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4. NOISE IMPACT ASSESSMENT

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 3.4.5 and Appendix C of the EIA Study Brief (ESB-360/2023) (hereinafter the ESB).

4.2 Environmental Legislation, 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), the Technical Memorandum on Environmental Impact Assessment Process, Guidance Notes under EIAO (EIAO-GN) and Professional Persons Environmental Consultative Committee (ProPECC) Practice Notes.

4.2.1.2 Assessment procedures and standards are set out in the following TM:

(a) Technical Memorandum on the Environmental Impact Assessment Process;
(b) Technical Memorandum on Noise from Percussive Piling (PP-TM);
(c) Technical Memorandum on Noise from Construction Work other than Percussive Piling (GW-TM);
(d) Technical Memorandum on Noise from Construction Work in Designated Areas (DA-TM);
(e) Technical Memorandum on Noise from Places other than Domestic Premises, Public Places or Construction Sites (IND-TM);
(f) EIAO-GN 9/2023 Preparation of Construction Noise Impact Assessment under the Environmental Impact Assessment Ordinance;
(g) EIAO-GN 16/2023 Preparation of Fixed Noise Sources Impact Assessment Under the Environmental Impact Assessment Ordinance; and
(h) ProPECC Practice Note PN 1/24 Minimizing Noise from Construction Activities;

4.2.2 Construction Noise Criteria

4.2.2.1 Noise from construction activities taking place at non-restricted working hours (0700 – 1900 hours on any day not being a Sunday or general holiday) is subject to the Noise Standards for Daytime Construction Activities in Table 1B of Annex 5 of the EIAO-TM. The criteria are summarized in **Table 4.1**.

Table 4.1 Noise Standards for Daytime Construction Activities

Uses	0700 to 1900 Hours on Any Day Not Being a Sunday or General Holiday, $L_{eq\ (30\ min)}$ dB(A)
• All domestic premises, • Temporary housing accommodation, • Hostels • Convalescent homes, and • Homes for the aged	75
• Places of public worship, • Courts of law, and • Hospitals and medical clinics	70

• Educational institutions (including kindergartens and nurseries)	70 65 (during examinations)

Notes:
- The above standards apply to uses which rely on opened windows for ventilation and are assessed at 1m from the external façade.

4.2.2.2 In the case which construction works would be carried out during restricted hours (all days between 1900 and 0700 hours and at any time on Sundays and general holidays), the noise standards should be referenced to relevant technical memoranda issued under the NCO. For carrying out such construction work, a Construction Noise Permit (CNP) shall be required. 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 NCO. 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.

4.2.3 Operational Fixed Noise Criteria

4.2.3.1 Fixed noise sources are controlled by Section 13 of the NCO and IND-TM. As stipulated in Annex 5 of the EIAO-TM, the noise criteria for planned fixed noise sources impact would be 5 dB(A) below the appropriate Acceptable Noise Levels (ANL) shown in the IND-TM or the prevailing background noise levels (for quiet areas with level 5 dB(A) below the ANL). For cumulative fixed noise sources impact from both planned & existing noise sources, the fixed noise criteria would be Acceptable Noise Levels (ANL) as shown in the IND-TM.

4.2.3.2 The ANL in the IND-TM would depend on the Area Sensitivity Rating (ASR). The ASR, ANL and fixed noise criteria are listed in below **Table 4.2**, **Table 4.3** and **Table 4.4**.

Table 4.2 Area Sensitivity Rating

Type of Area Containing NSR	Degree to which NSR is affected by Influencing Factor		
	Not Affected	Indirectly Affected	Directly Affected
(i) Rural area, including country parks or village type developments	A	B	B
(ii) Low density residential area consisting of low-rise or isolated high-rise developments	A	B	C
(iii) Urban area	B	C	C
(iv) 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.

Table 4.3 Acceptable Noise Level Listed in IND-TM

Time Period	Acceptable Noise Level (ANL) for Different Area Sensitivity Rating, dB(A)		
	ASR A	ASR B	ASR C
Day (0700 to 1900 hrs)	60	65	70
Evening (1900 to 2300 hrs)	60	65	70
Night (2300 to 0700 hrs)	50	55	60

Notes:
- The above standards apply to uses which rely on opened windows for ventilation and are assessed at 1m from the external façade.
- **Table 4.2** should be referenced for the Area Sensitivity Rating (ASR).

Table 4.4 Fixed Noise Criteria

Time Period	Fixed Noise Criteria for Different Area Sensitivity Rating Leq 30min, dB(A)					
	Cumulative Fixed Noise Source Impact Criteria			ANL- 5 for Establishing Criteria 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:
- The above standards apply to uses which rely on opened windows for ventilation and are assessed at 1m from the external façade.
- **Table 4.2** should be referenced for the Area Sensitivity Rating (ASR).
- Criteria for planned fixed noise sources would be the lower of ANL-5 dB(A) and the measured prevailing background noise level ($L_{90\ (60\text{-}min)}$) presented in **Table 4.7**. The criteria for planned fixed noise sources is summarised in **Table 4.17**.

4.2.4 Operational Airborne Rail Noise Criteria

4.2.4.1 The EIAO-TM stipulates the rail noise criteria to be the ANL, which are listed in **Table 4.3**.

4.2.5 Operational Ground-borne Rail Noise Criteria

4.2.5.1 The EIAO-TM stipulates the rail noise criteria to be the ANL in IND-TM, which are listed in **Table 4.3**. 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. The resulting ground-borne rail noise criteria are listed in **Table 4.5**.

Table 4.5 Ground-borne Rail Noise Criteria

Time Period	Ground-borne Rail Noise Criteria for Different Area Sensitivity Rating, ANL-10, dB(A)		
	ASR A	ASR B	ASR C
Day (0700 to 1900 hrs)	50	55	60
Evening (1900 to 2300 hrs)	50	55	60
Night (2300 to 0700 hrs)	40	45	50

Notes:
- The above standards apply to uses which rely on opened windows for ventilation and are assessed at 1m from the external façade.
- **Table 4.2** should be referenced for the Area Sensitivity Rating (ASR).

4.2.6 Operational Road Traffic Noise Criteria

4.2.6.1 For road traffic noise, the following $L_{10(1\ hr)}$ criteria stipulated in Annex 5, Table 1A of EIAO-TM are adopted for different types of noise sensitive receivers (NSRs) which rely on opened window for ventilation. Relevant criteria are listed in **Table 4.6**.

Table 4.6 Noise Standards for Road Traffic Noise

Uses	Peak Hour Traffic Noise Level, $L_{10\ (1\ hr)}$ 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

Notes:
- The above standards, or equivalent, apply to uses which rely on opened windows for ventilation and are assessed at 1m from the external façade.

4.2.7 Operational Marine Traffic Noise Criteria

4.2.7.1 No statutory standard for marine traffic noise was stipulated in the EIAO-TM. Non-statutory noise criteria were proposed according to the ESB. With reference to the approved EIA report (AEIAR-070/2003) for the Proposed Joint User Complex and Wholesale Fish Market at Area 44, Tuen Mun and the approved EIA report (AEIAR-196/2016) for Tung Chung New Town Extension, prevailing noise levels were referenced as the marine traffic noise criteria. Similarly, as agreed with EPD in a separate Methodology Paper on Marine Traffic Noise Impact Assessment, the prevailing noise levels in terms of Leq (1-hour) during peak marine traffic hour was adopted as the marine traffic noise criteria in this EIA Study.

4.3 Description of Existing Environment

4.3.1.1 The Project comprises of two development areas, TKO 137 and land created off TKO 132. Both areas are currently covered by the approved Tseung Kwan O Outline Zoning Plan No. S/TKO/29. Locations of the TKO 132 and TKO 137 are presented in **Figure 1.1**.

4.3.2 Tseung Kwan O Area 137 (TKO 137)

4.3.2.1 TKO 137 is located to the south of the TKO InnoPark (the former Tseung Kwan O Industrial Estate) (TKOIP) and Fat Tong Chau, northwest of the Desalination Plant at TKO (TKO DP), southwest of the SENT Landfill and its extension, west of the Clearwater Bay Country Park, and east of Tathong Channel. TKO 137 is currently zoned as “Other Specified Uses (Deep Waterfront Industry). Existing land uses of the TKO 137 is industrial nature.

4.3.2.2 The prevailing noise environment at TKO 137 is dominated by noise from existing Fill Bank operation at TKO 137, road traffic noise of Wan Po Road, industrial noise from TKOIP, TKO DP, SENT Landfill and its extension, as well as marine traffic noise from Tathong Channel.

4.3.3 Land to be Created off TKO 132

4.3.3.1 TKO 132 is situated at the northwest inside Junk Bay and will be formed by reclamation and slope-cutting. To the west of the TKO 132 is the Devil’s Peak where Junk Bay Chinese Permanent Cemetery and Lau Shui Hang On Luen Village (hereinafter referred as On Luen Village) are located. The prevailing noise environment at TKO 132 is dominated by the marine traffic noise at Junk Bay.

4.3.4 Prevailing Noise Measurement

4.3.4.1 To establish the fixed noise criteria as mentioned in **Section 4.2.3**, prevailing background noise measurement were conducted and the prevailing background noise level measured is detailed in **Appendix 4.1** and summarised in below **Table 4.7**.

Table 4.7 Summary of Prevailing Background Noise Measurement for Establishing Fixed Noise Criteria

Measurement Point		Average Prevailing Background Noise Level (Day / Evening / Night), $L_{90\ (60\text{-min})}$ dB(A)	Represented NSR
ID	Description		
MPT	Ma Pui Tsuen	56 / 52 / 51	E-MPT
OLV	On Luen Village	50 / 51 / 50	E-OLV
HFC	Heng Fa Chuen	56 / 54 / 53	P-PR1 to P-PR5 in TKO 137 (for NSR facing west)
OS	Ocean Shores	52 / 51 / 48	E-OS
YMS	Yan Wing Street, Yau Tong	66 / 58 / 53	P-PR1 to P-PR5 (not facing west), P-E1 to P-E5, P-PU1 to P-PU6 and in TKO 137

4.3.4.2 For TKO 137, given that the current land use of a Fill Bank is in operation, the prevailing background noise would not be representative for the proposed development under the Project. No prevailing background noise measurement at TKO 137 was conducted. However, to determine the potential background noise environment at the proposed development at TKO 137, noise measurement at location with similarity of noise environment, as described in **Section 4.3.2.2**, was conducted. The proposed development at Sites PR1 to PR5 are located next to the shoreline of TKO 137 adjacent to Tathong Channel and may be affected by marine traffic noise, while other sites in TKO 137 are affected by road traffic noise of existing Wan Po Road and other proposed local roads L1 to L8, as well as industrial noise as described in **Section 4.3.2.2**. Therefore, two prevailing background noise measurement points were selected to measure the noise levels under the relevant noise environment. Similar to the marine traffic noise environment at TKO 137 shoreline located to the west of Tathong Channel, a noise measurement point is located at Heng Fa Chuen, which is located to the west of Tathong Channel. Similar to the road traffic noise and industrial noise environment in TKO 137, other part of the existing Tseung Kwan O area does not have both industrial development and road traffic of similar scale. Therefore, the prevailing background noise measurement location was selected at St. James Church near the Yan Wing Street, which is a local distributor with an annual average daily traffic of 11,000 vehicle/day in Year 2022, according to Transport Department Census. The road category and daily traffic at this selected area are similar to that in TKO 137. The measurement point is surrounded by a good mix of industrial area, residential area and recreational uses. Hence, the prevailing background noise measurement results at Yan Wing Street is considered representative for noise environment of TKO 137.

4.3.4.3 For TKO 132, prevailing background noise levels were measured at On Luen Village. The locations of prevailing background noise measurement and the measurement records are provided in **Figure 4.2** and **Appendix 4.1**. The L90 (60-min) would be used for determining the fixed noise criteria (as mentioned in **Section 4.2.3**), while the Leq (60-min) of maximum marine vessel traffic hour as predicted by marine traffic consultant would be the marine traffic noise criteria. as mentioned in **Section 4.7.5.1**). The measurement result was presented in **Table 4.8.**

Table 4.8 Marine Traffic Noise Criteria

NSR ID	Prevailing Noise Level during Peak Marine Traffic Hour, Leq (1-hr) dB(A)	Measurement Location
E-OS	56	OS
E-OLV	54	OLV
E-MPT	64	MPT
P-PR1 to P-PR5	61	HFC

4.4 Identification of Representative Noise Sensitive Receivers

4.4.1.1 In accordance with Annex 13 of the EIAO-TM, all domestic premises, temporary housing accommodation, hostels, convalescent homes, homes for the aged, educational institutions (including kindergarten and nurseries), places of public worship, courts of law, hospitals, medical clinics are identified as noise sensitive receivers (NSRs).

4.4.1.2 The assessment area for construction noise, road traffic noise, fixed noise sources and rail noise impact assessments for the Project is defined as 300 m away from the Project boundary (i.e. the proposed development and associated works of the Project) in accordance with Clauses 2.2.1(a), 3.2.1(a), 4.2.1(a), and 5.1 of Appendix C and Clause 3.4.5.1 of the ESB and is presented in **Figure 4.1.1** to **Figure 4.1.3**. In view of the proposed water works and sewerage works from the proposed marine viaduct, via Tseung Lam Highway Garden and Tong Yin Street to Chui Ling Road, and the proposed footpath modification works near Tseung Lam Highway Garden would involve no proposed NSRs, no operational phase noise sources but involve proposed construction phase noise sources, the aforementioned area would be considered as Project boundary for construction phase, but not for operational phase.

4.4.1.3 Besides, according to Clause 3.4.5.2 of the ESB, the assessment area for operational phase road traffic noise shall be extended to include NSRs at distances over 300 metres from the boundary of the proposed development and associated works of the Project, which may be affected by the construction and operation of the Project and have a bearing on the environmental acceptability of the Project. Considering that the nearest existing NSRs from TKO 137, i.e. LOHAS Park, is located over 1500m from the Project boundary and no modification works of Wan Po Road near the LOHAS Park, this NSR is not likely be affected by the construction and operation of the Project. As such, no extension of assessment areas is required.

4.4.1.4 The TKO 132 and TKO 137 are located at the west and east of Junk Bay area. Based on the marine traffic data mentioned in **Sections 4.5.6** and **4.7.5**, the marine traffic related to the proposed facilities at TKO 132 would sail to and from TKO 132 via Lei Yu Mun. The marine traffic would induce potential marine traffic noise impact to existing NSRs. On the other hand, potential marine traffic noise impact to the proposed NSRs at TKO 137 would be expected by marine vessels sailing in the Junk Bay area via the channel between Cape Collison and the proposed TKO 137. Therefore, to assess the overall marine traffic noise impact, the assessment area includes area within 300 m from the operational phase Project boundary and the Junk Bay area (from Lei Yu Mun to the channel between Cape Collison and the proposed TKO 137), as presented in **Figure 4.1.4**.

4.4.1.5 Existing, committed and planned NSRs within the assessment boundary have been identified, based on the observations from site visits on 22 February and 8 April 2024, review of relevant land use plans including Outline Zoning Plans (OZP) and the latest Revised Recommended Outline Development Plan (RODP) and building layout, which were confirmed with the relevant government departments, as well as Lands Department's advice on Government Land Licence (GLL) at On Luen Village. NSRs that are in close proximity to proposed noise source were identified as representative Noise Assessment Point (NAP). The locations of the identified NAPs for construction noise, fixed noise, rail

noise, road traffic noise and marine traffic noise impact assessments are presented in **Figure 4.3 to Figure 4.7**, respectively. A list of the NSRs and representative NAPs are presented in **Table 4.9** to **Table 4.14**. Photographs of the existing NSRs, including On Luen Village, Ma Pui Tsuen, and Ocean Shores are presented in **Appendix 4.2**.

Table 4.9 Identified Noise Sensitive Receivers

Noise Sensitive Receiver		Existing / Planned	Use[1]	Approximate Distance from the Project Boundary, m	No. of Storey or Height in mPD	Assessment Conducted [2]
ID	Description					
E-PC	Park Central	Existing	R	230	170 mPD	C
E-HKMLCMTPS	Hong Kong and Macau Lutheran Church Ming Tao Primary School	Existing	E	260	35 mPD	C
E-CIHE	Caritas Institute of Higher Education	Existing	E	170	65 mPD	C
E-CBCC	Caritas Bianchi College of Careers	Existing	E	80	65 mPD	C
E-MT	Metro Town	Existing	R	<5	200 mPD	C
E-C	Capri	Existing	R	40	50 mPD	C
E-HKDI	Hong Kong Design Institute	Existing	E	10	65 mPD	C
E-PKSS	Po Kok Secondary School	Existing	E	180	40 mPD	C
E-AR	Alto Residences	Existing	R	140	60 mPD	C
E-FIS	French International School	Existing	E	170	30 mPD	C
E-SME	Shin Ming Estate	Existing	R	170	120 mPD	C
E-CMC	Choi Ming Court	Existing	R	170	120 mPD	C
E-KME	Kin Ming Estate	Existing	R	190	130 mPD	C
E-HTSSTKO	Heung To Secondary School (Tseung Kwan O)	Existing	E	240	55 mPD	C
E-GTEYS	G. T. (Ellen Yeung) School	Existing	E	200	45 mPD	C
E-OS	Ocean Shores	Existing	R	<5	48	C, F, T, M
E-OLV	On Luen Village	Existing	R[3]	30	1	C, F, T, M
E-MPT	Ma Pui Tsuen	Existing	R[3] / P[4]	260	2	M
P-PU1&2	Public Housing	Proposed	R	0	200 mPD	C, F, T
P-PU3&4	Public Housing	Proposed	R	0	190 mPD	C, F, T
P-PU5	Public Housing	Proposed	R	0	180 mPD	C, F, R, T
P-PU6	Public Housing	Proposed	R	0	175 mPD	C, F, R, T
P-PR1	Private Housing	Proposed	R	0	190 mPD	C, F, R, T, M
P-PR2	Private Housing	Proposed	R	0	175 mPD	F, R, T, M
P-PR3	Private Housing	Proposed	R	0	155 mPD	F, R, T, M
P-PR4	Private Housing	Proposed	R	0	120 mPD	C, F, R, T, M
P-PR5	Private Housing	Proposed	R	0	120 mPD	R, T, M
P-E1	Secondary School	Proposed	E	0	8	C, F, R, T
P-E2	Primary School	Proposed	E	0	8	C, F, R, T
P-E3	Primary School	Proposed	E	0	8	C, F, T
P-E4	Primary School	Proposed	E	0	8	C, F, T
P-E5	Secondary School	Proposed	E	0	8	C, F, T

Noise Sensitive Receiver		Existing / Planned	Use[1]	Approximate Distance from the Project Boundary, m	No. of Storey or Height in mPD	Assessment Conducted [2]
ID	Description					

Notes:
[1] R – Residential; E – Educational; P – Place of public worship.
[2] C – Construction Noise; F – Fixed Noise; R – Rail Noise; T – Road Traffic Noise; M – Marine Traffic Noise.
[3] Existing residential uses located on area zoned Green Belt
[4] Existing place of public worship uses located on area zoned Green Belt

Table 4.10 Representative Noise Assessment Points for Construction Noise

NSR ID	NAP ID	Existing / Planned / Proposed	Description	Use [1]	No. of Storey or Height in mPD
E-C	E-C-R-C1 to E-C-R-C2	Existing	Podium and residential block of Capri	R	50 mPD
E-CMC	E-CMC-R-C1	Existing	Residential block of Choi Kwai House	R	120 mPD
E-FIS	E-FIS-E-C1 to E-FIS-E-C3	Existing	French International School	E	30 mPD
E-HKDI	E-HKDI-C1 to E-HKDI-C2	Existing	Podium of Hong Kong Design Institute	E	65 mPD
E-PC	E-PC-R-C1	Existing	Tower 6, Park Central	R	170 mPD
E-MT	E-MT-R-C1 to E-MT-R-C3	Existing	Tower 1-3 of Metro town	R	200 mPD
E-OS	E-OS-R-C1 to E-OS-R-C2	Existing	Tower 1 and17, Ocean Shores	R	48
E-OLV	E-OLV-R-C1	Existing	Village House at GLL S11295 of On Luen Village	R[2]	1
	E-OLV-R-C2	Existing	Village House at GLL S11366a of On Luen Village	R[2]	1
	E-OLV-R-C3	Existing	Village House at GLL S11124a of On Luen Village	R[2]	1
	E-OLV-R-C4	Existing	Village House at GLL S11949 of On Luen Village	R[2]	1
P-PU1&2	P-PU12-R-C1, to P-PU12-R-C6	Proposed	Residential Block at the Proposed Site PU1&2	R	200 mPD
P-PU3&4	P-PU34-R-C1, to P-PU34-R-C4	Proposed	Residential Block at the Proposed Site PU3&4	R	190 mPD
P-PU5	P-PU5-R-C1 to P-PU5-R-C2	Proposed	Residential Block at the Proposed Site PU5	R	180 mPD
P-PU6	P-PU6-R-C1 to P-PU6-R-C3	Proposed	Residential Block at the Proposed Site PU6	R	175 mPD
P-PR1	P-PR1-R-C1	Proposed	Residential Block at the Proposed Site PR1	R	190 mPD
P-PR4	P-PR4-R-C1 to P-PR4-R-C2	Proposed	Residential Block at the Proposed Site PR4	R	120 mPD
P-E1	P-E1-E-C1	Proposed	School at the Proposed Site E1	E	8
P-E2	P-E2-E-C1 to P-E2-E-C2	Proposed	School at the Proposed Site E2	E	8
P-E3	P-E3-E-C1	Proposed	School at the Proposed Site E3	E	8
P-E4	P-E4-E-C1	Proposed	School at the Proposed Site E4	E	8
P-E5	P-E5-E-C1	Proposed	School at the Proposed Site E5	E	8

Notes:
[1] R – Residential; E – Educational
[2] Existing residential uses located on area zoned Green Belt

Table 4.11 Representative Noise Assessment Points for Fixed Noise

NSR ID	NAP ID	Existing / Planned	Description	Use [1]	No. of Storey or Height in mPD
E-OS	E-OS-R-F1	Existing	Tower 3, Ocean Shores	R	48
E-OLV	E-OLV-R-F1	Existing	Village House at GLL S11295 of On Luen Village	R[2]	1
	E-OLV-R-F2	Existing	Village House at GLL S11366a of On Luen Village	R[2]	1
	E-OLV-R-F3	Existing	Village House at GLL S11124a of On Luen Village	R[2]	1
	E-OLV-R-F4	Existing	Village House at GLL S11949 of On Luen Village	R[2]	1
P-PU1&2	P-PU1-R-F1 to P-PU1-R-F3 and P-PU2-R-F1	Proposed	Residential Block at the Proposed Site PU1&2	R	200 mPD
P-PU3	P-PU3-R-F1 to P-PU3-R-F3	Proposed	Residential Block at the Proposed Site PU3&4	R	190 mPD
P-PU5	P-PU5-R-F1 to P-PU5-R-F6	Proposed	Residential Block at the Proposed Site PU5	R	180 mPD
P-PU6	P-PU6-R-F1	Proposed	Residential Block at the Proposed Site PU6	R	175 mPD
P-PR1	P-PR1-R-F1	Proposed	Residential Block at the Proposed Site PR1	R	190 mPD
P-PR2	P-PR2-R-F1 to P-PR2-R-F2	Proposed	Residential Block at the Proposed Site PR2	R	175 mPD
P-PR3	P-PR3-R-F1	Proposed	Residential Block at the Proposed Site PR3	R	155 mPD
P-PR4	P-PR4-R-F1	Proposed	Residential Block at the Proposed Site PR4	R	120 mPD
P-E1	P-E1-E-F1	Proposed	School at the Proposed Site E1	E	8
P-E2	P-E2-E-F1	Proposed	School at the Proposed Site E2	E	8
P-E3	P-E3-E-F1	Proposed	School at the Proposed Site E3	E	8
P-E4	P-E4-E-F1	Proposed	School at the Proposed Site E4	E	8
P-E5	P-E5-E-F1 to P-E5-E-F2	Proposed	School at the Proposed Site E5	E	8

Notes:
[1] R – Residential; E – Educational
[2] Existing residential uses located on area zoned Green Belt

Table 4.12 Representative Noise Assessment Points for Rail Noise

NSR ID	NAP ID	Existing / Planned	Description	Use[1]	No. of Storey or Height in mPD	Approximate Separation Distance between TKLSE and NAP, m
P-PU4	P-PU4-R-R1	Proposed	Residential Block at the Proposed Site PU4	R	190 mPD	30
P-PU5	P-PU5-R-R1	Proposed	Residential Block at the Proposed Site PU5	R	180 mPD	30
P-PU6	P-PU6-R-R1	Proposed	Residential Block at the Proposed Site PU6	R	175 mPD	30
P-PR1	P-PR1-R-R1	Proposed	Residential Block at the Proposed Site PR1	R	190 mPD	30
P-PR2	P-PR2-R-R1	Proposed	Residential Block at the Proposed Site PR2	R	175 mPD	25

NSR ID	NAP ID	Existing / Planned	Description	Use[1]	No. of Storey or Height in mPD	Approximate Separation Distance between TKLSE and NAP, m
P-PR3	P-PR3-R-R1	Proposed	Residential Block at the Proposed Site PR3	R	155 mPD	25
P-PR4	P-PR4-R-R1	Proposed	Residential Block at the Proposed Site PR4	R	120 mPD	25
P-PR5	P-PR5-R-R1	Proposed	Residential Block at the Proposed Site PR5	R	120 mPD	30
P-E1	P-E1-E-R1	Proposed	School at the Proposed Site E1	E	8	60
P-E2	P-E2-E-R1	Proposed	School at the Proposed Site E2	E	8	50

Notes:
[1] R – Residential; E – Educational

Table 4.13 Representative Noise Assessment Points for Road Traffic Noise

Noise Sensitive Receiver		Existing / Proposed	Use [1]	Approx. Distance from the Project Boundary, m	No. of Storey or Height in mPD	NAP ID
NSR ID	Description of NSR					
Area TKO 132						
E-OS	Ocean Shores	Existing	R	130	48	E-OS-R-T01_01
E-OLV	On Luen Village	Existing	R[2]	30	1	E-OLV-R-T01_01 to E-OLV-R-T04_01
Area TKO 137						
P-PU1&2	Public Housing	Proposed	R	0	200 mPD	P-PU1-R-T01_01 to P-PU1-R-T04_01 P-PU2-R-T01_01 to P-PU2-R-T05_01
P-PU3&4	Public Housing	Proposed	R	0	190 mPD	P-PU3-R-T01_01 to P-PU3-R-T04_02 P-PU4-R-T01_01 to P- PU4-R-T04_01
P-PU5	Public Housing	Proposed	R	0	180 mPD	P-PU5-R-T01_01 to P-PU5-R-T04_01
P-PU6	Public Housing	Proposed	R	0	175 mPD	P-PU6-R-T01_01 to P-PU6-R-T06_02
P-PR1	Private Housing	Proposed	R	0	190 mPD	P-PR1-R-T01_01 to P-PR1-R-T05_01
P-PR2	Private Housing	Proposed	R	0	175 mPD	P-PR2-R-T01_01 to P-PR2-R-T04_02
P-PR3	Private Housing	Proposed	R	0	155 mPD	P-PR3-R-T01_01 to P-PR3-R-T04_01
P-PR4	Private Housing	Proposed	R	0	120 mPD	P-PR4-R-T01_01 to P-PR4-R-T03_02
P-PR5	Private Housing	Proposed	R	0	120 mPD	P-PR5-R-T01_01 to P-PR5-R-T04_01
P-E1	Secondary School	Proposed	E	0	8	P-E1-E-T01_01 to P-E1-E-T01_04
P-E2	Primary School	Proposed	E	0	8	P-E2-E-T01_01 to P-E2-E-T01_03
P-E3	Primary School	Proposed	E	0	8	P-E3-E-T01_01 to P-E3-E-T01_02
P-E4	Primary School	Proposed	E	0	8	P-E4-E-T01_01
P-E5	Secondary School	Proposed	E	0	8	P-E5-E-T01_01 to P-E5-E-T01_02

Notes:
[1] R – Residential; E – Educational
[2] Existing residential uses located on area zoned Green Belt

Table 4.14 Representative Noise Assessment Points for Marine Traffic Noise

NSR ID	NAP ID	Existing / Proposed	Description	Use [1]	No. of Storey or Height in mPD
E-OS	E-OS-R-M1	Existing	Tower 1, Ocean Shores	R	170 mPD
E-OLV	E-OLV-R-M1	Existing	Village House at GLL S11295 of On Luen Village	R[2]	1
	E-OLV-R-M2	Existing	Village House at GLL S11366a of On Luen Village	R[2]	1
	E-OLV-R-M3	Existing	Village House at GLL S11124a of On Luen Village	R[2]	1
	E-OLV-R-M4	Existing	Village House at GLL S11949 of On Luen Village	R[2]	1
E-MPT	E-MPT-R-M1	Existing	Tin Hau Temple near Ma Pui Tsuen	P[3]	2
P-PR1	P-PR1-R-M1	Proposed	Residential development at Site PR1	R	190 mPD
P-PR2	P-PR2-R-M1	Proposed	Residential development at Site PR2	R	175 mPD
P-PR3	P-PR3-R-M1	Proposed	Residential development at Site PR3	R	155 mPD
P-PR4	P-PR4-R-M1	Proposed	Residential development at Site PR4	R	120 mPD
P-PR5	P-PR5-R-M1	Proposed	Residential development at Site PR5	R	120 mPD

Notes:
[1] R – Residential; E – Educational; P – Place of Public Worship
[2] Existing residential uses located on area zoned Green Belt
[3] Existing place of worship uses located on area zoned Green Belt

4.5 Identification of Environmental Impacts

4.5.1 Construction Noise Impact

4.5.1.1 As mentioned in **Table 2.11**, the construction phase of the Project is anticipated to be commenced in Year 2025 and be completed by 2041. The tentative construction programme for the Project is provided in **Appendix 4.3**, and phasing programme for population intake is presented in **Appendix 2.1**.

4.5.1.2 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 are described in **Section 2.16**. For TKO 137 area, the major construction works include reclamation, site formation, infrastructure works (road works, waterworks, sewerage works, drainage works, utilities works, electrical and mechanical works and landscape works, etc.), and site development (building structure). For TKO 132 area, the major construction works include reclamation, site formation, infrastructure works (road works, waterworks, sewerage works, drainage works, utilities works, electrical and mechanical works and landscape works, etc.), construction of marine viaduct and site development (construction of EFs, CWHF, RTS, PFTF, CBP and SPS). The tentative list of powered mechanical equipment to be used have been confirmed with construction professionals of the Project Proponent and are presented in **Appendix 4.4**.

4.5.1.3 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 working hours.

4.5.2 Operational Fixed Noise Sources Impact

4.5.2.1 There is no existing fixed noise source identified within 300 m from the proposed development of TKO 132. Existing fixed noise sources in the vicinity of TKO 137 and proposed fixed noise sources in the assessment area of TKO 132 and TKO 137 were identified and listed in below **Table 4.15**. The locations of the fixed noise sources are presented in **Figure 4.4**.

Table 4.15 Identified Fixed Noise Sources

Site ID	Description	Existing / Proposed	Location	Approximate Distance from nearest NAP, m
EFs	Electricity Facilities (EFs)	Proposed	TKO 132	140
CWHF	Construction Waste Handling Facility (CWHF)	Proposed	TKO 132	160
PFTF	Public Fill Transfer Facility (PFTF)	Proposed	TKO 132	190
RTS	Refuse Transfer Station (RTS)	Proposed	TKO 132	260
CBP	Concrete Batching Plant (CBP)	Proposed	TKO 132	220
SPS	Sewage Pumping Station	Proposed	TKO 132	150
G2	Fire Station cum Ambulance Depot	Proposed	TKO 137	10
G3	Government Office Complex cum Sports Centre	Proposed	TKO 137	10
G3	Temporary Public Transport Facility (PTF) (during Years 2030 – 2034)	Proposed	TKO 137	10
G4	Government Complex	Proposed	TKO 137	10
O5	Temporary PTF (during Years 2033 – 2038)	Proposed	TKO 137	40
OU3	Green Filling Station (GFS)	Proposed	TKO 137	90
OU4	Effluent Polishing Plant (EPP)	Proposed	TKO 137	100
OU4	Advance Sewage Pumping Station	Proposed	TKO 137	100
PR1	Public Transport Interchange (PTI)	Proposed	TKO 137	0
PR3	Public PTI	Proposed	TKO 137	0
TKOIP	Tseung Kwan O InnoPark (TKOIP)	Existing	TKO 137	110
SENTX	Infrastructure Area of SENT Landfill and its Extension (SENTX)	Existing	TKO 137	120
SNG	Synthetic Natural Gas Plant (SNG)	Existing	TKO 137	70
TKO DP	Desalination Plant (TKO DP)	Existing	TKO 137	40
CD TKO	Cavern Development in Area around Tseung Kwan O	Planned	TKO 137	50
TKLSE	Ventilation buildings potentially at proposed railway reserve for Tseung Kwan O Line Southern Extension at Sites PR1, PR2, PR3 and PR5	Planned	TKO 137	0

4.5.3 Operational Airborne Rail Noise Impact

4.5.3.1 A planned extension to the existing Tseung Kwan O Line, i.e. the planned Tseung Kwan O Line Southern Extension (TKLSE), would be partially located within the Project Area and its vicinity (refer to **Figure 2.4**). The alignment of the TKLSE within the assessment area would be located underground. Hence, operational airborne rail noise impact would not be expected.

4.5.4 Operational Ground-borne Rail Noise Impact

4.5.4.1 Operational ground-borne rail noise impact would be anticipated when trains operate in tunnels that are located in close proximity to occupied structures, there is a possibility that vibrations associated with train passbys 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 NSRs.

4.5.5 Operational Road Traffic Noise Impact

4.5.5.1 Road traffic noise impact would be anticipated from the road network within the assessment area and is considered as a major noise source during operational phase of the Project. Wan Po Road is the major existing roads in the TKO 137 assessment area while L1 to L8 are proposed Local Roads under the Project. In the assessment area of TKO 132, major existing road would be Tseung Lam Highway, while a proposed road in the form of marine viaduct would connect the proposed TKO 132 and Tseung Lam Highway.

4.5.6 Operational Marine Traffic Noise Impact

4.5.6.1 Marine traffic noise impact would be anticipated from operation of existing marine vessels in the vicinity of the Junk Bay, Lei Yue Mun and Tathong Channel area, and from operation of additional marine from the marine vessel operation in connection to the proposed facilities at TKO 132. Therefore, marine traffic noise impact assessment would be carried out to assess the marine traffic noise impact on proposed NSRs in TKO 137 due to both project-related vessels and the existing vessels, and the additional marine traffic noise impact on the existing NSRs due to the project-related vessels.

4.5.6.2 To the existing NSRs, the potential additional marine traffic noise impact would be expected from the additional marine vessel operation in connection to the proposed facilities at TKO 132. The routing for the additional marine traffic from the proposed facilities at TKO 132 would be to/from TKO 132 via Victoria Harbour only, according to prediction by marine traffic consultant, which has been agreed with Marine Department (see **Appendix 4.5**). Hence, the most affected existing NSRs would be E-OLV, due to the close proximity.

4.5.6.3 To the proposed NSRs at TKO 137, the potential marine traffic noise impact would be expected from the existing vessels as mentioned in **Section 4.5.6.1** and the additional marine traffic from the marine vessel operation in connection to the proposed facilities at TKO 132.

4.5.7 Noise Impact from Concurrent Projects

4.5.7.1 The potential concurrent projects have been identified in **Section 2** with their locations shown in **Figure 2.13**. which are located within the noise assessment boundary and have potential cumulative noise impact are summarized as below:

(a) TKO DP
(b) Construction of New Berthing Facilities and Associated Structures within Tseung Kwan O Area 137 Fill Bank
(c) Cavern Development in Area around Tseung Kwan O (CD TKO)
(d) Proposed Tseung Kwan O Line Southern Extension (TKLSE)
(e) SENTX

4.5.7.2 For the Second Stage of TKO DP – Investigation, Design and Construction under Agreement No. CE92/2022 (WS), the consultancy agreement is expected to be completed by January 2031[1]. Therefore, it is expected that the construction of the project would be completed by Year 2031, before the main phase population intake of the Project in Year 2033-2035. The location of the project is shown in **Figure 2.4**. No noise sensitive uses would be located within 300 m of the Second Stage of TKO DP construction site during its construction period. Hence, no cumulative construction noise impact would be identified.

[1] https://www.wsd.gov.hk/en/tenders-contracts-and-consultancies/consultancies/award-consultancies/index.html

The operational phase fixed noise impact due to TKO DP (both First Stage and Second Stage) have been identified in above **Section 4.5.2**. Its potential operational phase fixed noise impact is to be addressed below in **Section 4.7.2**.

4.5.7.3 For the New Berthing Facilities and Associated Structures within Tseung Kwan O Area 137 Fill Bank, as confirmed by CEDD, the construction and operation period for this project would be Year 2025 to 2026 and Year 2026 to 2031, respectively. The location of this New Berthing Facilities and Associated Structures, as shown in **Figure 2.13**, would be located within the existing Tseung Kwan O Area 137 Fill Bank, and would be over 300 m from any existing or proposed noise sensitive uses between Years 2025-2031, which is before main phase population intake (as shown in **Appendix 2.1**). With reference to the site handover date in **Appendix 2.3**, no Fill Bank operation would be expected within 300 m from the proposed NSR at Site PU1&2 after Year 2030. Therefore, no cumulative construction and operational phase noise impact have been identified from this project.

4.5.7.4 For the Construction of Development of CD TKO, its construction would be conducted between Year 2027 to 2031, tentatively. Hence, its operation would commence in Year 2032, tentatively. The Cavern would be located within 300 m from the Project. Hence, potential cumulative construction noise and operational phase fixed noise impacts would be expected and to be assessed in below **Sections 4.7.1** and **4.7.2**, respectively.

4.5.7.5 For the TKLSE, it is expected the project construction would be conducted in Year 2028 to 2038. Given the alignment of TKLSE would be partially located within the Project, cumulative construction noise, operational phase fixed noise and rail noise impacts would be anticipated and to be assessed in below **Sections 4.7.1**, **Section 4.7.2** and **4.7.3**, respectively.

4.5.7.6 For the SENTX, the operational phase fixed noise impact due to infrastructure area of the SENTX have been identified in above **Section 4.5.2**. Its potential operational phase fixed noise impact is to be addressed below in **Section 4.7.2**.

4.6 Assessment Methodology

4.6.1 Construction Noise Impact

4.6.1.1 With reference to the Clause 2.1.2 of Appendix C of the ESB, construction noise impact assessment should be conducted qualitatively. Major construction noise sources, construction activities and tentative PME list have been identified above in **Section 4.5.1**, corresponding quiet construction methods and noise mitigation measures would be recommended.

4.6.1.2 Construction Noise Management Plan (CNMP) would be submitted to EPD for agreement. Detail requirements of the CNMPs are presented in **Section 4.8.1**.

4.6.2 Operational Fixed Noise Sources Impact

4.6.2.1 With reference to the Clause 4.1.2 of Appendix C of the ESB, fixed noise sources impact assessment should be conducted qualitatively. Major fixed noise sources have been identified above in **Section 4.5.2**. An inventory of noise sources for fixed noise sources impact assessment was identified, with its validity confirmed with relevant operators, government departments or authority. Direct mitigation measures, such as quieter fixed plant, use of acoustic louvre at opening, directing the opening away from NSRs, silencer, installation of noise barrier, noise enclosure, etc. are recommended to alleviate the potential fixed noise sources impact.

4.6.2.2 Fixed Noise Source Management Plans (FNMPs) would be submitted to EPD for agreement. Detail requirement of the FNMPs are presented in **Section 4.8.2**.

4.6.3 Operational Ground-borne Rail Noise Impact

4.6.3.1 Given insufficient design and operational information of TKLSE at the time of this EIA, ground-borne rail noise impact assessment was conducted qualitatively, having regard to other existing railway systems with similarities based on best available information.

4.6.4 Operational Road Traffic Noise Impact

4.6.4.1 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.

4.6.4.2 Road traffic noise impact was predicted based on the maximum traffic projections within 15 years upon operation of the Project according to Annex 13 of the EIAO-TM. As per the construction programme, the first population intake of the Project would be in Year 2030 while the full population intake of the Project would be in Year 2041. As predicted by Traffic Consultant of the Project, Year 2041 was predicted to be the year of peak traffic flow between 2041 and 2056 (i.e. 15 years after population intake of the last residential development). The peak traffic flow forecast for the prevailing scenario (i.e. 2024 without Project) and the assessment year (i.e. 2041 with Project) are presented in **Appendix 4.6**. The traffic flow forecast has been agreed with Transport Department and presented in **Appendix 4.7**. Drawings of road-plots of the road traffic noise model showing the road segments, barriers, and noise assessment points of NSRs are presented in **Appendix 4.8**.

4.6.4.3 The following scenarios are studied in the assessment:

(a) Unmitigated scenario in Year 2041;
(b) Mitigated scenario in Year 2041; and,
(c) Prevailing Scenario in Year 2024 for indirect technical remedies eligibility assessment.

4.6.4.4 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:

(a) "Project Roads" which in the context of this report describe all roads that are completely new located within the Project area or substantially altered by the proposed project. That is, the proposed local roads L1 to L8 at TKO 137, about 100 m widening of Wan Po Road that connecting to L8, and the proposed viaduct and roads at TKO 132 are considered as "Project Roads".
(b) "Other Roads" are unchanged existing roads within the assessment boundary.

4.6.4.5 For the purpose of the road traffic noise assessment, the roads within the original assessment boundary have been included in the assessment. No extension of assessment area for water works and sewerage works as explained in **Section 4.4.1.2** are considered necessary as it is only for construction phase. Road sections included in the assessment and the extent of Project Roads are presented in **Figure 4.8.1** and **Figure 4.8.2**. 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 to be constructed by Project Proponent have been considered in the assessment.

4.6.4.6 Direct mitigation measures would be proposed if adverse environmental impact is predicted from the Project Roads. If the NSRs are affected by adverse overall road traffic noise impact, direct mitigation measures would be recommended to reduce the noise from the Project Roads to a level that it:

(a) is not higher than the noise criteria listed in **Section 4.2.6**; and
(b) has no significant contribution (less than 1.0 dB(A)) to the cumulative noise level, if the overall noise level (i.e. noise from both Project Roads and Other Roads) exceeds the noise criteria.

4.6.4.7 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:

(a) the predicted overall noise level from the Project Roads and Other Roads within the assessment area must be above the noise criteria presented in **Section 4.2.6**;
(b) the predicted overall noise level is at least 1.0 dB(A) more than the prevailing traffic noise level; and
(c) the contribution to the increase in the predicted overall noise level from the Project Roads must be at least 1.0 dB(A).

4.6.4.8 If noise exceedance were predicted at planned NSRs, direct at-source mitigation measures would be proposed to minimize the overall noise level and Project Roads noise level to below the noise criteria and that the contribution from Project Road to overall noise level would be less than 1.0 dB(A). In case any residual impact due to engineering constraint that direct at-source noise mitigation measures cannot be applied for affected planned NSRs, additional mitigation measures at-receiver would be recommended for these planned developments and agreed with relevant parties.

4.6.5 Operational Marine Traffic Noise Impact

4.6.5.1 Marine traffic noise measurements have made reference to the international standard “ISO 2922:2020, Acoustics – Measurement of airborne sound emitted by vessels on inland waterways and harbours”. During the noise measurement period, measured maximum noise level (L_{max}) and duration of different events of vessel operation were recorded.

4.6.5.2 Based on noise measurement data obtained, the predicted marine traffic noise levels due to the marine traffic within the assessment area was assessed based on the source noise levels determined by noise survey. The measured maximum noise level ($L_{max,m}$) was then obtained.

4.6.5.3 To avoid environmental background noise affecting the measurement results, the measured L_{max} was corrected with background noise level (L_{Aeq}), so as to obtain the corrected maximum noise level ($L_{max,c}$), with reference to ISO 2922:2020. The background noise level is obtained by measurement before and after the vessel passage event, with measurement time of 5 minutes for each of the event. The $L_{max,c}$ is calculated by the following equation:

$$L_{max,c} = 10log_{10}(10^{0.1Lmax} - 10^{0.1LAeq}) \quad (1)$$

where,
L_{max} is the measured maximum noise level, in dB(A)
$L_{Aeq,}$ is the background noise level, in dB(A)
$L_{max,c}$ is the corrected marine traffic passby maximum noise level, in dB(A);

Remarks:

- Referenced from ISO 2922:2020 Measurement of airborne sound emitted by vessels on inland waterways and harbours

4.6.5.4 The single event sound exposure level (L_{AX}) for a sailing marine vessel at the measurement location can be expressed as:

$$L_{AX} = L_{max,c} + 10log_{10}\left(\frac{kd_m}{V}\right) \quad (2)$$

where,
L_{AX} is the single event sound exposure level;
$L_{max,c}$ is the corrected maximum noise level, in dB(A);
k is the empirical constant = 2 for marine traffic, with reference to Transportation Noise Reference Book, 1987;
d_m is the distance between the marine vessel and the measurement location, m;
V is the speed of the marine vessel in m/s.
Remarks:

- Distance between the measured vessel and the measurement point is based on vessel track of AIS/Radar or site observation and the location of the measurement point
- Speed of the measured vessel were obtained from AIS / Radar data
- Reference from equation 2.22 of Transportation Noise Reference Book, 1987

4.6.5.5 The L_{AX} is then corrected to a reference distance of 25m by below equation:

$$L_{AX25} = L_{AX} + 20log_{10}\left(\frac{d_m}{25}\right) \quad (3)$$

where
L_{AX25} is the single event sound exposure level at 25m from the sailing marine vessel
L_{AX} is the single event sound exposure level
d_m is the distance between the marine vessel and the measurement location, m.
Remarks:

- Referenced from ISO 2922:2020 Measurement of airborne sound emitted by vessels on inland waterways and harbours

4.6.5.6 If there are N vessels passing by during T, the total predicted noise level ($L_{eq(1\text{-}hr)}$) at the noise assessment point for the passage of these N marine vessels is given by

$$L_{eq(1-hr)} = L_{AX25} - 20log_{10}\left(\frac{d}{d_0}\right) - 10log_{10}T + 10log_{10}N + FC \quad (4)$$

where
d = distance between measured vessel along the notional vessel track and noise assessment point (m)
d_0= reference distance of 25 (m)
T = 1 hr = 3600 seconds
N = number of vessel passby per 1 hour period
FC = façade correction = +3dB(A)

4.6.5.7 The predicted marine traffic noise level is calculated by summing the $L_{eq(1\text{-}hr)}$ of total events of vessel during peak hour. Appropriate distance and façade corrections has been taken into account for the assessment. Where the predicted cumulative marine traffic noise level at the NSR is below the prevailing noise level, adverse marine traffic noise impact is not anticipated.

4.7 Prediction and Evaluation of Environmental Impacts

4.7.1 Construction Noise Impact

4.7.1.1 Potential construction noise impacts arising from the Project during the non-restricted working hours have been assessed.

4.7.1.2 In order to minimize the potential noise impact due to the construction of the Project, the construction of the Project would be conducted by phases. The construction programme is presented in **Appendix 4.3**, which indicates the construction of the Project would commence in Year 2025 for both TKO 137 and TKO 132, while the construction would be completed by Year 2041. The tentative first population intake years or operation years of Sites at TKO 137 would be between Years 2030 to 2041. The tentative first operation years of facilities at TKO 132 would be between Years 2030 to 2035. The tentative programme for first population intake/facilities operation is presented in below **Table 4.16**.

Table 4.16 Tentative Years of Population Intake / Operation for the Proposed Sites

Area	Sites	Facilities/Uses	Tentative First Population Intake / Operation Year
TKO 137	PU1&2	Residential	2030 [1]
TKO 137	PU3&4	Residential	2033 [1]
TKO 137	PU5	Residential	2035 [1]
TKO 137	PU6	Residential	2035 [1]
TKO 137	PR1	Residential	2035 [1]
TKO 137	PR2	Residential	2041 [1]
TKO 137	PR3	Residential	2041 [1]
TKO 137	PR4	Residential	2038 [1]
TKO 137	PR5	Residential	2041 [1]
TKO 137	E1	Educational	2030
TKO 137	E2	Educational	2030
TKO 137	E3	Educational	2035
TKO 137	E4	Educational	2035
TKO 137	E5	Educational	2035
TKO 137	G1	Police Station	2034
TKO 137	G2	Fire Station cum Ambulance Depot	2034
TKO 137	G3	Government Office Complex cum Sport Centre	2040
TKO 137	G4	Government Complex	2035
TKO 137	OU1	Electric Substation (ESS)	2030
TKO 137	OU2	Electric Substation (ESS)	2035
TKO 137	OU3	Green Filling Station (GFS)	2035
TKO 137	OU4	Advance Sewage Pumping Station	2030
TKO 137	OU4	Effluent Polishing Plant (EPP)	2035 / 2041 [2]
TKO 137	OU5	Fresh Water Service Reservoir	2031
TKO 137	OU6	Salt Water Service Reservoir	2030
TKO 132	OU1	EFs	2035
TKO 132	OU2	CWHF	2031
TKO 132	OU3	PFTF	2030
TKO 132	OU4	RTS	2031
TKO 132	OU5	CBP	2030
TKO 132	OU6	SPS	2031

Remarks:
[1] The above year of population intake/operation considered the 9-month period for occupation permit application, after the construction end dates, as shown in **Appendix 4.3**.
[2] Phase 1 and Phase 2 operation year for EPP are 2035 and 2041, respectively.

4.7.1.3 Listed in the tentative construction programme in **Appendix 4.3**, the construction activities by the Project are summarized in **Section 4.5.1**. To conduct the construction activities, powered mechanical equipment (PME) would be needed, which would induce potential

construction noise impact. The construction plant inventory of the representative PME was identified and is presented in **Appendix 4.4**. The construction programme and plant inventory specified in the **Appendix 4.3** and **Appendix 4.4** are referenced to the information provided by relevant project proponent and/or with reference to similar facilities, and their validity was confirmed by relevant operators, government departments and/or the construction professionals of CEDD to be practical and suitable for proposed works.

TKO 137

4.7.1.4 As the nearest existing NSRs from the TKO 137 development is LOHAS Park located over 1500 m away, the potential construction noise impact from TKO 137 to LOHAS Park is considered insignificant in view of the large distance separation.

4.7.1.5 At TKO 137, reclamation works would be conducted at the west of the current TKO 137 Fill Bank in Phases 1A, 1B, 1C, 2A and 2B (presented as ID 1-59 in **Appendix 4.3**). After installation of silt curtain, reclamation works would be conducted in the order of modification/removal of existing seawall as necessary, installation of sand blanket, seabed ground treatment using non-dredged marine deep cement mixing method, seawall construction, and completed by filling works (and associated stockpiling works) and jet grouting works until the reclaimed land reached the site formation level. Construction works for box culvert and seawall outfall would be conducted during reclamation Phases 1A, 1B, 2A and 2B (presented as ID 66-69 in **Appendix 4.3**). Use of PME in indices A, B, C and G as indicated in **Appendix 4.4** would be expected for these works. The reclamation would be conducted using non-dredged method to avoid/minimize the use of dredger to minimize the potential noise due to dredging works. For construction of seawall, quite construction method of installing precast structures for blockworks, instead of in-situ concreting would be used as far as practicable to minimise the potential noise impact. Sheet pile walls would be constructed using quiet construction method, i.e. hydraulic press-in method, to minimise the noise impact. Filling materials would be transported by barge to respective barging point located adjacent to the reclamation works area, as shown in **Appendix 4.3**. Each barging point would be equipped with conveyor belt, which is fully enclosed to minimise any potential noise impact. The barging point would also be located over 350m from the nearest NAP E-OLV-R-C4, minimal construction noise impact would be anticipated. To avoid potential construction noise impact to proposed noise sensitive uses, these reclamation Phases 1A, 1B and 1C would be completed by late 2030 tentatively, before tentative population intake of the initial phase (i.e. NSR P-PU1&2) and operation of NSRs E1 and E2 by end 2030. Therefore, no construction noise impact due to reclamation Phases 1A, 1B and 1C would be anticipated to proposed NSRs. Reclamation Phases 2A and 2B would be tentatively conducted between Years 2030 to 2034 at a distance of over 300 m from the nearest NSR PU3&4, which would have population intake year of 2033 tentatively. Given large separation distance, no adverse construction noise impact would be anticipated due to reclamation Phases 2A and 2B. The reclamation works would have been completed prior to population intake/operation of other proposed NSRs. Thus, it is considered that the construction noise impact due to reclamation works and construction works for box culvert and seawall outfall have been minimized in term of construction programme. Recommended construction noise mitigation measures are presented in **Section 4.8.1**, to allow further minimsation of potential noise impact.

4.7.1.6 Site formation works, including natural terrain hazard mitigation works (presented as ID 61-62 in **Appendix 4.3**), would be conducted at TKO 137 at the northwest of Site OU1 and east of Site OU4 during Year 2027 to 2029 tentatively. Use of PME in indices E and F as indicated in **Appendix 4.4** would be expected for these works. As no proposed NSRs would be located in the vicinity of the works area during the construction period, no adverse construction noise impact would be expected from the site formation works.

Recommended construction noise mitigation measures are presented in **Section 4.8.1**, to allow further minimsation of potential noise impact.

4.7.1.7 Infrastructure works (presented as ID 64-65 in **Appendix 4.3**), would be conducted at TKO 137 during Year 2027 to 2031 and 2036 to 2039 tentatively. Road works, stockpiling, waterworks, sewerage drainage, utilities, electrical and mechanical, and landscape works etc. would be conducted. Use of PME in index G as indicated in **Appendix 4.4** would be expected for these works. It is expected that these works would be carried out section by section involving relatively small area and hence small amount of PME at any given time. Thus, it is considered that the associated construction noise impact would be minor. To further minimize the potential impact, recommended construction noise mitigation measures are presented in **Section 4.8.1**.

4.7.1.8 Site formation works and construction works for service reservoirs at Site OU5 and OU6 (presented as ID 70-85 in **Appendix 4.3**) would be conducted tentatively during Year 2025 to 2031. Use of PME in indices F and H as indicated in **Appendix 4.4** would be expected for these works. Most of the construction works would be completed prior to initial phase population intake by end 2030, with exceptions of architectural and landscape works and testing and commissioning works which are expected less noisy. Hence, it is considered that the associated construction noise impact have been minimized from the aspect of construction programme. To further minimize the potential impact, recommended construction noise mitigation measures are presented in **Section 4.8.1**.

4.7.1.9 Temporary PTF at Site G3 would be constructed tentatively during Year 2025 to 2029, and demolished in Year 2036. Another Temporary PTF at Site O5 would be constructed during Year 2029 to 2032, and demolition during Year 2041 tentatively (presented as ID 91-94 in **Appendix 4.3**). Use of PME in index G as indicated in **Appendix 4.4** would be expected for these works. Potential noise impact would be anticipated due to short distance from nearest NSRs of less than 30m. Recommended construction noise mitigation measures are presented in **Section 4.8.1** to alleviate any potential construction noise impact.

4.7.1.10 Site development works would be conducted at TKO 137 in 3 phases, namely initial phase, main phase and remaining phase, as presented in **Section 2.16** (presented as ID 110-132 in **Appendix 4.3**). Use of PME in index K as indicated in **Appendix 4.4** would be expected for these works. For site development works, general building construction works would be expected to include substructure construction (including foundation works, piling works, etc.) and super structure works. Sites PU1&2, E1, E2 and OU1 would be conducted during Year 2025 to 2030 tentatively. No proposed NSRs would be expected in the vicinity of these construction works. No adverse construction noise impact would be anticipated from initial phase site development works. Sites PU3&4, PU5, PU6, PR1, E3, E4, E5, G1, G2, G4, OU2 and OU3 would be constructed for main phase population intake/occupation. Sites G3, PR2, PR3, PR4 and PR5 would be constructed tentatively during Years 2033 to 2041 for remaining phase population intake. Due to the phased development at TKO 137, proposed initial phase NSRs (such as P-PU1&2 at Site PU1&2) would be affected by the site development works from site development works for main phase development and remaining phase development. For instance, NSR P-PU1&2 at Site PU1&2 of initial phase would have its tentative population intake in Year 2030, while site development works at nearby main phase Sites PU3&4 would be conducted until Year 2033 tentatively. Potential construction noise impact would be anticipated at NSR P-PU1&2 due to the main phase development. Similar construction noise impact would be expected for the proposed NSRs at TKO 137. In view of the phased development and relatively short separation distance between these proposed NSRs and site development works, potential adverse construction noise impact would be anticipated. To minimize the potential construction noise impact, quieter construction method has been included in the latest construction design for TKO 137. Recommended construction noise mitigation measures are presented in **Section 4.8.1**.

4.7.1.11 The construction at Site OU4 (presented as ID 100-109 in **Appendix 4.3**) would be conducted tentatively during Year 2027 to 2030 for the advance sewage pumping station, Year 2029 to 2034 for EPP Phase 1 and during 2037 to 2041 for EPP Phase 2. Use of PME in index J as indicated in **Appendix 4.4** would be expected for these works. In view of the phased development and relatively short separation distance between the proposed nearby NSRs P-PU5 and P-E3 and the Site OU4, potential adverse construction noise impact would be anticipated. To minimize the potential construction noise impact, quieter construction method has been included in the latest construction design for TKO 137. Recommended construction noise mitigation measures are presented in **Section 4.8.1**.

4.7.1.12 To alleviate / minimize the potential construction noise impact, construction noise mitigation measures presented in **Section 4.8.1** has been recommended. During design phase, the construction noise mitigation measures should beconsidered as necessary in the CNMP(s) of above construction activities to ensure construction noise compliance, when detailed design information become available.

Concurrent Projects for TKO 137

4.7.1.13 **Section 4.5.7** identified concurrent projects that are located within 300 m assessment boundary and would induce potential construction noise impact with the Project.

4.7.1.14 For the CD TKO, its construction would be tentatively conducted between Year 2027 to 2031. Hence, its construction would still be on-going after tentative population intake of the Initial Phase of the Project in Year 2030 at Site PU1&2. However, given the development would be located underground inside a cavern, its airborne construction noise would be largely limited within cavern and in the vicinity of the portal. As a general practice for government projects, it is anticipated that its study would consider all committed projects in the vicinity, including but not limited to Project during their study. It would be expected that all necessary mitigation measures and best practices would be implemented to alleviate any potential construction noise impact. Hence, adverse cumulative construction noise impacts from the project are therefore not anticipated.

4.7.1.15 Similarly for TKLSE, it is expected that a separate Schedule 2 EIA would be required for the project. As a general practice for railway projects, it is anticipated that its study would consider all committed projects in the vicinity, including but not limited to Project during their study. It would be expected that all necessary mitigation measures and best practices would be implemented to alleviate any potential construction noise impact. Hence, adverse cumulative construction noise impacts from the project are therefore not anticipated.

TKO 132

4.7.1.16 No planned or proposed NSR is identified in the vicinity of TKO 132. Hence, no construction noise impact to any planned or proposed NSR would be anticipated from the construction of TKO 132.

4.7.1.17 In view of the scale of the construction activities at TKO 132 and its short distance from the nearest NSR On Luen Village at less than 30m from the Project boundary at TKO 132. Potential construction noise impact would be anticipated. Hence, to reduce the potential construction noise impact from the TKO 132 related construction works, the designed construction method of the marine viaduct would avoid the use of noisy percussive piling method and in-situ construction, but to use the quieter bored piling method and pre-casting of viaduct segment for on-site installation. Besides, the reclamation would be conducted using non-dredged method to avoid/minimize the use of dredger. These construction methods have been presented in the **Appendix 4.3** and **Appendix 4.4**. Recommended construction noise mitigation measures are presented in **Section 4.8.1**.

4.7.1.18 At TKO 132, reclamation works would be conducted at the south of Junk Bay Chinese Permanent Cemetery (presented as ID 140-155 in **Appendix 4.3**). After installation of silt curtain, reclamation works would be conducted in the order of removal of obstructions as necessary, installation of sand blanket, seabed ground treatment using non-dredged marine deep cement mixing method, seawall construction, and completed by filling works and jet grouting works until the reclaimed land reached the site formation level. These construction works would be conducted during Year 2025 to 2028 tentatively. Use of PME in indices A and B as indicated in **Appendix 4.4** would be expected for these works. The reclamation would be conducted using non-dredged method to avoid/minimize the use of dredger to minimize the potential noise due to dredging works. Dredging works would only be conducted to maintain sufficient water depth for marine vessel access for the CBP berthing facility. For construction of seawall, quite construction method of installing precast structures for blockworks, instead of in-situ concreting would be used as far as practicable to minimise the potential noise impact. Filling materials would be transported by barge to respective barging point located adjacent to / nearby the reclamation works area, as shown in **Appendix 4.3**. Each barging point would be equipped with conveyor belt, which is fully enclosed to minimise any potential noise impact. The barging point would also be located over 350m from the nearest NAP E-OLV-R-C4, minimal construction noise impact would be anticipated. Subject to detailed design, sheet pile walls would be constructed using quiet construction method, i.e. hydraulic press-in method, to minimise the noise impact. While the construction would be conducted at about 150m from the nearest NAP E-OLV-R-C3, potential construction noise impact would be anticipated and require implementation of construction noise mitigation measures as described in **Section 4.8.1**.

4.7.1.19 Site formation works including natural terrain hazard mitigation measures works (presented as ID 156-157 in **Appendix 4.3**) would be conducted during Year 2026 to 2028 tentatively. Use of PME in indices E and F as indicated in **Appendix 4.4** would be expected for these works. While the construction would be conducted at about 60m from the nearest NAP E-OLV-R-C4, potential construction noise impact would be anticipated and require implementation of construction noise mitigation measures as described in **Section 4.8.1**.

4.7.1.20 Infrastructure works including construction of SPS and waterworks and sewerage works connecting the proposed TKO 132 and existing water mains and sewage mains at Chui Ling Road, via the proposed marine viaduct, Tseung Lam Highway, Tong Yin Street to Chui Ling Road, as well as footpath modification works (presented as ID 158-163 in **Appendix 4.3**) would be conducted during Year 2027 to 2030 tentatively. Use of PME in indices G and H as indicated in **Appendix 4.4** would be expected for these works. While the construction of the infrastructure works and SPS would be conducted at about 150m from the nearest NAP E-OLV-R-C3, potential construction noise impact would be anticipated and require implementation of construction noise mitigation measures as described in **Section 4.8.1**. The proposed waterworks and sewerage works alignment would be located at about 5 m from the nearest NAP E-OS-R-C2. The proposed waterworks and sewerage works would be conducted section by section of length about 100 m. The required works would involve excavation, pipe laying, backfilling and surfacing of the road. The number of construction plant that could be placed in the small works area, the associated construction noise impact would be considered limited and transient. However, implementation of construction noise mitigation measures as described in **Section 4.8.1** is considered required to further reduce any potential noise impact to nearby NSRs.

4.7.1.21 Marine viaduct (presented as ID 165-169 in **Appendix 4.3**) would be constructed during Year 2026 to 2030 tentatively. Use of PME in index D as indicated in **Appendix 4.4** would be expected for these works. While the construction would be conducted at about 120m from the nearest NAP E-OLV-R-C4, potential construction noise impact would be

anticipated and require implementation of construction noise mitigation measures as described in **Section 4.8.1**.

4.7.1.22 Site development of public facilities at TKO 132 including EFs, CWHF, RTS, PFTF and CBP (presented as ID 170-174 in **Appendix 4.3**) would be conducted during Year 2029 to 2035. Use of PME in index K as indicated in **Appendix 4.4** would be expected for these works. While the construction would be conducted at about 140m from the nearest NAP E-OLV-R-C4, potential construction noise impact would be anticipated and require implementation of construction noise mitigation measures as described in **Section 4.8.1**.

4.7.2 Operational Fixed Noise Sources Impact

4.7.2.1 The proposed noise sensitive uses at TKO 137 would be located at the current TKO 137 Fill Bank, which is still in operation during the time of preparation of this EIA Report. The prevailing background noise measurement results at this area would not be representative. Prevailing background noise levels were measured at existing development outside the area of TKO 137 with similar noise nature as mentioned in above **Section 4.3.4**. The fixed noise criteria for proposed fixed noise sources would be the lower of ANL-5 dB(A) and prevailing background noise level. The fixed noise criteria for the cumulative impact from existing noise sources and proposed fixed noise sources would be ANL.

4.7.2.2 The ANL would be determined by the Area Sensitivity Rating (ASR) for NSR, according to **Table 4.2** and **Table 4.3**. Most of the proposed TKO 137 development would be classified as ASR "B", since the area is "Area other than those above" and would not be affected by an Influencing Factor (IF). The anticipated annual average daily traffic flow at all proposed roads in TKO 137 would not be in excess of 30,000 and hence not considered as IF. For the northern part of Site PU1&2, which is located between 100 m and 250 m from the TKOIP, the ASR in the area would also be classified as ASR "B", according to IND-TM. The ANL-5 dB(A) in Leq(30-min) would be 60, 60 and 50 dB(A) for day, evening and night-time, respectively.

4.7.2.3 For TKO 132, the nearby existing NSR E-OLV would be classified to have an ASR "A" for its village type development, which is not affected by an Influencing Factor. The ANL-5 would be Leq(30-min) 55, 55 and 45 dB(A) for day, evening and night-time, respectively. The fixed noise criteria for the proposed fixed noise sources would be the lower of the ANL-5 and the prevailing background noise measurement results. Ocean Shores is indirectly affected by influencing factor of the existing Tseung Kwan O Lam Tin Tunnel and is located in area of isolated high-rise development, its ASR would be "B". The fixed noise criteria for the proposed fixed noise sources at the identified NSRs have been summarized in **Table 4.17**.

Table 4.17 Fixed Noise Criteria for Proposed Fixed Noise Sources

NSR ID	NAP ID	Noise Level (Day / Evening / Night), dB(A)		
		ANL-5 ($L_{eq\ (30\text{-}min)}$)	Prevailing Background ($L_{90(1\text{-}hr)}$)	Fixed Noise Criteria for Proposed Fixed Plant ($L_{eq\ (30\text{-}min)}$)
E-OS	E-OS-R-F1	60 / 60 / 50	52 / 51 / 48	52 / 51 / 48
E-OLV	E-OLV-R-F1	55 / 55 / 45	50 / 51 / 50	50 / 51 / 45
	E-OLV-R-F2			
	E-OLV-R-F3			
	E-OLV-R-F4			
P-PU1&2	P-PU1-R-F1 to P-PU1-R-F3 and P-PU2-R-F1	60 / 60 / 50 [1]	56 / 54 / 53 [1]	56 / 54 / 50 [1]
P-PU3	P-PU3-R-F1 to P-PU3-R-F2			
P-PU5	P-PU5-R-F1 to			

NSR ID	NAP ID	Noise Level (Day / Evening / Night), dB(A)		
		ANL-5 ($L_{eq\ (30\text{-}min)}$)	Prevailing Background ($L_{90(1\text{-}hr)}$)	Fixed Noise Criteria for Proposed Fixed Plant ($L_{eq\ (30\text{-}min)}$)
	P-PU5-R-F6			
P-PR2	P-PR2-R-F1 to P-PR2-R-F2			
P-PR3	P-PR3-R-F1			
P-PR4	P-PR4-R-F1			
P-E1	P-E1-E-F1			
P-E2	P-E2-E-F1			
P-E3	P-E3-E-F1			
P-E4	P-E4-E-F1			
P-E5	P-E5-E-F1 to P-E5-E-F2			

Remarks:
[1] No night-time noise sensitive uses would be expected at the proposed educational use sites P-E1 to P-E5.

4.7.2.4 The fixed noise sources impact would be anticipated from the operation of the existing and proposed fixed noise sources as listed in **Table 4.15**. The associated fixed plant inventories are presented in **Appendix 4.9**, as agreed with relevant operator/departments/authority.

Proposed Fixed Noise Sources at TKO 137

4.7.2.5 The proposed Fire Station cum Ambulance Depot at Site G2 would be located at immediate vicinity of Site PU1. Its daily equipment testing on the saw, cutter, pump truck and hydraulic platform, etc. in the morning (during about 0900 to 1000 hours) would pose potential fixed noise sources impact at Site PU1. In view of the proposed Fire Station located at immediate north of the proposed noise sensitive use at PU1&2, fixed noise mitigation measures would be required and recommended in **Section 4.8.2**.

4.7.2.6 Potential fixed noise sources impact would be expected during the operation of the advanced sewage pumping station by Year 2030 and the subsequent proposed EPP at Site OU4. The potential fixed noise sources impact of the advance sewage pumping station would be generated from the operation of the fixed plants such as pumps, motors, ventilation fans and extraction fans. The potential fixed noise sources impact of the proposed EPP would be generated from the operation of the fixed plants, such as pumps, air blowers, motors, ventilation fans and extraction fans of deodourisation units, etc. at the proposed treatment facilities. The details of fixed plant inventory for proposed advanced sewage pumping station and the proposed EPP are provided and confirmed by project engineer and agreed by the proponent of the fixed noise sources. The fixed plants listed in **Appendix 4.9** for the advanced sewage pumping station and the EPP would be enclosed within reinforced concrete buildings, while ventilation fans would be provided at the ventilation vents of these buildings. The ventilation exhaust would be directed to the east, which would be farthest away from the nearby NSR to minimize the potential noise impact. Fixed noise mitigation measures are recommended in **Section 4.8.2** to further minimise the potential fixed noise impact.

4.7.2.7 The proposed green filling station is proposed at Site OU3. Subject to the design of the green filling station, it may have potential fixed noise impact due to refilling operation of the fuel tanker in the station to nearby NSRs at Sites PU6 and E5 at about 70m from the Site OU3. Mitigation measures would be expected in order to minimize the potential noise impact from the fuel tanker, as recommended in **Section 4.8.2**.

4.7.2.8 The proposed PTIs would be located inside the podium of Sites PR1 and PR3. Ventilation systems would be required. Fixed noise sources impact from the ventilation systems, such as fans, would be expected. The ventilation inlets and outlets would be directed away from nearby NSR (i.e. to the west side) as far as practicable to minimize the potential noise impact. Fixed noise mitigation measures are recommended in **Section 4.8.2** to further minimise the potential fixed noise impact.

4.7.2.9 Two Temporary PTFs would be located at Sites G3 and O5 during Years 2030 to 2034 and 2033 to 2038, respectively. Vehicular start-up noise in these open-designed temporary PTFs may pose potential fixed noise sources impact to the nearby residential development, such as Site PU1&2 and PU3&4. Control measures, such as noise panel erected along the bus lanes, would be considered during the design phase of the Project to minimize the potential noise impact. Fixed noise mitigation measures are recommended in **Section 4.8.2** to further minimise the potential fixed noise impact.

Cumulative Impact from Existing Fixed Noise Sources and Planned Fixed Noise Sources at TKO 137

4.7.2.10 Most of the tenants of the TKOIP are located over 300 m from the proposed NSRs at TKO 137, with the exception of TVB City. The only exposed fixed noise sources at TVB City are a group of 6 air-cooled chillers located over 270m from the nearest proposed NSR PU1. Given the large separation distance, the potential fixed noise sources impact from TVB City is considered minimal. No adverse fixed noise sources impact due to TVB City on the planned NSRs under this Project would be anticipated.

4.7.2.11 For SENT Landfill and its Extension (SENTX), it would be closed for aftercare before population intake of TKO 137. The SENTX area shown in **Figure 4.4.2** included a west potion of about 90m in length that is the SENTX office, while the remaining potion would be the infrastructure area. The fixed noise sources at SENTX would refer to the infrastructure area of SENTX only. While the infrastructure area of SENTX is about 120m from the nearest proposed NAP, the fixed plants are located at the eastern side of the infrastructure area of SENTX, which are over 200 m away from the proposed residential uses at Sites PU3&4 and PU5, minimal operational phase impact would be anticipated from SENTX to the Project due to the large separation distance.

4.7.2.12 For the existing SNG Plant, it would be located at about 70 m from the proposed NSR P-PU1&2. The SNG Plant converts the landfill gas from the SENTX into town gas. As confirmed by the operator of the SNG Plant, the SNG Plant would operate any time during the day to supply gas. However, as the landfill gas from SENTX is depleting, it is expected that the SNG Plant may cease its operation by Year 2033. Potential fixed noise impact would be expected from the SNG Plant to Site PU1&2. Noise mitigation measures are recommended in **Section 4.8.2** to alleviate the potential fixed noise sources impact.

4.7.2.13 The TKO DP, including the existing Stage 1 and the planned Stage 2, is located at the immediate southeast of the TKO 137, separated from the nearest NAPs at Sites E3, E4 and E5 by about 40m. As advised by the operator of the TKO DP, i.e. Water Service Department (WSD), the A-weighted sound pressure levels (Leq) at the boundary of the TKO DP should not exceed 60 dB(A) during Day, Evening and Night-time (i.e. 24 hours of a day). Most of the fixed plant at the TKO DP Stage 1 are fully enclosed and accommodated inside plant rooms, the associated fixed noise would be transmitted through façades of the buildings via the louvres, which account for less than half of the façade area facing north and west toward the proposed NSRs. It would be expected that the planned TKO DP Stage 2 would be of similar design to accommodate the fixed plant. Therefore, it is considered that most of the fixed noise sources are contained inside buildings with minimal fixed noise sources impact to the environment. No night-time noise sensitive uses would be expected at the nearest NSRs P-E3, P-E4 and P-E5, which are

of educational use. During daytime and evening time, with consideration of distance attenuation, the fixed noise from the TKO DP would be more than 5 dB(A) below the cumulative fixed noise criteria of 65 dB(A). During night-time, the nearest NSR P-PU5 and P-PU6 which are residential uses located over 70m and over 100 m from the TKO DP, respectively. Considering the maximum noise level at the boundary of TKO DP, minimal louvre area at the TKO DP façade and the distance attenuation, it is expected that the noise level at the nearest NSRs would be below the respective noise criteria, subject to the site layout at the P-PU5 and P-PU6 and the associated quantitative fixed noise assessment by the developer of the NSRs as stated in **Table 4.23**. Therefore, no adverse noise impact from operation of TKO DP would be anticipated.

4.7.2.14 Potential fixed plant noise would be expected due to operation of the planned CD TKO, which will be designed by its proponent at the location indicatively shown at **Figure 4.4**. Due to the early stage of the project, no fixed noise source inventory from CD TKO is available at the time of preparation of this EIA. As a general practice for government projects, it is anticipated that its study would consider all committed projects in the vicinity, including but not limited to the Project during their study. It would be expected that all necessary mitigation measures and best practices would be implemented to alleviate any potential fixed noise impact. Hence, adverse cumulative fixed noise impacts from the project are therefore not anticipated.

4.7.2.15 Potential fixed plant noise would also be expected due to the ventilation buildings of the planned TKLSE, which will be designed by its proponent to be located along the alignment of the TKLSE within the proposed railway reserve of TKLSE, as shown in **Figure 2.4**. However, there is no design information and confirmed programme at the time of this separate EIA study, as confirmed by Railway Development Office. The fixed noise impact associated with the TKLSE would be addressed in the separate EIA. Due to close proximity between the ventilation buildings potentially within the proposed railway reserve of TKLSE at Sites PR1, PR2, PR3 and PR5, mitigation measures would be required to ensure compliance to noise criteria. Given proper design and implementation of suitable mitigation measures as recommended by the separate EIA of the TKLSE, no adverse fixed noise impact would be anticipated.

Proposed Fixed Noise Sources at TKO 132

4.7.2.16 The fixed noise sources at TKO 132 would include the proposed EFs, CWHF, PFTF, RTS, CBP and SPS. Given large separation distance of over 800 m between these fixed noise sources and the existing NSR E-OS, minimal fixed noise sources impact would be anticipated to E-OS due to the Project. In contrast, these fixed noise sources are separated from existing NSRs E-OLV for about 140-260 m, potential fixed noise sources impact would be anticipated and is evaluated below. Viewshed drawings showing potential visual screening due to topography and buildings from NAPs of E-OLV to the proposed fixed noise sources are presented in **Appendix 4.9**.

4.7.2.17 The proposed EFs would be located at about 140 m from the nearest existing NAP E-OLV-R-F4. The proposed fixed plants of the EFs would be housed within acoustic plant room inside buildings with ventilation exhaust facing away from nearby existing NAPs to minimize potential fixed noise impact to E-OLV. The ventilation facilities would be placed as far as practicable from the E-OLV in order to minimize the potential fixed plant noise sources impact. Subjected to detailed design and mitigation measures proposed in a separate EIA study/project profile for directly application of EP by the proponent of the EFs, following the EIAO mechanism and the subsequent FNMP as stated in **Section 4.8.2**, no adverse fixed noise sources impact would be anticipated from operation of the EFs.

4.7.2.18 The proposed CWHF would be located about 160 m from the nearest existing NAP E-OLV-R-F4. The fixed plants of the proposed CWHF, except barging facilities at the marine

frontage, would be enclosed within buildings with ventilation exhaust facing away from NAP E-OLV to minimize potential fixed noise sources impact to E-OLV. Barging facilities at CWHF would be located to the southeast of the EFs, which are over 400m from the nearest NAP E-OLV-R-F4 of E-OLV. The building/terrain screening of the barging facilities at CWHF to E-OLV is shown in section drawings in **Appendix 4.9**. Given the large separation distance between the barging facilities to other NAPs E-OLV-R-F1, E-OLV-R-F2 and E-OLV-R-F3 of over 450 m, over 600 m and over 600 m respectively, no adverse fixed noise sources impact would be anticipated from CWHF to the existing NAP E E-OLV-R-F1, E-OLV-R-F2 and E-OLV-R-F3. Given the large separation distance and screening from the building structure of the CWHF and EFs, no adverse fixed noise sources impact would be anticipated from CWHF to the existing NSR E-OLV-R-F4. Noise mitigation measures are recommended in **Section 4.8.2** to minimize the potential fixed noise impact to the environment. Subjected to detailed design and mitigation measures proposed in a separate study and separate Environmental Permit (EP) application by the proponent of the CWHF, with a EIA study as necessary, following the EIAO mechanism and the subsequent FNMP as stated in **Section 4.8.2**, no adverse fixed noise impact would be anticipated from the operation of the CWHF.

4.7.2.19 The proposed PFTF would be located about 190 m from the nearest existing NAP E-OLV-R-F3. Some of the fixed plants would be housed within buildings, while other fixed plants would be located at berthing area and reception and handling area for material handling. The openings of the buildings would be facing away from E-OLV as far as practicable to minimize the potential fixed noise sources impact. The barging facilities would be located at the berthing area of the PFTF, which is over 300 m from the existing NAPs. The barging facilities would be in the form of tipping points with 3-side and top enclosures screen off the line of sight and hence to minimize the potential fixed noise sources impact. Based on the latest design information, the open material handling areas would be required for temporary storage of materials. Excavators and dump trucks for the material handling works would be expected at the open reception and handling areas. The open reception and handling areas would be located over 260 m from the nearest NAP E-OLV-R-F3 and over 280m from NAP E-OLV-R-F4, over 350 m from NAPs E-OLV-R-F1 and E-OLV-R-F2. Subject to the future detail design of the PFTF, the open reception and handling areas could be located farthest away from E-OLV as possible. Together with other noise mitigation measures detailed in **Section 4.8.2**, no adverse fixed noise sources impact would be anticipated from the operation of the PFTF. An environmental review in the form of Preliminary Environmental Review (PER) would be conducted in accordance with HKPSG and other existing planning and funding mechanisms.

4.7.2.20 The RTS would be located at about 260 m from the nearest existing NAP E-OLV-R-F2. Fixed plant noise would be anticipated from the operation of the RTS. Some of the fixed plants would be enclosed within buildings, while other fixed plants for barging facilities would be located at baring point areas of the RTS. The fixed plant located inside the buildings would be placed farthest away from existing NSR E-OLV and openings of the buildings would be facing away from E-OLV as far as practicable to minimize the potential fixed noise impact. The fixed plants at baring point areas would be located over 300 m from the existing NAP. The noise contribution from RTS was expected to be minimized. Subject to the future detail design of the RTS, and noise mitigation measures detailed in **Section 4.8.2**, no adverse fixed noise sources impact would be anticipated from the operation of the RTS. An EIA under separate study would be conducted when the detailed design information for the RTS become available to ensure its noise compliance.

4.7.2.21 The CBP would be located at about 220 m from the nearest existing NAP E-OLV-R-F2. Fixed plant noise would be anticipated from the operation of concrete batching plant and its barging point. The concrete batching operation and associated fixed plant would be located within a building/enclosed system with openings facing away from the E-OLV as far as practicable to minimize the potential fixed noise impact. The barging facilities would

be located along the marine frontage at the west of the CBP site. The terrain screening of the barging facilities at CWHF to E-OLV-R-F1 and E-OLV-R-F2 is shown in section drawings in **Appendix 4.9**. The separation distance between the barging facilities to NAPs E-OLV-R-F1, E-OLV-R-F2, E-OLV-R-F3 and E-OLV-R-F4 are approximately 250 m, 220 m, 350 m and 400 m, respectively. Given the abovementioned large separation distance and terrain screening, fixed noise impact from the barging facilities of the CBP to the existing NSR E-OLV would be minimised. With proper implementation of fixed noise mitigation measures as detailed in **Section 4.8.2**, no adverse fixed noise impact would be anticipated from the proposed CBP. An environmental review would be conducted for CBP in accordance with HKPSG and relevant lease conditions.

4.7.2.22 The SPS would be located about 140 m from the nearest existing NAP E-OLV-R-F3. The fixed plants in the proposed SPS would be enclosed within reinforced concrete structure with opening facing away from the near NAPs to minimize potential fixed noise impact. Proposed noise mitigation measures are listed in **Section 4.8.2** to further minimize the potential fixed noise impact. No adverse fixed noise sources impact would be anticipated from the proposed SPS to nearest NSR E-OLV.

Fixed Noise Impact Assessment Requirements

4.7.2.23 Fixed Noise Sources Management Plan (FNMP) would be submitted separately for various DPs to EPD for agreement prior to issuance of tender and commencement of construction of the proposed fixed noise sources to recommend detailed fixed noise mitigation measures and ensure noise compliance. Detail requirement of the FNMPs are presented in **Section 4.8.2**. For planned/proposed fixed noise sources of non-DPs within the Project area and existing noise sources within the assessment area affecting proposed NSRs under this Project, quantitative fixed noise impact assessment would be carried out according to **Section 4.8.2**.

4.7.3 Operational Ground-borne Rail Noise Impact

4.7.3.1 As shown in **Figure 4.5**, part of the planned TKLSE would be located within the Project Area. The alignment of TKLSE within TKO 137 would be along Road L1 and its station would be located between Site PR3 and Site PU5. However, there is no design information and confirmed programme at the time of this separate EIA study, as confirmed by Railway Development Office.

4.7.3.2 As a general comparison, the expected train frequency of LOHAS Park Station would be similar to the planned railway station at TKO 137, as the TKLSE would be an extension of Tseung Kwan O Line (TKL) from LOHAS Park Station. According to MTR website[2], the current train frequency at LOHAS Park Station is one train per 6.7 minutes at peak hours.

4.7.3.3 In view of the similar station separation distance (~3km between TKO Station and LOHAS Park Station, and 3~4 km between LOHAS Park Station and TKO 137 Station), the distance for train acceleration and train deceleration would be similar and hence the expected train speed at the underground track at TKO 137 would be similar to that near LOHAS Station.

4.7.3.4 The horizontal distance between the rail track and nearby noise sensitive uses at LOHAS Park Station would be about 10m near LOHAS Park Phase 1. Similarly, the horizontal distance between the rail track and nearby noise sensitive uses at TKO 137 would be more than 10m, with reference to **Table 4.12**.

[2] https://www.mtr.com.hk/en/customer/services/train_service_index.html

4.7.3.5 Given the above, the potential rail noise impact from TKLSE to TKO 137 would be similar to that at LOHAS Park due to TKL. That is, no adverse ground-borne noise impact would be anticipated due to TKLSE. Nevertheless, the design of the TKLSE would be subject to further review by the proponent of the TKLSE. TKLSE is a DP, and the proponent of the TKLSE would conduct an EIA separately, following the EIAO mechanism for the construction and operation of the TKLSE to ensure no adverse ground-borne noise impact from TKLSE. Ground-borne rail noise mitigation measures, such as floating slab trackform, and high attenuation baseplate etc. would be recommended in its EIA, if deemed necessary. Given proper implementation of the mitigation measures, no adverse ground-borne rail noise impact would be anticipated.

4.7.4 Operational Road Traffic Noise Impact

4.7.4.1 Quantitative road traffic noise assessment has been conducted based on the methodology presented in **Section 4.6.4**.

Area at TKO 132

4.7.4.2 The predicted road traffic noise levels in Year 2024 (Prevailing scenario) and Year 2041 (Unmitigated scenario) at representative NAPs at TKO 132 are presented in **Table 4.18** and detailed in **Appendix 4.10.**

4.7.4.3 As shown in **Table 4.18**, the predicted road traffic noise level in both Year 2024 (Prevailing) and Year 2041 (Unmitigated) at all representative NAPs at TKO 132 would comply with relevant noise criteria. No adverse road traffic noise impact on NSRs at TKO 132 is anticipated. No mitigation measures and eligibility test at TKO 132 area are required.

Table 4.18 Predicted Road Traffic Noise Level at TKO 132 under Prevailing (Year 2024) and Unmitigated (Year 2041) Scenarios

NSR ID	NAP ID [1]	Criteria, $L_{10\ 1\text{-}hr}$ dB(A)	Max. Predicted Noise Level, $L_{10\ 1hr}$ dB(A) [2]				Mitigation Measure required?
			Prevailing (Year 2024)	Unmitigated (Year 2041)			
				Project Roads	Other Roads	Overall	
E-OS	E-OS-R-T01_01	70	61 - 64	56 - 60	64 - 67	65 - 67	N
E-OLV	E-OLV-R-T01_01	70	N/A [3]	47	N/A [3]	47	N
	E-OLV-R-T02_01	70	N/A [3]	65	N/A [3]	65	N
	E-OLV-R-T03_01	70	N/A [3]	40	N/A [3]	40	N
	E-OLV-R-T04_01	70	N/A [3]	41	N/A [3]	41	N

Notes:

[1] The assessment only includes NSRs which rely on opened windows for ventilation.
[2] Noise levels would be rounded up to nearest integer to determine the compliance of the criteria.
[3] There are no existing roads/other roads within 300 m assessment area of these NAPs.

Area at TKO 137

4.7.4.4 There is no existing NSRs within 300 m assessment area. The nearest existing NSR, LOHAS Park, is located more than 1500 m from project boundary. No adverse road traffic noise impact due to proposed “Project Roads” on existing NSRs near TKO 137 is anticipated. Since no existing NSRs within 300 m assessment area, Prevailing Scenario is considered not necessary to be conducted.

4.7.4.5 Referring to **Table 4.19** below and **Appendix 4.11A**, the predicted road traffic noise levels under unmitigated scenario at residential NSRs, P-PU1, P-PU3 and P-PU5, are up to 72 dB(A). Besides, the predicted road noise levels at NSRs of planned schools, P-E1 to P-E5, are up to 73 dB(A). Noise exceedances are mainly due to “Project Roads” with noise

contribution more than 1.0 dB(A), direct mitigation measures should be considered to alleviate the adverse traffic noise impact.

4.7.4.6 No noise exceedance was observed at planned NSRs P-PR1 to P-PR5. The maximum predicted road traffic noise level is 69 dB(A) only. Noise mitigation measure is considered not necessary for these NSRs.

Table 4.19 Predicted Road Traffic Noise Level at TKO 137 under Unmitigated Scenario (Year 2041)

NSR ID	NAP ID [1]	Criteria, $L_{10\ 1\text{-}hr}$ dB(A)	Max. Predicted Noise Level in Year 2041, $L_{10\ 1hr}$ dB(A) [2] [3]			Floor with Noise Exceedance	Further Mitigation Measure required?
			Project Roads	Other Roads	Overall		
P-PU1&2	P-PU1-R-T01_01	70	59 - 62	36 – 59	59 - 63	-	N
	P-PU1-R-T02_01 to P-PU1-R-T02_05	70	58 - **71**	0 – 54	58 - **71**	4/F - 13/F	Y
	P-PU1-R-T03_01	70	46 - 69	16 – 19	46 - 69	-	N
	P-PU1-R-T04_01 to P-PU1-R-T04_04	70	60 - **72**	0 – 50	60 - **72**	1/F - 19/F	Y
	P-PU2-R-T01_01 to P-PU2-R-T06_01	70	61 - 70	0 – 58	61 - 70	-	N
P-PU3&4	P-PU3-R-T01_01	70	62 - 65	10 – 11	62 - 65	-	N
	P-PU3-R-T02_01 to P-PU3-R-T02_03	70	65 - **72**	13 – 47	65 - **72**	1/F - 14/F	Y
	P-PU3-R-T03_01 to P-PU3-R-T03_02	70	65 - **71**	0 – 45	65 - **71**	1/F - 5/F	Y
	P-PU3-R-T04_01 to P-PU3-R-T04_02	70	64 - 68	0 – 13	64 - 68	-	N
	P-PU4-R-T01_01 to P-PU4-R-T01_02	70	63 - 70	0	63 - 70	-	N
	P-PU4-R-T02_01	70	61 - 66	10 – 11	61 - 66	-	N
	P-PU4-R-T03_01 to P-PU4-R-T03_02	70	62 - 70	0	62 - 70	-	N
	P-PU4-R-T04_01	70	63 - 66	0	63 - 66	-	N
P-PU5	P-PU5-R-T01_01 to P-PU5-R-T01_02	70	63 - **71**	0	63 - **71**	1/F - 5/F	Y
	P-PU5-R-T02_01 to P-PU5-R-T02_02	70	63 - 68	0	63 - 68	-	N
	P-PU5-R-T03_01 to P-PU5-R-T03_02	70	63 - **72**	0	63 - **72**	1/F - 5/F	Y
	P-PU5-R-T04_01 to P-PU5-R-T04_02	70	64 - 68	0	64 - 68	-	N
P-PU6	P-PU6-R-T01_01 to P-PU6-R-T01_02	70	62 - 69	0	62 - 69	-	N
	P-PU6-R-T02_01 to P-PU6-R-T02_02	70	64 - 67	0	64 - 67	-	N
	P-PU6-R-T03_01	70	62 - 70	0	62 - 70	-	N
	P-PU6-R-T04_01	70	60 - 64	0	60 - 64	-	N
	P-PU6-R-T05_01 to P-PU6-R-T05_02	70	61 - 70	0	61 - 70	-	N
	P-PU6-R-T06_01 to P-PU6-R-T06_02	70	60 - 66	0	60 - 66	-	N
P-PR1	P-PR1-R-T01_01 to P-PR1-R-T03_01	70	63 - 68	0 - 45	63 - 68	-	N
P-PR2	P-PR2-R-T01_01 to P-PR2-R-T03_01	70	62 - 69	0	62 - 69	-	N
P-PR3	P-PR3-R-T01_01 to P-PR3-R-T02_02	70	57 - 68	0	57 - 68	-	N

NSR ID	NAP ID [1]	Criteria, $L_{10\ 1\text{-}hr}$ dB(A)	Max. Predicted Noise Level in Year 2041, $L_{10\ 1hr}$ dB(A) [2] [3]			Floor with Noise Exceedance	Further Mitigation Measure required?
			Project Roads	Other Roads	Overall		
P-PR4	P-PR3-R-T01_01 to P-PR3-R-T03_01	70	64 - 69	0	64 - 69	-	N
P-PR5	P-PR5-R-T01_01 to P-PR5-R-T04_02	70	59 - 66	0	59 - 66	-	N
P-E1	P-E1-E-T01_01 to P-E1-E-T01_04	65	60 - **68**	0 - 18	60 - **68**	1/F - 8/F	Y
P-E2	P-E2-E-T01_01 to P-E2-E-T01_03	65	62 - **69**	0 - 11	62 - **69**	1/F - 8/F	Y
P-E3	P-E3-E-T01_01 to P-E3-E-T01_02	65	**69** - **73**	0	**69** - **73**	1/F - 8/F	Y
P-E4	P-E4-E-T01_01	65	**71** - **73**	0	**71** - **73**	1/F - 8/F	Y
P-E5	P-E5-E-T01_01 to P-E5-E-T01_03	65	**68** - **73**	0	**68** - **73**	1/F - 8/F	Y

Notes:

[1] The assessment only includes NSRs which rely on opened windows for ventilation.

[2] Noise levels would be rounded up to nearest integer to determine the compliance of the criteria.

[3] Boldfaced and underline values indicate exceedance to relevant noise criteria.

4.7.5 Operational Marine Traffic Noise Impact

4.7.5.1 With reference to **Section 4.2.7**, the marine traffic noise criteria are defined as the measured prevailing Leq(1-hr) during peak hour. The prevailing noise measurement locations are presented in **Figure 4.2,** the measurement results are presented in **Appendix 4.12**, and summarised in **Table 4.8.**

4.7.5.2 Quantitative marine traffic noise assessment has been conducted based on the methodology presented in **Section 4.6.5** and marine traffic data presented in **Appendix 4.5**.

4.7.5.3 The predicted marine traffic noise levels at existing and proposed NAPs during peak hour are presented in **Appendix 4.12** and summarized in **Table 4.20**.

Table 4.20 Predicted Marine Traffic Noise Levels

NSR ID	NAP ID	Predicted Peak Hour Cumulative Marine Traffic Noise Level, Leq (1-hr) dB(A)	Predicted Peak Hour Marine Traffic Noise Level due to Project Related Vessels, Leq (1-hr) dB(A)	Marine Traffic Noise Criteria, Leq (1-hr) dB(A)
E-OS	E-OS-R-M1	49	40	56
E-OLV	E-OLV-R-M1	53	48	54
	E-OLV-R-M2	54	48	
	E-OLV-R-M3	52	48	
	E-OLV-R-M4	52	48	
E-MPT	E-MPT-R-M1	63	58	64
P-PR1	P-PR1-R-M1	61	/	61
P-PR2	P-PR2-R-M1	61		
P-PR3	P-PR3-R-M1	61		
P-PR4	P-PR4-R-M1	61		
P-PR5	P-PR5-R-M1	61		

4.7.5.4 As shown in **Table 4.20**, the predicted marine traffic noise levels due to Project-related vessels at existing NSRs would be lower than the marine traffic noise criteria. The predicted cumulative marine traffic noise levels at all NSRs would be lower than the marine traffic noise criteria. No adverse marine traffic noise impact would be anticipated. No marine traffic noise mitigation measures would be required.

4.8 Mitigation of Adverse Environmental Impacts

4.8.1 Construction Noise Impact

4.8.1.1 Due to the short separation distance between existing NSRs and construction works site at TKO 132, as well as the short separation distance between proposed NSRs at TKO 137 which are of earlier population intake and construction works site of later phase of TKO 137, potential adverse construction noise impact would be anticipated without proper noise mitigation measures. The following mitigation measures have been considered feasible, practicable and confirmed by the Project Engineers.

(a) Adoption of quieter construction methods;
(b) Use of quality PME;
(c) Careful schedule of use of PME among nearby construction work site;
(d) Grouping of PMEs;
(e) Use of movable noise barriers and full enclosures; and
(f) Good site practices.

4.8.1.2 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 hydraulic 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. Another quieter construction method for piling works is the large diameter bored piling method, which could be considered to replace percussive piling for piling works. Other 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.

4.8.1.3 The Contractor(s) may be able to obtain particular models of plant that are quieter than the PMEs given in GW-TM. 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.

4.8.1.4 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. Quieter rock or concrete breaking equipment (e.g. hydraulic crusher or hand-held breaker with QPME label) in some activities should be considered in the CNMPs as a mitigation measure, such as breaking large boulder into smaller pieces on site for removal during site formation works, and breaking seawall, breaking concrete plinth/shallow foundation during demolition of temporary PTF, seawall works for breaking existing large rock fill to finer rock fill for reuse. 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 and/or slope cutting works, where practicable. A list of quieter construction method / equipment is presented below. The Contractor should select appropriate quieter construction method / equipment as appropriate to minimize any potential construction noise impact to the environment. Quieter construction method/equipment listed in below **Table 4.21** should be used by the Contractor. The Contractor should explore other quieter construction method and equipment to further minimize the potential construction noise impact.

Table 4.21 Quieter Construction Method / Equipment

Construction Plant Inventory Index (reference to Appendix 4.4)	Involved Construction Process	Conventional Construction Method / Equipment	Quieter Construction Method / Equipment
All	Sheet pile walls and precast structures construction	In-situ concreting for reclamation works	Hydraulic press-in method
A	Demolition / Removal of existing seawall and concrete structure	Excavator-mounted breaker	Use of hydraulic crusher / bursting system / quieter type blade saw (e.g. diamond saw) / use of chemical expansion agent
A	Material handling / barging	Conveyor	Fully enclosed conveyor
C, F	Site formation / Filling / slope cutting	Drill and break method / Excavator-mounted breaker	Use of hydraulic splitter, hydraulic crusher / bursting system / quiet type saw / use of chemical expansion agent
D, E, F, G, H, I, J	Various, including marine viaduct works, site clearance, site formation (such as small boulder removal), infrastructure works, building construction, etc.	- Bitumen Paver - Drum Roller - Mobile Crane - Excavator - Bulldozer - Loader - Roller - Compactor - Generator - Air Compressor	Use of QPME[1]
F	Site Formation Works, such as small boulder removal	Excavator-mounted breaker	Mini-breaker
G	Hydraulic crusher for demolition of PTF	Excavator-mounted breaker	Hydraulic crusher
	infrastructural works	Excavator-mounted breaker	Mini-breaker
H	Large diameter pipe laying	Cut and cover method / Excavator-mounted breaker	Pipe jacking using micro tunnel boring machine
	Construction / site formation works, such as small boulder removal	Excavator-mounted breaker	Mini-breaker
K	Building works	Excavator-mounted breaker	Use of quiet type saw (e.g. diamond saw), Robot-type hydraulic crusher or handheld concrete crusher
	Construction works	Excavator-mounted breaker	Mini-breaker
	Piling works	Percussive piling	Large diameter bored piling method
	Building superstructure works	In-situ construction	Use of pre-casting and prefabrication technology
F, G, H, I, J, K	Road works (Concrete compacting)	Vibratory Poker	Self-compacting Concrete or Rubber head Poker Vibrator

Remarks:
[1] Quality PME available at https://www.epd.gov.hk/epd/english/environmentinhk/noise/qpme/search_gen.php?lang=eng&st=sim&valid=Y

4.8.1.5 Careful scheduling of construction activities and grouping of PMEs within a construction site and liaison between contractors of nearby construction sites could avoid multiple noisy

construction activities/construction equipment to be conducted/used at the same time within close proximity. Hence, the cumulative construction noise level could be reduced.

4.8.1.6 Movable noise barriers or noise enclosures would be erected to provide screening from the construction plant. Noise barriers would be most effective when located immediately adjacent to the PME and can reduce the noise level by 5 dB(A) for movable PME and by 10 dB(A) for stationary PME. 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. A noise reduction of 10 dB(A) is assumed for purpose-built noise barrier. Full enclosures can be considered as an alternative to shelter relatively static plant including generator. The provision of full enclosure is expected to provide 15 dB(A) noise reduction for static PME.

4.8.1.7 In addition to above mitigation measures, good site practice and noise management techniques could considerably reduce the noise impact from construction site activities on nearby NSRs. The following measures should be practised during each phase of construction:

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

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

Construction Noise Assessment Requirements

4.8.1.9 Given the full implementation of the above recommended mitigation measures, no adverse construction noise impact would be anticipated from the construction of the Project. When detailed design information become available, more detailed mitigation measures tailored to each construction activities should be recommended via construction noise assessment.

4.8.1.10 For each DP, a pre-tender CNMP as detailed in EIAO Guidance Note No. 9/2023 *"Preparation of Construction Noise Impact Assessment under the Environmental Impact Assessment Ordinance"* should be prepared by the proponent of the DP for submission to

EPD before tender invitation. A pre-construction CNMP should be prepared by the future Contractor before commencement of construction of each DP with reference to Section 8 and Annex 21 of the EIAO-TM as well as this EIA Report and Environmental Monitoring and Audit (EM&A) Manual. For other non-DPs, the proponent of each of the non-DP are also recommended to follow the requirements of ProPECC PN1/24 *"Minimizing Noise from Construction Activities"* to prepare CNMP before tender invitation and before commencement of construction of non-DP. A summary of the submission of CNMP for DPs and non-DPs are listed in **Table 4.22**.

Table 4.22 Requirements of Quantitative Construction Noise Assessment in Pre-tender Stage and Pre-construction Stage of Relevant Construction Activities

Construction Activity	Responsible Party	Mechanism of Conducting Construction Noise Assessment	Relevant Noise Guidelines
Construction of TKLSE	Proponent of the concurrent project	Application of EP via separate EIA or Direct Application of EP under EIAO-TM and subsequent CNMP(s)	EIAO-TM and EIAO-GN 9/2023
Construction of EFs	Proponent of the proposed facilities		
Construction of CWHF	Proponent of the proposed facilities		
Construction of RTS	Proponent of the proposed facilities		
Construction of Cavern Development of Tseung Kwan O	Proponent of the concurrent project	Under separate study	EIAO-TM, EIAO-GN 9/2023 or ProPECC PN1/24
TKO 137 reclamation works	Project Proponent	CNMP required under EP of this EIA Project	EIAO-TM and EIAO-GN 9/2023
TKO 132 reclamation works	Project Proponent		
Construction of Effluent Polishing Plant at OU4	Proponent of the proposed facilities		
Marine viaduct works	Project Proponent		
TKO 137 site formation works	Project Proponent	CNMP for non-DPs under EM&A of this EIA Project	ProPECC PN1/24
TKO 137 infrastructure works	Project Proponent		
TKO 137 advance sewage pumping station	Proponent of the proposed facilities		
TKO 132 site formation works	Project Proponent		
TKO 132 infrastructure works	Project Proponent		
Site formation and construction of service reservoirs	Proponent of the service reservoirs		
Construction of PFTF	Proponent of the proposed facilities	Existing planning and funding mechanism of PER	ProPECC PN1/24
Construction of SPS	Proponent of the proposed facilities		

Remarks:
Professional Persons Environmental Consultative Committee (ProPECC) Practice Notes (PN) 1/24 stated that for minimisation of construction noise impact for construction activities during non-restricted hours, the requirements and implementation of the noise control measures given under the Recommended Pollution Control Clauses for Construction Contracts in EPD's website should be followed. Further measures for construction works containing noisy construction activities in close proximity to NSRs, as stated in the ProPECC PN 1/24.

4.8.1.11 The CNMPs shall include the exact inventory of noise sources, quantitative construction noise impact assessment, listing of the quieter construction method/equipment, review the effectiveness and practicality of all proposed mitigation measures for the construction noise impact of the Project, implementation schedule of the mitigation measures (including implementation party, location, timing of implementation), and the details of the construction noise impact monitoring and audit program. The CNMPs should be 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.

4.8.1.12 For constructions of PFTF, SPS and CBP, quantitative construction noise impact assessment should be prepared according to ProPECC PN 1/24 requirements, by the proponent of the proposed facilities for submission to EPD before tender invitation.

4.8.2 Operational Fixed Noise Sources Impact

4.8.2.1 In view of the potential fixed noise impact arising from the existing and proposed fixed noise sources, direct mitigation measures should be considered at source to minimize the potential fixed noise impact. Direct mitigation measures include using quieter fixed plant, enclosing the fixed plant within reinforced concrete building or acoustic enclosure with openings directed away from NSRs, use of silencer, installation of acoustic louvre, installation of noise barrier, and installation of noise enclosure, etc. would be recommended to minimize the potential fixed noise sources impact from the proposed fixed noise sources, such that the fixed noise level would comply with the criteria at the NSR.

4.8.2.2 To mitigate the potential fixed noise impact due to the operation of SNG Plant on east-facing NSR P-PU1&2, it is agreed by the operator of the SNG Plant that on-site noise screening could be erected and acoustic mat could be used at the noisy equipment of SNG Plant, such as landfill gas compressors and cooling water pumps, to alleviate the potential fixed noise impact with the support by CEDD. The potential erection of noise screening and acoustic mat has been agreed with the operator of the SNG Plant. Given proper implementation of the noise screening and acoustic mat, no adverse fixed noise impact would be anticipated from the SNG Plant to P-PU1&2. The actual design and location of the noise screens would subject to the actual building design of Site PU1&2. Cumulative quantitative fixed noise assessment, as mentioned in below **Table 4.23**, should be conducted by the developer of the NSR P-PU1&2, when detailed design information of the Site PU1&2 become available.

4.8.2.3 To mitigate the potential fixed noise impact due to the daily equipment testing at the proposed Fire Station on NSR P-PU1&2, designated equipment testing area would be provided for testing of hand-held equipment, such as saw and cutter, and mobile equipment such as pump truck and hydraulic platform. The designated equipment testing area would be located to the immediate north of the Training Tower and/or Maintenance Storey Building. Therefore, line-of-sight from nearby noise sensitive uses at P-PU1&2on the designated equipment testing area would be partially or fully screened by the buildings. Quiet equipment and/or erecting noise barrier/enclosure could also be considered as far as practicable. Due to the screening by buildings, the potential fixed noise impact would be minimized. An indicative location of the designated equipment testing area and line-of-sight diagram are presented in **Appendix 4.9**. Given proper design of the proposed Fire Station, no adverse fixed noise impact would be anticipated from the proposed Fire Station. As mentioned in below **Table 4.23**, cumulative quantitative fixed noise assessment should be conducted by the proponent of the proposed Fire Station when detailed design information become available, to recommend the Fire Station design, including the actual location of the designated equipment testing area, Fire Station building orientation and potential additional noise barriers/semi-enclosure to be provided at the

proposed Fire Station, with due consideration of the potential cumulative fixed noise impact from TKOIP.

4.8.2.4 The potential fixed noise impact due to the advance sewage pumping station and the EPP would be mostly contained within the reinforced concrete buildings with opening facing away from nearby noise sensitive uses. With proper implementation of mitigation measures, including the use of quieter fixed plant, acoustic louvre and silencers, etc., no adverse fixed noise impact would be anticipated from the EPP. As mentioned in below **Table 4.23**, a quantitative fixed noise assessment for the advance sewage pumping station and FNMP(s) for the EPP should be conducted to recommend detailed design of the mitigation measures.

4.8.2.5 To mitigate the potential fixed noise impact due to fuel tanker at the GFS, noise barrier should be erected at the designated refilling area to provide screening next to the tanker for the nearby noise sensitive uses at Site PU6 and E5. Quieter tanker could also be used to minimise any potential fixed noise impact. With proper implementation of the mitigation measures, no adverse fixed noise impact would be anticipated from the GFS. As mentioned in below **Table 4.23**, a quantitative fixed noise assessment should be conducted by the proponent of the GFS, to recommend detailed design of the mitigation measures, e.g. the height and design of the barrier.

4.8.2.6 To mitigate the potential fixed noise impact due to the proposed PTIs at Sites PR1 and PR3, enclosing the PTI within reinforced concrete building and/or acoustic enclosure with openings directed away from NSRs, and use of quieter plant including ventilation fans, use of silencer, installation of acoustic louvre are recommended to minimize the potential fixed noise impact to nearby noise sensitive uses. With proper implementation of the recommended mitigation measures, no adverse fixed noise impact would be anticipated from the PTIs. Details of the mitigation measures would be provided in the corresponding quantitative fixed noise assessment, as mentioned in below **Table 4.23**.

4.8.2.7 To mitigate the potential fixed noise impact due to the proposed temporary PTFs at Site G3 and O5, noise barriers should be erected along bus / minibus lanes to screen off the potential fixed noise from vehicular start-up. With proper implementation of the recommended mitigation measures, no adverse fixed noise impact would be anticipated from the PTFs. Details of the mitigation measures would be provided in the corresponding quantitative fixed noise assessment, as mentioned in below **Table 4.23**.

4.8.2.8 To mitigate the potential fixed noise impact due to ventilation buildings of the TKLSE, quieter fixed plant, installation of acoustic louvre and installation of silencer should be considered in the separate EIA Study of the TKLSE, and subsequent FNMP, as mentioned in below **Table 4.23**. With proper implementation of the recommended mitigation measures, no adverse fixed noise impact would be anticipated from the TKLSE.

4.8.2.9 To mitigate the noise from the proposed facilities at TKO 132, including EFs, CWHF, PFTF, RTS, CBP and SPS, quiet fixed plant, locating fixed plant away from the nearby NSR E-OLV as far as practicable, enclosing fixed plant within noise enclosure, reinforced concrete buildings, acoustic plant room, opening or ventilation of the enclosure / building should be facing away from the nearby NSR, installation of acoustic louvre and silencers at vents, installation of high speed roller shutter doors at openings, and erecting noise barriers near sources / receivers, etc. should be considered in the FNMP / corresponding fixed noise impact assessment to alleviate the potential fixed noise impact from these facilities. Fixed noise at NSRs at OLV would comply with the relevant noise criteria. Details of the mitigation measures would be provided in the FNMP or the corresponding fixed noise impact assessment as detailed in **Table 4.23**.

Quantitative Fixed Noise Impact Assessment

4.8.2.10 For various DPs within the assessment area, Fixed Noise Source Management Plan (FNMP) as detailed in EIAO Guidance Note No. 16/2023 "Preparation of Fixed Noise Sources Impact Assessment under the Environmental Impact Assessment Ordinance" should be submitted to EPD for agreement prior to issuance of tender and commencement of the construction of proposed fixed noise sources. FNMP(s) should contain quantitative fixed noise source impact assessment with reference to the updated plant inventories of the fixed noise source, recommended noise mitigation measures, commissioning test requirements and environmental monitoring and audit programme. To ensure full implementation of the recommended mitigation measures, the mitigation measures implementation schedule including implementation party, implementation location and timing should be included in the FNMP(s). For planned/proposed fixed noise sources of non-DPs within the Project area and existing noise sources within the assessment area affecting the proposed NSRs under this Project, quantitative fixed noise impact assessment should be carried out via various planning/funding/land lease mechanism in accordance with the requirements of the HKPSG. A summary of the submission of quantitative fixed noise assessment for fixed noise sources of DPs and non-DPs are listed in **Table 4.23.**

Table 4.23 Requirements of Quantitative Fixed Noise Assessment in Pre-Tender Stage and Pre-Construction Stage of the Project

Noise Source		Responsible Party	Mechanism of Conducting Fixed Noise Assessment [1] [2]	Relevant Noise Guidelines
Source / Site ID	Description			
TKO 132				
EFs	Electricity Facilities (EFs)	Proponent of the proposed fixed noise source	Application of EP via separate EIA or Direct Application of EP under EIAO-TM and subsequent FNMP(s)	EIAO-TM and EIAO-GN16/2023
CWHF	Construction Waste Handling Facility (CWHF)	Proponent of the proposed fixed noise source	Application of EP via separate EIA or Direct Application of EP under EIAO-TM and subsequent FNMP(s)	EIAO-TM and EIAO-GN16/2023
RTS	Refuse Transfer Station (RTS)	Proponent of the proposed fixed noise source	Application of EP via separate EIA or Direct Application of EP under EIAO-TM and subsequent FNMP(s)	EIAO-TM and EIAO-GN16/2023
PFTF	Public Fill Transfer Facility (PFTF)	Proponent of the proposed fixed noise source	Preliminary Environmental Review (PER) under planning and funding mechanism	HKPSG
SPS	Sewage Pumping Station	Proponent of the proposed fixed noise source	PER under planning and funding mechanism	HKPSG
CBP	Concrete Batching Plant (CBP)	Proponent of the proposed fixed noise source	Lease condition	HKPSG
TKO 137				
G2	Fire Station cum Ambulance Depot	Proponent of the proposed fixed noise source	PER under planning and funding mechanism	HKPSG
G3	Government Office Complex cum Sports Centre	Proponent of the proposed fixed noise source	PER under planning and funding mechanism	HKPSG
G3	Temporary Public Transport Facility (PTF)	Proponent of the proposed fixed noise source	PER under planning and funding mechanism	HKPSG

Noise Source		Responsible Party	Mechanism of Conducting Fixed Noise Assessment [1] [2]	Relevant Noise Guidelines
Source / Site ID	Description			
G4	Government Complex	Proponent of the proposed fixed noise source	PER under planning and funding mechanism	HKPSG
O5	Temporary PTF	Proponent of the proposed fixed noise source	PER under planning and funding mechanism	HKPSG
OU3	Green Filling Station (GFS)	Proponent of the proposed fixed noise source	Lease condition	HKPSG
OU4	Effluent Polishing Plant (EPP)	Proponent of the proposed fixed noise source	FNMP required in the EP of this current EIA Project	EIAO-TM and EIAO-GN 16/2023
OU4	Advanced Sewage Pumping Station	Proponent of the proposed fixed noise source	PER under planning and funding mechanism	HKPSG
PR1	Public Transport Interchange (PTI)	Developer of the proposed fixed noise source	PER under Lease condition	HKPSG
PR3	Public Transport Interchange (PTI)	Developer of the proposed fixed noise source	PER under Lease condition	HKPSG
TKOIP	Tseung Kwan O InnoPark	Developer of the proposed NSR P-PU1&2	Environmental Assessment Study (EAS) for public housing development	HKPSG
SENTX	SENTX Landfill	Developer of the proposed NSR P-PU3&4 and P-PU5	EAS for public housing development	HKPSG
SNG	Existing SNG Plant	Developer of the proposed NSR P-PU1&2 (if the population intake of the NSRs happen while the SNG Plant in operation)	EAS for public housing development	HKPSG
TKO DP	Desalination Plant	Developer of the proposed NSR P-PU5, P-PU6, P-E3, P-E4, P-E5	Class Assessment Document for schools and Environmental Assessment Study (EAS) for public housing development	HKPSG
CD TKO	Cavern Development in Area around Tseung Kwan O	Proponent of the concurrent project	Submission under separate study	HKPSG / EIAO-TM and EIAO-GN 16/2023
TKLSE	Tseung Kwan O Line Southern Extension	Proponent of the concurrent project	Application of EP via separate EIA under EIAO-TM and subsequent FNMP(s)	EIAO-TM and EIAO-GN 16/2023

Remarks:
[1] Preliminary Environmental Review (PER) shall be submitted by proponents of the fixed noise sources in accordance with Technical Circular (Works) No. 13/2003 - Guidelines and Procedures for Environmental Impact Assessment of Government Projects and Proposals.
[2] Class Assessment Document shall be submitted by proponents of the schools in accordance with Final Report on Preparation of a Class Assessment Document for Standard Schools issued by Architectural Services Department.

4.8.2.11 To ensure fixed noise compliance at planned NSRs of this Project located within 300 m from existing fixed noise sources, as listed in **Table 4.23**, fixed noise assessment should be submitted to EPD by the developer of these NSRs prior to construction of the relevant developments.

4.8.3 Operational Ground-borne Rail Noise Impact

4.8.3.1 Qualitative ground-borne rail noise impact assessment has been conducted due to limited available information regarding TKLSE at the time of this assessment. Ground-borne rail noise mitigation measures, such as floating slab trackform, and high attenuation baseplate etc. would be recommended in the separate EIA for the planned TKLSE, if deemed necessary. Given proper implementation of the mitigation measures, no adverse ground-borne rail noise impact would be anticipated, and no additional noise mitigation measures at planned NSRs within TKO 137 would be required.

4.8.4 Operational Road Traffic Noise Impact

4.8.4.1 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.

Area at TKO 132

4.8.4.2 No noise mitigation measures are required for NSRs at TKO 132 as all representative NAPs predicted would comply with noise criteria.

Area at TKO 137

4.8.4.3 At area of TKO 137, all identified NSRs are planned developments under this Project. Different at-source mitigation scenarios have been considered such as adoption of LNRS, installation of noise barrier along “Project Roads”, etc.

4.8.4.4 Referring to the predicted noise level under unmitigated scenario as shown in **Table 4.19** and **Appendix 4.11**, noise exceedance at planned residential uses is up to 2 dB(A) and at planned schools is up to 8 dB(A). Direct at-source mitigation measures, i.e. Low Noise Road Surfacing (LNRS), at “Project Roads” L1 and L8 were recommended for alleviating road traffic noise impact on affected residential dwellings. Besides, to test the effectiveness of LNRS for planned schools, LNRS on Roads L2, L4 and L8 were tested. The predicted road traffic noise level with provisioning of LNRS as indicated in **Appendix 4.8** is presented in **Appendix 4.11A** and summarised in **Table 4.24**.

Table 4.24 Predicted Road Traffic Noise Level at TKO 137 under Mitigated Scenario with LNRS only (Year 2041)

NSR ID	NAP ID [1]	Criteria, $L_{10\ 1\text{-}hr}$ dB(A)	Max. Predicted Noise Level in Year 2041, $L_{10\ 1hr}$ dB(A) [2] [3]			Floor with Noise Exceedance	Further Mitigation Measure required?
			Project Roads	Other Roads	Overall		
P-PU1&2	P-PU1-R-T01_01	70	59 - 61	36 - 59	59 - 63	-	N
	P-PU1-R-T02_01 to P-PU1-R-T02_05	70	56 - 69	0 - 54	56 - 69	-	N
	P-PU1-R-T03_01	70	44 - 67	16 - 19	44 - 67	-	N
	P-PU1-R-T04_01 to P-PU1-R-T04_04	70	58 - **71**	0 - 50	58 - **71**	2/F - 6/F	Y [4]
	P-PU2-R-T01_01 to P-PU2-R-T06_01	70	61 - 70	0 - 58	61 - 70	-	N
P-PU3&4	P-PU3-R-T01_01	70	62 - 65	10 - 11	62 - 65	-	N
	P-PU3-R-T02_01 to P-PU3-R-T02_03	70	64 - **71**	13 - 47	64 - **71**	1/F - 2/F	Y [4]
	P-PU3-R-T03_01 to P-PU3-R-T03_02	70	64 - 69	0 - 45	64 - 69	-	N

NSR ID	NAP ID [1]	Criteria, $L_{10\ 1\text{-}hr}$ dB(A)	Max. Predicted Noise Level in Year 2041, $L_{10\ 1hr}$ dB(A) [2] [3]			Floor with Noise Exceedance	Further Mitigation Measure required?
			Project Roads	Other Roads	Overall		
	P-PU3-R-T04_01 to P-PU3-R-T04_02	70	64 - 68	0 - 13	64 - 68	-	N
	P-PU4-R-T01_01 to P-PU4-R-T01_02	70	62 - 70	0	62 - 70	-	N
	P-PU4-R-T02_01	70	61 - 66	10 - 11	61 - 66	-	N
	P-PU4-R-T03_01 to P-PU4-R-T03_02	70	62 - 70	0	62 - 70	-	N
	P-PU4-R-T04_01	70	63 - 66	0	63 - 66	-	N
P-PU5	P-PU5-R-T01_01 to P-PU5-R-T01_02	70	62 - 70	0	62 - 70	-	N
	P-PU5-R-T02_01 to P-PU5-R-T02_02	70	63 - 68	0	63 - 68	-	N
	P-PU5-R-T03_01 to P-PU5-R-T03_02	70	62 - 70	0	62 - 70	-	N
	P-PU5-R-T04_01 to P-PU5-R-T04_02	70	64 - 68	0	64 - 68	-	N
P-PU6	P-PU6-R-T01_01 to P-PU6-R-T01_02	70	62 - 69	0	62 - 69	-	N
	P-PU6-R-T02_01 to P-PU6-R-T02_02	70	63 - 67	0	63 - 67	-	N
	P-PU6-R-T03_01	70	62 - 70	0	62 - 70	-	N
	P-PU6-R-T04_01	70	58 - 63	0	58 - 63	-	N
	P-PU6-R-T05_01 to P-PU6-R-T05_02	70	61 - 70	0	61 - 70	-	N
	P-PU6-R-T06_01 to P-PU6-R-T06_02	70	59 - 66	0	59 - 66	-	N
P-PR1	P-PR1-R-T01_01 to P-PR1-R-T03_01	70	62 - 68	0 - 45	62 - 68	-	N
P-PR2	P-PR2-R-T01_01 to P-PR2-R-T03_01	70	62 - 69	0	62 - 69	-	N
P-PR3	P-PR3-R-T01_01 to P-PR3-R-T02_02	70	56 - 66	0	56 - 66	-	N
P-PR4	P-PR3-R-T01_01 to P-PR3-R-T03_01	70	64 - 69	0	64 - 69	-	N
P-PR5	P-PR5-R-T01_01 to P-PR5-R-T04_02	70	59 - 66	0	59 - 66	-	N
P-E1	P-E1-E-T01_01 to P-E1-E-T01_04	65	60 - **68**	0 - 18	60 - **68**	1/F - 8/F	Y [5]
P-E2	P-E2-E-T01_01 to P-E2-E-T01_03	65	62 - **68**	0 - 11	62 - **68**	1/F - 8/F	Y [5]
P-E3	P-E3-E-T01_01 to P-E3-E-T01_02	65	**69** - **71**	0	**69** - **71**	1/F - 8/F	Y [5]
P-E4	P-E4-E-T01_01	65	**69** - **70**	0	**69** - **70**	1/F - 8/F	Y [5]
P-E5	P-E5-E-T01_01 to P-E5-E-T01_03	65	**68** - **71**	0	**68** - **71**	1/F - 8/F	Y [5]

Notes:

[1] The assessment only includes NSRs which rely on opened windows for ventilation.
[2] Noise levels would be rounded up to nearest integer to determine the compliance of the criteria.
[3] Boldfaced and underline values indicate exceedance to relevant noise criteria.
[4] At-receiver mitigation measures such as acoustic window or blank façade are recommended.
[5] Noise insultation with suitable window type and air-conditioning is recommended.

4.8.4.5 Although all affected planned residential NAPs have more than 1.0 dB(A) noise benefit (see **Appendix 4.11A**) by adoption of LNRS on Roads L1 and L8, two residential NAPs (P-PU1-R-T04_02 and P-PU3-R-T02_02) facing the junction of L4 and L8 would still

exceed the noise criteria by 0.3 dB(A) in maximum and dominated by "Project Roads" with noise contribution greater than 1.0 dB(A). To further mitigate road traffic noise impact on these two representative NAPs, noise barrier along Road L8 was tested, at least 3.5m high vertical noise barrier at road kerb along northbound of Road L8 is required. Considering that using about 90m long of 3.5m high noise barrier for this 0.3 dB(A) exceedance and the noise barrier at road kerb might have sight-line issue and create visual impact, installation of noise barrier is not considered.

4.8.4.6 In fact, direct mitigation measures at-receiver such as orientation of residential building, adoption of acoustic window / enhanced acoustic balcony, blank wall, fixed window, architectural fin, etc. can achieve more than 1 dB(A) noise reduction, no adverse noise impact is anticipated if adoption of at-receiver noise mitigation measures. Environmental Assessment Study (EAS) for the planned public housing sites shall be conducted by Housing Department in the detailed design stage to comply with relevant noise criteria stipulated in EIAO-TM and HKPSG.

4.8.4.7 In view that no prevailing noise levels for planned development and no indirect mitigation measures is required for planned residential dwellings, eligibility test for indirect mitigation measures on affected NSRs is considered not applicable.

4.8.4.8 For planned proposed school, P-E1 to P-E5, with provision of LNRS on Roads L2, L4 and L8 as indicated in **Appendix 4.8**, the predicted result (**Appendix 4.11A** referred**)** shows that noise levels at some facades of all planned proposed schools would still exceed relevant noise criteria by up to 6 dB(A). Noise benefited by adopting LNRS on these roads at most NAPS is less than 1.0 dB(A), thus demonstrating LNRS is not effective for protecting these proposed planned schools. Although P-E1-E-T01_02 can be protected by adopting LNRS on Road L2, the noise benefit is less than 1.0 dB(A) thus this LNRS is not recommended. As such, noise insulation with suitable window type and air-conditioning is recommended for proposed planned school P-E1 to P-E5 including P-E1-E-T01_02. The school proponents should conduct and submit the Class Assessment Documents themselves and agreed by Director of Environmental Protection (DEP).

4.8.4.9 Since LNRS is not effective for planned schools, LNRS on Roads L2, L4 and section of Road L8 between Road L6 and L7 are not recommended. The optimised extent of recommended LNRS and at-receiver mitigation measures are summarized in **Table 4.25** and **Figure 4.9**. The predicated noise level under optimised mitigation measures scenario is summarized in **Table 4.26,** and detailed in **Appendix 4.11B.** With implementation of recommended mitigation measures as mentioned below, no adverse road traffic noise impact on NSRs due to the Project is anticipated.

Table 4.25 Optimised Mitigation Measures for Road Traffic Noise Impact

Affected NSRs	NAPs	Mitigation Measures	Implementation Schedule
Low Noise Road Surfacing			
P-PU1	P-PU1-R-T02_03, P-PU1-R-T04_02, P-PU1-T04_03	~ 250 m LNRS on Road L8 [1]	Commencement of Road L8
P-PU3	P-PU3-R-T02_02, P-PU3-R-T02_03, P-PU3-R-T03_01	~ 200 m LNRS on Road L8 [1]	Commencement of Road L8
P-PU5	P-PU5-R-T01_02, P-PU5-T03_01	~145 m LNRS on Road L1 [1]	Commencement of Road L1
At-receiver Mitigation Measures			
P-PU1	P-PU1-R-T04_02	Blank Wall / Acoustic Window [2]	Population Intake of the Protected NSR
P-PU3	P-PU3-R-T02_02	Blank Wall / Acoustic Window [2]	
P-E1 to P-E5	P-E1-E-T01_01, P-E1-E-T01_02 & P-E1-E-T01_04	Noise Insulation with suitable window type and air-conditioning.[3]	
	P-E2-E-T01_02 & P-E2-E-T01_03		

Affected NSRs	NAPs	Mitigation Measures	Implementation Schedule
Low Noise Road Surfacing			
	P-E3-E-T01_01 & P-E3-E-T01_02		
	P-E4-E-T01_01		
	P-E5-E-T01_01, P-E5-E-T01_02 & P-E5-E-T01_03 [1]		

Notes:

[1] Agreed with Highways Department.
[2] Agreed with Housing Department.
[3] Subject to the Class Assessment Report by the school proponents.

Table 4.26 Predicted Road Traffic Noise Level at TKO 137 under Optimised Mitigation Measures Scenario (Year 2041)

NSR ID	NAP ID [1]	Criteria, $L_{10\ 1\text{-}hr}$ dB(A)	Max. Predicted Noise Level in Year 2041, $L_{10\ 1hr}$ dB(A) [2]			Floor Require Mitigation	Mitigation Measures Implemented
			Project Roads	Other Roads	Overall		
P-PU1&2	P-PU1-R-T01_01	70	59 - 61	36 - 59	59 – 63	-	-
	P-PU1-R-T02_01 to P-PU1-R-T02_05	70	56 - 69	0 - 54	56 – 69	-	-
	P-PU1-R-T03_01	70	44 - 67	16 - 19	44 – 67	-	-
	P-PU1-R-T04_01 to P-PU1-R-T04_04	70	58 - 70	0 - 50	58 – 70	Only for 2/F – 6/F of P-PU1-R-T04_02 [3]	Acoustic Window [3]
	P-PU2-R-T01_01 to P-PU2-R-T06_01	70	61 - 70	0 - 58	61 – 70	-	-
P-PU3&4	P-PU3-R-T01_01	70	62 - 65	10 - 11	62 – 65	-	-
	P-PU3-R-T02_01 to P-PU3-R-T02_03	70	64 - 70	13 - 47	64 – 70	Only for 1/F – 2/F of P-PU3-R-T02_02 [3]	Acoustic Window [3]
	P-PU3-R-T03_01 to P-PU3-R-T03_02	70	64 - 69	0 - 45	64 – 69	-	-
	P-PU3-R-T04_01 to P-PU3-R-T04_02	70	64 - 68	0 - 13	64 – 68	-	-
	P-PU4-R-T01_01 to P-PU4-R-T01_02	70	63 - 70	0	63 – 70	-	-
	P-PU4-R-T02_01	70	61 - 66	10 - 11	61 – 66	-	-
	P-PU4-R-T03_01 to P-PU4-R-T03_02	70	62 - 70	0	62 – 70	-	-
	P-PU4-R-T04_01	70	63 - 66	0	63 – 66	-	-
P-PU5	P-PU5-R-T01_01 to P-PU5-R-T01_02	70	62 - 70	0	62 – 70	-	-
	P-PU5-R-T02_01 to P-PU5-R-T02_02	70	63 - 68	0	63 – 68	-	-
	P-PU5-R-T03_01 to P-PU5-R-T03_02	70	62 - 70	0	62 – 70	-	-
	P-PU5-R-T04_01 to P-PU5-R-T04_02	70	64 - 68	0	64 – 68	-	-
P-PU6	P-PU6-R-T01_01 to P-PU6-R-T01_02	70	62 - 69	0	62 – 69	-	-
	P-PU6-R-T02_01 to P-PU6-R-T02_02	70	64 - 67	0	64 – 67	-	-
	P-PU6-R-T03_01	70	62 - 70	0	62 – 70	-	-

NSR ID	NAP ID [1]	Criteria, $L_{10\ 1\text{-}hr}$ dB(A)	Max. Predicted Noise Level in Year 2041, $L_{10\ 1hr}$ dB(A) [2]			Floor Require Mitigation	Mitigation Measures Implemented
			Project Roads	Other Roads	Overall		
	P-PU6-R-T04_01	70	60 - 64	0	60 – 64	-	-
	P-PU6-R-T05_01 to P-PU6-R-T05_02	70	61 - 70	0	61 – 70	-	-
	P-PU6-R-T06_01 to P-PU6-R-T06_02	70	60 - 66	0	60 – 66	-	-
P-PR1	P-PR1-R-T01_01 to P-PR1-R-T03_01	70	63 - 68	0	63 – 68	-	-
P-PR2	P-PR2-R-T01_01 to P-PR2-R-T03_01	70	62 - 69	0	62 – 69	-	-
P-PR3	P-PR3-R-T01_01 to P-PR3-R-T02_02	70	56 - 66	0	56 – 66	-	-
P-PR4	P-PR3-R-T01_01 to P-PR3-R-T03_01	70	64 - 69	0	64 – 69	-	-
P-PR5	P-PR5-R-T01_01 to P-PR5-R-T04_02	70	59 - 66	0	59 – 66	-	-
P-E1	P-E1-E-T01_01	65	N/A	N/A	N/A	1/F – 8/F	Noise Insulation with suitable window type and air-conditioning
	P-E1-E-T01_02		N/A (1/F – 5/F)	N/A (1/F – 5/F)	N/A (1/F – 5/F)	1/F – 5/F	Noise Insulation with suitable window type and air-conditioning
			65 – 65 (6/F – 8/F)	18 – 18 (6/F – 8/F)	65 -65 (6/F – 8/F)		-
	P-E1-E-T01_03		60 -61	16 - 16	60 -61	-	-
	P-E1-E-T01_04		N/A	N/A	N/A	1/F – 8/F	Noise Insulation with suitable window type and air-conditioning
P-E2	P-E2-E-T01_01	65	62 – 62	11 -11	62 – 62	-	-
	P-E2-E-T01_02 to P-E2-E-T01_03		N/A	N/A	N/A	1/F – 8/F	Noise Insulation with suitable window type and air-conditioning
P-E3	P-E3-E-T01_01 to P-E3-E-T01_02	65	N/A	N/A	N/A	1/F – 8/F	Noise Insulation with suitable window type and air-conditioning
P-E4	P-E4-E-T01_01	65	N/A	N/A	N/A	1/F – 8/F	Noise Insulation with suitable window type and air-conditioning
P-E5	P-E5-E-T01_01 to P-E5-E-T01_03	65	N/A	N/A	N/A	1/F – 8/F	Noise Insulation with suitable

NSR ID	NAP ID [1]	Criteria, $L_{10\ 1\text{-}hr}$ dB(A)	Max. Predicted Noise Level in Year 2041, $L_{10\ 1hr}$ dB(A) [2]			Floor Require Mitigation	Mitigation Measures Implemented
			Project Roads	Other Roads	Overall		
							window type and air-conditioning

Notes:

[1] The assessment only includes NSRs which rely on opened windows for ventilation.

[2] Noise levels would be rounded up to nearest integer to determine the compliance of the criteria. "N/A" indicates noise criteria do not apply to the NSR due to the use of noise insulation with suitable window type and air-conditioning

[3] In general, adoption of acoustic window can reduce 5 dB(A) road traffic noise level.

4.8.4.10 With implementation of optimised mitigation measures, the estimated total number of dwellings and classrooms based on tentative layouts that would be exposed, benefited and protected respective to noise criteria are presented in **Table 4.27**.

Table 4.27 Estimated Number of Residential Dwellings / Classrooms Benefited and Protected by Mitigation Measures

NSR Type	No. of Dwellings / Classrooms						
	Exposed to Exceedance [1]			Benefited [2]		Protected [3]	
	Unmitigated	Mitigated by Direct Mitigation Measures [4]	Mitigated by Optimised Mitigation Measures [5]	Mitigated by Direct Mitigation Measures [4]	Mitigated by Optimised Mitigation Measures [5]	Mitigated by Direct Mitigation Measures [4]	Mitigated by Optimised Mitigation Measures [5]
Residential	203	0	0	203	203	203	203
School	130	125 [4]	0 [6]	112 [4]	130 [6]	5 [4]	130 [6]

Notes:

[1] The dwellings or classroom would be considered as "exposed to exceedance" if the predicted noise level exceeded the noise criteria under the respective scenario.

[2] The dwellings or classroom would be considered as "benefited" if (a) the predicted noise level at the dwellings or classroom exceeded the criteria under unmitigated scenario and (b) more than 1.0 dB (A) noise reduction is predicted as a result of the applied mitigated measures.

[3] The dwellings or classroom would be considered as "protected" if (a) the predicted noise level at the dwellings or classroom exceeded the criteria under unmitigated scenario and (b) the predicted noise level at the dwellings or classroom complied with the noise criteria as a result of the applied mitigated measures.

[4] With implementation of Low Noise Road Surfacing and acoustic windows/blank wall.

[5] With implementation of mitigation measures listed in **Table 4.25**.

[6] As mentioned in **Section 4.8.4.9** above, with the implementation of the recommended noise insulation with suitable window type and air-conditioning, the concerned premises would be no longer subjected to road traffic noise impact.

4.8.5 Operational Marine Traffic Noise Impact

4.8.5.1 Since the predicted cumulative marine traffic noise level at NAPs would comply with the respective noise criteria. No adverse marine traffic noise impact would be anticipated. Marine traffic noise mitigation measures would not be required.

4.9 Evaluation of Residual Impacts

4.9.1 Construction Noise Impact

4.9.1.1 No residual impact would be anticipated given proper implementation of the recommended mitigation measures.

4.9.2 Operational Fixed Noise Sources Impact

4.9.2.1 No residual impact would be anticipated given proper implementation of the recommended mitigation measures.

4.9.3 Operational Ground-borne Rail Noise Impact

4.9.3.1 No residual impact would be anticipated given proper implementation of recommended mitigation measures. A separate TKLSE EIA would be conducted by the project proponent of TKLSE to ensure that no adverse residual impact would be arisen from the TKLSE.

4.9.4 Operational Road Traffic Noise Impact

4.9.4.1 No residual impact would be anticipated given proper implementation of the recommended mitigation measures.

4.9.5 Operational Marine Traffic Noise Impact

4.9.5.1 Since the predicted cumulative marine traffic noise level at NAPs would comply with the respective noise criteria. No residual marine traffic noise impact would be anticipated. Marine traffic noise mitigation measures would not be required.

4.10 Environmental Monitoring and Audit

4.10.1 Construction Noise Impact

4.10.1.1 Regular site environmental audit during construction phase is recommended to ensure proper implementation of mitigation measures and good site practices. The implementation of the mitigation measures recommended in CNMPs should also be audited as part of the EM&A programme. Noise monitoring should be carried out as part of the EM&A programme for the construction phase of the Project to check compliance with the construction noise criteria. The EM&A requirements are to be detailed in CNMPs separately submitted to EPD for agreement, according to the requirements stated in **Section 4.8.1**.

4.10.2 Operational Fixed Noise Sources Impact

4.10.2.1 FNMPs for DPs and the fixed noise impact assessment for non-DPs should be prepared according to **Table 4.23** to assess quantitatively the potential fixed noise sources impacts and to assess the effectiveness and practicality of all proposed noise mitigation measures. The FNMPs should also contain fixed noise sources commissioning test plans and monitoring and audit programme.

4.10.3 Operational Rail Noise Impact

4.10.3.1 Operational ground-borne rail noise impact assessment will be conducted in the separate EIA for TKLSE, which would detail the environmental monitoring and audit requirements.

4.10.4 Operational Road Traffic Noise Impact

4.10.4.1 Although no adverse road traffic noise impact is anticipated from the Project with provision of recommended mitigation measures in place, road traffic noise levels should be monitored at representative NSRs, which are in the vicinity of the recommended direct mitigation measures (i.e. LNRS), during the first year after road opening or full population intake of protected NSRs, whichever is latest. The purpose of the monitoring is to ascertain that the recommended mitigation measures are effective in reducing the noise levels.

4.10.5 Operational Marine Traffic Noise Impact

4.10.5.1 Since the predicted cumulative marine traffic noise level at NAPs would comply with the respective noise criteria. No environmental monitoring and audit programme would be considered necessary for marine traffic noise.

4.11 Environmental Acceptability of Schedule 2 Designated Projects

4.11.1.1 With reference to **Section 2**, application for Environmental Permit would be submitted under this EIA for DP1, DP2 and DP3. Separate Environmental Permit(s) would be applied for DP4, DP5 and DP6, with support of EIA(s) as necessary.

4.11.2 Construction of and Operation of Carriageway Bridge at TKO 132 (DP1)

4.11.2.1 The predicted noise impact in 2041 for TKO 132 complied with the criteria (as detailed in **Table 4.17** and **Section 4.8.4.2**). No adverse noise impact would be resulted from this DP.

4.11.3 Reclamation works at TKO 137 and TKO 132 (DP2)

4.11.3.1 With proper construction method implemented and other mitigation (as described in **Section 4.8.1**) were proposed to reduce construction noise impact, no adverse impact would be resulted from this DP.

4.11.4 Construction and Operation of Effluent Polishing Plant (DP3)

4.11.4.1 With proper implementation of recommended mitigation for construction activities (as described in **Section 4.8.1**) and mitigation measures for fixed plant noise resulted from the operation of DP3 (as described in **Section 4.7.2.6** and **Section 4.8.2.4**), no adverse noise impact would be resulted from this DP.

4.11.5 Construction and Operation of Refuse Transfer Station (DP4)

4.11.5.1 With proper implementation of recommended mitigation for construction activities (as described in **Section 4.8.1** and mitigation measures with FNMP provided for fixed plant noise resulted from the operation of DP4 (as described in **Section 4.7.2.20** and **Section 4.8.2.9**), no adverse noise impact would be resulted from this DP.

4.11.6 Construction and Operation of Construction Waste Handling Facilities (DP5)

4.11.6.1 With proper implementation of recommended mitigation for construction activities (as described in **Section 4.8.1**) and mitigation measures with FNMP provided for fixed plant noise resulted from the operation of DP5 (as described in **Section 4.7.2.18** and **Section 4.8.2.9**), no adverse noise impact would be resulted from this DP.

4.11.7 Construction and Operation of Electricity Facilities (DP6)

4.11.7.1 With proper implementation of recommended mitigation for construction activities (as described in **Section 4.8.1**) and mitigation measures with FNMP provided for fixed plant noise resulted from the operation of DP6 (as described in **Section 4.7.2.17** and **Section 4.8.2.9**), no adverse noise impact would be resulted from this DP.

4.12 Conclusion

4.12.1 Construction Noise Impact

4.12.1.1 Qualitative assessment on potential construction noise impact arising from the Project has been conducted. With implementation of appropriate mitigation measures including quieter construction methods/equipment, careful scheduling of construction activities, provision of movable noise barrier/enclosure and good site practices, etc., the potential construction noise impact at all representative NSRs would be minimized and no adverse construction noise impact would be anticipated. A pre-tender CNMP should be submitted to EPD before tender invitation of each construction activity. A pre-construction CNMP should be prepared by the future Contractor of the construction activity and submitted to EPD for agreement before commencement of construction works. The CNMPs should be 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. Subject to detailed EM&A requirements in the CNMP, regular site environmental audit during construction phase should be recommended to ensure proper implementation of mitigation measures and good site practices.

4.12.2 Operational Fixed Noise Sources Impact

4.12.2.1 Fixed noise sources impact assessment has been conducted. With proper implementation of the necessary noise mitigation measures, including directing the ventilation exhaust for fixed plants away from NSRs, the use of quiet PME, silencer, acoustic louvre, barrier, enclosure, etc., adverse fixed noise sources impact would not be anticipated. FNMPs containing quantitative fixed noise sources impact assessment, recommended mitigation measures and monitoring and audit programme, should be submitted before construction of the Project.

4.12.3 Operational Rail Noise Impact

4.12.3.1 No airborne railway noise impact would be anticipated as the TKLSE would be underground. No adverse ground-borne rail noise impact would be anticipated, given proper implementation of the recommended mitigation measures in the separate EIA for the TKLSE.

4.12.4 Operational Road Traffic Noise Impact

4.12.4.1 No adverse road traffic noise impact would be anticipated on existing NSRs. With implementation of LNRS and at-receivers mitigation measures, no adverse road traffic noise impact on planned NSRs including residentials and schools is anticipated. Planned residential developments and planned schools are required to conduct road traffic noise assessments themselves to determine appropriate mitigation measures based on their detailed design.

4.12.5 Operational Marine Traffic Noise Impact

4.12.5.1 Marine traffic noise impact assessment has been conducted. Assessment indicated the marine traffic noise level during peak hour at the proposed NSRs at TKO 137 and at the existing NSRs at On Luen Village, Ocean Shores and Lei Yu Mun would be lower than the marine traffic noise criteria. Hence, no adverse marine traffic noise impact would be expected at planned NSRs in TKO 137. No adverse marine traffic noise impact would be expected at the existing NSRs in the vicinity of TKO 132. No environmental monitoring and audit programme for marine traffic noise would be considered necessary.