Appendix 7.6 Operational Ground-borne Noise Result

Remarks

1 10dB safety factor is adopted for compliance with NCO Statutory Criteria.

2 FDL of SP1900 measured in Pat Heung Depot in 2003 was adopted in the assessment. Train speed correction of $20\log(V/V_{ref})$ is applied to FDL.

3 $L_{max,\ slow}$ is calculated by adding 0.5dB(A) on top of the double passby noise level, with reference to WIL EIA

4 SEL = $L_{eq,\ passby}$ + 10 log(passby duration) + 3dB Head Tail Effect, with reference to WIL EIA

$L_{eq,30min}$ = SEL + 10 log(peak time train frequency) - 10 log(1800)

* Daytime peak train frequency = 15 per 30min per direction

* Nightime peak train frequency = 12 per 30min per direction

5 850 trains in both directions per day was used in the computation of Leq(24hrs)

Project:	SCL Operational Rail Noise Assessment	**Sounthbound Speed:**	63	kph	**Northbound Speed:** 63 kph
NSR No.:	HH2	**Passby in 30min per Direction (night):**	12		
NSR Usage:	Residential	**Head-Tail Effect:**	3	dB	
NSR Location:	Wing Fung Bldg榮豐大樓				
No. of Basement Floors:	0				
NSR Floor:	1				

	Horizontal Dist, m	Track Depth, m
Southbound	40	11
Northbound	45	11

Inferred Rockhead
30-40m

Descriptions	Unit			20	25	31.5	40	50	63	80	100	125	160	200	250	315	400	500
Southbound Calculation																		
FDL	dB re 1 lb/ft0.5			34.4	38.4	37.4	35.4	34.4	38.4	41.4	42.4	42.4	38.4	37.4	36.4	33.4	34.4	31.4
TOC	dB	N/1/2																
TIL	dB	Type	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TCF	dB	Type	3	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0
LSR	dB re micro-in/s * ft0.5/lb			14.0	18.8	11.1	9.4	6.5	5.3	-1.6	-6.6	-14.0	-23.5	-24.9	-23.8	-25.1	-25.8	-24.7
Up Track Vibration Level	dB re 1 micro-in/sec			45.5	54.3	45.5	41.8	37.9	40.7	36.8	32.8	25.4	12.0	9.5	9.7	5.4	5.6	3.7
Northbound Calculation																		
FDL	dB re 1 lb/ft0.5			34.4	38.4	37.4	35.4	34.4	38.4	41.4	42.4	42.4	38.4	37.4	36.4	33.4	34.4	31.4
TOC	dB	N/1/2																
TIL	dB	Type	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TCF	dB	Type	3	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0
LSR	dB re micro-in/s * ft0.5/lb			13.0	18.4	9.7	7.5	3.9	2.5	-4.9	-10.2	-18.4	-27.3	-28.7	-27.0	-27.9	-28.4	-27.4
Down Track Vibration Level	dB re 1 micro-in/sec			44.4	53.8	44.1	40.0	35.3	37.9	33.5	29.2	21.0	8.1	5.8	6.5	2.5	3.0	1.0
Total of Soutbound and Northbound Calculation																		
Total Vibration Level Outside Building				48.0	57.0	47.9	44.0	39.8	42.6	38.5	34.4	26.8	13.5	11.0	11.4	7.2	7.5	5.6
BCF	dB	Type	4	-7.0	-7.5	-8.0	-9.0	-10.0	-11.0	-12.0	-13.0	-14.0	-14.5	-14.5	-14.5	-14.5	-14.5	-14.5
BVR - Floor to Floor	dB	Floor	1	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
BVR - Resonance	dB			6.0	6.0	6.0	6.0	5.8	5.6	5.4	5.2	5.0	4.0	3.0	2.0	1.3	0.7	0.0
CTN	dB			2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
SAF	dB			10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Predicted Noise Level		1/3 Oct (Linear), dB		57.0	65.5	55.9	51.0	45.6	47.2	41.9	36.6	27.8	13.0	9.5	8.9	4.0	3.7	1.1
Predicted Noise Level		Oct (Linear), dB				66.1			50.2			37.1			12.8			6.7
Predicted Noise Level		1/3 Oct (A-weighted), dB		**6.5**	**20.8**	**16.5**	**16.4**	**15.4**	**21.0**	**19.4**	**17.5**	**11.7**	**-0.4**	**-1.4**	**0.3**	**-2.6**	**-1.1**	**-2.1**
Predicted Leq(Double PassBy)		dB(A)		**27.3**														
Predicted Lmax,slow		dB(A)		**27.8**														
Predicted Leq(24Hr)		dB(A)		**18.3**														
Predicted Leq(30min)		dB(A)		**19.6**														

Project:	SCL Operational Rail Noise Assessment	**Sounthbound Speed:**	63	kph	**Northbound Speed:** 63 kph
NSR No.:	HH3	**Passby in 30min per Direction (day):**	15		
NSR Usage:	School	**Head-Tail Effect:**	3	dB	
NSR Location:	Cheung On Tak Lecture Theatre張安德演講廳				
No. of Basement Floors:	0				
NSR Floor:	0				

	Horizontal Dist, m	Track Depth, m
Southbound	107	13
Northbound	100	13

Inferred Rockhead
40-50m

Descriptions	Unit			20	25	31.5	40	50	63	80	100	125	160	200	250	315	400	500
Southbound Calculation																		
FDL	dB re 1 lb/ft0.5			34.4	38.4	37.4	35.4	34.4	38.4	41.4	42.4	42.4	38.4	37.4	36.4	33.4	34.4	31.4
TOC	dB	N/1/2	1	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
TIL	dB	Type	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TCF	dB	Type	3	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0
LSR	dB re micro-in/s * ft0.5/lb			2.1	14.4	-5.0	-13.0	-25.4	-29.6	-43.5	-52.3	-71.1	-72.2	-72.4	-64.2	-60.8	-57.8	-58.2
Up Track Vibration Level	dB re 1 micro-in/sec			38.5	54.8	34.4	24.4	11.1	10.8	0.0	-7.9	-26.7	-31.8	-33.0	-25.8	-25.3	-21.4	-24.8
Northbound Calculation																		
FDL	dB re 1 lb/ft0.5			34.4	38.4	37.4	35.4	34.4	38.4	41.4	42.4	42.4	38.4	37.4	36.4	33.4	34.4	31.4
TOC	dB	N/1/2	1	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
TIL	dB	Type	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TCF	dB	Type	3	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0
LSR	dB re micro-in/s * ft0.5/lb			3.1	14.7	-3.5	-10.9	-22.2	-26.2	-39.3	-47.7	-65.3	-67.3	-67.7	-60.2	-57.2	-54.7	-54.9
Down Track Vibration Level	dB re 1 micro-in/sec			39.6	55.1	35.9	26.6	14.2	14.2	4.1	-3.3	-20.9	-26.9	-28.2	-21.7	-21.8	-18.2	-21.5
Total of Soutbound and Northbound Calculation																		
Total Vibration Level Outside Building				42.1	58.0	38.3	28.6	15.9	15.9	5.5	-2.0	-19.9	-25.7	-27.0	-20.3	-20.2	-16.5	-19.8
BCF	dB	Type	4	-7.0	-7.5	-8.0	-9.0	-10.0	-11.0	-12.0	-13.0	-14.0	-14.5	-14.5	-14.5	-14.5	-14.5	-14.5
BVR - Floor to Floor	dB	Floor	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BVR - Resonance	dB			6.0	6.0	6.0	6.0	5.8	5.6	5.4	5.2	5.0	4.0	3.0	2.0	1.3	0.7	0.0
CTN	dB			2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
SAF	dB			10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Predicted Noise Level		1/3 Oct (Linear), dB		53.1	68.5	48.3	37.6	23.7	22.5	10.9	2.2	-16.9	-24.2	-26.5	-20.8	-21.4	-18.3	-22.3
Predicted Noise Level		Oct (Linear), dB				68.5			26.3			2.3			-17.5			0.1
Predicted Noise Level		1/3 Oct (A-weighted), dB		**2.6**	**23.8**	**8.9**	**3.0**	**-6.5**	**-3.7**	**-11.6**	**-16.9**	**-33.0**	**-37.6**	**-37.4**	**-29.4**	**-28.0**	**-23.1**	**-25.5**
Predicted Leq(Double PassBy)		dB(A)		**24.0**														
Predicted Lmax,slow		dB(A)		**24.5**														
Predicted Leq(24Hr)		dB(A)		**15.0**														
Predicted Leq(30min)		dB(A)		**17.3**														

Project:	SCL Operational Rail Noise Assessment	**Sounthbound Speed:**	63	kph	**Northbound Speed:** 63 kph
NSR No.:	HH5	**Passby in 30min per Direction (day):**	15		
NSR Usage:	School	**Head-Tail Effect:**	3	dB	
NSR Location:	Poly U Phase 8理工大學8期				
No. of Basement Floors:	0				
NSR Floor:	0				

	Horizontal Dist, m	Track Depth, m
Southbound	105	15
Northbound	100	15

Inferred Rockhead
35-40m

Descriptions	Unit			20	25	31.5	40	50	63	80	100	125	160	200	250	315	400	500
Southbound Calculation																		
FDL	dB re 1 lb/ft0.5			34.4	38.4	37.4	35.4	34.4	38.4	41.4	42.4	42.4	38.4	37.4	36.4	33.4	34.4	31.4
TOC	dB	N/1/2	0															
TIL	dB	Type	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TCF	dB	Type	3	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0
LSR	dB re micro-in/s * ft0.5/lb			2.3	14.4	-4.4	-12.2	-24.2	-28.3	-41.9	-50.5	-68.9	-70.3	-70.6	-62.6	-59.4	-56.6	-56.9
Up Track Vibration Level	dB re 1 micro-in/sec			33.7	49.9	30.0	20.2	7.3	7.1	-3.4	-11.1	-29.5	-34.9	-36.2	-29.2	-29.0	-25.2	-28.5
Northbound Calculation																		
FDL	dB re 1 lb/ft0.5			34.4	38.4	37.4	35.4	34.4	38.4	41.4	42.4	42.4	38.4	37.4	36.4	33.4	34.4	31.4
TOC	dB	N/1/2	0															
TIL	dB	Type	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TCF	dB	Type	3	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0
LSR	dB re micro-in/s * ft0.5/lb			3.1	14.7	-3.3	-10.6	-21.9	-25.8	-38.8	-47.2	-64.7	-66.8	-67.2	-59.7	-56.9	-54.3	-54.5
Down Track Vibration Level	dB re 1 micro-in/sec			34.5	50.2	31.1	21.8	9.5	9.6	-0.4	-7.8	-25.3	-31.4	-32.7	-26.3	-26.4	-22.9	-26.1
Total of Soutbound and Northbound Calculation																		
Total Vibration Level Outside Building				37.1	53.0	33.6	24.1	11.5	11.5	1.3	-6.2	-23.9	-29.8	-31.1	-24.5	-24.5	-20.9	-24.1
BCF	dB	Type	4	-7.0	-7.5	-8.0	-9.0	-10.0	-11.0	-12.0	-13.0	-14.0	-14.5	-14.5	-14.5	-14.5	-14.5	-14.5
BVR - Floor to Floor	dB	Floor	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BVR - Resonance	dB			6.0	6.0	6.0	6.0	5.8	5.6	5.4	5.2	5.0	4.0	3.0	2.0	1.3	0.7	0.0
CTN	dB			2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
SAF	dB			10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Predicted Noise Level		1/3 Oct (Linear), dB		48.1	63.5	43.6	33.1	19.3	18.1	6.7	-2.0	-20.9	-28.3	-30.6	-25.0	-25.7	-22.7	-26.6
Predicted Noise Level		Oct (Linear), dB				63.6			21.9			-1.9			-21.7			0.0
Predicted Noise Level		1/3 Oct (A-weighted), dB		**-2.4**	**18.8**	**4.2**	**-1.5**	**-10.9**	**-8.1**	**-15.8**	**-21.1**	**-37.0**	**-41.7**	**-41.5**	**-33.6**	**-32.3**	**-27.5**	**-29.8**
Predicted Leq(Double PassBy)		dB(A)		**19.1**														
Predicted Lmax,slow		dB(A)		**19.6**														
Predicted Leq(24Hr)		dB(A)		**10.1**														
Predicted Leq(30min)		dB(A)		**12.4**														

Project:	SCL Operational Rail Noise Assessment	**Sounthbound Speed:**	81	kph	**Northbound Speed:** 63 kph
NSR No.:	HH7	**Passby in 30min per Direction (night):**	12		
NSR Usage:	Hotel	**Head-Tail Effect:**	3	dB	
NSR Location:	Metropolis Residence 都會軒				
No. of Basement Floors:	0				
NSR Floor:	4				

	Horizontal Dist, m	Track Depth, m
Southbound	90	11
Northbound	100	11

Inferred Rockhead
21-31m

Descriptions	Unit			20	25	31.5	40	50	63	80	100	125	160	200	250	315	400	500
Southbound Calculation																		
FDL	dB re 1 lb/ft0.5			36.6	40.6	39.6	37.6	36.6	40.6	43.6	44.6	44.6	40.6	39.6	38.6	35.6	36.6	33.6
TOC	dB	N/1/2	0															
TIL	dB	Type	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TCF	dB	Type	4	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
LSR	dB re micro-in/s * ft0.5/lb			4.9	15.1	-1.4	-7.7	-17.6	-21.1	-33.1	-41.0	-57.1	-65.4	-63.5	-54.2	-53.0	-49.8	-49.5
Up Track Vibration Level	dB re 1 micro-in/sec			36.5	50.7	33.2	24.9	14.0	14.5	5.5	-1.4	-17.5	-29.8	-28.9	-20.6	-22.4	-18.2	-20.9
Northbound Calculation																		
FDL	dB re 1 lb/ft0.5			34.4	38.4	37.4	35.4	34.4	38.4	41.4	42.4	42.4	38.4	37.4	36.4	33.4	34.4	31.4
TOC	dB	N/1/2	0															
TIL	dB	Type	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TCF	dB	Type	4	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
LSR	dB re micro-in/s * ft0.5/lb			3.3	14.7	-3.6	-10.9	-22.2	-26.1	-39.1	-47.6	-65.5	-73.2	-70.8	-60.0	-58.3	-54.3	-54.2
Down Track Vibration Level	dB re 1 micro-in/sec			32.8	48.1	28.8	19.5	7.3	7.3	-2.7	-10.1	-28.1	-39.7	-38.3	-28.6	-29.9	-24.9	-27.8
Total of Soutbound and Northbound Calculation																		
Total Vibration Level Outside Building				38.1	52.6	34.5	26.0	14.8	15.3	6.1	-0.8	-17.2	-29.3	-28.4	-20.0	-21.7	-17.4	-20.1
BCF	dB	Type	4	-7.0	-7.5	-8.0	-9.0	-10.0	-11.0	-12.0	-13.0	-14.0	-14.5	-14.5	-14.5	-14.5	-14.5	-14.5
BVR - Floor to Floor	dB	Floor	4	-8.0	-8.0	-8.0	-8.0	-8.0	-8.0	-8.0	-8.0	-8.0	-8.0	-8.0	-8.0	-8.0	-8.0	-8.0
BVR - Resonance	dB			6.0	6.0	6.0	6.0	5.8	5.6	5.4	5.2	5.0	4.0	3.0	2.0	1.3	0.7	0.0
CTN	dB			2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
SAF	dB			10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Predicted Noise Level		1/3 Oct (Linear), dB		41.1	55.1	36.5	27.0	14.6	13.9	3.5	-4.6	-22.2	-35.8	-35.9	-28.5	-30.9	-27.2	-30.6
Predicted Noise Level		Oct (Linear), dB				55.2			17.5			-4.5			-26.0			0.0
Predicted Noise Level		1/3 Oct (A-weighted), dB		**-9.4**	**10.4**	**-2.9**	**-7.6**	**-15.6**	**-12.3**	**-19.0**	**-23.7**	**-38.3**	**-49.2**	**-46.8**	**-37.1**	**-37.5**	**-32.0**	**-33.8**
Predicted Leq(Double PassBy)		dB(A)		**10.8**														
Predicted Lmax,slow		dB(A)		**11.3**														
Predicted Leq(24Hr)		dB(A)		**1.8**														
Predicted Leq(30min)		dB(A)		**3.1**														