

Site	Type	Concerned Noise Source in SEKD	
		Fixed Source	Road Traffic
Hoi Sham Park, Holy Carpenter Primary School Oblate Fathers Primary School			
Ma Tau Kok Area	Residential area with approx. 10 storeys buildings	SPS at 2G ESS & ventilation shaft at 3X	D1, L5
Laguna City	Residential area with approx. 25 storeys buildings	KTPTW and G/IC at 6C, RTS & PFBF at 6B	T2
Cha Kwo Ling Village, Cha Kwo Ling Housing Site (Planned)	Residential	KTPTW and G/IC at 6C	T2
Hollywood Plaza	High-rise residual area	N/A	T1 extension
Ha Yuen Leng (also a planned site 22936/EN/276 site no. 13)	Residential 1-3 storeys squatter houses	N/A	T1 extension
San Po Kong Area	Residential area with approx. 15 storeys buildings and schools	N/A	T1 Extension

3.5.1.4 The planned NSRs within 300m from the SEKD project was also checked with Planning Department. A list of potential planned NSRs is given in **Appendix 3B Table A3.2.12**. Potential planned NSRs are graphically shown in **Drawing Nos. 22936/EN/276A to D**. For all potential planned NSRs, the following NSRs in **Table 3.11** were found likely affected by SEKD and were assessed in details.

Table 3.11 Potential Planned NSRs affected by SEKD

Outline Zoning Plan No.	Location	Drawing Reference for 22936/EN/276	Expected Year of Completion
S/K9/12	J/O Tai Wan Road and Dyer Avenue, Hung Hom. KIL, 11056 (New Phase of Laguna Verde)	Site No. 1	Dec 2001
S/K10/12	R(E) Zones along Yuk Yat Street and Chi Kiang Street	Site No. 11	N.A.
S/K10/12	R(E) Zones along Sheung Heung Road and To Kwa Wan Road	Site No. 10	N.A.
S/K10/12	Gas Works, To Kwa Wan Road	Site No. 9	N.A.
S/K10/12	CAD(3), Sung Wong Toi Road	Site No. 6	N.A.
S/K10/12	CAD(2), Sung Wong Toi Road	Site No. 5	2004
S/K10/12	CAD(1), Sung Wong Toi Road	Site No. 4	N.A.
S/K10/12	KIL 4013, Sung Wong Toi Road	Site No. 3	2003
S/K8/11	Two areas located in South-west of Shek Ku Lung Road Playground at junction of Lok Sin Road and Sa Po Road	Site No. 12	Land Disposal Program scheduled in 2002/3
S/K11/12A	Proposed Residential Development at King Fuk Street	Site No. 14	After 2005

3.6 Potential Construction Phase Impact

3.6.0.1 The construction works would involve a number of noisy activities including the use of heavy plant for excavation, filling, concreting and piling operations as well as on-site haul road traffic and potential increase in off-site traffic along site access routes. Due to the large site area, the construction works would be divided into a number of phases lasting over a period of 10 years.

3.6.1 Construction Noise Assessment

- 3.6.1.1 Existing and future sensitive receivers located in the proximity to the project site (within 500m), which may be subjected to potential noise construction impacts of the project are identified and presented in **Appendix 3A Table 3.1.2a and 3.1.2b**. They are basically extracted from the ones for traffic noise assessment.
- 3.6.1.2 The South East Kowloon Development (SEKD) is a relatively isolated site. The construction activities of SEKD would mostly be within the Site itself and thus often far from existing noise sensitive receivers. The noise impacts from construction activities are likely to affect the first row of existing NSRs facing the Site. Future NSRs would be affected once the Site is occupied, prior to completion of construction works. Reference is made to the development schedule presented in **Appendix 3B Table A3.2.11** for the timing of population intake. Hoi Sham Area would be the least affected area since most of the NSRs would be occupied after the completion of major construction work in this Project.
- 3.6.1.3 The notional noise sources (NNSs) of each work tasks of the four major development packages were established in accordance with GW-TM, and is summarised in **Appendix 3A, Table 3.1.3**. The NNSs were used to calculate the noise level reaching the NSRs.
- 3.6.1.4 Construction noise levels were predicted for different construction activities and time periods. The noise levels presented show the cumulative impacts of construction activities due to the development packages listed in Table 3.8.

3.6.2 Potential Construction Noise Impact of Unmitigated Scenario

- 3.6.2.1 The potential unmitigated construction noise impact on the identified NSRs is summarised in **Table 3.12** below. Due to the complexity of calculations, the details of construction noise assessments are given in **Appendix 3A**.

Table 3.12 Construction Noise Level at Noise Sensitive Receivers – Unmitigated Scenario

Noise Sensitive Receivers	Assessment Points	Predicted Range (dBA)	Period with Maximum Noise Level Exceeding EIAO-TM Standard
Existing NSRs			
Rhythm Gardens	E1 (AP9305)	62-82	Oct 2003 – Mar 2006
Choi hung Estate	E2 (AP9309)	63-84	Oct 2003 – Mar 2006
Richland Gardens	E3 (AP9315)	64-87	Oct 2003 – Dec 2005
San Po Kong Area	E4 (AP9504)	60-86	Jul 2006 ** (84-85 dB(A) between Oct 2003 and Feb 2006)
San Po Kong Area	E5 (AP9507)	61-85	Oct 2003 – Feb 2006
Kowloon City Area	E6 (AP9204)	60-85	Jul 2004 84 dB(A) from Oct 2003 and Jun 2004
Kowloon City Area	E7(AP9211)	59-82	Jul 2004 81 dB(A) from Oct 2003 and Mar 2006
Kowloon City Area	E8 (AP9216)	59-77	Oct 2003 – Oct 2005
Mok Cheong St.	E9 (AP9118)	60-74	No exceedance
Wyler Gardens	E10 (AP9111)	60-72	No exceedance
Wyler Gardens	E11(AP9123)	60-71	No exceedance
To Kwa Wan Area	E12 (AP9120)	60-69	No exceedance
Laguna City	E13 (AP9401)	53-78	Jan 2013– Dec 2014
Cha Kwo Ling Area	E14 (AP9406)	52-71	No exceedance
Laguna Verde	E15 (AP9128)	58-87	Jul 2011 – Mar 2013
Future NSRs			
4C & 4E	F1 (AP8109)	63-68	No exceedance
4C & 4E	F2 (AP8153)	63-68	No exceedance

Noise Sensitive Receivers	Assessment Points	Predicted Range (dBA)	Period with Maximum Noise Level Exceeding EIAO-TM Standard
4F & 4L	F3 (AP8202)	64-69	No exceedance
4F & 4L	F4 (AP8295)	63-69	No exceedance
4K	F5 (AP8272)	64-69	No exceedance
4M	F6 (AP8304)	64-70	No exceedance
4R	F7 (AP8336)	65-70	No exceedance
5J	F8 (AP8672)	67-68	No exceedance
5J	F9 (AP8654)	67	No exceedance
4S	F10 (AP8369)	65-70	No exceedance
4H	F11 (AP8232)	63-65	No exceedance
4G	F12 (AP8212)	60-65	No exceedance
4D	F13 (AP8129)	62-68	No Exceedance
4A	F14 (AP8001)	61-69	No Exceedance
4J	F15 (AP8252)	65-66	No exceedance
5A	F16 (AP8404)	65-66	No exceedance
5E	F17 (AP8510)	67-66	No exceedance
5G	F18 (AP8568)	N/A	N/A
5C	F19 (AP8471)	N/A	N/A
5C	F20 (AP8434)	N/A	N/A
4E(School)	F21 (AP7001)	63-69	No exceedance
5J(School)	F22 (AP7304)	67	No exceedance
5L(School)	F23 (AP7404)	67	No exceedance
4L(School)	F24 (AP7102)	64-70	No exceedance
4N(School)	F25 (AP7207)	65-70	No exceedance
5K	F26 (AP8702)	N/A	N/A
5K	F27 (AP8731)	N/A	N/A
1E	F28 (AP8454)	N/A	N/A
1E	F29 (AP8401)	N/A	N/A
1E(School)	F30 (AP7311)	61-68	No exceedance
1C(School)	F31 (AP7102)	62-84	Oct 2003 – Mar 2006
2A	F32 (AP8612)	N/A	N/A
2A	F33 (AP8667)	N/A	N/A
2B	F34 (AP8768)	60-76	Jan 2006 – Feb 2006
2C	F35 (AP8808)	61-69	No exceedance
2F	F36 (AP8973)	75	No exceedance
2E	F37 (AP8932)	61-73	No exceedance
2D	F38 (AP8903)	61-75	No exceedance
1K	F39 (AP8532)	61-65	No exceedance
1K	F40 (AP8510)	61-65	No exceedance
1K	F41 (AP8505)	61-65	No exceedance
2A(School)	F42 (AP7602)	60-65	No exceedance
2A(School)	F43 (AP7611)	60-65	No exceedance
2B(School)	F44 (AP7707)	60-75	Exceedance
1L(School)	F45 (AP7401)	61-68	Exceedance
1P(School)	F46 (AP7509)	61-69	Exceedance

Note:

- Locations of assessment points are shown in Drawing nos. 22936/EN/280 to 282.
- Where it says N/A in the table, it means that the population intake of the particular site would occur after the construction works, and therefore would not be affected by construction noise.

3.6.2.2 Assessments of the unmitigated scenario showed that there would be some exceedances of noise levels at existing NSRs, depending on the location of the NSRs and the work package taken place.

3.6.2.3 Future NSRs would only be affected when population has been moved in. There are a few exceedances of future NSRs without mitigation measures as most of these sites would not be occupied before the completion of infrastructures. Once they are occupied, construction work would be located far away at distant sites.

3.6.3 Potential Construction Noise Impact of Mitigated Scenario

3.6.3.1 Without mitigation measures, construction activities associated with construction activities of the SEKD would only cause exceedances of the 75 dB(A) and 70 dB(A) limits at some of the NSRs during worst cases. The following mitigation measures should be considered:

Use of Quiet Plant and Working Methods

3.6.3.2 The use of quiet plant was identified to be a feasible solution to tackle adverse construction noise impacts. The Contractor should obtain particular models of plant that are quieter than standard types given in the GW-TM. The benefits achievable in this way would depend on the details of the Contractors' chosen methods of working, and it would be too restrictive to specify that a Contractor has to use specific items of plant for the construction operations. Since the sound power level (SWL) of the powered mechanical equipment (PME) in the GW-TM was used for the assessment, quiet PME is defined as PME whose actual SWL is less than the value specified in the GW-TM for the same item of plant. Reference can be made to the *British Standard BS5228: Part 1:1997 Control on Construction and Open Sites*. Alternative working methods for the same construction task but generate less noise should also be considered and applied as far as possible.

Using Temporary and Movable Noise Barriers

3.6.3.3 Locating movable barriers close to noisy plant could be very effective in screening NSRs from particular items of plant or noisy operations. Erecting movable barriers of 3 to 5 m height with a small cantilevered upper portion and skid footing within a few metres of stationary plant and within about 5 m or more of a mobile equipment such as an excavator and mobile crane etc. could block the line of sight of these plant items to the NSR. It would be possible for the Contractor to provide purpose-built noise barriers or screens constructed of appropriate material (minimum superficial density of 15 kg/m²) located close to operating PME, in order to reduce the noise impact to the surrounding sensitive uses. Certain types of PME, such as generators and compressors, could be completely screened by portable barriers giving a total noise reduction of 10 dB(A) or more.

Reducing the Numbers of Plant Operating in Critical Areas Close to NSRs

3.6.3.4 It would be appropriate to restrict the number of operating PME within certain parts of the site that are very close to the NSRs in order to reduce the level of noise impacts. This method could be more effective for activities associated with foundation work, pile construction and excavation activities in which a large number of PME are anticipated, but not all of them would be utilized at the same time. A noise reduction of up to 6 dB(A) could be achieved if the number of PME used on site is reduced to one, as estimated from the predicted values.

Using Noise Screening Structures or Purpose-built Noise Barriers along the Site Boundary

3.6.3.5 Considering the medium-rise nature of surrounding NSRs, it would be effective to have noise screening structures along the site boundary to protect NSRs close to the construction site boundary. The following measures could be applied to reduce the construction noise:

- Site buildings such as office and stores could be grouped together to form a substantial barrier separating site operations and nearby noise sensitive premises;
- Stacks of certain materials such as bricks, aggregate, timber or topsoil could be strategically placed to form a barrier;

- Earth bunds could be built to provide screening for major earthmoving operations; and
- For adverse cases, purpose-built noise barriers or screens could be placed along the site boundary.

3.6.3.6 Noise emissions from construction sites could be further minimised through good site practice, selecting quiet plant, quiet working methods and through the use of temporary barriers. However, it is particularly important for this large-scale construction work to derive an environmentally sound work programme to reduce the likely impacts.

3.6.3.7 The following good site practice should be adopted during the construction phase:

- The contractor should site noisy equipment and activities as far from sensitive receivers as practicable. Also, temporary site offices (and other similar structures) should be located, as far as is possible, such that sensitive receivers could be screened by these structures from the line of sight of the construction areas;
- Intermittent noisy activities should be scheduled to minimize exposure of nearby NSRs to high levels of construction noise. For example, noisy activities could be scheduled at times coinciding with periods when the schools are likely to be unoccupied. Prolonged operation of noisy equipment close to the schools should be avoided;
- Idle equipment should be turned off or throttled down. Noisy equipment should be properly maintained and used no more often than is necessary;
- Construction activities should be planned so that parallel operation of several sets of equipment close to a given receiver is avoided;
- Where possible, the numbers of concurrently operating items of plant should be reduced through sensitive programming; and
- Construction plant should be properly maintained and operated. Construction equipment often has silencing measures built in or added on, e.g. compressor panels, and mufflers. Silencing measures should be properly maintained and utilized.

Mitigation Measures Proposed

3.6.3.8 The following mitigation measures are proposed to be use for SEKD construction activities:

- Level 1 Mitigation Measure – Use of Quiet Plants
- Level 2 Mitigation Measure – Use of Quiet Plants and Acoustic Shielding

3.6.3.9 Results of the construction noise assessment have shown that the proposed Level 1 Mitigation Measure could not fully effective in reducing the construction noise levels at some NSRs to the limits of 75dB(A) and 70dB(A). Level 2 Mitigation Measures would need to be adopted at critical cases.

3.6.3.10 Predicted construction noise levels after the application of Level 2 Mitigation Measures summarised in **Table 3.13** below.

Table 3.13 Construction Noise Level at Noise Sensitive Receivers – Level 2 Mitigation Measures

Noise Sensitive Receivers	Assessment Points	Predicted Range (dBA)	Period Maximum Noise Level Exceeding EIAO-TM standard
Existing NSRs			
Rhythm Gardens	E1 (AP9305)	39-64	No exceedance
Choi hung Estate	E2 (AP9309)	50-72	No exceedance
Richland Gardens	E3 (AP9315)	51-75	No exceedance
San Po Kong Area	E4 (AP9504)	51-75	No exceedance
San Po Kong Area	E5 (AP9507)	51-74	No exceedance
Kowloon City Area	E6 (AP9204)	51-74	No exceedance

Noise Sensitive Receivers	Assessment Points	Predicted Range (dBA)	Period Maximum Noise Level Exceeding EIAO-TM standard
Kowloon City Area	E7(AP9211)	50-70	No exceedance
Kowloon City Area	E8 (AP9216)	50-66	No exceedance
Mok Cheong St.	E9 (AP9118)	51-64	No exceedance
Wyler Gardens	E10 (AP9111)	51-62	No exceedance
Wyler Gardens	E11(AP9123)	49-62	No exceedance
To Kwa Wan Area	E12 (AP9120)	48-60	No exceedance
Laguna City	E13 (AP9401)	40-71	No exceedance
Cha Kwo Ling Area	E14 (AP9406)	39-64	No exceedance
Laguna Verde	E15 (AP9128)	46-75	No exceedance
Future NSRs			
4C & 4E	F1 (AP8109)	53-58	No exceedance
4C & 4E	F2 (AP8153)	53-58	No exceedance
4F & 4L	F3 (AP8202)	54-58	No exceedance
4F & 4L	F4 (AP8295)	54-58	No exceedance
4K	F5 (AP8272)	54-58	No exceedance
4M	F6 (AP8304)	55-59	No exceedance
4R	F7 (AP8336)	55-60	No exceedance
5J	F8 (AP8672)	59	No exceedance
5J	F9 (AP8654)	58	No exceedance
4S	F10 (AP8369)	55-59	No exceedance
4H	F11 (AP8232)	54-55	No exceedance
4G	F12 (AP8212)	51-55	No exceedance
4D	F13 (AP8129)	53-58	No exceedance
4A	F14 (AP8001)	52-58	No exceedance
4J	F15 (AP8252)	55-56	No exceedance
5A	F16 (AP8404)	56-57	No exceedance
5E	F17 (AP8510)	57	No exceedance
5G	F18 (AP8568)	N/A	N/A
5C	F19 (AP8471)	N/A	N/A
5C	F20 (AP8434)	N/A	N/A
4E(School)	F21 (AP7001)	54-58	No exceedance
5J(School)	F22 (AP7304)	58	No exceedance
5L(School)	F23 (AP7404)	58-59	No exceedance
4L(School)	F24 (AP7102)	55-59	No exceedance
4N(School)	F25 (AP7207)	55-60	No exceedance
5K	F26 (AP8702)	N/A	N/A
5K	F27 (AP8731)	N/A	N/A
1E	F28 (AP8454)	N/A	N/A
1E	F29 (AP8401)	N/A	N/A
1E(School)	F30 (AP7311)	52-57	No exceedance
1C(School)	F31 (AP7102)	53-73	Oct 2003 – Mar 2006 (see text for explanation)
2A	F32 (AP8612)	N/A	N/A
2A	F33 (AP8667)	N/A	N/A
2B	F34 (AP8768)	51-66	No exceedance
2C	F35 (AP8808)	51-59	No exceedance
2F	F36 (AP8973)	64-65	No exceedance
2E	F37 (AP8932)	51-64	No exceedance
2D	F38 (AP8903)	52-64	No exceedance
1K	F39 (AP8532)	51-55	No exceedance
1K	F40 (AP8510)	51-55	No exceedance
1K	F41 (AP8505)	51-55	No exceedance
2A(School)	F42 (AP7602)	51-55	No exceedance
2A(School)	F43 (AP7611)	51-55	No exceedance
2B(School)	F44 (AP7707)	51-65	No exceedance
1L(School)	F45 (AP7401)	52-58	No exceedance
1P(School)	F46 (AP7509)	52-59	No exceedance

Note:

- Locations of assessment points are shown in Drawing nos. 22936/EN/280 to 282.
- Where it says N/A in the table, it means that the population intake of the particular site would occur after the construction works, and therefore would not be affected by construction noise.

- 3.6.3.11 With Level 2 Mitigation Measures, minor exceedance of 3dB(A) occurred at AP-F31 (schools at site 1C). This is due to the close proximity of the NSR (1C schools) to the road and drain construction works (WA17 – road and drain works in area 1) that would take place between October 2003 and March 2006. The intake of population of the site is scheduled to occur in 2005. It is anticipated that there should be no overlapping in the schools of site 1C being in use and the construction works of WA17. Road works are expected to complete for access prior to the intake of the schools. However, if overlapping of use of schools and construction works does occur, then the remaining construction works should take place during non-school hours and/or non-school days.
- 3.6.3.12 As a relatively high degree of noise control is required to avoid adverse noise impacts, regular environmental monitoring and audit will be required during the construction phase. The purpose of EM&A will be to examine the effectiveness of all the on-site measures so as to enable the Contractor to be aware of his environmental performance and provide necessary action if the assessment criteria are exceeded. Monitoring will also provide a direct response mechanism for the Project Proponent to manage the Contractor's action in effecting reductions in noise emissions at specific areas. The monitoring requirements are described in the EM&A Manual.

3.7 Potential Impact from Road Traffic

3.7.1 Road Traffic Noise Sources

- 3.7.1.1 Road traffic noise refers to noise generated from vehicles using roads and highways. The proposed road hierarchy in SEKD comprises 3 levels: Trunk Roads, District Distributors and Local Distributors. In this assessment, forecast of traffic flows in year 2031 has been used as a reference for evaluating potential traffic noise impacts. **Table 3.14** also provides an estimate of the influencing distance posed by the major roads in SEKD.

Table 3.14 Indicative Estimate of Setback Distance for Major Roads in NAKTA

Road	Traffic Flow (veh/hr)	Concerned Sites	Setback Distance without Mitigation Measures (m)
Trunk Road T1	1700	1A, 1B, 1C	70
Kwun Tong Bypass (KTP)	6000	1A, 1B, 1C	340
Prince Edward Road East (PER)	12000	1A, 1E, 1K, 2A	750
District Distributors	1300-1500	Various	50

Note: Setback distances presented are for indicative purpose only.

Trunk Roads

- 3.7.1.2 The trunk road system consists of the Central Kowloon Route, Trunk Road T1 and Trunk Road T2. The majority of traffic using trunk roads is through traffic, i.e. traffic for which the destination is not SEKD but just passing through SEKD. So, the trunk road system primarily caters for through regional traffic movements. Slip road connection would be made to Central Kowloon Route via Kai Cheung Road/Kai Fuk Road.

Central Kowloon Route (CKR)

- 3.7.1.3 The CKR connects with the SEKD near the existing Kowloon City Ferry Pier at a level of approximately -23mPD. The road is in a tunnel section before climbing up to the CKR/T2 interchange immediately adjacent to the existing Kai Tak Nullah. The portal of the tunnel would be located outside the Metropolitan Park. At this interchange the CKR has been proposed to be at-grade. At this interchange, the CKR provides direct connections at the