

Appendix D Detailed Noise Calculations

Table D-1 Sound Power Level (SWL) Evaluation - Unmitigated

	Activities	PME	TM ID Code	Unit	SWL dB(A)
<b>Powered Mechanical Equipment Used for Tunnel Construction</b>					
A	General	Loader	CNP 081	1	112
		Backhoe / Muck Car	CNP 081	1	112
		Concrete Lorry Mixer	CNP 044	1	109
		Mobile Crane	CNP 048	1	112
		Dump Truck	CNP 067	1	117
		Concrete Pump	CNP 047	1	109
		Mobile Generator	CNP 101	1	108
		Compressor	CNP 002	1	102
		Water Pump	CNP 281	1	88
		Ventilation Fan	CNP 241	1	108
<b>Total SWL</b>					<b>121</b>
B	Site Formation	Rock Drill (Hydraulic)	CNP 182	1	123
		Shotcrete Vehicle	CNP 047	1	109
		Explosive Delivery Vehicle	CNP 141	1	112
<b>Total SWL</b>					<b>123</b>
C	TBM Tunnel Construction	Tunnel Boring Machine	-	1	88
		Conveyor Belt System (thorough the tunnel and at the Outfall for spoil disposal)	CNP 041	1	90
<b>Total SWL</b>					<b>92</b>
D	Concreting Works	Concrete Delivery Truck	CNP 141	1	112
		Pumping Plant	CNP 047	1	109
<b>Total SWL</b>					<b>114</b>
<b>Powered Mechanical Equipment Used for Construction of I-1</b>					
A	General	Mobile Crane	CNP 048	1	112
		Dump Truck	CNP 067	2	112
		Mobile Generator	CNP 101	2	108
		Compressor	CNP 002	2	102
		Water Pump	CNP 281	2	88
<b>Total SWL</b>					<b>118</b>
B	Site Formation and Excavation	Excavator	CNP 081	2	112
		Dump Truck	CNP 067	1	117
<b>Total SWL</b>					<b>119</b>
C	Concreting	Crane, mobile	CNP 048	1	112
		Concrete Lorry Mixer	CNP 044	1	109
		Compactor, vibratory	CNP 050	1	105
<b>Total SWL</b>					<b>114</b>
D	Piling	Piling, large diameter bored, oscillator	CNP 165	1	115
		Piling, large diameter bored, reverse circulation drill	CNP 166	1	100
<b>Total SWL</b>					<b>116</b>
E	Slope work	Drill, percussive, hand-held (electric)	CNP 064	2	103
		Excavator	CNP 081	2	112
		Roller, vibratory	CNP 186	1	108
<b>Total SWL</b>					<b>116</b>
F	Formwork and Reinforcement	Bar bender and cutter (electric)	CNP 021	2	90
		Generator, standard	CNP 101	1	108
		Crane, mobile	CNP 048	1	112
		Saw, circular, wood	CNP 201	1	108
		Lorry	CNP 141	1	112
<b>Total SWL</b>					<b>116</b>

Appendix D Detailed Noise Calculations

Table D-1 Sound Power Level (SWL) Evaluation - Unmitigated

	Activities	PME	TM ID Code	Unit	SWL dB(A)
<b>Powered Mechanical Equipment Used for Construction of I-2</b>					
A	General	Mobile Crane	CNP 048	1	112
		Dump Trucks	CNP 067	2	117
		Mobile generator	CNP 101	2	108
		Compressor	CNP 002	2	102
		Water Pump	CNP 281	2	88
		Total SWL			
B	Site Formation and Excavation	Excavator	CNP 081	2	112
		Dump Trucks	CNP 067	1	117
		Total SWL			
C	Concreting	Crane, mobile	CNP 048	1	112
		Concrete Lorry Mixer	CNP 044	1	109
		Compactor, vibratory	CNP 050	1	105
		Total SWL			
D	Hand Digging for Intake Shaft (for the first 8m below ground)	Breaker, hand-held, mass>35kg	CNP026	1	114
		Excavator/loader, wheeled/tracked	CNP081	1	112
		Total SWL			
E	Drill & Blast for Intake Shaft	Rock Drill (Hydraulic)	CNP 182	1	123
		Shotcrete Vehicle	CNP 047	1	109
		Explosive Delivery Vehicle	CNP 141	1	112
		Total SWL			
F	Diaphragm walling	Piling, diaphragm wall, bentonite filtering plant	CNP 162	1	105
		Piling, diaphragm wall, hydraulic extractor	CNP 163	1	90
		Total SWL			
G	Formwork and Reinforcement	Bar bender and cutter (electric)	CNP 021	2	90
		Generator, standard	CNP 101	1	108
		Crane, mobile	CNP 048	1	112
		Saw, circular, wood	CNP 201	1	108
		Lorry	CNP 141	1	112
		Total SWL			
<b>Powered Mechanical Equipment Used for Construction of I-3</b>					
A	General	Mobile Crane	CNP 048	1	112
		Dump Trucks	CNP 067	2	117
		Mobile Generator	CNP 101	2	108
		Compressor	CNP 002	2	102
		Water Pump	CNP 281	2	88
		Total SWL			
B	Site Formation and Excavation	Excavator	CNP 081	2	112
		Dump Trucks	CNP 067	1	117
		Total SWL			
C	Concreting	Crane, mobile	CNP 048	1	112
		Concrete Lorry Mixer	CNP 044	1	109
		Compactor, vibratory	CNP 050	1	105
		Total SWL			
D	Drill & Blast for Intake Shaft	Rock Drill (Hydraulic)	CNP 182	1	123
		Shotcrete Vehicle	CNP 047	1	109
		Explosive Delivery Vehicle	CNP 141	1	112
		Total SWL			
E	Diaphragm walling	Piling, diaphragm wall, bentonite filtering plant	CNP 162	1	105
		Piling, diaphragm wall, hydraulic extractor	CNP 163	1	90
		Total SWL			

Appendix D Detailed Noise Calculations

Table D-1 Sound Power Level (SWL) Evaluation - Unmitigated

	Activities	PME	TM ID Code	Unit	SWL dB(A)
F	Slope work	Drill, percussive, hand-held (electric)	CNP 064	2	103
		Excavator	CNP 081	2	112
		Roller, vibratory	CNP 186	1	108
		Total SWL			
G	Formwork and Reinforcement	Bar bender and cutter (electric)	CNP 021	2	90
		Generator, standard	CNP 101	1	108
		Crane, mobile	CNP 048	1	112
		Saw, circular, wood	CNP 201	1	108
		Lorry	CNP 141	1	112
		Total SWL			
<b>Powered Mechanical Equipment Used for Construction of O-1</b>					
A	General	Mobile Crane	CNP 048	1	112
		Dump Trucks	CNP 067	2	117
		Mobile Generator	CNP 101	2	108
		Compressor	CNP 002	2	102
		Water Pump	CNP 281	2	88
		Total SWL			
B	Site Formation and Excavation	Excavator	CNP 081	2	112
		Dump Truck	CNP 067	1	117
		Total SWL			
C	Concreting	Crane, mobile	CNP 048	1	112
		Concrete Lorry Mixer	CNP 044	1	109
		Compactor, vibratory	CNP 050	1	105
		Explosive Delivery Vehicle	CNP 141	1	112
		Total SWL			
D	Piling	Piling, large diameter bored, oscillator	CNP 165	2	115
		Piling, large diameter bored, reverse circulation drill	CNP 166	1	100
		Total SWL			
E	Slope work	Drill, percussive, hand-held (electric)	CNP 064	2	103
		Excavator	CNP 081	2	112
		Roller, vibratory	CNP 186	1	108
Total SWL				<b>116</b>	
F	Formwork and Reinforcement	Bar bender and cutter (electric)	CNP 021	2	90
		Generator, standard	CNP 101	1	108
		Crane, mobile	CNP 048	1	112
		Saw, circular, wood	CNP 201	1	108
		Lorry	CNP 141	1	112
		Total SWL			
G	Rap-rip	Derrick barge	CNP 061	1	104
		Dump Truck	CNP 067	1	117
		Total SWL			

Appendix D Detailed Noise Calculations

Table D-1 Sound Power Level (SWL) Evaluation - Unmitigated

	Activities	PME	TM ID Code	Unit	SWL dB(A)
<b>Assuming PMEs for Tuen Mun Road Widening - the potential interfacing project</b>					
A	General	Mobile Crane	CNP 048	1	112
		Dump Trucks	CNP 067	2	117
		Mobile Generator	CNP 101	2	108
		Compressor	CNP 002	2	102
		Water Pump	CNP 281	2	88
				Total SWL	<b>121</b>
B	Site Formation and Excavation	Excavator	CNP 081	2	112
		Dump Truck	CNP 067	1	117
				Total SWL	<b>119</b>
C	Concreting	Crane, mobile	CNP 048	1	112
		Concrete lorry mixer	CNP 044	1	109
		Compactor, vibratory	CNP 050	1	105
				Total SWL	<b>114</b>
D	Piling	Piling, large diameter bored, oscillator	CNP165	1	115
		Piling, large diameter bored, reverse circulation drill	CNP166	1	100
				Total SWL	<b>116</b>
E	Slope work	Drill, percussive, hand-held (electric)	CNP064	2	103
		Excavator	CNP081	2	112
		Roller, vibratory	CNP186	1	108
				Total SWL	<b>116</b>
F	Formwork and Reinforcement	Bar bender and cutter (electric)	CNP 021	2	90
		Generator, standard	CNP 101	1	108
		Crane, mobile	CNP 048	1	112
		Saw, circular, wood	CNP 201	1	108
		Lorry	CNP 141	1	112
				Total SWL	<b>116</b>

Appendix D Detailed Noise Calculations

Table D-2 Predicted Noise Level (PNL) - Unmitigated

Construction of Tunnel												
Activity	Total SWL	NSRs	1	2	3	4	5	6	7	8	9	
		Construction Noise Criteria dB(A)	70	75	75	75	75	75	75	75	75	
		Distance from source (m)	60	90	24	55	70	50	160	70	60	
		Facade reflection dB(A)	+3	+3	+3	+3	+3	+3	+3	+3	+3	
		Screening effect dB(A)	0	0	0	0	0	0	0	0	0	
A General	121	Predicted Noise Level dB(A)	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	<b>79</b>	<b>81</b>	
B Site Formation	123		N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	<b>82</b>	<b>83</b>	
C TBM Tunnel Construction	92		N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	50	52	
D Concreting Works	114		N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	72	73	
Construction of I-1												
		Construction Noise Criteria dB(A)	70	75	75	75	75	75	75	75	75	
		Distance from source (m)	60	90	24	55	70	50	160	70	60	
		Facade reflection dB(A)	+3	+3	+3	+3	+3	+3	+3	+3	+3	
		Screening effect dB(A)	0	0	0	0	0	0	0	0	0	
A General	118	Predicted Noise Level dB(A)	<b>77</b>	74	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	
B Site Formation and Excavation	119		<b>79</b>	75	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	
C Concreting	114		<b>74</b>	70	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	
D Piling	116		<b>75</b>	72	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	
E Slope work	116		<b>76</b>	72	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	
F Formwork and Reinforcement	116		<b>76</b>	72	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	
Construction of I-2												
		Construction Noise Criteria dB(A)	70	75	75	75	75	75	75	75	75	
		Distance from source (m)	60	90	24	55	70	50	160	70	60	
		Facade reflection dB(A)	+3	+3	+3	+3	+3	+3	+3	+3	+3	
		Screening effect dB(A)	0	0	0	0	0	0	0	0	0	
A General	121	Predicted Noise Level dB(A)	N.A.	N.A.	<b>89</b>	<b>81</b>	<b>79</b>	N.A.	N.A.	N.A.	N.A.	
B Site Formation and Excavation	119		N.A.	N.A.	<b>87</b>	<b>79</b>	<b>77</b>	N.A.	N.A.	N.A.	N.A.	
C Concreting	114		N.A.	N.A.	<b>82</b>	74	72	N.A.	N.A.	N.A.	N.A.	
D Hand Digging for Intake Shaft	116		N.A.	N.A.	<b>84</b>	<b>76</b>	74	N.A.	N.A.	N.A.	N.A.	
E Drill & Blast for Intake Shaft	123		N.A.	N.A.	<b>91</b>	<b>84</b>	<b>82</b>	N.A.	N.A.	N.A.	N.A.	
F Diaphragm walling	105		N.A.	N.A.	73	65	63	N.A.	N.A.	N.A.	N.A.	
G Formwork and Reinforcement	116		N.A.	N.A.	<b>84</b>	<b>77</b>	75	N.A.	N.A.	N.A.	N.A.	
Construction of I-3												
		Construction Noise Criteria dB(A)	70	75	75	75	75	75	75	75	75	
		Distance from source (m)	60	90	24	55	70	50	160	70	60	
		Facade reflection dB(A)	+3	+3	+3	+3	+3	+3	+3	+3	+3	
		Screening effect dB(A)	0	0	0	0	0	0	0	0	0	
A General	121	Predicted Noise Level dB(A)	N.A.	N.A.	N.A.	N.A.	N.A.	<b>82</b>	72	N.A.	N.A.	
B Site Formation and Excavation	119		N.A.	N.A.	N.A.	N.A.	N.A.	<b>80</b>	70	N.A.	N.A.	
C Concreting	114		N.A.	N.A.	N.A.	N.A.	N.A.	75	65	N.A.	N.A.	
D Drill & Blast for Intake Shaft	123		N.A.	N.A.	N.A.	N.A.	N.A.	<b>85</b>	74	N.A.	N.A.	
E Diaphragm walling	105		N.A.	N.A.	N.A.	N.A.	N.A.	66	56	N.A.	N.A.	
F Slope work	116		N.A.	N.A.	N.A.	N.A.	N.A.	<b>77</b>	67	N.A.	N.A.	
G Formwork and Reinforcement	116		N.A.	N.A.	N.A.	N.A.	N.A.	<b>78</b>	67	N.A.	N.A.	
Construction of O-1												
		Construction Noise Criteria dB(A)	70	75	75	75	75	75	75	75	75	
		Distance from source (m)	60	90	24	55	70	50	160	70	60	
		Facade reflection dB(A)	+3	+3	+3	+3	+3	+3	+3	+3	+3	
		Screening effect dB(A)	0	0	0	0	0	0	0	0	0	
A General	121	Predicted Noise Level dB(A)	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	<b>79</b>	<b>81</b>	
B Site Formation and Excavation	119		N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	<b>77</b>	<b>79</b>	
C Concreting	116		N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	74	<b>76</b>	
D Piling	118		N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	<b>76</b>	<b>78</b>	
E Slope work	116		N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	74	<b>76</b>	
F Formwork and Reinforcement	116		N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	75	<b>76</b>	
G Rap-rip	117		N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	<b>76</b>	<b>77</b>	
A+TM General + Interfacing Project	124	Predicted Noise Level dB(A)	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	<b>82</b>	<b>84</b>	
B+TM Site Formation and Excavation + Interfacing Project	123		N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	<b>81</b>	<b>83</b>
C+TM Concreting + Interfacing Project	122		N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	<b>80</b>	<b>82</b>
D+TM Piling + Interfacing Project	123		N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	<b>81</b>	<b>82</b>
E+TM Slope work + Interfacing Project	122		N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	<b>80</b>	<b>82</b>
F+TM Formwork and Reinforcement + Interfacing Project	122		N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	<b>80</b>	<b>82</b>
G+TM Rap-rip + Interfacing Project	123		N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	<b>81</b>	<b>82</b>

Note:

- Bolded value means PNL exceeds the daytime construction noise criteria.
- N.A. Either too far away (>300m) or no PME employed
- NSR1 Sik Sik Yuen Ho Fung College  
NSR2 Kwai Shue House  
NSR3 Hong Hoi Chee Hong Temple  
NSR4 Yuen Yuen Care and Attention Home for the Aged  
NSR5 Western Monastery
- TM The potential interfacing project of the Reconstruction and Improvement of Tuen Mun Road

- NSR6 Squatters  
NSR7 Route Twisk Villa (Block 7-8)  
NSR8 Beach Tower (Long Beach Gardens)  
NSR9 Greenview Terrace (Block 1)

Appendix D Detailed Noise Calculations

Table D-3 Sound Power Level (SWL) Evaluation - 1st Level Mitigation Measures (Quiet Plant)

	Activities	PME	TM ID Code / BS5228	Ref. No.	Unit	SWL dB(A)
<b>Powered Mechanical Equipment Used for Tunnel Construction</b>						
A	General	<i>Loader</i>	Table C.3	97	1	105
		<i>Backhoe / Muck Car</i>	Table C.3	97	1	105
		<i>Concrete Lorry Mixer</i>	Table C.6	35	1	100
		<i>Mobile Crane</i>	Table C.7	114	1	101
		<i>Dump Truck</i>	Table C.9	27	1	105
		<i>Concrete Pump</i>	Table C.6	36	1	106
		<i>Mobile Generator</i>	Table C.7	62	1	100
		<i>Compressor</i>	Table C.7	25	1	98
		<i>Water Pump</i>	CNP 281	-	1	88
		<i>Ventilation Fan</i>	CNP 241	-	1	109
Total SWL						<b>114</b>
B	Site Formation	<i>Rock Drill (Hydraulic)</i>	CNP 182	-	1	123
		<i>Shotcrete Vehicle</i>	Table C.6	36	1	106
		<i>Explosive Delivery Vehicle</i>	Table C.9	27	1	105
		Total SWL				
C	TBM Tunnel Construction	<i>Tunnel Boring Machine</i>	-	-	1	88
		<i>Conveyor Belt System (thorough the tunnel and at the Outfall for spoil disposal)</i>	CNP 041	-	1	90
		Total SWL				
D	Concreting Works	<i>Concrete Delivery Truck</i>	Table C.6	35	1	100
		<i>Pumping Plant</i>	Table C.6	36	1	106
		Total SWL				
<b>Powered Mechanical Equipment Used for Construction of I-1</b>						
A	General	<i>Mobile Crane</i>	Table C.7	114	1	101
		<i>Dump Truck</i>	Table C.9	27	2	105
		<i>Mobile Generator</i>	Table C.7	62	2	100
		<i>Compressor</i>	Table C.7	25	2	98
		<i>Water Pump</i>	CNP 281	-	2	88
		Total SWL				
B	Site Formation and Excavation	<i>Excavator</i>	Table C.3	35	2	106
		<i>Dump Truck</i>	Table C.9	27	1	105
		Total SWL				
C	Concreting	<i>Crane, mobile</i>	Table C.7	114	1	101
		<i>Concrete Lorry Mixer</i>	Table C.6	35	1	100
		<i>Compactor, vibratory</i>	CNP 050	-	1	105
		Total SWL				
D	Piling	<i>Piling, large diameter bored, oscillator</i>	CNP 165	-	1	115
		<i>Piling, large diameter bored, reverse circulation drill</i>	CNP 166	-	1	100
		Total SWL				
E	Slope work	<i>Drill, percussive, hand-held (electric)</i>	CNP 064	-	2	103
		<i>Excavator</i>	Table C.3	35	2	106
		<i>Roller, vibratory</i>	CNP 186	-	1	108
		Total SWL				
F	Formwork and Reinforcement	<i>Bar bender and cutter (electric)</i>	CNP 021	-	2	90
		<i>Generator, standard</i>	Table C.7	62	1	100
		<i>Crane, mobile</i>	Table C.7	114	1	101
		<i>Saw, circular, wood</i>	Table C.7	78	1	106
		<i>Lorry</i>	Table C.9	27	1	105
		Total SWL				

Appendix D Detailed Noise Calculations

Table D-3 Sound Power Level (SWL) Evaluation - 1st Level Mitigation Measures (Quiet Plant)

	Activities	PME	TM ID Code / BS5228	Ref. No.	Unit	SWL dB(A)
<b>Powered Mechanical Equipment Used for Construction of I-2</b>						
A	General	<i>Mobile Crane</i>	Table C.7	114	1	101
		<i>Dump Trucks</i>	Table C.9	27	2	105
		<i>Mobile Generator</i>	Table C.7	62	2	100
		<i>Compressor</i>	Table C.7	25	2	98
		<i>Water Pump</i>	CNP 281	-	2	88
		<b>Total SWL</b>				
B	Site Formation and Excavation	<i>Excavator</i>	Table C.3	35	2	106
		<i>Dump Trucks</i>	Table C.9	27	1	105
		<b>Total SWL</b>				
C	Concreting	<i>Crane, mobile</i>	Table C.7	114	1	101
		<i>Concrete Lorry Mixer</i>	Table C.6	35	1	100
		<i>Compactor, vibratory</i>	CNP 050	-	1	105
		<b>Total SWL</b>				
D	Hand Digging for Intake Shaft (for the first 8m below ground)	<i>Breaker, hand-held, mass&gt;35kg</i>	CNP026	-	1	114
		<i>Excavator/loader, wheeled/tracked</i>	Table C.3	35	1	106
		<b>Total SWL</b>				
E	Drill & Blast for Intake Shaft	<i>Rock Drill (Hydraulic)</i>	CNP 182	-	1	123
		<i>Shotcrete Vehicle</i>	Table C.6	36	1	106
		<i>Explosive Delivery Vehicle</i>	Table C.9	27	1	105
		<b>Total SWL</b>				
F	Diaphragm walling	<i>Piling, diaphragm wall, bentonite filtering plant</i>	CNP 162	-	1	105
		<i>Piling, diaphragm wall, hydraulic extractor</i>	CNP 163	-	1	90
		<b>Total SWL</b>				
G	Formwork and Reinforcement	<i>Bar bender and cutter (electric)</i>	CNP 021		2	90
		<i>Generator, standard</i>	Table C.7	62	1	100
		<i>Crane, mobile</i>	Table C.7	114	1	101
		<i>Saw, circular, wood</i>	Table C.7	78	1	106
		<i>Lorry</i>	Table C.9	27	1	105
		<b>Total SWL</b>				
<b>Powered Mechanical Equipment Used for Construction of I-3</b>						
A	General	<i>Mobile Crane</i>	Table C.7	114	1	101
		<i>Dump Trucks</i>	Table C.9	27	2	105
		<i>Mobile Generator</i>	Table C.7	62	2	100
		<i>Compressor</i>	Table C.7	25	2	98
		<i>Water Pump</i>	CNP 281	-	2	88
		<b>Total SWL</b>				
B	Site Formation and Excavation	<i>Excavator</i>	Table C.3	35	2	106
		<i>Dump Truck</i>	Table C.9	27	1	105
		<b>Total SWL</b>				
C	Concreting	<i>Crane, mobile</i>	Table C.7	114	1	101
		<i>Concrete Lorry Mixer</i>	Table C.6	35	1	100
		<i>Compactor, vibratory</i>	CNP 050	-	1	105
		<b>Total SWL</b>				
D	Drill & Blast for Intake Shaft	<i>Rock Drill (Hydraulic)</i>	CNP 182		1	123
		<i>Shotcrete Vehicle</i>	Table C.6	36	1	106
		<i>Explosive Delivery Vehicle</i>	Table C.9	27	1	105
		<b>Total SWL</b>				
E	Diaphragm walling	<i>Piling, diaphragm wall, bentonite filtering plant</i>	CNP 162	-	1	105
		<i>Piling, diaphragm wall, hydraulic extractor</i>	CNP 163	-	1	90
		<b>Total SWL</b>				
F	Slope work	<i>Drill, percussive, hand-held (electric)</i>	CNP 064	-	2	103
		<i>Excavator</i>	Table C.3	35	2	106
		<i>Roller, vibratory</i>	CNP 186	-	1	108
		<b>Total SWL</b>				
G	Formwork and Reinforcement	<i>Bar bender and cutter (electric)</i>	CNP 021		2	90
		<i>Generator, standard</i>	Table C.7	62	1	100
		<i>Crane, mobile</i>	Table C.7	114	1	101
		<i>Saw, circular, wood</i>	Table C.7	78	1	106
		<i>Lorry</i>	Table C.9	27	1	105
		<b>Total SWL</b>				

Appendix D Detailed Noise Calculations

Table D-3 Sound Power Level (SWL) Evaluation - 1st Level Mitigation Measures (Quiet Plant)

	Activities	PME	TM ID Code / BS5228	Ref. No.	Unit	SWL dB(A)
<b>Powered Mechanical Equipment Used for Construction of O-1</b>						
A	General	<i>Mobile Crane</i>	Table C.7	114	1	101
		<i>Dump Trucks</i>	Table C.9	27	2	105
		<i>Mobile Generator</i>	Table C.7	62	2	100
		<i>Compressor</i>	Table C.7	25	2	98
		<i>Water Pump</i>	CNP 281	-	2	88
		Total SWL				
B	Site Formation and Excavation	<i>Excavator</i>	Table C.3	35	2	106
		<i>Dump Truck</i>	Table C.9	27	1	105
		Total SWL				
C	Concreting	<i>Crane, mobile</i>	Table C.7	114	1	101
		<i>Concrete Lorry Mixer</i>	Table C.6	35	1	100
		<i>Compactor, vibratory</i>	CNP 050	-	1	105
		<i>Explosive Delivery Vehicle</i>	Table C.9	27	1	105
		Total SWL				
D	Piling	Piling, large diameter bored, oscillator	CNP 165	-	2	115
		Piling, large diameter bored, reverse circulation drill	CNP 166	-	1	100
		Total SWL				
E	Slope work	Drill, percussive, hand-held (electric)	CNP 064	-	2	103
		<i>Excavator</i>	Table C.3	35	2	106
		Roller, vibratory	CNP 186	-	1	108
		Total SWL				
F	Formwork and Reinforcement	<i>Bar bender and cutter (electric)</i>	CNP 021	-	2	90
		<i>Generator, standard</i>	Table C.7	62	1	100
		<i>Crane, mobile</i>	Table C.7	114	1	101
		<i>Saw, circular, wood</i>	Table C.7	78	1	106
		<i>Lorry</i>	Table C.9	27	1	105
		Total SWL				
G	Rap-rip	<i>Derrick barge</i>	CNP 061	-	1	104
		<i>Dump Truck</i>	Table C.9	27	1	105
		Total SWL				



Appendix D Detailed Noise Calculations

Table D-3 Sound Power Level (SWL) Evaluation - 1st Level Mitigation Measures (Quiet Plant)

	Activities	PME	TM ID Code / BS5228	Ref. No.	Unit	SWL dB(A)
<b>Assuming PMEs for Tuen Mun Road Widening - the potential interfacing project</b>						
A	General	Mobile Crane	Table C.7	114	1	101
		Dump Trucks	Table C.9	27	2	105
		Mobile Generator	Table C.7	62	2	100
		Compressor	Table C.7	25	2	98
		Water Pump	CNP 281	-	2	88
Total SWL						<b>110</b>
B	Site Formation and Excavation	Excavator	Table C.3	35	2	106
		Dump Truck	Table C.9	27	1	105
Total SWL						<b>110</b>
C	Concreting	<i>Crane, mobile</i>	Table C.7	114	1	101
		<i>Concrete Lorry Mixer</i>	Table C.6	35	1	100
		Compactor, vibratory	CNP 050	-	1	105
Total SWL						<b>107</b>
D	Piling	Piling, large diameter bored, oscillator	CNP165	-	1	115
		Piling, large diameter bored, reverse circulation drill	CNP166	-	1	100
Total SWL						<b>116</b>
E	Slope work	Drill, percussive, hand-held (electric)	CNP064	-	2	103
		<i>Excavator</i>	Table C.3	35	2	106
		Roller, vibratory	CNP186	-	1	108
Total SWL						<b>113</b>
F	Formwork and Reinforcement	Bar bender and cutter (electric)	CNP 021	-	2	90
		<i>Generator, standard</i>	Table C.7	62	1	100
		<i>Crane, mobile</i>	Table C.7	114	1	101
		<i>Saw, circular, wood</i>	Table C.7	78	1	106
		<i>Lorry</i>	Table C.9	27	1	105
Total SWL						<b>110</b>

Appendix D Detailed Noise Calculations

Table D-4 Predicted Noise Level (PNL) - 1st Level Mitigation Measures (Quiet Plant)

Construction of Tunnel											
Activity	Total SWL	NSRs	1	2	3	4	5	6	7	8	9
		Construction Noise Criteria dB(A)	70	75	75	75	75	75	75	75	75
		Distance from source (m)	60	90	24	55	70	50	160	70	60
		Facade reflection dB(A)	+3	+3	3	+3	+3	+3	+3	+3	+3
		Screening effect dB(A)	0	0	0	0	0	0	0	0	0
A	General	114	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	72	73
B	Site Formation	123	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	<b>81</b>	<b>83</b>
C	TBM Tunnel Construction	92	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	50	52
D	Concreting Works	107	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	65	66
Construction of I-1											
Activity	Total SWL	NSRs	1	2	3	4	5	6	7	8	9
		Construction Noise Criteria dB(A)	70	75	75	75	75	75	75	75	75
		Distance from source (m)	60	90	24	55	70	50	160	70	60
		Facade reflection dB(A)	+3	+3	+3	+3	+3	+3	+3	+3	+3
		Screening effect dB(A)	0	0	0	0	0	0	0	0	0
A	General	110	70	66	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
B	Site Formation and Excavation	110	70	66	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
C	Concreting	107	67	63	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
D	Piling	116	<b>75</b>	72	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
E	Slope work	113	<b>72</b>	69	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
F	Formwork and Reinforcement	110	69	66	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Construction of I-2											
Activity	Total SWL	NSRs	1	2	3	4	5	6	7	8	9
		Construction Noise Criteria dB(A)	70	75	75	75	75	75	75	75	75
		Distance from source (m)	60	90	24	55	70	50	160	70	60
		Facade reflection dB(A)	+3	+3	+3	+3	+3	+3	+3	+3	+3
		Screening effect dB(A)	0	0	0	0	0	0	0	0	0
A	General	110	N.A.	N.A.	<b>78</b>	71	69	N.A.	N.A.	N.A.	N.A.
B	Site Formation and Excavation	110	N.A.	N.A.	<b>78</b>	71	69	N.A.	N.A.	N.A.	N.A.
C	Concreting	107	N.A.	N.A.	75	68	65	N.A.	N.A.	N.A.	N.A.
D	Hand Digging for Intake Shaft	115	N.A.	N.A.	<b>82</b>	75	73	N.A.	N.A.	N.A.	N.A.
E	Drill & Blast for Intake Shaft	123	N.A.	N.A.	<b>91</b>	<b>83</b>	<b>81</b>	N.A.	N.A.	N.A.	N.A.
F	Diaphragm walling	105	N.A.	N.A.	73	65	63	N.A.	N.A.	N.A.	N.A.
G	Formwork and Reinforcement	110	N.A.	N.A.	<b>77</b>	70	68	N.A.	N.A.	N.A.	N.A.
Construction of I-3											
Activity	Total SWL	NSRs	1	2	3	4	5	6	7	8	9
		Construction Noise Criteria dB(A)	70	75	75	75	75	75	75	75	75
		Distance from source (m)	60	90	24	55	70	50	160	70	60
		Facade reflection dB(A)	+3	+3	+3	+3	+3	+3	+3	+3	+3
		Screening effect dB(A)	0	0	0	0	0	0	0	0	0
A	General	110	N.A.	N.A.	N.A.	N.A.	N.A.	71	61	N.A.	N.A.
B	Site Formation and Excavation	110	N.A.	N.A.	N.A.	N.A.	N.A.	71	61	N.A.	N.A.
C	Concreting	107	N.A.	N.A.	N.A.	N.A.	N.A.	68	58	N.A.	N.A.
D	Drill & Blast for Intake Shaft	123	N.A.	N.A.	N.A.	N.A.	N.A.	<b>84</b>	74	N.A.	N.A.
E	Diaphragm walling	105	N.A.	N.A.	N.A.	N.A.	N.A.	66	56	N.A.	N.A.
F	Slope work	113	N.A.	N.A.	N.A.	N.A.	N.A.	74	64	N.A.	N.A.
G	Formwork and Reinforcement	110	N.A.	N.A.	N.A.	N.A.	N.A.	71	61	N.A.	N.A.
Construction of O-1											
Activity	Total SWL	NSRs	1	2	3	4	5	6	7	8	9
		Construction Noise Criteria dB(A)	70	75	75	75	75	75	75	75	75
		Distance from source (m)	60	90	24	55	70	50	160	70	60
		Facade reflection dB(A)	+3	+3	+3	+3	+3	+3	+3	+3	+3
		Screening effect dB(A)	0	0	0	0	0	0	0	0	0
A	General	110	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	69	70
B	Site Formation and Excavation	110	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	69	70
C	Concreting	109	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	67	69
D	Piling	118	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	<b>76</b>	<b>78</b>
E	Slope work	113	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	71	72
F	Formwork and Reinforcement	110	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	68	69
G	Rap-rip	108	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	66	67
A+TM	General + Interfacing Project	117	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	75	<b>76</b>
B+TM	Site Formation and Excavation + Interfacing Project	117	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	75	<b>77</b>
C+TM	Concreting + Interfacing Project	117	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	75	<b>76</b>
D+TM	Piling + Interfacing Project	120	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	<b>78</b>	<b>80</b>
E+TM	Slop work + Interfacing Project	118	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	<b>76</b>	<b>77</b>
F+TM	Formwork and Reinforcement + Interfacing Project	117	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	75	<b>76</b>
G+TM	Rap-rip + Interfacing Project	117	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	75	<b>76</b>

Note:

- (1) Bolded value means PNL exceeds the daytime construction noise criteria.
- (2) N.A. Either too far away (>300m) or no PME employed
- (3) NSR1 Sik Sik Yuen Ho Fung College  
NSR2 Kwai Shue House  
NSR3 Hong Hoi Chee Hong Temple  
NSR4 Yuen Yuen Care and Attention Home for the Aged  
NSR5 Western Monastery
- (4) TM The potential interfacing project of the Reconstruction and Improvement of Tuen Mun Road

- NSR6 Squatters  
NSR7 Route Twisk Villa (Block 7-8)  
NSR8 Beach Tower (Long Beach Gardens)  
NSR9 Greenview Terrace (Block 1)

Appendix D Detailed Noise Calculations

Table D-5 Sound Power Level (SWL) Evaluation - 2nd Level Mitigation Measures (Barrier Correction)

	Activities	PME	TM ID Code / BS5228	Ref. No.	Unit	SWL dB(A)		
<b>Powered Mechanical Equipment Used for Tunnel Construction</b>								
A	General	<i>Loader</i>	Table C.3	97	1	100		
		<i>Backhoe / Muck Car</i>	Table C.3	97	1	100		
		<i>Concrete Lorry Mixer</i>	Table C.6	35	1	100		
		<i>Mobile Crane</i>	Table C.7	114	1	101		
		<i>Dump Truck</i>	Table C.9	27	1	100		
		<i>Concrete Pump</i>	Table C.6	36	1	101		
		<i>Mobile Generator</i>	Table C.7	62	1	100		
		<i>Compressor</i>	Table C.7	25	1	98		
		<i>Water Pump</i>	CNP 281	-	1	88		
		<i>Ventilation Fan</i>	CNP 241	-	1	104		
Total SWL						<b>110</b>		
B	Site Formation	B1 <i>Rock Drill (Hydraulic)</i>	CNP 182	-	1	108		
		Total SWL						<b>108</b>
		B2 <i>Shotcrete Vehicle</i>	Table C.6	36	1	106		
		<i>Explosive Delivery Vehicle</i>	Table C.9	27	1	105		
Total SWL						<b>109</b>		
C	TBM Tunnel Construction	<i>Tunnel Boring Machine</i>	-	-	1	88		
		<i>Conveyor Belt System (thorough the tunnel and at the Outfall for spoil disposal)</i>	CNP 041	-	1	90		
		Total SWL						<b>92</b>
D	Concreting Works	<i>Concrete Delivery Truck</i>	Table C.6	35	1	100		
		<i>Pumping Plant</i>	Table C.6	36	1	106		
		Total SWL						<b>107</b>
<b>Powered Mechanical Equipment Used for Construction of I-1</b>								
A	General	<i>Mobile Crane</i>	Table C.7	114	1	101		
		<i>Dump Truck</i>	Table C.9	27	2	105		
		<i>Mobile Generator</i>	Table C.7	62	2	100		
		<i>Compressor</i>	Table C.7	25	2	98		
		<i>Water Pump</i>	CNP 281	-	2	88		
		Total SWL						<b>110</b>
B	Site Formation and Excavation	<i>Excavator</i>	Table C.3	35	2	106		
		<i>Dump Truck</i>	Table C.9	27	1	105		
		Total SWL						<b>110</b>
C	Concreting	<i>Crane, mobile</i>	Table C.7	114	1	101		
		<i>Concrete Lorry Mixer</i>	Table C.6	35	1	100		
		<i>Compactor, vibratory</i>	CNP 050	-	1	105		
		Total SWL						<b>107</b>
D	Piling	<i>Piling, large diameter bored, oscillator</i>	CNP 165	-	1	110		
		<i>Piling, large diameter bored, reverse circulation drill</i>	CNP 166	-	1	100		
		Total SWL						<b>110</b>
E	Slope work	<i>Drill, percussive, hand-held (electric)</i>	CNP 064	-	2	103		
		<i>Excavator</i>	Table C.3	35	2	101		
		<i>Roller, vibratory</i>	CNP 186	-	1	103		
		Total SWL						<b>109</b>
F	Formwork and Reinforcement	<i>Bar bender and cutter (electric)</i>	CNP 021	-	2	90		
		<i>Generator, standard</i>	Table C.7	62	1	100		
		<i>Crane, mobile</i>	Table C.7	114	1	101		
		<i>Saw, circular, wood</i>	Table C.7	78	1	106		
		<i>Lorry</i>	Table C.9	27	1	105		
		Total SWL						<b>110</b>

Appendix D Detailed Noise Calculations

Table D-5 Sound Power Level (SWL) Evaluation - 2nd Level Mitigation Measures (Barrier Correction)

	Activities	PME	TM ID Code / BS5228	Ref. No.	Unit	SWL dB(A)
<b>Powered Mechanical Equipment Used for Construction of I-2</b>						
A	General	<i>Mobile Crane</i>	Table C.7	114	1	101
		<i>Dump Trucks</i>	Table C.9	27	2	100
		<i>Mobile Generator</i>	Table C.7	62	2	100
		<i>Compressor</i>	Table C.7	25	2	98
		<i>Water Pump</i>	CNP 281	-	2	88
		Total SWL				
B	Site Formation and Excavation	<i>Excavator</i>	Table C.3	35	2	101
		<i>Dump Trucks</i>	Table C.9	27	1	105
		Total SWL				
C	Concreting	<i>Crane, mobile</i>	Table C.7	114	1	101
		<i>Concrete Lorry Mixer</i>	Table C.6	35	1	100
		Compactor, vibratory	CNP 050	-	1	105
Total SWL						<b>107</b>
D	Hand Digging for Intake Shaft (for the first 8m below ground)	<i>Breaker, hand-held, mass&gt;35kg</i>	CNP026	-	1	104
		<i>Excavator</i>	Table C.3	35	1	101
Total SWL						<b>106</b>
E	Drill & Blast for Intake Sha/D1	<i>Rock Drill (Hydraulic)</i>	CNP 182	-	1	108
		Total SWL				
	D2	<i>Shotcrete Vehicle</i>	Table C.6	36	1	101
		<i>Explosive Delivery Vehicle</i>	Table C.9	27	1	105
Total SWL						<b>106</b>
F	Diaphragm walling	Piling, diaphragm wall, bentonite filtering plant	CNP 162	-	1	105
		Piling, diaphragm wall, hydraulic extractor	CNP 163	-	1	90
		Total SWL				
G	Formwork and Reinforcement	Bar bender and cutter (electric)	CNP 021		2	90
		<i>Generator, standard</i>	Table C.7	62	1	100
		<i>Crane, mobile</i>	Table C.7	114	1	101
		<i>Saw, circular, wood</i>	Table C.7	78	1	101
		<i>Lorry</i>	Table C.9	27	1	100
		Total SWL				
<b>Powered Mechanical Equipment Used for Construction of I-3</b>						
A	General	<i>Mobile Crane</i>	Table C.7	114	1	101
		<i>Dump Trucks</i>	Table C.9	27	2	105
		<i>Mobile Generator</i>	Table C.7	62	2	100
		<i>Compressor</i>	Table C.7	25	2	98
		<i>Water Pump</i>	CNP 281	-	2	88
		Total SWL				
B	Site Formation and Excavation	<i>Excavator</i>	Table C.3	35	2	106
		<i>Dump Truck</i>	Table C.9	27	1	105
		Total SWL				
C	Concreting	<i>Crane, mobile</i>	Table C.7	114	1	101
		<i>Concrete Lorry Mixer</i>	Table C.6	35	1	100
		Compactor, vibratory	CNP 050	-	1	105
Total SWL					<b>107</b>	
D	Drill & Blast for Intake Sha/D1	<i>Rock Drill (Hydraulic)</i>	CNP 182	-	1	108
		Total SWL				
	D2	<i>Shotcrete Vehicle</i>	Table C.6	36	1	106
		<i>Explosive Delivery Vehicle</i>	Table C.9	27	1	105
Total SWL					<b>109</b>	
E	Diaphragm walling	Piling, diaphragm wall, bentonite filtering plant	CNP 162	-	1	105
		Piling, diaphragm wall, hydraulic extractor	CNP 163	-	1	90
		Total SWL				

Appendix D Detailed Noise Calculations

Table D-5 Sound Power Level (SWL) Evaluation - 2nd Level Mitigation Measures (Barrier Correction)

	Activities	PME	TM ID Code / BS5228	Ref. No.	Unit	SWL dB(A)
F	Slope work	Drill, percussive, hand-held (electric)	CNP 064	-	2	103
		<i>Excavator</i>	Table C.3	35	2	106
		Roller, vibratory	CNP 186	-	1	108
		Total SWL				
G	Formwork and Reinforcement	Bar bender and cutter (electric)	CNP 021		2	90
		<i>Generator, standard</i>	Table C.7	62	1	100
		<i>Crane, mobile</i>	Table C.7	114	1	101
		<i>Saw, circular, wood</i>	Table C.7	78	1	106
		<i>Lorry</i>	Table C.9	27	1	105
		Total SWL				
Powered Mechanical Equipment Used for Construction of O-1						
A	General	<i>Mobile Crane</i>	Table C.7	114	1	101
		<i>Dump Trucks</i>	Table C.9	27	2	105
		<i>Mobile Generator</i>	Table C.7	62	2	100
		<i>Compressor</i>	Table C.7	25	2	98
		Water Pump	CNP 281	-	2	88
		Total SWL				
B	Site Formation and Excavation	<i>Excavator</i>	Table C.3	35	2	106
		<i>Dump Truck</i>	Table C.9	27	1	105
		Total SWL				
C	Concreting	<i>Crane, mobile</i>	Table C.7	114	1	101
		<i>Concrete Lorry Mixer</i>	Table C.6	35	1	100
		Compactor, vibratory	CNP 050	-	1	105
		<i>Explosive Delivery Vehicle</i>	Table C.9	27	1	105
Total SWL					<b>109</b>	
D	Piling	<u>Piling, large diameter bored, oscillator</u>	CNP 165	-	2	110
		Piling, large diameter bored, reverse circulation drill	CNP 166	-	1	100
		Total SWL				
E	Slope work	Drill, percussive, hand-held (electric)	CNP 064	-	2	103
		<i>Excavator</i>	Table C.3	35	2	106
		Roller, vibratory	CNP 186	-	1	108
		Total SWL				
F	Formwork and Reinforcement	Bar bender and cutter (electric)	CNP 021		2	90
		<i>Generator, standard</i>	Table C.7	62	1	100
		<i>Crane, mobile</i>	Table C.7	114	1	101
		<i>Saw, circular, wood</i>	Table C.7	78	1	106
		<i>Lorry</i>	Table C.9	27	1	105
		Total SWL				
G	Rap-rip	Derrick barge	CNP 061	-	1	104
		<i>Dump Truck</i>	Table C.9	27	1	105
		Total SWL				

Appendix D Detailed Noise Calculations

Table D-5 Sound Power Level (SWL) Evaluation - 2nd Level Mitigation Measures (Barrier Correction)

	Activities	PME	TM ID Code / BS5228	Ref. No.	Unit	SWL dB(A)
<b>Assuming PMEs for Tuen Mun Road Widening - the potential interfacing project</b>						
A	General	Mobile Crane	Table C.7	114	1	101
		Dump Trucks	Table C.9	27	2	105
		Mobile Generator	Table C.7	62	2	100
		Compressor	Table C.7	25	2	98
		Water Pump	CNP 281	-	2	88
		Total SWL				
B	Site Formation and Excavation	Excavator	Table C.3	35	2	106
		Dump Truck	Table C.9	27	1	105
		Total SWL				
C	Concreting	<i>Crane, mobile</i>	Table C.7	114	1	101
		<i>Concrete Lorry Mixer</i>	Table C.6	35	1	100
		Compactor, vibratory	CNP 050	-	1	105
Total SWL						<b>107</b>
D	Piling	<u>Piling, large diameter bored, oscillator</u>	CNP165	-	1	110
		Piling, large diameter bored, reverse circulation drill	CNP166	-	1	100
		Total SWL				
E	Slope work	Drill, percussive, hand-held (electric)	CNP064	-	2	103
		<i>Excavator</i>	Table C.3	35	2	106
		Roller, vibratory	CNP186	-	1	108
Total SWL						<b>113</b>
F	Formwork and Reinforcement	Bar bender and cutter (electric)	CNP 021	-	2	90
		<i>Generator, standard</i>	Table C.7	62	1	100
		<i>Crane, mobile</i>	Table C.7	114	1	101
		<i>Saw, circular, wood</i>	Table C.7	78	1	106
		<i>Lorry</i>	Table C.9	27	1	105
		Total SWL				

Appendix D Detailed Noise Calculations

Table D-6 Predicted Noise Level (PNL) - 2nd Level Mitigation Measures (Barrier Correction)

Construction of Tunnel													
Activity	Total SWL	NSRs		1	2	3	4	5	6	7	8	9	
			Construction Noise Criteria dB(A)	70	75	75	75	75	75	75	75	75	
			Distance from source (m)	60	90	24	55	70	50	160	70	60	
			Facade reflection dB(A)	+3	+3	+3	+3	+3	+3	+3	+3	+3	
			Screening effect dB(A)	0	0	0	0	0	0	0	0	0	
A	General	110	Predicted Noise Level dB(A)	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	68	70	
B	Site Formation	B1 108		N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	66	67
		B2 109		N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	67	68
C	TBM Tunnel Construction	92		N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	50	52
D	Concreting Works	107		N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	65	66
Construction of I-1													
Activity	Total SWL	NSRs		1	2	3	4	5	6	7	8	9	
			Construction Noise Criteria dB(A)	70	75	75	75	75	75	75	75	75	
			Distance from source (m)	60	90	24	55	70	50	160	70	60	
			Facade reflection dB(A)	+3	+3	+3	+3	+3	+3	+3	+3	+3	
			Screening effect dB(A)	0	0	0	0	0	0	0	0	0	
A	General	98	Predicted Noise Level dB(A)	57	54	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	
B	Site Formation and Excavation	106		65	62	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
C	Concreting	100		59	56	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
D	Piling	110		70	66	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
E	Slope work	109		69	65	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
F	Formwork and Reinforcement	110		69	66	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Construction of I-2													
Activity	Total SWL	NSRs		1	2	3	4	5	6	7	8	9	
			Construction Noise Criteria dB(A)	70	75	75	75	75	75	75	75	75	
			Distance from source (m)	60	90	24	55	70	50	160	70	60	
			Facade reflection dB(A)	+3	+3	+3	+3	+3	+3	+3	+3	+3	
			Screening effect dB(A)	0	0	0	0	0	0	0	0	0	
A	General	108	Predicted Noise Level dB(A)	N.A.	N.A.	75	68	66	N.A.	N.A.	N.A.	N.A.	
B	Site Formation and Excavation	108		N.A.	N.A.	75	68	66	N.A.	N.A.	N.A.	N.A.	
C	Concreting	107		N.A.	N.A.	75	68	65	N.A.	N.A.	N.A.	N.A.	
D	Hand Digging for Intake Shaft	106		N.A.	N.A.	73	66	64	N.A.	N.A.	N.A.	N.A.	
E	Drill & Blast for Intake Shaft	D1 108 D2 106		N.A.	N.A.	75	68	66	N.A.	N.A.	N.A.	N.A.	
				N.A.	N.A.	74	67	65	N.A.	N.A.	N.A.	N.A.	
F	Diaphragm walling	105	N.A.	N.A.	73	65	63	N.A.	N.A.	N.A.	N.A.		
G	Formwork and Reinforcement	107	N.A.	N.A.	74	67	65	N.A.	N.A.	N.A.	N.A.		
Construction of I-3													
Activity	Total SWL	NSRs		1	2	3	4	5	6	7	8	9	
			Construction Noise Criteria dB(A)	70	75	75	75	75	75	75	75	75	
			Distance from source (m)	60	90	24	55	70	50	160	70	60	
			Facade reflection dB(A)	+3	+3	+3	+3	+3	+3	+3	+3	+3	
			Screening effect dB(A)	0	0	0	0	0	0	0	0	0	
A	General	110	Predicted Noise Level dB(A)	N.A.	N.A.	N.A.	N.A.	N.A.	71	61	N.A.	N.A.	
B	Site Formation and Excavation	110		N.A.	N.A.	N.A.	N.A.	N.A.	71	61	N.A.	N.A.	
C	Concreting	107		N.A.	N.A.	N.A.	N.A.	N.A.	68	58	N.A.	N.A.	
D	Drill & Blast for Intake Shaft	109		N.A.	N.A.	N.A.	N.A.	N.A.	70	60	N.A.	N.A.	
E	Diaphragm walling	105		N.A.	N.A.	N.A.	N.A.	N.A.	66	56	N.A.	N.A.	
F	Slope work	113		N.A.	N.A.	N.A.	N.A.	N.A.	74	64	N.A.	N.A.	
G	Formwork and Reinforcement	110	N.A.	N.A.	N.A.	N.A.	N.A.	71	61	N.A.	N.A.		
Construction of O-1													
Activity	Total SWL	NSRs		1	2	3	4	5	6	7	8	9	
			Construction Noise Criteria dB(A)	70	75	75	75	75	75	75	75	75	
			Distance from source (m)	60	90	24	55	70	50	160	70	60	
			Facade reflection dB(A)	+3	+3	+3	+3	+3	+3	+3	+3	+3	
			Screening effect dB(A)	0	0	0	0	0	0	0	0	0	
A	General	110	Predicted Noise Level dB(A)	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	69	70	
B	Site Formation and Excavation	110		N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	69	70
C	Concreting	109		N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	67	69
D	Piling	113		N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	71	73
E	Slope work	113		N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	71	72
F	Formwork and Reinforcement	110		N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	68	69
G	Rap-rip	108	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	66	67	
A+TM	General + Interfacing Project	115	Predicted Noise Level dB(A)	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	73	74	
B+TM	Site Formation and Excavation + Interfacing Project	115		N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	73	74
C+TM	Concreting + Interfacing Project	115		N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	73	74
D+TM	Piling + Interfacing Project	116		N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	74	75
E+TM	Slop work + Interfacing Project	116		N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	74	75
F+TM	Formwork and Reinforcement + Interfacing Project	115		N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	73	74
G+TM	Rap-rip + Interfacing Project	114	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	72	74	

Note:

- Bolded value means PNL exceeds the daytime construction noise criteria.
- N.A. Either too far away (>300m) or no PME employed
- NSR1 Sik Sik Yuen Ho Fung College  
NSR2 Kwai Shue House  
NSR3 Hong Hoi Chee Hong Temple  
NSR4 Yuen Yuen Care and Attention Home for the Aged  
NSR5 Western Monastery
- TM The potential interfacing project of the Reconstruction and Improvement of Tuen Mun Road

- NSR6 Squatters  
NSR7 Route Twisk Villa (Block 7-8)  
NSR8 Beach Tower (Long Beach Gardens)  
NSR9 Greenview Terrace (Block 1)

Appendix D Detailed Noise Calculations-Groundborne Noise/Vibration Assessment

**TBM Noise and Vibration Calculation**

NSR No.	Location	ASR	Type	Description	Noise Criteria (24 Hours)/dB(A)			Noise			Schedule of TBM Operation	
					Daytime 0700-1900	Evening 1900-2300	Night-time 2300-0700	Vertical (m)	Horizontal (m)	Slant (m)		Noise dB(A)
NSR 1	Intake 1	C <sup>(1)</sup>	School	Sik Sik Yuen Ho Fung College	60	60	45	13	60	61	36	OK for 24 Hrs
NSR 2		C	Residential	Kwai Shue House	65	60	45	18	90	92	29	OK for 24 Hrs
NSR 3	Intake 2	A <sup>(2)</sup>	Temple	Hong Hoi Chee Hong Temple <sup>(6)</sup>	65	50	35	31	30	43	42	Not Feasible during night-time
NSR 4		A	Temple	Yuen Yuen Care and Attention Home for the Aged	65	50	35	49	55	74	31	OK for 24 Hrs
NSR 5		A	Temple	Western Monastery	65	50	35	44	70	83	30	OK for 24 Hrs
NSR 6	Intake 3	A <sup>(3)</sup>	Residential	Squatters <sup>(5)</sup>	65	50	35	20	20	28	45	Not Feasible during night-time
NSR 7		A	Residential	Route Twisk Villa (Block 7-8)	65	50	35	93	20	95	29	OK for 24 Hrs
NSR 8	Outfall 1	C <sup>(4)</sup>	Residential	Beach Tower	65	60	45	21	160	161	24	OK for 24 Hrs
NSR 9		C	Residential	Greenview Terrace (Block 1)	65	60	45	12	100	101	28	OK for 24 Hrs
NSR		C		Yau Kom Tau Water Treatment Work				40	0	40	N/A	

Note(s):

- 1) For the area at Intake 1 being 'Urban Area' and directly affected by Influencing factor 'Cheung Pei Shan Road', hence ASR is classified as 'C'
- 2) For the area at Intake 2 being 'Low Density Area' and not affected by Influencing factor, hence ASR is classified as 'A'
- 3) For the area at Intake 3 being 'Low Density Area' and not affected by Influencing factor, hence ASR is classified as 'A'
- 4) For the area at Outfall 1 being 'Urban Area' and directly affected by Influencing factor 'Castle Peak Road and Tuen Mun Road', hence ASR is classified as 'C'
- 5) Assume the buildings on spread footing and no coupling loss from bedrock to pile



## Conversion from Vibration to Noise

Uses	Data		Correction (dB(A))			SPL-VL
	H(m)	RT(s)	-10 log h	+10 log RT	Constant	dB(A)
Residential	2.8	0.5	-4.5	-3.0	-20	-27
Temple	2.8	0.5	-4.5	-3.0	-20	-27
Classroom	2.8	1.0	-4.5	0.0	-20	-24

$$^{(1)} \text{SWL} = \text{VL} + 10\log S + 10\log\sigma - 34$$

$$^{(2)} \text{SWL} = \text{SPL} + 10\log(V/\text{RT}) - 14$$

$$\Rightarrow \text{SPL} - \text{VL} = -10 \log h + 10 \log \text{RT} - 20 \quad \{\sigma = 1; h = V/S\}$$

where

SWL: Sound Power Level (dB(A))

VL: Vibration Level (dB(V))

SPL: Sound Pressure Level (dB(A))

S: Surface Area (m<sup>2</sup>)

$\sigma$ : Radiation Efficiency

V: Volume (m<sup>3</sup>)

RT: Reverberation Time (s)

h: Height (m)

Note(s):

1) Reference please refer to 'Noise and Vibration Control Engineering, 1992'

2) Reference please refer to 'Woods Practical Guide to Noise Control, 1972'

Appendix D Detailed Noise Calculations-Groundborne Noise/Vibration Assessment

NSR 1: Sik Sik Yuen Ho Fung College  
 Location: Intake 1

Items	Description		
a)	PPV at 10 m (DB320 Kwai Tsing Tunnel )	=	1.1 mm/s
b)	100% PPV at 10 m (based on the TBM used for Drainage Tunnel)	=	1.1 mm/s
c)	Conversion the Velocity from PPV to RMS	=	0.274 mm/s
d)	Vibration Velocity (ref. $10^{-6}$ m/s)	=	$20 \log (V/V_{ref})$ 109 dB
e)	Distance Attenuation r= 61 m	=	$-20 \log (r/r_0)$ -16 dB
f)	Soil Damping Loss (Assume zero as through the Rock)	=	0 dB
g)	Building Coupling Loss <sup>(1)</sup> (at 63Hz to 250Hz)	=	-12 dB
h)	Floor to floor attenuation <sup>(1)</sup>	=	-1 dB
i)	Conversion from Vibration to Noise <sup>(2)</sup>	=	-24 dB
j)	Conversion from Linear to A-weighted Noise	=	-20 dB
k)	Predicted Noise Level (Groundborne) (d+e+f+g+h+i+j)	=	36 dB(A)

Note(s):

- 1) Please refer to the Section 4 of EIA Report
- 2) Please refer to the attached calculation using standard acoustic principles

Appendix D Detailed Noise Calculations-Groundborne Noise/Vibration Assessment

NSR 2: Kwai Shue House  
 Location: Intake 1

Items	Description		
a)	PPV at 10 m (DB320 Kwai Tsing Tunnel )	=	1.1 mm/s
b)	100% PPV at 10 m (based on the TBM used for Drainage Tunnel)	=	1.1 mm/s
c)	Conversion the Velocity from PPV to RMS	=	0.274 mm/s
d)	Vibration Velocity (ref. $10^{-6}$ m/s)	=	$20 \log (V/V_{ref})$ 109 dB
e)	Distance Attenuation r= 92 m	=	$-20 \log (r/r_0)$ -19 dB
f)	Soil Damping Loss (Assume zero as through the Rock)	=	0 dB
g)	Building Coupling Loss <sup>(1)</sup> (at 63Hz to 250Hz)	=	-12 dB
h)	Floor to floor attenuation <sup>(1)</sup>	=	-1 dB
i)	Conversion from Vibration to Noise <sup>(2)</sup>	=	-27 dB
j)	Conversion from Linear to A-weighted Noise	=	-20 dB
k)	Predicted Noise Level (Groundborne) (d+e+f+g+h+i+j)	=	29 dB(A)

Note(s):

- 1) Please refer to the Section 4 of EIA Report
- 2) Please refer to the attached calculation using standard acoustic principles

Appendix D Detailed Noise Calculations-Groundborne Noise/Vibration Assessment

NSR 3: Hong Hoi Tsz Hang Boat Temple  
 Location: Intake 2

Items	Description		
a)	PPV at 10 m (DB320 Kwai Tsing Tunnel )	=	1.1 mm/s
b)	100% PPV at 10 m (based on the TBM used for Drainage Tunnel)	=	1.1 mm/s
c)	Conversion the Velocity from PPV to RMS	=	0.274 mm/s
d)	Vibration Velocity (ref. $10^{-6}$ m/s)	=	$20 \log (V/V_{ref})$ 109 dB
e)	Distance Attenuation r= 43 m	=	$-20 \log (r/r_0)$ -13 dB
f)	Soil Damping Loss (Assume zero as through the Rock)	=	0 dB
g)	Building Coupling Loss <sup>(1)</sup> (at 63Hz to 250Hz)	=	-6 dB
h)	Floor to floor attenuation <sup>(1)</sup>	=	-1 dB
i)	Conversion from Vibration to Noise <sup>(2)</sup>	=	-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)

Note(s):

- 1) Please refer to the Section 4 of EIA Report
- 2) Please refer to the attached calculation using standard acoustic principles

Appendix D Detailed Noise Calculations-Groundborne Noise/Vibration Assessment

NSR 4: Yuen Yuen Care and Attention Home for the Aged  
 Location: Intake 2

Items	Description		
a)	PPV at 10 m (DB320 Kwai Tsing Tunnel )	=	1.1 mm/s
b)	100% PPV at 10 m (based on the TBM used for Drainage Tunnel)	=	1.1 mm/s
c)	Conversion the Velocity from PPV to RMS	=	0.274 mm/s
d)	Vibration Velocity (ref. $10^{-6}$ m/s)	=	$20 \log (V/V_{ref})$ 109 dB
e)	Distance Attenuation r= 74 m	=	$-20 \log (r/r_0)$ -17 dB
f)	Soil Damping Loss (Assume zero as through the Rock)	=	0 dB
g)	Building Coupling Loss <sup>(1)</sup> (at 63Hz to 250Hz)	=	-12 dB
h)	Floor to floor attenuation <sup>(1)</sup>	=	-1 dB
i)	Conversion from Vibration to Noise <sup>(2)</sup>	=	-27 dB
j)	Conversion from Linear to A-weighted Noise	=	-20 dB
k)	Predicted Noise Level (Groundborne) (d+e+f+g+h+i+j)	=	31 dB(A)

Note(s):

- 1) Please refer to the Section 4 of EIA Report
- 2) Please refer to the attached calculation using standard acoustic principles

Appendix D Detailed Noise Calculations-Groundborne Noise/Vibration Assessment

NSR 5: Western Monastery  
 Location: Intake 2

Items	Description		
a)	PPV at 10 m (DB320 Kwai Tsing Tunnel )	=	1.1 mm/s
b)	100% PPV at 10 m (based on the TBM used for Drainage Tunnel)	=	1.1 mm/s
c)	Conversion the Velocity from PPV to RMS	=	0.274 mm/s
d)	Vibration Velocity (ref. $10^{-6}$ m/s)	=	$20 \log (V/V_{ref})$ 109 dB
e)	Distance Attenuation r= 83 m	=	$-20 \log (r/r_0)$ -18 dB
f)	Soil Damping Loss (Assume zero as through the Rock)	=	0 dB
g)	Building Coupling Loss <sup>(1)</sup> (at 63Hz to 250Hz)	=	-12 dB
h)	Floor to floor attenuation <sup>(1)</sup>	=	-1 dB
i)	Conversion from Vibration to Noise <sup>(2)</sup>	=	-27 dB
j)	Conversion from Linear to A-weighted Noise	=	-20 dB
k)	Predicted Noise Level (Groundborne) (d+e+f+g+h+i+j)	=	30 dB(A)

Note(s):  
 1) Please refer to the Section 4 of EIA Report  
 2) Please refer to the attached calculation using standard acoustic principles

Appendix D Detailed Noise Calculations-Groundborne Noise/Vibration Assessment

NSR 6: Squatters  
 Location: Intake 3

Items	Description		
a)	PPV at 10 m (DB320 Kwai Tsing Tunnel )	=	1.1 mm/s
b)	100% PPV at 10 m (based on the TBM used for Drainage Tunnel)	=	1.1 mm/s
c)	Conversion the Velocity from PPV to RMS	=	0.274 mm/s
d)	Vibration Velocity (ref. $10^{-6}$ m/s)	=	$20 \log (V/V_{ref})$ 109 dB
e)	Distance Attenuation r= 28 m	=	$-20 \log (r/r_0)$ -9 dB
f)	Soil Damping Loss (Assume zero as through the Rock)	=	0 dB
g)	Building Coupling Loss <sup>(1)</sup> (at 63Hz to 250Hz)	=	-6 dB
h)	Floor to floor attenuation <sup>(1)</sup>	=	-1 dB
i)	Conversion from Vibration to Noise <sup>(2)</sup>	=	-27 dB
j)	Conversion from Linear to A-weighted Noise	=	-20 dB
k)	Predicted Noise Level (Groundborne) (d+e+f+g+h+i+j)	=	45 dB(A)

Note(s):  
 1) Please refer to the Section 4 of EIA Report  
 2) Please refer to the attached calculation using standard acoustic principles

Appendix D Detailed Noise Calculations-Groundborne Noise/Vibration Assessment

NSR 7: Route Twisk Villa (Block 7-8)  
 Location: Intake 3

Items	Description		
a)	PPV at 10 m (DB320 Kwai Tsing Tunnel )	=	1.1 mm/s
b)	100% PPV at 10 m (based on the TBM used for Drainage Tunnel)	=	1.1 mm/s
c)	Conversion the Velocity from PPV to RMS	=	0.274 mm/s
d)	Vibration Velocity (ref. $10^{-6}$ m/s)	=	$20 \log (V/V_{ref})$ 109 dB
e)	Distance Attenuation r= 95 m	=	$-20 \log (r/r_0)$ -20 dB
f)	Soil Damping Loss (Assume zero as through the Rock)	=	0 dB
g)	Building Coupling Loss <sup>(1)</sup> (at 63Hz to 250Hz)	=	-12 dB
h)	Floor to floor attenuation <sup>(1)</sup>	=	-1 dB
i)	Conversion from Vibration to Noise <sup>(2)</sup>	=	-27 dB
j)	Conversion from Linear to A-weighted Noise	=	-20 dB
k)	Predicted Noise Level (Groundborne) (d+e+f+g+h+i+j)	=	29 dB(A)

Note(s):  
 1) Please refer to the Section 4 of EIA Report  
 2) Please refer to the attached calculation using standard acoustic principles



Appendix D Detailed Noise Calculations-Groundborne Noise/Vibration Assessment

NSR 8: Beach Tower  
 Location: Outfall 1

Items	Description		
a)	PPV at 10 m (DB320 Kwai Tsing Tunnel )	=	1.1 mm/s
b)	100% PPV at 10 m (based on the TBM used for Drainage Tunnel)	=	1.1 mm/s
c)	Conversion the Velocity from PPV to RMS	=	0.274 mm/s
d)	Vibration Velocity (ref. $10^{-6}$ m/s)	=	$20 \log (V/V_{ref})$ 109 dB
e)	Distance Attenuation r= 161 m	=	$-20 \log (r/r_0)$ -24 dB
f)	Soil Damping Loss (Assume zero as through the Rock)	=	0 dB
g)	Building Coupling Loss <sup>(1)</sup> (at 63Hz to 250Hz)	=	-12 dB
h)	Floor to floor attenuation <sup>(1)</sup>	=	-1 dB
i)	Conversion from Vibration to Noise <sup>(2)</sup>	=	-27 dB
j)	Conversion from Linear to A-weighted Noise	=	-20 dB
k)	Predicted Noise Level (Groundborne) (d+e+f+g+h+i+j)	=	24 dB(A)

Note(s):

- 1) Please refer to the Section 4 of EIA Report
- 2) Please refer to the attached calculation using standard acoustic principles

Appendix D Detailed Noise Calculations-Groundborne Noise/Vibration Assessment

NSR 9: Greenview Terrace (Block 1)  
 Location: Outfall 1

Items	Description		
a)	PPV at 10 m (DB320 Kwai Tsing Tunnel )	=	1.1 mm/s
b)	100% PPV at 10 m (based on the TBM used for Drainage Tunnel)	=	1.1 mm/s
c)	Conversion the Velocity from PPV to RMS	=	0.274 mm/s
d)	Vibration Velocity (ref. $10^{-6}$ m/s)	=	$20 \log (V/V_{ref})$ 109 dB
e)	Distance Attenuation r= 101 m	=	$-20 \log (r/r_0)$ -20 dB
f)	Soil Damping Loss (Assume zero as through the Rock)	=	0 dB
g)	Building Coupling Loss <sup>(1)</sup> (at 63Hz to 250Hz)	=	-12 dB
h)	Floor to floor attenuation <sup>(1)</sup>	=	-1 dB
i)	Conversion from Vibration to Noise <sup>(2)</sup>	=	-27 dB
j)	Conversion from Linear to A-weighted Noise	=	-20 dB
k)	Predicted Noise Level (Groundborne) (d+e+f+g+h+i+j)	=	28 dB(A)

Note(s):  
 1) Please refer to the Section 4 of EIA Report  
 2) Please refer to the attached calculation using standard acoustic principles