

Appendix E

Site Noise Measurements and Calculations

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100 Hz	125 Hz	160 Hz	200 Hz	250 Hz	315 Hz	400 Hz	500 Hz	630 Hz	800 Hz	1.0 kHz	1.25 kHz	1.6 kHz	2.0 kHz	2.5 kHz	3.15 kHz	4.0 kHz	5.0 kHz	6.3 kHz	8.0 kHz	10.0 kHz	12.5 kHz	16.0 kHz	20.0 kHz	6.3 Hz	8.0 Hz	10 Hz	12.5 Hz	16 Hz	20 Hz	25 Hz	31.5 Hz	40 Hz	50 Hz	63 Hz	80 Hz			
69.9	69.5	69.3	66.4	68.4	68.3	72.5	75.4	71.9	71.1	71.5	74.2	76.1	69.2	66.6	63.5	62.4	60.8	60.5	57.4	54.2	52.3	51.3	49.1	-	-	67.3	67.1	66.1	64.6	63	62.5	62.3	65.3	69.4	60.8	60.4	66.5	
69.6	67.5	68.2	66.6	65.7	63	68.6	71.5	64.9	64.4	67	65.7	65.6	64.6	64.4	60	60.3	59	59.5	55.5	52.7	50.5	49.5	48	-	-	-	-	-	-	-	-	-	-	-	-	-		
70.7	67.8	67.9	68	67	63.9	67.6	70.7	65.2	64.1	66.7	66.4	65.4	64.5	64.3	59.9	59.3	59.3	59.6	55.7	53.2	51	49.7	48.9	-	-	-	-	-	-	-	-	-	-	-	-	-		
70.5	68.9	68.6	67.4	66.7	63.1	67.5	70.8	65.7	63.6	66.8	66.7	66.6	64.6	64.3	60.1	59.3	59.2	59	55.4	53.1	50.8	49.8	48.7	-	-	-	-	-	-	-	-	-	-	-	-	-		
75.4	75.7	76.1	81.3	73.5	75.5	79.2	77.7	76.8	74.6	76.5	77.1	75.2	76.3	77.2	74.3	71.7	71.9	70.3	68.8	67.1	65.2	62.5	58.5	-	-	-	-	-	-	-	-	-	-	-	-	-		
75.7	74.8	76.1	81.7	73.1	73.5	78.3	78.5	76.1	74.8	76.5	77.7	76.1	76.7	77.4	74.4	71.7	71.8	70.3	68.8	66.9	64.5	62.5	58.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
77.9	74.7	76.9	82.1	73.6	73.2	78.7	78.8	76.4	74.6	76.1	77.6	76.5	77.1	77.6	74.8	72.2	72.1	70.7	69.2	67.6	65.2	63.1	59.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
69.4	72.2	77	74.1	74	70.9	76.3	75.9	75.9	69.7	73.6	70	68.9	69.3	67.2	65.6	64	61.2	61.2	58.9	58.6	66.6	53.7	48.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
68.6	75.5	72.4	73.8	73.7	70.6	75	75.3	75.3	69.6	73.7	69.3	68.5	68.5	67	65.5	63.8	61.3	60.8	58.9	58.5	66.3	53.6	48.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
68	75.8	71.8	74	74	70.5	74.2	75.1	75.8	69.5	73.7	69.2	68.7	68.6	67.2	65.2	63.7	61.2	60.8	58.8	58.3	65.9	53.1	48.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
76.5	79.1	76.9	78	76.8	75.7	80.7	81	78.8	74.3	74.3	72.5	71.8	69.4	67.5	66.8	65.5	62.5	64.7	59	57.5	65.5	57.2	47.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
79.4	80	77.8	79.1	78	75.1	79.3	82.1	81	74.7	75.2	71	70.1	70	68.6	67	65.1	63.1	65.6	59.2	58.1	67	58.1	48.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
81.7	79.3	78.4	79.4	77.8	75.1	79.4	81.5	80.8	75	74.2	74.7	70.2	69.7	68.4	66.8	65.3	62.8	65.1	59.8	57.8	66.3	59.3	48.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
80.9	80.1	85	82.8	81.5	79	83.6	87.2	86.4	81.4	80.4	79.5	81.7	81.9	75.2	72.3	70.3	67	64	60.9	58	63.3	59.7	47.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
76.7	75.7	80.4	77.4	77.5	76.8	77.4	80.3	78.9	74.7	74.5	72.1	70.3	69.1	67.1	66.8	65	62.3	63.8	60.6	57.8	65.4	60.6	48.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
83.5	83.5	86.9	86.6	86.4	83.3	85.2	90.7	90.1	85.9	84.5	80.7	82.6	85.6	78.7	75.6	73.7	69.1	66.5	64	60	65.7	62.2	49.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
77.6	77.9	79.8	80.5	77	75.1	79	82.6	83.2	75.9	74.8	73.4	70.9	70.4	68.7	67.4	66.8	63.2	65	59.8	58.4	67.1	59	48.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	91.1	89.6	87.6	87.1	87.1	88.3	83.9	83.4	84.2	86.3	87.6	84.7
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	95.1	92.5	92.3	89.3	87.8	87.4	85.6	84.8	82.2	82.7	82.2	78.6
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	95	95.1	95.4	94.4	94.1	93.9	93.3	93.2	93.2	92.5	92.5	92
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	88.6	86.9	84.9	86	82.4	82.4	77.8	77.9	75.4	69.4	68.7	66.5
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	93.4	91.2	87.1	85	82.2	80.9	77.3	71.7	68	65.4	65.5	65.9
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	81.6	81.2	78.8	75.8	76	77.6	75.9	77.4	80.3	81.4	80	79.7

6.3 kHz	8.0 kHz	10.0 kHz
59.4	55.5	53.0
70.4	68.9	67.2
62.1	58.9	58.1
70.1	64.0	62.7
89.7	94.0	85.5
69.7	64.9	61.9
98.0	97.1	95.8
96.8	96.4	94.4
91.1	96.3	94.2

100 Hz	125 Hz	160 Hz	200 Hz	250 Hz	315 Hz	400 Hz	500 Hz	630 Hz	800 Hz	1.0 kHz	1.25 kHz	1.6 kHz	2.0 kHz	2.5 kHz	3.15 kHz	4.0 kHz	5.0 kHz	6.3 kHz	8.0 kHz	10.0 kHz	12.5 kHz	16.0 kHz	20.0 kHz
77.7	78.7	73	82.1	89.6	79.1	89.4	91	75	73.4	76	76.2	76	77.2	74.4	66.2	74.1	72.9	73.9	70.6	66.9	65.8	64.1	62.5
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91.7	100.4	108.6	111.9	106.7	110.7	117.5	111.9	112.2	111.5	105.8	106.1	106.1	107.4	105.1	100.8	99.7	98.1	97.3	98.9	98.1	104.5	99.1	97.2
89.3	100.6	107.5	109.5	104.3	110.8	114.5	110.6	111	109.4	105.6	107.9	108.4	109.6	109.4	105.3	98.2	99.5	95.8	95	93.5	97.8	96.7	91.3
99.2	100.5	106.8	110.2	107.6	111.6	115.8	110.4	111	108.5	105.3	107.3	108.1	108.2	108.6	107.1	105.4	106.1	100.9	97.3	95.7	94.7	95.8	97
77.9	83.1	87.6	89.1	85.4	92.2	94.8	99.5	96.9	100.8	103.2	103.3	105.2	103.3	100.6	91.7	96.1	99.6	91.3	95.5	92.4	92.5	90	89.7
79.3	84.7	88.3	88.1	89.7	92.1	97.5	100.3	99.5	103.2	105.7	102.8	104	104	103	97.5	94.5	91.4	90.8	97	96	97	94.9	94.9
89.4	98.8	106.3	109.6	106.6	105.6	111.5	110.8	109.9	106.1	105.2	103.6	103	101.1	100.8	98.5	98.8	97.8	96.8	96.4	94.4	93	92.9	93.9

Sound Pressure Level to Sound Power Level

Source		Measurement			Spectrum Weighting	Measured Sound Pressure Level (1/1 Octave Bands)								Overall SPL (dBA)	Calculated Sound Power Level (1/1 Octave Bands)								Overall PWL (dBA)			
ID	Description	Type	Directivity Factor (Q)	Area/Distance/Length (m)		32	63	125	250	500	1000	2000	4000		8000	32	63	125	250	500	1000	2000		4000	8000	
						77.9	84.3	73.7	70.8	73.4	70.6	69.7	64.4		61.5	76.2	101.9	108.4	97.8	94.8	97.5	94.7		93.8	88.4	85.6
	Tipper - Idle at 4.5m	Spherical	1	4.5	Linear	77.9	84.3	73.7	70.8	73.4	70.6	69.7	64.4	61.5	76.2	101.9	108.4	97.8	94.8	97.5	94.7	93.8	88.4	85.6	100.3	
	Tipper - Operating at 5m	Spherical	1	5	Linear	80.3	83.9	80.7	82.9	82.7	81.1	81.5	77.7	73.8	87.2	105.3	108.9	105.7	107.9	107.7	106.1	106.5	102.7	98.8	112.2	
	Dozer CAT D8T - Idle at 5m	Spherical	1	5	Linear	76.5	73.6	79.2	79.1	81.6	76.8	73.5	69.0	64.8	82.4	101.5	98.5	104.2	104.1	106.5	101.8	98.4	94.0	89.8	107.3	
	Dozer CAT D8T - 2nd Gear Passby at 6m	Spherical	1	6	Linear	83.1	83.6	87.7	86.5	92.0	82.9	78.3	73.1	71.7	90.6	109.7	110.2	114.3	113.0	118.5	109.5	104.8	99.6	98.2	117.2	
	Dozer CAT D8T - Reverse with Beeper 3rd Gear Passby at 6m	Spherical	1	6	Linear	91.2	92.6	90.2	89.7	94.6	95.6	100.2	94.9	95.8	104.1	117.7	119.2	116.7	116.3	121.2	122.1	126.8	121.4	122.3	130.7	
	Dozer CAT D8T - 3rd Gear Passby at 6m	Spherical	1	6	Linear	86.3	82.5	87.6	87.5	90.8	84.2	77.9	73.3	71.5	90.2	112.9	109.0	114.2	114.1	117.4	110.7	104.4	99.9	98.0	116.8	