
Tsing Lung Tau				
PNM-TLT	Tsing Lung Tau-Access Road near L'aquatique	48-56	47-49	47-51

Notes:

[1] Noise level with a 3dB(A) façade correction.

[2] Day: 0700-1900 hours, Evening: 1900-2300 hours, Night: 2300-0700 hours.

4.3 Noise Sensitive Receivers

4.3.1 Identification of Noise Sensitive Receivers

4.3.1.1 With reference to Annex 13 of the EIAO-TM, Noise Sensitive Receivers (NSRs) include residential uses (all domestic premises, temporary housing accommodation, hostels), educational institutions (including kindergarten and nurseries), hospitals, medical clinics, homes for the aged, convalescent homes, places of worship, courts of law and any others premises or places that are considered by the Director to have similar sensitivity to noise as the above.

4.3.1.2 Representative NSRs within the assessment area have been identified with the most affected layer of NSRs selected as Noise Assessment Points (NAPs) for assessment. These NSRs cover all existing sensitive developments, committed and planned NSRs during construction and operational phases of the Project.

4.3.1.3 The existing NSRs are identified by means of topographic maps, aerial photos, land status plans and site inspections. Planned / committed NSRs within the Assessment Area are identified by making reference to relevant documents as listed:

- Lam Tei and Yick Yuen Outline Zoning Plan (OZP) (No. S/TM-LTYY/12 dated 18 November 2022);
- Tuen Mun OZP (No. S/TM/37 dated 2 May 2023);
- So Kwun Wat OZP (No. S/TM-SKW/14 dated 30 September 2022);
- Tsuen Wan West OZP (No. S/TWW/20 dated 16 December 2022);
- North-East Lantau OZP (No. S/I-NEL/12 dated 8 November 2005);
- Planning Applications under of S.16 / S.12a Town Planning Ordinance;
- Land Sale Programme published by the Lands Department; and
- Other relevant published plans, including plans, drawings and applications by the correspondent project proponents.

4.3.1.4 Assessment areas and locations of NSRs are shown in **Figure 4.2**. Identified NSRs within 300m assessment area for construction noise, road traffic noise and fixed noise sources impact are listed in **Table 4.8** below. Discussion on the assessment area for construction noise, road traffic noise, and fixed noise sources impact is given in **Section 4.4**, **Section**

4.5 and **Section 4.6** respectively. Photos of the representative NSRs are presented in **Appendix 4.2**.

Table 4.8 NSRs within 300m Assessment Area for Construction Noise, Road Traffic Noise and Fixed Noise Sources Impact

NSR ID [1]	OZP Land Use	Description	Use [2]	Number of Storeys	Construction Noise	Road Traffic Noise	Fixed Noise Sources Impact
Existing NSRs							
a. Lam Tei							
LT01A	GB	Area at/near Wo Ping San Tsuen	R	1-3	✓	✓	X
LT01B	V	Area at/near Wo Ping San Tsuen	R	1-3	✓	✓	X
LT02A	GB	Area at/near Tsoi Yuen Tsuen	R	1-3	✓	✓	X
LT02B	R(D)	Area at/near Tsoi Yuen Tsuen	R	1-3	✓	✓	X
LT03A	R(C)	Area at/near Fuk Hang Tsuen	R	1-3	✓	✓	X
LT03B	R(C)	Area at/near Fuk Hang Tsuen	R	1-3	✓	✓	X
LT03C	R(D)	Area at/near Fuk Hang Tsuen	R	1-3	✓	✓	X
	R(D)	Church of Christian Faith Lam Tei Gospel Church	W	3	✓	✓	X
LT03D	GB	Area at/near Fuk Hang Tsuen	R	1-3	✓	✓	X
	GB	Church of Christian Faith Lam Tei Gospel Church	W	3	✓	✓	X
LT03E	CDA	Area at/near Fuk Hang Tsuen	R	1-3	✓	✓	X
	CDA	Temple at Fuk Hang Tsuen	W	1	✓	✓	X
LT03F	GB	Area at/near Fuk Hang Tsuen	R	1-3	✓	✓	X
LT03G	CDA	Area at/near Fuk Hang Tsuen	R	1-3	✓	✓	X
LT04	GB	Village Houses near Tung Fuk Road	R	1-3	✓	✓	X
LT05	GIC	Miu Fat Buddhist Monastery Ksitigarbha Hall	W	1	✓	✓	X
	GIC	Madam Lau Kam Lung Secondary School of Miu Fat Buddhist Monastery	E	7	✓	✓	X
	GIC	Miu Fat Buddhist Monastery Elderly Home	R	6	✓	✓	X
LT06	CDA	The Sherwood	R	16-17	✓	✓	X
LT07	V	Area at/near Tuen Mun San Tsuen	R	1-3	✓	✓	X
LT08	R(B)3	Botania Villa	R	11	✓	✓	X
LT09	R(B)3	GreenView	R	11	✓	✓	X
LT10	V	Area at/near To Yuen Wai	R	1-3	✓	X	X
LT11A	GB	Area at/near Lo Fu Hang	R	1-3	✓	✓	X

NSR ID [1]	OZP Land Use	Description	Use [2]	Number of Storeys	Construction Noise	Road Traffic Noise	Fixed Noise Sources Impact
	GB	Temples at Lo Fu Hang	W	1	✓	✓	X
LT11B	OU	Area at/near Lo Fu Hang	R	1-3	✓	✓	X
LT12A	GB	Area at/near Fu Tei Ha Tsuen	R	1-3	✓	✓	X
	GB	Temples at Fu Tei Ha Tsuen	W	3	✓	✓	X
LT12B	OU	Area at/near Fu Tei Ha Tsuen	R	1-2	✓	✓	✓
b. So Kwun Wat / Siu Lam/ Tai Lam							
SKW01A	GB	Area at/near So Kwun Wat Tsuen	R	1-3	✓	✓	✓
SKW01B	R(B)	Area at/near So Kwun Wat Tsuen	R	1-3	✓	✓	X
SKW01C	V	Area at/near So Kwun Wat Tsuen	R	1-3	✓	✓	X
SKW01D	GB	Area at/near So Kwun Wat Tsuen	R	1-3	✓	✓	X
SKW02	R(B)1	The Bloomsway-The Laguna	R	15-18	✓	✓	X
SKW03	R(B)1	The Bloomsway-The Terrace	R	3-7	✓	✓	X
SKW04	R(B)1	The Bloomsway-The Highland	R	3	✓	✓	X
SKW05	GIC	Harrow International School Hong Kong Staff Dormitory	R	9	✓	✓	X
	GIC	Harrow International School Hong Kong [8]	E	5-8	✓	✓	X
SKW06	GIC	Chu Hai College of Higher Education	E	7	✓	✓	X
SKW07	R(B)	Houses at Mun Fat Lane	R	1-3	✓	✓	X
SKW08	R(B)	Palm Beach	R	12	✓	✓	X
SKW09	R(B)15	The Royale	R	14-20	✓	✓	X
SKW10	GIC	STFA Lee Kam Primary School	E	9	✓	✓	X
SKW11	GIC	PLK Women's Welfare Club Western District Fung Lee Pui Yiu Primary School	E	8	✓	✓	X
SKW12	R(B)	Villa La Plage	R	3	✓	✓	X
SKW13	R(B)	Surfside	R	3	✓	✓	X
SKW14	R(B)	Blessing Villa	R	3	✓	✓	X
SKW15	R(B)	Spring Seaview Terrace	R	10-11	✓	✓	X
SKW16	R(B)	Monte Carlo Villas	R	2	✓	✓	X
SKW17	R(B)12	Hong Kong Gold Coast	R	25	✓	✓	X
SKW18	R(B)5	Aegean Coast	R	29	✓	✓	X

NSR ID [1]	OZP Land Use	Description	Use [2]	Number of Storeys	Construction Noise	Road Traffic Noise	Fixed Noise Sources Impact
SKW19	R(B)	Avignon	R	10	✓	✓	X
SKW20	R(B)17	Emerald Bay	R	20	✓	✓	X
SKW21	R(B)	NAPA	R	10	✓	✓	X
SKW22	GIC	Institute of Training and Development, Immigration Service	E	13	✓	✓	X
SKW23	Not Used						
SKW24	R(B)18	Le Pont	R	3-20	✓	X	X
SKW25	R(B)18	York International Pre-School	E	1	✓	X	X
SKW26	GIC	A.D. & F.D. of Pok Oi Hospital Mrs Cheng Yam On Millennium School	E	8	✓	X	X
SKW27	R(B)2	OMA OMA	R	16-18	✓	X	X
SKW28	GB	Siu Sau Tsuen	R	1-3	✓	X	X
SKW29	R(C)1	Grandview Terrace	R	3	✓	X	X
SKW30	R(B)2	Siu Lam San Tsuen	R	1-3	✓	X	X
SKW31	R(C)1	Peak Castle	R	3	✓	X	X
SKW32	R(B)13	The Castle Bay	R	1-3	✓	X	X
SL01A	GB	Area at/near So Kwun Wat San Tsuen	R	1-3	✓	✓	X
SL01B	V	Area at/near So Kwun Wat San Tsuen	R	1-3	✓	✓	✓
SL02	GB	Area at/near Siu Lam	R	1-3	✓	✓	✓
SL03	R(B)1	Grand Pacific Heights	R	24	✓	✓	X
SL04	GIC	Siu Lam Psychiatric Centre	R	4	✓	✓	X
SL05	GIC	Tai Lam Correctional Institution Dormitory	R	1-6	✓	✓	✓
SL06	GB	Area at/near Luen On San Tsuen	R	1-2	✓	✓	X
SL07	V	Area at/near Tai Lam Chung Tsuen	R	1-3	✓	✓	✓
c. Tsing Lung Tau							
TLT01A	GB	Area at/near Ka Loon Tsuen	R	1-3	✓	✓	X
TLT01B	R(C)	Area at/near Ka Loon Tsuen	R	1-3	✓	✓	X
TLT02	R(C)	Vistacove	R	3	✓	✓	X
TLT03	R(C)	Area at/near Tsing Lung Tau	R	1-3	✓	✓	X
TLT04A	V	Area at/near Choi Yuen Tsuen	R	1-3	✓	✓	X

NSR ID [1]	OZP Land Use	Description	Use [2]	Number of Storeys	Construction Noise	Road Traffic Noise	Fixed Noise Sources Impact
TLT04B	GB	Area at/near Choi Yuen Tsuen	R	1-3	✓	✓	✓
TLT05	R(B)1	Hong Kong Garden	R	20-29	✓	✓	✓
TLT06	R(B)	L'Aquatique	R	15	✓	✓	X
TLT07A	V	Area at/near Tsing Lung Tau New Village	R	1-3	✓	✓	X
TLT07B	GB	Area at/near Tsing Lung Tau New Village	R	1-3	✓	X	X
TLT08	R(B)	Royal Sea Crest	R	21	✓	X	X
TLT09	R(B)	Lung Tang Court	R	12	✓	X	X
d. North Lantau							
NL01	GB	Area at/near Tai Chuen	R	2	✓	✓	✓
e. Pillar Point [9]							
_ [10]	GB / GIC	Area near Tuen Mun West Fresh Water Service Reservoir	NA [10]	NA [10]	✓	X	X
Committed / Planned NSRs							
a. Lam Tei							
P1A	R(D)	Public Housing development at Nai Wai (population intake year is not available) [11]	R	55-56	✓	✓	X
P1B	R(C)	Public Housing development at Nai Wai (population intake year is not available) [11]	R	56	✓	✓	X
P2A	R(D)	Public Housing development at Lam Tei North (population intake year is not available) [11]	R	51-59	✓	✓	X
P2B	GB	Public Housing development at Lam Tei North (population intake year is not available) [11]	R	51-59	✓	✓	X
P3	GIC	Residential Care Home for the Elderly (RCHE) at Lam Tei (population intake in 2025-2026)	R	12	✓	✓	X
P4	CDA	CDA at Fuk Hang Tsuen Lane (population intake year is not available)	R	6	✓	✓	X
P5	CDA	CDA of Lot 2883 in D.D.130 at Fuk Hang Tsuen Lane (population intake year is not available)	R	3	✓	✓	X
P6	RI/R(D)/ GB/ OU	Lam Tei North East Development (population intake is not yet available)	R	[4]	X	X	X
b. So Kwun Wat / Siu Lam/ Tai Lam							
P7	R(B)	Residential Development at Y/TM/29, Various Lots in D.D.374 (population intake in 2028)	R	16-20	✓	✓	X

NSR ID [1]	OZP Land Use	Description	Use [2]	Number of Storeys	Construction Noise	Road Traffic Noise	Fixed Noise Sources Impact
P8	CDA(3)	Comprehensive Residential Development at TMTL Lot No.496 (population intake year is not available)	R	16-20	✓	✓	X
P9	GIC	Elderly Centre under Planning Application No. A/TM/578 (population intake year is not available)	R	8	✓	✓	X
P10	R(B)20	Residential Development at TMTL Lot No.518 (population intake year is not available)	R	20-23 [5]	✓	✓	X
P11	R(B)14	Residential Development at TMTL Lot No. 546 (population intake year is not available)	R	30 [6]	✓	✓	X
P12	R(B)2	Residential Development at TMTL Lot No. 520 (population intake year is not available)	R	30 [7]	✓	✓	X
c. Tsing Lung Tau							
P13	R(B)	Comprehensive Residential Development at Lot 94 in D.D. 388 (population intake in 2028)	R	15	✓	✓	X
P14	R(C)	Transitional Housing at 115 Castle Peak Road Tsing Lung Tau (tentative operation from 2023 to 2027)	R	3	✓	X	X

Notes:

[1] The assessment will only include NSRs which rely on opened windows for ventilation and within 300m assessment area.

[2] R-Residential, E-Educational Institutions, W-Place of Public Worship.

[3] For areas with committed/ planned development with site formation works/ population intake before 2028, only committed/planned NSRs have been considered. For areas with committed/ planned developments with site formation works/ population intake between 2028 and 2033 or without any available development programme, both existing and committed/planned NSRs have been considered.

[4] Lam Tei North East Development is still under Early Feasibility Study Stage, details of the Development are not yet available. As communicated with CEDD, assessments on Planned Lam Tei North East Development will be covered in its separate study.

[5] Based on maximum building height of 90mPD as stipulated in Town Planning Board RNTPC Paper No. 9/17.

[6] Since the land at P11 is under landsale programme from Lands Department (LandsD) and there was no available information on the maximum building height or maximum number of floor from relevant departments and operators during the preparation of this Report, 30 floors were assumed with reference to other residential development nearby, e.g. Aegean Coast.

[7] Based on maximum building height of 80mPD as stipulated in Tuen Mun OZP No. S/TM/37.

[8] For conservative assessment, openable window is assumed for Harrow International School Hong Kong.

[9] For magazine site only.

[10] No noise sensitive use building within 300m from magazine site.

[11] Although there is no confirmed programme on population intake for Proposed Public Housing Developments at Ping Shan South, Yuen Long, Lam Tei North and Nai Wai, Tuen Mun, it is confirmed by CEDD that the existing premises or place within the areas shall have been resumed for these planned developments by the time when R11 is commissioned. Hence, only planned NSRs within these development areas are included for noise assessment. The locations of representative NSRs for Proposed Public Housing Developments at Ping Shan South, Yuen Long, Lam Tei North and Nai Wai are based on conceptual plan provided by CEDD.

4.4 Construction Noise Impact Assessment

4.4.1 Construction Noise Impact Assessment Methodology

4.4.1.1 As set out in Appendix C Clause 2.1.2 of the EIA Study Brief (SB), a qualitative assessment is required to identify the major noise sources / activities, and propose corresponding quieter construction method and equipment adopted to demonstrate that no adverse construction noise impact will be associated with the Project. A summary of key steps for this qualitative construction noise assessment that has been conducted is:

- Determine 300m from the boundary of the Project Site and associated works and temporary work site / works area;
- Identify NSRs and locate representative assessment points that may be affected by the works;
- Summarize the construction method for the key construction work;
- Collate the construction plant inventory for the key construction work;
- Evaluate the potential impact on the NSRs qualitatively;
- Examine and recommend all practical mitigation measures, such as alternative construction methodology, quiet plant, silencer, enclosure, etc., to alleviate any potential noise impacts as much as practicable; and
- Consider noise mitigation measures that follows Annex 13 of EIAO-TM and EIAO Guidance Note No. 9/2010 on "Preparation of Construction Noise Impact Assessment under the Environmental Impact Assessment Ordinance".

4.4.2 Identification of Construction Noise Impact

Identification of Assessment Area and Noise Sensitive Receiver

4.4.2.1 The assessment area for construction noise includes an area within 300m from the site boundary of the Project and the work site / work areas of the Project. NSRs that are affected by construction noise impact are identified for construction noise assessment. Noise Assessment Points (NAPs) at these NSRs are selected for construction noise impact assessment and presented in **Table 4.8** and are summarised in **Table 4.9**. Locations of Representative NSRs and NAPs for construction noise impact assessment are shown in **Figure 4.3**.

Table 4.9 NSRs within 300m Assessment Area for Construction Noise

NSR ID [1]	OZP Land Use	Description	Use [2]	Number of Storeys	NAP ID [3]
Existing NSRs					
a. Lam Tei					
LT01A	GB	Area at/near Wo Ping San Tsuen	R	1-3	WPS-01 to WPS-02
LT01B	V	Area at/near Wo Ping San Tsuen	R	1-3	WPS-03
LT02A	GB	Area at/near Tsoi Yuen Tsuen	R	1-3	TYT-01
LT02B	R(D)	Area at/near Tsoi Yuen Tsuen	R	1-3	TYT-02 to TYT-17
LT03A	R(C)	Area at/near Fuk Hang Tsuen	R	1-3	FHT-01 to FHT-04
LT03B	R(C)	Area at/near Fuk Hang Tsuen	R	1-3	FHT-06 to FHT-11
LT03C	R(D)	Area at/near Fuk Hang Tsuen	R	1-3	FHT-12 to FHT-26, FHT-30, FHT-33
	R(D)	Church of Christian Faith Lam Tei Gospel Church	W	3	Te-02a
LT03D	GB	Area at/near Fuk Hang Tsuen	R	1-3	FHT-27 to FHT-29, FHT-31, FHT-32, FHT-34, FHT-35
	GB	Church of Christian Faith Lam Tei Gospel Church	W	3	Te-02b
LT03E	CDA	Area at/near Fuk Hang Tsuen	R	1-3	FHT-36
	CDA	Temple at Fuk Hang Tsuen	W	1	Te-03
LT03F	GB	Area at/near Fuk Hang Tsuen	R	1-3	FHT-37 to FHT-44
LT03G	CDA	Area at/near Fuk Hang Tsuen	R	1-3	FHT-05
LT04	GB	Village Houses near Tung Fuk Road	R	1-3	VH-01 to VH-12
LT05	GIC	Miu Fat Buddhist Monastery Ksitigarbha Hall	W	1	Te-01
	GIC	Madam Lau Kam Lung Secondary School of Miu Fat Buddhist Monastery	E	7	eLKL-01
	GIC	Miu Fat Buddhist Monastery Elderly Home	R	6	MFB-01
LT06	CDA	The Sherwood	R	16-17	SHE-01 to SHE-15
LT07	V	Area at/near Tuen Mun San Tsuen	R	1-3	[4]
LT08	R(B)3	Botania Villa	R	11	BOT-01 to BOT-03
LT09	R(B)3	GreenView	R	11	GRE-01
LT10	V	Area at/near To Yuen Wai	R	1-3	TYW-01
LT11A	GB	Area at/near Lo Fu Hang	R	1-3	LFH-02 to LFH-17
	GB	Temples at Lo Fu Hang	W	1	Te-07
LT11B	OU	Area at/near Lo Fu Hang	R	1-3	LFH-01, LFH-18 to LFH-19

NSR ID [1]	OZP Land Use	Description	Use [2]	Number of Storeys	NAP ID [3]
LT12A	GB	Area at/near Fu Tei Ha Tsuen	R	1-3	FTT-02 to FTT-05
	GB	Temples at Fu Tei Ha Tsuen	W	3	Te-04 to Te-06
LT12B	OU	Area at/near Fu Tei Ha Tsuen	R	1-2	FTT-01
b. So Kwun Wat / Siu Lam/ Tai Lam					
SKW01A	GB	Area at/near So Kwun Wat Tsuen	R	1-3	SKW-01 to SKW-17
SKW01B	R(B)	Area at/near So Kwun Wat Tsuen	R	1-3	SKW-19 to SKW-27
SKW01C	V	Area at/near So Kwun Wat Tsuen	R	1-3	SKW-28
SKW01D	GB	Area at/near So Kwun Wat Tsuen	R	1-3	SKW-31
SKW02	R(B)1	The Bloomsway-The Laguna	R	15-18	LAG-01 to LAG-02
SKW03	R(B)1	The Bloomsway-The Terrace	R	3-7	TER-01 to TER-05
SKW04	R(B)1	The Bloomsway-The Highland	R	3	[4]
SKW05	GIC	Harrow International School Hong Kong Staff Dormitory	R	9	HIS-06
	GIC	Harrow International School Hong Kong	E	5-8	eHIS-01 to eHIS-04
SKW06	GIC	Chu Hai College of Higher Education	E	7	[5]
SKW07	R(B)	Houses at Mun Fat Lane	R	1-3	MUN-01 to MUN-03
SKW08	R(B)	Palm Beach	R	12	PAL-01 to PAL-02
SKW09	R(B)15	The Royale	R	14-20	ROY-01 to ROY-03
SKW10	GIC	STFA Lee Kam Primary School	E	9	eSTF-01
SKW11	GIC	PLK Women's Welfare Club Western District Fung Lee Pui Yiu Primary School	E	8	ePLK-01
SKW12	R(B)	Villa La Plage	R	3	VIL-01 to VIL-11
SKW13	R(B)	Surfside	R	3	SUR-01
SKW14	R(B)	Blessing Villa	R	3	BLV-01
SKW15	R(B)	Spring Seaview Terrace	R	10-11	SPR-01
SKW16	R(B)	Monte Carlo Villas	R	2	MON-01 to MON-02
SKW17	R(B)12	Hong Kong Gold Coast	R	25	GOL-01 to GOL-05
SKW18	R(B)5	Aegean Coast	R	29	AEG-01 to AEG-02
SKW19	R(B)	Avignon	R	10	AVI-01 to AVI-16
SKW20	R(B)17	Emerald Bay	R	20	EME-01
SKW21	R(B)	NAPA	R	10	NAA-01 to NAA-02
SKW22	GIC	Institute of Training and Development, Immigration Service	E	13	[5]
SKW24	R(B)18	Le Point	R	3-20	LEP-01 to LEP-02
SKW25	R(B)18	York International Pre-School	E	1	eYIS-01

NSR ID [1]	OZP Land Use	Description	Use [2]	Number of Storeys	NAP ID [3]
SKW26	GIC	A.D. & F.D. of Pok Oi Hospital Mrs Cheng Yam On Millennium School	E	8	ePOH-01
SKW27	R(B)2	OMA OMA	R	16-18	OMA-01
SKW28	GB	Siu Sau Tsuen	R	1-3	SST-01
SKW29	R(C)1	Grandview Terrace	R	3	GRT-01 to GRT-03
SKW30	R(B)2	Siu Lam San Tsuen	R	1-3	[4]
SKW31	R(C)1	Peak Castle	R	3	PEC-01
SKW32	R(B)13	The Castle Bay	R	1-3	[4]
SL01A	GB	Area at/near So Kwun Wat San Tsuen	R	1-3	SKS-01 to SKS-03
SL01B	V	Area at/near So Kwun Wat San Tsuen	R	1-3	SKS-04 to SKS-08
SL02	GB	Area at/near Siu Lam	R	1-3	SIU-01 to SIU-16
SL03	R(B)1	Grand Pacific Heights	R	24	GRA-01 to GRA-02
SL04	GIC	Siu Lam Psychiatric Centre	R	4	SPC-01 to SPC-04
SL05	GIC	Tai Lam Correctional Institution Dormitory	R	1-6	TLC-01 to TLC-03, TLC-05 to TLC-08
SL06	GB	Area at/near Luen On San Tsuen	R	1-2	LOS-01 to LOS-05
SL07	V	Area at/near Tai Lam Chung Tsuen	R	1-3	TAI-01 to TAI-24
c. Tsing Lung Tau					
TLT01A	GB	Area at/near Ka Loon Tsuen	R	1-3	KLT-01 to KLT-11
TLT01B	R(C)	Area at/near Ka Loon Tsuen	R	1-3	KLT-12
TLT02	R(C)	Vistacove	R	3	VIS-01 to VIS-03
TLT03	R(C)	Area at/near Tsing Lung Tau	R	1-3	TLT-01
TLT04A	V	Area at/near Choi Yuen Tsuen	R	1-3	CYT-01
TLT04B	GB	Area at/near Choi Yuen Tsuen	R	1-3	CYT-02 to CYT-15
TLT05	R(B)1	Hong Kong Garden	R	20-29	HKG-01 to HKG-17
TLT06	R(B)	L'Aquatique	R	15	LAQ-01
TLT07A	V	Area at/near Tsing Lung Tau New Village	R	1-3	TLN-01 to TLN-05
TLT07B	GB	Area at/near Tsing Lung Tau New Village	R	1-3	TLN-06 to TLN-07
TLT08	R(B)	Royal Sea Crest	R	21	RSC-01 to RSC-02
TLT09	R(B)	Lung Tang Court	R	12	[4]
d. North Lantau					
NL01	GB	Area at/near Tai Chuen	R	2	[4]
e. Pillar Point [9]					
_ [10]	GB / GIC	Area near Tuen Mun West Fresh Water Service Reservoir	NA [10]	NA [10]	NA [10]

NSR ID [1]	OZP Land Use	Description	Use [2]	Number of Storeys	NAP ID [3]
Committed/ Planned NSRs					
a. Lam Tei					
P1A	R(D)	Public Housing development at Nai Wai (population intake year is not yet available) [11]	R	55-56	p-NAW-01 to p-NAW-16
P1B	R(C)	Public Housing development at Nai Wai (population intake year is not yet available) [11]	R	56	p-NAW-17 to p-NAW-20
P2A	R(D)	Public Housing development at Lam Tei North (population intake year is not yet available) [11]	R	51-59	p-LTN-01 to p-LTN-04, p-LTN-11 to p-LTN-12
P2B	GB	Public Housing development at Lam Tei North (population intake year is not yet available) [11]	R	51-59	p-LTN-05 to p-LTN-10
P3	GIC	RCHE at Lam Tei (population intake in 2025-2026)	R	12	[5]
P4	CDA	CDA at Fuk Hang Tsuen Lane (population intake year is not available)	R	6	pp-FHA-01 to pp-FHA-06
P5	CDA	CDA of Lot 2883 in D.D.130 at Fuk Hang Tsuen Lane (population intake year is not available)	R	3	p-FHB-01
b. So Kwun Wat / Siu Lam/ Tai Lam					
P7	R(B)	Residential Development under Planning Application No. Y/TM/29, Various Lots in D.D.374 (population intake in 2028)	R	16-20	pp-SKW1-01 to pp-SKW1-07
P8	CDA(3)	Comprehensive Residential Development at TMTL Lot No.496 (population intake year is not available)	R	16-20	pp-SKW2-01 to pp-SKW2-09
P9	GIC	Elderly Centre under Planning Application No. A/TM/578 (population intake year is not available)	R	8	pp-SKW3-01 to pp-SKW3-02
P10	R(B)20	Residential Development at TMTL Lot No.518 (population intake year is not available)	R	20-23 [6]	p-SKW4-01 to p-SKW4-08
P11	R(B)14	Residential Development at TMTL Lot No. 546 (population intake year is not available)	R	30 [7]	pp-CRO-01 to pp-CRO-02
P12	R(B)2	Residential Development at TMTL Lot No. 520 (population intake year is not available)	R	30 [8]	pp-SKW5-01 to pp-SKW5-03
c. Tsing Lung Tau					
P13	R(B)	Comprehensive Residential Development at Lot 94 in D.D. 388 (population intake in 2028)	R	15	[4]
P14	R(C)	Transitional Housing at 115 Castle Peak Road Tsing Lung Tau (tentative operation from 2023 to 2027)	R	3	p-TRA-01 to p-TRA-02

Notes:

[1] The assessment will only include NSRs which rely on opened windows for ventilation and within 300m assessment area.

[2] R-Residential, E-Educational Institutions, W-Place of Public Worship.

[3] For areas with committed/ planned development with site formation works/ population intake before 2028, only committed/planned NSRs have been considered. For areas with committed/ planned developments with site formation works/ population intake between 2028 and 2033 or without any available development programme, both existing and committed/planned NSRs have been considered.

[4] NSR is blocked by terrain/ other developments / structures, etc., and hence NAP is not the representative worst and so not considered in the assessment.

[5] As confirmed by the operator/ project proponent, central air-conditioning is provided at the facade facing to the Project Road, and hence no NAP is considered.

[6] Based on maximum building height of 90mPD as stipulated in Town Planning Board RNTPC Paper No. 9/17.

[7] Since the land at P11 is under landsale programme and there was no available information on the maximum building height or maximum number of floor from relevant departments and operators during the preparation of this Report, 30 floors were assumed with reference to other residential development nearby, e.g. Aegean Coast.

[8] Based on maximum building height of 80mPD as stipulated in Tuen Mun OZP No. S/TM/37.

[9] For magazine site only.

[10] No noise sensitive use building within 300m from magazine site.

[11] Although there is no confirmed programme on population intake for Proposed Public Housing Developments at Ping Shan South, Yuen Long, Lam Tei North and Nai Wai, Tuen Mun, it is confirmed by CEDD that the existing premises or place within the areas shall have been resumed for these planned developments by the time when R11 is commissioned. Hence, only planned NSRs within these development areas are included for noise assessment. The locations of representative NSRs for Proposed Public Housing Developments at Ping Shan South, Yuen Long, Lam Tei North and Nai Wai are based on conceptual plan provided by CEDD.

Inventory of Noise Sources

4.4.2.2 **Section 2** has described the key project elements and the associated construction methodology. The potential sources of noise impact during the construction of the Project would be the use of PME for various construction activities. The key construction works would include the following:

- Construction of road tunnels at Lam Tei, So Kwun Wat and Tai Lam;
- Construction of open roads, interchanges, flyovers and slip roads at Lam Tei, So Kwun Wat, Tai Lam, Tsing Lung Tau and North Lantau;
- Construction of Tsing Lung Bridge, including reclamation at Tsing Lung Tau;
- Realignment of So Kwun Wat Road at So Kwun Wat, TMR at Tsing Lung Tau and North Lantau Highway at Lantau;
- Road widening of Chui Fuk Road at Lam Tei and Tai Lam Chung Road at Tai Lam;
- Provision of noise barriers/enclosures to mitigate the noise impact on NSRs;
- Site formation, construction and decommission of explosive magazine site;
- Geotechnical works and natural terrain hazard mitigation works; and
- Ancillary works including slope works/formation, administration areas, ventilation buildings, other tunnel operation area, barging facilities, reprovision of existing facilities, landscaping works, road lighting, etc.

4.4.2.3 The currently envisaged construction programme would not require percussive piling. With due consideration of the EPD's list of good practices and state-of-the-art technologies within the industry, the following quieter construction methods / equipments are applicable in this Project.

- Quieter type saw and hydraulic crusher can be adopted for concrete removal for site clearance and road realignment works;
- Use non-explosive chemical expansion agent, hydraulic splitter for concrete or rock breaking activities;
- Use self-compacting concrete for concreting work to replace the vibratory poker;
- Press-in piling method can be adopted to retain the running traffic lanes during construction of the realigned TMR; and
- Pre-cast segments can be widely used in viaduct construction instead of in-situ concreting works.

4.4.2.4 Alternative method using Tunnel Boring Machine (TBM) has also been considered for construction of tunnels as a quieter construction method. However, as discussed in **Section 2.9.2**, it is considered not applicable due to engineering issues and constraints.

4.4.2.5 According to the construction methodology envisaged at this stage, the construction activities and its associated tentative PMEs has been identified in the following **Table 4.10**. The plant inventory adopted for the assessment have been confirmed by Project Engineer and HyD (Highways Department). It is noted that the Contractor would consider the engineering data available at that time and review and update this tentative construction plant inventory in the upcoming Construction Noise Management Plan (CNMP).

Table 4.10 Tentative Plant inventory for key construction activities

Activities	Possible PMEs Required [1]		
Site clearance and formation	• Air compressor • Backhoe • Breaker • Compactor • Crane	• Drill rig • Dump truck • Excavator • Generator • Grout mixer	• Grout pump • Hydraulic crusher • Lorry • Saw • Water pump
Reclamation	• Air compressor • Bulldozers • Conveyor belts • Crane	• Derrick barges • Dump trucks • Excavators • Generators	• Tug boats • Vibratory compactors • Water pumps
Construction of vehicular bridges	• Air compressor • Bar bender and cutter • Breaker • Cable hoist • Concrete lorry mixer • Concrete mixer • Concrete pump • Derrick barge	• Piling machine • Elevator • Excavator • Generator • Hydraulic Slip Form Machine • Lorry • Mobile crane	• Saw • Strand spinning machine • Tower Crane • Tug boat • Vibratory poker • Water pump • Winch
Construction of administration areas at Lam Tei and North Lantau	• Air compressor • Bar bender and cutter • Concrete lorry mixer • Concrete mixer • Concrete pump • Dump truck	• Excavator • Generator • Grout mixer • Grout pump • Lorry	• Mobile crane • Piling machine • Vibrating hammer • Vibratory poker • Water pump
Construction of ventilation buildings at Lam Tei, So Kwun Wat, Tai Lam and Tsing Lung Tau	• Air compressor • Bar bender and cutter • Concrete lorry mixer • Concrete mixer • Concrete pump	• Dump truck • Excavator • Generator • Lorry	• Mobile crane • Piling machine • Vibratory poker • Water pump
Construction of tunnel sections at Lam Tei, So Kwun Wat and Tai Lam	• Batching plant • Breaker • Concrete lorry mixer • Concrete mixer • Concrete pump • Conveyor belt	• Drill • Dumper • Dump truck • Excavator • Generator • Grader	• Grinder • Lorry • Mobile crane • Rock drill • Ventilation fan
Construction of portal structures at Lam Tei, So Kwun Wat, Tai Lam and Tsing Lung Tau	• Air compressor • Bar bender and cutter • Concrete lorry mixer • Concrete pump	• Dump truck • Excavator • Generator • Lorry	• Mobile Crane • Vibratory poker • Water pump
Road works [2]	• Air compressor • Asphalt paver • Bar bender and cutter • Compactor • Concrete lorry mixer • Concrete pump	• Dump truck • Excavator • Generator • Launching girder • Lorry • Mobile crane	• Paint liner marker • Roller • Trailer truck • Vibratory poker • Water pump
Installation of noise mitigation measures	• Lorry	• Mobile crane	

Activities	Possible PMEs Required [1]		
Construction works for magazine sites	• Breaker • Drill • Dumper • Dump truck	• Excavator Generator • Grader • Grinder	• Lorry • Mobile crane • Rock drill • Ventilation fan
Demolition works for existing barriers / magazine sites	• Air compressor • Breaker • Crane lorry	• Dump truck • Excavator • Generator	• Lorry • Mobile crane • Saw
Construction of Barging facility	• Conveyor belt • Derrick Barge	• Dump truck • Excavator	• Mobile crane • Tug boat
Construction of Concrete Batching Plant	• Air compressor • Breaker • Concrete lorry mixer • Concrete pump	• Dump truck • Excavator • Generator • Mobile crane	• Vibratory poker • Water pump
Construction of Anchorages for Tsing Lung Bridge	• Concrete lorry mixer • Concrete pump • Excavator	• Dump truck • Mobile crane	• Tower Crane • Water pump
Slope works	• Breaker • Concrete lorry mixer • Compactor • Drill • Drill rig	• Dump truck • Excavator • Generator • Grout mixer • Grout pump	• Hydraulic crusher • Lorry • Saw • Vibratory poker • Water pump
Geotechnical works	• Drilling rig	• Generator	• Water Pump
Landscape works	• Breaker • Dump truck • Excavator	• Generator • Lorry	• Mobile Crane • Saw

Notes:

[1] Quiet equipment or QPME would be adopted where appliable and practicable.

[2] Includes pavement, signage, drainage works and road widening.

4.4.2.6 For construction of tunnel, other than the above PME, drill and blast would be anticipated to carry out during the restricted hours. CNPs will have to be obtained by the Contractor before implementation of constructions works within the restricted hours.

4.4.3 Evaluation of Construction Noise Impact

Lam Tei Area

4.4.3.1 Key construction work sites in Lam Tei area include those within Lam Tei Quarry area and Fuk Hang Tsuen / Tsoi Yuen Tsuen area.

4.4.3.2 For the work sites within Lam Tei Quarry, key construction activities include site formation, slope cutting, construction of portal structures and tunnel section, construction of columns and decks for viaduct sections, construction of at-grade roads, road widening of Chui Fuk Road, construction of administration area and ventilation building, and construction of an underground magazine. NSRs in the vicinity include Lo Fu Hang, Fu Tei Ha Tsuen, and village houses along Tung Fuk Road. All these NSRs are village houses of 1 to 3 storeys high. Their separation distances are ranging approximately less than 20m from the nearest site boundary, approximately 200 to 260m from portal structures and tunnel section, approximately 30 to 130m from columns and decks of viaduct sections, approximately 190m to 220m from ventilation buildings and approximately 130m to 310m from underground magazine site. Based on the PME anticipated at this stage (see **Section 4.4.2**), it is considered that the mitigation measures

and good site practices including use of Quality Powered Mechanical Equipment (QPME) / quieter construction methods, noise barriers, noise enclosures and locating mobile plant as far away from NSRs as possible and practicable, etc., as discussed in **Section 4.4.4** would be required to control the associated construction noise impacts. However, as the NSRs near Lo Fu Hang, Fu Tei Ha Tsuen, and along Tung Fuk Road would be relatively closer to the site formation works (i.e. approximately less than 20m), there would be a need for a site hoarding with higher surface density and height to provide extra noise attenuation for the PME.

4.4.3.3 For the work sites within Fuk Hang Tsuen / Tsoi Yuen Tsuen area, key construction activities include site formation, construction of columns and decks for viaduct sections and construction noise mitigation measures on some of the viaduct sections. NSRs in the vicinity include the village houses of 1 to 3 storeys high near Fuk Hang Tsuen , Tsoi Yuen Tsuen, Wo Ping San Tsuen, etc., and the multistorey residential buildings such as The Sherwood, Botania Villa and GreenView. For the village houses and the multistorey residential buildings , their ranges of separation distances are approximately less than 20m to 250m from the nearest site boundary, approximately less than 20m to 270m from columns and decks of viaduct sections and approximately 60m to 180m from noise barriers. Based on the PME anticipated at this stage (see **Section 4.4.2**), it is considered that the mitigation measures and good practices including use of QPME / quieter construction methods, noise barriers, noise enclosures and locating mobile plant as far away from NSRs as possible and practicable, etc. as discussed in **Section 4.4.4** would be required to control the associated construction noise impacts. However, as the village houses NSRs near Fuk Hang Tsuen and Tsoi Yuen Tsuen would be relatively closer to the site formation work (i.e. approximately less than 20m), there would be a need for a site hoarding with higher surface density and height to provide extra noise attenuation to protect these NSRs.

4.4.3.4 For the construction of the viaduct sections and road works on the viaduct sections, it will mainly be conducted at vertical height of at least 10m above the local ground level. Once the slab of the viaduct sections is constructed, the viaduct slab will provide noise screening to villages houses near Fuk Hang Tsuen and Tsoi Yuen Tsuen, etc. for the construction activities above the viaduct slab. Hence, adverse construction noise impacts to village houses during construction at viaduct deck level is not anticipated. Besides, the construction methodology has duly considered the opportunities of optimizing the site works as much as practicable, and hence the use of pre-cast bridge decking would be adopted as much as practicable, that would further reduce the construction noise impacts.

4.4.3.5 Construction vehicles would also be required to transport various materials to and from the construction sites as necessary. In order to minimise the loading on existing roads (e.g. Fuk Hang Tsuen Road and Castle Peak Road, etc.), the Contractor will implement measures to ensure construction traffic would avoid the peak hours where practicable. This would largely help to minimise the nuisance from both traffic and environmental perspectives. It is also noted that the traffic induced by various construction works in Lam Tei Area including tunnelling, stockpiling, slope works, construction of administration building and ventilation buildings, etc. would vary as the construction progresses. For example, the construction traffic generated during the initial and later stages would likely be less than those during the peak construction period which would constitute a relatively shorter period. The Detailed Designer and the Contractor shall review all the contemporary issues (e.g. constructability, site constraints, detailed GI information, etc.) to optimise the construction methodology and the generation of construction vehicles. For Lam Tei Area in particular, the latest available information at this stage suggests that the

construction traffic generated along Fuk Hang Tsuen Road and Castle Peak Road would be typically in the order of 20 construction vehicles per hour per direction. During the peak construction phase, the construction traffic generated may increase to 60 vehicles per hour per direction.

So Kwun Wat Area

4.4.3.6 Key construction work sites in So Kwun Wat include those area near MacLehose Trail Section 10, along So Kwun Wat Road and along TMR.

4.4.3.7 For the work sites near MacLehose Trail Section 10, key construction activities include site formation, slope cutting, construction of portal structures and tunnel sections, construction of columns and decks for viaduct sections, construction of at-grade roads, construction of ventilation buildings and construction of noise barriers/ enclosures. NSRs in the vicinity include areas near So Kwun Wat Tsuen. All these NSRs are village houses of 1 to 3 storeys high. Their ranges of separation distances are approximately less than 20m from the nearest site boundary, approximately 70 to 220m from portal structures and tunnel section, approximately 30 to 70m from columns and decks of viaduct sections and approximately 50 to 190m from ventilation buildings and noise barriers/ enclosures. Based on the PME anticipated at this stage (**Section 4.4.2**), it is considered that the mitigation measures and good site practices including use of QPME / quieter construction methods, noise barriers, noise enclosures and locating mobile plant as far away from NSRs as possible and practicable, etc. as discussed in **Section 4.4.4** would be required to control the associated construction noise impacts. However, as the NSRs near So Kwun Wat Tsuen would be relatively closer to the site formation work (i.e. approximately less than 20m), there would be a need for a site hoarding with higher surface density and height to provide extra noise attenuation to protect these NSRs.

4.4.3.8 For the work sites along So Kwun Wat Road, key construction activities include site formation, construction of at-grade road and realignment of So Kwun Wat Road. NSRs in the vicinity include the village houses near So Kwun Wat Tsuen of 1 to 3 storeys high, and the multistorey residential buildings such as Avignon, Emerald Bay, NAPA, Le Pont, etc. Schools, including STFA Lee Kam Primary School and PLK Women's Welfare Club Western District Fung Lee Pui Yiu Primary School, of 8 to 9 storeys high are also found along So Kwun Wat Road as well. Their ranges of separation distances are approximately less than 20m to 250m from the nearest site boundary, approximately less than 20m to 250m from at-grade road and 50m to 240m from realignment of So Kwun Wat Road. Based on the PME anticipated at this stage (see **Section 4.4.2**), it is considered that the mitigation measures and good site practices including use of QPME / quieter construction methods, noise barriers, noise enclosures and locating mobile plant as far away from NSRs as possible and practicable, etc. as discussed in **Section 4.4.4** would be required to control the associated construction noise impacts. However, as the NSRs along So Kwun Wat Road would be relatively closer to the site formation work (i.e. approximately less than 20m), there would be a need for a site hoarding with higher surface density and height to provide extra noise attenuation to protect these NSRs.

4.4.3.9 For the work sites along TMR, key construction activities include site formation and construction of columns and decks for viaduct sections. NSRs in the vicinity include the village houses near So Kwun Wat Tsuen and houses at Mun Fat Lane of 1 to 3 storeys high, and the multistorey residential buildings such as The Bloomsway, The Royal, Palm Beach, Aegean Coast, etc. Schools including Harrow International School Hong Kong of 5 to 8 storeys high are found along TMR as well. Their separation distances are ranging from approximately less than 20m to 230m from the nearest site boundary and 30m to

260m from columns and decks of viaduct sections. Based on the PME anticipated at this stage (see **Section 4.4.2**), it is considered that the mitigation measures and good site practices including use of QPME / quieter construction methods, noise barriers, noise enclosures and locating mobile plant as far away from NSRs as possible and practicable, etc. as discussed in **Section 4.4.4** would be required to control the associated construction noise impacts. However, as the NSRs along TMR would be relatively closer to the site formation work (i.e. approximately less than 20m), there would be a need for a site hoarding with higher surface density and height to provide extra noise attenuation to protect these NSRs.

4.4.3.10 Construction vehicles would be required to transport various materials to and from the construction sites as necessary. In order to minimise the loading on existing roads (e.g. So Kwun Wat Road, etc.), the Contractor will implement measures to ensure construction traffic would avoid the peak hours where practicable. This would largely help to minimise the nuisance from both traffic and environmental perspectives. It is also noted that the traffic induced by various construction works in So Kwun Wat Area including tunnelling, stockpiling, slope works and construction of ventilation buildings, etc. would vary as the construction progresses. For example, the construction traffic generated during the initial and later stages would likely be less than those during the peak construction period which would constitute a relatively shorter period. The Detailed Designer and the Contractor shall review all the contemporary issues (e.g. constructability, site constraints, detailed GI information, etc.) to optimise the construction methodology and the generation of construction vehicles. For So Kwun Wat Area in particular, the latest available information at this stage suggests that the construction traffic generated along So Kwun Wat Road would be typically in the order of 20 construction vehicles per hour per direction respectively. During the peak construction phase, the construction traffic generated may increase to 25 vehicles per hour per direction for So Kwun Wat Road respectively.

Siu Lam Area

4.4.3.11 For the work sites near Siu Lam, key construction activities include site formation, slope cutting, construction of portal structures and tunnel section, construction of columns and decks for viaduct sections and construction of ventilation building. NSRs in the vicinity include village houses near So Kwun Wat San Tsuen and Siu Lam, Siu Lam Psychiatric Centre and multistorey residential buildings such as Grandview Terrace and Grand Pacific Heights. Their separation distances are ranging from approximately less than 20m to 210m from the nearest site boundary, approximately less than 20m to 260m from slope cutting, approximately 100m to 260m from portal structures and tunnel section, approximately 100 to 260m from columns and decks of viaduct sections and approximately 80 to 260m from ventilation building. Based on the PME anticipated at this stage (see **Section 4.4.2**), it is considered that the mitigation measures and good site practices including use of QPME / quieter construction methods, noise barriers, noise enclosures and locating mobile plant as far away from NSRs as possible and practicable, etc. as discussed in **Section 4.4.4** would be required to control the associated construction noise impacts. However, as the NSRs near Siu Lam would be relatively closer to the site formation work (i.e. approximately less than 20m), there would be a need for a site hoarding with higher surface density and height to provide extra noise attenuation to protect these NSRs.

4.4.3.12 For the construction of the viaduct sections and road works on the viaduct section, it will be conducted at vertical height of at least 30m above the local ground level. Once the slab of the viaducts is constructed, the viaduct slab will provide noise screening to village

houses near So Kwun Wat San Tsuen and Siu Lam, etc. for the construction activities above the viaduct slab. Hence, adverse construction noise impacts to village houses during construction at viaduct deck level is not anticipated. Besides, the construction methodology has duly considered the opportunities of optimizing the site works as much as practicable, and hence would adopt the use of pre-cast bridge decking would be adopted as much as possible, that would further reduce the construction noise impacts.

4.4.3.13 Construction vehicles would be required to transport various materials to and from the construction sites as necessary. In order to minimise the loading on existing roads (e.g. Kwun Fat Street, etc.), the Contractor will implement measures to ensure construction traffic would avoid the peak hours where practicable. This would largely help to minimise the nuisance from both traffic and environmental perspectives. It is also noted that the traffic induced by various construction works in Siu Lam Area including tunnelling, stockpiling, slope works and construction of ventilation buildings, etc. would vary as the construction progresses. For example, the construction traffic generated during the initial and later stages would likely be less than those during the peak construction period which would constitute a relatively shorter period. The Detailed Designer and the Contractor shall review all the contemporary issues (e.g. constructability, site constraints, detailed GI information, etc.) to optimise the construction methodology and the generation of construction vehicles. For Siu Lam Area in particular, the latest available information at this stage suggests that the construction traffic generated along Kwun Fat Street would be typically in the order of 60 construction vehicles per hour per direction respectively. During the peak construction phase, the construction traffic generated may increase to 90 vehicles per hour per direction for Kwun Fat Street respectively.

Tai Lam Area

4.4.3.14 For the work sites near Tai Lam Area, key construction activities include site formation, slope cutting, road widening of Tai Lam Chung Road, construction of portal structures and tunnel section, construction of columns and decks for viaduct sections and construction of ventilation building. NSRs within Tai Lam include the village houses near Tai Lam Chung Tsuen and Luen On San Tsuen, and Tai Lam Correctional Institution. Their separation distances are ranging from approximately less than 20m to 150m from the nearest site boundary, approximately 110m to 260m from portal structures and tunnel section, approximately 50m to 180m and columns and decks of viaduct sections and approximately 110m to 260m from ventilation buildings. Based on the PME anticipated at this stage (see **Section 4.4.2**), it is considered that the mitigation measures and good site practices including use of QPME / quieter construction methods, noise barriers, noise enclosures and locating mobile plant as far away from NSRs as possible and practicable, etc. as discussed in **Section 4.4.4** would be required to control the associated construction noise impacts. However, as the NSRs at Tai Lam Correctional Institution would be relatively closer to the site formation work, there would be a need for a site hoarding with higher surface density and height to provide extra noise attenuation to protect these NSRs.

4.4.3.15 For the construction of the viaduct sections and road works on the viaduct section, it will be conducted at vertical height of at least 20m above the local ground level. Once the slab of the viaducts is constructed, the viaduct slab will provide noise screening to villages houses near Tai Lam Chung Tsuen, Luen On San Tsuen and Tai Lam Correctional Institution for the construction activities above the viaduct slab. Hence, adverse construction noise impacts to village houses during construction at viaduct deck level is not anticipated. Besides, the construction methodology has duly considered the opportunities of optimizing the site works as much as practicable, and hence the use of

pre-cast bridge decking would be adopted as much as possible, that would further reduce the construction noise impacts.

4.4.3.16 Construction vehicles would be required to transport various materials to and from the construction sites as necessary. In order to minimise the loading on existing roads (e.g. Tai Lam Chung Road, etc.), the Contractor will implement measures to ensure construction traffic would avoid the peak hours where practicable. This would largely help to minimise the nuisance from both traffic and environmental perspectives. It is also noted that the traffic induced by various construction works in Tai Lam Area including tunnelling, stockpiling, slope works and construction of ventilation building, etc. would vary as the construction progresses. For example, the construction traffic generated during the initial and later stages would likely be less than those during the peak construction period which would constitute a relatively shorter period. The Detailed Designer and the Contractor shall review all the contemporary issues (e.g. constructability, site constraints, detailed GI information, etc.) to optimise the construction methodology and the generation of construction vehicles. For Tai Lam Area in particular, the latest available information at this stage suggests that the construction traffic generated along Tai Lam Chung Road would be typically in the order of 35 construction vehicles per hour per direction. During the peak construction phase, the construction traffic generated may increase to 50 vehicles per hour per direction.

Tsing Lung Tau Area

4.4.3.17 For the work sites within Tsing Lung Tau Area, key construction activities include site formation, slope cutting, reclamation, construction of portal structures and tunnel sections, construction of Tsing Lung Bridge, construction of at-grade roads, construction of ventilation buildings and construction of noise mitigation measures.

4.4.3.18 NSRs located in the vicinity include the village houses near Choi Yuen Tsuen, which are located on the terrain that will be overlooking the construction area along TMR. Their separation distances are ranging from approximately less than 20m from the nearest site boundary, approximately 60m from portal structures and tunnel sections, approximately 220m from Tsing Lung Bridge, less than 20m from at-grade and noise mitigation measures. Based on the PME anticipated at this stage (see **Section 4.4.2),** it is considered that the mitigation measures and good site practices including use of QPME / quieter construction methods, noise barriers, noise enclosures and locating mobile plant as far away from NSRs as possible and practicable, etc. as discussed in **Section 4.4.4** would be required to control the associated construction noise impacts. However, as the NSRs at Choi Yuen Tsuen would be relatively closer to the site formation work at TMR, there would be a need for a site hoarding with higher surface density and height to provide extra noise attenuation to protect these NSRs directly fronting TMR. The NSRs further back within Choi Yuen Tsuen would have been partially screened from TMR by the village houses directly fronting TMR.

4.4.3.19 For Tsing Lung Tau New Village and Ka Loon Tsuen of 1 to 3 storeys high, and low density residential houses such as Vistacove, they are located between TMR and Castle Peak Road which will be screened by the natural terrain. Based on the PME anticipated at this stage (see **Section 4.4.2**), it is considered that the mitigation measures and good site practices including use of QPME / quieter construction methods, noise barriers, noise enclosures and locating mobile plant as far away from NSRs as possible and practicable, etc. as discussed in **Section 4.4.4** would be required to control the associated construction noise impacts.

4.4.3.20 It is noted that the Transitional Housing at 115 Castle Peak Road (i.e. former Vista Cliff) would be located within 20m from the reclamation site. These transitional housing would be up to 3 storeys high. There would be a need for a site hoarding with higher surface density and height to provide extra noise attenuation.

4.4.3.21 For the multistorey residential buildings such as Hong Kong Garden and L'Aquatique, their separation distances are ranging from approximately less than 20m to 20m from the nearest site boundary, approximately 160m to 280m from reclamation, approximately 180m to 270m from portal structures and tunnel section, approximately 180m to 250m from Tsing Lung Bridge and approximately 50m to 200m at-grade and noise mitigation measures. Based on the PME anticipated at this stage (see **Section 4.4.2**), it is considered that the mitigation measures and good site practices including use of QPME / quieter construction methods, noise barriers, noise enclosures and locating mobile plant as far away from NSRs as possible and practicable, etc. as discussed in **Section 4.4.4** would be required to control the associated construction noise impacts.

4.4.3.22 While majority of the various materials will be transported through the barging facilities, construction vehicles would still be required to transport various materials to and from the construction sites as necessary. In order to minimise the loading on existing roads (e.g. Castle Peak Road, etc), the Contractor will implement measures to ensure construction traffic would avoid the peak hours where practicable. This would largely help to minimise the nuisance from both traffic and environmental perspectives. It is also noted that the traffic induced by various construction works in Tsing Lung Tau Area including tunnelling, stockpiling, slope works, realignment of Tuen Mun Road, construction of northern anchorage for Tsing Lung Bridge and construction of ventilation building, etc. would vary as the construction progresses. For example, the construction traffic generated during the initial and later stages would likely be less than those during the peak construction period which would constitute a relatively shorter period. The Detailed Designer and the Contractor shall review all the contemporary issues (e.g. constructability, site constraints, detailed GI information, etc.) to optimise the construction methodology and the generation of construction vehicles. For Tsing Lung Tau Area in particular, the latest available information at this stage suggests that the construction traffic generated along Castle Peak Road would be typically in the order of 15 construction vehicles per hour per direction. During the peak construction phase, the construction traffic generated may increase to 20 vehicles per hour per direction.

North Lantau

4.4.3.23 For the work sites within North Lantau Area, key construction activities include site formation, construction of columns and decks for viaduct sections, construction of at-grade roads and administration area. NSRs in the vicinity include the village houses near Tai Chuen. Their separation distances are ranging from approximately 250m to280m from the nearest site boundary. Based on the PME anticipated at this stage (see **Section 4.4.2**), it is considered that the mitigation measures and good site practices including use of QPME / quieter construction methods, noise barriers, noise enclosures and locating mobile plant as far away from NSRs as possible and practicable, etc. as discussed in **Section 4.4.4** would be required to control the associated construction noise impacts.

4.4.3.24 While many of the spoil generated rom the slope cutting would be conveyed back to the concrete batching plant in To Kau Wan, some of the spoil would still need to be transported off-site for further processing in designated facilities (e.g. fill bank) via barging facility in To Kau Wan. Nevertheless, construction vehicles would still be required to transport various materials to and from the construction sites as necessary. In

order to minimise the loading on existing roads (e.g. North Lantau Highway and the connecting local roads, etc.), the Contractor will implement measures to ensure construction traffic would avoid the peak hours where practicable. This would largely help to minimise the nuisance from both traffic and environmental perspectives. It is also noted that the traffic induced by various construction works in North Lantau Area stockpiling, slope works, construction of southern anchorage for Tsing Lung Bridge, local realignment of North Lantau Highway and construction of ventilation building, etc. would vary as the construction progresses. For example, the construction traffic generated during the initial and later stages would likely be less than those during the peak construction period which would constitute a relatively shorter period. The Detailed Designer and the Contractor shall review all the contemporary issues (e.g. constructability, site constraints, detailed GI information, etc.) to optimise the construction methodology and the generation of construction vehicles. For North Lantau Area in particular, the latest available information at this stage suggests that the construction traffic generated along North Lantau Highway and the connecting local roads would be minimal, in the order of 10 construction vehicles per day per direction.

Drill and Blasts for Underground Tunnel and Magazine Site

4.4.3.25 As discussed in **Section 2**, the initial sections of the tunnels will be excavated by mechanical methods. Drill-and-blast excavation will then be adopted for the construction of remaining tunnel sections starting from approximately 50m beyond the tunnel portal. The drill-and-blast works would possibly be conducted throughout a 24-hour cycle on a daily basis as the worst case scenario subject to the granting of CNP. For safety reason, a metal blast door would be installed at the portal and this blast door would be closed during the blasting works. According to the latest construction methodology, only 9 cycles of explosion would be conducted per week at each workfront that will be subject to the agreement from the Mines Division. Blasting should be carried out outside sensitive hours as far as practicable. As the blasting works will only last for very short duration and be infrequent, it will not cause adverse airborne nor groundborne noise impacts to NSRs in the vicinity.

4.4.3.26 Besides, even though all blasts will be conducted underground, the Contractor will be required to post highly visible warning notices/signs, with the blasting date and time stated, at suitable locations, i.e. near the intended blasting location, to alert the public on blasting works.

Magazine Sites at Lam Tei Quary, Siu Lam and Pillar Point

4.4.3.27 The underground magazine site at Lam Tai Quarry would be constructed by a combination of drill-and-blast and mined tunnelling methodology. Similar to the underground tunnel as discussed in the above sections, given that suitable mitigation measures are implemented, the noise generated by the construction of this underground explosive magazine site is not anticipated to be significant.

4.4.3.28 For the surface magazine sites at Siu Lam and Pillar Point, key construction activities include site formation and construction of the explosive storage. The nearest NSRs in the vicinity of the magazine site at Siu Lam is the village houses which are located at approximately 260m away. Based on the PME anticipated at this stage (see **Section 4.4.2**), it is considered that the mitigation measures and good site practices including use of QPME / quieter construction methods, noise barriers, noise enclosures and locating mobile plant as far away from NSRs as possible and practicable, etc. as discussed in **Section 4.4.4** would be required to control the associated construction noise impacts. For the surface magazine site at Pillar Point, there are no NSRs within 300m and in view of

the scale of the construction works, hence, adverse construction noise impact is not anticipated to the nearby NSRs.

Surface Blasting at Lam Tei, Tsing Lung Tau and North Lantau

4.4.3.29 Surface blasting works would also be required at several rock cut slope sites along the alignment where large portions of rock will be excavated. Surface blasting is anticipated to be excavated in a bench system with one to two blast(s) per day at each workfront that will be subject to the agreement from the Mines Division. Blasting should be carried out outside sensitive hours as far as practicable. Similar to the underground blasting, the surface blasting works will only last for very short duration and be infrequent, it will not cause adverse airborne nor groundborne noise impacts to NSRs in the vicinity.

Consideration of Cumulative Impacts

4.4.3.30 **Section 2.12** has identified a list of concurrent projects that would been to be considered in this EIA to address any significant cumulative impacts. The following sections discuss the cumulative impacts for each area.

4.4.3.31 For Lam Tei Area, concurrent projects include Tuen Mun Bypass (TMB), Widening of Yuen Long Highway (Section between Lam Tei Quarry and Tong Yan San Tsuen Interchange), Widening of Fuk Hang Tsuen Road (Between Castle Peak Road – Lam Tei and Fuk Hang Tsuen Lane), Underground Quarrying at Lam Tei, Tuen Mun, Relocation of Tuen Mun Water Treatment Works to Caverns, Hung Shui Kiu / Ha Tsuen New Development Area, Public Housing Development near Tan Kwai Tsuen, Yuen Long, Proposed Public Housing Developments at Ping Shan South, Yuen Long, Lam Tei North and Nai Wai, Tuen Mun, and Development at Lam Tei North East.

4.4.3.32 For TMB, the works area in Lam Tei Area would be much smaller than of the Project. The project proponent of TMB is the same as the Project and would implement the equivalent set of noise mitigation measures as the Project. Adverse cumulative construction impacts from TMB are therefore not anticipated.

4.4.3.33 For Widening of Yuen Long Highway (Section between Lam Tei Quarry and Tong Yan San Tsuen Interchange), the planning study is still on-going. It is anticipated that its study would consider all committed projects in the vicinity, including but not limited to Project during its subsequent study. Similar to any other studies by government, it is anticipated that they will also implement all the best practices to abate construction noise impacts where practicable. On this basis, adverse cumulative construction noise impacts from these projects are therefore not anticipated.

4.4.3.34 For Widening of Fuk Hang Tsuen Road (Between Castle Peak Road – Lam Tei and Fuk Hang Tsuen Lane), as there is no overlap of construction period, the cumulative impact during construction phase is not anticipated.

4.4.3.35 The Study of Underground Quarrying at Lam Tei, Tuen Mun, Relocation of Tuen Mun Water Treatment Works to Caverns and Development at Lam Tei North East are still on-going and there are no definitive design information at the time of preparing this EIA. Nevertheless, it is anticipated that their studies would consider all committed projects in the vicinity, including but not limited to Project during their subsequent study. Similar to any other studies by government, it is anticipated that they will also implement all the best practices to abate construction noise impacts where practicable. On this basis, adverse cumulative construction noise impacts from these projects are therefore not anticipated.

4.4.3.36 For Hung Shui Kiu / Ha Tsuen New Development Area, it is located at around 300m from the Project. For Public Housing Development near Tan Kwai Tsuen, Yuen Long, it is located at outside 300m assessment area. Given the large separation from the Project, adverse cumulative construction impacts from these concurrent projects are therefore not anticipated.

4.4.3.37 For Proposed Public Housing Developments at Ping Shan South, Yuen Long, Lam Tei North and Nai Wai, Tuen Mun, it would mainly involve site clearance, site formation and superstructure construction. As any other housing developments, it is anticipated that they will also implement all the best practices to abate construction noise impacts where practicable. On this basis, adverse cumulative construction noise impacts from the Site Formation and Infrastructure Works for Proposed Public Housing Developments at Ping Shan South, Yuen Long, Lam Tei North and Nai Wai, Tuen Mun are therefore not anticipated.

4.4.3.38 For So Kwun Wat and Tsing Lung Tau Area, the concurrent projects include the Widening of Castle Peak Road - Castle Peak Bay, Developments of Tuen Mun East and Adjacent Green Belt Cluster, Cycle Track between Tsuen Wan and Tuen Mun and Cycle Track between Tsuen Wan Bayview Garden and So Kwun Wat.

4.4.3.39 For the cycle track projects, given the relatively small scale of these cycle tracks, together with the good practices that they would implement, adverse cumulative construction noise impacts are therefore not anticipated.

4.4.3.40 For Developments of Tuen Mun East and Adjacent Green Belt Cluster, the planning study is still on-going and there is no definitive design information at the time of preparing this EIA. Nevertheless, it is anticipated that its study would consider all committed projects in the vicinity, including but not limited to Project during their subsequent study. Similar to any other studies by government, it is anticipated that they will also implement all the best practices to abate construction noise impacts where practicable. On this basis, adverse cumulative construction noise impacts from these projects are therefore not anticipated.

4.4.3.41 For Widening of Castle Peak Road - Castle Peak Bay, as there is no overlap of construction period, the cumulative impact during construction phase is not anticipated.

4.4.3.42 For North Lantau Area, concurrent projects include Sunny Bay Development, Road P1 (Tai Ho-Sunny Bay Section), Tsing Yi Lantau Link (TYLL) and Hong Kong Island West – Northeast Lantau (HKIW-NEL) Link. All these projects are still undergoing their respective studies and there is no definitive design information at the time of preparing this EIA. Nevertheless, it is anticipated that their studies would consider all committed projects in the vicinity, including but not limited to Project during their subsequent study. As any other studies by government, it is anticipated that they will also implement all the best practices to abate construction noise impacts where practicable. On this basis, adverse cumulative construction noise impacts from these projects are therefore not anticipated.

4.4.4 Mitigation of Construction Noise Impact

4.4.4.1 Due to the short separation from NSRs, for some construction areas, without proper noise mitigation measures, construction noise exceedances are anticipated. The following mitigation measures have been considered and confirmed the practicality by the Project Engineers:

- Good site practices to limit noise emissions at the source;
- Use of quality powered mechanical equipment (QPME) and quieter construction methods and equipment;
- Use of temporary noise barriers and noise enclosure to screen noise from relatively static PMEs;
- Install acoustic tunnel door or enclosure at the tunnel portal opening for tunnelling activities; and
- Alternative use of plant items within one worksite, wherever practicable.

4.4.4.2 The above mitigation measures would need to be implemented in work sites as good practices where appropriate. The future Contractor will also be required to prepare a CNMP with reference to Section 8 and Annex 21 of the EIAO-TM as well as this EIA Report and Environmental Monitoring and Audit (EM&A) Manual. The CNMP shall identify the exact inventory of noise sources, summarise the mitigation measures to be implemented for the Project and review of the effectiveness and practicality of all proposed mitigation measures for the construction noise impact of the Project. Detailed descriptions of these mitigation measures are given in the following sections.

Good Site Management Practices

4.4.4.3 Good site practice and noise management techniques could considerably reduce the noise impact from construction site activities on nearby NSRs. The following measures should be practised during each phase of construction:

- Only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction programme;
- Machines and plants (such as trucks, cranes, etc.) that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum;
- Plants known to emit noise strongly in one direction, where possible, be orientated so that the noise is directed away from nearby NSRs;
- Silencers or mufflers on construction equipment should be properly fitted and maintained during the construction works;
- Mobile plants should be located as far away from NSRs as possible and practicable; and
- Material stockpiles, site office and other structures should be effectively utilised, where practicable, to screen noise from on-site construction activities.

4.4.4.4 The benefits of these techniques can vary according to specific site conditions and operations. The environmental noise climate would certainly be improved with these control practices, although the improvement can only be quantified during implementation when specific site parameters are known.

Use of QPME and Quieter Construction Methods

4.4.4.5 To further mitigate construction noise impacts, quieter construction equipment/ methods would be adopted when necessary, including the use of quieter powered mechanical equipment for demolition (e.g. hydraulic crusher), quieter method for rock/ concrete breaking (e.g. quieter type saw, non-explosive chemical expansion agent, hydraulic splitter), non-percussive construction method, silent piling by press-in method, pre-cast segments construction, self-compacting concrete, etc. Use of quiet plant associated with

the construction works is made reference to the QPME/ other commonly used PME listed in adopted by Environmental Protection Department (EPD) web pages as far as possible which includes the sound power levels (SWLs) for specific quiet PME, and the quiet construction method and equipment listed in EPD web page. It is generally known (supported by field measurement) that particular models of construction equipment are quieter than standard types given in the TM-GW. The use of quieter construction equipment/ methods, if necessary, will be further reviewed in the detailed design and construction stages, and in the CNMP.

Use of Movable Noise Barrier and Full Enclosure for Relatively Stationary Plant Source

4.4.4.6 Movable temporary noise barriers that can be located close to noisy plant and be moved concurrently with the plant along a worksite can be very effective for screening noise from NSRs. A typical design which has been used locally is a wooden framed barrier with a small-cantilevered upper portion of surface mass density no less than 14kg/m^2 on a skid footing with approximately 50mm thick internal sound absorptive lining. The Contractor shall critically review the contemporary conditions and develop the detailed design of the noise mitigation measures. This measure is particularly effective for low level zone of NSRs. A cantilevered top cover would be required to achieve screening benefits at upper level zone of NSRs. Schematic drawing for the noise barrier and full enclosure are given in **Appendix 4.3**.

4.4.4.7 Movable temporary noise barriers will be used for some PME (e.g. excavator). It is anticipated that suitably designed barriers could achieve at least 5dB(A) reduction for movable plant and 10dB(A) for stationary plant.

4.4.4.8 For the use of movable noise barrier for at-grade construction works, working space would be adopted for their manoeuvrability and placement. Generally, sufficient separation between major plants during at-grade construction works is envisaged to cater for the use of temporary movable noise barriers onsite. Temporary movable noise barrier can be placed close to noise source locally as far as practicable.

4.4.4.9 The use of standard enclosure would be adopted to shelter relatively stationary plant including air compressor, generator, etc. These standard enclosures can provide at least 15dB(A) noise reduction.

Install Acoustic Tunnel Door or Enclosure at the Portal Opening for Tunnelling Activities

4.4.4.10 It is considered that installation of acoustic tunnel door or enclosure at the tunnel portals is an effective mitigation measure for construction works to be conducted inside the tunnels. The acoustic tunnel door or enclosure should be made of acoustic panels and the ventilation openings of the tunnel door or enclosure should also be fitted with silencers. The Contractor should select a proper type of acoustic panel and silencer which can provide necessary noise reduction performance to achieve the full compliance of ANLs.

Alternative use of plant items within one worksite

4.4.4.11 In practice, some plant items will operate sequentially within the same work site, and certain reduction of the predicted noise impacts could be achieved. However, any additional control on the sequencing of plant will impose a restrictive constraint to the Contractor on the operation and planning of plant items, and the implementation of the requirement would be difficult to be monitored. Hence, sequencing operation of PME has not been taken into consideration.

4.4.5 Construction Noise Management Plan

4.4.5.1 As set out in Appendix C Clause 2.4 of the EIA SB, the Construction Noise Management Plan (CNMP) shall be submitted for approval which will contain a quantitative

construction noise impact assessment, with reference to updated and identified noise mitigation measures once available and in any case before the tender invitation, and if there is any change to the construction noise mitigation measures recommended in the CNMP, an updated CNMP shall be submitted one month before the implementation of such change.

4.4.5.2 A summary of key steps for quantitative construction noise assessment in a CNMP will be conducted:

- Determine the study area of at least 300m from the boundary of the Project Site and associated works and temporary work site / works area;
- Identify NSRs and locate representative assessment points that may be affected by the works;
- Update the construction method for the key construction;
- Update the construction plant inventory for the key construction work;
- Determine the SWLs of the plant items according to the information stated in the GW-TM or other recognised sources of reference, where appropriate;
- Calculate the correction factors based on the distance between the NSRs and the notional noise source positions of the work sites;
- Apply corrections for façade, distance, barrier attenuation and acoustic reflection where applicable;
- Predict construction noise levels at the NSRs;
- Quantify the level of impact at the NSRs;
- Predict the cumulative noise impacts for any concurrent construction works in the vicinity of the proposed work identified at the time of assessment;
- For any exceedance of noise criteria, examine all practical mitigation measures such as alternative construction methodology, quiet plant, silencer, enclosure, etc. to alleviate the predicted noise impacts as much as practicable and minimize the residual impacts; and
- Consider noise mitigation measures that will follow Annex 13 of EIAO-TM and EIAO Guidance Note No. 9/2010 on “Preparation of Construction Noise Impact Assessment under the Environmental Impact Assessment Ordinance”.

4.4.5.3 The CNMP will include an implementation schedule to clearly list out the mitigation measures, the implementation party, construction noise impact monitoring and audit programme, locations and timing of implementation. Mitigation measures recommended and requirement specified in the CNMP shall be fully implemented by the Contactor.

4.5 Road Traffic Noise Impact Assessment

4.5.1 Road Traffic Noise Impact Assessment Methodology

4.5.1.1 Road traffic noise calculation is based on the method of UK Department of Transport "Calculation of Road Traffic Noise (CRTN)". The predicted noise levels at the sensitive receivers include 2.5dB(A) facade reflection and correction factors of effects due to gradient, distance, view angle, road surface and barriers.

4.5.1.2 The computer programme, RoadNoise 2000, has been used to model traffic noise from road networks. It complies with the Calculation of Road Traffic Noise (CRTN) developed

by the UK Department of Transport. The road traffic noise will be presented in terms of noise levels exceeded for 10% of the one-hour period during peak traffic flow (i.e. $L_{10(1hr)}$ dB(A)).

4.5.1.3 Calculations of future road traffic noise are based on the peak hourly flow for the maximum traffic projected within a 15 years period upon full operation of the roadworks. The traffic projection has adopted the Task Force Planning Dataset issued in June 2022, which has taken into account of various committed projects.

4.5.1.4 As discussed in **Section 2**, the commencement year of the Project would be in Year 2033. The assessment year with maximum traffic projections (morning peak hour traffic flows and vehicle compositions, which is generally higher traffic flows than afternoon peak) within 15 years upon operation of the Project would be Year 2048. Hence, Year 2048 was adopted as assessment year in road traffic noise assessment due to its peak traffic prediction in Traffic Impact Assessment of the Project. The traffic forecast for the prevailing year (i.e. the year before the commencement of construction works which is 2025 without project) and the assessment year is presented in **Appendix 4.4.** The traffic flow forecast has been confirmed with Transport Department.

4.5.1.5 The following concurrent road projects within the 300m assessment area have been identified and included in the traffic forecast and hence the road traffic noise assessment:

- TMB;
- Widening of Fuk Hang Tsuen Road;
- Widening of YLH (Section between Lam Tei Quarry and Tong Yan Sun Tsuen Interchange);
- Widening of Castle Peak Road-Castle Peak Bay;
- Road P1 (Tai Ho-Sunny Bay Section);
- TYLL; and
- HKIW-NEL Link.

4.5.1.6 The concurrent development projects have been identified and the induced traffic from these concurrent projects is included in the traffic forecast, including but not limited to:

- Hung Shui Kiu / Ha Tsuen New Development Area;
- Proposed Public Housing Developments at Ping Shan South, Yuen Long, Lam Tei North and Nai Wai, Tuen Mun; and
- Public Housing Development near Tan Kwai Tsuen, Yuen Long.

4.5.1.7 For assessment of the noise impacts on the existing NSRs due to the Project, according to EPD's Guidance Note No. 12/2010, the traffic noise impacts should be considered significant if the traffic noise level at the NSRs with the project is greater than that without the project by 1.0 dB(A) or more.

4.5.1.8 Where the predicted noise impacts with the project exceed the noise criteria, direct mitigation measures shall be considered to reduce the noise from the improved road and project road to a level that:

- is not higher than the standard; and
- has no significant contribution to the overall noise from other existing roads, if the cumulative noise level, i.e. noise from the project road together with other existing roads, exceeds the standard (i.e. less than 1.0 dB(A)).

4.5.1.9 In cases where direct noise mitigation measures alone are not adequate in mitigating noise to a level in compliance with the EIAO-TM noise criteria, indirect noise mitigation measures for existing NSRs may be adopted. Eligibility of the affected premises for indirect noise mitigation measures is determined with reference to EPD's Guidance Note GN No. 12/2010, the following three criteria, all of which must be satisfied:

- The predicted overall noise level exceeds the noise standard in accordance with EIAO-TM;
- The predicted overall noise level is at least 1.0 dB(A) more than the prevailing traffic noise level, i.e. the total traffic noise level existing before the works to construct the road were commenced; and
- The contribution from the Project to the increase in the predicted overall noise level is at least 1.0 dB(A).

4.5.1.10 The potential tunnel portal noise impact due to the proposed tunnel portals was also assessed qualitatively in the following section.

4.5.2 Identification of Road Traffic Noise Impact

Identification of Project Road

4.5.2.1 The Project Road Extent includes the following items and shown in **Appendix 4.5** and summarized in **Table 4.11**.

Table 4.11 Summary of Alignment for the Project

Section	Descriptions of Elements
Northern Section (Lam Tei to So Kwun Wat)	• Lam Tei Quarry Interchange, which comprises slip roads and viaducts, connecting the proposed Lam Tei Tunnel to Kong Sham Western Highway, Yuen Long Highway and the proposed TMB (under separate project) • Lam Tei Tunnel, which is an approximately 4.2 km long dual 3-lane carriageway tunnel, connecting the proposed Lam Tei Quarry Interchange and So Kwun Wat Interchange • Road widening of Chui Fuk Road
Central Section (So Kwun Wat to Tai Lam Chung)	• So Kwun Wat Interchange and So Kwun Wat – Siu Lam Open Road Section, which comprises slip roads and viaducts, connecting the proposed Lam Tei Tunnel, So Kwun Wat Link Road and Tai Lam Chung Tunnel • So Kwun Wat Link Road, which comprises an approximately 2.0 km long dual 2-lane carriageway tunnel and associated slip roads and viaducts, connecting to TMR and So Kwun Wat Road, and the proposed So Kwun Wat Interchange
Southern Section (Tai Lam Chung to North Lantau)	• Tai Lam Chung Tunnel, which is an approximately 1.7 km long dual 4-lane carriageway tunnel, a viaduct crossing Tai Lam Chung River and another tunnel to the west of Tai Lam Chung River, which is an approximately 360m long dual 4-lane carriageway tunnel, connecting the proposed So Kwun Wat Interchange and Tsing Lung Tau Interchange • Road widening of Tai Lam Chung Road

Section	Descriptions of Elements
	• Tsing Lung Tau Interchange, which comprises slip roads, viaducts and tunnel, connecting the proposed Tai Lam Chung Tunnel and Tsing Lung Bridge to TMR • Re-alignment of an approximately 1.4 km long section of TMR at Tsing Lung Tau • Tsing Lung Bridge, which is an approximately 1.7 km long dual 4-lane carriageway suspension bridge, crossing over the Ha Pang Fairway and connecting the proposed Tsing Lung Tau Interchange and North Lantau Interchange, with reclamation of approximately 2.2 ha for construction of bridge tower at Tsing Lung Tau • North Lantau Interchange, which comprises slip roads, viaducts and tunnels, connecting Tsing Lung Bridge to North Lantau Highway, Lantau Link and the proposed Road P1 (under separate project), the proposed TYLL (under separate project) and the proposed HKIW-NEL Link (under separate project)

Noise Assessment Points for Road Traffic Noise Impact Assessment

4.5.2.2 The assessment area for road traffic noise includes an area within 300m from the Project Road and highway / tunnel operation and maintenance facilities. Representative NSRs and NAPs that would be affected by road traffic noise have been identified and presented in **Table 4.8** and are summarised in **Table 4.12** below. Locations of Representative NSRs and NAPs for road traffic noise impact assessment are shown in **Figure 4.4**.

Table 4.12 Identified NSRs and NAPs within 300m of Road Traffic Noise Assessment Area

NSR ID [1]	OZP Land Use	Description	Use [2]	Number of Storeys	NAP ID [3]
Existing NSRs					
a. Lam Tei					
LT01A	GB	Area at/near Wo Ping San Tsuen	R	1-3	WPS-01 to WPS-02
LT01B	V	Area at/near Wo Ping San Tsuen	R	1-3	WPS-03
LT02A	GB	Area at/near Tsoi Yuen Tsuen	R	1-3	TYT-01
LT02B	R(D)	Area at/near Tsoi Yuen Tsuen	R	1-3	TYT-02 to TYT-17
LT03A	R(C)	Area at/near Fuk Hang Tsuen	R	1-3	FHT-01 to FHT-04
LT03B	R(C)	Area at/near Fuk Hang Tsuen	R	1-3	FHT-06 to FHT-11
LT03C	R(D)	Area at/near Fuk Hang Tsuen	R	1-3	FHT-12 to FHT-26, FHT-30, FHT-33
	R(D)	Church of Christian Faith Lam Tei Gospel Church	W	3	Te-02a
LT03D	GB	Area at/near Fuk Hang Tsuen	R	1-3	FHT-27 to FHT-29, FHT-31, FHT-32, FHT-34, FHT-35
	GB	Church of Christian Faith Lam Tei Gospel Church	W	3	Te-02b
LT03E	CDA	Area at/near Fuk Hang Tsuen	R	1-3	FHT-36
	CDA	Temple at Fuk Hang Tsuen	W	1	Te-03
LT03F	GB	Area at/near Fuk Hang Tsuen	R	1-3	FHT-37 to FHT-44
LT03G	CDA	Area at/near Fuk Hang Tsuen	R	1-3	FHT-05
LT04	GB	Village Houses near Tung Fuk Road	R	1-3	VH-01 to VH-12
LT05	GIC	Miu Fat Buddhist Monastery Ksitigarbha Hall	W	1	Te-01
	GIC	Madam Lau Kam Lung Secondary School of Miu Fat Buddhist Monastery	E	7	eLKL-01
	GIC	Miu Fat Buddhist Monastery Elderly Home	R	6	MFB-01
LT06	CDA	The Sherwood	R	16-17	SHE-01 to SHE-15
LT07	V	Area at/near Tuen Mun San Tsuen	R	1-3	[4]
LT08	R(B)3	Botania Villa	R	11	BOT-01 to BOT-03
LT09	R(B)3	GreenView	R	11	GRE-01
LT11A	GB	Area at/near Lo Fu Hang	R	1-3	LFH-02 to LFH-17
	GB	Temples at Lo Fu Hang	W	1	Te-07
LT11B	OU	Area at/near Lo Fu Hang	R	1-3	LFH-01, LFH-18 to LFH-19
LT12A	GB	Area at/near Fu Tei Ha Tsuen	R	1-3	FTT-02 to FTT-05
	GB	Temples at Fu Tei Ha Tsuen	W	1-2	Te-04 to Te-06

NSR ID [1]	OZP Land Use	Description	Use [2]	Number of Storeys	NAP ID [3]
LT12B	OU	Area at/near Fu Tei Ha Tsuen	R	1-3	FTT-01
b. So Kwun Wat / Siu Lam/ Tai Lam					
SKW01A	GB	Area at/near So Kwun Wat Tsuen	R	1-3	SKW-01 to SKW-17
SKW01B	R(B)	Area at/near So Kwun Wat Tsuen	R	1-3	SKW-19 to SKW-27
SKW01C	V	Area at/near So Kwun Wat Tsuen	R	1-3	SKW-28
SKW01D	GB	Area at/near So Kwun Wat Tsuen	R	1-3	SKW-31
SKW02	R(B)1	The Bloomsway-The Laguna	R	15-18	LAG-01 to LAG-02
SKW03	R(B)1	The Bloomsway-The Terrace	R	3-7	TER-01 to TER-05
SKW04	R(B)1	The Bloomsway-The Highland	R	3	[4]
SKW05	GIC	Harrow International School Hong Kong Staff Dormitory	R	9	HIS-06
	GIC	Harrow International School Hong Kong [9]	E	5-8	eHIS-01 to eHIS-04
SKW06	GIC	Chu Hai College of Higher Education	E	7	[5]
SKW07	R(B)	Houses at Mun Fat Lane	R	1-3	MUN-01 to MUN-03
SKW08	R(B)	Palm Beach	R	12	PAL-01 to PAL-02
SKW09	R(B)15	The Royale	R	14-20	ROY-01 to ROY-03
SKW10	GIC	STFA Lee Kam Primary School	E	9	eSTF-01
SKW11	GIC	PLK Women's Welfare Club Western District Fung Lee Pui Yiu Primary School	E	8	ePLK-01
SKW12	R(B)	Villa La Plage	R	3	VIL-01 to VIL-11
SKW13	R(B)	Surfside	R	3	SUR-01
SKW14	R(B)	Blessing Villa	R	3	BLV-01
SKW15	R(B)	Spring Seaview Terrace	R	10-11	SPR-01
SKW16	R(B)	Monte Carlo Villas	R	2	MON-01 to MON-02
SKW17	R(B)12	Hong Kong Gold Coast	R	25	GOL-01 to GOL-05
SKW18	R(B)5	Aegean Coast	R	29	AEG-01 to AEG-02
SKW19	R(B)	Avignon	R	10	AVI-01 to AVI-16
SKW20	R(B)17	Emerald Bay	R	20	EME-01
SKW21	R(B)	NAPA	R	10	NAA-01 to NAA-02
SKW22	GIC	Institute of Training and Development, Immigration Service	E	13	[5]
SL01A	GB	Area at/near So Kwun Wat San Tsuen	R	1-3	SKS-01 to SKS-03
SL01B	V	Area at/near So Kwun Wat San Tsuen	R	1-3	SKS-04 to SKS-08
SL02	GB	Area at/near Siu Lam	R	1-3	SIU-01 to SIU-16
SL03	R(B)1	Grand Pacific Heights	R	24	GRA-01 to GRA-02
SL04	GIC	Siu Lam Psychiatric Centre	R	4	SPC-01

NSR ID [1]	OZP Land Use	Description	Use [2]	Number of Storeys	NAP ID [3]
SL05	GIC	Tai Lam Correctional Institution Dormitory	R	1-6	TLC-01 to TLC-03, TLC-05 to TLC-08
SL06	GB	Area at/near Luen On San Tsuen	R	1-2	LOS-01 to LOS-05
SL07	V	Area at/near Tai Lam Chung Tsuen	R	1-3	TAI-01 to TAI-24
c. Tsing Lung Tau					
TLT01A	GB	Area at/near Ka Loon Tsuen	R	1-3	KLT-01 to KLT-11
TLT01B	R(C)	Area at/near Ka Loon Tsuen	R	1-3	KLT-12
TLT02	R(C)	Vistacove	R	3	VIS-01 to VIS-03
TLT03	R(C)	Area at/near Tsing Lung Tau	R	1-3	TLT-01
TLT04A	V	Area at/near Choi Yuen Tsuen	R	1-3	CYT-01
TLT04B	GB	Area at/near Choi Yuen Tsuen	R	1-3	CYT-02 to CYT-15
TLT05	R(B)1	Hong Kong Garden	R	20-29	HKG-01 to HKG-16
TLT06	R(B)	L'Aquatique	R	15	LAQ-01
TLT07A	V	Area at/near Tsing Lung Tau New Village	R	1-3	TLN-01 to TLN-02
d. North Lantau					
NL01	GB	Area at/near Tai Chuen	R	2	[4]
Committed/ Planned NSRs					
a. Lam Tei					
P1A	R(D)	Public Housing development at Nai Wai (population intake year is not available) [10]	R	55-56	p-NAW-01 to p-NAW-16
P1B	R(C)	Public Housing development at Nai Wai (population intake year is not available) [10]	R	56	p-NAW-17 to p-NAW-20
P2A	R(D)	Public Housing development at Lam Tei North (population intake year is not available) [10]	R	51-59	p-LTN-01 to p-LTN-04, p-LTN-11 to p-LTN-12
P2B	GB	Public Housing development at Lam Tei North (population intake year is not available) [10]	R	51-59	p-LTN-05 to p-LTN-10
P3	GIC	RCHE at Lam Tei (population intake in 2025-2026)	R	12	[5]
P4	CDA	CDA at Fuk Hang Tsuen Lane (population intake year is not available)	R	6	pp-FHA-01 to pp-FHA-06
P5	CDA	CDA of Lot 2883 in D.D.130 at Fuk Hang Tsuen Lane (population intake year is not available)	R	3	p-FHB-01
b. So Kwun Wat / Siu Lam/ Tai Lam					
P7	R(B)	Residential Development under Planning Application No. Y/TM/29, Various Lots in D.D.374 (population intake in 2028)	R	16-20	pp-SKW1-01 to pp-SKW1-07

NSR ID [1]	OZP Land Use	Description	Use [2]	Number of Storeys	NAP ID [3]
P8	CDA(3)	Comprehensive Residential Development at TMTL Lot No.496 (population intake year is not available)	R	16-20	p-SKW2-01 to p-SKW2-09 [11]
P9	GIC	Elderly Centre under Planning Application No. A/TM/578 (population intake year is not available)	R	8	pp-SKW3-01 to pp-SKW3-02
P10	R(B)20	Residential Development at TMTL Lot No.518 (population intake year is not available)	R	20-23 [6]	p-SKW4-01 to p-SKW4-08
P11	R(B)14	Residential Development at TMTL Lot No. 546 (population intake year is not available)	R	30 [7]	pp-CRO-01 to pp-CRO-03
P12	R(B)2	Residential Development at TMTL Lot No. 520(population intake year is not available)	R	30 [8]	pp-SKW5-01 to pp-SKW5-03
c. Tsing Lung Tau					
P13	R(B)	Comprehensive Residential Development at Lot 94 in D.D. 388 (population intake in 2028)	R	15	[4]

Notes:

[1] The assessment will only include NSRs which rely on opened windows for ventilation and within 300m assessment area.

[2] R-Residential, E-Educational Institutions, W-Place of Public Worship.

[3] For areas with committed/ planned development with population intake before 2033, only planned NSRs have been considered. For areas with committed/ planned developments with population intake between 2033 and 2048 or without any available development programme, both existing and planned NSRs have been considered.

[4] NSR is blocked by terrain/ other developments / structures, etc., and hence NAP is not the representative worst and so not considered.

[5] As confirmed by the operator/ project proponent, central air-conditioning is provided at the facade facing to the Project Road, and hence no NAP is considered.

[6] Based on maximum building height of 90mPD as stipulated in Town Planning Board RNTPC Paper No. 9/17.

[7] Since the land at P11 is under landsale programme and there was no available information on the maximum building height or maximum number of floor from relevant departments and operators during the preparation of this Working Paper, 30 floors were assumed with reference to other residential developments nearby, e.g. Aegean Coast.

[8] Based on maximum building height of 80mPD as stipulated in Tuen Mun OZP No. S/TM/37.

[9] For conservative assessment, openable window is assumed for Harrow International School Hong Kong.

[10] Although there is no confirmed programme on population intake for Proposed Public Housing Developments at Ping Shan South, Yuen Long, Lam Tei North and Nai Wai, Tuen Mun, it is confirmed by CEDD that the existing premises or place within the areas shall have been resumed for these planned developments by the time when R11 is commissioned. Hence, only planned NSRs within these development areas are included for noise assessment. The locations of representative NSRs for Proposed Public Housing Developments at Ping Shan South, Yuen Long, Lam Tei North and Nai Wai are based on conceptual plan provided by CEDD..

[11] According to the information collated from the relevant government department, receiving-end noise mitigation measures (i.e. Acoustic windows and balconies with sliding doors) would be adopted to abate the road traffic noise impacts. According to “Practice Note on Application of Innovative Noise Mitigation Designs in Planning Private Residential Developments against Road Traffic Noise Impact”, the minimum noise reduction for road traffic noise from acoustic windows and balconies with sliding doors (i.e. enhanced acoustic balcony (baffle type)) is 6dB(A) and 8dB(A) respectively, hence, a 6dB(A) noise reduction from provision of receiving-end noise mitigation measures would be adopted for road traffic noise impact assessment.

Inventory of Noise Sources

4.5.2.3 Road traffic noise will be generated from vehicular traffic on existing road network and the proposed open road network, which would be assessed within the 300m assessment boundary from the Project Roads extent. The key road traffic noise sources from existing roads include YLH, KSWH, Castle Peak Road, TMR, etc.

4.5.2.4 The key road traffic noise sources from planned roads include Lam Tei Quarry Interchange, So Kwun Wat Link Road, So Kwun Wat Interchange, So Kwun Wat – Siu Lam Open Road Section, Tai Lam Chung River Viaduct, Tsing Lung Tau Interchange, realigned TMR at Tsing Lung Tau, realigned North Lantau Highway at North Lantau and North Lantau Interchange are shown in **Figure 1.1**. The road segments are classified as "Project roads" and "Other roads". Computer plots of the traffic noise model are presented in **Appendix 4.5**. Agreement on the road sections to be included in the road traffic noise assessment has been obtained from EPD in accordance with Appendix C Clause 3.2.2(a) of the EIA Study Brief.

4.5.2.5 The characteristics of the road network such as road width, surface type and traffic flow and the use of low noise road surfacing (LNRS), the existing and committed noise mitigation measures have been confirmed by HyD and considered in the assessment.

4.5.2.6 The locations of existing and committed noise mitigation measures (i.e. noise barrier proposed in the Approved EIA for Deep Bay Link (AEIAR-064/2002)) and it's Environmental Permit No. EP-163/2003/H are presented in **Appendix 4.6**.

4.5.2.7 In accordance with HyD Guidance Notes on Road Surface Requirements for Expressways and High Speed Roads (RD/GN/032A), Highly Modified Friction Course (HMFC) is proposed as the standard surfacing material on the high speed road sections of new road projects with design speed of 80km/hr or above and expressway. From the RD/GN/032A, the noise reduction performance of HMFC is comparable to Polymer Modified Friction Course (i.e. PMFC), hence, both HMFC and PMFC can serve as LNRS, which provide a noise reduction performance of approximately 2.5dB(A) compare to concrete paving. Locations of existing and committed LNRS (including HMFC to be implemented at proposed project roads) are presented in **Appendix 4.7**.

4.5.3 Prediction and Evaluation of Road Traffic Noise Impact

Modelling Scenarios

4.5.3.1 Referring to the requirements of the EIA SB, the following scenarios were assessed in the EIA study.

(i) Unmitigated scenario at the assessment year with maximum traffic projection within 15 years upon operation of the Project (i.e. Year 2048);

(ii) Mitigated scenario at the assessment year with maximum traffic projection within 15 years upon operation of the Project (i.e. Year 2048);

(iii) Prevailing stage for indirect mitigated measures eligibility test (i.e. Year 2025); and

(iv) Interim stage for realignment of TMR at Tsing Lung Tau at Year 2033.

4.5.3.2 For the interim stage, the realignment of TMR will be carried out in 5 stages tentatively. The construction programme for each stage is not available yet, hence,

the traffic forecast of Year 2033 is adopted for the interim stage just before the commencement of the Project. This traffic forecast for 2033 also represents the highest traffic flow just before the operation of the Project.

4.5.4 Prediction Of Noise Impact of Unmitigated Scenario

4.5.4.1 The predicted road traffic noise levels at each representative NAPs under unmitigated scenario are presented in **Table 4.13**. **Appendix 4.8** shows the details of the noise impacts at different levels of the NAPs under unmitigated scenario.

Table 4.13 Predicted Road Traffic Noise Impact at NAPs Under Unmitigated Scenario in Year 2048

NSR ID [1]	Description	NAP ID [2]	Use [3]	Criterion, $L_{10\ 1hr}$ dB(A)	Max. Predicted Noise Level, $L_{10\ hr}$ dB(A) [4]				Whether Noise Mitigation Measures on "Project Roads" are required (Y/N)
					Overall	Project Roads	Other Roads	Max. "Project Roads" Contribution when Overall Noise Level Exceed Criterion [5] [6]	
Existing NSRs									
a. Lam Tei									
LT01	Area at/near Wo Ping San Tsuen	WPS-01-WPS-03	R	70	68-**73**	44-51	68-**73**	0.1	N
LT02	Area at/near Tsoi Yuen Tsuen	TYT-01-TYT-17	R	70	64-**71**	58-67	62-70	0.5	N
LT03	Area at/near Fuk Hang Tsuen	FHT-01-FHT-44	R	70	59-**82**	≤40-67	52-**82**	**1.8**	**Y**
	Church of Christian Faith Lam Tei Gospel Church	Te-02	W	65	64-**76**	58-**66**	59-**76**	**3.9**	**Y**
	Temple at Fuk Hang Tsuen	Te-03	W	65	**71**	60	**71**	0.4	N
LT04	Village Houses near Tung Fuk Road	VH-01-VH-12	R	70	65-**74**	≤40-68	65-**74**	**3.0**	**Y**
LT05	Miu Fat Buddhist Monastery Ksitigarbha Hall	Te-01	W	65	**72**	≤40	**71**	0.1	N
	Madam Lau Kam Lung Secondary School of Miu Fat Buddhist Monastery	eLKL-01	E	65	**68-70**	≤40	**68-70**	0.1	N
	Miu Fat Buddhist Monastery Elderly Home	MFB-01	R	70	60-63	≤40-42	60-63	-	N
LT06	The Sherwood	SHE-01-SHE-15	R	70	61-**78**	46-**71**	61-**77**	**1.6**	**Y**
LT08	Botania Villa	BOT-01-BOT-03	R	70	**72-75**	57-66	**72-74**	0.7	N
LT09	GreenView	GRE-01	R	70	**76-80**	62-67	**76-80**	0.4	N

NSR ID [1]	Description	NAP ID [2]	Use [3]	Criterion, $L_{10\ 1hr}$ dB(A)	Max. Predicted Noise Level, $L_{10\ hr}$ dB(A) [4]				Whether Noise Mitigation Measures on "Project Roads" are required (Y/N)
					Overall	Project Roads	Other Roads	Max. "Project Roads" Contribution when Overall Noise Level Exceed Criterion [5] [6]	
LT11	Area at/near Lo Fu Hang	LFH-01-LFH-19	R	70	63-**71**	41-69	59-70	0.5	N
	Temples at Lo Fu Hang	Te-07	W	65	57	49	56	-	N
LT12	Area at/near Fu Tei Ha Tsuen	FTT-01-FTT-05	R	70	54-66	≤40-63	50-62	-	N
	Temples at Fu Tei Ha Tsuen	Te-04-Te-06	W	65	46-61	44-47	42-61	-	N
b. So Kwun Wat / Siu Lam/ Tai Lam									
SKW01	Area at/near So Kwun Wat Tsuen	SKW-01-SKW-17, SKW-19-SKW-28, SKW-31	R	70	59-**81**	50-68	58-**81**	**3.6**	**Y**
SKW02	The Bloomsway-The Laguna	LAG-01-LAG-02	R	70	**71-81**	≤40-49	**71-81**	0.1	N
SKW03	The Bloomsway-The Terrace	TER-01-TER-05	R	70	62-**72**	≤40-51	62-**72**	0.0	N
SKW05	Harrow International School Hong Kong Staff Dormitory	HIS-06	R	70	**73-79**	66-**71**	**72-78**	**1.0**	**Y**
	Harrow International School Hong Kong	eHIS-01-eHIS-04	E	65	63-**80**	42-57	63-**80**	0.1	N
SKW07	Houses at Mun Fat Lane	MUN-01-MUN-03	R	70	61-63	≤40-40	61-63	-	N
SKW08	Palm Beach	PAL-01-PAL-02	R	70	61-**74**	≤40-52	61-**74**	0.1	N
SKW09	The Royale	ROY-01-ROY-03	R	70	62-**79**	≤40-64	62-**78**	0.4	N
SKW10	STFA Lee Kam Primary School	eSTF-01	E	65	60-**69**	48-54	60-**69**	0.2	N
SKW11	PLK Women's Welfare Club Western District	ePLK-01	E	65	56-62	≤40-42	56-62	-	N

NSR ID [1]	Description	NAP ID [2]	Use [3]	Criterion, $L_{10\ 1hr}$ dB(A)	Max. Predicted Noise Level, $L_{10\ hr}$ dB(A) [4]				Whether Noise Mitigation Measures on "Project Roads" are required (Y/N)
					Overall	Project Roads	Other Roads	Max. "Project Roads" Contribution when Overall Noise Level Exceed Criterion [5] [6]	
	Fung Lee Pui Yiu Primary School								
SKW12	Villa La Plage	VIL-01-VIL-11	R	70	70-**79**	≤40	70-**79**	0.1	N
SKW13	Surfside	SUR-01	R	70	52-64	≤40	52-64	-	N
SKW14	Blessing Villa	BLV-01	R	70	**78**	≤40	**78**	0.0	N
SKW15	Spring Seaview Terrace	SPR-01	R	70	**73-75**	≤40	**73-75**	0.1	N
SKW16	Monte Carlo Villas	MON-01-MON-02	R	70	70-**76**	≤40	70-**76**	0.1	N
SKW17	Hong Kong Gold Coast	GOL-01-GOL-05	R	70	**72-76**	≤40-57	**71-76**	0.2	N
SKW18	Aegean Coast	AEG-01-AEG-02	R	70	62-**72**	41-54	62-**72**	0.1	N
SKW19	Avignon	AVI-01-AVI-16	R	70	40-**75**	≤40-67	40-**74**	**1.4**	**Y**
SKW20	Emerald Bay	EME-01	R	70	64-70	≤40-50	64-70	-	N
SKW21	NAPA	NAA-01-NAA-02	R	70	63-70	≤40	63-70	-	N
SL01	Area at/near So Kwun Wat San Tsuen	SKS-01-SKS-08	R	70	58-63	57-62	≤40-59	-	N
SL02	Area at/near Siu Lam	SIU-01-SIU-16	R	70	52-66	52-66	≤40-64	-	N
SL03	Grand Pacific Heights	GRA-01-GRA-02	R	70	53-66	≤40-66	48-57	-	N
SL04	Siu Lam Psychiatric Centre	SPC-01	R	70	63-64	62-63	48	-	N
SL05	Tai Lam Correctional Institution Dormitory	TLC-01-TLC-03, TLC-05-TLC-08	R	70	47-57	47-57	≤40-47	-	N
SL06	Area at/near Luen On San Tsuen	LOS-01-LOS-05	R	70	57-60	57-59	≤40-53	-	N
SL07	Area at/near Tai Lam Chung Tsuen	TAI-01-TAI-24	R	70	54-**72**	47-64	≤40-**72**	0.0	N

NSR ID [1]	Description	NAP ID [2]	Use [3]	Criterion, $L_{10\ 1hr}$ dB(A)	Max. Predicted Noise Level, $L_{10\ hr}$ dB(A) [4]				Whether Noise Mitigation Measures on "Project Roads" are required (Y/N)
					Overall	Project Roads	Other Roads	Max. "Project Roads" Contribution when Overall Noise Level Exceed Criterion [5] [6]	
c. Tsing Lung Tau									
TLT01	Area at/near Ka Loon Tsuen	KLT-01-KLT-12	R	70	62-70	53-67	53-70	-	N
TLT02	Vistacove	VIS-01-VIS-03	R	70	60-**73**	59-61	53-**72**	0.3	N
TLT03	Area at/near Tsing Lung Tau	TLT-01	R	70	**71-72**	57-58	**71-72**	0.2	N
TLT04	Area at/near Choi Yuen Tsuen	CYT-01-CYT-15	R	70	60-**73**	58-**73**	≤40-68	**48.9**	**Y**
TLT05	Hong Kong Garden	HKG-01-HKG-16	R	70	51-**77**	≤40-**77**	≤40-**72**	**20.6**	**Y**
TLT06	L'Aquatique	LAQ-01	R	70	59-65	58-63	53-61	-	N
TLT07A	Area at/near Tsing Lung Tau New Village	TLN-01-TLN-02	R	70	58-62	≤40-50	58-61	-	N
Committed / Planned NSRs									
a. Lam Tei									
P1	Public Housing development at Nai Wai (population intake year is not available) [8]	p-NAW-01-p-NAW-20	R	70	58-**82**	≤40-**79**	53-**82**	**7.4**	**Y**
P2	Public Housing development at Lam Tei North (population intake year is not available) [8]	p-LTN-01 – p-LTN-12	R	70	66-**80**	≤40-**73**	64-**80**	**1.9**	**Y**

NSR ID [1]	Description	NAP ID [2]	Use [3]	Criterion, $L_{10\ 1hr}$ dB(A)	Max. Predicted Noise Level, $L_{10\ hr}$ dB(A) [4]				Whether Noise Mitigation Measures on "Project Roads" are required (Y/N)
					Overall	Project Roads	Other Roads	Max. "Project Roads" Contribution when Overall Noise Level Exceed Criterion [5] [6]	
P4	CDA at Fuk Hang Tsuen Lane (population intake year is not available)	pp-FHA-01-pp-FHA-06	R	70	70-**80**	57-**72**	70-**80**	**1.2**	**Y**
P5	CDA of Lot 2883 in D.D.130 at Fuk Hang Tsuen Lane (population intake year is not available)	p-FHB-01	R	70	63-67	≤40	63-67	-	N
b. So Kwun Wat / Siu Lam/ Tai Lam									
P7	Residential Development under Planning Application No. Y/TM/29, Various Lots in D.D.374 (population intake in 2028)	pp-SKW1-01-pp-SKW1-07	R	70	61-**81**	53-**71**	61-**81**	0.8	**Y**
P8	Comprehensive Residential Development at TMTL Lot No.496 (population intake year is not available)	p-SKW2-01-p-SKW2-09 [7]	R	70	60-**72**	≤40-62	60-**72**	0.1	N
P9	Elderly Centre under Planning Application No. A/TM/578 (population intake	pp-SKW3-01-pp-SKW3-02	R	70	70-**77**	54-58	70-**77**	0.1	N

NSR ID [1]	Description	NAP ID [2]	Use [3]	Criterion, $L_{10\ 1hr}$ dB(A)	Max. Predicted Noise Level, $L_{10\ hr}$ dB(A) [4]				Whether Noise Mitigation Measures on "Project Roads" are required (Y/N)
					Overall	Project Roads	Other Roads	Max. "Project Roads" Contribution when Overall Noise Level Exceed Criterion [5] [6]	
	year is not available)								
P10	Residential Development at TMTL Lot No.518 (population intake year is not available)	p-SKW4-01-p-SKW4-08	R	70	59-**79**	≤40-59	59-**79**	0.1	N
P11	Residential Development at TMTL Lot No. 546 (population intake year is not available)	pp-CRO-01-pp-CRO-03	R	70	67-**79**	56-70	67-**79**	0.7	N
P12	Residential Development at TMTL Lot No. 520 (population intake year is not available)	pp-SKW5-01-pp-SKW5-03	R	70	56-67	≤40-45	56-67	-	N

Notes:

[1] The assessment will only include NSRs which rely on opened windows for ventilation and within 300m assessment area.

[2] For areas with committed/ planned development with population intake before 2033, only planned NSRs have been considered. For areas with committed/ planned developments with population intake between 2033 and 2048 or without any available development programme, both existing and planned NSRs have been considered.

[3] R-Residential, E-Educational Institutions, W-Place of Public Worship.

[4] Bold figure denotes the predicted noise level is over the relevant EIAO-TM noise criteria.

[5] Bold figure denotes the noise exceedance which is over the relevant EIAO-TM noise criteria and the contribution from Project Roads to the overall noise level is equal to or higher than 1.0 dB(A).

[6] Maximum Project Roads contribution for NSRs with overall noise level exceeding relevant criteria.

[7] According to the information collated from the relevant government department, receiving-end noise mitigation measures (i.e. Acoustic windows and balconies with sliding doors) would be adopted to abate the road traffic noise impacts. According to "Practice Note on Application of Innovative Noise Mitigation Designs in Planning Private Residential Developments against Road Traffic Noise Impact", the minimum noise reduction for road traffic noise from acoustic windows and balconies with sliding doors (i.e. enhanced acoustic balcony (baffle type)) is 6dB(A) and 8dB(A) respectively, hence, a 6dB(A) noise reduction from provision of receiving-end noise mitigation measures would be adopted for road traffic noise impact assessment.

[8] Although there is no confirmed programme on population intake for Proposed Public Housing Developments at Ping Shan South, Yuen Long, Lam Tei North and Nai Wai, Tuen Mun, it is confirmed by CEDD that the existing premises or place within the areas shall have been resumed for these planned developments by the time when R11 is commissioned. Hence, only planned NSRs within these development areas are included for noise assessment. The locations of representative NSRs for Proposed Public Housing Developments at Ping Shan South, Yuen Long, Lam Tei North and Nai Wai are based on conceptual plan provided by CEDD.

Lam Tei Area

4.5.4.2 As discussed in **Section 4.5.2**, the NSRs within the Assessment Area for road traffic noise comprise of both villages houses of 1 to 3 storeys high and multi-storey buildings (up to 44 storeys).

4.5.4.3 According to the noise assessment results, the cumulative road traffic noise levels at most of low-rise buildings at Fuk Hang Tsuen (LT03), Fu Tei Ha Tsuen (LT12), Lo Fu Hang (LT11) and Tsoi Yuen Tsuen (LT02) would comply with the relevant criteria. This is attributable to the fact that the Project Road in this area is mainly in the form of a viaduct and hence the structural deck would have provided noise screening to the noise generated by the traffic travelling on the viaduct. Besides, these NSRs are either located further away from or screened from local roads.

4.5.4.4 However, some of village houses / church at Fuk Hang Tsuen, Fu Tei Ha Tsuen, Lo Fu Hang, Tsoi Yuen Tsuen, Wo Ping San Tsuen and along Tung Fuk Road and planned CDA at Fuk Hang Tsuen Lane (P4) would be fronting Fuk Hang Tsuen Road, KSWH and YLH and with less separation distances. Results indicate that the cumulative road traffic noise impacts at these NSRs would exceed relevant criteria (i.e. 70dB(A) for residential and 65dB(A) for church). Among these NSRs, only 3 of them (i.e. Fuk Hang Tsuen (LT03), village house along Tung Fuk Road (LT04) and planned CDA at Fuk Hang Tsuen Lane (P4)) would experience a project contribution of more than 1dB(A). Hence, mitigation measures within the Project Road extent would be only required to alleviate the noise impacts at these 3 NSRs.

4.5.4.5 Other than the village houses stated above, there are also multi-storey buildings in the vicinity of the assessment area, including the existing residential buildings at The Sherwood (LT06), Botania Villa (LT08), GreenView (LT09) and the planned housing site at Nai Wai and Lam Tei North (P1 and P2). For the existing Botania Villa and GreenView, the cumulative noise levels for the NAPs at lower levels are mainly attributable to the traffic on other roads and would exceed 70dB(A) noise criterion, but the project contribution is less than 1dB(A). Hence, mitigation measures are not required for the residential units below the deck level.

4.5.4.6 For The Sherwood, they are 16 to 17 storeys high and there are approximately 7 to 8 storeys above the nearest deck level of the Project. Hence, all the residential floors below the deck level are screened by the structural deck of Project and the adjoining existing viaduct / connecting roads (i.e. the viaduct section of KSWH). Besides, some of the existing viaduct sections of KSWH are installed with noise mitigation measures such as vertical barriers and cantilevered barriers, etc.

4.5.4.7 Assessment results also indicate that the noise levels at The Sherwood at levels below the deck level would experience noise screening effects. While the cumulative noise levels for the NAPs at lower levels are mainly attributable to the traffic on other roads and would exceed 70dB(A) noise criterion, the project contribution is less than 1dB(A). Hence, mitigation measures are not required for the residential units below the deck level.

4.5.4.8 For the NAPs of The Sherwood above the deck level, results indicate that the existing noise mitigation measures are providing some noise screening effects already. However, the noise contribution at some of the NAPs closer to the Project Road extent (i.e. Blocks 1, 2 and 9 to 13 of Sherwood) would still experience cumulative noise levels exceeding 70dB(A), and with noise contributions more

than 1dB(A). Hence, direct noise mitigation measures on the Project Road extent would be required.

4.5.4.9 For the planned public housing developments at Nai Wai and Lam Tei North (P1 and P2), a close liaison has been made with the respective project proponents. It is noted that these NSRs are still progressing their respective detailed design and hence no confirmed design information is available at the time of preparing this assessment. As conservative assessment, latest information from the project proponent of both housing developments has been obtained and adopted. Assessment results however have indicated that the noise levels at most of the NAPs at the public housing development at Nai Wai would be dominated by other roads. For example, for the NAPs in north-western part of the planned public housing development in Nai Wai (i.e. NAP p-NAW-10 to p-NAW-12, p-NAW-17 to p-NAW-20), the maximum cumulative noise impacts would exceed 70dB(A) noise criterion and the contribution from the Project is less than 1dB(A). This is attributable to the larger separation distance from the project road extent. For the NAPs in the south-eastern part (i.e. NAP p-NAW-01 to p-NAW-09, p-NAW-16), the maximum cumulative noise impacts would exceed 70dB(A) noise criterion and the contribution from the Project is more than 1dB(A). This is attributable to the smaller separation distance from the project road extent. This concludes that any noise mitigation measures within the project road extent could only alleviate certain cumulative noise impacts for the NAPs in the south-eastern part, and it is unlikely to ensure full compliance of the noise criterion if mitigation measures are provided at the proposed project alone. **Section 4.5.5** will discuss the proposed noise mitigation measures package that would be implemented within the project road extent and the housing site to reduce the noise impacts.

4.5.4.10 For the NAPs in the southern part of the planned public housing development in Lam Tei North (i.e. NAP p-LTN-01 to p-LTN-06), the maximum cumulative noise impacts would exceed 70dB(A) noise criterion and the contribution from the Project is more than 1dB(A). This is attributable to smaller separation distance from the project road extent. Hence, direct noise mitigation measures on the Project Road extent would be required. The planned public housing development at Lam Tei North also has a similar finding as the planned public housing development at Nai Wai. Assessment results also indicate that most of the NAPs at planned public housing development at Lam Tei North would be dominated by existing roads (e.g. YLH). For example, for the NAPs in northern part of the planned public housing development in Lam Tei North (i.e. NAP p-LTN-07 to p-LTN-12), the maximum cumulative noise impacts would exceed 70dB(A) noise criterion and the contribution from the Project is less than 1dB(A). This concludes that any noise mitigation measures within the project road extent could only alleviate certain cumulative noise impacts for the NAPs in the southern part, and it is unlikely to ensure full compliance of the noise criterion if mitigation measures are provided at the proposed project alone. **Section 4.5.5** will discuss the proposed noise mitigation measures that would be implemented within the project road extent to reduce the noise impacts.

<u>So Kwun Wat / Siu Lam/ Tai Lam Area</u>

4.5.4.11 As discussed in **Section 4.5.2**, the NSRs within the Assessment Area for road traffic noise comprise of both villages houses of 1 to 3 storeys high and multi-storey buildings (up to 30 storeys).

4.5.4.12 According to the noise assessment results, the cumulative road traffic noise levels most of village houses at So Kwun Wat San Tsuen (SL01), Siu Lam (SL02), Luen On San Tsuen (SL06) and Tai Lam Chung Tsuen (SLT07) would comply with relevant criteria, except So Kwun Wat Tsuen (SKW01). This is attributable to the fact that the Project Road in this area is mainly in the form of a viaduct and hence the structural deck would have provided noise screening to the noise generated by the traffic travelling on the viaduct. Besides, these NSRs are either located further away from or screened from local roads. For the village houses at So Kwun Wat Tsuen (SKW01) which are directly fronting the proposed slip roads with less separation distances. The cumulative road traffic noise impacts at these NSRs would exceed 70dB(A) noise criterion. Among these NAPs, only one of them would has a project contribution more than 1.0dB(A). Hence, mitigation measures within the Project Road Extent would be only required to alleviate the noise impacts at this NAP.

4.5.4.13 Noise exceedances were also found for multi-storey buildings in the vicinity of the assessment area, including the existing residential buildings at Avignon (SKW19) and Harrow International School Hong Kong Staff Dormitory (SKW05). The cumulative road traffic noise impacts at these NSRs would exceed 70dB(A) noise criterion with a project contribution more than 1.0dB(A). Hence, mitigation measures within the Project Road extent would be required to alleviate the noise impacts at these NSRs.

4.5.4.14 For the northern part of the planned residential developments at TMTL Lot No.496 (P8) facing slip road connecting So Kwun Wat Road, the cumulative noise levels for the NAPs would comply with 70dB(A) criterion with the provision of at-receiver end noise mitigation measures.

4.5.4.15 For other multi-storey buildings, such as The Royale (SKW09), Hong Kong Gold Coast (SKW17), etc., and the planned residential developments, such as TMTL Lot No.518 (P10) and southern west part of the planned residential developments at TMTL Lot No.496 (P8), etc., the cumulative noise levels for the NAPs at lower levels are mainly attributable to the traffic on other roads and would exceed 70dB(A) noise criterion, but the project contribution is less than 1dB(A). Hence, mitigation measures are not required for these residential units.

4.5.4.16 For Planned Development under Planning Application No. Y/TM/29, Various Lots in D.D.374 (P7), the maximum predicted noise levels of Project Road would exceed 70dB(A) noise criterion as it is fronting the proposed slip road with approximately 20m separation. Hence, mitigation measures within the Project Road Extent would be only required to alleviate the noise impacts at this NSR.

4.5.4.17 Schools including Harrow International School Hong Kong (SKW05) and STFA Lee Kam Primary School (SKW10) are mainly attributable to the traffic on other roads and would exceed 70dB(A) noise criterion, but the project contribution is less than 1dB(A). Hence, mitigation measures are not required for these schools.

4.5.4.18 As the Tai Lam Chung Road will be widened for the construction of the Project, the traffic noise impact from widened Tai Lam Chung Road is assessed. The nearest NSRs are village houses at Luen On San Tsuen (SL06) and Tai Lam Chung Tsuen (SL07) and they would comply with 70dB(A) noise criterion for residential use. Hence, the adverse impact from Tai Lam Chung Road widening is not anticipated and no mitigation measures are required.

Tsing Lung Tau Area

4.5.4.19 As discussed in **Section 4.5.2**, the NSRs within the Assessment Area for road traffic noise comprise of both villages houses of 1 to 3 storeys high and multi-storey buildings (up to 29 storeys).

4.5.4.20 According to the noise assessment results, the cumulative road traffic noise levels for village houses at Ka Loon Tsuen (TLT01) and Tsing Lung Tau New Village (TLT07) would comply with 70dB(A) noise criterion. This is attributable to the fact that these NSRs are located at the level lower than the re-aligned TMR and screened by natural terrain. Hence, mitigation measures are not required for these NSRs.

4.5.4.21 For low-rise buildings at Vistacove (TLT02) and Tsing Lung Tau (TLT03), they are also located at the level lower than the re-aligned TMR and screened by natural terrain. The cumulative noise levels for the NSRs are mainly attributable to the traffic on other roads. The cumulative noise impacts would exceed 70dB(A) noise criterion, but the project contribution is less than 1dB(A). Hence, mitigation measures are not required for these NSRs.

4.5.4.22 However, some of village houses at Choi Yuen Tsuen (TLT04) would be fronting the re-aligned TMR and overlooking TMR as these NSRs were built on the terrain with less separation distances from the re-aligned TMR. Results indicate that the cumulative road traffic noise impacts at these NSRs would exceed 70dB(A) noise criterion and with project contribution more than 1dB(A). Hence, mitigation measures within the Project Road extent would be required to alleviate the noise impacts at this NSR.

4.5.4.23 Other than village houses or low-rise buildings, there are multi-storey buildings along the re-aligned TMR, including Hong Kong Garden (TLT05). They are 20 to 29 storeys high and they are approximately 13 to 20 storeys above the nearest road level of the re-aligned TMR. Hence, all the residential floors from 1/F to 7/F are screened by the natural terrain. Assessment results also indicate that the noise levels of NAPs of Hong Kong Garden at levels below the level of the re-aligned TMR would experience noise screening effects and comply with the noise criterion.

4.5.4.24 For the NAPs of Hong Kong Garden (TLT05) above the level of the re-aligned TMR , results indicate that the noise contribution at some of the NAPs closer to the Project Road Extent (i.e. Blocks 9, 10, 16 to 21 of Hong Kong Garden) would experience cumulative noise levels exceeding 70dB(A) noise criterion, and with noise contributions more than 1dB(A). Hence, mitigation measures within the Project Road extent would be required to alleviate the noise impacts at this NSR.

4.5.4.25 For the remaining tower blocks of Hong Kong Garden (TLT05) and L'Aquatique (TLT06), they are located further away from re-aligned TMR and screened by the multi-storey buildings in front. Hence, the cumulative road traffic noise levels would comply with 70dB(A) noise criterion. Hence, mitigation measures are not required for these NSRs.

North Lantau Area

4.5.4.26 The NSR in Tai Chuen is substantially screened by terrain/ other developments / structures, etc., and hence NAP is not considered necessary. Hence, no road traffic noise assessment has been carried out for North Lantau. Mitigation measures are also not required for this area.

4.5.5 Mitigation of Road Traffic Noise Impact

Direct Mitigation Measures

4.5.5.1 As discussed above, some NSRs will be exposed to noise levels exceeding the respective requirements, and hence, direct noise mitigation measures within the Project Road extent would be provided as far as practicable until the mitigated overall noise levels would comply with the relevant standards or the mitigated noise levels from the Project roads does not exceed the relevant standards and does not contribute to the overall noise levels by 1.0 dB(A) or more. Hence, direct noise mitigation measures as listed below are proposed to alleviate adverse traffic noise impact on the affected NSRs.

4.5.5.2 At-source mitigation measures has been adopted before the adoption of at-received end measures. LNRS will be adopted as the first priority, then follows by vertical / cantilevered barrier. The semi-enclosure will be adopted as the last resort of at-sources mitigation measures due to potential visual impact to the NSRs.

Consideration of Tunnel Portal Noise

4.5.5.3 For portal openings at Lam Tei, the NSRs within 300m from the portal openings are village houses, which are located below the portal level. The portal opening would be screened by the viaduct structure of new road sections. Hence, adverse noise impact from the portal is not anticipated.

4.5.5.4 For portal openings near Pak Shek Hang, the NSRs within 300m from the portal opening are village houses, which are located below the portal level. The portal openings are also screened by the viaduct structures of new road sections. Hence, adverse noise impact from the portal is not anticipated.

4.5.5.5 For portal opening at So Kwun Wat, there is a NSR (i.e. So Kwun Wat Tsuen (SKW01)) within 300m from the portal opening which is located above the viaduct level and would be overlooking the portal opening. Hence, a cantilevered barrier (with a 5m vertical section with a 3m cantilevered at 45^{o}) is proposed to minimise any adverse noise impact from the tunnel portal.

4.5.5.6 For portal openings near Tai Lam and Siu Lam, the NSRs within 300m from the portal openings are low-rise residential buildings, which are located below the portal level. The portal openings are screened by the viaduct structure of new road section. Hence, adverse noise impact from the portal is not anticipated.

4.5.5.7 For portal opening at Tsing Lung Tau connecting to Tsing Lung Bridge, it is directly facing the sea and no NSR will have direct view to this portal. Hence, adverse noise impact from the portal is not anticipated.

4.5.5.8 For portal opening at Tsing Lung Tau connecting to TMR, it is screened by the slip road, noise barrier and semi-enclosure, and no NSR will have a direct view to this portal. Hence, adverse noise impact from the portal is not anticipated.

4.5.5.9 Further to the LNRS provided on high speed road sections of new road projects with 80km/hr or above and expressway (as discussed in **Section 4.5.2.7** and **Appendix 4.7**), LNRS (e.g. 6mm Polymer Modified Stone Mastic Asphalt (PMSMA6) or equivalent) on local roads of new road projects also has been adopted as mitigation measures, summary of additional proposed at-source noise mitigation measures is shown in **Table 4.14**. Locations of the direct mitigation measures are shown in **Figure 4.5**.

Table 4.14 Recommended At-source Noise Mitigation Measure

ID	Location	Noise Mitigation Measures [1]	Height above road (m)	Approx. Length (m) [2]	Benefited NSRs	
					Existing	Committed / Planned
a. Lam Tei						
VB01	Along slip road connecting YLH Westbound (WB) slip road	3m VB	3	145	LT04	–
CB01	Along slip road from TMB connecting KSWH Northbound (NB)	CB (5.5m + 3m at 45º)	7.6	475	LT03, LT06	P4
CB02	Along slip road from Lam Tei Tunnel connecting KSWH NB	CB (5.5m + 3m at 45º)	7.6	390	LT03, LT06	P4
CB03	Along slip road connecting YLH Eastbound (EB)	CB (5.5m + 3m at 45º)	7.6	235	LT03, LT06	P4
CB09	Along slip road from TMB connecting KSWH Southbound (SB)	CB (5.5m + 3m at 45º)	7.6	225	–	P1
CB10	Along slip road from Lam Tei Tunnel connecting KSWH NB	CB (5.5m + 3m at 45º)	7.6	195	–	P1
CB11	Along slip road connecting KSWH SB	CB (5.5m + 3m at 45º)	7.6	120	–	P2
CB12	Along slip road connecting YLH EB	CB (5.5m + 3m at 45º)	7.6	145	–	P2
b. So Kwun Wat / Tai Lam						
LNRS01	Along trunk road at So Kwun Wat Link Road western tunnel portal	LNRS	–	70	SKW01	–
LNRS02	Along slip road connecting TMR EB	LNRS	–	410	SKW01, SKW05	P7
LNRS03	Along slip road connecting TMR WB	LNRS	–	865	SKW01, SKW05	P7
LNRS04	Along slip road NB connecting So Kwun Wat Road	LNRS	–	665	SKW01, SKW19	–
LNRS05	Along slip road SB connecting So Kwun Wat Road	LNRS	–	495	SKW01, SKW19	–
CB08 [4]	Along trunk road at So Kwun Wat Link Road western tunnel portal	CB (5.5m + 3m at 45º) [3]	7.6	70	SKW01	–
c. Tsing Lung Tau						
VB02	Along realigned TMR EB	4m VBs	4	215	TLT04	–
CB04	Along slip road from realigned TMR WB connecting Tsing Lung Bridge SB	CB (5.5m + 3m at 45º) [3]	7.6	160	TLT05	–
CB05	Along realigned TMR WB	CB (5.5m + 3m at 45º) [3]	7.6	165	TLT05	–
CB06	Along realigned TMR WB	CB (5.5m + 2m at 35º) [3]	6.6	70	TLT05	–
CB07	Along realigned TMR EB	CB (5.5m + 3m at 45º) [3]	7.6	250	TLT05	–
SE01	Along realigned TMR WB	Semi-enclosure with opening at north [3]	7.6	250	TLT05	–

Notes:
[1] VB: Vertical barrier; CB (Xm + Y at Zº): Cantilevered barrier, with X-height of vertical section, Y-length of cantilevered arm, Z-inclination angle of cantilevered arm
[2] Rounded to nearest 5m.
[3] The side(s) of noise mitigation measures facing to the road traffic will be installed with absorptive materials/ panels.
[4] Cantilevered barrier is proposed for portal noise screening.

Reprovision of Noise Barrier at Lam Tei

4.5.5.10 A 30m long section of an existing 3m vertical barrier will be reprovisioned at existing stub end near a slip road connecting KSWH SB to YLH WB which TMB will be connected at. During the construction phase, a temporary noise barrier of the same height, length and surface density will be installed at a location between the existing traffic lane and existing barrier before removing the existing barriers to ensure the same noise reduction performance. Before the completion of construction works, the 3m vertical barrier will be reprovisioned back to the concerned slip road before removing the temporary noise barrier.

4.5.5.11 With the implementation of the recommended noise mitigation measures, including LNRS, noise barriers and semi-enclosure, the noise levels at some of the representative NSRs would comply with the traffic noise criteria. However, exceedance of the traffic noise would still be predicted at some of the representative NSRs due to other roads, which the noise contribution from the road is less than 1dB(A). The predicted overall noise levels of all the NSRs are summarized in **Table 4.15** and presented in **Appendix 4.9**.

Table 4.15 Predicted Road Traffic Noise Impact at NAPs Under Mitigated Scenario in Year 2048

NSR ID [1]	Description	NAP ID [2]	Use [3]	Criterion, $L_{10\ 1hr}$ dB(A)	Predicted Noise Level, $L_{10\ hr}$ dB(A) [4]				Whether Further Noise Mitigation Measures on "Project Roads" are required (Y/N)
					Overall	Project Roads	Other Roads	Max. "Project Roads" Contribution when Overall Noise Level Exceed Criterion [5] [6]	
Existing NSRs									
a. Lam Tei									
LT01	Area at/near Wo Ping San Tsuen	WPS-01-WPS-03	R	70	68-**73**	44-51	68-**73**	0.1	N
LT02	Area at/near Tsoi Yuen Tsuen	TYT-01-TYT-17	R	70	63-**71**	54-67	62-70	0.3	N
LT03	Area at/near Fuk Hang Tsuen	FHT-01-FHT-44	R	70	55-**82**	≤40-65	52-**82**	0.5	N
	Church of Christian Faith Lam Tei Gospel Church	Te-02	W	65	60-**76**	55-61	59-**76**	0.1	N
	Temple at Fuk Hang Tsuen	Te-03	W	65	**71**	58	**71**	0.2	N
LT04	Village Houses near Tung Fuk Road	VH-01-VH-12	R	70	65-**74**	≤40-66	65-**74**	0.6	N
LT05	Miu Fat Buddhist Monastery Ksitigarbha Hall	Te-01	W	65	**72**	≤40	**71**	0.1	N
	Madam Lau Kam Lung Secondary School of Miu Fat Buddhist Monastery	eLKL-01	E	65	68-**70**	≤40	68-**70**	0.1	N
	Miu Fat Buddhist Monastery Elderly Home	MFB-01	R	70	60-63	≤40-43	60-63	-	N
LT06	The Sherwood	SHE-01-SHE-15	R	70	61-**78**	47-64	61-**77**	0.5	N
LT08	Botania Villa	BOT-01-BOT-03	R	70	**72-75**	53-59	**72-74**	0.2	N
LT09	GreenView	GRE-01	R	70	**76-80**	57-61	**76-80**	0.1	N

NSR ID [1]	Description	NAP ID [2]	Use [3]	Criterion, $L_{10\ 1hr}$ dB(A)	Predicted Noise Level, $L_{10\ hr}$ dB(A) [4]				Whether Further Noise Mitigation Measures on "Project Roads" are required (Y/N)
					Overall	Project Roads	Other Roads	Max. "Project Roads" Contribution when Overall Noise Level Exceed Criterion [5] [6]	
LT11	Area at/near Lo Fu Hang	LFH-01-LFH-19	R	70	63-**71**	≤40-69	60-70	0.5	N
	Temples at Lo Fu Hang	Te-07	W	65	57	49	56	-	N
LT12	Area at/near Fu Tei Ha Tsuen	FTT-01-FTT-05	R	70	54-65	≤40-63	50-62	-	N
	Temples at Fu Tei Ha Tsuen	Te-04-Te-06	W	65	46-61	44-47	42-61	-	N
b. So Kwun Wat / Siu Lam/ Tai Lam									
SKW01	Area at/near So Kwun Wat Tsuen	SKW-01-SKW-17, SKW-19-SKW-28, SKW-31	R	70	59-**81**	48-66	58-**81**	0.7	N
SKW02	The Bloomsway-The Laguna	LAG-01-LAG-02	R	70	**71-81**	≤40-46	**71-81**	0.1	N
SKW03	The Bloomsway-The Terrace	TER-01-TER-05	R	70	62-**72**	≤40-49	62-**72**	0.0	N
SKW05	Harrow International School Hong Kong Staff Dormitory	HIS-06	R	70	**72-78**	63-68	**72-78**	0.6	N
	Harrow International School Hong Kong	eHIS-01-eHIS-04	E	65	63-**80**	≤40-55	63-**80**	0.1	N
SKW07	Houses at Mun Fat Lane	MUN-01-MUN-03	R	70	61-63	≤40	61-63	-	N
SKW08	Palm Beach	PAL-01-PAL-02	R	70	61-**74**	≤40-50	61-**74**	0.1	N
SKW09	The Royale	ROY-01-ROY-03	R	70	62-**78**	≤40-61	62-**78**	0.2	N
SKW10	STFA Lee Kam Primary School	eSTF-01	E	65	60-**69**	46-52	60-**69**	0.1	N
SKW11	PLK Women's Welfare Club Western District Fung Lee Pui Yiu Primary School	ePLK-01	E	65	56-62	≤40-40	56-62	-	N

NSR ID [1]	Description	NAP ID [2]	Use [3]	Criterion, $L_{10\ 1hr}$ dB(A)	Predicted Noise Level, $L_{10\ hr}$ dB(A) [4]				Whether Further Noise Mitigation Measures on "Project Roads" are required (Y/N)
					Overall	Project Roads	Other Roads	Max. "Project Roads" Contribution when Overall Noise Level Exceed Criterion [5] [6]	
SKW12	Villa La Plage	VIL-01 – VIL-11	R	70	70-**79**	≤40	70-**79**	0.1	N
SKW13	Surfside	SUR-01	R	70	52-64	≤40	52-64	-	N
SKW14	Blessing Villa	BLV-01	R	70	**78**	≤40	**78**	0.0	N
SKW15	Spring Seaview Terrace	SPR-01	R	70	**73-75**	≤40	**73-75**	0.1	N
SKW16	Monte Carlo Villas	MON-01-MON-02	R	70	70-**76**	≤40	70-**76**	0.1	N
SKW17	Hong Kong Gold Coast	GOL-01-GOL-05	R	70	**71-76**	≤40-55	**71-76**	0.1	N
SKW18	Aegean Coast	AEG-01-AEG-02	R	70	62-**72**	≤40-52	62-**72**	0.1	N
SKW19	Avignon	AVI-01 – AVI-16	R	70	40-**74**	≤40-64	≤40-**74**	0.9	N
SKW20	Emerald Bay	EME-01	R	70	64-70	≤40-47	64-70	-	N
SKW21	NAPA	NAA-01-NAA-02	R	70	63-70	≤40	63-70	-	N
SL01	Area at/near So Kwun Wat San Tsuen	SKS-01-SKS-08	R	70	58-63	57-62	≤40-59	-	N
SL02	Area at/near Siu Lam	SIU-01 – SIU-16	R	70	52-66	52-66	≤40-64	-	N
SL03	Grand Pacific Heights	GRA-01-GRA-02	R	70	53-66	≤40-66	48-57	-	N
SL04	Siu Lam Psychiatric Centre	SPC-01	R	70	63-64	62-63	48	-	N
SL05	Tai Lam Correctional Institution Dormitory	TLC-01-TLC-03, TLC-05-TLC-08	R	70	47-57	47-57	≤40-47	-	N
SL06	Area at/near Luen On San Tsuen	LOS-01-LOS-05	R	70	57-60	57-59	≤40-53	-	N
SL07	Area at/near Tai Lam Chung Tsuen	TAI-01 – TAI-24	R	70	54-**72**	47-64	≤40-**72**	0.0	N
c. Tsing Lung Tau									
TLT01	Area at/near Ka Loon Tsuen	KLT-01-KLT-12	R	70	62-70	53-67	53-70	-	N
TLT02	Vistacove	VIS-01 – VIS-03	R	70	60-**73**	59-61	53-**72**	0.3	N

NSR ID [1]	Description	NAP ID [2]	Use [3]	Criterion, $L_{10\ 1hr}$ dB(A)	Predicted Noise Level, $L_{10\ hr}$ dB(A) [4]				Whether Further Noise Mitigation Measures on "Project Roads" are required (Y/N)
					Overall	Project Roads	Other Roads	Max. "Project Roads" Contribution when Overall Noise Level Exceed Criterion [5] [6]	
TLT03	Area at/near Tsing Lung Tau	TLT-01	R	70	**71-72**	57-58	**71-72**	0.2	N
TLT04	Area at/near Choi Yuen Tsuen	CYT-01-CYT-15	R	70	56-70	51-70	≤40-68	-	N
TLT05	Hong Kong Garden	HKG-01-HKG-16	R	70	44-**72**	≤40-69	≤40-**72**	0.9	N
TLT06	L'Aquatique	LAQ-01	R	70	57-64	55-61	53-61	-	N
TLT07A	Area at/near Tsing Lung Tau New Village	TLN-01-TLN-02	R	70	58-61	≤40-44	58-61	-	N
Committed / Planned NSRs									
a. Lam Tei									
P1	Public Housing development at Nai Wai (population intake year is not available) [9]	p-NAW-01-p-NAW-20 [8]	R	70	57-70	≤40-69	53-70	-	N
P2	Public Housing development at Lam Tei North (population intake year is not available) [9]	p-LTN-01 – p-LTN-12 [8]	R	70	64-70	≤40-68	62-70	-	N
P4	CDA at Fuk Hang Tsuen Lane (population intake year is not available)	pp-FHA-01-pp-FHA-06	R	70	70-**80**	56-69	70-**80**	0.5	N
P5	CDA of Lot 2883 in D.D.130 at Fuk Hang Tsuen Lane (population intake year is not available)	p-FHB-01	R	70	63-67	≤40	63-67	-	N

NSR ID [1]	Description	NAP ID [2]	Use [3]	Criterion, $L_{10\ 1hr}$ dB(A)	Predicted Noise Level, $L_{10\ hr}$ dB(A) [4]				Whether Further Noise Mitigation Measures on "Project Roads" are required (Y/N)
					Overall	Project Roads	Other Roads	Max. "Project Roads" Contribution when Overall Noise Level Exceed Criterion [5] [6]	
b. So Kwun Wat / Siu Lam/ Tai Lam									
P7	Residential Development under Planning Application No. Y/TM/29, Various Lots in D.D.374 (population intake in 2028)	pp-SKW1-01-pp-SKW1-07	R	70	61-**81**	51-69	61-**81**	0.5	N
P8	Comprehensive Residential Development at TMTL Lot No.496 (population intake year is not available)	p-SKW2-01-p-SKW2-09 [7]	R	70	60-**72**	≤40-60	60-**72**	0.1	N
P9	Elderly Centre under Planning Application No. A/TM/578 (population intake year is not available)	pp-SKW3-01-pp-SKW3-02	R	70	70-**77**	51-56	70-**77**	0.1	N
P10	Residential Development at TMTL Lot No.518 (population intake year is not available)	p-SKW4-01-p-SKW4-08	R	70	59-**79**	≤40-57	59-**79**	0.1	N
P11	Residential Development at TMTL Lot No. 546 (population intake year is not available)	pp-CRO-01-pp-CRO-03	R	70	67-**79**	53-68	67-**79**	0.5	N

NSR ID [1]	Description	NAP ID [2]	Use [3]	Criterion, $L_{10\ 1hr}$ dB(A)	Predicted Noise Level, $L_{10\ hr}$ dB(A) [4]				Whether Further Noise Mitigation Measures on "Project Roads" are required (Y/N)
					Overall	Project Roads	Other Roads	Max. "Project Roads" Contribution when Overall Noise Level Exceed Criterion [5] [6]	
P12	Residential Development at TMTL Lot No. 520 (population intake year is not available)	pp-SKW5-01-pp-SKW5-03	R	70	56-67	≤40-43	56-67	-	N

Notes:

[1] The assessment will only include NSRs which rely on opened windows for ventilation and within 300m assessment area.

[2] For areas with committed/ planned development with population intake before 2033, only planned NSRs have been considered. For areas with committed/ planned developments with population intake between 2033 and 2048 or without any available development programme, both existing and planned NSRs have been considered.

[3] R-Residential, E-Educational Institutions, W-Place of Public Worship.

[4] Bold figure denotes the predicted noise level is over the relevant EIAO-TM noise criteria.

[5] Bold figure denotes the noise exceedance which is over the relevant EIAO-TM noise criteria and the contribution from Project Roads to the overall noise level is equal to or higher than 1.0 dB(A).

[6] Maximum Project Roads contribution for NSRs with overall noise level exceeding relevant criteria.

[7] According to the information collated from the relevant government department, receiving-end noise mitigation measures (i.e. Acoustic windows and balconies with sliding doors) would be adopted to abate the road traffic noise impacts. According to "Practice Note on Application of Innovative Noise Mitigation Designs in Planning Private Residential Developments against Road Traffic Noise Impact", the minimum noise reduction for road traffic noise from acoustic windows and balconies with sliding doors (i.e. enhanced acoustic balcony (baffle type)) is 6dB(A) and 8dB(A) respectively, hence, a 6dB(A) noise reduction from provision of receiving-end noise mitigation measures would be adopted for road traffic noise impact assessment.

[8] 7dB(A) and 12dB(A) reduction for possible acoustic window and acoustic balconies respectively are recommended for P1 and P2.

[9] Although there is no confirmed programme on population intake for Proposed Public Housing Developments at Ping Shan South, Yuen Long, Lam Tei North and Nai Wai, Tuen Mun, it is confirmed by CEDD that the existing premises or place within the areas shall have been resumed for these planned developments by the time when R11 is commissioned. Hence, only planned NSRs within these development areas are included for noise assessment. The locations of representative NSRs for Proposed Public Housing Developments at Ping Shan South, Yuen Long, Lam Tei North and Nai Wai are based on conceptual plan provided by CEDD.

Lam Tei Area

4.5.5.12 As mentioned in **Section 4.5.4,** mitigation measures are required for some NSRs (i.e. Fuk Hang Tsuen (LT03), village house along Tung Fuk Road (LT04) and The Sherwood (LT06) and planned public housing developments at Nai Wai and Lam Tei North (P1 and P2) and planned CDA at Fuk Hang Tsuen Lane (P4)).

4.5.5.13 With the proposed mitigation measures as descripted in **Table 4.14**, for existing NSRs exposed to noise exceedance, their respective contributions from Project roads in their predicted overall traffic noise level would be less than 1.0 dB(A), and their predicted traffic noise levels due to Project roads would comply the respective traffic noise criteria.

4.5.5.14 For planned CDA at Fuk Hang Tsuen Lane (P4), the contributions from Project roads in their predicted overall traffic noise level would be less than 1.0 dB(A), and its predicted traffic noise level due to Project roads would comply with the respective traffic noise criteria.

4.5.5.15 Due to the current land use zones, both planned public housing developments (P1 and P2) will be subject to future rezoning of land use to give effect to the high-rise development status. However, as conservative assessment, best available information from the project proponent has been adopted at the time of assessment. As discussed in **Section 4.5.4**, the noise levels at these NSRs are mainly dominated by other roads in their close proximity. While these NSRs are still developing their detailed design of public housing hence no final design information is available at the time of preparing this assessment, it is noted that their population intake year would be close to the commissioning year of the Project. Some noise mitigation measures within the project extent of the Project. Cantilevered noise barriers would be implemented along the slip roads connecting KSWH / YLH to reduce the noise contribution from the Project. As a concerted effort, HyD, Housing Department (HD) and CEDD will implement a package of necessary noise mitigation measures both at source and receiving ends in a holistic and effective manner for compliance of the relevant traffic noise planning requirements.

4.5.5.16 As discussed in **Section 4.5.4.9**, for the NAPs in north-western part of the planned public housing development in Nai Wai, the cumulative noise impacts are dominated by the noise generated by other roads. The contribution from the Project is less than 1dB(A). Additional noise mitigation (e.g. full enclosure) would not be able to reduce the cumulative nose impact to comply with the respective noise criterion. For the NAPs in the south-eastern part of the planned public housing development in Nai Wai, the proposed noise mitigation measures (e.g cantilevered noise barrier) within the project road extent would alleviate the cumulative noise impacts already. Noise mitigation measures with better noise reduction performance (e.g. full enclosure) are not effective to ensure full compliance with the respective noise criterion as these NAPs are still affected by other roads.

4.5.5.17 As discussed in **Section 4.5.4.10**, the NAPs in the planned public housing development at Lam Tei North are dominated by the traffic on other roads. Similar to the case for the planned public housing development in Nai Wai, the provision of at-source noise mitigation measures with better noise reduction performance (e.g. full enclosure) within the extent of the Project are not effective to ensure full compliance with the respective noise criterion.

4.5.5.18 As explained previously, at-source noise mitigation measures with better noise reduction performance are not effective to ensure full compliance of noise criteria at these planned public housing developments. The project proponents of these planned public housing developments will also implement all the necessary mitigation measures within their project boundary to ensure that the noise levels at the planned public housing developments will be further reduced to an appropriate level. After implementing this balanced and cost-effective approach for noise mitigation measures, it is anticipated that the noise levels at the planned public housing development will be reduced to an appropriate level. The respective project proponents would submit separate noise assessment reports to the authority to fulfil the administrative requirements based on the latest design parameters. As a concerted effort, HyD, HD and CEDD will implement a package of necessary noise mitigation measures both at source and receiving ends in a holistic and effective manner for compliance of the relevant traffic noise planning requirements.

4.5.5.19 After the implementation of the above at-source mitigation measures by the Project, the predicted overall noise levels of the planned NSRs still exceed the noise criteria. While the provision of noise mitigation measures by the site formation and infrastructure works and at-receiver mitigation measures for any planned public housings are subject to further study by the project proponents, at-receiver mitigation measures, such as alternative building orientation, building setback, special building design, boundary wall noise barriers and provision of architectural fins/acoustic windows/balconies, are recommended to alleviate the road traffic noise impacts on the planned NSRs. Boundary wall of the housing developments, if any, could be designed as noise barrier to screen the propagation of road traffic noise source. The project proponents can further explore alternative options which can achieve corresponding road traffic noise planning requirements during the detailed design stage.

So Kwun Wat / Siu Lam/ Tai Lam Area

4.5.5.20 As mentioned in **Section 4.5.4,** mitigation measures are required for NSRs (i.e. So Kwun Wat Tsuen (SKW01), Harrow International School Hong Kong Staff Dormitory (SKW05), Avignon (SKW19), planned development under Planning Application No. Y/TM/29, Various Lots in D.D.374 (P7).

4.5.5.21 With the proposed mitigation measures in **Table 4.15**, for all NSRs exposed to noise exceedance, their respective contributions from Project roads would be less than 1.0 dB(A), and their predicted traffic noise levels due to Project roads would comply with the respective traffic noise criteria.

Tsing Lung Tau Area

4.5.5.22 As mentioned in **Section 4.5.4,** mitigation measures are required for NSRs (i.e. Choi Yuen Tsuen (TLT04) and Hong Kong Garden (TLT05)).

4.5.5.23 With the proposed mitigation measures in **Table 4.15**, for existing NSRs exposed to noise exceedance, their respective contributions from Project roads would be less than 1.0 dB(A), and their predicted traffic noise levels due to Project roads would comply with the respective traffic noise criteria.

4.5.6 Indirect Mitigation Measures

4.5.6.1 According to Section 4.8 of EIAO Guidance Note No. 12/2010, the testing criteria for consideration of Indirect Mitigation Measures are set out as below:

(i) the predicted overall noise level from the road project together with other traffic noise in the vicinity must be above a specified noise level;

(ii) the predicted overall noise level is at least 1.0 dB(A) more than the prevailing traffic noise level, i.e. the total traffic noise level existing before the works to construct the road were commenced; and

(iii) the contribution to the increase in the predicted overall noise level from the road project must be at least 1.0 dB(A).

4.5.6.2 As mentioned above, in the case where NSRs are still exposed to noise levels exceeding the relevant noise criteria after the implementation of all direct mitigation measures, the total number of existing dwellings, classrooms and other noise sensitive elements which may qualify for indirect technical remedies should be identified. However, for those NSRs with cumulative noise level exceed the relevant noise criteria, the noise contribution from "Project Road" would be less than 1.0 dB(A). The assessment result of the prevailing stage is shown in **Appendix 4.10**. Hence, irrespective of the prevailing noise level, all the NSRs would not satisfy the eligibility assessment criteria.

4.5.7 Evaluation of Protected and Benefitted Noise Sensitive Uses with the Noise Mitigation Measures

4.5.7.1 To study the noise performance of the project, traffic noise levels at the residential, schools and other noise sensitive uses including place of worship which have a direct line of sight to the Project have been predicted. The numbers of dwellings, classrooms and other noise sensitive uses that would be benefited from and be protected by the provision of noise mitigation measures have been calculated. The definition of "exposed", "benefited" and "protected" noise sensitive uses are defined as follow:

- Exposed-Noise sensitive uses with unmitigated noise level greater than relevant noise criteria;
- Benefited-Exposed noise sensitive uses with a noise reduction of 1.0 dB(A) or greater in overall noise level with the noise mitigation measures in place; and
- Protected-Exposed noise sensitive uses with an overall noise level not greater than relevant noise criteria with the noise mitigation measures in place.

4.5.7.2 Number of dwellings and classrooms that would be benefited from and be protected by the provision of noise mitigation measures will be identified for existing residential and schools respectively, while place of worship will be identified as number of floors. Results of existing noise sensitive uses are presented in tables below.

Table 4.16 Summary of Protected and Benefitted Noise Sensitive Uses

Noise Sensitive Uses	Unmitigated Scenario	Mitigated Scenario		
	Approx. No. of Exposed Dwellings/ Classrooms/ Noise Sensitive Uses [1]	Approx. No. of Exposed Dwellings/ Classrooms/ Noise Sensitive Uses [1]	Approx. No. of Protected Dwellings/ Classrooms/ Noise Sensitive Uses [1]	Approx. No. of Benefitted Dwellings/ Classrooms/ Noise Sensitive Uses [1]
Dwelling	2300 [2]	2070 [2]	230 [2]	990 [2]
Classroom	110 [2]	110 [2]	0	0
Place of Worships	6	5	1	3

Notes:
[1] Planned Dwellings/ Classrooms/ Noise Sensitive Uses are excluded.
[2] Rounded to the nearest ten.

4.5.8 Prediction of Noise Impact of Interim Stages for Realignment of TMR

4.5.8.1 As discussed in Section 2, in order to allow for the construction of the Project at Tsing Lung Tau, realignment of a section TMR is required. Approximately 1.4km long section of Tuen Mun Road at Tsing Lung Tau will be realigned to make room for slip roads connecting TMR to Tsing Lung Bridge and Tai Lam Chung Tunnel (South Section) to enhance the connectivity of the Project. The realignment work will be carried out in 5 sections each of around 300m long from south to north tentatively.

4.5.8.2 The existing TMR is installed with noise barriers in both EB and WB. During interim stages, approximately 390m long of the existing noise mitigation measures will need to be demolished in tandem with the realignment works. Sheet pile will be installed by press-in method to retain the running traffic lanes during the westbound realignment works. New noise migration measures, if any, will be installed prior to diverting the westbound traffic to the newly realigned road.

4.5.8.3 The existing westbound road will then be closed for the eastbound realignment works. Sheet pile will be installed by press-in method to retain the running traffic lanes. New noise migration measures, if any, will be installed prior to diverting the eastbound traffic to the newly realigned road.

4.5.8.4 The realignment works will be implemented in 5 stages tentatively. These TMR sections are installed with existing noise barriers including the cantilever barrier (5.5m + 3m cantilevered barrier) in EB, and the cantilever barrier (5.5m + 3m cantilevered barrier) in WB.

4.5.8.5 During these interim stages, the existing noise mitigation measures at TMR will need to be demolished in tandem with the realignment of the corresponding road sections. During the construction of the realigned road sections, new noise mitigation measures such as noise barriers and semi-noise enclosures (see **Section 4.5.5** on the configuration and length of the noise mitigation measures) would be installed as well. Hence, the road traffic noise assessment would consider these interim stages for the NSRs in the vicinity of Tsing Lung Tau area.

4.5.8.6 A summary of the sequence of works for the 5 stages is given below (see also **Appendix 4.11** for illustration).

Stage	Summary of Sequence of Works
1	• Commence foundation and slope works, construction of retaining walls • Existing noise barriers at TMR and existing TMR remain no change
2	• Commence construction of the new TMR WB section • Install new noise barriers (i.e. CB05 and CB06) and vertical parts with cantilevered arms of the semi-enclosure (i.e. SE01) along southern side of the realigned TMR WB section • Existing noise barriers at TMR and existing TMR remain no change
3	• Demolish existing noise barriers at TMR WB section • Commence operation of re-aligned TMR WB section • Commence construction of the new TMR EB section • Install new noise barriers (i.e. CB07) and vertical footings of the semi-enclosure (i.e. SE01) along southern side of the realigned TMR EB section • Existing noise barriers at TMR EB section and TMR EB section remain no change
4	• Demolish existing noise barriers at TMR EB section and existing TMR EB • Commence operation of re-aligned TMR EB section • Commence construction of slip roads for TMR • Install new noise barriers (i.e. CB04 and VB02) and top cover of the semi-enclosure (i.e. SE01)
5	• All construction works completed • Re-aligned TMR and its associated slip roads in operation • All noise mitigation measures in place

4.5.8.7 Based on the above sequence of works, it can be seen that the existing noise barriers would remain unchanged during both Stages 1 and 2. During Stage 3, there are periods which the vertical sections with cantilevered arms of semi-closure and CB07 and CB04 are yet to be installed while the re-aligned TMR WB section is under operation. The details of Stage 3 is presented in **Appendix 4.12.** During Stage 4, all the vertical sections of the noise enclosures would have been completed.

4.5.8.8 It could therefore be considered that Stage 3 would represent the worst case as far as the interim stages of realignment of TMR are concerned. The noise assessment for Stage 3 is therefore adopted in the road traffic noise model using the traffic forecast for 2033 for the interim stage just before the commencement of the Project. This traffic forecast for 2033 also represents the highest traffic flow just before the operation of the Project. A summary of the predicted noise levels for Stage 3 is shown in **Appendix 4.13** and **Table 4.17** below.

Table 4.17 Predicted Road Traffic Noise Impact at NAPs Under Interim Stage

NSR ID [1]	Description	NAP ID [2]	Use [3]	Criterion, $L_{10\ 1hr}$ dB(A)	Predicted Noise Level, $L_{10\ hr}$ dB(A) [4]		
					Prevailing Stage	Interim Stage	Max. difference when Interim Stage exceed criteria [5]
Existing NSRs							
c. Tsing Lung Tau							
TLT01	Area at/near Ka Loon Tsuen	KLT- 01-KLT- 12	R	70	64-**73**	63-**71**	0.0
TLT02	Vistacove	VIS-01-VIS-03	R	70	65-**74**	61-**73**	-0.2
TLT03	Area at/near Tsing Lung Tau	TLT-01	R	70	**72-73**	**72-73**	0.0
TLT04	Area at/near Choi Yuen Tsuen	CYT-01-CYT-15	R	70	57-**76**	56-**76**	0.1
TLT05	Hong Kong Garden	HKG-01-HKG-16	R	70	49-**72**	46-**72**	0.2
TLT06	L'Aquatique	LAQ-01	R	70	55-63	55-63	-
TLT07A	Area at/near Tsing Lung Tau New Village	TLN-01-TLN-02	R	70	59-61	59-61	-

Notes:

[1] The assessment will only include NSRs which rely on opened windows for ventilation and within 300m assessment area.

[2] For areas with committed/ planned development with population intake before 2033, only planned NSRs have been considered. For areas with committed/ planned developments with population intake between 2033 and 2048 or without any available development programme, both existing and planned NSRs have been considered.

[3] R-Residential.

[4] Bold figure denotes the predicted noise level is over the relevant EIAO-TM noise criteria.

[5] Bold figure denotes the noise exceedance which is over the relevant EIAO-TM noise criteria and the overall noise level of Interim Stage is equal to or higher than 1.0 dB(A) compared to that of prevailing stage.

4.5.8.9 The prediction results indicate that the change in predicted noise levels compared to those of prevailing stage at the representative NSRs during interim stage will be less than 1.0 dB(A) and considered to be insignificant. Adverse road traffic noise impact is not anticipated comparing to prevailing stage.

4.5.9 Evaluation of Residual Road Traffic Noise Impact

4.5.9.1 According to **Section 4.5.5**, adverse residual road traffic noise impact due to the project is not anticipated.

4.6 Fixed Noise Sources Impact Assessment

4.6.1 Fixed Noise Sources Impact Assessment Methodology

4.6.1.1 As set out in Appendix C Clause 4.1.2 of the EIA SB, a qualitative assessment is required to identify the fixed noise sources/ temporary industrial sources, and proposing corresponding direct mitigation measures to be adopted during operational phase to demonstrate that no adverse fixed noise sources impact will be associated with the Project. A summary of key steps for this qualitative fixed noise sources noise assessment that has conducted is:

- Determine the assessment area from Project Road and highway / tunnel operation and maintenance facilities;
- Summarize the fixed noise sources;
- Identify and locate representative NSRs that may be affected by the noise sources;
- Determine the noise criteria for both daytime and nighttime;
- Evaluate the potential qualitative impact at the NSRs; and
- Examine and recommend all practical mitigation measures such as quiet plant, silencer, enclosure, etc., to alleviate any potential noise impacts as much as practicable.

4.6.2 Identification of Fixed Noise Sources Impact

Identification of Assessment Area and Noise Sensitive Receiver

4.6.2.1 The assessment area for fixed noise source impact includes an area within 300m from the Project Road and highway / tunnel operation and maintenance facilities. Representative NSRs and NAPs locations that would be affected by the fixed noise sources have been identified and presented in **Table 4.8** and are summarised in the **Table 4.18** below. Locations of Representative NSRs and NAPs for fixed noise sources impact assessment are shown in **Figure 4.6**.

Table 4.18 Representative NSRs for Fixed Noise Source Impact Assessment

NSR ID [1]	OZP Land Use	Description	Use [2]	Number of Storeys	NAP ID	Area Sensitivity Ratings [3]	ANL – 5, dB(A)	Prevailing Background Noise Levels, dB(A)	Noise Criteria, dB(A) [4,5]
Existing NSRs									
a. Lam Tei									
LT12B	OU	Area at/near Fu Tei Ha Tsuen	R	1-3	FTT-01	B	60 / 60 / 50	52/ 50 / 45	52 / 50 / 45
b. So Kwun Wat / Siu Lam/ Tai Lam									
SKW01A	GB	Area at/near So Kwun Wat Tsuen	R	1-3	SKW-04	B	60 / 60 / 50	55 /55 / 47	55 / 55 / 47
SL01A	GB	Area at/near So Kwun Wat San Tsuen	R	1-3	SKS-01	A	55 / 55 / 45	37 / 37 / 37	37 / 37 / 37
SL02	GB	Area at/near Siu Lam	R	1-3	SIU-13	A	55 / 55 / 45	37 / 37 / 37	37 / 37 / 37
SL05	GIC	Tai Lam Correctional Institution Dormitory	R	1-6	TLC-01	A	55 / 55 / 45	50 / 49 / 49	50 / 49 / 45
SL07	V	Area at/near Tai Lam Chung Tsuen	R	1-3	TAI-05	A	55 / 55 / 45	39 / 37 / 35	39 / 37 / 35
c. Tsing Lung Tau									
TLT04B	GB	Area at/near Choi Yuen Tsuen	R	1-3	CYT-02	B	60 / 60 / 50	48 / 47 / 47	48 / 47 / 47
TLT05	R(B)1	Hong Kong Garden	R	20-29	HKG-01	C	65 / 65 / 55	48 / 47 / 47	48 / 47 / 47
d. North Lantau									
NL01	GB	Area at/near Tai Chuen	R	2	TAC-01	B	60 / 60 / 50	NA	60 / 60 / 50

Notes:

[1] The assessment will only include NSRs which rely on opened windows for ventilation and within 300m assessment area.

[2] R-Residential.

[3] Refer to **Appendix 4.14**.

[4] Day / Evening / Nighttime criteria

[5] Fixed noise criteria are stipulated in Annex 5 of EIAO-TM and summarized below:

(a) 5dB(A) below the appropriate ANLs shown in Table 2 of the Technical Memorandum for the Assessment of Noise from Places Other than Domestic Premises, Public Places or Construction Sites, or

(b) the prevailing background noise levels (For quiet areas with noise level 5 dB(A) below the ANL).

Inventory of Noise Sources

4.6.2.2 According to current design, 7 ventilation buildings and 2 administration buildings in administration areas (i.e. a total no. of 2 in Lam Tei and North Lantau) are proposed and summarized in **Table 4.19** below. Potential fixed noise impacts arising from the ventilation buildings would be caused by operation of the ventilation fans. The locations of the potential fixed noise sources during operational phase are shown in **Figure 4.6**.

Table 4.19 Summary of Ventilation Building and Administration Buildings Location

Location	Number of Fixed Noise Source(s)	Remarks for the Ventilation Building(s)
Lam Tei	1 Ventilation Building 1 Administration Building and associated facilities	1 for Lam Tei Tunnel
So Kwun Wat	3 Ventilation Buildings	2 for So Kwun Wat Link Road 1 for Lam Tei Tunnel
Tai Lam	2 Ventilation Buildings	1 for emergency use for Tai Lam Chung Tunnel (North Section) 1 for the Tai Lam Chung Tunnel (South Section)
Tsing Lung Tau	1 Ventilation Building	1 for the Tai Lam Chung Tunnel (South Section)
North Lantau	1 Administration Building	-

4.6.3 Evaluation of Fixed Noise Sources Impact

4.6.3.1 As discussed in **Section 2**, the 7 proposed ventilation buildings (i.e. a total of 7 no. in Lam Tei, So Kwun Wat, Tai Lam and Tsing Lung Tau) and 2 administration buildings (i.e. a total no. of 2 in Lam Tei and North Lantau) are proposed and are the key fixed noise sources for the Project. **Section 4.3** has also identified the NSRs in the vicinity of these fixed noise sources.

4.6.3.2 For Lam Tei area, the nearest NSR in the vicinity of the ventilation building are the village houses near Fu Tei Ha Tsuen (LT12B). The separation distance between ventilation building and this NSR is larger than 100m. It is anticipated that, with a combination of the mitigation measures such as selection of quieter plant, installation of suitable sound attenuators, suitable orientation of the key louvers, etc. (see **Section 2**), adverse fixed noise impact is not anticipated. The detailed designer / contractor of the ventilation building shall consider all the contemporary circumstances in the upcoming Fixed Noise Sources Management Plan (FNMP), to be submitted for approval before commencement of construction, when designing the noise mitigation measures. For So Kwun Wat Tsuen, Siu Lam and Tai Lam Chung Tsuen areas, the nearest NSRs in the vicinity of the ventilation building include the village houses at So Kwun Wat Tsuen (SKW01A), village house at So Kwun Wat San Tsuen (SL01A), village house at Siu Lam (SL02), Tai Lam Correctional Institution Dormitory (SL05) and the village houses near Tai Lam Chung Tsuen (SL07). The separation distances between the ventilation buildings and these NSRs are mostly larger than 100m, except for the village

houses in So Kwun Wat Tsuen (SKW01A) and Siu Lam (SL02) at which the separation distances are about 60m and 80m respectively. All the mitigation measures as discussed for the Lam Tei area would also be applicable. Nevertheless, the detailed designer / contractor of the ventilation building shall orient the major lourvres away from nearby NSRs as far as practicable and consider all the contemporary circumstances in the upcoming FNMP, to be submitted for approval before commencement of construction, when designing the noise mitigation measures.

4.6.3.3 For Tsing Lung Tau area, the nearest NSRs in the vicinity of the ventilation building are the village houses at Choi Yuen Tsuen (TLT04B) and residential buildings of Hong Kong Garden (TLT05). The separation distance between ventilation building and these NSRs are larger than 100m. All the mitigation measures as discussed for Lam Tei area would also be applicable. The detailed designer / contractor of the ventilation building shall consider all the contemporary circumstances in the upcoming FNMP, to be submitted for approval before commencement of construction, when designing the noise mitigation measures.

4.6.3.4 For the administration buildings in administration areas (i.e. a total no. of 2 in Lam Tei and North Lantau), since there will not be any major plant, adverse fixed noise impact is not anticipated. Nonetheless, good practices as stated in **Section 4.6.4** should also be implemented to avoid any adverse fixed noise sources impact where appropriate. The detailed designer / contractor of the administration buildings shall consider all the contemporary circumstances in the upcoming FNMP, to be submitted for approval before commencement of construction.

4.6.4 Mitigation of Fixed Noise Sources Impact

4.6.4.1 Possible mitigation measures with reference to EPD's "Good Practices on Ventilation System Noise Control" could be considered the fixed noise sources, for example:

- Quieter equipment;
- Silencer;
- Barrier; and
- Enclosure, etc.

4.6.4.2 The detailed design should incorporate the following good practice in order to minimize the nuisance on the neighboring NSRs. In case the contractor would change the design and locations of the vents, they would need to comply with the legislative impacts at the receivers.

- Louvres should be orientated away from adjacent NSRs, preferably onto main roads which are less sensitive; and
- The façade for these ventilation shafts should have adequate sound insulation properties to minimise the noise emanating through the building fabric.

4.6.5 Fixed Noise Sources Management Plan

4.6.5.1 As set out in Appendix C Clause 4.4 of the EIA SB, a FNMP shall be submitted for approval which will contain the quantitative fixed noise sources impact assessment, noise mitigation measures and fixed noise sources impact monitoring

and audit programme, with reference to the updated and identified inventories once available and in any case before the commencement of the project.

4.6.5.2 A summary of key steps for quantitative fixed noise sources noise assessment will be conducted is:

- Determine the assessment areas from the fixed noise sources impact shall generally include areas within 300 metres from the boundary of the Project and the works of the Project;
- Update representative NSRs that may be affected by the noise sources;
- Review and update the noise criteria for both daytime and nighttime if necessary;
- Use standard acoustic principle for attenuation and directivity;
- Adopt correction of tonality, impulsiveness and intermittency as stipulated in IND-TM;
- Calculate the noise impacts using plant inventories and utilisation schedule, if available; and
- Cumulative impacts included.

4.6.5.3 If there is any change to the specifications of the planned fixed noise sources, layout design, operation modes, mitigation measures, or any other factors that would have implications on the fixed noise sources impact as concluded in the FNMP, an updated FNMP shall be submitted to EPD no later than one month before the implementation of any such change.

4.6.5.4 The FNMP will include an implementation schedule clearly listing out the mitigation measures, the implementation party, location and timing of implementation. Mitigation measures recommended and requirement specified in the FNMP shall be fully implemented by the contactor.

4.7 Environmental Monitoring and Audit

4.7.1 Construction Noise

4.7.1.1 Noise monitoring should be carried out as part of the EM&A programme for the construction phase of the Project to check compliance with the construction noise criteria. A CNMP should evaluate the potential construction noise impacts and to assess the effectiveness and practicality of all proposed noise mitigation measures. The CNMP would be prepared before the tender invitation and commencement of construction works. The implementation of the mitigation measures recommended in CNMP should also be audited as part of the EM&A programme. Details of the EM&A requirements are provided in the EM&A Manual.

4.7.2 Road Traffic Noise

4.7.2.1 Road traffic noise monitoring should be carried out during operational phase at representative NSRs located in the vicinity of the recommended direct mitigation measures. Details of the programme are provided in the EM&A Manual.

4.7.3 Fixed Noise Source Impact

4.7.3.1 A FNMP should evaluate the potential fixed noise sources impacts and to assess the effectiveness and practicality of all proposed noise mitigation measures. The FNMP would be prepared before commencement of Project. Fixed noise audit should be carried out for the proposed fixed noise sources during the testing and commissioning stage to verify the compliance of the EIAO-TM criteria.

4.8 Conclusion

4.8.1 Construction Noise

4.8.1.1 An assessment on construction noise has been conducted according to the requirements in the EIA SB. Results indicated that, with the adoption of proposed noise mitigation measures, including the use of QPME, use of quieter equipment/method, use of noise barrier / enclosure, etc., adverse noise impact arising from construction works of the Project is not anticipated. Nevertheless, a CNMP, which contains a quantitative construction noise impact assessment, mitigation measures and monitoring and audit programme, should be submitted before the tender invitation and commencement of construction works.

4.8.2 Road Traffic Noise

4.8.2.1 A road traffic noise assessment has been conducted according to the requirements in EIA SB. Mitigation measures, such as LNRS, noise barriers and semi-enclosure have been recommended to be implemented within the Project Road extent to fulfil the respective requirements.

4.8.3 Fixed Noise Source Impact

4.8.3.1 An assessment on fixed noise sources has been conducted according to the requirements in EIA SB. With the adoption of proposed noise mitigation measures, including the use of quieter equipment, silencer, barrier, enclosure, etc., adverse noise impact arising from fixed noise sources is not anticipated. Nevertheless, a FNMP, which contains a quantitative fixed noise sources impact assessment, mitigation measures and monitoring and audit programme, should be submitted before commencement of the Project.