

## **APPENDIX 9.3 DEMOLITION AND CONSTRUCTION NOISE ASSESSMENT**

## Appendix 9.3: Demolition and Construction Noise Assessment

The significance criteria for the noise assessment of the preparation and construction works are based on 'The ABC Method' from BS 5228-1:2009+A1:2014. An extract describing this method is provided below in **Table 9.3.1**.

Table 9.3.1: ABC Categories

Assessment category and threshold value period ( $L_{Aeq}$ )	Threshold value, in decibels (dB)		
	Category A <sup>A)</sup>	Category B <sup>B)</sup>	Category C <sup>C)</sup>
Night-time (23.00-07.00)	45	50	55
Evenings and weekends <sup>D)</sup>	55	60	65
Daytime (07.00-19.00) and Saturdays (07.00-13.00)	65	70	75

NOTE 1 A significant impact has been deemed to occur if the total  $L_{Aeq}$  noise level, including construction, exceeds the threshold level for the Category appropriate to the ambient noise level.

NOTE 2 If the ambient noise level exceeds the threshold values given in the table (i.e. the ambient noise level is higher than the above values), then a significant effect is deemed to occur if the total  $L_{Aeq}$  noise level for the period increases by more than 3 dB due to construction activity.

NOTE 3 Applied to residential receptors only.

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

<sup>B)</sup> Category B: threshold values to use when the ambient noise levels (when rounded to the nearest 5 dB) are the same as category A values.

<sup>C)</sup> Category C: threshold values to use when the ambient noise levels (when rounded to the nearest 5 dB) are higher than category A values.

<sup>D)</sup> 19.00-23.00 weekdays, 13.00-23.00 Saturdays and 07.00-23.00 Sundays.

Source: BS 5228-1:2009+A1:2014, Page119

Calculations have not been undertaken for the evening or night-time periods as it is assumed that evening and night-time demolition and construction work would only be undertaken under exceptional circumstances and not without prior approval. Exceptional circumstances may include concreting operations where the pumping of concrete to foundations has to be a continuous process which may require operations outside the daytime period.

Table 9.3.2 presents the ABC BS5228 construction threshold daytime noise levels based on the measured prevailing noise levels for key sensitive receptors (SRs).

Table 9.3.2: Construction Threshold Noise Levels

SR Ref	SR Description	Measured Daytime Noise Level dB L <sub>Aeq,T</sub>	BS5228 ABC Threshold Noise Level dB L <sub>Aeq,T</sub>	Distance from Demolition (approx. m)	Distance from Site Boundary (approx. m)
A	5-68 Watney Road	60 (LT4)	65	150	25
B	4-24 William Lane	60 (LT4)	65	22	5
C	1-69 Lower Richmond Road	71 (LT1)	75	20	5
D	Chertsey Court	72 (ST8)	75	180	5
E	139 Lower Richmond Road	72 (ST8)	75	215	5
F	Future Residential	-	65	n/a	15 (from nearest works)

Generic calculations were undertaken using the data and procedures set out in BS 5228-1:2009+A1:2014 for the noisiest construction phases, to derive indicative noise levels at selected sensitive receptors (SRs).

The highest noise levels tend to be associated with plant associated with, demolition, piling, construction of the substructure and superstructure. During the fit-out, construction noise would be significantly lower. The calculations assume that plant would be operating at the closest point to the SR, and do not take into account any existing or proposed screening. The noisiest construction phases and associated noise levels are considered to be as follows:

- Demolition 90 dB L<sub>Aeq,1h</sub> at 10m
- Enabling Works 87 dB L<sub>Aeq,1h</sub> at 10m
- Substructure, Basement Sheet Piling 88 dB L<sub>Aeq,1h</sub> at 10m
- Substructure, Excavation 84 dB L<sub>Aeq,1h</sub> at 10m
- Substructure, CFA 85 dB L<sub>Aeq,1h</sub> at 10m
- Substructure Concreting 86 dB L<sub>Aeq,1h</sub> at 10m
- Superstructure, Building Steel Frame 85 dB L<sub>Aeq,1h</sub> at 10m
- Superstructure, Concrete Floor Slab (incl power floating) 86 dB L<sub>Aeq,1h</sub> at 10m
- Public Realm & Landscaping 85 dB L<sub>Aeq,1h</sub> at 10m
- Highways Pavement 80 dB L<sub>Aeq,1h</sub> at 10m

Table 9.3.3 presents the generic plant and on-time used in the calculation of the demolition and construction noise levels. A maximum worst case noise level over a one hour period was calculated, assuming that plant would be operating at the closest point to the nearest NSRs in the absence of mitigation. In practice, noise levels would tend to be lower owing to greater separation distance as the works progress. They would also tend to reduce over a 12-hour working day (week-day, 5 hours Saturday) owing to periods of plant inactivity.

Table 9.3.3: Generic Construction Noise Levels

Phase / Plant	Source	LW	LAeq @10m	Distance From Boundary to NSR (m)	Kh	(t/T)*100	Partial Exposure	Barrier Attenuation	Noise Level @ NSR LAeq,1h (dB)	Overall LAeq,1h (dB)
<b>Demolition Buildings</b>										<b>90</b>
High Reach Hydraulic Excavator	CAT 340F UHD	106	78	10	0	1.00	0	0	78	
Tracked Crusher (47t)	BS5228 Table C1 ref 14		82	10	0	0.25	-6	0	76	
Breaker Mounted on Wheeled Backhoe (7.4t)	BS5228 Table C1 ref 1		92	10	0	0.50	-3	0	89	
Dozer (11t)	BS5228 Table C2 ref 13		78	10	0	0.25	-6	0	72	
Hand Held Pneumatic Breaker (concrete foundation)	BS5228 Table C1 ref 6		83	10	0	0.25	-6	0	77	
Wheeled Backhoe Loader (8t)	BS5228 Table C2 ref 8		68	10	0	0.50	-3	0	65	
Compressor	BS5228 Table C5 ref 5		65	10	0	0.50	-3	0	62	
Lump Hammer	BS5228 Table C1 ref 19		69	10	0	0.25	-6	0	63	
Hand-held circular saw (Petrol-cutting concrete blocks)	BS5228 Table C4 ref 72		79	10	0	0.10	-10	0	69	
Scaffold poles and clips	BS5228 Table D7 ref 1		80	10	0	0.20	-7	0	73	
Tracked Mobile Crane	BS5228 Table C4 ref 50		71	10	0	0.50	-3	0	68	
Lorry x 2	BS5228 Table C2 ref 34		83	10	0	0.10	-10	0	73	
<b>Enabling Works</b>										<b>87</b>
Breaker Mounted on Wheeled Backhoe (7.4t)	BS5228 Table C1 ref 1		92	10	0	0.25	-6	0	86	
Hand Held Pneumatic Breaker (concrete foundation)	BS5228 Table C1 ref 6		83	10	0	0.25	-6	0	77	
Hand-held circular saw (Petrol-cutting concrete blocks)	BS5228 Table C4 ref 72		79	10	0	0.10	-10	0	69	
Tracked Crusher (47t)	BS5228 Table C1 ref 14		82	10	0	0.25	-6	0	76	
Wheeled Backhoe Loader (8t)	BS5228 Table C2 ref 8		68	10	0	0.50	-3	0	65	
Lorry x 2	BS5228 Table C2 ref 34		83	10	0	0.10	-10	0	73	
Tracked Excavator (14t)	BS5228 Table C2 ref 7		70	10	0	1.00	0	0	70	
<b>Sheet Piling (substructure)</b>										<b>88</b>
Vibratory Sheet Piling	BS5228 Table C3 ref 8		88	10	0	1.00	0	0	88	

Phase / Plant	Source	LW	LAeq @10m	Distance From Boundary to NSR (m)	Kh	(t/T)*100	Partial Exposure	Barrier Attenuation	Noise Level @ NSR LAeq,1h (dB)	Overall LAeq,1h (dB)
Dewatering Pumps	BS5228 Table C2 ref 45		65	10	0	1.00	0	0	65	
Water Jet Pump	BS5228 Table C3 ref 13		63	10	0	1.00	0	0	63	
<b>Excavation (substructure)</b>										<b>84</b>
Tracked Excavator (14t)	BS5228 Table C2 ref 7		70	10	0	1.00	0	0	70	
Tracked Excavator (14t)	BS5228 Table C2 ref 7		70	10	0	1.00	0	0	70	
Wheeled Backhoe Loader (8t)	BS5228 Table C2 ref 8		68	10	0	1.00	0	0	68	
Hydraulic Vibratory Compactor (Tracked Excavator)	BS5228 Table C2 ref 42		78	10	0	1.00	0	0	78	
Dozer (11t)	BS5228 Table C2 ref 13		78	10	0	1.00	0	0	78	
Lorry (4-axle wagon)	BS5228 Table C2 ref 34		80	10	0	1.00	0	0	80	
<b>CFA (substructure)</b>										<b>85</b>
Crawler mounted rig - Continuous Flight Auger Piling Cast In-Situ	BS5228 Table C3 ref 21		79	10	0	1.00	0	0	79	
Tracked Excavator	BS5228 Table C3 Ref 23		68	10	0	1.00	0	0	68	
Tracked Excavator Inserting Cylindrical Metal Cage	BS5228 Table C3 Ref 24		74	10	0	1.00	0	0	74	
Truck Mounted Concrete Pump + Boom Arm	BS5228 Table C4 ref 29		80	10	0	1.00	0	0	80	
Concrete Mixer Truck	BS5228 Table C4 Ref 20		80	10	0	1.00	0	0	80	
Pump Boom + Vibrating Poker	BS5228 Table C4 ref 36		71	10	0	1.00	0	0	71	
<b>Concreting (substructure)</b>										<b>86</b>
Truck Mounted Concrete Pump + Boom Arm	BS5228 Table C4 ref 29		80	10	0	1.00	0	0	80	
Concrete Mixer Truck	BS5228 Table C4 Ref 20		80	10	0	1.00	0	0	80	
Pump Boom + Vibrating Poker	BS5228 Table C4 ref 36		71	10	0	1.00	0	0	71	
CM60 Concrete Batching Plant	Manufacturer's Data	111	83	10	0	1.00	0	0	83	
<b>Building Steel Frame (superstructure)</b>										<b>85</b>
Mobile Telescopic Crane	BS5228 Table C4 ref 39		77	10	0	1.00	0	0	77	
Mobile Telescopic Crane	BS5228 Table C4 ref 39		77	10	0	1.00	0	0	77	
Site Lift Worker	BS5228 Table C4 ref 62		66	10	0	1.00	0	0	66	

Phase / Plant	Source	LW	LAeq @10m	Distance From Boundary to NSR (m)	Kh	(t/T)*100	Partial Exposure	Barrier Attenuation	Noise Level @ NSR LAeq,1h (dB)	Overall LAeq,1h (dB)
Diesel scissor lift	BS5228 Table C4 ref 59		78	10	0	1.00	0	0	78	
Diesel scissor lift	BS5228 Table C4 ref 59		78	10	0	1.00	0	0	78	
Power for welder diesel	BS5228 Table C4 ref 85		77	10	0	1.00	0	0	77	
Power for welder diesel	BS5228 Table C4 ref 85		77	10	0	1.00	0	0	77	
<b>Building Floor Slab (superstructure)</b>										<b>86</b>
Truck Mounted Concrete Pump + Boom Arm	BS5228 Table C4 ref 29		80	10	0	1.00	0	0	80	
Concrete Mixer Truck	BS5228 Table C4 Ref 20		80	10	0	1.00	0	0	80	
Pump Boom + Vibrating Poker	BS5228 Table C4 ref 36		71	10	0	1.00	0	0	71	
CM60 Concrete Batching Plant	Manufacturer's Data	111	83	10	0	1.00	0	0	83	
Power Float	Manufacturer's Data	105	77	10	0	1.00	0	0	77	
<b>Public Realm &amp; Landscaping</b>										<b>85</b>
Tracked Excavator (14t)	BS5228 Table C2 ref 7		70	10	0	1.00	0	0	70	
Tracked Excavator (14t)	BS5228 Table C2 ref 7		70	10	0	1.00	0	0	70	
Wheeled Backhoe Loader (8t)	BS5228 Table C2 ref 8		68	10	0	1.00	0	0	68	
Hydraulic Vibratory Compactor (Tracked Excavator)	BS5228 Table C2 ref 42		78	10	0	1.00	0	0	78	
Dozer (11t)	BS5228 Table C2 ref 13		78	10	0	0.50	-3	0	75	
Lorry (4-axle wagon)	BS5228 Table C2 ref 34		80	10	0	1.00	0	0	80	
Concrete Mixer Truck	BS5228 Table C4 Ref 20		80	10	0	0.25	-6	0	74	
Truck Mounted Concrete Pump + Boom Arm	BS5228 Table C4 ref 29		80	10	0	0.25	-6	0	74	
Mobile Telescopic Crane	BS5228 Table C4 ref 39		77	10	0	0.50	-3	0	74	
<b>Highways - Pavement</b>										<b>80</b>
Road planer	BS5228 Table C5 ref 7		82	10	0	0.50	-3	0	79	
Spreading chip and fill	BS5228 Table C5 ref 12		77	10	0	0.25	-6	0	71	
Vibratory roller	BS5228 Table C5 ref 20		75	10	0	0.25	-6	0	69	
Asphalt paver (+ tipper lorry)	BS5228 Table C5 ref 30		75	10	0	0.25	-6	0	69	

Phase / Plant	Source	LW	LAeq @10m	Distance From Boundary to NSR (m)	Kh	(t/T)*100	Partial Exposure	Barrier Attenuation	Noise Level @ NSR LAeq,1h (dB)	Overall LAeq,1h (dB)
Vibratory compactor (asphalt)	BS5228 Table C5 ref 29		82	10	0	0.50	-3	0	79	
Lorry (4-axle wagon)	BS5228 Table C2 ref 34		80	10	0	0.25	-6	0	74	

Predicted construction noise levels of the demolition and construction works both with and without mitigation are summarised in **Table 9.3.4** to **Table 9.3.9**.

Table 9.3.4: Demolition and Construction Predicted Noise Levels

SR	Demolition / Construction Activity	Threshold Limit (dB(A))	Predicted Site Noise Level (dB(A))	Significance of Effect	Predicted Site Noise Level With Mitigation (dB(A))	Significance of Residual Effect
SR A	Demolition	65	67	Insignificant	<65	Insignificant
	Enabling		79	Major	69	Minor
	Sheet Piling (substructure)		77	Major	67	Insignificant
	Excavation (substructure)		65	Insignificant	<65	Insignificant
	CFA (substructure)		67	Insignificant	<65	Insignificant
	Concreting (substructure)		67	Insignificant	<65	Insignificant
	Steel Frame (superstructure)		67	Insignificant	<65	Insignificant
	Floor Slab (superstructure)		68	Minor	<65	Insignificant
	Public Realm & Landscaping		85	Major	<75 <sup>1</sup>	Moderate
	Highways Pavement		80	Major	70	Moderate
	SR B		Demolition	65	83	Major
Enabling		87	Major		<75 <sup>1</sup>	Moderate
Sheet Piling (substructure)		67	Insignificant		<65	Insignificant
Excavation (substructure)		81	Major		71	Moderate
CFA (substructure)		82	Major		72	Moderate
Concreting (substructure)		82	Major		72	Moderate
Steel Frame (superstructure)		82	Major		72	Moderate
Floor Slab (superstructure)		83	Major		73	Moderate
Public Realm & Landscaping		85	Major		<75 <sup>1</sup>	Moderate
Highways Pavement		80	Major		70	Moderate
SR C		Demolition	75		84	Moderate
	Enabling	87		Major	77	Insignificant
	Sheet Piling (substructure)	76		Insignificant	66	Insignificant
	Excavation (substructure)	76		Insignificant	66	Insignificant
	CFA (substructure)	77		Insignificant	67	Insignificant



SR	Demolition / Construction Activity	Threshold Limit (dB(A))	Predicted Site Noise Level (dB(A))	Significance of Effect	Predicted Site Noise Level With Mitigation (dB(A))	Significance of Residual Effect
	Concreting (substructure)		78	Minor	68	Insignificant
	Steel Frame (superstructure)		77	Insignificant	67	Insignificant
	Floor Slab (superstructure)		79	Minor	69	Insignificant
	Public Realm & Landscaping		85	Major	75	Insignificant
	Highways Pavement		80	Moderate	70	Insignificant
SR D	Demolition		65	Insignificant	<65	Insignificant
	Enabling		87	Major	77	Insignificant
	Sheet Piling (substructure)		60	Insignificant	<60	Insignificant
	Excavation (substructure)		60	Insignificant	<60	Insignificant
	CFA (substructure)		61	Insignificant	<61	Insignificant
	Concreting (substructure)	75	62	Insignificant	<62	Insignificant
	Steel Frame (superstructure)		61	Insignificant	<61	Insignificant
	Floor Slab (superstructure)		62	Insignificant	<62	Insignificant
	Public Realm & Landscaping		85	Major	75	Insignificant
	Highways Pavement		80	Moderate	70	Insignificant
	SR E	Demolition		63	Insignificant	<63
Enabling			87	Major	77	Insignificant
Sheet Piling (substructure)			62	Insignificant	<62	Insignificant
Excavation (substructure)			63	Insignificant	<63	Insignificant
CFA (substructure)			64	Insignificant	<64	Insignificant
Concreting (substructure)		75	65	Insignificant	<65	Insignificant
Steel Frame (superstructure)			64	Insignificant	<64	Insignificant
Floor Slab (superstructure)			65	Insignificant	<65	Insignificant
Public Realm & Landscaping			85	Major	75	Insignificant
Highways Pavement			80	Moderate	70	Insignificant
SR F		Demolition		n/a	n/a	n/a
	Enabling	65	84	Major	74	Moderate
	Sheet Piling (substructure)		85	Major	<75 <sup>1</sup>	Moderate

SR	Demolition / Construction Activity	Threshold Limit (dB(A))	Predicted Site Noise Level (dB(A))	Significance of Effect	Predicted Site Noise Level With Mitigation (dB(A))	Significance of Residual Effect
	Excavation (substructure)		81	Major	71	Moderate
	CFA (substructure)		82	Major	72	Moderate
	Concreting (substructure)		82	Major	72	Moderate
	Steel Frame (superstructure)		82	Major	72	Moderate
	Floor Slab (superstructure)		83	Major	73	Moderate
	Public Realm & Landscaping		81	Major	71	Moderate
	Highways Pavement		77	Major	67	Insignificant

Note: <sup>1</sup> Additional mitigation assumed when works proximate to site boundary thereby allow up to 15dB attenuation to be achieved. This would be achieved either by additional shielding, change in method of working. Reducing on-time etc.