

**A Rooftop Helipad at New Acute Hospital at Kai Tak Development Area
Environmental Impact Assessment**

**Appendix 5F
Calculation of Helicopter Noise Levels**

Result Summary

NSR ID	SPL (L _{max}) at NSR, dB(A)															
	Unmitigated Scenario								Mitigated Scenario							
	Approach	Take-off	Flyover	Hovering	Touchdown	Idling	Lift-off	Highest	Approach	Take-off	Flyover	Hovering	Touchdown	Idling	Lift-off	Highest
E01	78	75	64	77	72	68	75	78	78	75	64	77	72	68	75	78
P01a	85	81	66	81	77	73	80	85	85	81	66	81	77	73	80	85
P01b	85	81	66	86	81	78	85	86	85	81	66	81	76	73	80	85
P01c	85	81	66	85	81	77	84	85	85	81	66	85	81	77	84	85
P02a	84	81	66	85	81	77	84	85	84	81	66	85	81	77	84	85
P02b	84	81	66	83	78	75	82	84	84	81	66	83	78	75	82	84
P03	85	81	66	82	77	74	81	85	85	81	66	82	77	74	81	85
P04	83	80	71	74	69	66	73	83	83	80	71	74	69	66	73	83
P05	82	79	69	77	72	69	76	82	82	79	69	77	72	69	76	82
P06	85	82	65	78	73	70	77	85	85	82	65	78	73	70	77	85
P07	85	82	65	78	73	70	77	85	85	82	65	78	73	70	77	85
P08	84	81	66	78	73	69	76	84	84	81	66	78	73	69	76	84
P09	84	81	68	76	71	68	75	84	84	81	68	76	71	68	75	84

Note:

1. The helicopter noise criteria for the NSRs is L_{max} 85dB(A).

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**Appendix 5F
Calculation of Helicopter Noise Levels**

Operation Mode of Helicopter	<u>Approach</u>
Helipad Surface Level, mPD	119.15
Assumed Helicopter Height, m	5.0
Assumed Approach/Take-off Angle, degree	4.6
Approach/Take-off Height above Helipad, m	2.5
SPL (L_{max}) at Reference Distance, dB(A)	82.1
Reference Distance, m	120.0

NSR ID	Horizontal Distance from Nearest Flight Path ^[1] , m	Assessment Level, mPD	Slant Distance, m	Unmitigated Scenario				Mitigated Scenario		
				Distance Correction, dB(A)	Screening Correction, dB(A)	Façade Correction, dB(A)	SPL (L_{max}) at NSR, dB(A)	Direct Mitigation Measure	Screening Correction, dB(A)	SPL (L_{max}) at NSR, dB(A)
E01	249.5	38.2	271.5	-7.1	0	3	78	--	--	78
P01a	116.0	98.2	124.9	-0.3	0	3	85	--	--	85
P01b	116.0	98.2	124.9	-0.3	0	3	85	--	--	85
P01c	116.0	98.2	124.9	-0.3	0	3	85	--	--	85
P02a	116.0	78.2	132.5	-0.9	0	3	84	--	--	84
P02b	116.0	78.2	132.5	-0.9	0	3	84	--	--	84
P03	116.0	98.2	127.1	-0.5	0	3	85	--	--	85
P04	116.0	93.2	147.3	-1.8	0	3	83	--	--	83
P05	156.1	108.2	169.5	-3.0	0	3	82	--	--	82
P06	116.0	118.2	120.2	0.0	0	3	85	--	--	85
P07	116.0	108.2	123.2	-0.2	0	3	85	--	--	85
P08	116.0	93.2	130.0	-0.7	0	3	84	--	--	84
P09	116.0	93.2	133.7	-0.9	0	3	84	--	--	84

Note:

1. The nearest horizontal distance between the site of NSR and flight path is adopted.
2. The helicopter noise criteria for the NSRs is L_{max} 85dB(A).
3. Predicted noise level in grey shade is denoted as noise exceedance of noise criteria.

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**Appendix 5F
Calculation of Helicopter Noise Levels**

Operation Mode of Helicopter	Take-off
Helipad Surface Level, mPD	119.15
Assumed Helicopter Height, m	5.0
Assumed Approach/Take-off Angle, degree	4.6
Approach/Take-off Height above Helipad, m	2.5
SPL (L_{max}) at Reference Distance, dB(A)	76.8
Reference Distance, m	150.0

NSR ID	Horizontal Distance from Nearest Flight Path ^[1] , m	Assessment Level, mPD	Slant Distance, m	Unmitigated Scenario				Mitigated Scenario		
				Distance Correction, dB(A)	Screening Correction, dB(A)	Façade Correction, dB(A)	SPL (L_{max}) at NSR, dB(A)	Direct Mitigation Measure	Screening Correction, dB(A)	SPL (L_{max}) at NSR, dB(A)
E01	249.5	38.2	271.5	-5.2	0	3	75	--	--	75
P01a	116.0	98.2	124.9	1.6	0	3	81	--	--	81
P01b	116.0	98.2	124.9	1.6	0	3	81	--	--	81
P01c	116.0	98.2	124.9	1.6	0	3	81	--	--	81
P02a	116.0	78.2	132.5	1.1	0	3	81	--	--	81
P02b	116.0	78.2	132.5	1.1	0	3	81	--	--	81
P03	116.0	98.2	127.1	1.4	0	3	81	--	--	81
P04	116.0	93.2	147.3	0.2	0	3	80	--	--	80
P05	156.1	108.2	169.5	-1.1	0	3	79	--	--	79
P06	116.0	118.2	120.2	1.9	0	3	82	--	--	82
P07	116.0	108.2	123.2	1.7	0	3	82	--	--	82
P08	116.0	93.2	130.0	1.2	0	3	81	--	--	81
P09	116.0	93.2	133.7	1.0	0	3	81	--	--	81

Note:

1. The nearest horizontal distance between the site of NSR and flight path is adopted.
2. The helicopter noise criteria for the NSRs is L_{max} 85dB(A).
3. Predicted noise level in grey shade is denoted as noise exceedance of noise criteria.

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Calculation of Helicopter Noise Levels

Operation Mode of Helicopter	<u>Flyover</u>
Helipad Surface Level, mPD	119.15
Assumed Helicopter Height, m	5.0
Seperation above Helipad, m	91.4
Assumed Source Level, mPD	215.6
SPL (L_{max}) at Reference Distance, dB(A)	78.0
Reference Distance, m	150.0

NSR ID	Horizontal Distance from Nearest Flight Path ^[1] , m	Assessment Level, mPD	Slant Distance, m	Unmitigated Scenario				Mitigated Scenario		
				Distance Correction, dB(A)	Screening Correction, dB(A)	Façade Correction, dB(A)	SPL (L_{max}) at NSR, dB(A)	Direct Mitigation Measure	Screening Correction, dB(A)	SPL (L_{max}) at NSR, dB(A)
E01	1035.3	38.2	1050.4	-16.9	0	3	64	--	--	64
P01a	885.2	98.2	892.9	-15.5	0	3	66	--	--	66
P01b	885.2	98.2	892.9	-15.5	0	3	66	--	--	66
P01c	885.2	98.2	892.9	-15.5	0	3	66	--	--	66
P02a	858.5	78.2	869.4	-15.3	0	3	66	--	--	66
P02b	858.5	78.2	869.4	-15.3	0	3	66	--	--	66
P03	789.9	98.2	798.6	-14.5	0	3	66	--	--	66
P04	467.3	93.2	483.1	-10.2	0	3	71	--	--	71
P05	596.2	108.2	605.8	-12.1	0	3	69	--	--	69
P06	911.2	118.2	916.4	-15.7	0	3	65	--	--	65
P07	982.4	108.2	988.3	-16.4	0	3	65	--	--	65
P08	830.1	93.2	839.1	-15.0	0	3	66	--	--	66
P09	663.8	93.2	675.0	-13.1	0	3	68	--	--	68

Note:

1. The nearest horizontal distance between the site of NSR and flight path is adopted.
2. The helicopter noise criteria for the NSRs is L_{max} 85dB(A).
3. Predicted noise level in grey shade is denoted as noise exceedance of noise criteria.

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Calculation of Helicopter Noise Levels

Operation Mode of Helicopter	<u>Hovering</u>
Helipad Surface Level, mPD	119.15
Assumed Helicopter Height, m	5.0
Seperation above Helipad, m	2.5
Assumed Source Level, mPD	126.7
SPL (L_{max}) at Reference Distance, dB(A)	83.5
Reference Distance, m	150.0

NSR ID	Horizontal Distance from FATO, m	Assessment Level, mPD	Slant Distance, m	Unmitigated Scenario				Mitigated Scenario		
				Distance Correction, dB(A)	Screening Correction, dB(A)	Façade Correction, dB(A)	SPL (L_{max}) at NSR, dB(A)	Direct Mitigation Measure	Screening Correction, dB(A)	SPL (L_{max}) at NSR, dB(A)
E01	465.7	38.2	474.0	-10.0	0	3	77	--	--	77
P01a	153.9	98.2	156.5	-0.4	-5	3	81	--	--	81
P01b	155.9	98.2	158.5	-0.5	0	3	86	Noise Barrier	-5	81
P01c	166.7	98.2	169.1	-1.0	0	3	85	--	--	85
P02a	163.3	78.2	170.3	-1.1	0	3	85	--	--	85
P02b	216.6	78.2	222.0	-3.4	0	3	83	--	--	83
P03	250.2	98.2	251.8	-4.5	0	3	82	--	--	82
P04	633.3	93.2	634.2	-12.5	0	3	74	--	--	74
P05	442.5	108.2	442.9	-9.4	0	3	77	--	--	77
P06	401.9	118.2	402.0	-8.6	0	3	78	--	--	78
P07	401.4	108.2	401.8	-8.6	0	3	78	--	--	78
P08	420.5	93.2	421.8	-9.0	0	3	78	--	--	78
P09	497.7	93.2	498.8	-10.4	0	3	76	--	--	76

Note:

1. The helicopter noise criteria for the NSRs is L_{max} 85dB(A).
2. Predicted noise level in grey shade is denoted as noise exceedance of noise criteria.

Noise levels on the 12th and 13th floor from the top floor of P01b

NSR ID	Horizontal Distance from FATO, m	Assessment Level, mPD	Slant Distance, m	Unmitigated Scenario				Mitigated Scenario		
				Distance Correction, dB(A)	Screening Correction, dB(A)	Façade Correction, dB(A)	SPL (L_{max}) at NSR, dB(A)	Direct Mitigation Measure	Screening Correction, dB(A)	SPL (L_{max}) at NSR, dB(A)
P01b	155.9	65.2	167.6	-1.0	0	3	86	Noise Barrier	-5	81
P01b	155.9	62.2	168.7	-1.0	0	3	85	Noise Barrier	-5	80

Note:

1. Assessment Level 65.2 mPD and 62.2 mPD correspond to the 12th and 13th floor from the top floor respectively.
2. The helicopter noise criteria for the NSRs is L_{max} 85dB(A).
3. Predicted noise level in grey shade is denoted as noise exceedance of noise criteria.

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**Appendix 5F
Calculation of Helicopter Noise Levels**

Operation Mode of Helicopter	<u>Touchdown</u>
Helipad Surface Level, mPD	119.15
Assumed Helicopter Height, m	5.0
Seperation above Helipad, m	2.5
Assumed Source Level, mPD	126.7
SPL (L_{max}) at Reference Distance, dB(A)	78.9
Reference Distance, m	150.0

NSR ID	Horizontal Distance from FATO, m	Assessment Level, mPD	Slant Distance, m	Unmitigated Scenario				Mitigated Scenario		
				Distance Correction, dB(A)	Screening Correction, dB(A)	Façade Correction, dB(A)	SPL (L_{max}) at NSR, dB(A)	Direct Mitigation Measure	Screening Correction, dB(A)	SPL (L_{max}) at NSR, dB(A)
E01	465.7	38.2	474.0	-10.0	0	3	72	--	--	72
P01a	153.9	98.2	156.5	-0.4	-5	3	77	--	--	77
P01b	155.9	98.2	158.5	-0.5	0	3	81	Noise Barrier	-5	76
P01c	166.7	98.2	169.1	-1.0	0	3	81	--	--	81
P02a	163.3	78.2	170.3	-1.1	0	3	81	--	--	81
P02b	216.6	78.2	222.0	-3.4	0	3	78	--	--	78
P03	250.2	98.2	251.8	-4.5	0	3	77	--	--	77
P04	633.3	93.2	634.2	-12.5	0	3	69	--	--	69
P05	442.5	108.2	442.9	-9.4	0	3	72	--	--	72
P06	401.9	118.2	402.0	-8.6	0	3	73	--	--	73
P07	401.4	108.2	401.8	-8.6	0	3	73	--	--	73
P08	420.5	93.2	421.8	-9.0	0	3	73	--	--	73
P09	497.7	93.2	498.8	-10.4	0	3	71	--	--	71

Note:

1. The helicopter noise criteria for the NSRs is L_{max} 85dB(A).
2. Predicted noise level in grey shade is denoted as noise exceedance of noise criteria.

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**Appendix 5F
Calculation of Helicopter Noise Levels**

Operation Mode of Helicopter	Idling
Helipad Surface Level, mPD	119.15
Assumed Helicopter Height, m	5.0
Seperation above Helipad, m	0.0
Assumed Source Level, mPD	124.2
SPL (L_{max}) at Reference Distance, dB(A)	75.4
Reference Distance, m	150.0

NSR ID	Horizontal Distance from FATO, m	Assessment Level, mPD	Slant Distance, m	Unmitigated Scenario				Mitigated Scenario		
				Distance Correction, dB(A)	Screening Correction, dB(A)	Façade Correction, dB(A)	SPL (L_{max}) at NSR, dB(A)	Direct Mitigation Measure	Screening Correction, dB(A)	SPL (L_{max}) at NSR, dB(A)
E01	465.7	38.2	473.6	-10.0	0	3	68	--	--	68
P01a	153.9	98.2	156.1	-0.3	-5	3	73	--	--	73
P01b	155.9	98.2	158.0	-0.5	0	3	78	Noise Barrier	-5	73
P01c	166.7	98.2	168.7	-1.0	0	3	77	--	--	77
P02a	163.3	78.2	169.6	-1.1	0	3	77	--	--	77
P02b	216.6	78.2	221.4	-3.4	0	3	75	--	--	75
P03	250.2	98.2	251.5	-4.5	0	3	74	--	--	74
P04	633.3	93.2	634.1	-12.5	0	3	66	--	--	66
P05	442.5	108.2	442.8	-9.4	0	3	69	--	--	69
P06	401.9	118.2	401.9	-8.6	0	3	70	--	--	70
P07	401.4	108.2	401.7	-8.6	0	3	70	--	--	70
P08	420.5	93.2	421.6	-9.0	0	3	69	--	--	69
P09	497.7	93.2	498.7	-10.4	0	3	68	--	--	68

Note:

1. The helicopter noise criteria for the NSRs is L_{max} 85dB(A).
2. Predicted noise level in grey shade is denoted as noise exceedance of noise criteria.

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Calculation of Helicopter Noise Levels**

Operation Mode of Helicopter	<u>Lift-off</u>
Helipad Surface Level, mPD	119.15
Assumed Helicopter Height, m	5.0
Seperation above Helipad, m	2.5
Assumed Source Level, mPD	126.7
SPL (L_{max}) at Reference Distance, dB(A)	82.4
Reference Distance, m	150.0

NSR ID	Horizontal Distance from FATO, m	Assessment Level, mPD	Slant Distance, m	Unmitigated Scenario				Mitigated Scenario		
				Distance Correction, dB(A)	Screening Correction, dB(A)	Façade Correction, dB(A)	SPL (L_{max}) at NSR, dB(A)	Direct Mitigation Measure	Screening Correction, dB(A)	SPL (L_{max}) at NSR, dB(A)
E01	465.7	38.2	474.0	-10.0	0	3	75	--	--	75
P01a	153.9	98.2	156.5	-0.4	-5	3	80	--	--	80
P01b	155.9	98.2	158.5	-0.5	0	3	85	Noise Barrier	-5	80
P01c	166.7	98.2	169.1	-1.0	0	3	84	--	--	84
P02a	163.3	78.2	170.3	-1.1	0	3	84	--	--	84
P02b	216.6	78.2	222.0	-3.4	0	3	82	--	--	82
P03	250.2	98.2	251.8	-4.5	0	3	81	--	--	81
P04	633.3	93.2	634.2	-12.5	0	3	73	--	--	73
P05	442.5	108.2	442.9	-9.4	0	3	76	--	--	76
P06	401.9	118.2	402.0	-8.6	0	3	77	--	--	77
P07	401.4	108.2	401.8	-8.6	0	3	77	--	--	77
P08	420.5	93.2	421.8	-9.0	0	3	76	--	--	76
P09	497.7	93.2	498.8	-10.4	0	3	75	--	--	75

Note:

1. The helicopter noise criteria for the NSRs is L_{max} 85dB(A).
2. Predicted noise level in grey shade is denoted as noise exceedance of noise criteria.