

OVG Manchester:

Appendix 10.2 – Noise and Vibration – Construction Noise Assessment

OVG Manchester

Noise and Vibration – Construction Noise Assessment – Appendix 10.2

0042841

14 February 2020

Revision 02

Revision	Description	Issued by	Date	Checked
00	First Issue	GD	17/01/20	BFB
01	Incorporated comments from stakeholders	GD	17/1/20	BFB
02	Scoping Opinion and Legal Review comments incorporated.	GD	14/2/20	BFB

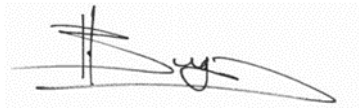
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author **Gareth Davies**

date **14/2/20**

approved **Ben Burgess**

signature



date **14/2/20**

1 Construction Noise Assessment

Methodology

The criteria for the significance of effect due to construction noise upon noise sensitive receptors are derived from Annex E of BS 5228-1. This criterion is based on the total construction noise level, which is the combination of the pre-existing ambient noise level plus construction noise.

The significance of construction noise can be determined using the ABC method which sets an appropriate "Assessment Category" that is derived from the pre-existing ambient noise level. If the total construction noise level exceeds the Assessment Category value, then a significant effect is deemed to occur. The threshold of significant effect on dwellings criteria is included in the Table below.

Threshold of significant effect on dwellings

Evaluation period	Assessment category ($L_{Aeq,T}$ dB)		
	A	B	C
Night-time (23:00-07:00)	45	50	55
Evening and Weekends*	55	60	65
Daytime (07:00-19:00)	65	70	75

*19:00 - 23:00 weekdays, 13:00 - 23:00 Saturdays and 07:00 - 23:00 Sundays.

Category A: threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are less than these values.

Category B: threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are the same as Cat A.

Category C: threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are higher than Cat A.

The Category (A, B or C) is to be determined separately for each time period and the lowest noise category is then used throughout the 24-hour cycle, e.g. a site which is Category A by day and Category B or C in the evening and night will be treated as Category A for day, evening and night.

The magnitude of impact from noise can be summarised as shown in the following Table.

Magnitude of impact from construction noise

Magnitude of impact	Total construction noise level
Negligible	0 to 3 dB > Assessment Category
Small	3 to 5 dB > Assessment Category
Medium	5 to 10 dB > Assessment Category
Large	+10 dB > Assessment Category

Plant and Equipment

The Tables in the section below identify the sound pressure level of construction plant and equipment at the 10 metres threshold as presented in BS 5228-1:2009+A1:2014 and at distances representative of the nearest noise sensitive receptors from the noise source.

Indicative plant type and equipment during construction activities

Plant	Stage of Construction					BS 5228-1 reference
	Site preparation	Piling	Concrete operations	General site activities	L _w dBA	
Air Compressors	x	x	x	x	93	Table C.5, Item 5
Concrete Crushing Plant	x	-	-	-	110	Table C.1, Item 14
Delivery Trucks	x	x	x	x	106	Table C.8, Item 21
Diamond Cutting Tools/Saws	-	-	-	x	119	Table C.4, Item 70
Dumpers	x	x	x	x	107	Table C.2, Item 30-31
Eight-wheeler Trucks	x	-	x	x	113	Table C.10, Item 16
Excavator Mounted Hydraulic Breakers	x	-	-	x	118	Table C.1, Item 9
Forklift Trucks	-	-	-	x	116	Table D.7, Item 94
Hand Held Tools including breakers (pneumatic and hydraulic)	x	-	x	x	111	Table C.1, Item 6
Hand/Power Tools	x	-	x	x	93	-
Mobile Access Platforms	-	-	x	x	95	Table C.4, Item 57
Mobile Craneage / Tower Cranes	x	x	x	x	104	Table C.4, Item 48
Piling Rigs (Rotary)	-	x	-	-	111	Table C.3, Item 14
Power Tools including percussion drills, cutting disks, pipe - threaders	x	x	-	x	106	Table D.6, Item 52
Pulveriser Mounted on Excavator	-	-	-	-	104	Table C.1, Item 4
Scaffold	x	-	-	x	108	Table D.7, Item 1
Skips and Skip Trucks	x	x	x	x	106	Table C.8, Item 21

Plant	Stage of Construction					BS 5228-1 reference
	Site preparation	Piling	Concrete operations	General site activities	L _w dBA	
Tracked / Wheeled 360 degree Excavators	x	x	x	x	105	Table C.2, Item 2

This list of plant (referenced from BS 5228-1) has been used to derive the total sound power output level for each construction activity. A full list of plant associated with each construction phase is represented below.

Site preparation

Site activity	L _w dB A	Time 'on'	Number of plant	Corrected for number of plant	Corrected for time 'on'	Corrected L _w dBA
Air Compressors	93	0.6	1	0	-2	91
Concrete Crushing Plant	110	0.3	2	3	-5	108
Delivery Trucks	106	0.5	2	3	-3	106
Diamond Cutting Tools/Saws	119	-	-	-	-	-
Dumpers	107	0.3	2	3	-5	105
Eight-wheeler Trucks	113	0.75	3	5	-1	117
Excavator Mounted Hydraulic Breakers	118	0.5	2	3	-3	118
Forklift Trucks	116	-	-	-	-	-
Hand Held Tools including breakers (pneumatic and hydraulic)	111	0.3	1	0	-5	106
Hand/Power Tools	93	0.3	2	3	-5	91
Mobile Access Platforms	95	-	-	-	-	-
Mobile Craneage / Tower Cranes	104	0.5	1	0	-3	101
Piling Rigs (Rotary)	111	-	-	-	-	-
Power Tools including percussion drills, cutting disks, pipe - threaders	106	0.3	2	3	-5	104
Pulveriser Mounted on Excavator	104	-	-	-	-	-
Scaffold	108	0.75	3	5	-1	112
Skips and Skip Trucks	106	0.75	2	3	-1	108
Tracked / Wheeled 360 degree Excavators	105	0.75	2	3	-1	107
Total						122

Piling

Site activity	L _w dB A	Time 'on'	Number of plant	Corrected for number of plant	Corrected for time 'on'	Corrected L _w dBA
Air Compressors	93	0.5	2	3	-3	93

Site activity	L _w dB A	Time 'on'	Number of plant	Corrected for number of plant	Corrected for time 'on'	Corrected L _w dBA
Concrete Crushing Plant	110	-	-	-	-	-
Delivery Trucks	106	0.5	2	3	-3	106
Diamond Cutting Tools/Saws	119	-	-	-	-	-
Dumpers	107	0.3	2	3	-5	105
Eight-wheeler Trucks	113	-	-	-	-	-
Excavator Mounted Hydraulic Breakers	118	-	-	-	-	-
Forklift Trucks	116	-	-	-	-	-
Hand Held Tools including breakers (pneumatic and hydraulic)	111	-	-	-	-	-
Hand/Power Tools	93	-	-	-	-	-
Mobile Access Platforms	95	-	-	-	-	-
Mobile Craneage / Tower Cranes	104	0.75	2	3	-1	106
Piling Rigs (Rotary)	111	0.75	2	3	-1	113
Power Tools including percussion drills, cutting disks, pipe - threaders	106	0.3	2	3	-5	104
Pulveriser Mounted on Excavator	104	-	-	-	-	-
Scaffold	108	-	-	-	-	-
Skips and Skip Trucks	106	0.75	2	3	-1	108
Tracked / Wheeled 360 degree Excavators	105	0.75	2	3	-1	107
Total						116

Concrete operations

Site activity	L _w dB A	Time 'on'	Number of plant	Corrected for number of plant	Corrected for time 'on'	Corrected L _w dBA
Air Compressors	93	0.5	2	3	-3	93
Concrete Crushing Plant	110	-	-	-	-	-
Delivery Trucks	106	0.5	2	3	-3	106
Diamond Cutting Tools/Saws	119	-	-	-	-	-
Dumpers	107	0.3	2	3	-5	105
Eight-wheeler Trucks	113	-	-	-	-	-
Excavator Mounted Hydraulic Breakers	118	-	-	-	-	-
Forklift Trucks	116	-	-	-	-	-
Hand Held Tools including breakers (pneumatic and hydraulic)	111	-	-	-	-	-
Hand/Power Tools	93	-	-	-	-	-

Site activity	L _w dB A	Time 'on'	Number of plant	Corrected for number of plant	Corrected for time 'on'	Corrected L _w dBA
Mobile Access Platforms	95	-	-	-	-	-
Mobile Craneage / Tower Cranes	104	0.75	2	3	-1	106
Piling Rigs (Rotary)	111	0.75	2	3	-1	113
Power Tools including percussion drills, cutting disks, pipe - threaders	106	0.3	2	3	-5	104
Pulveriser Mounted on Excavator	104	-	-	-	-	-
Scaffold	108	-	-	-	-	-
Skips and Skip Trucks	106	0.75	2	3	-1	108
Total						115

General site activities

Site activity	L _w dB A	Time 'on'	Number of plant	Corrected for number of plant	Corrected for time 'on'	Corrected L _w dBA
Air Compressors	93	0.5	2	3	-3	93
Concrete Crushing Plant	110	-	-	-	-	-
Delivery Trucks	106	0.5	2	3	-3	106
Diamond Cutting Tools/Saws	119	0.2	1	0	-7	112
Dumpers	107	0.3	2	3	-5	105
Eight-wheeler Trucks	113	0.5	2	3	-3	113
Excavator Mounted Hydraulic Breakers	118	0.5	2	3	-3	118
Forklift Trucks	116	0.3	2	3	-5	114
Hand Held Tools including breakers (pneumatic and hydraulic)	111	0.3	1	0	-5	106
Hand/Power Tools	93	0.5	2	3	-3	93
Mobile Access Platforms	95	0.3	2	3	-5	93
Mobile Craneage / Tower Cranes	104	0.3	2	3	-5	102
Piling Rigs (Rotary)	111	-	-	-	-	-
Power Tools including percussion drills, cutting disks, pipe - threaders	106	0.5	2	3	-3	106
Pulveriser Mounted on Excavator	104	-	-	-	-	-
Scaffold	108	0.5	2	3	-3	108
Skips and Skip Trucks	106	0.5	1	0	-3	103
Tracked / Wheeled 360 degree Excavators	105	0.75	2	3	-1	107
Total						122

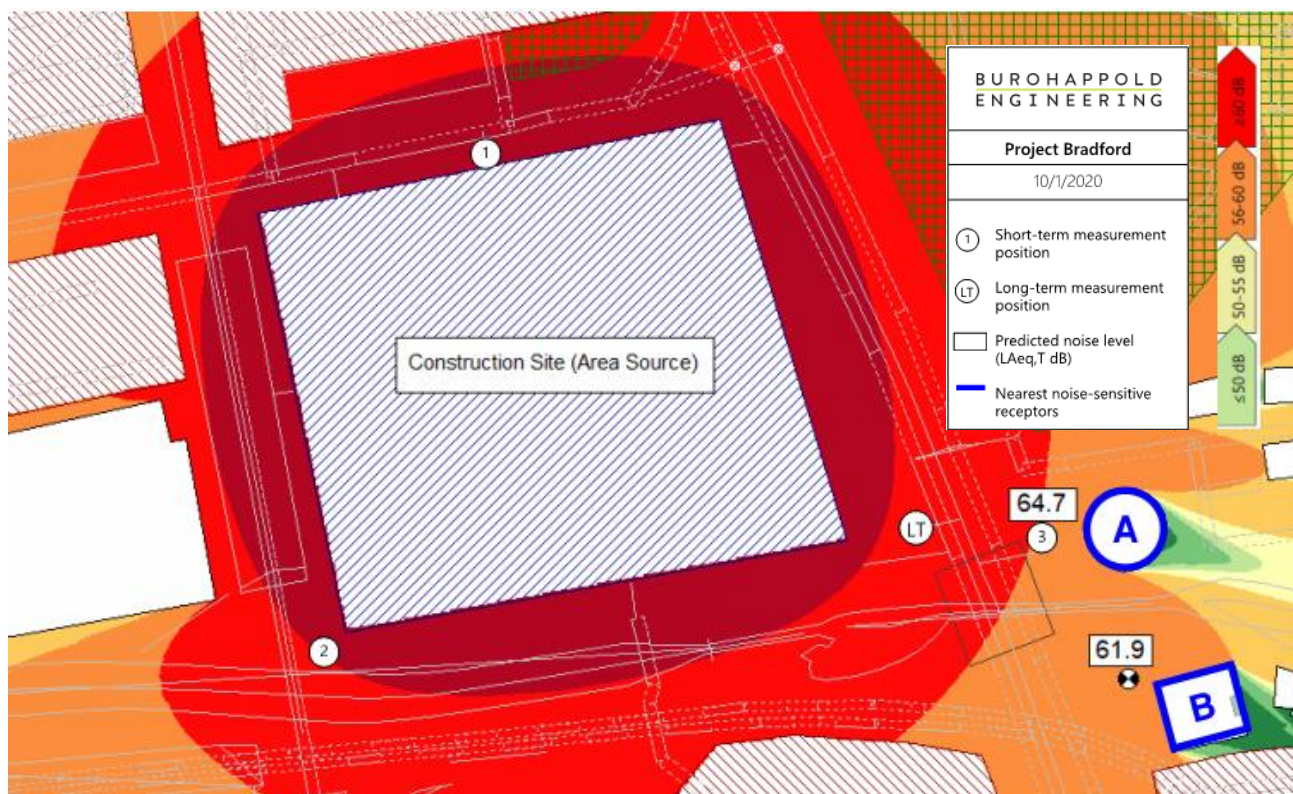
The magnitude of impact and significance of effect due to construction noise has been calculated based on the levels generated by either site preparation and general site activities given that they are considered the construction phases which have the potential to generate the highest levels of noise impact.

Assessment category

NSR #	Measured baseline ambient L_{Aeq} noise level – $L_{Aeq,T}$ dBA	Assessment category	Daytime noise threshold level – $L_{Aeq,T}$ dBA
A	63	B	70
B	63	B	70
C	51	A	65
D	63	B	70

The total sound power noise levels predicted for the worst-case construction phases, i.e. L_w 122 dBA, have been applied to a noise model of the development. Noise modelling takes into account numerous acoustic factors such as distance attenuation, terrain, directivity and screening to predict sound pressure levels at receivers e.g. NSRs. As such, an area source positioned 1.5 m above the proposed construction site was entered into the noise model so that noise levels at the nearest NSRs could be predicted. A screenshot of the modelled construction site is shown below with predicted noise levels.

Construction noise modelling predictions



Predicted noise levels from the noise modelling exercise at the nearest NSRs are presented in the table below.

Predicted $L_{Aeq,T}$ noise level due to construction activities

NSR	Receptor sensitivity	Site preparation – $L_{Aeq,T}$ dBA	General site activities – $L_{Aeq,T}$ dBA
A	High	65	65
B	High	62	62
C	High	53	53
D	High	53	53

Magnitude of impact due to construction activities

NSR	Receptor sensitivity	Site preparation	General site activities
A	High	Negligible	Negligible
B	High	Negligible	Negligible
C	High	Negligible	Negligible
D	High	Negligible	Negligible

Significance of effect due to construction activities

NSR	Receptor sensitivity	Site preparation	General site activities
A	High	Negligible	Negligible
B	High	Negligible	Negligible
C	High	Negligible	Negligible
D	High	Negligible	Negligible