

Appendix 4-8

Calculation of Construction Noise Impact Assessment (Unmitigated Scenario)

Appendix 4-8-1 Summary Table of Calculated Construction Noise Level at NSRs (Unmitigated Scenario)

NSR Label	Descriptions	Construction Noise Level from Each Work Group						Cumulative Construction Noise Due to Concurrent Works				Highest Noise Level, dB(A)	Noise Criteria, dB(A)
		A	B	C	D	E	F	A+F	B+D	B+E	C+E		
		Site Formation, Filling and Excavation	Construction of Underground Services and Utilities	Road works	Foundation	Superstructure	Dump Trucks Travelling on Haul Road						
Existing NSRs													
N1	Fairview Park	72	70	66	68	69	67	73	72	73	71	73	75
N2	Fairview Park	72	70	66	68	69	67	73	72	72	70	73	75
N3	Fairview Park	77	75	71	73	74	70	78	77	77	76	78	75
N4	Fairview Park	78	76	72	74	75	70	78	78	78	77	78	75
N5	Fairview Park	72	70	66	68	69	67	73	72	73	71	73	75
N6	Chuk Yuen Tsuen	73	71	67	69	70	67	74	73	73	71	74	75
N7	Chuk Yuen Tsuen	72	70	66	68	69	67	73	72	73	71	73	75
N8	Bethel High School	76	74	70	72	73	69	76	76	76	74	76	70 (65 during examination)
N9	Helene Terrace	80	78	74	76	77	71	81	80	81	79	81	75
N10	Villa Camllia	79	77	73	75	76	71	80	79	80	78	80	75
N11	Fairview Park	75	73	69	71	72	68	76	75	75	73	76	75
N12	Wong Chan Sook Ying Memorial School	74	72	68	70	71	68	75	74	75	73	75	70 (65 during examination)
N13	Man Yuen Tsuen	75	73	69	71	72	68	76	75	75	73	76	75
N14	Chuk Yuen Tsuen	73	71	67	69	70	68	74	73	74	72	74	75
N15	Hang Fook Garden	74	72	68	70	71	68	75	74	75	73	75	75
N16	Ha San Wai	74	72	68	70	71	68	75	74	75	73	75	75
N17	Ha San Wai	73	71	67	69	70	68	74	74	74	72	74	75
Planned NSRs													
N1P	Planned Development at REC Site	77	75	71	73	74	69	78	77	77	76	78	75
N2P	Planned Development at REC Site	80	78	74	76	77	71	81	80	81	79	81	75
N3P	Planned Development at RD Site	84	82	78	80	81	73	84	84	85	83	85	75
V1P	Village Zone Development	84	82	78	80	81	73	84	84	84	82	84	75
V2P	Planned R(D) Zone	87	85	81	83	84	75	87	87	88	86	88	75
V3P	Planned R(D) Zone	82	80	76	78	79	72	82	82	82	81	82	75
V4P	Planned "V" Zone	87	85	81	83	84	75	87	87	88	86	88	75

**Appendix 4-8-2 Plant Inventory and Calculated SWLs for Construction Noise
Impact Assessment for Planned Kam Pok Road Site (Unmitigated)**

		PMEs Inventory - Unmitigated						Highest SWL of Each Construction Activity, dB(A) @		
Construction Activity	Sub. Work Group	Powered Mechanical Equipment	TM Ref.	SWL per unit, dB(A)	Qty	Total, SWL	Total SWL, dB(A)			
(A) Site Formation, Filling and Excavation	A1 Excavation and Filling	Air Compressor	CNP003	104	2	107	127	127		
		Breaker, Excavator mounted	CNP027	122	2	125				
		Excavator	CNP081	112	3	117				
		Generator, Standard	CNP101	108	3	113				
		Dump Truck	CNP067	117	2	120				
	A2 Ground Compression	Roller, vibratory	CNP186	108	2	111	119			
		Bulldozer	CNP030	115	2	118				
(B) Construction of Underground Services and Utilities	B1 Earthwork	Breaker, Excavator mounted	CNP027	122	1	122	125	125		
		Dump Truck	CNP067	117	2	120				
		Excavator	CNP081	112	2	115				
	B2 Utilities laying	Air Compressor	CNP003	104	2	107	115			
		Generator, Standard	CNP101	108	2	111				
		Lorry	CNP141	112	1	112				
		Water Pump, Submersible (Electric)	CNP283	85	2	88				
	B3 Ground reinstatement	Concrete Lorry Mixer	CNP044	109	1	109	116			
		Power Rammer (Petrol)	CNP169	108	1	108				
		Poker, Vibratory, Hand-held	CNP170	113	1	113				
		Roller, Vibratory	CNP186	108	1	108				
	(C) Road Works	C1 Earthwork	Dump Truck	CNP067	117	2	120		121	121
Excavator			CNP081	112	1	112				
C2 Concreting Works		Concrete Lorry Mixer	CNP044	109	2	112	118			
		Generator, Standard	CNP101	108	2	111				
		Poker, Vibratory, Hand-held	CNP170	113	2	116				
C3 Road Finishing		Air Compressor	CNP003	104	2	107	119			
		Asphalt Paver	CNP004	109	2	112				
		Generator, Standard	CNP101	108	2	111				
		Lorry	CNP141	112	2	115				
		Power Rammer (Petrol)	CNP169	108	1	108				
		Road Roller	CNP185	108	1	108				
(D) Foundation		D1 General foundation construction	Air Compressor	CNP003	104	5	111	123	123	
			Bar bender and cutter (electric)	CNP021	90	5	97			
	Mobile Crane		CNP048	112	3	117				
	Generator, standard		CNP101	108	4	114				
	Lorry		CNP141	112	2	115				
	Drill/grinder, hand-held (electric)		CNP065	98	4	104				
	Excavator		CNP081	112	3	117				
	Saw, circular, wood		CNP201	108	4	114				
	Water pump, submersible (electric)	CNP283	85	4	91					
	D2 Piling works	Generator, standard	CNP101	108	4	114	119			
		Non-percussive piling machine	**	115	2	118				

		PMEs Inventory - Unmitigated						
Construction Activity	Sub. Work Group	Powered Mechanical Equipment	TM Ref.	SWL per unit, dB(A)	Qty	Total, SWL	Total SWL, dB(A)	Highest SWL of Each Construction Activity, dB(A) [@]
	D3	Concreting Works						
		Concrete Lorry Mixer	CNP044	109	3	114	120	
		Generator, standard	CNP101	108	4	114		
		Poker, vibratory, hand-held	CNP170	113	3	118		
(E) Superstructure	E1	General construction works						
		Air Compressor	CNP003	104	6	112	121	124
		Bar bender and cutter (electric)	CNP021	90	9	100		
		Mobile Crane	CNP048	112	3	117		
		Drill/grinder, hand-held (electric)	CNP065	98	10	108		
		Generator, standard	CNP101	108	4	114		
		Saw, circular, wood	CNP201	108	7	116		
	E2	Concreting works						
		Concrete Lorry Mixer	CNP044	109	8	118	124	
		Concrete Pump	CNP047	109	4	115		
		Generator, standard	CNP101	108	4	114		
		Poker, vibratory, hand-held	CNP170	113	7	121		
(F) Dump Trucks Travelling on Haul Road During Site Formation	F	Dump Trucks Travelling on Haul Road						
		Dump Truck (Moving along Haul Road)	CNP067	117	8	126	126	126

Note:

[@] The highest SWL calculated for each Construction Activity for construction noise impact assessment. Each Construction Activity has been divided into several sub. work groups based on the sequence of construction works. Construction activities of respective sub-work groups under each Construction Activity will not overlap with one another.

The above plant inventory has been based on assumption and plant inventory of similar development project.
^{**} Non-percussive type piling machine will be used, subject to the detailed design stage the exact type of non-percussive piling machine will be proposed. To be conservative, noise level of commonly used non-percussive piling machines according to the Technical Memorandum on Noise From Construction Work Other Than Percussive Piling, has been used for noise calculation

Appendix 4-8-3 Calculation of Construction Noise Level (Unmitigated Scenario)

NSR	Construction Activity	Total SWL, dB(A)	Dist. (NSR to Site Boundary) (A), m	Dist. (Site Boundary to Notional Source) (B), m	Horz. Distance (= A+B), m	Dist. Corr., dB(A)	Façade Corr., dB(A)	CNL, dB(A)
N1	A Site Formation, Filling and Excavation	127	272	43	315	-57.9	3.0	72
	B Construction of Underground Services and Utilities	125	272	43	315	-57.9	3.0	70
	C Road works	121	272	43	315	-57.9	3.0	66
	D Foundation	123	272	43	315	-57.9	3.0	68
	E Superstructure	124	272	43	315	-57.9	3.0	69
N2	A Site Formation, Filling and Excavation	127	286	42	328	-58.3	3.0	72
	B Construction of Underground Services and Utilities	125	286	42	328	-58.3	3.0	70
	C Road works	121	286	42	328	-58.3	3.0	66
	D Foundation	123	286	42	328	-58.3	3.0	68
	E Superstructure	124	286	42	328	-58.3	3.0	69
N3	A Site Formation, Filling and Excavation	127	130	50	180	-53.1	3.0	77
	B Construction of Underground Services and Utilities	125	130	50	180	-53.1	3.0	75
	C Road works	121	130	50	180	-53.1	3.0	71
	D Foundation	123	130	50	180	-53.1	3.0	73
	E Superstructure	124	130	50	180	-53.1	3.0	74
N4	A Site Formation, Filling and Excavation	127	112	50	162	-52.2	3.0	78
	B Construction of Underground Services and Utilities	125	112	50	162	-52.2	3.0	76
	C Road works	121	112	50	162	-52.2	3.0	72
	D Foundation	123	112	50	162	-52.2	3.0	74
	E Superstructure	124	112	50	162	-52.2	3.0	75
N5	A Site Formation, Filling and Excavation	127	257	50	307	-57.7	3.0	72
	B Construction of Underground Services and Utilities	125	257	50	307	-57.7	3.0	70
	C Road works	121	257	50	307	-57.7	3.0	66
	D Foundation	123	257	50	307	-57.7	3.0	68
	E Superstructure	124	257	50	307	-57.7	3.0	69
N6	A Site Formation, Filling and Excavation	127	242	50	292	-57.3	3.0	73
	B Construction of Underground Services and Utilities	125	242	50	292	-57.3	3.0	71
	C Road works	121	242	50	292	-57.3	3.0	67
	D Foundation	123	242	50	292	-57.3	3.0	69
	E Superstructure	124	242	50	292	-57.3	3.0	70
N7	A Site Formation, Filling and Excavation	127	262	50	312	-57.9	3.0	72
	B Construction of Underground Services and Utilities	125	262	50	312	-57.9	3.0	70
	C Road works	121	262	50	312	-57.9	3.0	66
	D Foundation	123	262	50	312	-57.9	3.0	68
	E Superstructure	124	262	50	312	-57.9	3.0	69
N8	A Site Formation, Filling and Excavation	127	163	50	213	-54.5	3.0	76
	B Construction of Underground Services and Utilities	125	163	50	213	-54.5	3.0	74
	C Road works	121	163	50	213	-54.5	3.0	70
	D Foundation	123	163	50	213	-54.5	3.0	72
	E Superstructure	124	163	50	213	-54.5	3.0	73
N9	A Site Formation, Filling and Excavation	127	72	50	122	-49.7	3.0	80
	B Construction of Underground Services and Utilities	125	72	50	122	-49.7	3.0	78
	C Road works	121	72	50	122	-49.7	3.0	74
	D Foundation	123	72	50	122	-49.7	3.0	76
	E Superstructure	124	72	50	122	-49.7	3.0	77
N10	A Site Formation, Filling and Excavation	127	86	50	136	-50.7	3.0	79
	B Construction of Underground Services and Utilities	125	86	50	136	-50.7	3.0	77
	C Road works	121	86	50	136	-50.7	3.0	73
	D Foundation	123	86	50	136	-50.7	3.0	75
	E Superstructure	124	86	50	136	-50.7	3.0	76
N11	A Site Formation, Filling and Excavation	127	183	50	233	-55.3	3.0	75
	B Construction of Underground Services and Utilities	125	183	50	233	-55.3	3.0	73
	C Road works	121	183	50	233	-55.3	3.0	69
	D Foundation	123	183	50	233	-55.3	3.0	71
	E Superstructure	124	183	50	233	-55.3	3.0	72
N12	A Site Formation, Filling and Excavation	127	200	50	250	-55.9	3.0	74
	B Construction of Underground Services and Utilities	125	200	50	250	-55.9	3.0	72
	C Road works	121	200	50	250	-55.9	3.0	68
	D Foundation	123	200	50	250	-55.9	3.0	70
	E Superstructure	124	200	50	250	-55.9	3.0	71
N13	A Site Formation, Filling and Excavation	127	186	50	236	-55.4	3.0	75
	B Construction of Underground Services and Utilities	125	186	50	236	-55.4	3.0	73
	C Road works	121	186	50	236	-55.4	3.0	69
	D Foundation	123	186	50	236	-55.4	3.0	71
	E Superstructure	124	186	50	236	-55.4	3.0	72
N14	A Site Formation, Filling and Excavation	127	231	50	281	-57.0	3.0	73
	B Construction of Underground Services and Utilities	125	231	50	281	-57.0	3.0	71
	C Road works	121	231	50	281	-57.0	3.0	67
	D Foundation	123	231	50	281	-57.0	3.0	69
	E Superstructure	124	231	50	281	-57.0	3.0	70
N15	A Site Formation, Filling and Excavation	127	202	50	252	-56.0	3.0	74
	B Construction of Underground Services and Utilities	125	202	50	252	-56.0	3.0	72
	C Road works	121	202	50	252	-56.0	3.0	68
	D Foundation	123	202	50	252	-56.0	3.0	70
	E Superstructure	124	202	50	252	-56.0	3.0	71
N16	A Site Formation, Filling and Excavation	127	194	50	244	-55.7	3.0	74
	B Construction of Underground Services and Utilities	125	194	50	244	-55.7	3.0	72
	C Road works	121	194	50	244	-55.7	3.0	68
	D Foundation	123	194	50	244	-55.7	3.0	70
	E Superstructure	124	194	50	244	-55.7	3.0	71
N17	A Site Formation, Filling and Excavation	127	221	48	269	-56.6	3.0	73
	B Construction of Underground Services and Utilities	125	221	48	269	-56.6	3.0	71
	C Road works	121	221	48	269	-56.6	3.0	67
	D Foundation	123	221	48	269	-56.6	3.0	69
	E Superstructure	124	221	48	269	-56.6	3.0	70
N1P	A Site Formation, Filling and Excavation	127	133	50	183	-53.2	3.0	77
	B Construction of Underground Services and Utilities	125	133	50	183	-53.2	3.0	75
	C Road works	121	133	50	183	-53.2	3.0	71
	D Foundation	123	133	50	183	-53.2	3.0	73
	E Superstructure	124	133	50	183	-53.2	3.0	74
N2P	A Site Formation, Filling and Excavation	127	74	50	124	-49.9	3.0	80
	B Construction of Underground Services and Utilities	125	74	50	124	-49.9	3.0	78

NSR	Construction Activity		Total SWL, dB(A)	Dist. (NSR to Site Boundary) (A), m	Dist. (Site Boundary to Notional Source) (B), m	Horz. Distance (= A+B), m	Dist. Corr., dB(A)	Façade Corr., dB(A)	CNL, dB(A)
	C	Road works	121	74	50	124	-49.9	3.0	74
	D	Foundation	123	74	50	124	-49.9	3.0	76
	E	Superstructure	124	74	50	124	-49.9	3.0	77
N3P	A	Site Formation, Filling and Excavation	127	30	50	80	-46.0	3.0	84
	B	Construction of Underground Services and Utilities	125	30	50	80	-46.0	3.0	82
	C	Road works	121	30	50	80	-46.0	3.0	78
	D	Foundation	123	30	50	80	-46.0	3.0	80
	E	Superstructure	124	30	50	80	-46.0	3.0	81
V1P	A	Site Formation, Filling and Excavation	127	32	50	82	-46.3	3.0	84
	B	Construction of Underground Services and Utilities	125	32	50	82	-46.3	3.0	82
	C	Road works	121	32	50	82	-46.3	3.0	78
	D	Foundation	123	32	50	82	-46.3	3.0	80
	E	Superstructure	124	32	50	82	-46.3	3.0	81
V2P	A	Site Formation, Filling and Excavation	127	6	50	56	-42.9	3.0	87
	B	Construction of Underground Services and Utilities	125	6	50	56	-42.9	3.0	85
	C	Road works	121	6	50	56	-42.9	3.0	81
	D	Foundation	123	6	50	56	-42.9	3.0	83
	E	Superstructure	124	6	50	56	-42.9	3.0	84
V3P	A	Site Formation, Filling and Excavation	127	52	50	102	-48.2	3.0	82
	B	Construction of Underground Services and Utilities	125	52	50	102	-48.2	3.0	80
	C	Road works	121	52	50	102	-48.2	3.0	76
	D	Foundation	123	52	50	102	-48.2	3.0	78
	E	Superstructure	124	52	50	102	-48.2	3.0	79
V4P	A	Site Formation, Filling and Excavation	127	26	30	56	-42.9	3.0	87
	B	Construction of Underground Services and Utilities	125	26	30	56	-42.9	3.0	85
	C	Road works	121	26	30	56	-42.9	3.0	81
	D	Foundation	123	26	30	56	-42.9	3.0	83
	E	Superstructure	124	26	30	56	-42.9	3.0	84

Remark: ** Distance is based on shortest horizontal distance.

The notional noise source location is assumed based on the methodology listed in the statutory Technical Memorandum on Noise from Construction work other than Percussive Piling and that used in the approved EIA report for Wo Shan Wai. It has been assumed that all PME items are operating and gathered within a worksite for a conservative assessment.

Calculation of Noise Level Due to Travelling of Dump Truck within the Project Construction Area During Site Formation, Filling and Excavation Stage

NSR		Construction Activity	No. of Trucks/hr.	SWL per Unit, dB(A)	Horz. Distance From NSR, m	Average Speed, km/hr	Calculated LAeq Due to Travelling of Dump Truck, dB(A) @
N1	F	Dump Trucks Travelling on Haul Road	8	126	315	10	67
N2	F	Dump Trucks Travelling on Haul Road	8	126	328	10	67
N3	F	Dump Trucks Travelling on Haul Road	8	126	180	10	70
N4	F	Dump Trucks Travelling on Haul Road	8	126	162	10	70
N5	F	Dump Trucks Travelling on Haul Road	8	126	307	10	67
N6	F	Dump Trucks Travelling on Haul Road	8	126	292	10	67
N7	F	Dump Trucks Travelling on Haul Road	8	126	312	10	67
N8	F	Dump Trucks Travelling on Haul Road	8	126	213	10	69
N9	F	Dump Trucks Travelling on Haul Road	8	126	122	10	71
N10	F	Dump Trucks Travelling on Haul Road	8	126	136	10	71
N11	F	Dump Trucks Travelling on Haul Road	8	126	233	10	68
N12	F	Dump Trucks Travelling on Haul Road	8	126	250	10	68
N13	F	Dump Trucks Travelling on Haul Road	8	126	236	10	68
N14	F	Dump Trucks Travelling on Haul Road	8	126	281	10	68
N15	F	Dump Trucks Travelling on Haul Road	8	126	252	10	68
N16	F	Dump Trucks Travelling on Haul Road	8	126	244	10	68
N17	F	Dump Trucks Travelling on Haul Road	8	126	269	10	68
N1P	F	Dump Trucks Travelling on Haul Road	8	126	183	10	69
N2P	F	Dump Trucks Travelling on Haul Road	8	126	124	10	71
N3P	F	Dump Trucks Travelling on Haul Road	8	126	80	10	73
V1P	F	Dump Trucks Travelling on Haul Road	8	126	82	10	73
V2P	F	Dump Trucks Travelling on Haul Road	8	126	56	10	75
V3P	F	Dump Trucks Travelling on Haul Road	8	126	102	10	72
V4P	F	Dump Trucks Travelling on Haul Road	8	126	56	10	75

Remark: * According to information available at EPD website: http://www.epd.gov.hk/epd/english/application_for_licences/guidance/files/OtherSWLe.pdf

@ Based on equation in the British Standard "Noise Control on Construction and Open Sites, BS 5228: Part 1: 2009": $LA_{eq} = SWL - 33 + 10\log_{10} Q - 10\log_{10} V - 10\log_{10} D$

Where,

SWL = Sound Power Level of the dump truck

Q is the number of vehicles per hour

V is the average speed (10 km/hr)

D is the distance of receiver position from the haul road (m) (the horizontal distance between the receiver position and the construction notional noise source is taken in this noise assessment)