

Appendix 4-5

Estimated Construction Noise Levels Due to Planned RD Site

Appendix 4-5-2 Summary Table of Calculated Construction Noise Level at NSRs (Mitigated Scenario with QPMEs and Movable Noise Barriers)

NSR Label	Descriptions	Construction Noise Level from Each Work Group							Cumulative		Highest Noise Level, dB(A)	Noise Criteria, dB(A)
		A	B	C	D	E	F	G	A+G+F	B+C		
		Site Formation, Filling and Excavation	Construction of Underground Services and Utilities	Road works	Foundation	Superstructure	Sub-structure (Pile Cap)	Dump Trucks Travelling on Haul Road				
Existing NSRs												
N9	Fairview Park	60	58	60	62	58	58	58	64	62	64	75
N4	Fairview Park	58	56	58	60	56	56	57	62	60	62	75
N5	Yau Mei San Tsuen	61	59	61	63	59	59	59	65	63	65	75
N12	Chuk Yuen Tsuen	73	71	73	75	71	71	65	75	75	75	75
N13	Chuk Yuen Tsuen	72	70	72	74	70	70	64	74	74	74	75
N3	Fairview Park	58	56	58	60	56	56	57	62	60	62	75
N6	Palm Springs	53	51	53	55	51	51	55	58	55	58	75
N7	Temp. house at Yau Mei San Tsuen	57	55	57	59	55	55	57	61	59	61	75
N14	Yau Mei San Tsuen	59	57	59	61	57	57	58	62	61	62	75
N_ch	Christian Ministry Institute	58	56	58	60	56	56	57	62	60	62	70 (65 during examination)
N8	Royal Palms	55	53	55	57	53	53	56	60	57	60	75
N_sch	Hong Chi Morninglight School Yuen Long	50	48	50	52	48	48	54	56	52	56	70 (65 during examination)
N4c	Fairview Park	59	57	59	61	57	57	58	63	61	63	75
Planned NSRs												
V1P	Village Zone Development	71	69	71	73	69	69	64	74	73	74	75

PMEs Inventory - Mitigated (with QPMEs and Movable Noise Barriers)												
Construction Activity	Sub. Work Group	Powered Mechanical Equipment	Reference	SWL per unit	Qty	Total SWL	Total SWL, dB(A)	At-source Noise Mitigation Measure	Noise Barrier Effect **	Total SWL (Mitigated)	Total SWL, dB(A)	Highest SWL of Each Construction Activity, dB(A) ^a
	D2	Piling works	Generator, super silenced	CNP103	95	4	101	Movable noise barrier	-10	91	114	
			Continuous Flight Auger (CFA) piles (piling, earth auger)	CNP167	114	3	119		Provision of acoustic shielding	-5		
	D3	Concreting works	Concrete Lorry Mixer	CNP044	109	5	116	Movable noise barrier	-10	106	107	
			Generator, super silenced	CNP103	95	4	101	Movable noise barrier	-10	91		
			Poker, vibratory, hand-held (electric)	EPD *	102	4	108	Movable noise barrier	-10	98		
(E)	E1	General construction works	Air Compressor	CNP001	100	6	108	Movable noise barrier	-10	98	110	
			Bar bender and cutter (electric)	CNP021	90	9	100	Movable noise barrier	-10	90		
			Mobile Crane	Hitachi Sumitomo SCX700, 132kW	101	3	106	Movable noise barrier	-5	101		
			Drill/grinder, hand-held (electric)	CNP065	98	10	108	Movable noise barrier	-10	98		
			Generator, super silenced	CNP103	95	4	101	Movable noise barrier	-10	91		
			Saw, circular, wood	CNP201	108	12	119	Movable noise barrier	-10	109		
	E2	Concreting works	Concrete Lorry Mixer	CNP044	109	8	118	Movable noise barrier	-10	108	110	
			Concrete Pump	CNP047	109	4	115	Movable noise barrier	-10	105		
			Generator, super silenced	CNP103	95	4	101	Movable noise barrier	-10	91		
			Poker, vibratory, hand-held (electric)	EPD *	102	7	110	Movable noise barrier	-10	100		
(F)	F1	General pile cap construction	Bar bender and cutter (electric)	CNP021	90	10	100	Movable noise barrier	-10	90	108	
			Generator, super silenced	CNP103	95	5	102	Movable noise barrier	-10	92		
			Lorry (5.5 tonne < Gross vehicle weight <= 38 tonne)	EPD *	105	2	108		0	108		
	F2	Concreting works	Concrete Lorry Mixer	CNP044	109	3	114	Movable noise barrier	-5	109	110	
			Concrete Pump	CNP047	109	1	109	Movable noise barrier	-10	99		
			Generator, super silenced	CNP103	95	6	103	Movable noise barrier	-10	93		
			Poker, vibratory, hand-held (electric)	EPD *	102	2	105	Movable noise barrier	-10	95		
	F3	Backfill and reinstatement	Excavator, wheeled/tracked	KATO model HD820V (EPD-01233)	99	2	102	Movable noise barrier	-5	97	98	
			Roller, vibratory	SAKAI model SW250-1 (EPD-00509)	95	1	95	Movable noise barrier	-5	90		
(G)	G	Dump Trucks Travelling on Haul Road During Site Formation	Dump Truck (5.5 tonne < Gross vehicle weight <= 38 tonne)	EPD *	105	10	115			115	115	115

Note: Noise levels of the above construction plants are based on the "Technical Memorandum on Noise From Construction Work Other Than Percussive Piling" and EPD's QPMEs database (available at: <http://www.epd.gov.hk/cgi-bin/npg/qpme/index.pl?lang=eng>)

* EPD website: http://www.epd.gov.hk/epd/english/application_for_licences/guidance/files/OtherSWLE.pdf

** According to EIAO Guidance Note No. 9/2010, with provision of noise barriers, a 5dB(A) noise reduction for movable plant, 10 dB(A) for stationary plant and 15 dB(A) for enclosed ones can be assumed.

According to "A Practical Guide for the Reduction of Noise from Construction Works" (page 11), published by HKSAR Gov. Environmental Protection Department, July 1989, excavated-mounted breaker with sound proof hammer bracket installed could achieve a noise reduction up to 10dB(A).

According to the "Best Practice Guide for Environmental Protection on Construction Sites", page 6-9, published by Hong Kong Construction Association, January 2009, excavator-mounted breaker with sound proof hammer bracket can achieve a noise reduction of up to 10dB(A). (Doc. Available at: <http://www.hkca.com.hk/front/20090306bpg.pdf>)

@ 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. The respective sub-work groups of each Construction Activity will not overlap with one another.

Appendix 4-5-4 Calculation of Construction Noise Level (Mitigated Scenario with QPMEs and Movable Noise Barriers)

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)
N9	A Site Formation, Filling and Excavation	112	178	50	228	-55.1	3.0	60
	B Construction of Underground Services and Utilities	110	178	50	228	-55.1	3.0	58
	C Road works	112	178	50	228	-55.1	3.0	60
	D Foundation	114	178	50	228	-55.1	3.0	62
	E Superstructure	110	178	50	228	-55.1	3.0	58
	F Sub-structure (Pile Cap)	110	178	50	228	-55.1	3.0	58
N4	A Site Formation, Filling and Excavation	112	242	50	292	-57.3	3.0	58
	B Construction of Underground Services and Utilities	110	242	50	292	-57.3	3.0	56
	C Road works	112	242	50	292	-57.3	3.0	58
	D Foundation	114	242	50	292	-57.3	3.0	60
	E Superstructure	110	242	50	292	-57.3	3.0	56
	F Sub-structure (Pile Cap)	110	242	50	292	-57.3	3.0	56
N5	A Site Formation, Filling and Excavation	112	147	50	197	-53.9	3.0	61
	B Construction of Underground Services and Utilities	110	147	50	197	-53.9	3.0	59
	C Road works	112	147	50	197	-53.9	3.0	61
	D Foundation	114	147	50	197	-53.9	3.0	63
	E Superstructure	110	147	50	197	-53.9	3.0	59
	F Sub-structure (Pile Cap)	110	147	50	197	-53.9	3.0	59
N12	A Site Formation, Filling and Excavation	112	3	50	53	-42.5	3.0	73
	B Construction of Underground Services and Utilities	110	3	50	53	-42.5	3.0	71
	C Road works	112	3	50	53	-42.5	3.0	73
	D Foundation	114	3	50	53	-42.5	3.0	75
	E Superstructure	110	3	50	53	-42.5	3.0	71
	F Sub-structure (Pile Cap)	110	3	50	53	-42.5	3.0	71
N13	A Site Formation, Filling and Excavation	112	9	50	59	-43.4	3.0	72
	B Construction of Underground Services and Utilities	110	9	50	59	-43.4	3.0	70
	C Road works	112	9	50	59	-43.4	3.0	72
	D Foundation	114	9	50	59	-43.4	3.0	74
	E Superstructure	110	9	50	59	-43.4	3.0	70
	F Sub-structure (Pile Cap)	110	9	50	59	-43.4	3.0	70
N3	A Site Formation, Filling and Excavation	112	242	50	292	-57.3	3.0	58
	B Construction of Underground Services and Utilities	110	242	50	292	-57.3	3.0	56
	C Road works	112	242	50	292	-57.3	3.0	58
	D Foundation	114	242	50	292	-57.3	3.0	60
	E Superstructure	110	242	50	292	-57.3	3.0	56
	F Sub-structure (Pile Cap)	110	242	50	292	-57.3	3.0	56
N6	A Site Formation, Filling and Excavation	112	469	50	519	-62.3	3.0	53
	B Construction of Underground Services and Utilities	110	469	50	519	-62.3	3.0	51
	C Road works	112	469	50	519	-62.3	3.0	53
	D Foundation	114	469	50	519	-62.3	3.0	55
	E Superstructure	110	469	50	519	-62.3	3.0	51
	F Sub-structure (Pile Cap)	110	469	50	519	-62.3	3.0	51
N7	A Site Formation, Filling and Excavation	112	275	50	325	-58.2	3.0	57
	B Construction of Underground Services and Utilities	110	275	50	325	-58.2	3.0	55
	C Road works	112	275	50	325	-58.2	3.0	57
	D Foundation	114	275	50	325	-58.2	3.0	59
	E Superstructure	110	275	50	325	-58.2	3.0	55
	F Sub-structure (Pile Cap)	110	275	50	325	-58.2	3.0	55
N14	A Site Formation, Filling and Excavation	112	218	50	268	-56.5	3.0	59
	B Construction of Underground Services and Utilities	110	218	50	268	-56.5	3.0	57
	C Road works	112	218	50	268	-56.5	3.0	59
	D Foundation	114	218	50	268	-56.5	3.0	61
	E Superstructure	110	218	50	268	-56.5	3.0	57
	F Sub-structure (Pile Cap)	110	218	50	268	-56.5	3.0	57
N_ch	A Site Formation, Filling and Excavation	112	248	50	298	-57.5	3.0	58
	B Construction of Underground Services and Utilities	110	248	50	298	-57.5	3.0	56
	C Road works	112	248	50	298	-57.5	3.0	58
	D Foundation	114	248	50	298	-57.5	3.0	60
	E Superstructure	110	248	50	298	-57.5	3.0	56
	F Sub-structure (Pile Cap)	110	248	50	298	-57.5	3.0	56
N8	A Site Formation, Filling and Excavation	112	343	50	393	-59.9	3.0	55
	B Construction of Underground Services and Utilities	110	343	50	393	-59.9	3.0	53
	C Road works	112	343	50	393	-59.9	3.0	55
	D Foundation	114	343	50	393	-59.9	3.0	57
	E Superstructure	110	343	50	393	-59.9	3.0	53
	F Sub-structure (Pile Cap)	110	343	50	393	-59.9	3.0	53
N_sch	A Site Formation, Filling and Excavation	112	649	50	699	-64.9	3.0	50
	B Construction of Underground Services and Utilities	110	649	50	699	-64.9	3.0	48
	C Road works	112	649	50	699	-64.9	3.0	50
	D Foundation	114	649	50	699	-64.9	3.0	52
	E Superstructure	110	649	50	699	-64.9	3.0	48
	F Sub-structure (Pile Cap)	110	649	50	699	-64.9	3.0	48
N4c	A Site Formation, Filling and Excavation	112	210	50	260	-56.3	3.0	59
	B Construction of Underground Services and Utilities	110	210	50	260	-56.3	3.0	57
	C Road works	112	210	50	260	-56.3	3.0	59
	D Foundation	114	210	50	260	-56.3	3.0	61
	E Superstructure	110	210	50	260	-56.3	3.0	57
	F Sub-structure (Pile Cap)	110	210	50	260	-56.3	3.0	57
V1P	A Site Formation, Filling and Excavation	112	17	50	67	-44.5	3.0	71
	B Construction of Underground Services and Utilities	110	17	50	67	-44.5	3.0	69
	C Road works	112	17	50	67	-44.5	3.0	71
	D Foundation	114	17	50	67	-44.5	3.0	73
	E Superstructure	110	17	50	67	-44.5	3.0	69
	F Sub-structure (Pile Cap)	110	17	50	67	-44.5	3.0	69

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.

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)
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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) [@]
N9	G Dump Trucks Travelling on Haul Road	10	115	228	10	58
N4	G Dump Trucks Travelling on Haul Road	10	115	292	10	57
N5	G Dump Trucks Travelling on Haul Road	10	115	197	10	59
N12	G Dump Trucks Travelling on Haul Road	10	115	53	10	65
N13	G Dump Trucks Travelling on Haul Road	10	115	59	10	64
N3	G Dump Trucks Travelling on Haul Road	10	115	292	10	57
N6	G Dump Trucks Travelling on Haul Road	10	115	519	10	55
N7	G Dump Trucks Travelling on Haul Road	10	115	325	10	57
N14	G Dump Trucks Travelling on Haul Road	10	115	268	10	58
N ch	G Dump Trucks Travelling on Haul Road	10	115	298	10	57
N8	G Dump Trucks Travelling on Haul Road	10	115	393	10	56
N sch	G Dump Trucks Travelling on Haul Road	10	115	699	10	54
N4c	G Dump Trucks Travelling on Haul Road	10	115	260	10	58
V1P	G Dump Trucks Travelling on Haul Road	10	115	67	10	64

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)