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4. NOISE IMPACT

4.1 Introduction

4.1.1.1 This section presents an assessment on the potential noise impacts arising from the construction and operation of the Project. The noise impact assessment is conducted in accordance with the requirements of Annex 5 and Annex 13 of the Technical Memorandum on Environmental Impact Assessment Process (EIAO-TM) as well as the requirements set out under Clause 3.4.4 and Appendix C of the EIA Study Brief (ESB-340/2021).

4.1.1.2 An application for an Environmental Permit (EP) would be submitted for the following Schedule 2 Designated Projects (DPs) and the potential noise impact due to these DPs during construction and operation phases are addressed in this assessment. These DPs include:

- New primary distributor and new district distributor roads (DP1);
- New San Tin Lok Ma Chau Effluent Polishing Plant (STLMC EPP) (DP2);
- New Water Reclamation Plant (DP3);
- Revitalisation of San Tin Eastern Main Drainage Channel (DP6);
- Recreational Development within Deep Bay Buffer Zone 2 (DP7).

4.1.1.3 The following DPs would apply the EP through separate EIA studies but their potential impacts during construction and operation phases are also addressed in this assessment. These DPs include:

- Refuse Transfer Station (RTS) (DP4);
- 400kV Electricity Substation (DP5).

4.1.1.4 For the Northern Link (NOL) Project, the EIA Study of NOL would consider the impact of this Project as its concurrent project and should be included in its EIA Study according to the EIA Study Brief of NOL EIA (ESB-346/2021). The noise impact assessment would follow the requirements and criteria set out in the EIAO-TM to determine the environmental acceptability. There are no construction activities which would result in ground-borne construction noise impact (e.g. tunnelling) in the Project. Hence, the cumulative construction noise impact (including ground-borne noise) arising from the NOL would be addressed in NOL EIA Report while the cumulative fixed noise impact arising from noise sources of NOL would be addressed in this EIA report.

4.2 Environmental Legislations, Standards and Guidelines

4.2.1 General

4.2.1.1 Noise impact has been assessed in accordance with the criteria and methodology given in the Technical Memoranda (TM) under the Noise Control Ordinance (NCO), and the Technical Memorandum on Environmental Impact Assessment Process (EIAO-TM).

4.2.1.2 The NCO and Environmental Impact Assessment Ordinance (EIAO) provide the statutory framework for noise control. Assessment procedures and standards are set out in the following TM:

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

4.2.1.3 With regard to the assessments of the construction noise impact during restricted hours (i.e. between 19:00 and 07:00 hours and at any time on Sundays and general holidays), the NCO designates ANLs for Noise Sensitive Receivers (NSRs) on the basis of an Area Sensitivity Rating (ASR), based on the characteristics of the area within which they are located such as rural, village, low-density residential, or urban (see **Table 4.1** Within these areas, the presence of "influencing factors" (such as the presence of industrial area or major roads) can further affect the ASR and hence the acceptable noise levels.)

Table 4.1 Area Sensitivity Ratings

Type of Area Containing NSR	Degree to which NSR is affected by Influencing Factor		
	Not Affected	Indirectly Affected	Directly Affected
Rural area, including country parks or village type developments	A	B	B
Low density residential area consisting of low-rise or isolated high-rise developments	A	B	C
Urban area	B	C	C
Area other than those above	B	B	C

Notes:
- "Country park" means an area that is designated as a country park pursuant to section 14 of the Country Parks Ordinance;
- "Directly affected" means that the NSR is at such a location that noise generated by the IF is readily noticeable at the NSR and is a dominant feature of the noise climate of the NSR;
- "Indirectly affected" means that the NSR is at such a location that noise generated by the IF, whilst noticeable at the NSR, is not a dominant feature of the noise climate of the NSR;
- "Not affected" means that the NSR is at such a location that noise generated by the IF is not noticeable at the NSR; and
- "Urban area" means an area of high density, diverse development including a mixture of such elements as industrial activities, major trade or commercial activities and residential premises.

4.2.2 Construction Phase

General Construction Works

4.2.2.1 The NCO provides the statutory framework for noise control of construction works, other than percussive piling, using PME between the hours of 1900 and 0700 hours or at any time on Sundays and general holiday (that is, restricted hours). Noise from construction activities taking place at 0700 – 1900 hours on any day not being a Sunday or general holiday is subject to the Noise Standards for Daytime Construction Activities stated in Table 1B of Annex 5 in the EIAO-TM. The noise limit is $L_{eq(30\ minutes)}$ 75 dB(A) at 1m from the external façades of all domestic premises, temporary housing accommodation, hostels, convalescent homes and homes for the aged which rely on opened window for ventilation, and $L_{eq(30\ minutes)}$ 70 dB(A) at 1m from the external façade of places of pubic worship, courts of law, hospitals and medical clinics and educational institutions (including kindergartens and nurseries) which rely on opened window for ventilation ($L_{eq(30\ minutes)}$ 65 dB(A) during examinations).

Construction Works during Restricted Hours

4.2.2.2 On all days between 1900 and 0700 hours and at any time on Sundays and general holidays, the use of PME for the purpose of carrying out construction works is prohibited unless a Construction Noise Permit (CNP) has been obtained. A CNP may be granted provided that the ANL for the NSRs can be complied with. ANLs are assigned depending upon the ASR and are given in **Table 4.2**

Table 4.2 Acceptable Noise Levels under the Technical Memorandum on Noise from Construction Work other than Percussive Piling

Time Period	Acceptable Noise Level (ANLs), dB(A)		
	ASR A	ASR B	ASR C
All days during the evening (1900 to 2300 hours), and general holidays (including Sundays) during the daytime and evening (0700 to 2300 hours)	60	65	70

Time Period	Acceptable Noise Level (ANLs), dB(A)		
	ASR A	ASR B	ASR C
All days during the night-time (2300 to 0700 hours)	45	50	55

4.2.2.3 The Noise Control Authority will consider a well-justified CNP application, for construction works within restricted hours as guided by the relevant Technical Memoranda issued under the Noise Control Ordinance. The Noise Control Authority will take into account of contemporary conditions / situations of adjoining land uses and any previous complaints against construction activities at the site before making his decision in granting a CNP. Nothing in this EIA shall bind the Noise Control Authority in making his decision. If a CNP is to be issued, the Noise Control Authority shall include in it any condition he thinks fit. Failure to comply with any such conditions will lead to cancellation of the CNP and prosecution action under the NCO.

4.2.2.4 Under the DA-TM, the use of five types of Specified Powered Mechanical Equipment (SPME) and three types of Prescribed Construction Work (PCW) within a designated area during restricted hours would require a valid CNP. The SPME includes hand-held breaker, bulldozer, concrete lorry mixer, dump truck and hand-held vibratory poker. The PCW are:

- Erecting or dismantling of formwork or scaffolding.
- Loading, unloading or handling of rubble, wooden boards, steel bars, wood or scaffolding material.
- Hammering.

4.2.2.5 In general, it should not be presumed that a CNP may be granted for carrying out PCW within a designated area during restricted hours only if the location of work being carried out is screened by solid barriers, such as purpose-designed acoustic screens, buildings or topographical features. The CNP may be granted for the execution of construction works during restricted hours involving the use of PME and/ or SPME if the relevant Acceptable Noise Levels and criteria stipulated in the GW-TM and DA-TM can be met. The ANLs for the use of SPME within a designated area (i.e. those listed in DA-TM) are more stringent (i.e. 15 dB(A) lower than those listed in the GW-TM) to offer additional protection to the population.

4.2.2.6 Percussive piling is prohibited between 1900 and 0700 hours on any weekday not being a general holiday and at any time on Sunday or general holiday. A CNP is required for the carrying out of percussive piling between 0700 and 1900 hours on any day not being a general holiday. PP-TM sets out the requirements for working and determination of the permitted hours of operations for the CNP applications. The permitted hours of operations would be 3, 5 or 12 hours per day depending on the types of percussive piling and the predicted noise impact at NSRs.

Construction Ground-borne Noise

4.2.2.7 Construction ground-borne noise is under the control of the NCO, EIAO and their subsidiary Technical Memorandum.

4.2.2.8 Noise arising from general construction works of the Project during normal daytime (0700 – 1900 except general holidays and Sundays) is governed by the EIAO-TM. With reference to the IND-TM under the NCO, the criteria for noise transmitted primarily through the structural elements of the building or buildings should be 10 dB(A) less than the relevant ANL. These criteria apply to all NSRs, such as residential buildings, schools, clinics, hospitals, temples and churches. Therefore, the ground-borne construction noise criteria are limited to 10 dB(A) below respective ANL stipulated in the GW-TM.

4.2.2.9 The construction ground-borne noise criteria for the representative ground-borne NSR of the Project, taking ASR "B" as an example, are presented in **Table 4.3** below.

Table 4.3 Noise Criteria for Construction Ground-borne Noise

Type of NSR / Assessment Point	Ground-borne Noise Criteria [(a)]

	Daytime (0700 to 1900 hours on any day not being a Sunday or general holiday), Leq (30 mins), dB(A)	All days during evening (1900 to 2300 hours), and general holidays (including Sundays) during the daytime and evening (0700 to 2300 hours) (Leq 5 mins, dB(A))	All days during the night-time (2300 to 0700 hours) (Leq 5 mins, dB(A))
Domestic premises, hotels	65	55	40
Schools	60 / 55[(b)]	55	N/A[(c)]

Notes:
(a) Assessment point located at an internal location of a building in which the NSR is located.
(b) A 5 dB(A) reduction to the ground-borne noise criteria is recommended for school during examination period.
(c) Generally, no sensitive use/operation during this time period.

4.2.3 Operation Phase

Road Traffic Noise

4.2.3.1 For road traffic noise, the $L_{10(1\ hour)}$ criteria stipulated in Annex 5, Table 1A of EIAO-TM are adopted for different types of noise sensitive receivers (NSRs) which rely on opened windows for ventilation are presented in **Table 4.4**.

Table 4.4 Noise Criteria for Road Traffic Noise

NSR	Road Traffic Noise Criteria, $L_{10(1hr)}$, dB(A)
• All domestic premises • Temporary housing accommodation • Hostels • Convalescent homes, and • Homes for the aged	70
• Educational institutions (including kindergartens and nurseries) • Places of public worship, and • Courts of law	65
• Hospitals and medical clinics	55

Note:
(a) The above standards, or equivalent, apply to uses which reply on opened windows for ventilation and are assessed at 1m from the external façade.

Fixed Noise

4.2.3.2 Fixed noise sources are controlled by Section 13 of the NCO and IND-TM. Noise criteria for fixed noise sources impact with a noise criterion of 5 dB(A) below the appropriate ANL shown in Table 2 of the IND-TM or the prevailing background noise levels (for quiet areas with level 5 dB(A) below the ANL) recommended in the Annex 5 of EIAO-TM for planning purposes are applied to this study. The ANLs and criteria for different ASRs are summarized in **Table 4.5** below.

Table 4.5 Noise Criteria for Fixed Noise Sources

Time Period	Fixed Noise Criteria for Different Area Sensitivity Rating (Leq 30min, dB(A))[(a)]					
	ANL, dB(A)			ANL-5, dB(A) for Planned Fixed Noise Sources		
	ASR A	ASR B	ASR C	ASR A	ASR B	ASR C
Day (0700 to 1900 hrs)	60	65	70	55	60	65
Evening (1900 to 2300 hrs)	60	65	70	55	60	65
Night (2300 to 0700 hrs)	50	55	60	45	50	55

Notes:
(a) The fixed noise criteria apply to uses which rely on opened window for ventilation only.
(b) The above standards should be viewed as the maximum permissible noise levels assessed at 1m from the external façade.

Airborne Railway Noise

4.2.3.3 The EIAO-TM and IND-TM stipulate the appropriate ANL for airborne rail noise. The ANLs are dependent on ASRs of the NSRs and are shown in **Table 4.6**.

Table 4.6 Acceptable Noise Levels for Airborne Rail Noise

Time Period	Noise Criteria (Leq, 30 min, dB(A))		
	ASR A	ASR B	ASR C
Daytime and Evening (0700 to 2300 hours)	60	65	70
Night-time (2300 to 0700 hours)	50	55	60

Ground-borne Railway Noise

4.2.3.4 The noise criterion for assessing ground-borne rail noise is given in **Table 4.7**. 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.

Table 4.7 Criteria for Ground-borne Railway Noise

Time Period	ANL-10, dB(A)		
	ASR A	ASR B	ASR C
Daytime and Evening (0700 to 2300 hours)	50	55	60
Night-time (2300 to 0700 hours)	40	45	50

4.3 Description of Environment

4.3.1.1 The site area of the Project is about 610 hectares and locates to the west of Kwu Tung North and Fanling North New Development Areas (NDAs), Fanling and Sheung Shui New Towns and to the northeast of Yuen Long and Tin Shui Wai New Towns. It is bound to the North by San Tin Highway and the Lok Ma Chau Boundary Control Point and to the South by San Tin Barracks and its neighbouring hills. The proposed associated infrastructure is mainly located along the existing roads and rural area. The noise climate at areas proposed for the associated infrastructure is dominated by road traffic noise from the road network.

4.3.1.2 A summary of the prevailing background noise level measured within the Study Area is given in **Table 4.8** and the locations of background noise measurement are shown in **Figure 4.2**. Detailed prevailing background noise measurement records are provided in **Appendix 4.2**.

Table 4.8 Prevailing Background Noise Measurement Results

ID	Measurement Location	Measured Noise Level $L_{90\ (1\text{-}hr)}$, dB(A)		
		0700 to 1900 (Daytime)	1900 to 2300 (Evening time)	2300 to 0700 (Nighttime)
N1	Near 81 Tsing Lung Tsuen	56	56	54
N2	Near 69 Mai Po Tsuen	57	57	55
N3	Lamp Post VG2332 (near Ko Hang)	55	55	54
N4	Near 35 Shek Wu Wai	46	45	44
N5	Lamp post VA1829	50	50	49
N6	Lamp Post BD0673	48	48	48
N7	Near 291 Chau Tau Tsuen	40	40	39
N8	Near 1C Mai Po San Tsuen	48	48	46
N9	Lamp post BD0844 along Kwu Tong Road	53	53	47

Note:
(1) Façade correction has been adopted.

4.4 Identification of Noise Sensitive Receivers

4.4.1.1 In accordance with Annex 13 of the EIAO-TM, domestic premises including temporary housing, educational institutions (including kindergartens and nurseries), hospitals, medical

clinics, homes for the aged, convalescent homes, places of public worship, courts of law are identified as NSRs.

4.4.1.2 The assessment area for noise impact assessment for the Project is defined as 300m away from the Project works boundary in accordance with Clauses 2.2.1(a), 3.2.1(a), 4.2.1(a), 5.2.1(a) and 6.2.1(a), Appendix C of the EIA Study Brief and is presented in **Figure 4.1**. Based on the observations from site visits on 17 and 18 October 2022, review of relevant land use plans including Outline Zoning Plans (OZP) and the latest Revised Recommended Outline Development Plan (RODP) and building massing (the representative massing layouts have been confirmed with the relevant government departments), existing, committed and planned NSRs within 300m of the Project Boundary have been identified. The locations of the identified representative NSRs and Noise Assessment Point (NAPs) for construction noise, road traffic noise, fixed noise and railway noise impact assessments are presented in **Figure 4.3** to **Figure 4.6**. A list of the representative NSRs and NAPs are presented in **Table 4.9** to **Table 4.12**. Photographs of the existing NSRs are presented in **Appendix 4.1**.

4.4.1.3 In order to evaluate the noise impacts during operation phase associated with the Project, representative existing/committed/planned NSRs located within the assessment area have been identified for assessment. Only the first layer of NSRs have been identified for assessment because it would provide acoustic shielding to those receivers at further distance behind.

4.4.1.4 Given that a District Cooling System (DCS) will be provided for the proposed educational institutions, talent accommodation and social welfare facilities, these facilities will not rely on opened windows for ventilation. Therefore, no noise assessment point will be identified in the noise impact assessments.

4.4.1.5 A list showing area sensitivity rating as well as day and evening time noise criteria and night-time noise criteria for fixed noise impact assessment for the representative NSRs are presented in **Table 4.13**.

Table 4.9 Representative NSRs and NAPs for Construction Noise Impact Assessment

NSR	NAP	NAP Description	Land Use	Number of Storey
P-RSc21	P-RSc21-R32	Proposed Public Housing Development at RSc 2.1	R	41
	P-RSc21-R65		R	41
P-RSc22	P-RSc22-R1	Proposed Public Housing Development at RSc 2.2	R	41
	P-RSc22-R21		R	41
P-RSc24	P-RSc24-R42	Proposed Public Housing Development at RSc 2.4	R	41
P-RSc25	P-RSc25-R1	Proposed Public Housing Development at RSc 2.5	R	42
	P-RSc25-R16		R	42
	P-RSc25-R19		R	42
	P-RSc25-R67		R	42
P-RSc26	P-RSc26-R28	Proposed Public Housing Development at RSc 2.6	R	41
P-RSc27	P-RSc27-R1	Proposed Public Housing Development at RSc 2.7	R	41
	P-RSc27-R12		R	41
P-RSc31	P-RSc31-R30	Proposed Public Housing Development at RSc 3.1	R	41
P-RSc32	P-RSc32-R29	Proposed Public Housing Development at RSc 3.2	R	40
P-RSc121	P-RSc121-R1	Proposed Residential Development at R1.2.1	R	39
	P-RSc121-R7		R	39
P-RSc122	P-RSc122-R10	Proposed Residential Development at R1.2.2	R	39
P-RSc1231	P-RSc1231-R13	Proposed Residential Development at R1.2.3	R	35
P-RSc1232	P-RSc1232-R8	Proposed Residential Development at R1.2.3	R	42
	P-RSc1232-R17		R	42
P-RSc131	P-RSc131-R17	Proposed Residential Development at R1.3.1	R	42
P-RSc132	P-RSc132-R11	Proposed Residential Development at R1.3.2	R	39
P-VR	P-VR-R15	Village Re-Site at VR3.1	R	3
E-MP	E-MP-R1	69 Mai Po San Tsuen	R	3
	E-MP-R4	1C Mai Po San Tsuen	R	3
E-SH	E-SH-R1	Scenic Heights Block B2	R	3
E-RH	E-RH-R1	30 Rolling Hills Phase II	R	3
	E-RH-R2	6 Rolling Hills Phase I	R	3

NSR	NAP	NAP Description	Land Use	Number of Storey
E-SWW	E-SWW-R1	35C Shek Wu Wai	R	3
	E-SWW-R3	35 Shek Wu Wai	R	3
E-TLT	E-TLT-R2	18 Tsing Lung Tsuen	R	3
E-TST	E-TST-W1	Tung Shan Temple	W	3
E-TYS	E-TYS-E1	Tun Yu School	E	3
E-SLT	E-SLT-R1	2J San Lung Tsuen	R	3
E-YSW	E-YSW-R1	80A Yan Shau Wai	R	3
E-WPT	E-WPT-R1	161 Wing Ping Tsuen	R	3
	E-WPT-R4	285B Wing Ping Tsuen	R	3
E-CT	E-CT-R1	291 Chau Tau Tsuen	R	3
	E-CT-R3	218 Chau Tau Tsuen	R	3
	E-CT-R5	74 Pun Uk Tsuen	R	3
E-TS	E-TS-R1	Village house to the south of lamp post EA2021	R	1
E-TMB	E-TMB-B1	49 Tam Mei Barracks	B	1
E-STB	E-STB-B1	San Tin Barracks Block 69	B	1
	E-STB-B2	San Tin Barracks	B	1
	E-STB-B4	San Tin Barracks Block 40	B	1
	E-STB-B5	San Tin Barracks Block 6	B	1
	E-STB-B6	San Tin Barracks Block 68	B	1
E-SHT	E-SHT-R1	Village House near Siu Hom Tsuen	R	3
	E-SHT-R4	616 Siu Hom Tsuen	R	3
E-AB12	E-AB12-E1	310 Wing Ping Tsuen	R	3
E-PSA	E-PSA-E1	Village House near Pak Shek Au	R	2
E-SAT	E-SAT-E1	Temporary Structure near Shek Wu Wai San Tsuen	R	1
	E-SAT-E2	Village House near Pak Shek Au	R	1
	E-SAT-E3	Village House near Shek Wu Wai	R	2
	E-SAT-E4	89 Shek Wu Wai	R	2
E-KLR	E-KLR-E1	Temporary Structure near Siu Hum Tsuen	R	1
E-HWFST	E-HWFST-R1	23 Ha Wan Fisherman San Tsuen	R	2
	E-HWFST-R2	Temporary Structure near Ha Wan Fisherman San Tsuen	R	1
E-LMC	E-LMC-R1	301 Lok Ma Chau	R	2
	E-LMC-R2	206 Lok Ma Chau	R	2

Note:
[1] R – Residential; E – Educational; G – Government; IC – Institution and Community; W – Place of Worship; B – Barracks; OU – Other Specified Uses.

Table 4.10 Representative NSRs and NAPs for Traffic Noise Impact Assessment

NSR	NAP	NAP Description	Land Use	Number of Storey
P-RSc21	P-RSc21-R1 – P-RSc21-R70	Proposed Public Housing Development at RSc 2.1	R	41
P-RSc22	P-RSc22-R1 – P-RSc22-R27	Proposed Public Housing Development at RSc 2.2	R	41
P-RSc23	P-RSc23-R1 – P-RSc23-R205	Proposed Public Housing Development at RSc 2.3	R	47
P-RSc24	P-RSc24-R1 – P-RSc24-R44	Proposed Public Housing Development at RSc 2.4	R	41
P-RSc25	P-RSc25-R1 – P-RSc25-R72	Proposed Public Housing Development at RSc 2.5	R	42
P-RSc26	P-RSc26-R1 – P-RSc26-R46	Proposed Public Housing Development at RSc 2.6	R	41
P-RSc27	P-RSc27-R1 – P-RSc27-R44	Proposed Public Housing Development at RSc 2.7	R	41
P-RSc31	P-RSc31-R1 – P-RSc31-R47	Proposed Public Housing Development at RSc 3.1	R	41
P-RSc32	P-RSc32-R1 – P-RSc32-R45	Proposed Public Housing Development at RSc 3.2	R	40
P-RSc121	P-RSc121-R1 – P-RSc121-R16	Proposed Residential Development at RSc 1.2.1	R	39
P-RSc122	P-RSc122-R1 – P-RSc122-R20	Proposed Residential Development at RSc 1.2.2	R	39
P-RSc1231	P-RSc1231-R1 – P-RSc1231-R22	Proposed Residential Development at RSc 1.2.3.1	R	35
P-RSc1232	P-RSc1232-R1 – P-RSc1232-R19	Proposed Residential Development at RSc 1.2.3.2	R	42

NSR	NAP	NAP Description	Land Use	Number of Storey
P-RSc131	P-RSc131-R1 – P-RSc131-R18	Proposed Residential Development at RSc 1.3.1	R	42
P-RSc132	P-RSc132-R1- P-RSc132-R12	Proposed Residential Development at RSc 1.3.2	R	39
P-OU(MU)121	P-OU(MU)121-R1 – P-OU(MU)121-R50	Proposed Residential Development at OU(MU)1.2.1	R	41
P-G31	P-G31-R1 – P-G31-R12	Proposed FSD Staff Quarters	R	30
P-OU(MU)211	P-OU(MU)211-R1 - P-OU(MU)211-R4	Proposed Residential Development at OU(MU)1.2.2	R	43
	P-OU(MU)211-R5 P-OU(MU)211-R12			41
	P-OU(MU)211-R13 - P-OU(MU)211-R16			39
	P-OU(MU)211-R17 - P-OU(MU)211-R20			40
	P-OU(MU)211-R21 - P-OU(MU)211-R28			38
	P-OU(MU)211-R29 - P-OU(MU)211-R32			33
	P-OU(MU)211-R33 - P-OU(MU)211-R36			32
	P-OU(MU)211-R37 - P-OU(MU)211-R40			31
P-VR	P-VR-R1 – P-VR-R8	Village Re-Site at VR3.1	R	3
P-SHT	P-SHT-R1 – P-SHT-R12	Potential Village Development in existing “V” Zone in OZP No. S/YL-ST/8	R	3
P-SWW	P-SWW-R1 – P-SWW-R12	Potential Village Development in existing "V" zone in Shek Wu Wai	R	3
P-CT	P-CT-R1 – P-CT-R12	Potential Village Development in existing "V" zone in Chau Tau Tsuen and Pun Uk Tsuen	R	3
P-S_YL-ST_8	P-S_YL-ST_8-R1 - P-S_YL-ST_8-R15	Potential Village Development in existing "V" zone in No. S/YL-ST/8	R	3
E-MP	E-MP-R1	69 Mai Po San Tsuen	R	3
	E-MP-R2	165B Mai Po San Tsuen	R	3
	E-MP-R3	301 Mai Po San Tsuen (Eden Villa)	R	3
	E-MP-R4	1C Mai Po San Tsuen	R	3
E-SH	E-SH-R1	Scenic Heights Block B2	R	3
E-RH	E-RH-R1	30 Rolling Hills Phase II	R	3
E-SWW	E-SWW-R1	35C Shek Wu Wai	R	3
	E-SWW-R2	8A Shek Wu Wai	R	3
	E-SWW-R3	35 Shek Wu Wai	R	3
	E-SWW-R4	49 Shek Wu Wai	R	3
	E-SWW-R5	89 Shek Wu Wai	R	3
	E-SWW-R6	70 Shek Wu Wai	R	3
	E-SWW-R7	Temporary Structure in DD102 839	R	3
	E-SWW-R8	Temporary Structure in DD105 404	R	3
	E-SWW-R9	Temporary Structure in DD102 833	R	3
	E-SWW-R10	Temporary Structure in DD102 833	R	3
E-TLT	E-TLT-R1	125 Tsing Lung Tsuen	R	3
	E-TLT-R2	18 Tsing Lung Tsuen	R	3
	E-TLT-R3	121 Tsing Lung Tsuen	R	3
	E-TLT-R4	90 Tsing Lung Tsuen	R	3
E-TST	E-TST-W1	Tung Shan Temple	W	3
E-TYS	E-TYS-E1	Tun Yu School	E	3
E-SLT	E-SLT-R1	2J San Lung Tsuen	R	3
	E-SLT-R2	75 San Lung Tsuen	R	3
E-FTT	E-FTT-R1	6C1 Fan Tin Tsuen	R	3
	E-FTT-R2	103H Fan Tin Tsuen	R	3
E-YSW	E-YSW-R1	80A Yan Shau Wai	R	3
E-TCW	E-TCW-R1	63A Tung Chan Wai	R	3
E-WPT	E-WPT-R1	161 Wing Ping Tsuen	R	3
	E-WPT-R2	310 Castle Peak Road, San Tin	R	3
	E-WPT-R3	283 Wing Ping Tsuen	R	3
	E-WPT-R4	285B Wing Ping Tsuen	R	3
	E-WPT-R5	281A Wing Ping Tsuen	R	3
	E-WPT-R6	287 Wing Ping Tsuen	R	3
	E-WPT-R7	298 Wing Ping Tsuen	R	3
	E-WPT-R8	300 Wing Ping Tsuen	R	3
	E-WPT-R9	310 Wing Ping Tsuen	R	3
	E-WPT-R10	4 Castle Peak Road – San Tin	R	3

NSR	NAP	NAP Description	Land Use	Number of Storey
E-CT	E-CT-R1	291 Chau Tau Tsuen	R	3
	E-CT-R2	271 Chau Tau Tsuen	R	3
	E-CT-R3	218 Chau Tau Tsuen	R	3
	E-CT-R4	18C Chau Tau Tsuen	R	3
	E-CT-R5	74 Pun Uk Tsuen	R	3
	E-CT-R6	202 Chau Tau Tsuen	R	3
	E-CT-R7	18B Chau Tau Tsuen	R	3
E-TS	E-TS-R1	Village house to the south of lamp post EA2021	R	1
E-TMB	E-TMB-B1	49 Tam Mei Barracks	B	1
E-STB	E-STB-B1	San Tin Barracks Block 69	B	1
	E-STB-B2	San Tin Barracks	B	1
	E-STB-B3	San Tin Barracks Block 42	B	1
	E-STB-B4	San Tin Barracks Block 40	B	1
E-SHT	E-SHT-R1	Village House near Siu Hom Tsuen	R	3
	E-SHT-R2	610 Siu Hom Tsuen	R	3
	E-SHT-R3	610 Siu Hom Tsuen	R	3
	E-SHT-R4	616 Siu Hom Tsuen	R	3
	E-SHT-R5	616 Siu Hom Tsuen	R	3
	E-SHT-R6	601 Siu Hom Tsuen	R	3
	E-SHT-R7	600 Siu Hom Tsuen	R	3
	E-SHT-R8	607 Siu Hom Tsuen	R	3
	E-SHT-R9	511 Siu Hom Tsuen	R	3
	E-SHT-R10	200 Siu Hom Tsuen	R	3
Note: [1] R – Residential; E – Educational; G – Government; IC – Institution and Community; W – Place of Worship; B – Barracks; OU – Other Specified Uses.				

Table 4.11 Representative NSRs and NAPs for Fixed Noise Impact Assessment

NSR	NAP	NAP Description	Land Use	Number of Storey
P-RSc21	P-RSc21-R1	Proposed Public Housing Development at RSc 2.1	R	41
P-RSc22	P-RSc22-R1	Proposed Public Housing Development at RSc 2.2	R	41
	P-RSc22-R10			
P-RSc23	P-RSc23-R119 [2]	Proposed Public Housing Development at RSc 2.3	R	47
	P-RSc23-R126			
	P-RSc23-R202 [2]			
P-RSc25	P-RSc25-R16	Proposed Public Housing Development at RSc 2.5	R	42
	P-RSc25-R49			
P-RSc27	P-RSc27-R1	Proposed Public Housing Development at RSc 2.7	R	41
	P-RSc27-R28			
P-RSc32	P-RSc32-R19	Proposed Public Housing Development at RSc 3.2	R	40
	P-RSc32-R40			
P-RSc121	P-RSc121-R1	Proposed Residential Development at R1.2.1	R	39
	P-RSc121-R15			
P-RSc122	P-RSc122-R10	Proposed Residential Development at R1.2.2	R	39
P-RSc1231	P-RSc1231-R1	Proposed Residential Development at R1.2.3	R	35
	P-RSc1231-R8			
P-RSc132	P-RSc132-R1	Proposed Residential Development at R1.3.2	R	39
P-G31	P-G31-R4	Proposed FSD Staff Quarters	R	30
	P-G31-R7			
P-OU(MU)211	P-OU(MU)211-R1	Proposed Residential Development at OU(MU)2.1.1	R	41
	P-OU(MU)211-R14			39
	P-OU(MU)211-R24			38
P-VR	P-VR-R15	Village Re-Site at VR3.1	R	3
P-SHT	P-SHT-R1	Potential Village Development in existing “V” Zone in OZP No. S/YL-ST/8	R	3
	P-SHT-R5			
	P-SHT-R8			
P-SWW	P-SWW-R10	Potential Village Development in existing “V” Zone in Shek Wu Wai	R	3
P-CT	P-CT-R1	Potential Village Development in existing "V" zone in Chau Tau Tsuen and Pun Uk Tsuen	R	3
	P-CT-R3			
	P-CT-R5			
	P-CT-R9			
	P-CT-R10			
P-S_YL-ST_8	P-S_YL-ST_8-R4	Potential Village Development in existing “V” Zone in OZP No. S/YL-ST/8	R	3
	P-S_YL-ST_8-R8			

NSR	NAP	NAP Description	Land Use	Number of Storey
	P-S_YL-ST_8-R11			
	P-S_YL-ST_8-R13			
	P-S_YL-ST_8-R15			
E-MP	E-MP-R1	69 Mai Po San Tsuen	R	3
	E-MP-R4	1C Mai Po San Tsuen	R	3
E-SH	E-SH-R1	Scenic Heights Block B2	R	3
E-RH	E-RH-R2	6 Rolling Hills Phase I	R	3
E-SWW	E-SWW-R2	8A Shek Wu Wai	R	3
E-TLT	E-TLT-R2	18 Tsing Lung Tsuen	R	3
E-SLT	E-SLT-R1	2J San Lung Tsuen	R	3
E-WPT	E-WPT-R4	285B Wing Ping Tsuen	R	3
E-CT	E-CT-R1	291 Chau Tau Tsuen	R	3
	E-CT-R5	74 Pun Uk Tsuen	R	3
E-TS	E-TS-R1	Village house to the south of lamp post EA2021	R	1
E-STB	E-STB-B1	San Tin Barracks Block 69	B	1
	E-STB-B2	San Tin Barracks	B	1
	E-STB-B5	San Tin Barracks Block 6	B	1
	E-STB-B6	San Tin Barracks Block 68	B	1
E-PSA	E-PSA-E2	Village House near Pak Shek Au	R	2
E-SAT	E-SAT-E4	89 Shek Wu Wai	R	1
E-HWFST	E-HWFST-R2	Temporary Structure near Ha Wan Fisherman San Tsuen	R	2
E-LMC	E-LMC-R1	301 Lok Ma Chau	R	1
	E-LMC-R2	206 Lok Ma Chau	R	2

Notes:

[1] R – Residential; E – Educational; G – Government; IC – Institution and Community; W – Place of Worship; B – Barracks; OU – Other Specified Uses.
[2] Representative NAPs for Shooting Noise from Tam Mei and San Tin Barracks.

Table 4.12 Representative NSRs and NAPs for Railway Noise Impact Assessment

NSR	NAP	NAP Description	Land Use	Number of Storey
P-OU(MU)211	P-OU(MU)211-R2	Proposed Residential Development at OU(MU)2.1.1	R	43
	P-OU(MU)211-R10		R	41
	P-OU(MU)211-R14		R	39

Note:
[1] R – Residential; E – Educational; G – Government; IC – Institution and Community; W – Place of Worship; B – Barracks; OU – Other Specified Uses.

Table 4.13 Area Sensitivity Rating and Noise Criteria for Fixed Noise Impact Assessment

NSR	NAP	Type of Area Containing NSR [1]	Degree to which NSR is affected by IF[2]	Area Sensitivity Rating	ANL-5 (Daytime & Evening Time / Nighttime) (1)	Reference Noise Monitoring ID	Measured Prevailing Noise Levels (Day & Evening Time / Nighttime) (2)	Criteria dB(A) min. of (1) & (2)
P-RSc21	P-RSc21-R1	Type 4	Directly Affected	C	65/55	N3	55/54	55/54
P-RSc22	P-RSc22-R1	Type 4	Directly Affected	C	65/55	N3	55/54	55/54
	P-RSc22-R10		Directly Affected	C	65/55	N3	55/54	55/54
P-RSc23	P-RSc23-R126	Type 4	Not Affected	B	60/50	N3	55/54	55/50
P-RSc25	P-RSc25-R16	Type 4	Not Affected	B	60/50	N3	55/54	55/50
	P-RSc25-R49		Not Affected	B	60/50	N3	55/54	55/50
P-RSc27	P-RSc27-R1	Type 4	Not Affected	B	60/50	N3	55/54	55/50
	P-RSc27-R28		Not Affected	B	60/50	N3	55/54	55/50

NSR	NAP	Type of Area Containing NSR [1]	Degree to which NSR is affected by IF[2]	Area Sensitivity Rating	ANL-5 (Daytime & Evening Time / Nighttime) (1)	Reference Noise Monitoring ID	Measured Prevailing Noise Levels (Day & Evening Time / Nighttime) (2)	Criteria dB(A) min. of (1) & (2)
P-RSc32	P-RSc32-R19	Type 4	Not Affected	B	60/50	N3	55/54	55/50
	P-RSc32-R40		Not Affected	B	60/50	N3	55/54	55/50
P-RSc121	P-RSc121-R1	Type 4	Not Affected	B	60/50	N3	55/54	55/50
	P-RSc121-R15		Not Affected	B	60/50	N3	55/54	55/50
P-RSc122	P-RSc122-R10	Type 4	Not Affected	B	60/50	N3	55/54	55/50
P-RSc1231	P-RSc1231-R1	Type 4	Not Affected	B	60/50	N3	55/54	55/50
	P-RSc1231-R8			B	60/50	N3	55/54	55/50
P-RSc132	P-RSc132-R1	Type 4	Indirectly Affected	B	60/50	N4	45/44	45/44
P-G31	P-G31-R4	Type 4	Directly Affected	C	65/55	N9	53/47	53/47
	P-G31-R7		Directly Affected	C	65/55	N9	53/47	53/47
P-OU(MU)211	P-OU(MU)211-R1	Type 4	Not Affected	B	60/50	N5	50/49	50/49
	P-OU(MU)211-R14			B	60/50	N5	50/49	50/49
	P-OU(MU)211-R24			B	60/50	N5	50/49	50/49
P-VR	P-VR-R15	Type 2	Directly Affected	C	65/55	N1	56/54	56/54
P-SHT	P-SHT-R1	Type 2	Directly Affected	C	65/55	N1	56/54	56/54
	P-SHT-R5	Type 2	Directly Affected	C	65/55	N1	56/54	56/54
	P-SHT-R8	Type 2	Directly Affected	C	65/55	N1	56/54	56/54
P-SWW	P-SWW-R2	Type 2	Directly Affected	C	65/55	N1	56/54	56/54
	P-SWW-R10	Type 2	Not Affected	A	55/45	N4	45/44	45/44
P-CT	P-CT-R1	Type 2	Indirectly Affected	B	60/50	N6	48/48	48/48
	P-CT-R3		Indirectly Affected	B	60/50	N6	48/48	48/48
	P-CT-R5		Indirectly Affected	B	60/50	N6	48/48	48/48
	P-CT-R9		Not Affected	A	55/45	N6	48/48	48/45
	P-CT-R10		Not Affected	A	55/45	N6	48/48	48/45
P-S_YL-ST_8	P-S_YL-ST_8-R4	Type 1	Not Affected	A	55/45	N5	50/49	50/45
	P-S_YL-ST_8-R8		Not Affected	A	55/45	N5	50/49	50/45

NSR	NAP	Type of Area Containing NSR [1]	Degree to which NSR is affected by IF[2]	Area Sensitivity Rating	ANL-5 (Daytime & Evening Time / Nighttime) (1)	Reference Noise Monitoring ID	Measured Prevailing Noise Levels (Day & Evening Time / Nighttime) (2)	Criteria dB(A) min. of (1) & (2)
	P-S_YL-ST_8-R11		Not Affected	A	55/45	N5	50/49	50/45
	P-S_YL-ST_8-R13		Not Affected	A	55/45	N5	50/49	50/45
	P-S_YL-ST_8-R15		Indirectly Affected	B	60/50	N1	56/54	56/50
E-MP	E-MP-R1	Type 2	Directly Affected	C	65/55	N2	57/55	57/55
	E-MP-R4		Indirectly Affected	B	60/50	N8	48/46	48/46
E-SH	E-SH-R1	Type 2	Directly Affected	C	65/55	N3	55/54	55/54
E-RH	E-RH-R2	Type 2	Indirectly Affected	B	60/50	N3	55/54	55/50
E-SWW	E-SWW-R2	Type 2	Indirectly Affected	B	60/50	N4	45/44	45/44
E-TLT	E-TLT-R2	Type 2	Directly Affected	C	65/55	N1	56/54	56/54
E-SLT	E-SLT-R1	Type 2	Not Affected	A	55/45	N1	56/54	55/45
E-WPT	E-WPT-R4	Type 2	Directly Affected	C	65/55	N5	50/49	50/49
E-CT	E-CT-R1	Type 2	Indirectly Affected	B	60/50	N6	48/48	48/48
	E-CT-R5	Type 2	Not Affected	A	55/45	N6	48/48	48/45
E-TS	E-TS-R1	Type 2	Directly Affected	C	65/55	N9	53/47	53/47
E-STB	E-STB-B1	Type 2	Not Affected	A	55/45	N7	40/39	40/39
	E-STB-B2			A	55/45	N7	40/39	40/39
	E-STB-B5			A	55/45	N7	40/39	40/39
	E-STB-B6			A	55/45	N7	40/39	40/39
E-PSA	E-PSA-E2	Type 2	Directly Affected	C	65/55	N9	53/47	53/47
E-SAT	E-SAT-E4	Type 2	Indirectly Affected	B	60/50	N4	45/44	45/44
E-HWFST	E-HWFST-R2	Type 2	Not Affected	A	55/45	N5	50/49	50/45
E-LMC	E-LMC-R1	Type 2	Not Affected	A	55/45	N5	50/49	50/45
	E-LMC-R2			A	55/45	N5	50/49	50/45

Notes:
[1] "Type 1" refers to "Rural area, including country parks or village type developments"; "Type 2" refers to "Low density residential area consisting of low-rise or isolated high-rise developments"; "Type 3" refers to "Urban area", and "Type 4" refers to "Area other than those above".
[2] "Directly affected" means that the NSR is at such a location that noise generated by the IF is readily noticeable at the NSR and is a dominant feature of the noise climate of the NSR; "Indirectly affected" means that the NSR is at such a location that noise generated by the IF, whilst noticeable at the NSR, is not a dominant feature of the noise climate of the NSR; "Not affected" means that the NSR is at such a location that noise generated by the IF is not noticeable at the NSR; and
[3] San Tin Highway is considered as IF as its AADT in 2022 is excess of 30,000.

4.5 Identification of Environmental Impacts

4.5.1 Construction Phase

4.5.1.1 The potential sources of noise impact during construction phase of the Project have been identified to be from the use of PME for the various construction activities. The major construction activities to be carried out include site clearance, removal or demolition of existing facilities/structures, excavation works, piling and foundation of the proposed road works and building works. Details of the proposed construction methods and schedule of

works are described in **Section 2** of this EIA Report. Piling works would be carried out for the foundation works. No percussive piling works will be required within the project boundary. Alternative piling method has been considered and adopted in lieu of percussive piling method.

4.5.1.2 Based on the best-available information during the preparation of this EIA Report, no construction activities would be carried out during the restricted hours (i.e. between 1900 and 0700 hours and at any time on Sundays and general holidays). Hence, it is assumed that all construction activities would be carried out during non-restricted hours (0700 to 1900, Monday to Saturday).

4.5.1.3 Also, as mentioned in **Section 2**, the construction phase of the Proposed Project is anticipated to commence in Year 2024 and be completed by 2039. The tentative construction programme for the Project is provided in **Appendix 4.3**. The potential concurrent projects have been identified as below:

- Northern Link (NOL)
- Development of Lok Ma Chau Loop – Main Works Package 1
- Advance Site Formation and Engineering Infrastructure Works at Kwu Tung North and Fanling North New Development Areas

4.5.1.4 Locations of the identified concurrent projects are illustrated in **Figure 4.7** and details of the concurrent projects are listed in **Table 2.10**. Cumulative construction noise impact associated with the concurrent projects would be assessed in the later parts of this EIA Report.

4.5.2 Operation Phase

Road Traffic Noise

4.5.2.1 Road traffic noise from the road network within the Study Area, including both the “Project roads” and the “Existing roads”, would be a major noise source during operation phase of the Project. The definition of road type is presented in **Section 4.6.2.4**. The extent of Project roads” is presented in **Figure 4.9**.

4.5.2.2 For road traffic noise assessment, potential concurrent projects have been identified. Cumulative operation road traffic noise impact from “Strategic Study on Major Roads beyond 2030 – Feasibility Study”, “Ngau Tam Mei New Development Area”, “Development of Lok Ma Chau Loop- Main Works Package 1” and “Advance Site Formation and Engineering Infrastructure Works at Kwu Tung North and Fanling North New Development Area” have been considered in this study.

Fixed Noise

4.5.2.3 Existing fixed noise sources (e.g. Mai Po Electricity Substation (ESS), Chau Tau Ventilation Building, Tam Mei Barracks Firing Range, San Tin Barracks Firing Range) and planned fixed noise sources (e.g. ventilation buildings, electricity substations, sewage treatment works, water treatment plant, pumping stations, information and technology park, logistic facilities, refuse collection facilities, public transport facilities, district cooling system, private hospital, etc. and fixed noise sources of the proposed NOL Project) are identified within the assessment area and summarized in **Table 4.14**. The inventory of planned fixed noise sources has been confirmed by Project Proponent. The locations of the potential fixed noise sources during operation phase are presented in **Figure 4.5**.

Table 4.14 List of Existing and Planned Fixed Noise Sources

Type	Noise Sources	Land Lot
Existing Sources	Mai Po ESS	OU.5.12
	Chau Tau Ventilation Building	OU(VB)
	Tam Mei Barracks Firing Range	See note (1)
	San Tin Barracks Firing Range	See note (1)
Planned Sources	Customs Dog Base	G.1.1

Type	Noise Sources	Land Lot
	HKPF Weight Station	G.1.2
	Wetland Conservation Park Management Office	G.1.3
	Highways Department Depot	G.1.4
	Lok Ma Chau Police Station cum Operational Base, Petrol Station and Dangerous Goods Storage	G.1.5
	Divisional Fire Station-cum-ambulance Depot (FSAD)	G.3.1
	Sport Centre	G.5.1
	Cultural & Recreational Complex	G.5.7
	Potential Healthcare Facilities	G.5.8
	Joint User Government Office	G.5.10
	GIC Complex	G.5.11
	Sport Centre	G.5.14
	Green Fuel Station	OU(GFS).1.1
	Green Fuel Station	OU(GFS).5.1
	Information and Technology - Zone 1	OU(I&T)1.1.1
	Information and Technology - Zone 1	OU(I&T)1.1.2
	Information and Technology - Zone 1	OU(I&T)1.1.3
	Information and Technology - Zone 2	OU(I&T)2.1.1
	Information and Technology - Zone 2	OU(I&T)2.1.2
	Information and Technology - Zone 3 (Data Centre)	OU(I&T)3.1.1
	Information and Technology - Zone 3 (Data Centre)	OU(I&T)3.1.2
	Information and Technology - Zone 3	OU(I&T)3.1.3
	Information and Technology - Zone 3	OU(I&T)3.1.4
	Information and Technology - Zone 3	OU(I&T)3.1.5
	Information and Technology - Zone 3 (Government Data Centre)	OU(I&T)3.1.6
	Information and Technology - Zone 3	OU(I&T)3.1.7
	Information and Technology - Zone 3	OU(I&T)3.1.8
	Information and Technology - Zone 3	OU(I&T)3.1.9
	Information and Technology - Zone 4	OU(I&T)4.4.1
	Information and Technology - Zone 4	OU(I&T)4.4.2
	Information and Technology - Zone 4	OU(I&T)4.4.3
	Information and Technology - Zone 4	OU(I&T)4.4.4
	Information and Technology - Zone 4	OU(I&T)4.4.5
	Information and Technology - Zone 5	OU(I&T)5.1.2
	Information and Technology - Zone 6	OU(I&T)6.1.1
	District Cooling System	OU(I&T)7.1.1
	Electricity Substation	OU(I&T)7.1.2
	District Cooling System	OU(I&T)7.1.3
	Electricity Substation	OU(I&T)7.1.4
	Logistic, Storage and Warehouse	OU(LSW).1.1
	Logistic, Storage and Warehouse	OU(LSW).1.2
	Logistic, Storage and Warehouse	OU(LSW).4.1
	San Tin Station Transport Interchange Hub	OU(MU)1.TIH
	Transport Interchange Hub at Proposed Station near Chau Tau	OU(MU)2.TIH
	Stormwater Pumping Station	OU.1.1
	Sewage Pumping Station	OU.1.2
	Electricity Substation	OU.1.4
	District Cooling System	OU.1.6
	Electricity Substation	OU.1.7
	Refuse Collection Point	OU.1.8
	Refuse Transfer Station cum Resource Recovery Facilities	OU.1.9
	Electricity Substation	OU.1.10
	District Cooling System	OU.1.11
	Electricity Substation	OU.2.1
	Electricity Substation	OU.3.1

Type	Noise Sources	Land Lot
	Sewage Pumping Station	OU.3.2
	District Cooling System	OU.4.1
	Electricity Substation	OU.4.2
	Public Transport Interchange	OU.4.3
	STLMC Water Reclamation Plant	OU.5.2
	Effluent Polishing Plant and Food Waste Pre-treatment Facilities	OU.5.3
	Electricity Substation	OU.5.4
	Refuse Collection Point	OU.5.5
	Electricity Substation	OU.5.6
	Sewage Pumping Station	OU.5.7
	Electricity Substation	OU.5.8
	District Cooling System	OU.5.9
	Electricity Substation	OU.5.10
Planned NOL Fixed Noise Sources	Ventilation Shaft	OU(MU)1.2.1_1
	Ventilation Shaft	OU(MU)1.2.1_2
	Ventilation Shaft	G(RAF).1.7
	Ventilation Shaft	G(RAF).3.4
	Ventilation Shaft	G(RAF).5.15
	Pak Shek Au Ancillary Building	See note (1)

Note: (1) Fixed Noise Source is located outside the Project Boundary.

Airborne Railway Noise

4.5.2.4 The existing Lok Ma Chau Spurs Line (LMCSL) is located within the Study Area (refer to **Figure 4.6**), planned noise sensitive uses in the vicinity is expected to be affected by its operation. The source of impact includes rolling noise generated by train movements on LMCSL tracks and air-conditioning noise.

Ground-borne Railway Noise

4.5.2.5 As shown **in Figure 4.6**, the existing Lok Ma Chau Spurs Line (LMCSL) is located within the Study Area. The closest NSR to the tunnel is located at OU(MU)2.1.1. The separation distance between the tunnel and OU(MU)2.1.1 is about 320m. With consideration that there is sufficient separation distance, ground-borne railway noise arising from the LMCSL operation is not anticipated. For the NOL Spur Line, there is no design information and confirmed programme at the time of this EIA study as advised by Railway Development Office. Therefore, this project is not considered in this EIA Study. A separate EIA study would be conducted for accessing the ground-borne noise impact of the NOL Spur Line.

4.5.2.6 For the trains operate in NOL tunnel that is located in close proximity to occupied structures, there is a possibility that vibrations associated with trains passed-by can be transmitted through the ground and structure and be radiated as noise in the occupied spaces within the structure. The transmitted noise through structures may have potential impact on the ground-borne noise sensitive receivers.

Helicopter Noise

4.5.2.7 Based on the latest available information, the existing helipad at Lok Ma Chau Control Point will be demolished as part of the Project. No existing, planned or committed helipad(s) are identified within the 300m noise assessment study area. As adverse noise impact associated with helicopter noise is not expected at the noise sensitive uses within the study area, helicopter noise assessment is not considered to be required.

4.6 Assessment Methodology

4.6.1 Construction Phase

Construction Works during Non-Restricted Hours

4.6.1.1 The construction noise impact assessment was undertaken based on standard acoustic principles and followed the procedures given in the GW-TM. The sound pressure level of

each construction activity has been calculated, depending on the type and number of plant items and the distance from NSR. The general approach is summarized below:

- Locate the NSRs which would most likely be affected by noise from the construction work;
- Determine the items of PME for each discrete construction activity, based on available information or agreed plant inventories;
- Assign sound power levels (SWLs) to the proposed PME according to the GW-TM or other recognized sources of reference, where appropriate;
- Calculate distance attenuation and screening effects to NSRs from notional noise source;
- Apply corrections in the calculations such as potential screening effects and acoustic reflection, if any;
- Predict construction noise levels at NSRs in the absence of any mitigation measures;
- Consider cumulative impact from concurrent projects within 300m of the NSRs, if any; and
- Compare the cumulative construction noise level against the corresponding noise criterion and propose suitable mitigation measures where necessary.

4.6.1.2 The construction programme and zoning arrangement of construction activities are presented in **Appendix 4.3** and the plant inventory (including type and quantity of the PME used as well as percentage on time utilization), which has been confirmed by the Project Engineer to be practical and suitable for the proposed works, is presented in **Appendix 4.8**. The SWL of plant in Table 3 of GW-TM or "Sound power levels of other commonly used PME" (Other PME) published by EPD have been referred to. The SWL of each construction activity has been calculated based on types and quantity of the plant, SWL of plant and percentage on-time utilization.

4.6.1.3 To calculate the sound pressure level of each construction activity, distance attenuation correction has been applied. The distance attenuation was determined by using the following formula:

Distance Attenuation in dB(A) = 20 log D + 8
where D is horizontal distance between notional source position of work-front and NSR in metres

4.6.1.4 The following assumptions have been applied in the assessment:

- A +3 dB(A) façade correction was added to the predicted noise levels to account for the facade effect at each identified representative NSR;
- All PME items required for a particular construction activity was assumed to be located at the notional source position, a position mid-way between the approximate geographical centre of the construction site and its boundary nearest to the NSR, of the work-front where such activity is to be performed in accordance with the GW-TM;
- Only the dominant portion of the linear site closest to the NSR with a length to width ratio of 5:1 was considered for the purpose of determining the notional source position, when the construction site is linear in shape with a length to width ratio exceeding 5:1 in accordance with the GW-TM;
- As a worst-case assumption, noise impact at the nearest sensitive facades of the residential buildings to the sources position was assessed; and
- As a worst-case assumption, noise assessment points of all NSRs were assumed at the same height as the work-fronts.

4.6.1.5 The noise levels at the NSRs are then be predicted by adding up the SPLs of all concurrent construction tasks within the Study Area of the Project.

4.6.1.6 The predicted construction noise impact would be compared with the noise standards stated in **Section 4.2.2.1**. Where exceedance of relevant noise standards is predicted, practicable direct noise mitigation measures including the use of quieter PME, moveable noise barriers, enclosures and quieter alternative construction methods would be considered. Appropriate correction factors for barrier effect would be adopted in accordance with Section 2.10 of the GW-TM.

Construction Works during Restricted Hours

4.6.1.7 Based on the best-available information during the preparation of this EIA Report, no construction activities would be carried out during the restricted hours. Hence, no adverse construction noise impact would be expected during restricted hours.

4.6.2 Operation Phase

Road Traffic Noise

4.6.2.1 Road traffic noise was adhering strictly to the procedures stipulated in the "Calculation of Road Traffic Noise (CRTN)" (1988) published by Department of Transport, UK. Road traffic noise was presented in terms of noise levels exceeded for 10% of the one-hour period having the peak traffic flow (i.e. $L_{10, 1hour}$, dB(A)). A 2.5 dB(A) façade reflection and correction factors for effects due to gradient, distance, view angle, road surface and barriers was included in the assessment. Drawings of road-plots of the traffic noise model showing the road segments, barriers, and assessment points of NSR are provided in **Appendix 4.17**.

4.6.2.2 Traffic noise impact was predicted based on the worst-case year traffic forecast within 15 years upon commencement of operation of the Project according to Annex 13 of the EIAO-TM. The full population intake of last phase would be Year 2039. The assessment year should be the maximum traffic projection between Year 2039 and 2054. Since Year 2051 is the peak population projections under the "High Population Projection" scenario and there is no further increasing trend according to the "Hong Kong Population Projections 2020 – 2069" by the Census and Statistics Department (C&SD), Year 2051 represents the peak population prediction between 2039 and 2054. It is understood that in the Task Force Planning Dataset (TFPD) received on 6 June 2022, the year 2051 was adopted as a deputation for the post-2046 situation given that the highest population figures in C&SD's High Population Projection would be in 2051. Therefore, the assessment year with maximum traffic projections within 15 years upon operation of the Project would be post-2046. The peak traffic flow of prevailing scenario at Year 2024 and "with Project" at post-2046 are presented in **Appendix 4.4** and **Appendix 4.5**, respectively. Endorsement of the traffic forecast data for this study from Transport Department is presented in **Appendix 4.6**.

4.6.2.3 The following scenarios are studied in the assessment:

- Unmitigated scenario in post-2046;
- Mitigated scenario in post-2046; and,
- Prevailing Scenario in Year 2024 for indirect technical remedies eligibility assessment.

4.6.2.4 With consideration of the scope of this Project, road sections have been classified as the following categories for the purpose of the road traffic noise assessment:

- "Project roads" which in the context of this report describe all roads that are completely new or are substantially altered by the proposed project. In this Project, proposed roads and the sections of San Tin Highway to be widened have been identified as "Project roads". All road sections defined in the scope of designated project in the EIAO are considered as "Project Roads".
- "Existing" Roads which are unchanged or without significant traffic noise impact (i.e. the traffic noise level with the road project would be less than that without the road project at the design year by 1.0 dB(A))

4.6.2.5 For the purpose of the traffic noise assessment, the roads within 300m from the proposed Project boundary have been included in the assessment. Road sections included in the

assessment and the extent of Project roads are presented in **Figure 4.9**. 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 and landscape features (e.g. planters) to be constructed by Project Proponent as shown in **Figure 4.8** have been considered in the assessment.

4.6.2.6 Direct mitigation measures would be proposed for Project roads if adverse environmental impact is predicted. If the NSRs are affected by noise from existing roads, direct mitigation measures are required to reduce the noise from the Project roads to a level that it:

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

4.6.2.7 If any façades of existing NSRs are still exposed to predicted noise levels exceeding the relevant noise criteria after the implementation of all direct mitigation measures, provision of indirect technical remedies in the form of acoustic insulation and air conditioning should be considered under the EIAO-TM. The eligibility for indirect technical remedies (ITR) would be tested against the following three criteria:

- the predicted overall noise level, L10 (1hour), from the Project Roads, together with other traffic noise in the vicinity must be above a respective noise level (for example, 70 dB(A) for domestic premises and 65 dB(A) for educational institutions.);
- the predicted overall noise level is at least 1.0 dB(A) more than the prevailing traffic noise level; and
- the contribution to the increase in the predicted overall noise level from the Project Roads must be at least 1.0 dB(A).

Fixed Noise

4.6.2.8 The fixed noise impact assessment for operation phase has been conducted in accordance with the IND-TM and the criteria set in Annex 5 of the EIAO-TM. The worst operation mode with 100% operation is assumed in the prediction. As there is no design information on the planned fixed noise sources, maximum allowable sound power level for the planned fixed noise sources have been predicted based on backward calculation of separation distance between the noise source and the nearest NSRs. Cumulative fixed noise impact arising from fixed noise sources located within 300m assessment area at each identified NSR was assessed. CEDD should further liaise and agree with the relevant departments on the responsibility of implementation and maintenance of the predicted maximum allowable sound power level for the planned fixed plant noise sources at later detailed design stage. For the existing Mai Po ESS, due to no noise noticeable during the site survey in June 2023, fixed noise from Mai Po ESS is not considered in the cumulative fixed plant noise impact assessment.

4.6.2.9 The fixed noise impact assessment for operation phase has been undertaken based on standard acoustic principles and adhered to the procedures given in the IND-TM. The planned fixed noise sources should be free of the characteristics of tonality, impulsiveness and intermittency. If the planned fixed noise sources could not be free of characteristics of tonality, impulsiveness and intermittency, the maximum SWL should be reduced in accordance with the correction factors, in the range of 3 to 6 dB(A), as given in Section 3.3 of IND-TM. The following standard acoustic formula was used for calculating the sound pressure levels at the representative NSRs.

SPL = SWL – DC + FC
Where:
SPL = Sound Pressure Level at NSR, in dB(A)
SWL = Sound Power Level of the PME, in dB(A)
DC = Distance Attenuation, in dB(A) (i.e. 20logD +8 [where D is the distance in metres])
FC = Façade Correction, in dB(A) (i.e. 3 dB(A))

4.6.2.10 It is assumed that all existing and planned fixed noise sources would be operated simultaneously at any time of the day for the worst-case scenario. Daytime and Night-time criterion were adopted for conservative assessment to determine the maximum allowable sound power level.

Fixed Plant Noise from Lok Ma Chau Spur Line (LMCSL)

4.6.2.11 For the fixed noise sources for LMCSL project, the maximum allowable SWLs are made reference to the EIA report of Sheung Shui to Lok Ma Chau Spur Line (Register No.: AEIAR-052/2002) and presented in **Table 4.15**. Locations of fixed noise sources and the relevant concerned NSRs are shown in **Figure 4.5**.

Table 4.15 Maximum Allowable SWL for Existing Noise Source of LMCSL

Land Lot	Name	Overall Design Noise Limits at ventilation buildings dB(A)
OU(VB)	Chau Tau Ventilation Building	87

Fixed Plant Noise from NOL Project

4.6.2.12 For the proposed fixed noise sources for NOL project, the maximum allowable SWLs are provided by the project proponent of NOL and presented in **Table 4.16**. Locations of fixed noise sources and the relevant concerned NSRs are shown in **Figure 4.5**.

Table 4.16 Maximum Allowable SWL for Planned Noise Source of NOL

Location	Fixed Plant Source ID	Fixed Plant Source	Maximum Allowable SWL during Daytime/Evening Period, dB(A)	Maximum Allowable SWL during Night-time Period, dB(A)
OU(MU)1.2.1	S01	Ventilation Louvre	88	80
	S02	Ventilation Louvre	88	80
	S03	Ventilation Louvre at Tx Room	88	80
	S04	Ventilation Louvre at Tx Room	88	80
	S05	Ventilation Louvre at Tx Room	88	80
	S06	Ventilation Louvre	88	80
	S07	Ventilation Louvre at Tx Room	88	80
	S08	Ventilation Louvre at Tx Room	88	80
	S09	Ventilation Louvre at Tx Room	88	80
	S09a	Ventilation Louvre	88	80
	S09b	Ventilation Louvre	93	85
	S10	Ventilation Louvre	89	81
	S10a	Ventilation Louvre	88	80
	S11	Ventilation Louvre	96	88
	S12	Ventilation Louvre	86	78
	S13	Ventilation Louvre	85	77
	S14	Ventilation Louvre	85	77
	S14a	Ventilation Louvre	83	75
	S14b	Ventilation Louvre	81	73
	S14c	Ventilation Louvre	81	73
	S15	Ventilation Louvre	87	79
	S15a	Ventilation Louvre	80	72
	S15b	Ventilation Louvre	80	72
	S16	Ventilation Louvre	88	80
	S16a	Ventilation Louvre	78	70
	S17	Ventilation Louvre	85	77
	S18	Ventilation Louvre	85	77
	S19	Ventilation Louvre	84	76
	S20	Ventilation Louvre	86	78
	S20a	AC Outdoor Unit	88	77

Location	Fixed Plant Source ID	Fixed Plant Source	Maximum Allowable SWL during Daytime/Evening Period, dB(A)	Maximum Allowable SWL during Night-time Period, dB(A)
G(RAF).1.7	KTA-1	Ventilation Louvre	95	88
	KTA-1a	Ventilation Louvre	93	86
	KTA-1b	Ventilation Louvre	93	86
	KTA-2	Ventilation Louvre at Tx Room	95	85
	KTA-3	Ventilation Louvre at Tx Room	95	85
	KTA-4	Ventilation Louvre	95	85
	KTA-5	Ventilation Louvre at Tx Room	95	85
	KTA-5a	Ventilation Louvre	95	88
	KTA-6	Ventilation Louvre at Tx Room	95	85
	KTA-7	Ventilation Louvre at Tx Room	95	85
	KTA-7a	Ventilation Louvre	95	88
	KTA-7b	Ventilation Louvre	95	88
	KTA-8	Ventilation Louvre at Tx Room	95	85
	KTA-9	Ventilation Louvre at Tx Room	95	85
	KTA-9a	Ventilation Louvre	95	88
	KTA-9b	Ventilation Louvre	95	88
	KTA-10	Ventilation Louvre	95	88
	KTA-10a	Ventilation Louvre	95	88
	KTA-10b	Ventilation Louvre	95	88
	KTA-11	AC Outdoor Unit	97	90
G(RAF).3.4	KLA-1	Ventilation Louvre at Tx Room	96	88
	KLA-2	Ventilation Louvre at Tx Room	96	88
	KLA-3	Ventilation Louvre at Tx Room	96	88
	KLA-4	Ventilation Louvre at Tx Room	96	88
	KLA-4a	Ventilation Louvre	93	85
	KLA-4b	Ventilation Louvre	93	85
	KLA-4c	Ventilation Louvre	93	85
	KLA-4d	Ventilation Louvre	93	85
	KLA-4e	Ventilation Louvre	93	85
	KLA-4f	Ventilation Louvre	93	85
	KLA-4g	Ventilation Louvre	93	85
	KLA-4h	Ventilation Louvre	93	85
	KLA-4i	Ventilation Louvre	93	85
	KLA-4j	Ventilation Louvre	96	88
	KLA-4k	Ventilation Louvre	96	88
	KLA-5	AC Outdoor Unit	97	88
G(RAF).5.15	SNA-1	Ventilation Louvre	88	80
	SNA-1a	Ventilation Louvre	88	80
	SNA-2	Ventilation Louvre	88	80
	SNA-3	Ventilation Louvre	88	80
	SNA-4	Ventilation Louvre at Tx Room	82	74
	SNA-5	Ventilation Louvre at Tx Room	82	74
	SNA-6	Ventilation Louvre at Tx Room	82	74
	SNA-7	Ventilation Louvre at Tx Room	82	74
	SNA-8	Ventilation Louvre at Tx Room	82	74
	SNA-9	Ventilation Louvre at Tx Room	82	74
	SNA-10	Ventilation Louvre at Tx Room	82	74
	SNA-11	Ventilation Louvre at Tx Room	82	74
	SNA-11a	Ventilation Louvre	82	74
	SNA-12	Ventilation Louvre	88	80
	SNA-12a	Ventilation Louvre	83	75

Location	Fixed Plant Source ID	Fixed Plant Source	Maximum Allowable SWL during Daytime/Evening Period, dB(A)	Maximum Allowable SWL during Night-time Period, dB(A)
	SNA-12b	Ventilation Louvre	83	75
	SNA-13	AC Outdoor Unit	94	86
	SNA-13a	Ventilation Louvre	83	75
	SNA-13b	Ventilation Louvre	82	74
	SNA-13c	Ventilation Louvre	82	74
	SNA-13d	Ventilation Louvre	82	74
	SNA-14	Ventilation Louvre	82	74
G(RAF). PSA	PAA-1	Ventilation Louvre at Tx Room	87	81
	PAA-2	Ventilation Louvre at Tx Room	87	81
	PAA-3	Ventilation Louvre at Tx Room	87	81
	PAA-4	Ventilation Louvre at Tx Room	87	81
	PAA-4a	Ventilation Louvre	87	81
	PAA-4b	Ventilation Louvre	87	81
	PAA-4c	Ventilation Louvre	87	81
	PAA-4d	Ventilation Louvre	87	81
	PAA-4e	Ventilation Louvre	87	81
	PAA-4f	Ventilation Louvre	87	81
	PAA-4g	Ventilation Louvre	87	81
	PAA-4h	Ventilation Louvre	87	81
	PAA-4i	Ventilation Louvre	89	83
	PAA-5	AC Outdoor Unit	91	85
	PAA-6	Ventilation Louvre at Tx Room	93	87
	PAA-7	Ventilation Louvre	87	81
	PAA-8	Ventilation Louvre	87	81
	PAA-9	Ventilation Louvre	87	81
	PAA-10	Ventilation Louvre	87	81
	PAA-11	Ventilation Louvre	87	81
	PAA-12	Ventilation Louvre	87	81
	PAA-12a	Ventilation Louvre	87	81
	PAA-13	Ventilation Louvre at Tx Room	93	87
	PAA-14	Ventilation Louvre	87	81
	PAA-15	Ventilation Louvre	87	81
	PAA-16	Ventilation Louvre	87	81
	PAA-17	Ventilation Louvre	87	81
	PAA-18	Ventilation Louvre	87	81
	PAA-19	Ventilation Louvre	87	81
	PAA-20	Ventilation Louvre	93	87
	PAA-21	Ventilation Louvre	93	87
	PAA-22	Ventilation Louvre	87	81
	PAA-23	Ventilation Louvre	87	81
	PAA-24	Ventilation Louvre	93	87
	PAA-25	Ventilation Louvre	93	87
	PAA-26	Ventilation Louvre	87	81
	PAA-27	Ventilation Louvre	93	87
	PAA-28	Ventilation Louvre	93	87
	PAA-29	Ventilation Louvre	87	81
	PAA-30	AC Outdoor Unit	87	81

Firing Range Noise

Crowd Noise

4.6.2.13 Noise generated by crowd activities at the Tam Mei Barracks and San Tin Barracks have been qualitatively assessed based on separation distance between planned NSR that rely on opened window for ventilation and crowd activities.

Shooting Noise

4.6.2.14 Firing range noise impact assessment has been conducted based on the approach adopted in *Agreement No. CE61/2007(CE) North East New Territories New Development Areas Planning and Engineering Study - Investigation* (NENT NDA) and *Agreement No. CE31/2014(CE) Engineering Study for Police Facilities in Kong Nga Po – Feasibility Study* (KNP). The following equation was used for calculating the SPL at the representative NSRs:

$$SPL = SWL - DC + FC + IC - 10\log(T) + 10\log(N)$$

where

SPL: Sound Pressure Level in dB(A)
SWL: Sound Power Level for single mode shooting in dB(A)
DC: Distance Attenuation in dB(A) = 20logD + 8 [where D is the distance in metres]
FC: Façade Correction in dB(A) = +3 dB(A)
IC: Impulsiveness Correction in dB(A) = +3 dB(A)
T: 30 minutes = 1800s
N: Number of shots per 30 minutes period

4.6.2.15 Due to site access issue, noise measurement within Tam Mei Barracks and San Tin Barracks is not taken. Nevertheless, noise survey to identify shooting mode has been conducted near Tam Mei Barracks and San Tin Barracks. From review of the noise survey results of shooting noise events, it was not discernible whether there was a standard module of weapon used. Additionally, there was only one firing mode (i.e. single mode) notified during the noise survey period and burst mode was not recorded. It was noted that all shooting noise events were recorded only during daytime period and none was recorded on days with adverse weather (e.g. rainy days) nor during evening time and night time periods.

4.6.2.16 Referring to the assessment methodology adopted in approved EIA Reports of NENT NDA and KNP, according to the best available information, it is considered reasonable to refer to noise measurement data (i.e. average SWL for single mode shooting) from the approved EIA Reports as presented in **Table 4.17** for assessment purposes. As it is unknown whether a standard module of weapon is used during shooting noise events at Tam Mei Barracks and San Tin Barracks, the average SWL for single mode shooting for all weapon types has been adopted for assessment.

Table 4.17 Summary of SWL for Single Mode Shooting

Weapon	SWL for Single Mode Shooting, dB(A)		Maximum of SWL
	CE61/2007 (CE)	CE31/2014 (CE)	
	NENT P&E Study - I	Kong Nga Po - FS	
Revolver	122.4	-	122.4
9mm Pistol	-	117.1	117.1
MP5	117.4	-	117.4
AR15	120.5	120.9	120.9
Shotgun	121.3	121.1	121.3
Glock	120.6	-	120.6
Sniper	116.7	-	116.7
		Average	**119.5**

4.6.2.17 Reference was made to the noise survey data for number of shots in a 30-minute period. Survey was made during 28 Mar 2022 to 27 May 2022 with full day measurement. The suspected number of shots during any shooting noise event in the whole noise survey

period was in the range of 3 to 144 for Tam Mei Barracks and 6 to 19 for San Tin Barracks and the average duration was less than 1 minute. According to best available information, the maximum suspected number of shots at firing ranges of the barracks in a 30-minute period were adopted for assessment, as presented in **Table 4.18** below.

Table 4.18 Number of Shots in 30-minute period during Training Day

Firing Range	Number of shots in 30 mins
Tam Mei Barracks	144
San Tin Barracks	19

Airborne Railway Noise from LMCSL

4.6.2.18 Airborne railway noise impact has been predicted according to "Calculation of Railway Noise (CRN) (1995)" by the UK Department of Transport. Whilst the calculation would be based on CRN, the train noise (both rolling noise and air-conditioning noise) source term would base upon the noise level measured during the commissioning of SP1900 train and is based on a disc braked Electric Multiple Unit (EMU). The source term has made reference to the Environmental Impact Assessment report for Shatin to Central Link – Tai Wai to Hung Hom Section (AEIAR-164/2012). A description of the noise source term is given below.

Lmax	75.3 dB(A)
Rail	Continuously weld rail
Trackform	Ballasted track
Speed	130kph
Distance	25m

The calculation of SEL (single train event) from Lmax is based on the following equation:
$SEL = Lmax + 10 \log (L/V) + 10.5 - 10 \log (4D / (4D^2+1)) + 2 \tan^{-1} (1/2D))$

Where L = train length, m (200m for SCL (TAW-HUH) train, the same as Ma On Shan Line (MOL) 8-car configuration, for 9-car in current LMCSL, the train length is 225m.)
V = train speed, kph
d = Distance from track, m (reference distance at 25m)
D = d / L

SEL for 9-car = 83.3 dB(A)

4.6.2.19 The assessment area for rail noise impact assessment includes areas within 300m from the viaduct section of the LMCSL, which is shown in drawing **Figure 4.6**. A summary of correction factors adopted in the airborne railway noise assessment is presented in **Table 4.19** below.

Table 4.19 Summary of Correction Factors for Airborne Railway Noise Assessment

Parameters	Assumptions	Remarks
Train Type	SP1900 or equivalent, train length of 9-car	-
Track wear correction	3 dB(A)	A 3 dB(A) rail deterioration has been included for conservative assessment according to the approved EIAs for the Shatin to Central Link – Tai Wai to Hung Hom Section (AEIAR167/2012) and Shatin to Central Link – Stabling Sidings at Hung Hom Freight Yard (AEIAR164/2012)
Train speed	Change of SEL with speed = $20 \log (V / V_{ref})$ dB(A)	V is the train speed and V_{ref} is reference train speed
Distance	Change of SEL with distance = $10 \log (d_1 / 25)$ dB(A)	d_1 is the distance between track and receiver
Barrier effects	As per Chart 6(a) of CRN	-

Parameters	Assumptions	Remarks
Joints / Crossovers	7 dB(A)	To represent the augmentation in noise due to thermal expansion joints. Similar approach has been adopted in the approved EIAs for the Shatin to Central Link – Tai Wai to Hung Hom Section (AEIAR-167/2012) and Shatin to Central Link – Stabling Sidings at Hung Hom Freight Yard (AEIAR-164/2012).
Air absorption	0.2 – 0.008*d*	-
Train Frequency	10 log(N_1)	• N_1 is the train frequency in 30 minutes • Frequency (trains / direction / 30 minutes)
View Angle	10 log (πΘ/180-cos2α sinΘ) – 5 dB(A)	α is the acute angle between a line drawn through the receiver point, parallel to the track and the line bisecting the angle view Θ. Θ is the view angle.
Reflective Correction from Opposite Façade	1.5 (Θ'/Θ) dB(A)	Θ' is the sum of angles subtended by all reflecting façades on the opposite side of the railway facing the receiver point and Θ is the total angle subtended by the source line at the receiver point.
Façade Reflection	2.5 dB(A)	-
To $L_{eq,\ 30\text{-}min}$	10 log(1/1800)	-

The calculation of noise level of Leq_{30min} at NSRs was based on the following equation:

$L_{eq(30min)}$ at NSR = Reference Leq_{30min} at 25m+ $[C_{dist}+C_{air}+C_{angl}+C_{bar}+C_{refl}]$

Where:

C_{dist} Distance correction, dB(A)
C_{air} Air absorption correction, dB(A)
C_{bar} Barrier effect correction, dB(A)
C_{angl} Angle of view correction, dB(A)
C_{refl} Façade reflection correction, dB(A)

Note: For conservative purpose, the barrier correction has not been considered in the calculation.

The calculation of noise level of Lmax at NSRs was based on the following equation:

$L_{max\ at}$ NSR = Reference Lmax at 25m+ $[C_{dist}+C_{air}+C_{angl}+C_{bar+}C_{refl}]$

Where:

C_{dist} Distance correction, dB(A)
C_{air} Air absorption correction, dB(A)
C_{bar} Barrier effect correction, dB(A)
C_{angl} Angle of view correction, dB(A)
C_{refl} Façade reflection correction, dB(A)

Note: For conservative purpose, the barrier correction has not been considered in the calculation.

4.6.2.20 As advised by the train operator, MTRC, each train of the LMCSL would be consisted by 9 cars, the operating speed of the train would be ranged from 50km/h to 115km/h within the study area, and there would be maximum 3 trains per 30 minutes passing through the assessment area during both daytime and evening (07:00-23:00) peak hours. In addition, train frequency would be reduced during night-time period (23:00-7:00), maximum 2 trains per 30mins would be adopted during night-time assessment for conservative purpose.

Information provided by MTRC is presented in **Appendix 4.7**. The adopted train speed profile for airborne railway noise calculation is presented in **Appendix 4.12**.

Ground-borne Railway Noise from NOL

4.6.2.21 The EIA Study of NOL would consider the ground-borne railway noise impact of NOL according to the EIA Study Brief of NOL EIA (ESB-346/2021). As there is no other ground-borne railway noise arising from this Project, the ground-borne railway noise impact from NOL on NSRs within the project boundary of this Project will be addressed in the EIA report of NOL.

4.7 Prediction and Evaluation of Environmental Impacts

4.7.1 Construction Phase

4.7.1.1 Potential construction noise impacts of the Project during the normal daytime working hours have been assessed at the representative floors of representative NSRs based on the construction programme as shown in **Appendix 4.3** and the construction plant inventory presented in **Appendix 4.8**.

4.7.1.2 The unmitigated predicted construction noise levels at representative NSRs are presented in **Table 4.20**. Details of the unmitigated construction noise assessment are presented in **Appendix 4.9**.

Table 4.20 Summary of Predicted Construction Noise Levels at Representative NSRs under Unmitigated Scenario

NSR ID	NSR Description	NAP ID	Noise Criteria, Leq 30mins, dB(A) [1]	Predicted Unmitigated Overall Noise Level, dB(A) [2]
P-RSc21	Proposed Residential Development at RSc.2.1	P-RSc21-R32	75	67 - **89**
P-RSc21	Proposed Residential Development at RSc.2.1	P-RSc21-R65	75	**76** - **85**
P-RSc22	Proposed Residential Development at RSc.2.2	P-RSc22-R1	75	**84** - **85**
P-RSc22	Proposed Residential Development at RSc.2.2	P-RSc22-R21	75	70 - **86**
P-RSc24	Proposed Residential Development at RSc.2.4	P-RSc24-R42	75	74 – **86**
P-RSc25	Proposed Residential Development at RSc.2.5	P-RSc25-R1	75	**78** – **84**
P-RSc25	Proposed Residential Development at RSc.2.5	P-RSc25-R16	75	72 – **86**
P-RSc25	Proposed Residential Development at RSc.2.5	P-RSc25-R19	75	71 – **87**
P-RSc25	Proposed Residential Development at RSc.2.5	P-RSc25-R67	75	74 – **85**
P-RSc26	Proposed Residential Development at RSc.2.6	P-RSc26-R28	75	**78** – **78**
P-RSc27	Proposed Residential Development at RSc.2.7	P-RSc27-R1	75	**79** - **88**
P-RSc27	Proposed Residential Development at RSc.2.7	P-RSc27-R12	75	**80** – **84**
P-RSc31	Proposed Residential Development at RSc.3.1	P-RSc31-R30	75	62 – **84**
P-RSc32	Proposed Residential Development at RSc.3.2	P-RSc32-R19	75	**76** – **77**
P-RSc121	Proposed Residential Development at R1.2.1	P-RSc121-R1	75	74 – **82**
P-RSc121	Proposed Residential Development at R1.2.1	P-RSc121-R7	75	75 – **86**
P-RSc122	Proposed Residential Development at R1.2.2	P-RSc122-R10	75	**79** - **83**

NSR ID	NSR Description	NAP ID	Noise Criteria, Leq 30mins, dB(A) [1]	Predicted Unmitigated Overall Noise Level, dB(A) [2]
P-RSc123	Proposed Residential Development at R1.2.3	P-RSc1231-R13	75	73 - **86**
P-RSc123	Proposed Residential Development at R1.2.3	P-RSc1232-R8	75	**78** - **85**
P-RSc123	Proposed Residential Development at R1.2.3	P-RSc1232-R17	75	**81** - **84**
P-RSc131	Proposed Residential Development at R1.3.1	P-RSc131-R17	75	**76** - **82**
P-RSc132	Proposed Residential Development at R1.3.2	P-RSc132-R11	75	67 - **81**
P-VR	Proposed Village Development	P-VR-R15	75	73 - **88**
E-MP	69 Mai Po San Tsuen	E-MP-R1	75	75 - **81**
E-MP	1C Mai Po San Tsuen	E-MP-R4	75	69 - **80**
E-SH	Scenic Heights Block B2	E-SH-R1	75	**84** - **90**
E-RH	30 Rolling Hills Phase II	E-RH-R1	75	**79** - **87**
E-RH	6 Rolling Hills Phase I	E-RH-R2	75	68 - **89**
E-SWW	35C Shek Wu Wai	E-SWW-R1	75	69 - **92**
E-SWW	35 Shek Wu Wai	E-SWW-R3	75	69 - **93**
E-TLT	18 Tsing Lung Tsuen	E-TLT-R2	75	67 - **89**
E-TST	Tung Shan Temple	E-TST-W1	70	65 - **81**
E-TYS	Tun Yu School	E-TYS-E1	65/70	65 - **80**
E-SLT	2J San Lung Tsuen	E-SLT-R1	75	70 - **78**
E-YSW	80A Yan Shau Wai	E-YSW-R1	75	69 - **84**
E-WPT	161 Wing Ping Tsuen	E-WPT-R1	75	70 - **89**
E-WPT	285B Wing Ping Tsuen	E-WPT-R4	75	74 - **91**
E-CT	291 Chau Tau Tsuen	E-CT-R1	75	72 - **91**
E-CT	218 Chau Tau Tsuen	E-CT-R3	75	67 - **88**
E-CT	74 Pun Uk Tsuen	E-CT-R5	75	70 - **84**
E-TS	Village house to the south of lamp post EA2021	E-TS-R1	75	72 - **76**
E-TMB	49 Tam Mei Barracks	E-TMB-B1	75	67 - 72
E-STB	San Tin Barracks Block 69	E-STB-B1	75	60 - **89**
E-STB	San Tin Barracks	E-STB-B2	75	**80** - **93**
E-STB	San Tin Barracks Block 40	E-STB-B4	75	69 - **88**
E-STB	San Tin Barracks Block 6	E-STB-B5	75	70 - **89**
E-STB	San Tin Barracks Block 68	E-STB-B6	75	68 - **87**
E-SHT	Village House near Siu Hom Tsuen	E-SHT-R1	75	68 - **87**
E-SHT	Village House near Siu Hom Tsuen	E-SHT-R4	75	69 - **87**
E-AB12	310 Wing Ping Tsuen	E-AB12-E1	75	68 - **82**
E-PSA	Village House near Pak Shek Au	E-PSA-E1	75	71 - **78**
E-SAT	Temporary Structure near Shek Wu Wai San Tsuen	E-SAT-E1	75	65 - 69
E-SAT	Temporary Structure near Shek Wu Wai San Tsuen	E-SAT-E2	75	68 - 72
E-SAT	Village House near Shek Wu Wai	E-SAT-E3	75	67 - **87**
E-SAT	89 Shek Wu Wai	E-SAT-E4	75	61 - **90**

NSR ID	NSR Description	NAP ID	Noise Criteria, Leq 30mins, dB(A) [1]	Predicted Unmitigated Overall Noise Level, dB(A) [2]
E-KLR	Temporary Structure near Siu Hum Tsuen	E-KLR-E1	75	70 - 75
E-HWFST	23 Ha Wan Fisherman San Tsuen	E-HWFST-R1	75	71 - **85**
E-HWFST	Temporary Structure near Ha Wan Fisherman San Tsuen	E-HWFST-R2	75	71 - **82**
E-LMC	301 Lok Ma Chau	E-LMC-R1	75	**78** – **86**
E-LMC	206 Lok Ma Chau	E-LMC-R2	75	60 – **83**

Notes:
[1] 75 dB(A) for all domestic premises (including temporary housing accommodation) hotels and hostels, 70 dB(A) for place of public worship and educational institution, whereas 65 dB(A) for examination period.
[2] Boldfaced and underline values indicate exceedance to relevant noise criteria.

4.7.1.3 Referring to **Table 4.20**, in the absence of noise mitigation measures, the predicted noise levels at the representative NSRs would be in the range of 60 dB(A) to 93 dB(A). Non-compliance of the construction noise criteria is predicted at some of the representative NSRs. Hence, mitigation measures would be required to alleviate some of the potential noise impact on the affected NSRs during construction phase.

4.7.2 Operation Phase

Road Traffic Noise

4.7.2.1 Road traffic noise assessment has been conducted for the representative NSRs in the worst-case post-2046. The predicted traffic noise levels at the representative NSRs under the unmitigated scenario are presented in **Table 4.21** while the detailed traffic noise assessment results are presented in **Appendix 4.10**.

Table 4.21 Summary of Predicted Road Traffic Noise Assessment Results under Unmitigated Scenario (Post-2046)

NSR ID	NSR Description	Land Use [1]	NAP ID	Noise Criteria, L10(1 hr), dB(A)	Predicted Noise Level, $L_{10(1\text{-}hr)}$ dB(A)				Whether Noise Mitigation Measures on "Project Roads" are required (Y/N)
					Overall	Project Roads	Existing Roads	Max. "Project Roads" Contribution where Overall Noise Level Exceed Criteria	
P-RSc21	Proposed Public Housing Development at RSc2.1	R	P-RSc21-R1 – P-RSc21-R70	70	<50 – **75**	<50 – **72**	<50 – **74**	**31.1**	Y
P-RSc22	Proposed Public Housing Development at RSc2.2	R	P-RSc22-R1 – P-RSc22-R25	70	<50 – **75**	<50 – **72**	<50 – **74**	**53.9**	Y
P-RSc23	Proposed Public Housing Development at RSc2.3	R	P-RSc23-R1 – P-RSc23-R204	70	<50 – **73**	<50 – **73**	<50 – 68	**69.6**	Y
P-RSc24	Proposed Public Housing Development at RSc2.4	R	P-RSc24-R1 – P-RSc24-R44	70	<50 – **71**	<50 – **71**	<50 – 59	**56.1**	Y
P-RSc25	Proposed Public Housing Development at RSc2.5	R	P-RSc25-R1 – P-RSc25-R72	70	<50 – **73**	<50 – **73**	<50	**64.2**	Y
P-RSc26	Proposed Public Housing Development at RSc2.6	R	P-RSc26-R1 – P-RSc26-R45	70	<50 – **72**	<50 – **72**	<50 – 61	**21.6**	Y
P-RSc27	Proposed Public Housing Development at RSc2.7	R	P-RSc27-R1 – P-RSc27-R44	70	<50 – **71**	<50 – **71**	<50-53.6	**68.3**	Y
P-RSc31	Proposed Public Housing Development at RSc 3.1	R	P-RSc31-R1 – P-RSc31-R46	70	<50 – **72**	<50 – **72**	<50 – 59	**68.4**	Y
P-RSc32	Proposed Public Housing Development at RSc 3.2	R	P-RSc32-R1 – P-RSc32-R45	70	<50 – **73**	<50 – **73**	<50 – 51	**68.2**	Y
P-RSc121	Proposed Residential Development at RSc1.2.1	R	P-RSc121-R1 – P-RSc121-R16	70	59 – **74**	59 – **74**	<50 – 51	**69.6**	Y
P-RSc122	Proposed Residential Development at RSc1.2.2	R	P-RSc122-R1 – P-RSc122-R20	70	<50 – **74**	<50 – **74**	<50	**69.7**	Y
P-RSc1231	Proposed Residential Development at RSc1.2.3.1	R	P-RSc1231-R1 – P-RSc1231-R22	70	<50 – 67	<50 – 67	<50	N/A	N
P-RSc1232	Proposed Residential Development at RSc1.2.3.2	R	P-RSc1232-R1 – P-RSc1232-R19	70	<50 – **74**	<50 – **74**	<50	**63.0**	Y

NSR ID	NSR Description	Land Use [1]	NAP ID	Noise Criteria, L10(1 hr), dB(A)	Predicted Noise Level, $L_{10(1\text{-}hr)}$ dB(A)				Whether Noise Mitigation Measures on "Project Roads" are required (Y/N)
					Overall	Project Roads	Existing Roads	Max. "Project Roads" Contribution where Overall Noise Level Exceed Criteria	
P-RSc131	Proposed Residential Development at RSc1.3.1	R	P-RSc131-R1 – P-RSc131-R18	70	<50 – 70	<50 – 68	<50 – 66	N/A	N
P-RSc132	Proposed Residential Development at RSc1.3.2	R	P-RSc132-R1 – P-RSc132-R12	70	63 – **75**	63 – **75**	<50 – 67	**57.3**	Y
OU(MU)121	Proposed Residential Development at OU(MU)1.2.1	R	P-OU(MU)121-R1 – P-OU(MU)121-R50	70	<50 – **74**	<50 – **74**	<50 – 54	**70.7**	Y
P-G31	Proposed FSD Staff Quarter	R	P-G31-R1 – P-G31-R12	70	<50 – **76**	<50 – **76**	<50 – **73**	**11.5**	Y
OU(MU)211	Proposed Residential Development at OU(MU)2.1.1	R	P-OU(MU)211-R1 – P-OU(MU)211-R40	70	<50 – **74**	<50 – **74**	<50 – **72**	**66.9**	Y
E-MP	Mai Po San Tsuen	R	E-MA-R1 – E-MP-R4	70	**75** – **84**	53 – 64	**74** – **84**	0.4	N
E-SH	Scenic Heights	R	E-SH-R1	70	60	57	57-58	N/A	N
E-RH	Rolling Hills	R	E-RH-R1	70	61	61	<50	N/A	N
E-SWW	Shek Wu Wai	R	E-SWW-R1 – E-SWW-R10	70	69 – **76**	68 – **75**	<50 – **71**	**18.8**	Y
E-TLT	Tsing Lung Tsuen	R	E-TLT-R1 – E-TLT-R4	70	70 – **77**	66 – **75**	68 – **74**	**3.8**	Y
E-TST	Tung Shan Temple	WP	E-TST-W1	65	**78**	65	**78**	0.2	N
E-TYS	Tun Yu School	E	E-TYS-E1	65	**77**	64	**77**	0.2	N
E-SLT	San Lung Tsuen	R	E-SLT-R1 – E-SLT-R2	70	60 – **74**	60 – 64	<50 - **74**	0.4	N
E-FTT	Fan Tin Tsuen	R	E-FTT-R1 – E-FTT-R2	70	59	59	<50	N/A	N
E-YSW	Yan Shau Wai	R	E-YSW-R1	70	63-64	63-64	<50	N/A	N
E-TCW	Tung Chan Wai	R	E-TCW-R1	70	67	67	<50	N/A	N
E-WPT	Wing Ping Tsuen	R	E-WPT-R1 – E-WPT-R10	70	**73** – **78**	61 – **73**	64 – **78**	**9.0**	Y
E-CT	Chau Tau Tsuen	R	E-CT-R1 – E-CT-R7	70	58 – **71**	58 – **71**	<50 – 62	**26.0**	Y
E-TS	TS to the south of lamp post EA2021	R	E-TS-R1	70	**77**	<50	**77**	0.0	N
E-LMC	301 Lok Ma Chau	R	E-LMC-R1	70	**74**	59-60	**73**	0.2	N
E-HWFST	23 Ha Wan Fisherman San Tsuen	R	E-HWFST-R1	70	**75**	<50	**75**	0.0	N
E-TMB	Tam Mei Barracks	B	E-TMB-B1	70 [5]	<50	<50	<50	N/A	N
E-STB	San Tin Barracks	B	E-STB-B1 – E-STB-B4	70 [5]	58–68	58–68	<50	N/A	N

NSR ID	NSR Description	Land Use [1]	NAP ID	Noise Criteria, L10(1 hr), dB(A)	Predicted Noise Level, $L_{10(1\text{-}hr)}$ dB(A)				Whether Noise Mitigation Measures on "Project Roads" are required (Y/N)
					Overall	Project Roads	Existing Roads	Max. "Project Roads" Contribution where Overall Noise Level Exceed Criteria	
E-SHT	Siu Hom Tsuen	R	E-SHT-R1 – E-SHT-R10	70	67 – **79**	65 – **79**	<50 – **73**	**30.1**	Y
P-SHT	Potential Village House at S/YL-ST/8	R	P-SHT-R1 – P-SHT-R12	70	73 – **84**	64 – **83**	60 – **82**	**20.1**	Y
P-CT	Potential Village Development in existing "V" zone	R	P-CT-R1 – P-CT-R12	70	63–70	51-69	<50-69	N/A	N
P-S_YL-ST_8	Potential Village Development in existing "V" zone in No. S/YL-ST/8	R	P-S_YL-ST_8-R1 – P-S_YL-ST_8-R15	70	61 – **75**	61 – **75**	<50 – 66	**69.7**	Y
P-SWW	Potential Village Development in existing "V" zone in Shek Wu Wai	R	P-SWW-R1 – P-SWW-R12	70	66 – **79**	66 – **78**	<50 – **74**	**29.8**	Y
P-VR	Potential Village Development in Village Re-site	R	P-VR-R1 – P-VR-R18	70	64 – **79**	64 – **79**	<50 – 69	**22.6**	Y

Notes:
[1] Residential-R; Educational Institution-E; Place of Public Worship-WP; Temporary Accommodation / hostels - A; Performance Art Centre - G/IC; Clinic / Home for the aged – C; Barracks – B
[2] The assessment only includes NSRs which rely on opened windows for ventilation.
[3] Boldfaced and underline values indicate exceedance to relevant noise criteria.
[4] Noise levels would be rounded up to nearest integer to determine the compliance of the criteria.
[5] With reference to the approved EIA report for Upgrading of Remaining Sections of Kam Tin Road and Lam Kam Road (AEIAR-222/2020), dormitory of barracks have been considered in traffic noise impact assessment and the noise criterion was 70 dB(A).

4.7.2.2 Referring to **Table 4.21** and **Appendix 4.10**, the predicted noise levels at the representative NSRs are up to 84 dB(A) and some of representative NRSs exceed the relevant noise criteria. Hence, direct mitigation measures should be considered to alleviate the adverse traffic noise impact.

Fixed Noise

Crowd Noise from Tam Mei and San Tin Barracks

4.7.2.3 With reference to **Table 4.22**, the separation distance between Tam Mei Barracks to nearest planned NSR at Land Lot ID RSc2.3 is approximately 490m. With consideration of the large separation distance (>300m), adverse crowd noise impact on planned NSRs within the Project Boundary is not anticipated. Location of fixed noise sources at Tam Mei Barracks and separation distances between fixed noise sources at Tam Mei Barracks and the nearest planned NSRs that rely on opened window for ventilation are shown in **Figure 4.10**. For the San Tin Barracks, the distance between San Tin Barracks to the nearest planned NSRs that rely on opened window for ventilation is approximately 336m. With consideration of the large separation distance (>300m), adverse crowd noise impact on planned NSRs within the Project Boundary is not anticipated. Location of fixed noise sources at San Tin Barracks and separation distances between fixed noise sources at San Tin Barracks and the nearest planned NSRs that rely on opened window for ventilation are shown in **Figure 4.11**. As such, adverse noise impact due to noise generated from crowd activities is not expected.

Table 4.22 Separation Distance between Tam Mei Barracks and San Tin Barracks to nearby NSRs

Barracks	Nearest NSR Land Lot ID	Nearest distance from crowd noise source, m
Tam Mei	RSc2.3	490
San Tin	RSc2.7	336

Shooting Noise from Tam Mei and San Tin Barracks

4.7.2.4 The predicted noise level at representative NAPs due to the Tam Mei Barracks Firing Range and San Tin Barracks Firing Range are presented in **Table 4.23**. For Tam Mei Barracks Firing Range, there are topography screening on the lower floors of P-RSc23-R202. Assumed the lower floors with direct line of sight over the noise source location of Tam Mei Barracks Firing Range are the worst affected flat. For the Detailed calculation of shooting noise impacts is presented in **Appendix 4.11**. The predicted noise levels at representative NAPs comply with the relevant noise criteria.

4.7.2.5 In addition, the predicted noise level at representative NAPs would still meet the 65 dB(A) noise criteria even if the no. of shots is 2 times the observed maximum. Therefore, adverse noise impact from the Firing Range is not expected.

Table 4.23 Predicted Noise Level for noise from existing Firing Range

NAP ID	Use	Predicted Noise Level, dB(A)*		Noise Criteria (Daytime and Evening Time)	Exceedance of Noise Criteria? (Y/N)
		TMB FR	STB FR		
P-RSc23-R119	Residential	56	N/A	65	N
P-RSc23-R202	Residential	61	N/A	65	N
P-RSc25-R16	Residential	N/A	42	65	N

Note: * TMB FR: Tam Mei Barracks Firing Range; STB FR: San Tin Barracks Firing Range

Fixed Plant Noise

4.7.2.6 Fixed plant noise assessment has been conducted to determine the maximum allowable SWL based on the respective separation distances between the proposed fixed plant and the nearby representative NSRs. **Table 4.24** presents a summary of the calculated maximum allowable SWLs for the proposed fixed noise sources. Detailed calculations are presented in **Appendix 4.11**.

4.7.2.7 The worst operation mode with 100% operation (i.e. 24-hrs basis) is assumed in the assessment. Fixed plant noise from NOL has been included in the assessment. The predicted fixed noise level at the representative NSRs due to operation of fixed plant would comply with the daytime, evening time and night-time noise criteria. The maximum allowable SWLs of planned fixed noise sources would be specified in the tender specification to ensure the operational noise impact complying with relevant noise criteria. In future, Lands Department would specify in the lease condition the requirement of noise impact assessment for fixed noise sources at these land lots to demonstrate compliance of noise criteria.

Table 4.24 Summary of Maximum Allowable SWL for Planned Fixed Noise Sources

Land Lot of Fixed Noise Source	Fixed Noise Source	Maximum Allowable SWL, dB(A)
G.1.1	Customs Dog Base	96
G.1.2	HKPF Weigh Station	97
G.1.3	Wetland Conservation Park Management Office	85
G.1.4	Highways Department Depot	82
G.1.5	Lok Ma Chau Police Station cum Operational Base, Petrol Station and Dangerous Goods Storage	88
G.3.1	Divisional Fire Station-cum-ambulance Depot	79
G.5.1	Sport Centre	88
G.5.7	Cultural & Recreational Complex	76
G.5.8	Potential Healthcare Facilities	81
G.5.10	Joint User Government Office	76
G.5.11	GIC Complex	80
G.5.14	Sport Centre	90
OU(GFS).1.1	Green Fuel Station	91
OU(GFS).5.1	Green Fuel Station	100
OU(I&T)1.1.1	Information and Technology - Zone 1	93
OU(I&T)1.1.2	Information and Technology - Zone 1	84
OU(I&T)1.1.3	Information and Technology - Zone 1	87
OU(I&T)2.1.1	Information and Technology - Zone 2	89
OU(I&T)2.1.2	Information and Technology - Zone 2	94
OU(I&T)3.1.1	Information and Technology - Zone 3 (Data Centre)	80
OU(I&T)3.1.2	Information and Technology - Zone 3 (Data Centre)	82
OU(I&T)3.1.3	Information and Technology - Zone 3	79
OU(I&T)3.1.4	Information and Technology - Zone 3	86
OU(I&T)3.1.5	Information and Technology - Zone 3	90
OU(I&T)3.1.6	Information and Technology - Zone 3 (Government Data Centre)	68
OU(I&T)3.1.7	Information and Technology - Zone 3	80
OU(I&T)3.1.8	Information and Technology - Zone 3	83
OU(I&T)3.1.9	Information and Technology - Zone 3	91
OU(I&T)4.4.1	Information and Technology - Zone 4	83
OU(I&T)4.4.2	Information and Technology - Zone 4	83
OU(I&T)4.4.3	Information and Technology - Zone 4	101
OU(I&T)4.4.4	Information and Technology - Zone 4	76
OU(I&T)4.4.5	Information and Technology - Zone 5	74
OU(I&T)5.1.2	Information and Technology - Zone 5	95
OU(I&T)6.1.1	Information and Technology - Zone 6	90
OU(I&T)7.1.1	District Cooling System	79
OU(I&T)7.1.2	Electricity Substation	59
OU(I&T)7.1.3	District Cooling System	82
OU(I&T)7.1.4	Electricity Substation	98
OU(LSW).1.1	Logistic, Storage and Warehouse	94
OU(LSW).1.2	Logistic, Storage and Warehouse	93
OU(LSW).4.1	Logistic, Storage and Warehouse	103
OU.1.1	Stormwater Pumping Station	96
OU.1.2	Sewage Pumping Station	97
OU.1.4	Electricity Substation	91
OU.1.6	District Cooling System	90
OU.1.7	Electricity Substation	91
OU.1.8	Refuse Collection Point	86
OU.1.9	Refuse Transfer Station cum Resource Recovery Facilities	86
OU.1.10	Electricity Substation	90
OU.1.11	District Cooling System	109
OU.2.1	Electricity Substation	82
OU.3.1	Electricity Substation	81

Land Lot of Fixed Noise Source	Fixed Noise Source	Maximum Allowable SWL, dB(A)
OU.3.2	Sewage Pumping Station	72
OU.4.1	District Cooling System	71
OU.4.2	Electricity Substation	86
OU.4.3	Public Transport Interchange	90
OU.5.2	STLMC Water Reclamation Plant	86
OU.5.3	Effluent Polishing Plant and Food Waste Pre-treatment Facilities	95
OU.5.4	Electricity Substation	81
OU.5.5	Refuse Collection Point	83
OU.5.6	Electricity Substation	101
OU.5.7	Sewage Pumping Station	86
OU.5.8	Electricity Substation	80
OU.5.9	District Cooling System	72
OU.5.10	Electricity Substation	73
OU(MU)1.TIH	San Tin Station Transport Interchange Hub	89
OU(MU)2.TIH	Transport Interchange Hub at Proposed Station near Chau Tau	90

4.7.2.8 The relevant government department/future operator shall install acoustic silencers, noise barrier or acoustic enclosure as appropriate to ensure the specified maximum SWLs as shown in **Table 4.24** will not be exceeded. The relevant government department/future operator shall also take into account the latest available information at the time of detailed design to review and update the maximum allowable SWL as appropriate. Noise commissioning test for fixed noise sources will be carried out by relevant government departments/ future operators before operation of fixed noise sources.

4.7.2.9 For the proposed FSAD at land lot G3.1, noise sources related to emergency duties include sirens, vehicle sirens and station loudspeakers are short duration and infrequent. Administrative measures world be adopted by the Director of Fire Services to minimize the noise impact to nearby NSRs. In addition, staff who lives in FSD staff quarters are well informed before in-taking and the direct line of sight between FSAD and FSD staff quarters should be totally screened. Adverse noise impact of FSD staff quarters due to FSAD is not expected.

Airborne Railway Noise

4.7.2.10 The predicted airborne railway noise results from LMCSL to adjacent NSRs are presented in **Table 4.25**. The calculations for the unmitigated scenario are presented in **Appendix 4.12**. No noise exceedance was observed at the representative NSR during daytime, evening and night-time period. Hence, no mitigation measures would be required to abate the railway noise impact during operation phase.

4.7.2.11 With regard to the Clause 5.3.2(b) of EIA Study Brief (ESB-340/2021), contour plots of the predicted $L_{eq30min}$ during both daytime & evening time and night-time has been presented in drawing **Figure 4.12**.

Table 4.25 Summary of Airborne Railway Noise Calculation (Unmitigated)

NSR ID	Assessment Level, mPD	Area Sensitivity Rating	Noise Criteria, dB(A)	Predicted Railway Noise Levels, dB(A)		
			$Leq_{30\ min}$ [1]	$Leq_{30\ min}$		L_{max}
				Daytime &Evening	Nighttime	
P-OU(MU)211-R2	39.7-174.1	B	65/55	52-53	50-52	69-71
P-OU(MU)211-R10	39.7-167.7			53-54	50-52	69-71
P-OU(MU)211-R14	39.7-161.3			52-53	50-52	69-71

Note: [1] The noise criteria are presented for [Daytime & evening/ Nighttime criteria].

4.8 Mitigation of Adverse Environmental Impacts

4.8.1 Construction Phase

4.8.1.1 In order to reduce the excessive noise impact at the affected NSRs during non-restricted working hours, mitigation measures such as adopting quality PME, using quieter construction method, movable noise barriers, full enclosures and grouping of PMEs are recommended. The Contractor(s) may be able to obtain particular models of plant that are quieter than the PMEs given in GW-TM.

4.8.1.2 The use of quality PME associated with the construction works is prescribed in EPD's Quality Powered Mechanical Equipment (QPME) database, which contains the SWLs for quality/quiet PME of various types, brands and models. The SWLs for quality PMEs adopted for construction noise assessment during non-restricted hours are detailed in **Appendix 4.13**.

4.8.1.3 To alleviate the construction noise impact on the affected NSRs, noise barriers or enclosures would be erected to provide screening from the construction plant. Noise barriers will become more effective when located immediately adjacent to the PME and can reduce the noise level by up to 5 dB(A) and 10 dB(A) for mobile and stationary plants, respectively. The contractors shall be responsible for design of the noise barrier with due consideration given to the size of the PME and the requirement of intercepting the line of sight between the NSRs and PME. The barrier material of movable noise barrier should have at least 10 kg/m^2 surface density. Purpose-built acoustics barrier can be used to screen noise from particular items of PME or noisy construction activities. The direct line of sight between the PME and the NSRs should be totally screened by a substantial barrier such that the PME will not be visible when viewed from any window, door or other opening in any façade of the NSR. Reference can be made to the EPD webpage[1] for the design of purpose-built noise barrier. Subject to the work arrangement in construction stage, the Contractor may propose other form of mitigation measures to achieve the full compliance. A noise reduction of 10 dB(A) is assumed for purpose-built noise barrier.

4.8.1.4 Furthermore, full enclosures can be considered as an alternative to shelter relatively static plant including generator. The provision of full enclosure is expected able to provide ~15 dB(A) noise reduction.

4.8.1.5 Quieter construction method such as silent piling by press-in method is adopted as an alternative of traditional sheet piling. A sheet pile is clipped and pressed under the ground. Noise can be minimized by press-in sheet piles with drilling simultaneously for piling works at harder ground. The noise impact can also be further reduced as the piling works can be completed within the shorter duration by using this method. Furthermore, quieter construction method includes the bursting system and quieter type blade saw will be adopted to replace traditional handheld percussive breakers and traditional blade saw for concrete breaking/removal activities.

4.8.1.6 The use of hydraulic breaker for rock or concrete breaking would inevitably generate high level of noise as operation principle of hydraulic breaker is by percussive striking actions of its chisels. As confirmed by Project engineer, it is feasible to adopt quieter rock or concrete breaking equipment (e.g. hydraulic crusher or hand-held breaker with QPME label) in some activities as a mitigation measure. These quieter rock breaking equipment would create less noise impact to NSRs. The Contractor should, subject to the actual site conditions, proactively adopt quieter rock breaking equipment, hydraulic crusher or non-mechanical breaking method (e.g. use of chemical expansion agent) to carry out the demolition works, where practicable.

4.8.1.7 For work sites near San Tin Barracks and Shek Wu Wai (i.e. site A.2.1-1-1-0, A.2.1-2-1-1, A.2.1-2-1-2, A.5.3-0-1-1 and A.5.3-0-1-2 (**Figure 4.3**)), a refined construction activity (i.e.

[1] https://www.epd.gov.hk/epd/misc/construction_noise/contents/index.php/en/road-works/item/74-mitigation-measures/157-construction-noise-barrier.html

roller and excavator should not be operated with backhoe and bulldozer simultaneously) for ground treatment - high arsenic containing soil has been adopted.

4.8.1.8 Possible noise reduction from adoption of noise mitigation measures such as quiet plant, temporary noise barriers and enclosures for construction plants as mentioned above have been applied in the assessment. The mitigation measures have been confirmed with the Project Engineer to be practicable and suitable for the construction programme.

4.8.1.9 The mitigated construction plant inventory is presented in **Appendix 4.13** while detailed construction noise calculations and results for the mitigated scenario are presented in **Appendix 4.14**. A summary of the predicted noise levels at the representative floor of representative NSRs is presented in **Table 4.26**.

Table 4.26 Summary of Predicted Construction Noise Levels at Representative NSRs under Mitigated Scenario (non-restricted hours)

NSR ID	NSR Description	NAP ID	Noise Criteria, Leq 30mins, dB(A) [1]	Predicted Mitigated Overall Noise Level, dB(A) [2]
P-RSc21	Proposed Residential Development at RSc.2.1	P-RSc21-R32	75	49 - 71
P-RSc21	Proposed Residential Development at RSc.2.1	P-RSc21-R65	75	58 - 68
P-RSc22	Proposed Residential Development at RSc.2.2	P-RSc22-R1	75	67 - 68
P-RSc22	Proposed Residential Development at RSc.2.2	P-RSc22-R21	75	53 - 69
P-RSc24	Proposed Residential Development at RSc.2.4	P-RSc24-R42	75	57 - 70
P-RSc25	Proposed Residential Development at RSc.2.5	P-RSc25-R1	75	61 - 67
P-RSc25	Proposed Residential Development at RSc.2.5	P-RSc25-R16	75	54 - 70
P-RSc25	Proposed Residential Development at RSc.2.5	P-RSc25-R19	75	53 - 71
P-RSc25	Proposed Residential Development at RSc.2.5	P-RSc25-R67	75	54 – 69
P-RSc26	Proposed Residential Development at RSc.2.6	P-RSc26-R28	75	61 – 61
P-RSc27	Proposed Residential Development at RSc.2.7	P-RSc27-R1	75	62 - 71
P-RSc27	Proposed Residential Development at RSc.2.7	P-RSc27-R12	75	63 - 67
P-RSc31	Proposed Residential Development at RSc.3.1	P-RSc31-R30	75	45 - 66
P-RSc32	Proposed Residential Development at RSc.3.2	P-RSc32-R19	75	60 - 60
P-RSc121	Proposed Residential Development at R1.2.1	P-RSc121-R1	75	57 - 64
P-RSc121	Proposed Residential Development at R1.2.1	P-RSc121-R7	75	58 - 69
P-RSc122	Proposed Residential Development at R1.2.2	P-RSc122-R10	75	62 - 66
P-RSc123	Proposed Residential Development at R1.2.3	P-RSc1231-R13	75	56 - 69
P-RSc123	Proposed Residential Development at R1.2.3	P-RSc1232-R8	75	61 - 68
P-RSc123	Proposed Residential Development at R1.2.3	P-RSc1232-R17	75	64 - 68
P-RSc131	Proposed Residential Development at R1.3.1	P-RSc131-R17	75	59 - 65
P-RSc132	Proposed Residential Development at R1.3.2	P-RSc132-R11	75	50 - 63
P-VR	Proposed Village Development	P-VR-R15	75	56 - 72

NSR ID	NSR Description	NAP ID	Noise Criteria, Leq 30mins, dB(A) [1]	Predicted Mitigated Overall Noise Level, dB(A) [2]
E-MP	69 Mai Po San Tsuen	E-MP-R1	75	57 - 64
E-MP	1C Mai Po San Tsuen	E-MP-R4	75	54 - 64
E-SH	Scenic Heights Block B2	E-SH-R1	75	66 - 73
E-RH	30 Rolling Hills Phase II	E-RH-R1	75	61 - 70
E-RH	6 Rolling Hills Phase I	E-RH-R2	75	51 - 72
E-SWW	35C Shek Wu Wai	E-SWW-R1	75	52 - 75
E-SWW	35 Shek Wu Wai	E-SWW-R3	75	51 - 74
E-TLT	18 Tsing Lung Tsuen	E-TLT-R2	75	49 - 72
E-TST	Tung Shan Temple	E-TST-W1	70	47 - 64
E-TYS	Tun Yu School	E-TYS-E1	65/70	47 - 63
E-SLT	2J San Lung Tsuen	E-SLT-R1	75	53 - 62
E-YSW	80A Yan Shau Wai	E-YSW-R1	75	52 - 67
E-WPT	161 Wing Ping Tsuen	E-WPT-R1	75	52 - 73
E-WPT	285B Wing Ping Tsuen	E-WPT-R4	75	57 - 75
E-CT	291 Chau Tau Tsuen	E-CT-R1	75	55 - 74
E-CT	218 Chau Tau Tsuen	E-CT-R3	75	49 - 71
E-CT	74 Pun Uk Tsuen	E-CT-R5	75	52 - 68
E-TS	Village house to the south of lamp post EA2021	E-TS-R1	75	55 - 59
E-TMB	49 Tam Mei Barracks	E-TMB-B1	75	49 - 55
E-STB	San Tin Barracks Block 69	E-STB-B1	75	47 - 72
E-STB	San Tin Barracks	E-STB-B2	75	62 - 75
E-STB	San Tin Barracks Block 40	E-STB-B4	75	51 - 71
E-STB	San Tin Barracks Block 6	E-STB-B5	75	53 – 73
E-STB	San Tin Barracks Block 68	E-STB-B6	75	50 - 71
E-SHT	Village House near Siu Hom Tsuen	E-SHT-R1	75	50 - 70
E-SHT	Village House near Siu Hom Tsuen	E-SHT-R4	75	51 - 70
E-AB12	310 Wing Ping Tsuen	E-AB12-E1	75	50 - 65
E-PSA	Village House near Pak Shek Au	E-PSA-E1	75	53 - 62
E-SAT	Temporary Structure near Shek Wu Wai San Tsuen	E-SAT-E1	75	47 - 53
E-SAT	Temporary Structure near Shek Wu Wai San Tsuen	E-SAT-E2	75	50 – 57
E-SAT	Village House near Shek Wu Wai	E-SAT-E3	75	52 – 70
E-SAT	89 Shek Wu Wai	E-SAT-E4	75	46 – 73
E-KLR	Temporary Structure near Siu Hum Tsuen	E-KLR-E1	75	51 – 59
E-HWFST	23 Ha Wan Fisherman San Tsuen	E-HWFST-R1	75	54 - 69
E-HWFST	Temporary Structure near Ha Wan Fisherman San Tsuen	E-HWFST-R2	75	54 – 66
E-LMC	301 Lok Ma Chau	E-LMC-R1	75	61 - 70
E-LMC	206 Lok Ma Chau	E-LMC-R2	75	45 - 67

Note:
[1] 75 dB(A) for all domestic premises (including temporary housing accommodation) hotels and hostels, 70 dB(A) for educational institution, whereas 65 dB(A) for examination period.

4.8.1.10 As shown in **Table 4.26**, with the adoption of mitigation measures such as quieter construction methods, quiet plant, temporary noise barriers and grouping of PME, the predicted construction noise levels arising from the proposed project at Representative NSRs (i.e. included dwellings and classroom) would comply with relevant noise criteria set in Annex 5 in the EIAO-TM under mitigated scenario. No dwellings, classrooms and other NSRs that will be exposed to noise impacts exceeding the criteria.

4.8.1.11 A construction noise management plan, which to verify the inventory of noise sources, and to assess the effectiveness and practicality of all identified measures for mitigating the construction noise impact of the project, would be prepared before tender stage and before commencement of construction works, which are prepared by a Certified Noise Modelling Professional as recognized by the Hong Kong Institute of Qualified Environmental Professionals Limited (HKIQEP), or equivalent as agreed by the Director of Environmental Protection.

Cumulative Construction Noise Impact

4.8.1.12 As mentioned in **Section 4.5.1.3**, the following concurrent projects which may cause potential cumulative construction noise impact are listed as the following and locations of the concurrent projects are shown in **Figure 4.7**.

- NOL
- Development of Lok Ma Chau Loop – Main Works Package 1
- Advance Site Formation and Engineering Infrastructure Works at Kwu Tung North and Fanling North New Development Areas

4.8.1.13 For NOL, potential cumulative construction noise impact would be expected at its construction sites near Kwu Tung Road, Pak Shek Au, Ka Lung Road as well as the proposed San Tin Station (SAT). Distance between the nearest representative NAP under the Project (E-CT-R1) to the construction site near Kwu Tung Road under NOL Project would be more than 300m, cumulative construction noise impact is therefore not expected.

4.8.1.14 For the remaining construction sites under NOL Project, NAPs which would likely be affected by cumulative construction noise impact are also identified, namely E-PSA-E1 for the site near Pak Shek Au, E-KLR-E1 and E-SHT-R4 for the site near Ka Lung Road, as well as E-SAT-E1 to E-SAT-E4 for the site near the proposed San Tin Station (SAT). The above-mentioned NAPs are all residential premises and the criteria for construction noise during non-restricted hours would be 75dB(A).

4.8.1.15 With reference to **Table 4.26**, the predicted maximum mitigated construction noise level under the Project would be 62dB(A) at E-PSA-E1, 59dB(A) at E-KLR-E1, 70dB(A) at E-SHT-R4, and 73dB(A) at E-SAT-E1 to E-SAT-E4. The noise contribution from this project will be incorporated in the cumulative construction noise assessment in NOL EIA. Proper coordination and communication with the NOL Project team would be conducted to ensure that the predicted cumulative construction noise level at representative NAPs would not exceed the 75dB(A) noise criteria. Therefore, adverse cumulative impact would not be expected.

4.8.1.16 For Development of Lok Ma Chau Loop - Main Works Package 1, potential cumulative construction noise impact would be expected at the northern part of the Proposed Project. NAP with shortest horizontal distance to the works limit of the Lok Ma Chau Loop- Main Works Package 1 would be E-LMC-R1 and E-WPT-R4. With reference to the Approved Development of Lok Ma Chau Loop EIA Report (AEIAR-176/2013), the predicted maximum mitigated construction noise level at E-LMC-R1 and E-WPT-R4 would be 69dB(A) and 54dB(A), respectively. As shown in **Table 4.26**, the predicted maximum construction noise level under the Proposed Project would be 70dB(A) at E-LMC-R1 and 75dB(A) at E-WPT-R4. It is therefore considered that the cumulative noise level at E-LMC-R1 and E-WPT-R4 would not exceed the 75dB(A) noise criteria for domestic premises, adverse cumulative impact is therefore not expected.

4.8.1.17 For Advance Site Formation and Engineering Infrastructure Works at Kwu Tung North and Fanling North New Development Areas, potential cumulative construction noise impact would be expected at the eastern part of the Proposed Project. NAP with shortest horizontal

distance to the works limit of the Advance Site Formation and Engineering Infrastructure Works at Kwu Tung North and Fanling North New Development Areas would be E-TS-R1. With reference to the Approved North East New Territories New Development Areas EIA Report (AEIAR-175/2013), the maximum mitigated predicted noise level at the location of E-TS-R1 would be 70dB(A). As shown in **Table 4.26**, the maximum predicted mitigated construction noise level at E-TS-R1 under the Proposed Project would be 59dB(A), cumulative noise level at E-TS-R1 would not exceed the 75dB(A) noise criteria for domestic premises, adverse cumulative impact is therefore not expected.

4.8.2 Operation Phase

Road Traffic Noise

4.8.2.1 With reference to Annex 13 of the EIAO-TM, where the predicted noise impacts exceed the applicable noise criteria, direct mitigation measures such as low noise road surfacing (LNRS), alternative land use, alternative siting, screening by noise tolerant buildings, acoustic windows/balconies, etc. shall be considered and evaluated in appropriate manner.

4.8.2.2 With implementation of direct mitigation measures, including the application of LNRS and acoustic window/balconies at private/public housing sites as well as vertical and cantilevered noise barriers, all planned NSRs within the project boundary would comply with relevant traffic noise criteria. The locations of the proposed direct mitigation measures are shown in **Figure 4.13** with details summarized in **Table 4.27**.

4.8.2.3 The proposed noise barriers are to protect both existing and planned NSRs. For the noise barriers solely required for planned NSRs, the noise barriers will be constructed before the population intake of these planned NSRs. The implementation of the proposed noise barrier is illustrated in **Figure 4.13** for reference. The extent of affected zones that require the erection of noise barriers to be constructed before intake of the protected NSR within the affected zones are presented in **Figure 4.14**.

4.8.2.4 A traffic noise management plan, which to review and confirm the direct mitigation measure (e.g. noise barrier) for the operation phase traffic noise impacts arising from the Project, would be prepared for EPD's approval before commencement of construction works.

4.8.2.5 The proposed at-receiver mitigation measures i.e. the provision of acoustic windows for some planned public and private housing sites are subject to further study by Hong Kong Housing Authority (HKHA) and future private developers respectively. A detailed Noise Impact Assessment (NIA) or Environmental Assessment Study (EAS) for the planned housing sites shall be conducted by HKHA and private developers in the detailed design stage with reference to Chapter 9 of the HKPSG to address environmental impacts and to comply with relevant criteria. Indicative required noise reduction of the at-receiver measures are shown in **Table 4.27**.

4.8.2.6 With the implementation of the recommended direct noise mitigation measures, including LNRS, acoustic windows/balconies and noise barriers, the noise levels at most of the representative NSRs would comply with the traffic noise criteria. However, exceedance of traffic noise level would still be predicted at some of the representative existing and planned NSRs outside the project boundary due to traffic noise from existing roads while contributions from the Project roads to the overall noise levels at all NSRs are predicted to be less than 1.0 dB(A). Therefore, additional noise mitigation measures are considered not required. The predicted overall noise levels of all the NSRs are summarized in **Table 4.28** and presented in **Appendix 4.15**.

Table 4.27 Extent and Locations of Proposed Direct Noise Mitigation Measures

ID	Type	Required At-receiver Noise Reduction, dB(A)	Vertical Height, m	Approx. Length, m	Location	NSR to be Protected / Benefited	Implementation Schedule
LNRS1	LNRS	N/A	N/A	220	Road D1	P-RSc22	Commencement of Road D1
LNRS2	LNRS	N/A	N/A	470	Road D1	P-RSc23, P-RSc123	Commencement of Road D1
LNRS3	LNRS	N/A	N/A	155	Road D1	P-RSc121, P-OU(MU)121	Commencement of Road D1
LNRS4	LNRS	N/A	N/A	250	Road D1	P-RSc122, P-OU(MU)121	Commencement of Road D1
LNRS5	LNRS	N/A	N/A	200	Road D1	P-RSc27	Commencement of Road D1
LNRS6	LNRS	N/A	N/A	240	Road D1	P-RSc32	Commencement of Road D1
LNRS7	LNRS	N/A	N/A	590	Road D1	P-RSc31, P-RSc32, P-RSc132, P-G31	Commencement of Road D1
LNRS8	LNRS	N/A	N/A	200	Road D2	P-RSc121, P-RSc122	Commencement of Road D2
LNRS9	LNRS	N/A	N/A	275	Road D4	P-OU(MU)211	Commencement of Road D4
LNRS10	LNRS	N/A	N/A	135	Road D5	P-RSc32	Commencement of Road D5
LNRS11	LNRS	N/A	N/A	100	Road P1	P-OU(MU)211	Commencement of Road P1
LNRS12	LNRS	N/A	N/A	450	Road P1	P-OU(MU)211	Commencement of Road P1
LNRS13	LNRS	N/A	N/A	240	Road L1	P-RSc32	Commencement of Road L1
LNRS14	LNRS	N/A	N/A	860	Road L3	P-RSc24, P-RSc25, P-RSc26	Commencement of Road L3
LNRS15	LNRS	N/A	N/A	450	Road L4	P-RSc21, P-RSc22	Commencement of Road L4
LNRS16	LNRS	N/A	N/A	255	Road L5	P-RSc22	Commencement of Road L5
LNRS17	LNRS	N/A	N/A	250	Road L6	E-SWW, P-SWW	Commencement of Road L6
LNRS18	LNRS	N/A	N/A	245	Road L7	E-SWW, P-SWW	Commencement of Road L7
LNRS19	LNRS	N/A	N/A	255	Road L8	P-VR	Commencement of Road L8
LNRS20	LNRS	N/A	N/A	100	Road L9	P-VR	Commencement of Road L9
LNRS21	LNRS	N/A	N/A	110	Road L10	P-VR	Commencement of Road L10
LNRS22	LNRS	N/A	N/A	240	Road L10	P-G31	Commencement of Road L10
LNRS23	LNRS	N/A	N/A	55	Road L13	E-YSW, E-TCW, P-S_YL-ST_8	Commencement of Road L13
LNRS24	LNRS	N/A	N/A	100	Road L13	P-S_YL-ST_8, E-WPT, P-WPT	Commencement of Road L13
LNRS25	LNRS	N/A	N/A	280	Road L14	P-OU(MU)211, P-S_YL-ST_8, E-WPT, P-WPT	Commencement of Road L14
LNRS26	LNRS	N/A	N/A	80	Road L14	P-OU(MU)211, P-S_YL-ST_8, E-WPT, P-WPT	Commencement of Road L14
LNRS27	LNRS	N/A	N/A	350	Road L19	E-CT, P-CT	Commencement of Road L19
LNRS28	LNRS	N/A	N/A	65	Road L20	E-CT, P-CT	Commencement of Road L20
AW1	Acoustic Windows/ acoustic balconies [1]	0.1-4.2	N/A	N/A	RSc.2.1	P-RSc21	Population Intake of the Protected NSR
AW2	Acoustic Windows/ acoustic balconies [1]	0.1-4.2	N/A	N/A	RSc.2.2	P-RSc22	Population Intake of the Protected NSR

ID	Type	Required At-receiver Noise Reduction, dB(A)	Vertical Height, m	Approx. Length, m	Location	NSR to be Protected / Benefited	Implementation Schedule
AW3	Acoustic Windows/ acoustic balconies [1]	0.1-2.0	N/A	N/A	R.1.2.1	P-RSc121	Population Intake of the Protected NSR
AW4	Acoustic Windows/ acoustic balconies [1]	0.1-3.2	N/A	N/A	R.1.2.2	P-RSc122	Population Intake of the Protected NSR
AW5	Acoustic Windows/ acoustic balconies [1]	0.1-1.6	N/A	N/A	R.1.2.3.2	P-RSc1232	Population Intake of the Protected NSR
AW6	Acoustic Windows/ acoustic balconies [1]	0.2-2.4	N/A	N/A	R.1.3.2	P-RSc132	Population Intake of the Protected NSR
AW7	Acoustic Windows/ acoustic balconies [1]	0.1-1.7	N/A	N/A	OU(MU)1.2.1	P-OU(MU)121	Population Intake of the Protected NSR
AW8	Acoustic Windows/ acoustic balconies [1]	0.1-2.0	N/A	N/A	OU(MU)2.1.1	P-OU(MU)211	Population Intake of the Protected NSR
AW9	Acoustic Windows/ acoustic balconies [1]	0.1-3.7	N/A	N/A	G.3.1	P-G31	Population Intake of the Protected NSR
AW10	Acoustic Windows/ acoustic balconies [1]	0.1-1.0	N/A	N/A	RSc.3.2	P-RSc32	Population Intake of the Protected NSR
NB1	Vertical Noise Barrier	N/A	7	200	Road L8, Road L9	P-VR	Before Population Intake of the Protected NSR
NB2	Vertical Noise Barrier	N/A	4	50	Road L6	E-SWW, P-SWW	Commencement of Road L6
NB3	Vertical Noise Barrier	N/A	5	50	Road L6	P-SWW	Commencement of Road L6
NB4	Vertical Noise Barrier	N/A	4	25	Road L6	P-SWW	Commencement of Road L6
NB5	Vertical Noise Barrier	N/A	3	75	Road L6	E-SWW, P-SWW	Commencement of Road L6
NB6	Vertical Noise Barrier	N/A	4	125	Road L7	E-SWW, P-SWW	Commencement of Road L7
NB7	Vertical Noise Barrier	N/A	3	50	Road L7	P-SWW	Commencement of Road L7
NB8	Vertical Noise Barrier	N/A	4	60	Road L13	P-S_YL-ST_8	Before Population Intake of the Protected NSR
NB9	Vertical Noise Barrier	N/A	5	35	Near Existing San Tin Tuen Road	P-S_YL-ST_8	Before Population Intake of the Protected NSR
NB10	Vertical Noise Barrier	N/A	2	35	Road L14	P-S_YL-ST_8	Before Population Intake of the Protected NSR
NB11	Vertical Noise Barrier	N/A	4	60	Road L14	P-S_YL-ST_8	Before Population Intake of the Protected NSR
NB12	Vertical Noise Barrier	N/A	5	150	Road L14	E-WPT, P-S_YL-ST_8	Commencement of Road L14
NB13	5m (H) with 3m Cantilever at 30 Degree	N/A	5	100	San Tin Highway	E-TLT	Commencement of the Operation of the Widened San Tin Highway

ID	Type	Required At-receiver Noise Reduction, dB(A)	Vertical Height, m	Approx. Length, m	Location	NSR to be Protected / Benefited	Implementation Schedule
NB14	7m (H) with 3m Cantilever at 30 Degree	N/A	7	775	San Tin Highway	E-TLT, E-SHT, P-SHT	Commencement of the Operation of the Widened San Tin Highway
NB15	7m (H) with 3m Cantilever at 30 Degree	N/A	7	135	San Tin Highway	E-SWW, P-SWW	Commencement of the Operation of the Widened San Tin Highway

Note: [1] Details refer to “Innovative Noise Mitigation Designs and Measures” on EPD’s Website. (https://www.epd.gov.hk/epd/Innovative/greeny/eng/index.html)

Table 4.28 Summary of Predicted Road Traffic Noise Assessment Results under the Mitigated Scenario (Post-2046)

NSR ID	NSR Description	Land Use [1]	NAP ID	Noise Criteria, L10(1 hr), dB(A)	Predicted Noise Level, $L_{10(1\text{-}hr)}$ dB(A)				Whether Further Noise Mitigation Measures on "Project Roads" are required (Y/N)
					Overall	Project Roads	Existing Roads	Max. "Project Roads" Contribution where Overall Noise Level Exceed Criteria	
P-RSc21	Proposed Public Housing Development at RSc2.1	R	P-RSc21-R1 – P-RSc21-R70	70	<50 – 70	<50 – 69	<50 – 70	N/A	N
P-RSc22	Proposed Public Housing Development at RSc2.2	R	P-RSc22-R1 – P-RSc22-R25	70	<50 – 70	<50 – 69	<50 – 70	N/A	N
P-RSc23	Proposed Public Housing Development at RSc2.3	R	P-RSc23-R1 – P-RSc23-R204	70	<50 – 70	<50 – 70	<50 – 68	N/A	N
P-RSc24	Proposed Public Housing Development at RSc2.4	R	P-RSc24-R1 – P-RSc24-R44	70	<50 – 69	<50 – 69	<50 – 59	N/A	N
P-RSc25	Proposed Public Housing Development at RSc2.5	R	P-RSc25-R1 – P-RSc25-R72	70	<50 – 70	<50 – 70	<50	N/A	N
P-RSc26	Proposed Public Housing Development at RSc2.6	R	P-RSc26-R1 – P-RSc26-R45	70	<50 – 69	<50 – 69	<50 – 61	N/A	N
P-RSc27	Proposed Public Housing Development at RSc2.7	R	P-RSc27-R1 – P-RSc27-R44	70	<50 – 70	<50 – 70	<50 – 54	N/A	N
P-RSc31	Proposed Public Housing Development at RSc 2.8	R	P-RSc31-R1 – P-RSc31-R46	70	<50 – 70	<50 – 70	<50 – 59	N/A	N
P-RSc32	Proposed Public Housing Development at RSc 3.2	R	P-RSc32-R1 – P-RSc32-R45	70	<50 – 70	<50 – 70	<50 – 51	N/A	N
P-RSc121	Proposed Residential Development at RSc1.2.1	R	P-RSc121-R1 – P-RSc121-R16	70	58 – 70	58 – 70	<50 – 51	N/A	N
P-RSc122	Proposed Residential Development at RSc1.2.2	R	P-RSc122-R1 – P-RSc122-R20	70	<50 – 70	<50 – 70	<50	N/A	N
P-RSc1231	Proposed Residential Development at RSc1.2.3.1	R	P-RSc1231-R1 – P-RSc1231-R22	70	<50 – 66	<50 – 66	<50	N/A	N
P-RSc1232	Proposed Residential Development at RSc1.2.3.2	R	P-RSc1232-R1 – P-RSc1232-R19	70	<50 – 70	<50 – 70	<50	N/A	N

NSR ID	NSR Description	Land Use [1]	NAP ID	Noise Criteria, L10(1 hr), dB(A)	Predicted Noise Level, $L_{10(1\text{-}hr)}$ dB(A)				Whether Further Noise Mitigation Measures on "Project Roads" are required (Y/N)
					Overall	Project Roads	Existing Roads	Max. "Project Roads" Contribution where Overall Noise Level Exceed Criteria	
P-RSc131	Proposed Residential Development at RSc1.3.1	R	P-RSc131-R1 – P-RSc131-R18	70	<50 – 70	<50 – 68	<50 – 66	N/A	N
P-RSc132	Proposed Residential Development at RSc1.3.2	R	P-RSc132-R1 – P-RSc132-R12	70	62 – 70	60 – 70	<50 – 67	N/A	N
OU(MU)121	Proposed Residential Development at OU(MU)1.2.1	R	P-OU(MU)121-R1 – P-OU(MU)121-R50	70	<50 – 70	<50 – 70	<50 – 54	N/A	N
P-G31	Proposed FSD Staff Quarter	R	P-G31-R1 – P-G31-R12	70	<50 – 70	<50 – 70	<50 – 70	N/A	N
OU(MU)211	Proposed Residential Development at OU(MU)2.1.1	R	P-OU(MU)211-R1 – P-OU(MU)211-R40	70	<50 – 70	<50 – 70	<50 – 70	N/A	N
E-MP	Mai Po San Tsuen	R	E-MA-R1 – E-MP-R4	70	**75** – **84**	53 – 64	**74** – **84**	0.4	N
E-SH	Scenic Heights	R	E-SH-R1	70	60	57	57-58	N/A	N
E-RH	Rolling Hills	R	E-RH-R1	70	60	60	<50	N/A	N
E-SWW	Shek Wu Wai	R	E-SWW-R1 – E-SWW-R10	70	60 – 70	53 – 70	52 – 68	N/A	N
E-TLT	Tsing Lung Tsuen	R	E-TLT-R1 – E-TLT-R4	70	68 – **74**	62 – 66	66 – **74**	0.8	N
E-TST	Tung Shan Temple	WP	E-TST-W1	65	**78**	57	**78**	0.1	N
E-TYS	Tun Yu School	E	E-TYS-E1	65	**77**	57	**77**	0.1	N
E-SLT	San Lung Tsuen	R	E-SLT-R1 – E-SLT-R2	70	60 – **74**	55 – 59	51 – **74**	0.1	N
E-FTT	Fan Tin Tsuen	R	E-FTT-R1 – E-FTT-R2	70	58 – 59	57 – 59	<50	N/A	N
E-YSW	Yan Shau Wai	R	E-YSW-R1	70	62 – 63	62 – 63	<50	N/A	N
E-TCW	Tung Chan Wai	R	E-TCW-R1	70	63 – 64	63 – 64	<50	N/A	N
E-WPT	Wing Ping Tsuen	R	E-WPT-R1 – E-WPT-R10	70	62 – **78**	55 – 63	54 – **78**	0.3	N
E-CT	Chau Tau Tsuen	R	E-CT-R1 – E-CT-R7	70	57 – 70	57 – 70	50 – 62	N/A	N
E-TS	TS to the south of lamp post EA2021	R	E-TS-R1	70	**77**	<50	**77**	0	N
E-TMB	Tam Mei Barracks	B	E-TMB-B1	70 [5]	<50	<50	<50	N/A	N
E-STB	San Tin Barracks	B	E-STB-B1 – E-STB-B4	70 [5]	58-68	58 – 68	<50	N/A	N

NSR ID	NSR Description	Land Use [1]	NAP ID	Noise Criteria, L10(1 hr), dB(A)	Predicted Noise Level, $L_{10(1\text{-}hr)}$ dB(A)				Whether Further Noise Mitigation Measures on "Project Roads" are required (Y/N)
					Overall	Project Roads	Existing Roads	Max. "Project Roads" Contribution where Overall Noise Level Exceed Criteria	
E-SHT	Siu Hom Tsuen	R	E-SHT-R1 – E-SHT-R10	70	60 – **72**	58 – 68	<50 – **71**	0.5	N
E-LMC	301 Lok Ma Chau	R	E-LMC-R1	70	58 – 70	<50 – 57	58 – 70	N/A	N
E-HWFST	23 Ha Wan Fisherman San Tsuen	R	E-HWFST-R1	70	70	<50	70	N/A	N
P-SHT [6]	Potential Village House at S/YL-ST/8	R	P-SHT-R1 – P-SHT-R12	70	65 – **82**	58 – 69	55 – **82**	0.9	N
P-CT	Potential Village Development in existing "V" zone	R	P-CT-R1 – P-CT-R12	70	61 – 70	<50 – 67	<50 – 69	N/A	N
P-S_YL-ST_8	Potential Village Development in existing "V" zone in No. S/YL-ST/8	R	P-S_YL-ST_8-R1 - P-S_YL-ST_8-R15	70	56 – 70	53 – 70	<50 – 67	N/A	N
P-SWW	Potential Village Development in existing "V" zone in Shek Wu Wai	R	P-SWW-R1 – P-SWW-R12	70	64 – 70	64 – 70	50 – 66	N/A	N
P-VR	Potential Village Development in Village Re-site	R	P-VR-R1 – P-VR-R18	70	53 – 68	53 – 68	<50 – 61	N/A	N

Notes:
[1] Residential-R; Educational Institution-E; Place of Public Worship-WP; Temporary Accommodation / hostels - A; Performance Art Centre - G/IC; Clinic / Home for the aged – C; Barracks – B
[2] The assessment only includes NSRs which rely on opened windows for ventilation.
[3] Boldfaced and underline values indicate exceedance to relevant noise criteria.
[4] Noise levels would be rounded up to nearest integer to determine the compliance of the criteria.
[5] With reference to the approved EIA report for Upgrading of Remaining Sections of Kam Tin Road and Lam Kam Road (AEIAR-222/2020), dormitory of barracks has been considered in traffic noise impact assessment and the noise criterion was 70 dB(A).
[6] Potential houses along San Tin Highway in existing "V" zone outside project boundary.

4.8.2.7 Noise impact assessment for the planned private residential developments shall be conducted by private developers and Environmental Assessment Study (EAS) for the planned public housing developments shall be conducted by Housing Department in the detailed design stage to comply with relevant noise criteria stipulated in EIAO-TM and HKPSG.

4.8.2.8 With reference to Clause 3.4.1(b) of Appendix C of the EIA Study Brief, the estimated total number of existing dwellings, classrooms and other NSRs that will be benefited and protected are summarized in **Table 4.29** while the estimated total number for planned NSRs are summarized in **Table 4.30**.

Table 4.29 Number of Existing Residential Dwellings/ Rooms Benefited and Protected under Mitigated Scenario

Description	No. of Existing Residential Dwellings	No. of Existing Classrooms	No. of Other Existing NSRs (Place of Public Worship, Accommodation / Hostel, Clinic / Home for the aged)	Total
Benefited	108	0	0	108
Protected	58	0	0	58

Notes:
[1] Benefited – Exposed dwellings with a noise reduction of 1.0 dB(A) or greater in overall noise level with the noise mitigation measures in place.
[2] Protected – Exposed dwellings with an overall noise level not greater than the noise criteria with the noise mitigation measures in place .

Table 4.30 Number of Planned Residential Dwellings/ Rooms Benefited and Protected under Mitigated Scenario

Description	No. of Planned Residential Dwellings	No. of Planned Classrooms [4]	No. of Other Planned NSRs (Place of Public Worship, Accommodation / Hostel, Clinic / Home for the aged) [3] [4]	Total
Benefited	1,733	0	0	1,733
Protected	1,708	0	0	1,708

Notes:
[1] Benefited – Exposed dwellings with a noise reduction of 1.0 dB(A) or greater in overall noise level with the noise mitigation measures in place.
[2] Protected – Exposed dwellings with an overall noise level not greater than the noise criteria with the noise mitigation measures in place .
[3] No planned Place of Public Worship and Accommodation / hostel under this study.
[4] Given that a District Cooling System (DCS) will be provided for the proposed educational institutions, talent accommodation and social welfare facilities, these facilities will not rely on opened windows for ventilation.

4.8.2.9 With reference to Clause 3.3.2(c), Appendix C of the EIA Study Brief, the estimated total number of dwellings, classrooms and other noise sensitive receivers that will be exposed to noise impact exceeding the respective criteria are presented in **Table 4.31** and **Table 4.32**.

Table 4.31 Estimated Number of Existing Dwellings, Classrooms and Other NSRs Exposed to Noise Exceedance

Scenario	Estimated Number Exposed to Noise Exceedance			
	No. of Existing Residential Dwellings	No. of Existing Classrooms	No. of Other Existing NSRs (Place of Public Worship, Accommodation / Hostel, Clinic / Home for the aged)	Total
Prevailing in 2024	93	1	1	95

Scenario	Estimated Number Exposed to Noise Exceedance			
	No. of Existing Residential Dwellings	No. of Existing Classrooms	No. of Other Existing NSRs (Place of Public Worship, Accommodation / Hostel, Clinic / Home for the aged)	Total
Unmitigated in post-2046	109	1	1	111
Mitigated in post-2046	51	1	1	53

Notes:
[1] Exposed dwellings - dwellings with noise level greater than the noise criteria.
[2] The exposed existing dwellings, classroom and other NSRs in mitigated scenario are in existing "V" zone outside project boundary and their noise exceedances are due to traffic noise from existing roads.

Table 4.32 Estimated Number of Planned Dwellings, Classrooms and Other NSRs Exposed to Noise Exceedance

Scenario	Estimated Number Exposed to Noise Exceedance			
	No. of Planned Residential Dwellings	No. of Planned Classrooms	No. of Other Planned NSRs (Place of Public Worship, Accommodation / Hostel, Clinic / Home for the aged)	Total
Unmitigated in post-2046	1,734	0	0	1,734
Mitigated in post-2046	26	0	0	26

Notes:
[1] Exposed dwellings - dwellings with noise level greater than the noise criteria.
[2] The exposed planned residential dwellings in mitigated scenario are the potential houses in existing "V" zone outside project boundary and their noise exceedances are due to traffic noise from existing roads.

4.8.2.10 Prior to the commencement of the Project, it is estimated that 95 existing dwellings, classroom and other NSRs have already been subject to traffic noise impact due to the existing roads. The project without any noise mitigation measures will slightly increase the number of existing dwellings, classroom and other NSRs along the Project to be exposed to the excessive traffic noise by 16, i.e. 111 dwellings, classroom and other NSRs. Upon exhausting all practicable direct noise mitigation measures, it is estimated that the number of dwellings, classroom and other NSRs exposed to exceedance will be 53, which is less than that prior to the commencement of the Project. These existing NSRs are in existing "V" zone outside project boundary and their noise exceedances are due to the traffic noise from existing roads.

Fixed Noise

Fixed Noise Sources

4.8.2.11 By implementing noise control measure at source with the adoption of the proposed maximum allowable SWLs for the proposed fixed plant, the fixed noise levels at representative NSRs would comply with the relevant noise criteria. Therefore, no adverse impact from the proposed fixed noise sources of the Project would be anticipated.

Shooting Noise from Tam Mei and San Tin Barracks

4.8.2.12 With reference to **Section 4.7.2.4**, for shooting noise from Tam Mei Barracks and San Tin Barracks Firing Ranges, the predicted noise levels at representative NAPs would comply with the relevant noise criteria and adverse noise impact is not expected.

Airborne Railway Noise

4.8.2.13 With no adverse airborne railway noise impact predicted, no mitigation measure is required.

4.9 Evaluation of Residual Impacts

Construction Noise

4.9.1.1 As mentioned in **Section 4.7**, the predicted construction noise levels at all representative NSRs would comply with the noise criteria stipulated in EIAO-TM with the implementation of the mitigation measures. Therefore, no residual construction noise impacts is anticipated.

Road Traffic Noise

4.9.1.2 For the existing NSRs where the overall noise level still exceeds the criteria, all feasible direct mitigation measures such as noise barrier and low noise road surfacing have been considered and exhausted. With the proposed noise mitigation measures in place, the "Project roads" noise levels at all representative NSRs would comply with the relevant noise criteria and the "Project roads" contributions to the overall noise levels at all representative NSRs would be insignificant, i.e. less than 1.0 dB(A). No further direct mitigation measures are required for the existing NSRs. Results of the eligibility assessment for indirect technical remedies is presented in **Appendix 4.16.** Due to high prevailing noise levels and/or dominant noise contribution from existing roads, none of the NSRs are eligible for consideration for indirect technical remedies under the EIAO-TM.

4.9.1.3 For the planned NSRs, with the implementation of the recommended noise mitigation measures, including LNRS, acoustic windows/balconies and noise barriers, the noise levels at planned NSRs within the project boundary would comply with the traffic noise criteria.

4.9.1.4 With the implementation of all the proposed direct noise mitigation measures, no residual traffic noise impact on existing and planned NSRs is anticipated.

Fixed Noise

4.9.1.5 No residual fixed noise impact due to operation of the Project is anticipated.

Railway Noise

4.9.1.6 No residual airborne and ground-borne railway noise impact is anticipated.

4.10 Environmental Monitoring and Audit

Construction Noise

4.10.1.1 It is recommended to establish an EM&A Programme during the construction phase. As shown in **Appendix 4.9**, noise exceedances are observed under the unmitigated scenario. Thus, it is recommended to conduct construction noise monitoring. Regular site environmental audit during construction phase is recommended to ensure proper implementation of mitigation measures and good site practices. Details of the EM&A programme are provided in a stand-alone EM&A Manual.

Road Traffic Noise

4.10.1.2 No adverse traffic noise impact is anticipated from Project contribution with the proposed mitigation measures in place. Road traffic noise levels should be monitored at representative NSR, which are in the vicinity of the recommended direct mitigation measures, during the first year after road opening. The purpose of the monitoring is to ascertain that the recommended mitigation measures are effective in reducing the noise levels.

Fixed Noise

4.10.1.3 The assessment results indicate that with the proper implementation of the calculated maximum allowable SWL for the planned fixed noise sources of the Project, compliance with the EIAO-TM criteria would be expected. As part of the design process, monitoring of operation phase noise from the proposed fixed noise sources during the testing and commissioning stage would be recommended to verify compliance with the EIAO-TM criteria.

4.11 Environmental Acceptability of Schedule 2 Designated Projects

4.11.1.1 An application for an EP would be submitted under this EIA for DP1, DP2, DP3, DP6 and DP7.

New Primary Distributor and District Distributor Road (DP1)

4.11.1.2 With proper implementation of the recommended mitigation measures for construction activities (as detailed in Section 4.8.1), as well as the mitigation measures to reduce traffic noise impact during the operational phase (as described in Section 4.8.2), no adverse noise impact would be resulted from these DP roads.

New San Tin Lok Ma Chau Effluent Polishing Plant (STLMC EPP) (DP2) and New Water Reclamation Plant (DP3)

4.11.1.3 With proper implementation of the recommended mitigation measures for construction activities (as detailed in Section 4.8.1), and the design of EPP and Water Reclamation Plant follow the maximum allowable sound power level as described in **Table 4.24** to minimise potential fixed plant noise impact, no adverse noise impact would be resulted from these DPs.

Revitalisation of San Tin Eastern Main Drainage Channel (DP6), Recreational Development within Deep Bay Buffer Zone 2 (DP7)

4.11.1.4 With the proper implementation of recommended mitigation measures for construction activities (as detailed in Section 4.8.1), no adverse noise impact during the constructional stage would be resulted from these DPs. There is no noise emission source associated with these DPs during operation phase, thus there is no operational noise impact from these DPs.

Other DPs

4.11.1.5 There will be separate EIA studies to assess the following Schedule 2 DPs. The noise impact of these Schedule 2 DPs during construction and operation phases will be further investigated in their own EIA studies under the EIAO. The relevant EM&A requirements for these Schedule 2 DPs will also be provided under their own EIA studies.

- Refuse Transfer Station (RTS) (DP4);
- 400kV Electricity Substation (DP5).

4.12 Conclusion

Construction Noise

4.12.1.1 Assessment on potential construction noise impact arising from the proposed project has been conducted. The assessment results indicate that with implementation of appropriate mitigation measures including quieter construction methods, good site practices, the predicted construction noise levels at all representative NSRs would comply with the noise criteria stipulated in the EIAO-TM and no adverse construction noise impact would be anticipated. A construction noise management plan, which to verify the inventory of noise sources, and to assess the effectiveness and practicality of all identified measures for mitigating the construction noise impact of the project, would be prepared before tender stage and before commencement of construction works, which are prepared by a Certified Noise Modelling Professional as recognized by the Hong Kong Institute of Qualified Environmental Professionals Limited (HKIQEP), or equivalent as agreed by the Director of Environmental Protection. Regular site environmental audit during construction phase is recommended to ensure proper implementation of mitigation measures and good site practices.

Road Traffic Noise

4.12.1.2 Road traffic noise impact assessment has been conducted. The predicted overall noise levels would exceed the respective noise criteria at most NSRs in the unmitigated scenario. Direct noise mitigation measures such as LNRS, provision of acoustics windows/balconies,

and vertical and cantilevered noise barriers have been considered to alleviate the potential traffic noise impact.

4.12.1.3 For the existing NSRs where the overall noise level still exceeds the criteria, all feasible direct mitigation measures such as noise barrier and LNRS have been considered and exhausted. The "Project roads" noise levels at all these representative NSRs would comply with the relevant noise criteria and the "Project roads" contributions to the overall noise levels would be insignificant, i.e. less than 1.0 dB(A). No further direct mitigation measures are required for these existing NSRs.

4.12.1.4 For the planned NSRs, with implementation of the above recommended noise mitigation measures, the noise levels at all planned NSRs within the project boundary would comply with the traffic noise criteria.

4.12.1.5 Fixed Noise

4.12.1.6 Noise impact from planned fixed plant could be effectively mitigated by implementing noise control measure at source during the detailed design stage. With the adoption of the proposed maximum allowable SWLs for the proposed fixed plant, the impact noise levels at representative NSRs would comply with the relevant noise criteria. Therefore, no adverse impact from the proposed fixed noise sources of the Project would be anticipated.

Railway Noise

4.12.1.7 No adverse airborne and ground-borne railway noise impact would be anticipated.