Annex 5D-1a

Construction Noise Assessment - Predicted Noise Levels from Desalination Plant (Mitigated Scenario)

NSR: TLC1 Village House at Tung Lung Chau

No.	Activity Description	SWL dB(A) [2]	Distance m	Corr. for Distance dB(A) [1][2]	Corr. for façade dB(A)	Predicted Construction Noise Level (dB(A)) Year 1												Year 2												Year 3												Year 4												Year 5												Max. CNL dB(A)
						1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	
	Package A - Desalination Plant																																																																	
4	Site Clearance and Ground Investigation	121	1340	-71	3																			54	54	54	54	54	54																																					
5	Foundation and Pilling	120	1340	-71	3																									52	52	52	52	52	52																													
6	Building Works	116	1340	-71	3																															48	48	48	48	48	48	48	48	48	48	48	48																			
7	Architectural and Landscaping Work	109	1340	-71	3																																											42	42	42	42	42	42													
8	Submarine Intake and Outfall	121	1340	-71	3																									54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54																			
9	Slope Mitigation	107	1340	-71	3																															39	39	39	39	39	39																									
10	E&M Installation, Testing and Commissioning	107	1340	-71	3																																											39	39	39	39	39	39	39	39	39	39	39	39	39	39	39				
	Predicted Noise Level during Daytime Period, dB(A)																							54	54	54	54	54	54	56	56	56	56	56	56	55	55	55	55	55	55	55	55	55	55	55	55	44	44	44	44	44	44	39	39	39	39	39	39	39	39	39				56

Note:

[1] Distance Correction for PMEs = 10*log(2*PI*r^2)

[2] The figures are rounded-up to a whole number.

[3] Distance more than 300m from the works area were not assessed

Annex 5D-1b

Construction Noise Assessment - Predicted Noise Levels from Desalination Plant (Unmitigated Scenario)

NSR: LP1 Lohas Park

No.	Activity Description	SWL dB(A) [2]	Distance m	Corr. for Distance dB(A) [1][2]	Corr. for façade dB(A)
	Package A - Desalination Plant				
4	Site Clearance and Ground Investigation	121	2600	-76	3
5	Foundation and Pilling	120	2600	-76	3
6	Building Works	116	2600	-76	3
7	Architectural and Landscaping Work	109	2600	-76	3
8	Submarine Intake and Outfall	121	2600	-76	3
9	Slope Mitigation	107	2600	-76	3
10	E&M Installation, Testing and Commissioning	107	2600	-76	3

Predicted Construction Noise Level (dB(A))

No.	Year 1												Year 2											
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
4																			48	48	48	48	48	48
5																								
6																								
7																								
8																								
9																								
10																								
Predicted Noise Level during Daytime Period, dB(A)																			48	48	48	48	48	48

No.	Year 3												Year 4											
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
4																								
5	47	47	47	47	47	47																		
6							43	43	43	43	43	43	43	43	43	43	43	43						
7																			36	36	36	36	36	36
8	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48						
9							34	34	34	34	34	34												
10																			34	34	34	34	34	34
Predicted Noise Level during Daytime Period, dB(A)	50	50	50	50	50	50	49	49	49	49	49	49	49	49	49	49	49	49	38	38	38	38	38	38

No.	Year 5												Max. CNL
	1	2	3	4	5	6	7	8	9	10	11	12	dB(A)
4													
5													
6													
7													
8													
9													
10	34	34	34	34	34	34	34	34	34				
Predicted Noise Level during Daytime Period, dB(A)	34	34	34	34	34	34	34	34	34				50

Note:

[1] Distance Correction for PMEs = 10*log(2*PI*r^2)

[2] The figures are rounded-up to a whole number.

Annex 5D-2a: Construction Noise Assessment - Predicted Noise Levels from Mainlaying - Trenching (Unmitigated Scenario)

	NSR Location	EIAO-TM Noise Criteria dB(A)[1]	Activity Description	SWL, dB(A)[4]									Distances from workfronts m[2]	Corr. for distance dB(A)[3][4]	Corr. for screening[5] dB(A)	Corr. for façade dB(A)	Predicted CNL, dB(A)[4][6]							
				Sawcutting pavement a)	Breaking up of pavement b)	Excavation/Shoring c)	Pipe laying d)	Backfilling e)	Reinstatement (concrete) f)	Reinstatement (asphalt) g)	Painting of roading marking h)	Maximum No. of Workfronts					Sawcutting pavement a)	Breaking up of pavement b)	Excavation/Shoring c)	Pipe laying d)	Backfilling e)	Reinstatement (concrete) f)	Reinstatement (asphalt) g)	Painting of roading marking h)
LP1	Lohas Park	75	Section A (Desalination Plant to Shek Kok Rd)	114	105	113	104	107	102	107	86	3	17	-32	0	3	85	76	84	75	78	73	78	57
													58	-43	0	3	74	65	73	64	67	62	67	46
													116	-49	0	3	68	59	67	58	61	56	61	40
																Total CNL	85	76	84	75	78	73	78	57
TB1	The Beaumont	75	Section B (Shek kok Rd to Po Shun Rd)	114	105	113	104	107	102	107	86	4	185	-53	0	3	64	55	63	54	57	52	57	36
													190	-54	0	3	64	55	62	54	57	52	56	36
													190	-54	0	3	64	55	62	54	57	52	56	36
													201	-54	0	3	63	54	62	53	56	51	56	35
																Total CNL	70	61	68	60	63	58	62	42
CSS1	Creative Secondary School	70/65	Section B (Shek kok Rd to Po Shun Rd)	114	105	113	104	107	102	107	86	4	26	-36	0	3	81	72	80	71	74	69	74	53
													40	-40	0	3	77	68	76	67	70	65	70	49
													48	-42	0	3	76	67	74	66	69	64	68	48
													76	-46	0	3	72	63	70	62	65	60	64	44
																Total CNL	84	75	82	74	77	72	76	56
OS1	Oscar by the Sea	75	Section B (Shek kok Rd to Po Shun Rd)	114	105	113	104	107	102	107	86	4	84	-46	0	3	71	62	69	61	64	59	63	43
													92	-47	0	3	70	61	69	60	63	58	63	42
													92	-47	0	3	70	61	69	60	63	58	63	42
													113	-49	0	3	68	59	67	58	61	56	61	40
																Total CNL	76	67	75	66	69	64	69	48
TKOP1	Tseung Kwan O Plaza	75	Section B (Shek kok Rd to Po Shun Rd)	114	105	113	104	107	102	107	86	4	24	-36	0	3	82	73	80	72	75	70	74	54
													48	-42	0	3	76	67	74	66	69	64	68	48
													48	-42	0	3	76	67	74	66	69	64	68	48
													80	-46	0	3	71	62	70	61	64	59	64	43
																Total CNL	84	75	82	74	77	72	76	56
BG1	Beverly Garden	75	Section B (Shek kok Rd to Po Shun Rd)	114	105	113	104	107	102	107	86	4	43	-41	0	3	77	68	75	67	70	65	69	49
													58	-43	0	3	74	65	73	64	67	62	67	46
													63	-44	0	3	73	64	72	63	66	61	66	45
													90	-47	0	3	70	61	69	60	63	58	63	42
																Total CNL	80	71	79	70	73	68	73	52
STE1	Sheung Tak Estate	75	Section B (Shek kok Rd to Po Shun Rd)	114	105	113	104	107	102	107	86	4	29	-37	0	3	80	71	79	70	73	68	73	52
													48	-42	0	3	76	67	74	66	69	64	68	48
													50	-42	0	3	75	66	74	65	68	63	68	47
													82	-46	0	3	71	62	70	61	64	59	64	43
																Total CNL	83	74	81	73	76	71	75	55
KNH1	Kwong Ming Court - Kwong Ning House	75	Section B (Shek kok Rd to Po Shun Rd)	114	105	113	104	107	102	107	86	4	38	-40	0	3	78	69	76	68	71	66	70	50
													55	-43	0	3	75	66	73	65	68	62	67	47
													58	-43	0	3	74	65	73	64	67	62	67	46
													88	-47	0	3	70	61	69	60	64	58	63	42
																Total CNL	81	72	80	71	74	69	74	53
LSTPS1	Leung Sing Tak Primary School	70/65	Section B (Shek kok Rd to Po Shun Rd)	114	105	113	104	107	102	107	86	4	268	-57	0	3	61	52	59	51	54	49	53	33
													285	-57	0	3	60	51	59	50	53	48	53	32
													285	-57	0	3	60	51	59	50	53	48	53	32
													315	-58	0	3	59	50	58	49	52	47	52	31
																Total CNL	66	57	65	56	59	54	59	38
NFP1	Nan Fung Plaza	75	Section B (Shek kok Rd to Po Shun Rd)	114	105	113	104	107	102	107	86	4	298	-57	0	3	60	51	58	50	53	48	52	32
													300	-58	0	3	60	51	58	50	53	48	52	32
													300	-58	0	3	60	51	58	50	53	48	52	32
													305	-58	0	3	60	51	58	50	53	48	52	32
																Total CNL	66	57	64	56	59	54	58	38
SACK1	St. Andrew's Catholic Kindergarten	70/65	Section B (Shek kok Rd to Po Shun Rd)	114	105	113	104	107	102	107	86	4	278	-57	0	3	60	51	59	50	54	48	53	32
													283	-57	0	3	60	51	59	50	53	48	53	32
													283	-57	0	3	60	51	59	50	53	48	53	32
													288	-57	0	3	60	51	59	50	53	48	53	32
																Total CNL	66	57	65	56	59	54	59	38
CKWPS1	POH Chan Kwok Wai Primary School	70/65	Section B (Shek kok Rd to Po Shun Rd)	114	105	113	104	107	102	107	86	4	144	-51	0	3	66	57	65	56	59	54	59	38
													150	-52	0	3	66	57	64	56	59	54	58	38
													150	-52	0	3	66	57	64	56	59	54	58	38
													165	-52	0	3	65	56	64	55	58	53	58	37
																Total CNL	72	63	70	62	65	60	64	44

Annex 5D-2a: Construction Noise Assessment - Predicted Noise Levels from Mainlaying - Trenching (Unmitigated Scenario)

	NSR Location	EIAO-TM Noise Criteria	Activity Description	SWL, dB(A)[4]									Distances from workfronts	Corr. for distance	Corr. for screening[5]	Corr. for façade	Predicted CNL, dB(A)[4][6]							
				Sawcutting pavement	Breaking up of pavement	Excavation/Shoring	Pipe laying	Backfilling	Reinstatement (concrete)	Reinstatement (asphalt)	Painting of roading marking	Maximum No. of Workfronts					Sawcutting pavement	Breaking up of pavement	Excavation/Shoring	Pipe laying	Backfilling	Reinstatement (concrete)	Reinstatement (asphalt)	Painting of roading marking
		dB(A)[1]		a)	b)	c)	d)	e)	f)	g)	h)		m[2]	dB(A)[3][4]	dB(A)	dB(A)	a)	b)	c)	d)	e)	f)	g)	h)
HHCSC1	Haven of Hope Christian Service Chapel	75	Section C (Po Shun Rd to TKOFWPSR)	114	105	113	104	107	102	107	86	3	54	-43	0	3	75	66	73	65	68	63	67	47
													68	-45	0	3	73	64	71	63	66	61	65	45
													70	-45	0	3	72	63	71	62	65	60	65	44
																Total CNL	78	69	77	68	71	66	71	50
DHMC1	Ma Chan Duen Hey Memorial College	70/65	Section C (Po Shun Rd to TKOFWPSR)	114	105	113	104	107	102	107	86	3	100	-48	0	3	69	60	68	59	62	57	62	41
													108	-49	0	3	69	60	67	59	62	57	61	41
													110	-49	0	3	68	59	67	58	62	56	61	40
																Total CNL	74	65	72	64	67	62	66	46
MC1	Metro City	75	Section C (Po Shun Rd to TKOFWPSR)	114	105	113	104	107	102	107	86	3	67	-45	0	3	73	64	71	63	66	61	65	45
													78	-46	0	3	72	63	70	62	65	59	64	44
													80	-46	0	3	71	62	70	61	64	59	64	43
																Total CNL	77	68	75	67	70	65	69	49
VH1	Verbena Heights	75	Section C (Po Shun Rd to TKOFWPSR)	114	105	113	104	107	102	107	86	3	44	-41	0	3	76	67	75	66	70	64	69	48
													60	-44	0	3	74	65	72	64	67	62	66	46
													63	-44	0	3	73	64	72	63	66	61	66	45
																Total CNL	80	71	78	70	73	67	72	52
HSG1	Hong Sing Garden	75	Section C (Po Shun Rd to TKOFWPSR)	114	105	113	104	107	102	107	86	3	201	-54	0	3	63	54	62	53	56	51	56	35
													205	-54	0	3	63	54	62	53	56	51	56	35
													205	-54	0	3	63	54	62	53	56	51	56	35
																Total CNL	68	59	67	58	61	56	61	40
KLC1	King Ling College	70/65	Section C (Po Shun Rd to TKOFWPSR)	114	105	113	104	107	102	107	86	3	272	-57	0	3	61	52	59	51	54	49	53	33
													275	-57	0	3	61	52	59	51	54	48	53	33
													275	-57	0	3	61	52	59	51	54	48	53	33
																Total CNL	65	56	64	55	58	53	58	37
SP1	Senerity Place	75	Section C (Po Shun Rd to TKOFWPSR)	114	105	113	104	107	102	107	86	3	16	-32	0	3	85	76	84	75	78	73	78	57
													45	-41	0	3	76	67	75	66	69	64	69	48
													45	-41	0	3	76	67	75	66	69	64	69	48
																Total CNL	86	77	85	76	79	74	79	58
RT1	Radiant Towers	75	Section C (Po Shun Rd to TKOFWPSR)	114	105	113	104	107	102	107	86	3	41	-40	0	3	77	68	76	67	70	65	70	49
													58	-43	0	3	74	65	73	64	67	62	67	46
													63	-44	0	3	73	64	72	63	66	61	66	45
																Total CNL	80	71	79	70	73	68	73	52
FP1	Finery Park	75	Section C (Po Shun Rd to TKOFWPSR)	114	105	113	104	107	102	107	86	3	49	-42	0	3	76	67	74	66	69	63	68	48
													63	-44	0	3	73	64	72	63	66	61	66	45
													65	-44	0	3	73	64	72	63	66	61	66	45
																Total CNL	79	70	78	69	72	67	72	51
WOG1	Well On Garden	75	Section C (Po Shun Rd to TKOFWPSR)	114	105	113	104	107	102	107	86	3	46	-41	0	3	76	67	75	66	69	64	69	48
													60	-44	0	3	74	65	72	64	67	62	66	46
													60	-44	0	3	74	65	72	64	67	62	66	46
																Total CNL	79	70	78	69	73	67	72	51
PLKLFC1	PLK Laws Foundation College	70/65	Section C (Po Shun Rd to TKOFWPSR)	114	105	113	104	107	102	107	86	3	7	-25	0	3	92	83	91	82	85	80	85	64
													40	-40	0	3	77	68	76	67	70	65	70	49
													40	-40	0	3	77	68	76	67	70	65	70	49
																Total CNL	93	84	91	83	86	81	85	65
KTPS1	TKO Kei Tak Primary School	70/65	Section C (Po Shun Rd to TKOFWPSR)	114	105	113	104	107	102	107	86	3	14	-31	0	3	86	77	85	76	79	74	79	58
													40	-40	0	3	77	68	76	67	70	65	70	49
													43	-41	0	3	77	68	75	67	70	65	69	49
																Total CNL	87	78	86	77	80	75	80	59
CJCLS1	The Church of Jesus Christ of Latter-days Saints	75	Section C (Po Shun Rd to TKOFWPSR)	114	105	113	104	107	102	107	86	3	30	-38	0	3	80	71	78	70	73	68	72	52
													50	-42	0	3	75	66	74	65	68	63	68	47
													50	-42	0	3	75	66	74	65	68	63	68	47
																Total CNL	82	73	81	72	75	70	75	54
PYH1	Po Lam Estate - Po Yan House	75	Section C (Po Shun Rd to TKOFWPSR)	114	105	113	104	107	102	107	86	3	132	-50	0	3	67	58	66	57	60	55	60	39
													138	-51	0	3	67	58	65	57	60	54	59	39
													143	-51	0	3	66	57	65	56	59	54	59	38
																Total CNL	71	62	70	61	64	59	64	43

Annex 5D-2a: Construction Noise Assessment - Predicted Noise Levels from Mainlaying - Trenching (Unmitigated Scenario)

	NSR Location	EIAO-TM Noise Criteria dB(A)[1]	Activity Description	SWL, dB(A)[4]									Distances from workfronts m[2]	Corr. for distance dB(A)[3][4]	Corr. for screening[5] dB(A)	Corr. for façade dB(A)	Predicted CNL, dB(A)[4][6]							
				Sawcutting pavement a)	Breaking up of pavement b)	Excavation/Shoring c)	Pipe laying d)	Backfilling e)	Reinstatement (concrete) f)	Reinstatement (asphalt) g)	Painting of roading marking h)	Maximum No. of Workfronts					Sawcutting pavement a)	Breaking up of pavement b)	Excavation/Shoring c)	Pipe laying d)	Backfilling e)	Reinstatement (concrete) f)	Reinstatement (asphalt) g)	Painting of roading marking h)
TKOV1	TKO Village No. 271	75	Section C (Po Shun Rd to TKOFWPSR)	114	105	113	104	107	102	107	86	3	32	-38	0	3	79	70	78	69	72	67	72	51
													53	-42	0	3	75	66	74	65	68	63	68	47
													65	-44	0	3	73	64	72	63	66	61	66	45
																Total CNL	**81**	**72**	**80**	**71**	**74**	**69**	**74**	**53**
KMC1	King Ming Court	75	Section C (Po Shun Rd to TKOFWPSR)	114	105	113	104	107	102	107	86	3	21	-34	0	3	83	74	81	73	76	71	75	55
													30	-38	0	3	80	71	78	70	73	68	72	52
													35	-39	0	3	78	69	77	68	72	66	71	50
																Total CNL	**86**	**77**	**84**	**76**	**79**	**73**	**78**	**58**
TLE1	Tsui Lam Estate	75	Section C (Po Shun Rd to TKOFWPSR)	114	105	113	104	107	102	107	86	3	21	-34	0	3	83	74	81	73	76	71	75	55
													45	-41	0	3	76	67	75	66	69	64	69	48
													48	-42	0	3	76	67	74	66	69	64	68	48
																Total CNL	**84**	**75**	**83**	**74**	**77**	**72**	**77**	**56**
SCPS1	School of Continuing and Professional Studies - CUHK (Tseung Kwan O Learning Centre)	70/65	Section C (Po Shun Rd to TKOFWPSR)	114	105	113	104	107	102	107	86	3	16	-32	0	3	85	76	84	75	78	73	78	57
													30	-38	0	3	80	71	78	70	73	68	72	52
													40	-40	0	3	77	68	76	67	70	65	70	49
																Total CNL	**87**	**78**	**85**	**77**	**80**	**75**	**79**	**59**
YC1	Youth College (Tseung Kwan O)	70/65	Section C (Po Shun Rd to TKOFWPSR)	114	105	113	104	107	102	107	86	3	34	-39	0	3	79	70	77	69	72	67	71	51
													55	-43	0	3	75	66	73	65	68	62	67	47
													55	-43	0	3	75	66	73	65	68	62	67	47
																Total CNL	**81**	**72**	**80**	**71**	**74**	**69**	**74**	**53**
HCMS1	Hong Chi Morninghill School Tsui Lam	70/65	Section C (Po Shun Rd to TKOFWPSR)	114	105	113	104	107	102	107	86	3	66	-44	0	3	73	64	72	63	66	61	66	45
													85	-47	0	3	71	62	69	61	64	59	63	43
													90	-47	0	3	70	61	69	60	63	58	63	42
																Total CNL	**76**	**67**	**75**	**66**	**69**	**64**	**69**	**48**
LP2	Lohas Park - Block 9	75	Section A (Desalination Plant to Shek Kok Rd)	114	105	113	104	107	102	107	86	3	48	-42	0	3	76	67	74	66	69	64	68	48
													81	-46	0	3	71	62	70	61	64	59	64	43
													119	-49	0	3	68	59	66	58	61	56	60	40
																Total CNL	**77**	**68**	**76**	**67**	**71**	**65**	**70**	**49**

Notes:

[1] 70/65 Noise criteria during normal school days / examination period
[2] Distance more than 300m from the works area were not assessed
[3] Distance Correction for PMEs = $10*\log(2*PI*r^2)$
[4] The figures are rounded to a whole number.
[5] A negative correction of -10dB(A) is applied to the NSR when the whole construction workfront will not be visible when viewed from the assessment point.
[6] Predicted Noise Level exceeded the corresponding EIAO-TM noise criteria. **76** **66**

Annex 5D-2b: Construction Noise Assessment - Predicted Noise Levels from Mainlaying - Trenchless (Unmitigated Scenario)

NSR	NSR Location	Pipe jacking SWL [3]	Closest pipe jacking works area	Distance to pipe jacking works area[3]	Correction for distance [2]	Correction for screening	Correction for façade	Predicted CNL, dB(A) [1][3][4]
LP1	Lohas Park Tower 1	115	Pipe Jacking Works Area 3	72	-45	0	3	73
		115	Pipe Jacking Works Area 4	270	-57	0	3	61
							Total CNL	**73**
KMC1	King Ming Court	115	Pipe Jacking Works Area 5	23	-35	0	3	83
LP2	Lohas Park Tower 9	115	Pipe Jacking Works Area 4	40	-40	0	3	78
		115	Pipe Jacking Works Area 3	266	-56	0	3	61
							Total CNL	**78**

Notes:

[1] 70/65 Noise criteria during normal school days / examination period

[2] Distance Correction for PMEs = $10*\log(2*PI*r^2)$

[3] The figures are rounded to a whole number.

[4] **76** Predicted Noise Level exceeded the corresponding EIAO-TM noise criteria.

Annex 5D-3: Construction Noise Assessment - Predicted Maximum Cumulative Noise Levels from Mainlaying, Construction of Desalination Plant, Cross Bay Link and TKO Area 86 (Without Mitigation)

	NSR Location	EIAO-TM Noise Criteria	Predicted CNL, dB(A)[2][3][4]											Predicted Maximum Cumulative CNL, dB(A)[2][3][4]								
			Mainlaying									Desalination Plant	Cross Bay Link and TKO Area 86[5]	Mainlaying, Desalination Plant, Cross Bay Link and TKO Area 86								
			Sawcutting pavement	Breaking up of pavement	Excavation/ Shoring	Pipe laying	Backfilling	Reinstatement (concrete)	Reinstatement (asphalt)	Painting of roading marking	Pipe jacking (trenchless)			Sawcutting pavement	Breaking up of pavement	Excavation/ Shoring	Pipe laying	Backfilling	Reinstatement (concrete)	Reinstatement (asphalt)	Painting of roading marking	Pipe jacking (trenchless)
		dB(A)[1]	a)	b)	c)	d)	e)	f)	g)	h)	i)			a)	b)	c)	d)	e)	f)	g)	h)	i)
LP1	Lohas Park	75	85	76	84	75	78	73	78	57	73	50	67	85	77	84	76	79	74	78	68	74

Notes:

[1] 70/65 Noise criteria during normal school days / examination period

[2] Distance Correction for PMEs = $10*\log(2*PI*r^2)$

[3] The figures are rounded to a whole number.

[4] **76** Predicted Noise Level exceeded the corresponding EIAO-TM noise criteria.

[5] Noise impact from Cross Bay Link and TKO Area 86 Development is taken from *Section 6* of the approved *Cross Bay Link EIA report AEIAR-172/2013*

Annex 5D-4a Ground-borne noise calculation for King Ming Court:

NSR	King Ming Court			
Item	Description			
a	PPV at 10m (Drainage Improvement in Tsuen Wan, Kwai Chung, & Tsing Yi - Tsuen Wan Drainage Tunnel)		=	1.1 mm/s
b	100% PPV at 10m (based on the TBM used for Drainage Tunnel)		=	1.1 mm/s
c	Conversion the Velocity from PPV to RMS		=	0.275 mm/s
d	Vivbration Velocity (ref. 10^-6 m/s)		= =	20 log(V/Vref) 109 dB
e	Distance Attenuation r=	23 m	= =	-20*log(r/r0) -7 dB
f	Soil Damping Loss (Assume zero)		=	0 dB
g	Building Coupling Loss (at 63Hz to 250 Hz)		=	-12 dB
h	Floor to floor attenuation		=	-1 dB
i	Conversion from Vibration to Noise		=	-27 dB
j	Conversion from Linear to A-weighted Noise		=	-20 dB
k	Predicted Noise Level (Groundborne) (d+e+f+g+h+i+j)		=	42 dB(A)
		Criterion	=	65 dB(A)

Annex 5D-4b Calculation of minimum separation between NSR and the micro-TBM:

a) For Domestic Premises and Temple

Item	Description			
a	PPV at 10m (Drainage Improvement in Tsuen Wan, Kwai Chung, & Tsing Yi - Tsuen Wan Drainage Tunnel)	=	1.1	mm/s
b	100% PPV at 10m (based on the TBM used for Drainage Tunnel)	=	1.1	mm/s
c	Conversion the Velocity from PPV to RMS	=	0.275	mm/s
d	Vivbration Velocity (ref. 10^-6 m/s)	=	20 log(V/Vref)	
		=	109	dB
e	Distance Attenuation	=	-20*log(r/r0)	
	r= 5 m	=	6	dB
f	Soil Damping Loss (Assume zero)	=	0	dB
g	Building Coupling Loss (at 63Hz to 250 Hz)	=	-12	dB
h	Floor to floor attenuation	=	-1	dB
i	Conversion from Vibration to Noise	=	-27	dB
j	Conversion from Linear to A-weighted Noise	=	-20	dB
k	Safety Factor	=	10	dB(A)
l	Predicted Noise Level (Groundborne) (d+e+f+g+h+i+j+k)	=	65	dB(A)
	Criterion for ground-borne noise	=	65	dB(A)

b) For Educational Institutions (Normal Period)

Item	Description			
a	PPV at 10m (Drainage Improvement in Tsuen Wan, Kwai Chung, & Tsing Yi - Tsuen Wan Drainage Tunnel)	=	1.1	mm/s
b	100% PPV at 10m (based on the TBM used for Drainage Tunnel)	=	1.1	mm/s
c	Conversion the Velocity from PPV to RMS	=	0.275	mm/s
d	Vivbration Velocity (ref. 10^-6 m/s)	=	20 log(V/Vref)	
		=	109	dB
e	Distance Attenuation	=	-20*log(r/r0)	
	r= 12 m	=	-2	dB
f	Soil Damping Loss (Assume zero)	=	0	dB
g	Building Coupling Loss (at 63Hz to 250 Hz)	=	-12	dB
h	Floor to floor attenuation	=	-1	dB
i	Conversion from Vibration to Noise	=	-24	dB
j	Conversion from Linear to A-weighted Noise	=	-20	dB
k	Safety Factor	=	10	dB(A)
l	Predicted Noise Level (Groundborne) (d+e+f+g+h+i+j+k)	=	60	dB(A)
	Criterion for ground-borne noise	=	60	dB(A)

c) For Educational Institutions (During examination)

Item	Description			
a	PPV at 10m (Drainage Improvement in Tsuen Wan, Kwai Chung, & Tsing Yi - Tsuen Wan Drainage Tunnel)	=	1.1	mm/s
b	100% PPV at 10m (based on the TBM used for Drainage Tunnel)	=	1.1	mm/s
c	Conversion the Velocity from PPV to RMS	=	0.275	mm/s
d	Vivbration Velocity (ref. 10^-6 m/s)	=	20 log(V/Vref)	
		=	109	dB
e	Distance Attenuation	=	-20*log(r/r0)	
	r= 23 m	=	-7	dB
f	Soil Damping Loss (Assume zero)	=	0	dB

g	Building Coupling Loss (at 63Hz to 250 Hz)	=	-12	dB
h	Floor to floor attenuation	=	-1	dB
i	Conversion from Vibration to Noise	=	-24	dB
j	Conversion from Linear to A-weighted Noise	=	-20	dB
k	Safety Factor	=	10	dB(A)
l	Predicted Noise Level (Groundborne) (d+e+f+g+h+i+j+k)	=	55	dB(A)
	Criterion for ground-borne noise	=	55	dB(A)