

Annex D

Example Calculations

Table D1 Methodology for Construction Noise Calculations

Steps	Source	Details
<p><i>Information Required</i></p> <ul style="list-style-type: none"> • Construction Programme • Plant Inventory 	Maunsell	
<p><i>Source Data</i></p> <ul style="list-style-type: none"> • Sound Power Levels (SWLs) of plant items 	<ul style="list-style-type: none"> • Technical Memorandum on Noise from Construction Work other than Percussive Piling • British Standard BS5228 	
Determine the contribution to the total construction activity SWL of each plant item	Calculated based on the number of the plant likely to operate and whether or not the plant will be screened. Note no corrections for tonal or intermittent characteristics have been considered necessary.	SWL + 10 log (no. plant) + barrier correction
Establish total SWL during each construction activity (SWL _T)	Calculated from the SWL of each item of plant.	$10 \log (10^{(SWL_r/10)} + 10^{(SWL_r/10)} + \dots)$
Establish distance from each Construction Site to each NSR	Measurement using suitably scaled plans received from Maunsell.	
Determine the noise contribution in terms of L _{Aeq(30 mins)} dB for each activity a each NSR	Calculated from the total SWL _T for each construction activity and the distance separating the particular construction site from the NSR (r). (Includes 3dB(A) facade correction)	$SWL_T - 10 \log (r^2/2\pi) + 3$
Establish total L _{Aeq(30 mins)} during each construction quarter at each NSR	Calculated from the contribution of each construction activity (in terms of L _{Aeq(30 mins)}) likely to occur during each construction quarter.	$10 \log (10^{(L_{Aeq_r/10})} + 10^{(L_{Aeq_r/10})} + \dots)$

Table D2 Methodology for Operational Noise Calculations

Steps	Source	Details
<p><i>Information Required</i></p> <ul style="list-style-type: none"> • Plans at suitable scale detailing the alignment and the elevation of the proposed road • Projected traffic flows for appropriate years in terms of (i) total no. of vehicles/peak hour (ii) %HGV 	Maunsell	
<p><i>Calculations</i></p> <p>All Calculations were carried out using a proprietary road traffic noise model based on the (CRTN) methodology.</p>	UK Department of Transport's "Calculation of Road Traffic Noise" (CRTN). 1988	An example output from the model detailing the operational noise calculation is attached.

Table D3 - Example Operational Noise Calculation

HFANOISE v1.10 RESULTS FILE : FULL OUTPUT

File : NEWMOD.DAT

Time : 12:44:31

Date : Tuesday, 17 November 1998

Receiver no: N101

X=842658.4 Y=831978.2 Z= 20.0 Height=4.5m (2nd Floor)

Road Segment	Sub Segment	Flow	Speed	%Heavy	Gradient	Basic		Corrections							Segment Total		
						Noise Level	Speed	Gradient	Surface	Distance	Angle of View	Barrier	Ground Cover	Facade		Reflectio	
102	103	1	850	50	39	3.3	71.5	4.1	1	-1	-6.1	-16.4	-0.5	0	2.5	0	55.1
102	103	2	850	50	39	3.3	71.5	4.1	1	-1	-6.1	-14.7	-1.1	0	2.5	1.5	57.7
102	103	3	850	50	39	3.3	71.5	4.1	1	-1	-6.1	-15.8	-2.6	0	2.5	1.5	55.1
102	103	4	850	50	39	3.3	71.5	4.1	1	-1	-6.1	-12.3	-4.7	0	2.5	1.5	56.5
102	103	5	850	50	39	3.3	71.5	4.1	1	-1	-6.1	-10.1	-7.6	0	2.5	1.5	55.8
102	103	6	850	50	39	3.3	71.5	4.1	1	-1	-6.1	-9.2	-10.4	0	2.5	1.5	53.9
102	103	Category Noise		Level:	63.6												
206	207	1	1090	50	42	2.4	72.6	4.4	0.7	-1	-7.8	-17.9	-12.3	0	2.5	1.5	42.7
206	207	2	1090	50	42	2.4	72.6	4.4	0.7	-1	-7.8	-17	-12.7	0	2.5	1.5	43.2
206	207	3	1090	50	42	2.4	72.6	4.4	0.7	-1	-7.8	-16.6	-13	0	2.5	1.5	43.3
206	207	4	1090	50	42	2.4	72.6	4.4	0.7	-1	-7.8	-17.9	-13.3	0	2.5	1.5	41.7
206	207	5	1090	50	42	2.4	72.6	4.4	0.7	-1	-7.8	-12	-13.8	0	2.5	1.5	47.1
206	207	6	1090	50	42	2.4	72.6	4.4	0.7	-1	-7.8	-15.3	-14.2	0	2.5	1.5	43.4
206	207	7	1090	50	42	2.4	72.6	4.4	0.7	-1	-7.8	-19.4	-14.4	0	2.5	1.5	39.1
206	207	8	1090	50	42	2.4	72.6	4.4	0.7	-1	-7.8	-9.7	-14.8	0	2.5	1.5	48.4
206	207	Category Noise		Level:	53.5												
100	101	1	920	50	41	1.1	71.8	4.3	0.3	-1	-6.5	-14	-0.5	0	2.5	0	56.9
100	101	2	920	50	41	1.1	71.8	4.3	0.3	-1	-6.5	-8.9	-0.4	0	2.5	0	62.1
100	101	Category Noise		Level:	63.2												
101	102	1	850	50	39	0.3	71.5	4.1	0.1	-1	-6.1	-19.6	0	0	2.5	1.5	53
101	102	2	850	50	39	0.3	71.5	4.1	0.1	-1	-6.1	-14.7	0	0	2.5	0	56.4
101	102	3	850	50	39	0.3	71.5	4.1	0.1	-1	-6.1	-9.9	0	0	2.5	0	61.2
101	102	4	850	50	39	0.3	71.5	4.1	0.1	-1	-6.1	-16.6	-0.5	0	2.5	0	54
101	102	Category Noise		Level:	63.4												
260	261	1	290	50	33	9.7	66.8	3.5	2.9	-1	-3.4	-8.7	-0.4	0	2.5	0	62.2
260	261	2	290	50	33	9.7	66.8	3.5	2.9	-1	-3.4	-15.7	0	0	2.5	0	55.6
260	261	Category Noise		Level:	63.1												
207	208	1	1090	50	42	2.7	72.6	4.4	0.8	-1	-7.8	-19.3	-13.1	0	2.5	1.5	40.6
207	208	2	1090	50	42	2.7	72.6	4.4	0.8	-1	-7.8	-15.4	-2.8	0	2.5	0	53.3
207	208	3	1090	50	42	2.7	72.6	4.4	0.8	-1	-7.8	-18.6	-2.8	0	2.5	0	50.1
207	208	4	1090	50	42	2.7	72.6	4.4	0.8	-1	-7.8	-10.8	-3	0	2.5	0	57.7
207	208	Category Noise		Level:	59.6												
262	263	1	190	50	41	3.6	65	4.3	1.1	-1	-1.9	-7.1	0	0	2.5	0	62.9
262	263	Category Noise		Level:	62.9												
205	206	1	1090	50	42	2.4	72.6	4.4	0.7	-1	-7.5	-14.7	-2	0	2.5	0	55
205	206	2	1090	50	42	2.4	72.6	4.4	0.7	-1	-7.5	-17.7	-3.8	0	2.5	0	50.2
205	206	3	1090	50	42	2.4	72.6	4.4	0.7	-1	-7.5	-13.6	-15.3	0	2.5	0	42.8
205	206	Category Noise		Level:	56.4												
208	209	1	940	50	36	2.4	71.9	3.8	0.7	-1	-7.8	-16.7	-1.7	0	2.5	0	51.7
208	209	2	940	50	36	2.4	71.9	3.8	0.7	-1	-7.8	-18	-2	0	2.5	0	50.1
208	209	3	940	50	36	2.4	71.9	3.8	0.7	-1	-7.8	-13.5	-1.8	0	2.5	0	54.8
208	209	4	940	50	36	2.4	71.9	3.8	0.7	-1	-7.8	-18.1	-2	0	2.5	0	50
208	209	Category Noise		Level:	58.1												
103	104	1	850	50	39	2.5	71.5	4.1	0.8	-1	-6.2	-14.6	0	0	2.5	0	57.1
103	104	2	850	50	39	2.5	71.5	4.1	0.8	-1	-6.2	-17.2	-8.1	0	2.5	0	46.4
103	104	Category Noise		Level:	57.5												
209	210	1	940	50	36	5.6	71.9	3.8	1.7	-1	-8.1	-12	-2	0	2.5	0	56.8
209	210	Category Noise		Level:	56.8												
250	251	1	450	50	44	4.8	68.7	4.5	1.4	-1	-4	-14.1	-0.3	0	2.5	0	57.7
250	251	Category Noise		Level:	57.7												
252	253	1	500	50	36	3.4	69.2	3.8	1	-1	-1.5	-16.2	-0.1	0	2.5	0	57.7
252	253	Category Noise		Level:	57.7												
Total contribution from :																	
Unaltered		71.5															
Altered		0															
New		60.6															
OVERALL		71.8															