Appendix 7.1 - Sample Calculation of Ground-borne Noise Impacts from PME

NSR No. **HH7**
Name **The Metropolis Residence**

PME Hydraulic Breaker

Item	Description								Assumption
	Octave Band Frequency	16	31.5	63	125	250	500	Hz	
	rms velocity	0.06	0.07	0.06	0.05	0.06	0.12	mm/s	
1	Vibration Velocity, ref 10^ -6 mm/s	95	97	96	94	96	102	dB(V)	
2	Ro	5.5	5.5	5.5	5.5	5.5	5.5	m	Site measurement of breaker operation at distance = 5.5m
	R	90	90	90	90	90	90	m	Shortest distance from the site to the NSR
	Distance Attenuation	-24	-24	-24	-24	-24	-24	dB	
3	Soil / Rock Damping	0	0	0	0	0	0	dB	The whole transmission path is assumed to be rock and no damping applied
4	Building Coupling Loss	0	0	0	0	0	0	dB	
5	Floor to Floor Attenuation	-8	-8	-8	-8	-8	-8	dB	Assume -2 dB per floor and the worst affected NSR is located on 4th floor.
6	Conversion from Vibration to Noise	-27	-27	-27	-27	-27	-27	dB	Adopted from KSL EIA Table 7-4
7	Conversion to A-weighted Noise	-56.7	-39.4	-26.2	-16.1	-8.6	-3.2	dB(A)	Standard acoustic principal
	Individual Groundborne Noise	-21	-2	10	19	28	39	dB(A)	Standard acoustic principal
	Predicted Groundborne Noise for ONE hydraulic breaker Operation						39.5	dB(A)	

PME Pile Rig

	Using the calculated hydraulic breaker noise to correct to pipepile noise	6.6	dB(A)	20log(0.638/0.298) Site measurement in KSL EIA Appendix 7-1
	Predicted Groundborne Noise for pile rig operation	46	dB(A)	

Predicted Ground-borne Noise Level

Scenario	Type of PME	No. of PME	Predicted Ground-borne Noise Level	Construction Activities
1	Modified Rig*	10	50	Construction of diaphragm wall
2	Hydraulic Breaker	2	48	Excavation for HUH
	Piling Rig	1		

Note: *
The modified rig is mainly used for excavation of soil during construction of diaphragm wall. However, it would also be used in minor rock chiselling in order to toe in the diaphragm wall into the the rock. In view of similar nature of rock chiseling by modified rig and rock breaking by hydraulic breaker, the rms veolcity for hydraulic breaker, that has been used in KSL EIA (Appendix 7-1), is adopted for assessment.