Building Coupling Loss (BCF)

	Building Type	Limit	Building Coupling Loss (dB)							
	Building Type		16 Hz	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz		
1	Large Masonry Building on Pile	Lower	-6	-7	-11	-13	-14	-12		
2	Large Masonry Building on Spread Footings	Lower	-12	-14	-14	-13	-11	-10		
3	1 to 2 Storey Residential	Lower	-4	-5	-5	-4	-3	-1		
4	Building Foundation on Rock Layer		0	0	0	0	0	0		

Note(s):

- 1) Reference: Saurenman, H., Nelson, J., Wilson, G. 1982, Handbook of Urban Rail Noise and Vibration Control, US Department of Transportation Urban Mass Transportation Administration (Figure 8.12)
- 2) For conservative assessment, the lower limit adjustment factors (**BOLD**) will be used in the study

Building Vibration Response (BVR)

Building Structure Attenuation (BSA) (1)

	Building Structure Attenuation (BSA)							
	16 Hz	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz		
Floor Attenuation Factor, dB	0	0	0	0	0	0		

Building Structure Resonance (BSR) (2)

	Building Structure Resonance (BSR)							
	16 Hz	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz		
Floor Attenuation Factor, dB	6	6	6	6	6	6		

Building Vibration Response (BVR) at Ground Floor

		Building Vibration Response (BVR)							
	16 Hz	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz			
Building Vibration Response, dB	6	6	6	6	6	6			

Building Structure Attenuation (BSA) (1)

	Building Structure Attenuation (BSA)									
	16 Hz	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz				
Floor Attenuation Factor, dB	2	2	2	2	2	2				

Building Structure Resonance (BSR) (2)

		Building Structure Resonance (BSR)						
	16 Hz	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz		
Floor Attenuation Factor, dB	6	6	6	6	6	6		

Building Vibration Response (BVR) at First Floor

	Building Vibration Response (BVR)						
	16 Hz	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	
Building Vibration Response, dB	4	4	4	4	4	4	

Note(s)

- 1) Reference: Saurenman, H., Nelson, J., Wilson, G. 1982, Handbook of Urban Rail Noise and Vibration Control, US Department of Transportation Urban Mass Transportation Administration (Figure 8.12)
- 2) Reference: Hanson, C., Towers, D., Meister, L. 2006, Transit Noise and Vibration Impact Assessment Final Report, US Department of Transportation Urban Mass Transportation Administration.

Building Vibration Response (BVR)

Building Structure Attenuation (BSA) (1)

	Building Structure Attenuation (BSA)							
	16 Hz	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz		
Floor Attenuation Factor, dB	4	4	4	4	4	4		

Building Structure Resonance (BSR) (2)

	Building Structure Resonance (BSR)									
	16 Hz	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz				
Floor Attenuation Factor, dB	6 6 6 6 6									

Building Vibration Response (BVR) at Second Floor

		,0011a 1 100	•				
	Building Vibration Response (BVR)						
	16 Hz	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	
Building Vibration Response, dB	2	2	2	2	2	2	

Building Structure Attenuation (BSA) (1)

	Building Structure Attenuation (BSA)								
	16 Hz	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz			
Floor Attenuation Factor, dB	6	6	6	6	6	6			

Building Structure Resonance (BSR) (2)

·	Building Structure Resonance (BSR)							
	16 Hz	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz		
Floor Attenuation Factor, dB	6	6	6	6	6	6		

Building Vibration Response (BVR) at Third Floor

	Building Vibration Response (BVR)								
	16 Hz	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz			
Building Vibration Response, dB	0	0	0	0	0	0			

Note(s):

- 1) Reference: Saurenman, H., Nelson, J., Wilson, G. 1982, Handbook of Urban Rail Noise and Vibration Control, US Department of Transportation Urban Mass Transportation Administration (Figure 8.12)
- 2) Reference: Hanson, C., Towers, D., Meister, L. 2006, Transit Noise and Vibration Impact Assessment Final Report, US Department of Transportation Urban Mass Transportation Administration.

Building Vibration Response (BVR)

Building Structure Attenuation (BSA) (1)

·		Building Structure Attenuation (BSA)								
	16 Hz 31.5 Hz 63 Hz 125 Hz 250 Hz 500 Hz									
Floor Attenuation Factor, dB	8	8	8	8	8	8				

Building Structure Resonance (BSR) (2)

	Building Structure Resonance (BSR)								
	16 Hz 31.5 Hz 63 Hz 125 Hz 250 Hz								
Floor Attenuation Factor, dB	6	6	6	6	6	6			

Building Vibration Response (BVR) at Forth Floor

		Building Vibration Response (BVR)									
	16 Hz	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz					
Building Vibration Response, dB	-2	-2	-2	-2	-2	-2					

Building Structure Attenuation (BSA) (1)

	Building Structure Attenuation (BSA)										
	16 Hz	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz					
Floor Attenuation Factor, dB	10	10	10	10	10	10					

Building Structure Resonance (BSR) (2)

·	,	Building Structure Resonance (BSR)								
	16 Hz 31.5 Hz 63 Hz 125 Hz 250 Hz 500									
Floor Attenuation Factor, dB	6	6	6	6	6	6				

Building Vibration Response (BVR) at Fifth Floor

	Building Vibration Response (BVR)								
	16 Hz	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz			
Building Vibration Response, dB	-4	-4	-4	-4	-4	-4			

Note(s)

- 1) Reference: Saurenman, H., Nelson, J., Wilson, G. 1982, Handbook of Urban Rail Noise and Vibration Control, US Department of Transportation Urban Mass Transportation Administration (Figure 8.12)
- 2) Reference: Hanson, C., Towers, D., Meister, L. 2006, Transit Noise and Vibration Impact Assessment Final Report, US Department of Transportation Urban Mass Transportation Administration.

Conversion from Vibration to Noise (CTN)

		Octave Band Centre Frequency (Hz)								
	16	31.5	63	125	250	500				
K _{rad} (dB)	0.0	0.0	0.0	0.0	0.0	0.0				
A weighting correction	-56.7	-39.4	-26.2	-16.1	-8.6	-3.2				
CTN (for vibration), dB	-56.7	-56.7 -39.4 -26.2 -16.1 -8.6 -3.2								

For L_{ν} vibration level reference to 1 μ in/s

Reverberant Sound Pressure Level, L_A (dBA) = L_v (VdB ref 1 μ in/s) + CTN

CTN = K rad + A-weighting Correction

Conversion Factors for Multiple Vibration Sources

No. of Equipments Used Concurrently	Multiple Source Correction, dB(A)
1	0
I	U
2	3
3	5
4	6
5	7
>=6	*

Note(*): Multiple Source Correction, dB(A), for no. of equipments used concurrently more than or equal to 6 should be determined by standard acoustic principle.

Conversion Factors for Construction Equipments

Construction		Vibration (RMS) at Reference Distance of 5.5m from
Equipments	Construction Site	source (mm/s)
Drilling Rig	Salisbury Road Overrun Tunnel	0.536
Hydraulic Breaker	TST site	0.298
Handheld Breaker	New World Centre site	0.279

Ref: Appendix 7-1 of Kowloon Southern Link EIA Report

Conversion from Hydraulic Breaker to Handheld Breaker, dB(A)

- = 20 x Log (Virbation (RMS) of Handheld Breaker/ Vibration (RMS) of Hydraulic Breaker)
- $= 20 \times Log (0.279/0.298)$
- $= -0.6 \, dB(A)$

Conversion from Hydraulic Breaker to Drilling Rig, dB(A)

- = 20 x Log (Vibration (RMS) of Drilling Rig/ Vibration (RMS) of Hydraulic Breaker)
- = 20 x Log (0.536/0.298)
- = +5.1 dB(A)

_	SLH ADM		3.0 m				Вι	uilding Type:	1	
Items	Description		1/F							
						Oct	ave Band Fr	equency, Hz		
a)		oratory Velocity site measurement with an exca	mm/s vator-mounted b	= reaker oper	16 0.05886 ating at distanc	31.5 0.06816	63 0.06195	125 0.05033	250 0.06225	500 0.12091
b)	Source Vil	oratory Velocity	in/s	=	2.32E-03	2.68E-03	2.44E-03	1.98E-03	2.45E-03	4.76E-03
c)	Vibration \	/elocity (ref. 10^-6 in/s)	20 log (V/Vref) dB	=	67	69	68	66	68	74
d)	Distance A	Attenuation 8.0 m	-20 log (r/ro) dB	=	-3	-3	-3	-3	-3	-3
e)	Soil Damp (Assume z	ing Loss zero as through the Rock)	dB	=	0	0	0	0	0	0
f)	Building C	oupling Loss	dB	=	-6	-7	-11	-13	-14	-12
g)	Building V	ibration Response	dB	=	-2	-2	-2	-2	-2	-2
h)	Conversio	n from Vibration to Noise	dB	=	-56.7	-39.4	-26.2	-16.1	-8.6	-3.2
i)	Multiple Vi	bration Soures (C _{multi})	dB	=	0	0	0	0	0	0
j)	Predicted (c+d+e+f+	Noise Level for Hydraulic Break	er dB(A)	=	-1	17	25	32	40	53
	(0+0+0+1+	y+11+1)			Predic	ted Noise Le	53.3	dB(A)		
					Correct	ted Noise Lev	el for Handh	neld Breaker	52.8	dB(A)
						Corrected	Noise Level	I for Drill Rig	58.4	dB(A)

RP ADM						Вι	uilding Type:	1		
		1/F								
Descripti	on				0-4	D C.				
				16					500	
Source V	ibratory Velocity	mm/s	=	0.05886	0.06816	0.06195	0.05033	0.06225	0.12091	
(Based o	n site measurement with an ex	cavator-mounted t	oreaker ope	rating at distanc	e Ro=5.5m)					
Source V	ibratory Velocity	in/s	=	2.32E-03	2.68E-03	2.44E-03	1.98E-03	2.45E-03	4.76E-03	
Vibration	Velocity (ref. 10^-6 in/s)	20 log (V/Vref)								
		dB	=	67	69	68	66	68	74	
Distance	Attenuation	-20 log (r/ro)								
r=	87.9 m	dB	=	-24	-24	-24	-24	-24	-24	
		dB	=	0	0	0	0	0	0	
Building	Coupling Loss	dB	=	-6	-7	-11	-13	-14	-12	
Building '	Vibration Response	dB	=	4	4	4	4	4	4	
Conversi	on from Vibration to Noise	dB	=	-56.7	-39.4	-26.2	-16.1	-8.6	-3.2	
Multiple \	Vibration Soures (C _{multi})	dB	=	0	0	0	0	0	0	
	-	aker dB(A)	=	-15	2	10	17	25	38	
(CTUTE+I	тутити			Predic	ted Noise Le	vel for Hydra	ulic Breaker	38.5	38.5 dB(A)	
				Correct	ted Noise Lev	vel for Handh	neld Breaker	37.9	dB(A)	
					Corrected	Noise Level	I for Drill Rig	43.6	dB(A)	
	Source V (Based of Source V Vibration Distance r= Soil Dam (Assume Building Building Conversi Multiple V	ADM NSR distance: Assessment Floor: Description Source Vibratory Velocity (Based on site measurement with an extension of the property of the	ADM NSR distance: 87.9 m Assessment Floor: 1/F Description Source Vibratory Velocity mm/s (Based on site measurement with an excavator-mounted by the state of	ADM NSR distance: 87.9 m Assessment Floor: 1/F Description Source Vibratory Velocity mm/s = (Based on site measurement with an excavator-mounted breaker operatory Velocity in/s = Vibration Velocity (ref. 10^-6 in/s) 20 log (V/Vref) dB = Distance Attenuation re 87.9 m dB = Soil Damping Loss (Assume zero as through the Rock) Building Coupling Loss dB = Building Vibration Response dB = Conversion from Vibration to Noise dB = Multiple Vibration Soures (C multi) dB = Predicted Noise Level for Hydraulic Breaker dB(A) =	ADM NSR distance: 87.9 m Assessment Floor: 1/F Description 16 Source Vibratory Velocity mm/s = 0.05886 (Based on site measurement with an excavator-mounted breaker operating at distance of the distance o	ADM NSR distance:	ADM NSR distance: 87.9 m Assessment Floor: 1/F Description NSR distance: 1/F	ADM NSR distance: Assessment Floor: 87.9 m 1/F Description Cotave Band Frequency, Hz 31.5 63 l25 Source Vibratory Velocity mm/s = 0.05886 0.06816 0.06195 0.05033 Source Vibratory Velocity in/s = 2.32E-03 2.68E-03 2.44E-03 1.98E-03 Vibration Velocity (ref. 10^-6 in/s) 20 log (V/Vref) dB = 67 69 68 66 Distance Attenuation r= 87.9 m -20 log (r/ro) dB = -24 -24 -24 -24 Soil Damping Loss (Assume zero as through the Rock) dB = 0 0 0 0 Building Coupling Loss (Assume zero as through the Rock) dB = 4 4 4 4 Conversion from Vibration Response dB = -56.7 -39.4 -26.2 -16.1 Multiple Vibration Soures (C multi) dB = 0 0 0 0 Predicted Noise Level for Hydraulic Breaker dB(A) = -15 2 10 17	ADM	

_	NLH ADM	Jockey Club New Life Hotsel NSR distance: 156.6 Assessment Floor: 1/6					Вι	uilding Type:	1	
Items	Descriptio		-							
						Oct	ave Band Fr	equency, Hz		
a)		bratory Velocity site measurement with an excava	mm/s ator-mounted b	= reaker opera	16 0.05886 ating at distance	31.5 0.06816 e Ro=5.5m)	63 0.06195	125 0.05033	250 0.06225	500 0.12091
b)	Source Vil	bratory Velocity	in/s	=	2.32E-03	2.68E-03	2.44E-03	1.98E-03	2.45E-03	4.76E-03
c)	Vibration \	Velocity (ref. 10^-6 in/s) 20	log (V/Vref) dB	=	67	69	68	66	68	74
d)	Distance A	Attenuation 156.6 m	-20 log (r/ro) dB	=	-29	-29	-29	-29	-29	-29
e)	Soil Damp (Assume 2	oing Loss zero as through the Rock)	dB	=	0	0	0	0	0	0
f)	Building C	oupling Loss	dB	=	-6	-7	-11	-13	-14	-12
g)	Building V	ibration Response	dB	=	4	4	4	4	4	4
h)	Conversio	n from Vibration to Noise	dB	=	-56.7	-39.4	-26.2	-16.1	-8.6	-3.2
i)	Multiple V	ibration Soures (C _{multi})	dB	=	0	0	0	0	0	0
j)	Predicted (c+d+e+f+	Noise Level for Hydraulic Breaker	dB(A)	=	-20	-3	5	12	20	33
	(0+0+0+1+	g+11+1)			Predict	ted Noise Lev	vel for Hydra	ulic Breaker	33.5	dB(A)
					Correct	ed Noise Lev	el for Handh	neld Breaker	32.9	dB(A)
						Corrected	Noise Level	for Drill Rig	38.6	dB(A)

NOD ID	010	0 101 1						ilalia a T		
NSR ID.: Location:	CIS ADM	Carmel School NSR distance:	162.3 m				Ві	uilding Type:	1	
		Assessment Floor:	G/F							
Items	Descripti	on								
					40			equency, Hz		500
a)	Course V	ibratory Velocity	mm/s		16 0.05886	31.5 0.06816	63 0.06195	125 0.05033	250 0.06225	500 0.12091
a)		n site measurement with an		= reaker ope			0.06195	0.05055	0.06223	0.12091
	,			·	Ü	*				
b)	Source V	ibratory Velocity	in/s	=	2.32E-03	2.68E-03	2.44E-03	1.98E-03	2.45E-03	4.76E-03
c)	Vibration	Velocity (ref. 10^-6 in/s)	20 log (V/Vref)							
,		,	dB	=	67	69	68	66	68	74
d)	Distance	Attenuation	-20 log (r/ro)							
۵)	r=	162.3 m	dB	=	-29	-29	-29	-29	-29	-29
					_		_	_	_	_
e)		ping Loss zero as through the Rock)	dB	=	0	0	0	0	0	0
	(710001110	2010 do tinodgii tho Hooky								
f)	Building	Coupling Loss	dB	=	-6	-7	-11	-13	-14	-12
g)	Building '	Vibration Response	dB	=	6	6	6	6	6	6
b \	Camuarai	on from Vibration to Noise	dB		-56.7	-39.4	-26.2	-16.1	-8.6	-3.2
h)	Conversi	on from vibration to Noise	ав	=	-56.7	-39.4	-20.2	-10.1	-0.0	-3.2
i)	Multiple \	Vibration Soures (C $_{\rm multi}$)	dB	=	0	0	0	0	0	0
j)	Predicted	d Noise Level for Hydraulic B	Breaker dB(A)	=	-19	-1	7	13	22	35
	(c+d+e+f	+g+h+i)			D !			" D 1	05.0	ID(A)
					Predic	ted Noise Le	vei for Hydra	ulic Breaker	35.2	dB(A)
					Correct	ted Noise Lev	el for Handl	neld Breaker	34.6	dB(A)
						Corrected	l Noise Leve	I for Drill Rig	40.3	dB(A)

_	ILS ADM		5.2 m				Вι	uilding Type:	1	
Items	Description		/F							
						Oct	ave Band Fr	equency, Hz		
a)		oratory Velocity site measurement with an exca	mm/s vator-mounted b	= reaker oper	16 0.05886 ating at distance	31.5 0.06816 e Ro=5.5m)	63 0.06195	125 0.05033	250 0.06225	500 0.12091
b)	Source Vil	oratory Velocity	in/s	=	2.32E-03	2.68E-03	2.44E-03	1.98E-03	2.45E-03	4.76E-03
c)	Vibration \	/elocity (ref. 10^-6 in/s)	20 log (V/Vref) dB	=	67	69	68	66	68	74
d)	Distance A	attenuation 175.2 m	-20 log (r/ro) dB	=	-30	-30	-30	-30	-30	-30
e)	Soil Damp (Assume z	ing Loss ero as through the Rock)	dB	=	0	0	0	0	0	0
f)	Building C	oupling Loss	dB	=	-6	-7	-11	-13	-14	-12
g)	Building V	ibration Response	dB	=	6	6	6	6	6	6
h)	Conversio	n from Vibration to Noise	dB	=	-56.7	-39.4	-26.2	-16.1	-8.6	-3.2
i)	Multiple Vi	bration Soures (C _{multi})	dB	=	0	0	0	0	0	0
j)	Predicted (c+d+e+f+	Noise Level for Hydraulic Break	er dB(A)	=	-19	-2	6	13	21	34
	(0+0+6+1+	y+11+1)			Predict	ted Noise Lev	vel for Hydra	ulic Breaker	34.5	dB(A)
					Correct	ed Noise Lev	el for Handh	ield Breaker	34.0	dB(A)
						Corrected	Noise Level	for Drill Rig	39.6	dB(A)

GOV	Non Dopartmental Quarter	·C				D.	ilding Type:	- 1	
						ы	illullig Type.	'	
,	Assessment Floor:	1/F							
Description	on								
				-			-		500
			. =			0.06195	0.05033	0.06225	0.12091
(Based o	n site measurement with an e	excavator-mounted b	геакег оре	rating at distanc	e H0=5.5m)				
Source V	ibratory Velocity	in/s	=	2.32E-03	2.68E-03	2.44E-03	1.98E-03	2.45E-03	4.76E-03
\/ibratian	Valanity (raf. 100 C in/a)	00 log (\//\/rof\							
vibration	velocity (ref. 107-6 in/s)		_	67	60	68	66	68	74
		uБ	=	07	09	00	00	00	74
Distance	Attenuation	-20 log (r/ro)							
r=	175.7 m	dB	=	-30	-30	-30	-30	-30	-30
		dB	=	0	0	0	0	0	0
(Assume	zero as through the Hock)								
Building (Coupling Loss	dB	=	-6	-7	-11	-13	-14	-12
3	9	-					-		
Building '	Vibration Response	dB	=	4	4	4	4	4	4
		ID.		50.7	00.4	00.0	40.4	0.0	0.0
Conversi	on from Vibration to Noise	аВ	=	-56.7	-39.4	-26.2	-16.1	-8.6	-3.2
Multiple \	/ibration Sources (C)	dB	_	0	0	Λ	0	Λ	0
Marapio	noration Coardo (O multi)	uБ	_	Ü	O	O	O	O	O
Predicted	Noise Level for Hydraulic Br	eaker dB(A)	=	-21	-4	4	11	19	32
		. ,							
				Predic	ted Noise Le	vel for Hydra	ulic Breaker	32.5	dB(A)
								04.0	ID(A)
				Correct	tea Noise Lev	vei for Handi	ieid Breaker	31.9	aR(A)
					Corrected	l Noise I eve	I for Drill Ria	37.6	dB(A)
	Source V (Based o Source V Vibration Distance r= Soil Dam (Assume Building Conversi Multiple V Predicted	ADM NSR distance: Assessment Floor: Description Source Vibratory Velocity (Based on site measurement with an experience Vibratory Velocity Vibration Velocity (ref. 10^-6 in/s) Distance Attenuation r= 175.7 m Soil Damping Loss (Assume zero as through the Rock) Building Coupling Loss Building Vibration Response Conversion from Vibration to Noise Multiple Vibration Soures (C multi)	ADM NSR distance: 175.7 m Assessment Floor: 1/F Description Source Vibratory Velocity mm/s (Based on site measurement with an excavator-mounted b Source Vibratory Velocity in/s Vibration Velocity (ref. 10^-6 in/s) 20 log (V/Vref) dB Distance Attenuation -20 log (r/ro) r= 175.7 m dB Soil Damping Loss (Assume zero as through the Rock) Building Coupling Loss dB Building Vibration Response dB Conversion from Vibration to Noise dB Multiple Vibration Soures (C multi) dB Predicted Noise Level for Hydraulic Breaker dB(A)	ADM NSR distance: 175.7 m Assessment Floor: 1/F Description Source Vibratory Velocity mm/s = (Based on site measurement with an excavator-mounted breaker ope Source Vibratory Velocity in/s = Vibration Velocity (ref. 10^-6 in/s) 20 log (V/Vref) dB = Distance Attenuation -20 log (r/ro) r= 175.7 m dB = Soil Damping Loss dB = Soil Damping Loss dB = Conversion from Vibration to Noise dB = Multiple Vibration Soures (C multi) dB = Predicted Noise Level for Hydraulic Breaker dB(A) =	ADM NSR distance: 175.7 m Assessment Floor: 1/F Description 16 Source Vibratory Velocity mm/s = 0.05886 (Based on site measurement with an excavator-mounted breaker operating at distance of the standard	ADM NSR distance: 175.7 m Assessment Floor: 1/F Description 16	ADM	ADM NSR distance: 1/5.7 m Assessment Floor: 1/F Description Tourish	ADM Assessment Floor: 175.7 m Assessment Floor: 175.7 m In Assessment Floor: 175.7 m Assessment Floor: 175.7 m Assessment Floor: 175.7 m Assessment Floor: 175.7 m Assessment Floor: 16 31.5 m Assessment Floor: 31.5 m Assessment Floor: 250 <

ID .	Land Use	Existing/ Planned NSR	No. of Floor	Assessment Floor	mPD	Ground-borne Noise Criteria, dB(A)	Activity		Distance (m)		No. of Hydraulic Breakers used on site	Multiple Source correction, dB(A)	No. of Hand-held Breakers used on	Multiple Source correction, dB(A)	No. of Rock Drills/ Drilling Rig used on site	Multiple Source correction, dB(A)	Impact from Hyrauli	Ground-borne Noise Impact from Hand- held Breakers, dB(A)	Ground-borne Noise Impact from Rock Drill/ Drilling Rig,	Ground-borne Noise of each Activity, dB(A)	
			Non				Daytime		Horizontal	Vertical	Slant	Site		Site		Site		breakers, ub(A)	neid breakers, db(A)	dB(A)	UB(A)
Hong Ko	ong Park & Tunnel																				
SLH	Island Shangri-La Hotel	Hotel	Existing	27	4/F	58.7	65	6 7	0.0 0.0	8.0 8.0	8.0 8.0	1 1	0 0	2 2	3 3	1 1	0	53 53	56 56	58 58	61 61
RP	Regent on the Park	Residential	Existing	35	1/F	67.4	65	6 7	24.0 24.0	84.6 84.6	87.9 87.9	1 1	0	2 2	3 3	1 1	0	39 39	41 41	44 44	46 46
NLH	Jockey Club New Life Hostel	Hostel	Existing	4	1/F	83.8	65	6 7	115.5 115.5	105.7 105.7	156.6 156.6	1 1	0	2 2	3 3	1 1	0	34 34	36 36	39 39	41 41
CIS	Carmel School	Educational	Existing	3	G/F	135.6	60	6 7	6.0 6.0	162.2 162.2	162.3 162.3	1 1	0	2 2	3 3	1 1	0	35 35	38 38	40 40	43 43
ILS	Island School	Educational	Existing	5	G/F	147.2	60	6 7	0.0 0.0	175.2 175.2	175.2 175.2	1 1	0 0	2 2	3 3	1 1	0	35 35	37 37	40 40	42 42
GOV	Non Departmental Quarters	Educational	Existing	11	1/F	171.6	65	6 7	0.0 0.0	175.7 175.7	175.7 175.7	1 1	0 0	2 2	3 3	1 1	0 0	33 33	35 35	38 38	40 40

Note: The vertical distance is measured between the SIL(E) tunnel and the pile foundation of NSRs, except SLH which is measured between the SCL overrun tunnel and the pile foundation.

NOD ID	0000 011 0 10 1 11 10 1	0 1 1				5	9 F T		
NSR ID.: Location:	SPPS St's Paul Co-educational Primar Nam Fung NSR distance: 60.	y School 0 m				Ві	uilding Type:	1	
Location:	Assessment Floor: 1/								
Items	Description 1/								
ILEITIS	Description				Oct	ave Band Fr	equency, Hz		
				16	31.5	63	125	250	500
a)	Source Vibratory Velocity	mm/s	=	0.05886	0.06816	0.06195	0.05033	0.06225	0.12091
ω,	(Based on site measurement with an excav-		reaker oper			0.00.00	0.0000	0.00220	0200
	(Edoca on one medaarement man an execut		round, open	amig at alotallo	0.10 0.0,				
b)	Source Vibratory Velocity	in/s	=	2.32E-03	2.68E-03	2.44E-03	1.98E-03	2.45E-03	4.76E-03
,	, ,								
c)	Vibration Velocity (ref. 10^-6 in/s) 20	log (V/Vref)							
		dB	=	67	69	68	66	68	74
d)		-20 log (r/ro)							
	r= 60.0 m	dB	=	-21	-21	-21	-21	-21	-21
				_	_	_	_	_	_
e)	Soil Damping Loss	dB	=	0	0	0	0	0	0
	(Assume zero as through the Rock)								
t/	Building Coupling Loss	dB		-6	-7	-11	-13	-14	-12
1)	Building Coupling Loss	иь	=	-0	-7	-11	-13	-14	-12
g)	Building Vibration Response	dB	=	4	4	4	4	4	4
9)	Daliang Vibration response	uВ	_	-	7	-	-	7	7
h)	Conversion from Vibration to Noise	dB	=	-56.7	-39.4	-26.2	-16.1	-8.6	-3.2
,					-				
i)	Multiple Vibration Soures (C multi)	dB	=	0	0	0	0	0	0
-,	- I - I - I - I - I - I - I - I - I - I			-					-
i)	Predicted Noise Level for Hydraulic Breaker	dB(A)	=	-12	5	14	20	28	42
17	(c+d+e+f+g+h+i)	()			-				
	,			Predic	ted Noise Le	vel for Hydra	ulic Breaker	41.8	dB(A)
						•			
	Corrected Noise Level for Dr							46.9	dB(A)

NSR ID	Description	Land Use	Existing/ Planned NSR	No. of Floor	Assessment Floor	Ground-borne Noise Criteria, dB(A)	Activity	Horizontal	Distance (m)	Slant	No. of Hydraulic Breakers used on site	Multiple Source correction, dB(A)	No. of Hand-held Breakers used on site	Multiple Source correction, dB(A)	No. of Rock Drills/ Drilling Rig used on site	Multiple Source correction, dB(A)	Ground-borne Noise Impact from Hyraulic Breakers, dB(A)	Ground-borne Noise Impact from Hand- held Breakers, dB(A)	Ground-borne Noise Impact from Rock Drill/ Drilling Rig, dB(A)	Ground-borne Noise of each Activity, dB(A)
Nam F	ing Portal								10111021											
SPSS	St's Paul Co-educational Primary School	Educational	Existing	7	1/F	60	4	60.0	0.0	60.0	0	0	0	0	4	6	0	0	53	53

NSR ID.:	SWT1 Sham Wan Towers - Tower	1				Ві	uilding Type:	1	
Location:		37.5 m					0 71		
		2 level podium							
Items	Description				Oct	tave Band Fr	equency, Hz		
				16	31.5	63	125	250	500
a)	Source Vibratory Velocity	mm/s	=	0.05886	0.06816	0.06195	0.05033	0.06225	0.12091
	(Based on site measurement with an ex-	cavator-mounted b	reaker ope	rating at distand	ce Ro=5.5m)				
b)	Source Vibratory Velocity	in/s	=	2.32E-03	2.68E-03	2.44E-03	1.98E-03	2.45E-03	4.76E-03
c)	Vibration Velocity (ref. 10^-6 in/s)	20 log (V/Vref)							
-,	,	dB	=	67	69	68	66	68	74
d)	Distance Attenuation	-20 log (r/ro)							
	r= 37.5 m	dB	=	-17	-17	-17	-17	-17	-17
e)	Soil Damping Loss (Assume zero as through the Rock)	dB	=	0	0	0	0	0	0
f)	Building Coupling Loss	dB	=	-6	-7	-11	-13	-14	-12
g)	Building Vibration Response	dB	=	0	0	0	0	0	0
h)	Conversion from Vibration to Noise	dB	=	-56.7	-39.4	-26.2	-16.1	-8.6	-3.2
i)	Multiple Vibration Soures (C $_{\rm multi}$)	dB	=	0	0	0	0	0	0
j)	Predicted Noise Level for Hydraulic Brea (c+d+e+f+g+h+i)	aker dB(A)	=	-12	6	14	20	29	42
				Predic	ted Noise Le	vel for Hydra	ulic Breaker	41.9	dB(A)
					Corrected	l Noise Leve	I for Drill Rig	47.0	dB(A)

65

Ground-borne Noise of each Activity, dB(A)

50

Ground-borne Noise Impact from Rock Drill/ Drilling Rig, dB(A)

50

Ground-borne Noise Impact from Hyraulic Breakers, dB(A) Ground-borne Noise Impact from Handheld Breakers, dB(A)

Multiple Source correction, dB(A)

0

E	nviro	nmental Impact Assess	sment										
	NSR	Description	Land Use	Existing/ Planned	No. of	Ground-borne Noise Criteria, dB(A)	Activity	Distance (m)	No. of Hydraulic Breakers used on	Multiple Source	No. of Hand-held Breakers used on	Multiple Source	No. of Rock Drills/ Drilling Rig used on

37.5

Horizontal Vertical Slant

0.0

37.5

Cut and Cover Work near Sham Wan SWT1 Sham Wan Towers - Tower 1

Residential

Existing

43

NSR ID.: Location:	YOC1 Yue On Court - Pik On House (LET NSR distance: 34	Block C) .7 m				Вι	uilding Type:	4	
	Assessment Floor: 1	/F							
ltems	Description				Oct	ave Band Fr	equency, Hz		
a)	Source Vibratory Velocity (Based on site measurement with an exca	mm/s vator-mounted I	= oreaker opera	16 0.05886 ating at distand	31.5 0.06816 ce Ro=5.5m)	63 0.06195	125 0.05033	250 0.06225	500 0.12091
b)	Source Vibratory Velocity	in/s	=	2.32E-03	2.68E-03	2.44E-03	1.98E-03	2.45E-03	4.76E-03
c)	Vibration Velocity (ref. 10^-6 in/s) 2	0 log (V/Vref) dB	=	67	69	68	66	68	74
d)	Distance Attenuation r= 34.7 m	-20 log (r/ro) dB	=	-16	-16	-16	-16	-16	-16
e)	Soil Damping Loss (Assume zero as through the Rock)	dB	=	0	0	0	0	0	0
f)	Building Coupling Loss	dB	=	0	0	0	0	0	0
g)	Building Vibration Response	dB	=	4	4	4	4	4	4
h)	Conversion from Vibration to Noise	dB	=	-56.7	-39.4	-26.2	-16.1	-8.6	-3.2
i)	Multiple Vibration Soures (C $_{\rm multi}$)	dB	=	0	0	0	0	0	0
j)	Predicted Noise Level for Hydraulic Breake (c+d+e+f+g+h+i)	er dB(A)	=	-1	17	30	38	47	58
				Predic	ted Noise Le	vel for Hydra	ulic Breaker	58.7	dB(A)
					Corrected	Noise Level	for Drill Rig	63.8	dB(A)
NSR ID.: Location:	YOC2 Yue On Court - Tse On House LET NSR distance: 35 Assessment Floor: 1,	.8 m				Вι	uilding Type:	4	
Items	Description Assessment Floor.	1							
a)	Source Vibratory Velocity (Based on site measurement with an exca	mm/s vator-mounted l	= oreaker opera	16 0.05886 ating at distand	31.5 0.06816	ave Band Fr 63 0.06195	equency, Hz 125 0.05033	250 0.06225	500 0.12091
b)	Source Vibratory Velocity	in/s	=	2.32E-03	2.68E-03	2.44E-03	1.98E-03	2.45E-03	4.76E-03
c)	Vibration Velocity (ref. 10^-6 in/s) 2	0 log (V/Vref) dB	=	67	69	68	66	68	74
d)	Distance Attenuation r= 35.8 m	-20 log (r/ro) dB	=	-16	-16	-16	-16	-16	-16
e)	Soil Damping Loss (Assume zero as through the Rock)	dB	=	0	0	0	0	0	0
f)	Building Coupling Loss	dB	=	0	0	0	0	0	0
g)	Building Vibration Response	dB	=	4	4	4	4	4	4
h)	Conversion from Vibration to Noise	dB	=	-56.7	-39.4	-26.2	-16.1	-8.6	-3.2
i)	Multiple Vibration Soures (C _{multi})	dB	=	0	0	0	0	0	0
j)	Predicted Noise Level for Hydraulic Breake (c+d+e+f+g+h+i)	er dB(A)	=	-2	17	29	38	47	58
	(OTOTOTITYTHTI)			Predic	ted Noise Le	vel for Hydra	ulic Breaker	58.4	dB(A)
					Corrected	Noise Level	for Drill Rig	63.5	dB(A)

NSR ID.:		On House (Block F)				Ві	uilding Type:	4	
Location:	LET NSR distance: Assessment Floor:	12.2 m 1/F							
Items	Description				Oct	avo Band Er	equency, Hz		
				16	31.5	63	125	250	500
a)	Source Vibratory Velocity (Based on site measurement with	mm/s	= oreaker oner	0.05886	0.06816	0.06195	0.05033	0.06225	0.12091
	(Based on site measurement with	an excavator mounted t	nealler oper	ating at distance	c 110=0.0111)				
b)	Source Vibratory Velocity	in/s	=	2.32E-03	2.68E-03	2.44E-03	1.98E-03	2.45E-03	4.76E-03
c)	Vibration Velocity (ref. 10^-6 in/s)	20 log (V/Vref) dB	=	67	69	68	66	68	74
d)	Distance Attenuation r= 12.2 m	-20 log (r/ro) dB	=	-7	-7	-7	-7	-7	-7
e)	Soil Damping Loss (Assume zero as through the Rock	dB <)	=	0	0	0	0	0	0
f)	Building Coupling Loss	dB	=	0	0	0	0	0	0
g)	Building Vibration Response	dB	=	4	4	4	4	4	4
h)	Conversion from Vibration to Nois	e dB	=	-56.7	-39.4	-26.2	-16.1	-8.6	-3.2
i)	Multiple Vibration Soures (C _{multi})	dB	=	0	0	0	0	0	0
j)	Predicted Noise Level for Hydrauli	c Breaker dB(A)	=	8	26	39	47	56	67
	(c+d+e+f+g+h+i)			Predict	ted Noise Le	vel for Hydra	ulic Breaker	67.8	dB(A)
					Corrected	Noise Leve	I for Drill Rig	72.9	dB(A)
NSR ID.:	SPC Aberdeen Baptist Lui N	Ming Choi College				Вι	uilding Type:	4	
Location:	LET NSR distance: Assessment Floor:	47.9 m 1/F							
Items	Description								
				16	31.5	ave Band Fr 63	equency, Hz 125	250	500
a)	Source Vibratory Velocity	mm/s	=	0.05886	0.06816	0.06195	0.05033	0.06225	0.12091
	(Based on site measurement with	an excavator-mounted b	reaker oper	ating at distance	e Ro=5.5m)				
b)	Source Vibratory Velocity	in/s	=	2.32E-03	2.68E-03	2.44E-03	1.98E-03	2.45E-03	4.76E-03
c)	Vibration Velocity (ref. 10^-6 in/s)	20 log (V/Vref) dB	=	67	69	68	66	68	74
d)	Distance Attenuation	-20 log (r/ro)							
u)	r= 47.9 m	dB	=	-19	-19	-19	-19	-19	-19
e)	Soil Damping Loss (Assume zero as through the Rock	dB <)	=	0	0	0	0	0	0
f)	Building Coupling Loss	dB	=	0	0	0	0	0	0
g)	Building Vibration Response	dB	=	4	4	4	4	4	4
h)	Conversion from Vibration to Nois	e dB	=	-56.7	-39.4	-26.2	-16.1	-8.6	-3.2
i)	Multiple Vibration Soures (C _{multi})	dB	=	0	0	0	0	0	0
j)	Predicted Noise Level for Hydrauli	c Breaker dB(A)	=	-4	14	27	35	44	56
	(c+d+e+f+g+h+i)			Predict	ted Noise Le	vel for Hydra	ulic Breaker	55.9	dB(A)

NSR ID.:	LMCC	St Peter's Catholic Primary	School				Вι	uilding Type:	4	
Location:		NSR distance: Assessment Floor:	56.0 m 1/F							
Items	Descriptio	n				Oct	ave Band Fr	equency, Hz		
a)		bratory Velocity site measurement with an e	mm/s cavator-mounted b	= reaker opera	16 0.05886 ating at distance	31.5 0.06816	63 0.06195	125 0.05033	250 0.06225	500 0.12091
b)	Source Vil	bratory Velocity	in/s	=	2.32E-03	2.68E-03	2.44E-03	1.98E-03	2.45E-03	4.76E-03
c)	Vibration \	Velocity (ref. 10^-6 in/s)	20 log (V/Vref) dB	=	67	69	68	66	68	74
d)	Distance /	Attenuation 56.0 m	-20 log (r/ro) dB	=	-20	-20	-20	-20	-20	-20
e)	Soil Damp (Assume 2	oing Loss zero as through the Rock)	dB	=	0	0	0	0	0	0
f)	Building C	oupling Loss	dB	=	0	0	0	0	0	0
g)	Building V	ibration Response	dB	=	4	4	4	4	4	4
h)	Conversio	n from Vibration to Noise	dB	=	-56.7	-39.4	-26.2	-16.1	-8.6	-3.2
i)	Multiple V	ibration Soures (C _{multi})	dB	=	0	0	0	0	0	0
j)	Predicted (c+d+e+f+	Noise Level for Hydraulic Bre	eaker dB(A)	=	-6	13	25	34	43	54
	(010111	g,			Predict	ed Noise Le	vel for Hydra	ulic Breaker	54.6	dB(A)
						Corrected	Noise Level	for Drill Rig	59.6	dB(A)
NSR ID.: Location:		Lei Tung Lutheran Day Nur NSR distance: Assessment Floor:	sery (G/F of Tung N 56.3 m G/F	lau House)			Вι	uilding Type:	4	
Items	Descriptio		G/F							
a)		bratory Velocity site measurement with an e	mm/s cavator-mounted b	= reaker opera	16 0.05886 ating at distance	31.5 0.06816	ave Band Fr 63 0.06195	equency, Hz 125 0.05033	250 0.06225	500 0.12091
b)	Source Vil	bratory Velocity	in/s	=	2.32E-03	2.68E-03	2.44E-03	1.98E-03	2.45E-03	4.76E-03
c)	Vibration \	Velocity (ref. 10^-6 in/s)	20 log (V/Vref) dB	=	67	69	68	66	68	74
d)	Distance /	Attenuation 56.3 m	-20 log (r/ro) dB	=	-20	-20	-20	-20	-20	-20
e)	Soil Damp (Assume 2	oing Loss zero as through the Rock)	dB	=	0	0	0	0	0	0
f)	Building C	oupling Loss	dB	=	0	0	0	0	0	0
g)	Building V	ibration Response	dB	=	6	6	6	6	6	6
h)	Conversio	n from Vibration to Noise	dB	=	-56.7	-39.4	-26.2	-16.1	-8.6	-3.2
i)	Multiple V	ibration Soures (C _{multi})	dB	=	0	0	0	0	0	0
j)	Predicted (c+d+e+f+	Noise Level for Hydraulic Bre	eaker dB(A)	=	-4	15	27	36	45	56
	(0+0+0+1+	grufi)			Predict	ed Noise Le	vel for Hydra	ulic Breaker	56.5	dB(A)
						Corrected	Noise Level	I for Drill Rig	61.6	dB(A)

NSR ID.: Location:		CMA Lei Tung Child Care (66.8 m	Hing House)		Вι	uilding Type:	4			
Items	Descriptio	Assessment Floor:	G/F									
items	Descriptio	II .				Oct	ave Band Fr	equency, Hz				
a)		bratory Velocity site measurement with an e	mm/s xcavator-mounted b	= reaker opera	16 0.05886 ating at distance	31.5 0.06816 e Ro=5.5m)	63 0.06195	125 0.05033	250 0.06225	500 0.12091		
b)	Source Vil	bratory Velocity	in/s	=	2.32E-03	2.68E-03	2.44E-03	1.98E-03	2.45E-03	4.76E-03		
c)	Vibration \	Velocity (ref. 10^-6 in/s)	20 log (V/Vref) dB	=	67	69	68	66	68	74		
d)	Distance A	Attenuation 66.8 m	-20 log (r/ro) dB	=	-22	-22	-22	-22	-22	-22		
e)	Soil Damp (Assume 2	oing Loss zero as through the Rock)	dB	=	0	0	0	0	0	0		
f)	Building C	Coupling Loss	dB	=	0	0	0	0	0	0		
g)	Building V	ibration Response	dB	=	6	6	6	6	6	6		
h)	Conversio	n from Vibration to Noise	dB	=	-56.7	-39.4	-26.2	-16.1	-8.6	-3.2		
i)	Multiple V	ibration Soures (C _{multi})	dB	=	0	0	0	0	0	0		
j)	Predicted (c+d+e+f+	Noise Level for Hydraulic Br	eaker dB(A)	=	-5	13	26	34	43	55		
	(0.0.0	g,			Predict	ed Noise Le	vel for Hydra	ulic Breaker	er 55.0 dB(A)			
						Corrected	Noise Level	I for Drill Rig	60.1 dB(A)			
NSR ID.: Location:		Apleichau Kaifong Primary NSR distance: Assessment Floor:	School 54.3 m 1/F				Вι	uilding Type:	4			
Items	Descriptio		1/1									
a)		bratory Velocity site measurement with an e	mm/s xcavator-mounted b	= reaker opera	16 0.05886 ating at distance	31.5 0.06816	ave Band Fr 63 0.06195	equency, Hz 125 0.05033	250 0.06225	500 0.12091		
b)	Source Vil	bratory Velocity	in/s	=	2.32E-03	2.68E-03	2.44E-03	1.98E-03	2.45E-03	4.76E-03		
c)	Vibration \	Velocity (ref. 10^-6 in/s)	20 log (V/Vref) dB	=	67	69	68	66	68	74		
d)	Distance /	Attenuation 54.3 m	-20 log (r/ro) dB	=	-20	-20	-20	-20	-20	-20		
e)	Soil Damp (Assume 2	oing Loss zero as through the Rock)	dB	=	0	0	0	0	0	0		
f)	Building C	Coupling Loss	dB	=	0	0	0	0	0	0		
g)	Building V	ibration Response	dB	=	4	4	4	4	4	4		
h)	Conversio	n from Vibration to Noise	dB	=	-56.7	-39.4	-26.2	-16.1	-8.6	-3.2		
i)	Multiple V	ibration Soures (C _{multi})	dB	=	0	0	0	0	0	0		
j)	Predicted (c+d+e+f+	Noise Level for Hydraulic Br	eaker dB(A)	=	-5	13	26	34	43	54		
	(0+0+0+1+	9THT1)			Predict	ed Noise Le	vel for Hydra	ulic Breaker	r 54.8 dB(A)			
						Corrected	Noise Level	59.9 dB(A)				

NSR ID	Description	Land Use	Existing/ Planned NSR	No. of Floor	Assessment Floor	mPD	Ground-borne Noise Criteria, dB(A)	Activity		Distance (m)	No. of Hydraulic Breakers used on site	Multiple Source correction, dB(A)	No. of Hand-held Breakers used on site	Multiple Source correction, dB(A)	No. of Rock Drills/ Drilling Rig used on site	Multiple Source correction, dB(A)	Ground-borne Noise Impact from Hyraulic	Ground-borne Noise	Ground-borne Noise Impact from Rock Drill/ Drilling Rig,	Ground-borne Noise of each Activity, dB(A)
			Non				Daytime		Horizontal	Vertical	Slant	Site		Site		Site		Breakers, ub(A)	nielu breakers, ub(A)	dB(A)	UB(A)
LET Stat			1		1					1	1	1	1	ı				1			
YOC1	Yue On Court - Pik On House (Block C)	Residential	Existing	35	1/F	46.5	65	1	2.1	34.6	34.7	0	0	0	0	1	0	0	0	64	64
YOC2	Yue On Court - Tse On House (Block D)	Residential	Existing	35	1/F	46.5	65	1	0.6	35.8	35.8	0	0	0	0	1	0	0	0	64	64
	Yue On Court - Shan On House (Block F)	Residential	Existing	35	1/F	36.9	65	1	5.4	10.9	12.2	0	0	0	0	1	0	0	0	73	73
	Aberdeen Baptist Lui Ming Choi College	School	Existing	8	1/F	58.0	60	1	0.0	47.9	47.9	0	0	0	0	1	0	0	0	61	61
LMCC	St Peter's Catholic Primary School	School	Existing	7	1/F	64.0	60	1	15.0	54.0	56.0	0	0	0	0	1	0	0	0	60	60
LDN	Lei Tung Lutheran Day Nursery (G/F of Tung Mau House)	Nursery	Existing	1	G/F	63.7	65	1	0.0	56.3	56.3	0	0	0	0	1	0	0	0	62	62
CMA	CMA Lei Tung Child Care Centre (G/F of Tung Hing House)	Nursery	Existing	1	G/F	69.6	65	1	0.0	66.8	66.8	0	0	0	0	1	0	0	0	60	60
AKPS	Apleichau Kaifong Primary School	School	Existing	7	1/F	68.1	60	1	0.0	54.3	54.3	0	0	0	0	1	0	0	0	60	60

NSR ID.: Location:	SOH5 SOH	South Horizons Phase I NSR distance: Assessment Floor:	II - Mei Cheung Court (E 8.0 m 1/F plus 3 level podium				Ви	uilding Type:	1		
Items	Description		1/1 plus 3 level podium								
								equency, Hz			
a)		oratory Velocity site measurement with a	mm/s an excavator-mounted b	= reaker opera	16 0.05886 ating at distance	31.5 0.06816 Ro=5.5m)	63 0.06195	125 0.05033	250 0.06225	500 0.12091	
b)	Source Vib	oratory Velocity	in/s	=	2.32E-03	2.68E-03	2.44E-03	1.98E-03	2.45E-03	4.76E-03	
c)	Vibration \	/elocity (ref. 10^-6 in/s)	20 log (V/Vref) dB	=	67	69	68	66	68	74	
d)	Distance A	Attenuation 8.0 m	-20 log (r/ro) dB	=	-3	-3	-3	-3	-3	-3	
e)	Soil Damp (Assume z	oing Loss zero as through the Rock)	dB	=	0	0	0	0	0	0	
f)	Building C	oupling Loss	dB	=	-6	-7	-11	-13	-14	-12	
g)	Building V	ibration Response	dB	=	-2	-2	-2	-2	-2	-2	
h)	Conversio	n from Vibration to Noise	dB	=	-56.7	-39.4	-26.2	-16.1	-8.6	-3.2	
i)	Multiple Vi	bration Soures (C _{multi})	dB	=	0	0	0	0	0	0	
j)	Predicted (c+d+e+f+	Noise Level for Hydraulic	Breaker dB(A)	=	-1	17	25	32	40	53	
	(0.0.0	3 ·····,			Predicte	ed Noise Lev	el for Hydra	ulic Breaker	53.3 dB(A)		
		eld Breaker	r 52.8 dB(A)								
						Corrected	Noise Level	for Drill Rig	58.4	dB(A)	
NSR ID.: Location:	SOH6 SOH	South Horizons Phase I NSR distance:	8.0 m			Corrected		for Drill Rig		dB(A)	
		NSR distance: Assessment Floor:					Ві	uilding Type:	1	dB(A)	
Location:	SOH Description Source Vit	NSR distance: Assessment Floor:	8.0 m 1/F plus 3 level podium mm/s	=	16 0.05886 ating at distance	Oct 31.5 0.06816	Ві		1	500 0.12091	
Location: Items	SOH Description Source Vit (Based on	NSR distance: Assessment Floor: n pratory Velocity	8.0 m 1/F plus 3 level podium mm/s	=	0.05886	Oct 31.5 0.06816	Bu ave Band Fr 63	uilding Type: equency, Hz 125	250	500 0.12091	
Location: Items a)	SOH Description Source Vik (Based on Source Vik	NSR distance: Assessment Floor: n pratory Velocity site measurement with a	8.0 m 1/F plus 3 level podium mm/s in excavator-mounted bi	= reaker opera	0.05886 ating at distance	Oct 31.5 0.06816 Ro=5.5m)	Bu ave Band Fr 63 0.06195	equency, Hz 125 0.05033	250 0.06225	500 0.12091	
Location: Items a) b)	SOH Description Source Vit (Based on Source Vit Vibration V	NSR distance: Assessment Floor: n pratory Velocity site measurement with a pratory Velocity	8.0 m 1/F plus 3 level podium mm/s in excavator-mounted bi in/s 20 log (V/Vref)	= reaker opera =	0.05886 ating at distance 2.32E-03	Oct 31.5 0.06816 Ro=5.5m) 2.68E-03	Bu ave Band Fr 63 0.06195 2.44E-03	equency, Hz 125 0.05033 1.98E-03	250 0.06225 2.45E-03	500 0.12091 4.76E-03	
Location: Items a) b) c)	SOH Description Source Vite (Based on Source Vite Vibration Vibr	NSR distance: Assessment Floor: n pratory Velocity site measurement with a pratory Velocity Velocity Velocity (ref. 10^-6 in/s) Attenuation 8.0 m	8.0 m 1/F plus 3 level podium mm/s in excavator-mounted bi in/s 20 log (V/Vref) dB -20 log (r/ro) dB dB	= reaker opera = =	0.05886 ating at distance 2.32E-03 67	Oct 31.5 0.06816 Ro=5.5m) 2.68E-03	ave Band Fr 63 0.06195 2.44E-03	equency, Hz 125 0.05033 1.98E-03	250 0.06225 2.45E-03 68	500 0.12091 4.76E-03	
Location: Items a) b) c) d)	SOH Description Source Vit (Based on Source Vit Vibration V Distance A r= Soil Damp (Assume z	NSR distance: Assessment Floor: n pratory Velocity site measurement with a pratory Velocity Velocity (ref. 10^-6 in/s) Attenuation 8.0 m	8.0 m 1/F plus 3 level podium mm/s in excavator-mounted bi in/s 20 log (V/Vref) dB -20 log (r/ro) dB dB	= reaker opera = = =	0.05886 ating at distance 2.32E-03 67 -3	Oct 31.5 0.06816 Ro=5.5m) 2.68E-03 69	Buave Band Fr 63 0.06195 2.44E-03 68	equency, Hz 125 0.05033 1.98E-03 66	250 0.06225 2.45E-03 68 -3	500 0.12091 4.76E-03 74	
Location: Items a) b) c) d)	SOH Description Source Vit (Based on Source Vit Vibration Vibrat	NSR distance: Assessment Floor: n oratory Velocity site measurement with a oratory Velocity Velocity (ref. 10^-6 in/s) Attenuation 8.0 m oing Loss zero as through the Rock)	8.0 m 1/F plus 3 level podium mm/s in excavator-mounted bi in/s 20 log (V/Vref) dB -20 log (r/ro) dB dB	= reaker opera = = = = =	0.05886 ating at distance 2.32E-03 67 -3 0	Oct 31.5 0.06816 Ro=5.5m) 2.68E-03 69 -3	ave Band Fr 63 0.06195 2.44E-03 68 -3 0	equency, Hz 125 0.05033 1.98E-03 66 -3 0	250 0.06225 2.45E-03 68 -3 0	500 0.12091 4.76E-03 74 -3 0	
Location: Items a) b) c) d) e)	SOH Description Source Vite (Based on Source Vite Vibration Vibr	NSR distance: Assessment Floor: n pratory Velocity site measurement with a pratory Velocity Velocity Velocity (ref. 10^-6 in/s) Attenuation 8.0 m pring Loss prero as through the Rock) poupling Loss	8.0 m 1/F plus 3 level podium mm/s in excavator-mounted bi in/s 20 log (V/Vref) dB -20 log (r/ro) dB dB dB dB	= reaker opera = = = = =	0.05886 ating at distance 2.32E-03 67 -3 0 -6	Oct 31.5 0.06816 Ro=5.5m) 2.68E-03 69 -3 0	ave Band Fr 63 0.06195 2.44E-03 68 -3 0	equency, Hz 125 0.05033 1.98E-03 66 -3 0	250 0.06225 2.45E-03 68 -3 0	500 0.12091 4.76E-03 74 -3 0	
Location: Items a) b) c) d) e) f) g)	SOH Description Source Vite (Based on Source Vite Vibration V Distance A r= Soil Damp (Assume z Building C Building V Conversion	NSR distance: Assessment Floor: n pratory Velocity site measurement with a pratory Velocity Velocity (ref. 10^-6 in/s) Attenuation 8.0 m pring Loss tero as through the Rock) oupling Loss ibration Response	8.0 m 1/F plus 3 level podium mm/s in excavator-mounted bi in/s 20 log (V/Vref) dB -20 log (r/ro) dB dB dB dB	= reaker opera = = = = = = = =	0.05886 ating at distance 2.32E-03 67 -3 0 -6 -2	Oct 31.5 0.06816 Ro=5.5m) 2.68E-03 69 -3 0	Buave Band From 63 0.06195 2.44E-03 68 -3 0 -11	equency, Hz 125 0.05033 1.98E-03 66 -3 0 -13	250 0.06225 2.45E-03 68 -3 0 -14 -2	500 0.12091 4.76E-03 74 -3 0 -12 -2	
Location: Items a) b) c) d) e) f) g) h)	SOH Description Source Vit (Based on Source Vit Vibration V Distance Ar Soil Damp (Assume ar Building C Building V Conversion Multiple Vit Predicted	NSR distance: Assessment Floor: n pratory Velocity site measurement with a pratory Velocity Velocity Velocity (ref. 10^-6 in/s) Attenuation 8.0 m pring Loss pero as through the Rock) poupling Loss ibration Response in from Vibration to Noise ibration Soures (C multi) Noise Level for Hydraulic	8.0 m 1/F plus 3 level podium mm/s In excavator-mounted bi in/s 20 log (V/Vref) dB -20 log (r/ro) dB dB dB dB dB dB	= reaker opera = = = = = = = =	0.05886 ating at distance 2.32E-03 67 -3 0 -6 -2 -56.7	Oct 31.5 0.06816 Ro=5.5m) 2.68E-03 69 -3 0 -7 -2 -39.4	Buave Band From 63 0.06195 2.44E-03 68 -3 0 -111 -2 -26.2	equency, Hz 125 0.05033 1.98E-03 66 -3 0 -13 -2 -16.1	250 0.06225 2.45E-03 68 -3 0 -14 -2 -8.6	500 0.12091 4.76E-03 74 -3 0 -12 -2 -3.2	
Location: Items a) b) c) d) e) f) g) h)	SOH Description Source Vit (Based on Source Vit Vibration V Distance A r= Soil Damp (Assume z Building C Building V Conversion Multiple Vit	NSR distance: Assessment Floor: n pratory Velocity site measurement with a pratory Velocity Velocity Velocity (ref. 10^-6 in/s) Attenuation 8.0 m pring Loss pero as through the Rock) poupling Loss ibration Response in from Vibration to Noise ibration Soures (C multi) Noise Level for Hydraulic	8.0 m 1/F plus 3 level podium mm/s In excavator-mounted bi in/s 20 log (V/Vref) dB -20 log (r/ro) dB dB dB dB dB dB	= reaker opera = = = = = = = = = = = = = = = = = = =	0.05886 ating at distance 2.32E-03 67 -3 0 -6 -2 -56.7 0 -1	Oct 31.5 0.06816 Ro=5.5m) 2.68E-03 69 -3 0 -7 -2 -39.4 0	Buave Band Fr 63 0.06195 2.44E-03 68 -3 0 -11 -2 -26.2 0 25	equency, Hz 125 0.05033 1.98E-03 66 -3 0 -13 -2 -16.1 0	250 0.06225 2.45E-03 68 -3 0 -14 -2 -8.6 0 40	500 0.12091 4.76E-03 74 -3 0 -12 -2 -3.2 0	
Location: Items a) b) c) d) e) f) g) h)	SOH Description Source Vit (Based on Source Vit Vibration V Distance Ar Soil Damp (Assume ar Building C Building V Conversion Multiple Vit Predicted	NSR distance: Assessment Floor: n pratory Velocity site measurement with a pratory Velocity Velocity Velocity (ref. 10^-6 in/s) Attenuation 8.0 m pring Loss pero as through the Rock) poupling Loss ibration Response in from Vibration to Noise ibration Soures (C multi) Noise Level for Hydraulic	8.0 m 1/F plus 3 level podium mm/s In excavator-mounted bi in/s 20 log (V/Vref) dB -20 log (r/ro) dB dB dB dB dB dB	= reaker opera = = = = = = = = = = = = = = = = = = =	0.05886 ating at distance 2.32E-03 67 -3 0 -6 -2 -56.7 0 -1 Predicte	Oct 31.5 0.06816 Ro=5.5m) 2.68E-03 69 -3 0 -7 -2 -39.4 0 17	Buave Band From 63	equency, Hz 125 0.05033 1.98E-03 66 -3 0 -13 -2 -16.1 0 32	250 0.06225 2.45E-03 68 -3 0 -14 -2 -8.6 0 40 53.3	500 0.12091 4.76E-03 74 -3 0 -12 -2 -3.2 0 53	

NSR ID.: Location:		III - Mei Cheung Court 12.5 m 1/F plus 4 level podiu				Ві	uilding Type:	1		
Items	Description	1/F plus 4 level podiul	111							
							equency, Hz			
a)	Source Vibratory Velocity (Based on site measurement with	mm/s an excavator-mounted	= breaker opera	16 0.05886 ating at distance	31.5 0.06816 Ro=5.5m)	63 0.06195	125 0.05033	250 0.06225	500 0.12091	
b)	Source Vibratory Velocity	in/s	=	2.32E-03	2.68E-03	2.44E-03	1.98E-03	2.45E-03	4.76E-03	
c)	Vibration Velocity (ref. 10^-6 in/s)	20 log (V/Vref) dB	=	67	69	68	66	68	74	
d)	Distance Attenuation r= 12.5 m	-20 log (r/ro) dB	=	-7	-7	-7	-7	-7	-7	
e)	Soil Damping Loss (Assume zero as through the Roc	dB k)	=	0	0	0	0	0	0	
f)	Building Coupling Loss	dB	=	-6	-7	-11	-13	-14	-12	
g)	Building Vibration Response	dB	=	-4	-4	-4	-4	-4	-4	
h)	Conversion from Vibration to Nois	e dB	=	-56.7	-39.4	-26.2	-16.1	-8.6	-3.2	
i)	Multiple Vibration Soures (C $_{\rm multi}$)	dB	=	0	0	0	0	0	0	
j)	Predicted Noise Level for Hydraul (c+d+e+f+g+h+i)	ic Breaker dB(A)	=	-7	11	19	26	34	47	
	(6.2.2)			Predicte	ed Noise Le	vel for Hydra	ulic Breaker	47.5 dB(A)		
				Correcte	ed Noise Lev	el for Handr	neld Breaker	46.9 dB(A)		
					Corrected	Noise Leve	I for Drill Rig	52.6 dB(A)		
NSR ID.: Location:		III - Mei Cheung Court 4.5 m 1/F plus 4 level podiu				Вι	uilding Type:	1		
Items	Description	77 plus 4 level podial			Oct	ave Band Fr	equency, Hz			
a)	Source Vibratory Velocity (Based on site measurement with	mm/s an excavator-mounted	= breaker opera	16 0.05886 ating at distance	31.5 0.06816	63 0.06195	125 0.05033	250 0.06225	500 0.12091	
b)	Source Vibratory Velocity	in/s	=	2.32E-03	2.68E-03	2.44E-03	1.98E-03	2.45E-03	4.76E-03	
c)	Vibration Velocity (ref. 10^-6 in/s)	20 log (V/Vref) dB	=	67	69	68	66	68	74	
d)	Distance Attenuation r= 4.5 m	-20 log (r/ro) dB	=	2	2	2	2	2	2	
e)	Soil Damping Loss (Assume zero as through the Roc	dB k)	=	0	0	0	0	0	0	
f)	Building Coupling Loss	dB	=	-6	-7	-11	-13	-14	-12	
g)	Building Vibration Response	dB	=	-4	-4	-4	-4	-4	-4	
h)	Conversion from Vibration to Nois	e dB	=	-56.7	-39.4	-26.2	-16.1	-8.6	-3.2	
	Multiple Viloupties Course (C.)	dB	=	0	0	0	0	0	0	
i)	Multiple Vibration Soures (C _{multi})									
i) j)	Predicted Noise Level for Hydraul	ic Breaker dB(A)	=	2	20	28	35	43	56	
Ĺ		ic Breaker dB(A)	=				35 Julic Breaker		56 dB(A)	
Ĺ	Predicted Noise Level for Hydraul	ic Breaker dB(A)	=	Predicte	ed Noise Le	vel for Hydra		56.3		

NSR ID.:	PBPS	Precious Blood Primary So		s)			Ві	uilding Type:	1	
Location:	SOH	NSR distance:	75.0 m							
Items	Description	Assessment Floor:	1/F							
ILCITIS	Description)II				Oct	ave Band Fr	equency, Hz		
					16	31.5	63	125	250	500
a)	Source Vi	0.05033	0.06225	0.12091						
	(Based or	n site measurement with an e	excavator-mounted b	reaker ope	erating at distanc	e Ro=5.5m)				
b)	Source Vi	bratory Velocity	in/s	=	2.32E-03	2.68E-03	2.44E-03	1.98E-03	2.45E-03	4.76E-03
,		•								
c)	Vibration	Velocity (ref. 10^-6 in/s)	20 log (V/Vref)		67	00	00	00	00	74
			dB	=	67	69	68	66	68	74
d)	Distance .	Attenuation	-20 log (r/ro)							
•	r=	75.0 m	dB	=	-23	-23	-23	-23	-23	-23
e)	Soil Damı	oing Locs	dB	=	0	0	0	0	0	0
6)		zero as through the Rock)	UD	_	O	U	U	U	U	O
	•	,								
f)	Building C	Coupling Loss	dB	=	-6	-7	-11	-13	-14	-12
g)	Buildina V	/ibration Response	dB	=	4	4	4	4	4	4
97					•		•	•	•	•
h)	Conversion	on from Vibration to Noise	dB	=	-56.7	-39.4	-26.2	-16.1	-8.6	-3.2
i)	Multiple V	ibration Soures (C multi)	dB	=	0	0	0	0	0	0
''	wattpic v	ibration codies (o multi)	UD	_	O	U	U	U	U	O
j)	Predicted	Noise Level for Hydraulic Br	eaker dB(A)	=	-14	3	12	18	26	40
	(c+d+e+f+	+g+h+i)			5 "					
					Predic	ted Noise Le	vel for Hydra	ulic Breaker	39.9	dB(A)
					Correct	ted Noise Lev	39.3	dB(A)		
						Corrected	l Noise Leve	I for Drill Rig	45.0	dB(A)

Appendix 3.5

South Island Line (East)	
Environmental Impact Assessment	

NSR ID	Description	Land Use	Existing/ Planned NSR	No. of Floor	Assessment Floor	Ground-borne Noise Criteria, dB(A)	Activity		Distance (m)		No. of Hydraulic Breakers used on site	Multiple Source correction, dB(A)	No. of Hand-held Breakers used on site	Multiple Source correction, dB(A)	No. of Rock Drills/ Drilling Rig used on site	Multiple Source correction, dB(A)	Impact from Hyraulic	Ground-borne Noise	Drill/ Drilling Rig,	Ground-borne Noise of each Activity, dB(A)
			1011			Daytime		Horizontal	Vertical	Slant	Site		Site		Site		Dicancio, ab(A)	nera breakers, ab(A)	dB(A)	GB(A)
	OH Station																			
	South Horizons Phase III - Mei Cheung Court (Block 20)	Residential	Existing	40	1/F	65	5	8.0	0.0	8.0	0	0	1	0	2	3	0	53	61	62
	South Horizons Phase III - Mei Ka Court (Block 23A)	Residential	Existing	39	1/F	65	5	8.0	0.0	8.0	0	0	1	0	2	3	0	53	61	62
	South Horizons Phase IV - Cambridge Court (Block 33A)	Residential	Existing	25	1/F	65	5	12.5	0.0	12.5	0	0	1	0	2	3	0	47	56	56
	South Horizons Phase IV - Dover Court (Block 25)	Residential	Existing	35	1/F	65	5	4.5	0.0	4.5	0	0	1	0	2	3	0	56	64	65
PBPS	Precious Blood Primary School (South Horizons)	Educational	Existing	7	1/F	60	5	75.0	0.0	75.0	0	0	1	0	2	3	0	39	48	49