Appendix 4.7 Calculations of Operational Fixed Plant Noise Levels without Mitigation Measures

NSR ID	Description	Representative Assessment Level, mPD [1]	Fixed Plant	SWL / Item, dB(A) [2]	No. of Items [3]	Minimum Horizontal Distance, m	Slant Distance, m	Distance Attenuation, dB(A) [4]	Correction, dB(A)			Sound Pressure Level, dB(A)	Overall Predicted Noise Level, $L_{eq\ (30\text{-}min)}$, dB(A)
									Screening Effect [5]	Façade	Sight Line		
N1a	Hong Kong Baptist Theological Seminary (HKBTS) Staff & Students Quarters	7.8	Submersible pump	88	2	76	76	-46	-20	3	0	28	45
			Mechanically raked screen	89	1	76	76	-46	-20	3	0	26	
			Exhaust fan of deodorising unit (8,600 m³/hr)	83	1	112	112	-49	0	3	-10	27	
			Ventilation fan (34000 m³/hr)	89	1	95	95	-48	0	3	-10	34	
			Transformer	85	1	34	34	-39	-20	3	0	29	
			Ventilation fan (1700 m³/hr)	79	2	46	46	-41	0	3	0	44	
		16.8	Submersible pump	88	2	76	77	-46	-20	3	0	28	44
			Mechanically raked screen	89	1	76	77	-46	-20	3	0	26	
			Exhaust fan of deodorising unit (8,600 m³/hr)	83	1	112	113	-49	0	3	-10	27	
			Ventilation fan (34000 m³/hr)	89	1	95	96	-48	0	3	-10	34	
			Transformer	85	1	34	36	-39	-20	3	0	29	
			Ventilation fan (1700 m³/hr)	79	2	46	47	-42	0	3	0	44	
		22.8	Submersible pump	88	2	76	78	-46	-20	3	0	28	44
			Mechanically raked screen	89	1	76	78	-46	-20	3	0	26	
			Exhaust fan of deodorising unit (8,600 m³/hr)	83	1	112	113	-49	0	3	-10	27	
			Ventilation fan (34000 m³/hr)	89	1	95	97	-48	0	3	-10	34	
			Transformer	85	1	34	38	-40	-20	3	0	28	
			Ventilation fan (1700 m³/hr)	79	2	46	49	-42	0	3	0	43	
N1b	Hong Kong Baptist Theological Seminary (HKBTS) Staff & Students Quarters	7.8	Submersible pump	88	2	68	68	-45	-20	3	0	29	46
			Mechanically raked screen	89	1	68	68	-45	-20	3	0	27	
			Exhaust fan of deodorising unit (8,600 m³/hr)	83	1	101	101	-48	0	3	-10	28	
			Ventilation fan (34000 m³/hr)	89	1	82	82	-46	0	3	-10	36	
			Transformer	85	1	30	30	-37	-20	3	0	31	
			Ventilation fan (1700 m³/hr)	79	2	37	37	-39	0	3	0	46	
		16.8	Submersible pump	88	2	68	69	-45	-20	3	0	29	46
			Mechanically raked screen	89	1	68	69	-45	-20	3	0	27	
			Exhaust fan of deodorising unit (8,600 m³/hr)	83	1	101	102	-48	0	3	-10	28	
			Ventilation fan (34000 m³/hr)	89	1	82	83	-46	0	3	-10	36	
			Transformer	85	1	30	32	-38	-20	3	0	30	
			Ventilation fan (1700 m³/hr)	79	2	37	39	-40	0	3	0	45	
		22.8	Submersible pump	88	2	68	70	-45	-20	3	0	29	46
			Mechanically raked screen	89	1	68	70	-45	-20	3	0	27	
			Exhaust fan of deodorising unit (8,600 m³/hr)	83	1	101	103	-48	0	3	-10	28	
			Ventilation fan (34000 m³/hr)	89	1	82	84	-46	0	3	-10	36	
			Transformer	85	1	30	34	-39	-20	3	0	29	
			Ventilation fan (1700 m³/hr)	79	2	37	41	-40	0	3	0	45	
N2	HKBTS Administration and Education Block	8.1	Submersible pump	88	2	110	110	-49	-20	3	0	25	40
			Mechanically raked screen	89	1	110	110	-49	-20	3	0	23	
			Exhaust fan of deodorising unit (8,600 m³/hr)	83	1	149	149	-51	0	3	-10	25	
			Ventilation fan (34000 m³/hr)	89	1	135	135	-51	0	3	-10	31	
			Transformer	85	1	70	70	-45	-20	3	0	23	
			Ventilation fan (1700 m³/hr)	79	2	84	84	-47	0	3	0	38	
		14.1	Submersible pump	88	2	110	111	-49	-20	3	0	25	40
			Mechanically raked screen	89	1	110	111	-49	-20	3	0	23	
			Exhaust fan of deodorising unit (8,600 m³/hr)	83	1	149	149	-51	0	3	-10	25	
			Ventilation fan (34000 m³/hr)	89	1	135	135	-51	0	3	-10	31	
			Transformer	85	1	70	70	-45	-20	3	0	23	
			Ventilation fan (1700 m³/hr)	79	2	84	85	-47	0	3	0	38	
		20.1	Submersible pump	88	2	110	111	-49	-20	3	0	25	40
			Mechanically raked screen	89	1	110	111	-49	-20	3	0	23	
			Exhaust fan of deodorising unit (8,600 m³/hr)	83	1	149	150	-52	0	3	-10	24	
			Ventilation fan (34000 m³/hr)	89	1	135	136	-51	0	3	-10	31	
			Transformer	85	1	70	71	-45	-20	3	0	23	
			Ventilation fan (1700 m³/hr)	79	2	84	86	-47	0	3	0	38	
N3a	Proposed School with Recreational Area under the Approved Planning Application No. A/MOS/125	9.2	Submersible pump	88	2	72	72	-45	-20	3	0	29	42
			Mechanically raked screen	89	1	72	72	-45	-20	3	0	27	
			Exhaust fan of deodorising unit (8,600 m³/hr)	83	1	108	108	-49	0	3	-10	27	
			Ventilation fan (34000 m³/hr)	89	1	105	105	-48	0	3	-10	34	
			Transformer	85	1	50	50	-42	-20	3	0	26	
			Ventilation fan (1700 m³/hr)	79	2	65	65	-44	0	3	0	41	
		18.2	Submersible pump	88	2	72	73	-45	-20	3	0	29	42
			Mechanically raked screen	89	1	72	73	-45	-20	3	0	27	
			Exhaust fan of deodorising unit (8,600 m³/hr)	83	1	108	109	-49	0	3	-10	27	
			Ventilation fan (34000 m³/hr)	89	1	105	105	-48	0	3	-10	34	
			Transformer	85	1	50	52	-42	-20	3	0	26	
			Ventilation fan (1700 m³/hr)	79	2	65	66	-44	0	3	0	41	
		27.2	Submersible pump	88	2	72	76	-46	-20	3	0	28	42
			Mechanically raked screen	89	1	72	76	-46	-20	3	0	26	
			Exhaust fan of deodorising unit (8,600 m³/hr)	83	1	108	110	-49	0	3	-10	27	
			Ventilation fan (34000 m³/hr)	89	1	105	107	-49	0	3	-10	33	
			Transformer	85	1	50	54	-43	-20	3	0	25	
			Ventilation fan (1700 m³/hr)	79	2	65	69	-45	0	3	0	40	
N3b	Proposed School with Recreational Area under the Approved Planning Application No. A/MOS/125	9.2	Submersible pump	88	2	57	57	-43	-20	3	0	31	42
			Mechanically raked screen	89	1	57	57	-43	-20	3	0	29	
			Exhaust fan of deodorising unit (8,600 m³/hr)	83	1	84	84	-47	0	3	-10	29	
			Ventilation fan (34000 m³/hr)	89	1	83	83	-46	0	3	-10	36	
			Transformer	85	1	64	65	-44	-20	3	0	24	
			Ventilation fan (1700 m³/hr)	79	2	77	77	-46	0	3	0	39	
		18.2	Submersible pump	88	2	57	59	-43	-20	3	0	31	42
			Mechanically raked screen	89	1	57	59	-43	-20	3	0	29	
			Exhaust fan of deodorising unit (8,600 m³/hr)	83	1	84	85	-47	0	3	-10	29	
			Ventilation fan (34000 m³/hr)	89	1	83	84	-46	0	3	-10	36	
			Transformer	85	1	64	66	-44	-20	3	0	24	
			Ventilation fan (1700 m³/hr)	79	2	77	78	-46	0	3	0	39	
		27.2	Submersible pump	88	2	57	61	-44	-20	3	0	30	41
			Mechanically raked screen	89	1	57	61	-44	-20	3	0	28	
			Exhaust fan of deodorising unit (8,600 m³/hr)	83	1	84	87	-47	0	3	-10	29	
			Ventilation fan (34000 m³/hr)	89	1	83	85	-47	0	3	-10	35	
			Transformer	85	1	64	68	-45	-20	3	0	23	
			Ventilation fan (1700 m³/hr)	79	2	77	80	-46	0	3	0	39	
N4	Symphony Bay, Block 11	15.2	Submersible pump	88	2	259	260	-56	-20	3	0	18	31
			Mechanically raked screen	89	1	259	260	-56	-20	3	0	16	
			Exhaust fan of deodorising unit (8,600 m³/hr)	83	1	297	297	-57	0	3	-10	19	
			Ventilation fan (34000 m³/hr)	89	1	290	290	-57	0	3	-10	25	
			Transformer	85	1	228	228	-55	-20	3	0	13	
			Ventilation fan (1700 m³/hr)	79	2	243	243	-56	0	3	0	29	
		24.2	Submersible pump	88	2	259	260	-56	-20	3	0	18	31
			Mechanically raked screen	89	1	259	260	-56	-20	3	0	16	
			Exhaust fan of deodorising unit (8,600 m³/hr)	83	1	297	298	-57	0	3	-10	19	
			Ventilation fan (34000 m³/hr)	89	1	290	291	-57	0	3	-10	25	
			Transformer	85	1	228	229	-55	-20	3	0	13	
			Ventilation fan (1700 m³/hr)	79	2	243	244	-56	0	3	0	29	
		33.2	Submersible pump	88	2	259	261	-56	-20	3	0	18	31
			Mechanically raked screen	89	1	259	261	-56	-20	3	0	16	
			Exhaust fan of deodorising unit (8,600 m³/hr)	83	1	297	299	-58	0	3	-10	18	
			Ventilation fan (34000 m³/hr)	89	1	290	291	-57	0	3	-10	25	
			Transformer	85	1	228	230	-55	-20	3	0	13	
			Ventilation fan (1700 m³/hr)	79	2	243	245	-56	0	3	0	29	
N5	Zessa Vista	7.2	Submersible pump	88	2	233	233	-55	-20	3	0	19	38
			Mechanically raked screen	89	1	233	233	-55	-20	3	0	17	
			Exhaust fan of deodorising unit (8,600 m³/hr)	83	1	252	252	-56	0	3	0	30	
			Ventilation fan (34000 m³/hr)	89	1	233	233	-55	0	3	0	37	
			Transformer	85	1	235	235	-55	-20	3	0	13	
			Ventilation fan (1700 m³/hr)	79	2	239	239	-56	0	3	0	29	
		10.2	Submersible pump	88	2	233	233	-55	-20	3	0	19	38
			Mechanically raked screen	89	1	233	233	-55	-20	3	0	17	
			Exhaust fan of deodorising unit (8,600 m³/hr)	83	1	252	252	-56	0	3	0	30	
			Ventilation fan (34000 m³/hr)	89	1	233	233	-55	0	3	0	37	
			Transformer	85	1	235	235	-55	-20	3	0	13	
			Ventilation fan (1700 m³/hr)	79	2	239	239	-56	0	3	0	29	
		13.2	Submersible pump	88	2	233	233	-55	-20	3	0	19	38
			Mechanically raked screen	89	1	233	233	-55	-20	3	0	17	
			Exhaust fan of deodorising unit (8,600 m³/hr)	83	1	252	252	-56	0	3	0	30	
			Ventilation fan (34000 m³/hr)	89	1	233	233	-55	0	3	0	37	
			Transformer	85	1	235	235	-55	-20	3	0	13	
			Ventilation fan (1700 m³/hr)	79	2	239	240	-56	0	3	0	29	

Notes:

[1] The floor to floor height of the NSR is assumed as 3m and the assessment levels adopted are 1.2m from the floor of the lowest, middle and highest storeys. The noise source is assumed at 5.5mPD.

[2] Refer to **Appendix 4.5** for the references of the adopted SWL for fixed plants.

[3] Standby items are not included in noise assessment.

[4] Distance Attenuation in dB(A) = 20 log D + 8, where D is slant distance in metres.

[5] Noise reduction of 20 dB(A) is assumed for the submersible pumps and mechanically raked screens which will be underground and housed in a 200mm thick reinforced concrete structure and soundproof door.
Noise reduction of 20 dB(A) is assumed for the transformer which will be housed in a 200mm thick reinforced concrete structure and soundproof door.

Appendix 4.7 Calculations of Operational Fixed Plant Noise Levels without Mitigation Measures

Overall Fixed Plant Noise Impact

NSR ID	Description	Land use	Area Sensitivity Rating	Noise Criteria, dB(A) [2]		No. of Storeys	Representative Assessment Level, mPD [1]	Overall Predicted Noise Level, $L_{eq\ (30\text{-}min)}$, dB(A)[2][3]	Exceedance*, dB(A)	
				Daytime & Evening	Night-time				Daytime & Evening	Night-time
N1a	Hong Kong Baptist Theological Seminary (HKBTS) Staff & Students Quarters	Residential	B	44	41	6	8	**45**	1	4
							17	44	0	3
							23	44	0	3
N1b	Hong Kong Baptist Theological Seminary (HKBTS) Staff & Students Quarters	Residential	B	44	41	6	8	**46**	2	5
							17	**46**	2	5
							23	**46**	2	5
N2	HKBTS Administration and Education Block	Education	B	44	N/A [4]	5	8	40	0	N/A[4]
							14	40	0	N/A[4]
							20	40	0	N/A[4]
N3a	Proposed School with Recreational Area under the Approved Planning Application No. A/MOS/125	Education	B	42	N/A [4]	6	9	42	0	N/A[4]
							18	42	0	N/A[4]
							27	42	0	N/A[4]
N3b	Proposed School with Recreational Area under the Approved Planning Application No. A/MOS/125	Education	B	42	N/A [4]	6	9	42	0	N/A[4]
							18	42	0	N/A[4]
							27	41	0	N/A[4]
N4	Symphony Bay, Block 11	Residential	A	44	41	7	15	31	0	0
							24	31	0	0
							33	31	0	0
N5	Zessa Vista	Residential	A	44	41	3	7	38	0	0
							10	38	0	0
							13	38	0	0

Notes:

N/A Not applicable

[1] The floor to floor height of the NSR is assumed as 3m and the assessment levels adopted are 1.2m from the floor of the lowest, middle and highest storeys. The noise source is assumed at 5.5mPD.

[2] The noise criteria adopted are either ANL-5dB(A) in accordance to the IND-TM or the measured background level, whichever lower. Refer to **Appendix 4.1** for detailed determination of Noise Criteria for Operational Fixed Noise Sources. As the proposed SPS would operate 24 hours a day, the more stringent night-time noise criterion was adopted in the assessment.

[3] **Bolded** values denote exceedance of EIAO-TM criteria during daytime & evening; underlined values denote exceedance of EIAO-TM criteria during night-time.

* Operational noise exceedances are predicted at the lowest assessment levels at representative NSR N1a & N1b. Based on the assessment results and distances of the other sensitive façade of the noise sensitive uses and the project site, it is estimated that operational noise exceedance would be expected at the sensitive façades facing the Project site under the unmitigated scenarios, affecting approximately up to <35 flats.

[4] It is assumed that there would be no night-time activities (2300 – 0700 hours) for education institutes. Daytime criterion is adopted for educational institutes.