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**AGAR 1B
AGAR GROVE
LONDON
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ASSESSMENT OF NOISE & VIBRATION FROM DEMOLITION & CONSTRUCTION

v.1

Client:

HILL PARTNERSHIPS LIMITED

The Power House
Gunpowder Mill
Powdermill Road
Waltham Abbey
Essex EN9 1BN

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1. SUMMARY

- 1.1 An acoustic appraisal has been conducted for Hill Partnership Limited at Agar Grove, London. The project comprises the demolition of any number of existing residential buildings, and then the construction of two new residential blocks in their place, with associated landscaping & external works.
- 1.2 The Local Authority have requested an assessment of acoustic impact on adjacent noise sensitive receptors during the demolition and construction phases of a project:
- 1.3 This report will therefore describe the proposed demolition and construction works, and the likely impact on the adjacent noise-sensitive residents.

2. ASSESSMENT OF DEMOLITION & CONSTRUCTION NOISE

- 2.1 BS5228 is perhaps the most appropriate Standard to adopt when considering the impact of site working on adjacent noise sensitive occupiers. It provides a means of calculating likely noise levels and a possible standard against which the predictions may be judged.
- 2.2 The method of prediction is based on the consideration of each major items of plant or equipment which will found on the site. Residual noise levels at the adjacent receptors will be based on a number of factors, including:
- (i) The acoustic strength of the equipment, usually expressed as an overall sound power level, or a sound pressure level at a stated distance
 - (ii) The duration of operation of the plant, normally taken as a percentage over any hour
 - (iii) The distance from the source of the noise to the receiving
 - (iv) The effect of any obstruction which might interfere with the direct transmission of noise from the source to the receiving (including both screening losses and reflections)
 - (v) Any ground absorption (generally only applicable where there is soft ground and a significant distance between source and receiver).
- 2.3 The individual contributions from each item of equipment are then added in order to provide a total noise level over the reference time period (commonly any single working hour). Of course, the worst-case hour must be assessed.
- 2.4 BS5228 then provides a means of assessing whether the predicted level will have any adverse effect. The Standard offers two methods for assessing impact - the 'ABC' Method and the '2 - 5 dB Change' method. For projects lasting more than one month, it is commonly prescribed that the former approach should be used.
- 2.5 The British Standard describes the approach as follows:
- Noise levels generated by construction activities are deemed to be significant if the total noise (pre-construction ambient plus construction noise) exceeds the pre-construction ambient noise by 5 dB or more, subject to lower cut-off values of 65 dB, 55 dB and 45 dB L_{Aeq} period for construction noise alone, for the day time, evening and night time respectively; and a duration of one month or more, unless works of a shorter duration are likely to result in significant impact.*
- 2.7 In order to determine the likely impact, it is therefore necessary to understand the pre-existing noise climate in the vicinity.
- 2.8 Reference is made here to the 'Environmental Noise Assessment' report by Ian Sharland Limited, dated 1 March 2017. This report describes a survey of ambient noise, conducted on the north-east corner of the site, overlooking Agar Grove.

2.9 The table below confirms the range of typical measured values, across each of the seven days:

Period	Ambient Level
Night-time 2300 – 0700	50 – 65
Evenings & Weekends	55 – 65
Daytime 0700 - 1900 & Saturdays 0700 - 1300	60 – 65

2.10 In this instance, all noise and vibration on site will be limited to the Daytime and Saturday morning periods only. Therefore, it will be taken that the existing ambient noise climate is 60 dB(A).

2.11 Therefore, the target for the noise due to new demolition or construction noise would be 65 dB(A)¹ at the facade of neighbouring properties facing the site

2.12 To assess the likely noise affecting adjacent noise sensitive residents, calculations have been undertaken to consider the effect at the following locations (see Figure 1):

A - Properties on the north side of Agar Grove, 20m from site boundary

B – Properties on the west side of Agar Place, 10m from site boundary

C – Flats forming Phase 1A of the development (now completed), some 10m to the south of the site boundary

D – Tower Block to the east of the site, some 10m from the site boundary.

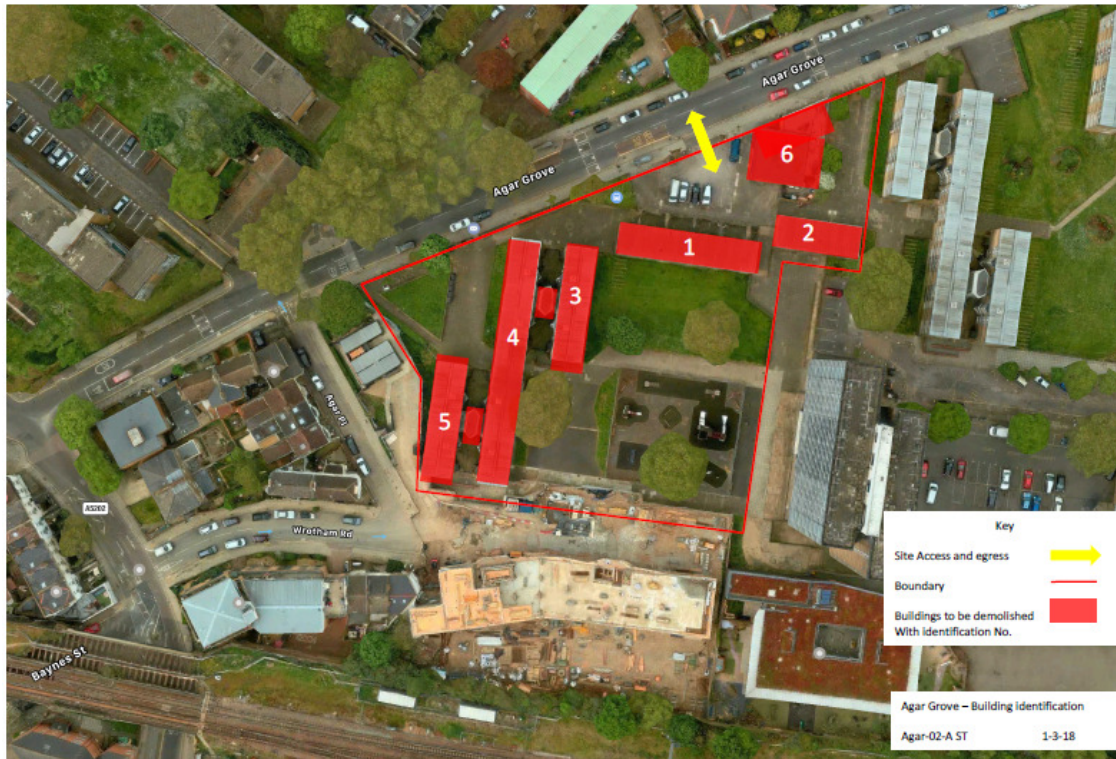
¹ When added to the pre-existing ambient level of 65 dB(A) on Castle Street, the total would then be 70 dB(A).

3. PREDICTION OF DEMOLITION & CONSTRUCTION NOISE

- 3.1 Hill Partnerships have produced project-specific documents, which detail the principal elements of the project. These have been used as a source for the assessment of likely demolition and construction noise.

Demolition Phase

- 3.2 The photograph below confirms the extent of the demolition works, a project which will run for 15 weeks:



- 3.2 It is noted that site working will be limited to Day Time (0700 - 1800) Monday to Friday, and Saturday mornings 0800 - 13.00.
- 3.3 The soft strip will be undertake using hand tools and 110v tools such as mattocks and reciprocating saws. Segregate drop zones will be created and at a specified period, windows will be removed and dropped to below.
- 3.4 Demolition on site will be undertaken by a number of different size machines. For the low rise, single storey and two storey buildings, 22T and 35T 360° demolition-specification excavators will be employed. For the taller buildings, similar equipment will used, incorporating long-reach attachments.
- 3.5 At a point in the demolition works, a mobile crusher will be brought to site to aid processed of the demolition works. A 360 excavator will load material onto the crusher and form separate stock piles after processing.

- 3.6 Waste will be removed in various different containers, most frequency 40 or 20-yard roll on/roll off muck away lorries.

Construction

- 3.7 Construction of the new buildings will then follow. The site will be served by two tower cranes.
- 3.8 Pile foundations will be provided through continuous augur piling around the perimeter of each block.
- 3.9 Thereafter, construction of the concrete-framed buildings will continue in a fairly traditional fashion.
- 3.10 Appendix A provides a schedule of the principal equipment to be adopted during the demolition and construction phases.
- 3.11 Appendix B provides a matrix of the equipment which would be expected to be used during the demolition stage and the subsequent construction stages, along an assumed number of vehicle movements into and out of the site per day.
- 3.12 Appendix C then provides a calculation of noise generation from the various activities in each of the six phases lists above. The calculations consider upper floor windows, and assume the provision of a nominally 2m high timber hoarding around the perimeter of the site.
- 3.13 The tables below summarise the predicted levels, and the level of compliance (the excess of the predicted facade level over the criteria confirmed in Section 2).

Receptor	1 - Agar Grove, north side				2 - Agar Place, west side			
Phase	Predicted Activity Noise Level	Target	Excess over Target Level	Primary Sources	Predicted Activity Noise Level	Target	Excess over Target Level	Primary Sources
Demolition	76	65	11	High Reach Demolition M/C, Crusher	79	65	14	High Reach Demolition M/C, Crusher
Substructure	74	65	9	CFA Rigs, Concrete Delivery Excavator / Dumper / Telehandler / Roller	76	65	11	CFA Rigs, Concrete Mixer Lorry
RC Frame	71	65	6	Concrete Delivery Telehandler	72	65	7	Tower Cranes, Concrete Delivery Telehandler
External Envelop	71	65	6	Misc Construction Tools Telehandler	70	65	5	Tower Cranes, Misc Construction Tools Telehandler
Internal Fit-Out	72	65	7	Misc Construction Tools	73	65	8	Tower Crane, Misc Construction Tools
Landscaping	73	65	8	Hard Landscaping Dumper, Telehandler, Roller	72	65	7	Hard Landscaping Dumper, Telehandler, Roller

Receptor	3 - Phase 1A Flats				4 - Tower Block			
Phase	Predicted Activity Noise Level	Target	Excess over Target Level	Primary Sources	Predicted Activity Noise Level	Target	Excess over Target Level	Primary Sources
Demolition	80	65	15	High Reach Demolition M/C, Crusher	80	65	15	High Reach Demolition M/C, Crusher
Substructure	78	65	13	CFA Piling Rig, Concrete Delivery Excavator / Dumper / Telehandler / Roller	80	65	15	CFA Piling Rig, Concrete Delivery Excavator / Dumper / Telehandler / Roller
RC Frame	74	65	9	Tower Cranes, Concrete Delivery Telehandler	75	65	10	Tower Cranes, Concrete Delivery Telehandler
External Envelop	73	65	8	Tower Cranes, Misc Construction Tools Telehandler	75	65	10	Tower Cranes, Misc Construction Tools Telehandler
Internal Fit-Out	75	65	10	Tower Cranes, Breakers, Disc Cutters, Core Drills Telehandler	75	65	10	Tower Cranes, Breakers, Disc Cutters, Core Drills Telehandler
Landscaping	77	65	12	Hard Landscaping Dumper, Telehandler, Roller	78	65	13	Hard Landscaping Dumper, Telehandler, Roller

3.14 It can be seen that the predicted noise levels may rise above the target values at the neighbouring residential neighbours.

3.15 Means of mitigation must therefore be considered.

4. NOISE MITIGATION

- 4.1 BS5228:2009 provides detailed guidelines for the mitigation of noise from construction and demolition sites. The following paragraphs will describe the measures to be adopted during this project.
- 4.2 Community relations - Good relations with neighbouring occupiers will be developed by keeping people informed of progress and by treating complaints fairly and expeditiously. Hill Partnerships Limited will appoint a responsible person to liaise with the public, and the following extract from their site management plan confirms their intended approach:

Neighbouring Properties

Establishing and maintaining good relationships with the neighbouring properties will be key on this project and the following procedures will be put into place:

- We will look to implement a series of initial engagement meetings with the neighbours.
 - We will deliver leaflets inviting residents and local businesses to public meetings, encouraging them to raise any concerns with our team. Following these we will hold drop in sessions on site for residents to pop in during the construction works.
 - We will also appoint a dedicated point of contact that residents can communicate with as well as provide regular newsletters, keeping residents and local businesses informed of upcoming works and site progress.
 - Contact information and update notices will be displayed on the site hoardings and gates. Should there be any complaints or concerns from the neighbours we will encourage them to contact our dedicated point of contact. We will always try and resolve or reassure them at site level in the first instance.
- 4.3 Noise and persons on site - All operatives on site will be trained to employ appropriate techniques to keep site noise to a minimum, and will be supervised to ensure that best working practice in respect of noise reduction is followed. The training will be provided through the standard Tool Box Talks. These talks will include:
- a) the proper use and maintenance of tools and equipment;
 - b) the positioning of machinery on site to reduce the emission of noise to the neighbourhood and to site personnel;
 - c) the avoidance of unnecessary noise when carrying out manual operations and when operating plant and equipment;
 - d) the protection of persons against noise;
 - e) the operation of sound measuring equipment (selected personnel).
- 4.4 Project supervision - The intention here is minimize levels of site noise wherever possible (whilst having due regard to the practicability and economic implication of any proposed control or mitigation measures).
- 4.5 The project methodology will be designed to minimise the number of operations likely to be particularly disturbing as far as is possible within the constraints of the project.

- 4.6 Contractors will select the most appropriate plant to minimise overall noise impact, with due regard to:
- a) site layout, e.g. location of static noise sources;
 - b) use of site buildings, material dumps, etc., as ad hoc barriers;
 - c) types of machinery likely to be used and whether alternative types or techniques would achieve less disturbance.
- 4.7 It is noted that Hill Partnerships Limited will review the plant selections and confirm that they represent the quietest available to them for the processes concerned. Where possible, materials dumps will be used for screening (e.g. either side of the crusher plant) but it must be recognised that the adjacent buildings to the south and east are close to the site and have sensitive windows at second floor levels and above. Thus, the possibility of effective screening is limited.
- 4.8 All available techniques will be used to minimize, as far as is appropriate, the level of noise to which operators and others in the neighbourhood of site operations will be exposed. Measures will include the following:
- a) The hours of working are planned with due regard to the effects of noise upon persons in areas surrounding site operations, taking into account the nature of land use in the areas concerned, the duration of work and the likely consequence of any lengthening of work periods.
 - b) Wherever reasonably practicable, the quietest working methods will be employed, including use of the most suitable plant, reasonable hours of working for noisy operations, and economy and speed of operations.
 - c) As required, noise source will be controlled at source
 - d) On-site noise levels will be monitored regularly, particularly if changes in machinery or project designs are introduced, by a suitably qualified person appointed specifically for the purpose (see below)
- 4.9 All equipment will be switched off when not in use, and vehicles drivers will be advised not to rev engines unnecessarily
- 4.10 Internal routes will be maintained throughout the duration of the project
- 4.11 Materials will be lowered whenever practicable rather than be dropped. The surfaces on to which the materials are dropped will be covered by a resilient material.
- 4.12 Plant and vehicles will be started sequentially rather than all together.

- 4.13 Audible reversing warning systems on mobile plant and vehicles should be of a type which, whilst ensuring that they give proper warning, have a minimum noise impact on persons outside sites.
- 4.14 Where reasonably practicable, sources of significant noise would be enclosed or locally screened from neighbouring receptors. As discussed above, however, beyond the efficacy of a nom. 2m high site hoarding, the practical scope for this is deemed to be limited.
- 4.15 Site storage compounds and equipment will be located away from noise-sensitive neighbours. Wherever possible, loading and unloading will also be carried out away from such areas.
- 4.16 Lorries will arrive at or depart from the site in accordance with the times specified in the planning permission.
- 4.17 All plant and equipment will be regularly maintained by trained personnel.
- 4.18 All piling operations will adopt the hydraulic pressure or CFA approach, rather than drop impact methods.

5. NOISE MONITORING

- 5.1 The site team for both demolition and construction phases shall be equipped with a Type 1 or Type 2 precision sound level meter, capable of recording time-averaged sound pressure levels in overall dB(A). The meter shall be accompanied by a Calibrator, and both items shall be kept within a valid calibration cycle for the duration of the project.
- 5.2 A trained operative shall take sample measures at positions on each site boundary (as close to noise sensitive neighbours as possible) for a 20-minute period at least once per week. The samples should aim to capture a representative sample of the typical working at that stage of the project.
- 5.3 Additional measurements should be taken at key times, including (but not limited to) the commencement of concrete crushing, piling works and concrete pouring, and in response to any comment from neighbouring occupiers.
- 5.4 Formal records of the noise recordings, and contemporaneous observations, should be kept. The following information should be recorded:
 - (a) The measured values of L_{Aeq} and, where appropriate, $L_{Amax, f}$, together with details of the relevant time periods;
 - (b) Details of the instrumentation and measurement methods used, including details of any sampling techniques, position of the microphone in relation to the site and system calibration data:
 - (c) Any factors that might have adversely affected the reliability or accuracy of the measurements;
 - (d) Plans of the site and neighbourhood showing the position of plant, associated buildings and notes of site activities during the monitoring periods:
 - (e) Notes on weather conditions, including where relevant, wind speed/direction, temperature, rain etc
 - (f) Time, date and name of person carrying out the measurement.
- 5.5 Should any unexpectedly high levels be recorded, attributed to a particular activity or process, or if complaints are received from neighbouring occupiers, further noise control measures may be required.

6. ASSESSMENT OF CONSTRUCTION VIBRATION

- 6.1 Once again, BS5228 is perhaps the most appropriate Standard to adopt when considering the impact of vibration from site operations. Part 2 - 'Vibration' provides guidance of acceptable noise levels with respect to human response and building damage
- 6.2 Table 2 below provides a copy of Tables B.1 and B2, taken from BS5228:2009 Part 2. These described threshold criteria for both human response and cosmetic damage:

Table B.1 Guidance on effects of vibration levels

Vibration level	Effect
0.14 mm·s ⁻¹	Vibration might be just perceptible in the most sensitive situations for most vibration frequencies associated with construction. At lower frequencies, people are less sensitive to vibration.
0.3 mm·s ⁻¹	Vibration might be just perceptible in residential environments.
1.0 mm·s ⁻¹	It is likely that vibration of this level in residential environments will cause complaint, but can be tolerated if prior warning and explanation has been given to residents.
10 mm·s ⁻¹	Vibration is likely to be intolerable for any more than a very brief exposure to this level.

Table B.2 Transient vibration guide values for cosmetic damage

Line (see Figure B.1)	Type of building	Peak component particle velocity in frequency range of predominant pulse	
		4 Hz to 15 Hz	15 Hz and above
1	Reinforced or framed structures Industrial and heavy commercial buildings	50 mm/s at 4 Hz and above	50 mm/s at 4 Hz and above
2	Unreinforced or light framed structures Residential or light commercial buildings	15 mm/s at 4 Hz increasing to 20 mm/s at 15 Hz	20 mm/s at 15 Hz increasing to 50 mm/s at 40 Hz and above

NOTE 1 Values referred to are at the base of the building.

NOTE 2 For line 2, at frequencies below 4 Hz, a maximum displacement of 0.6 mm (zero to peak) is not to be exceeded.

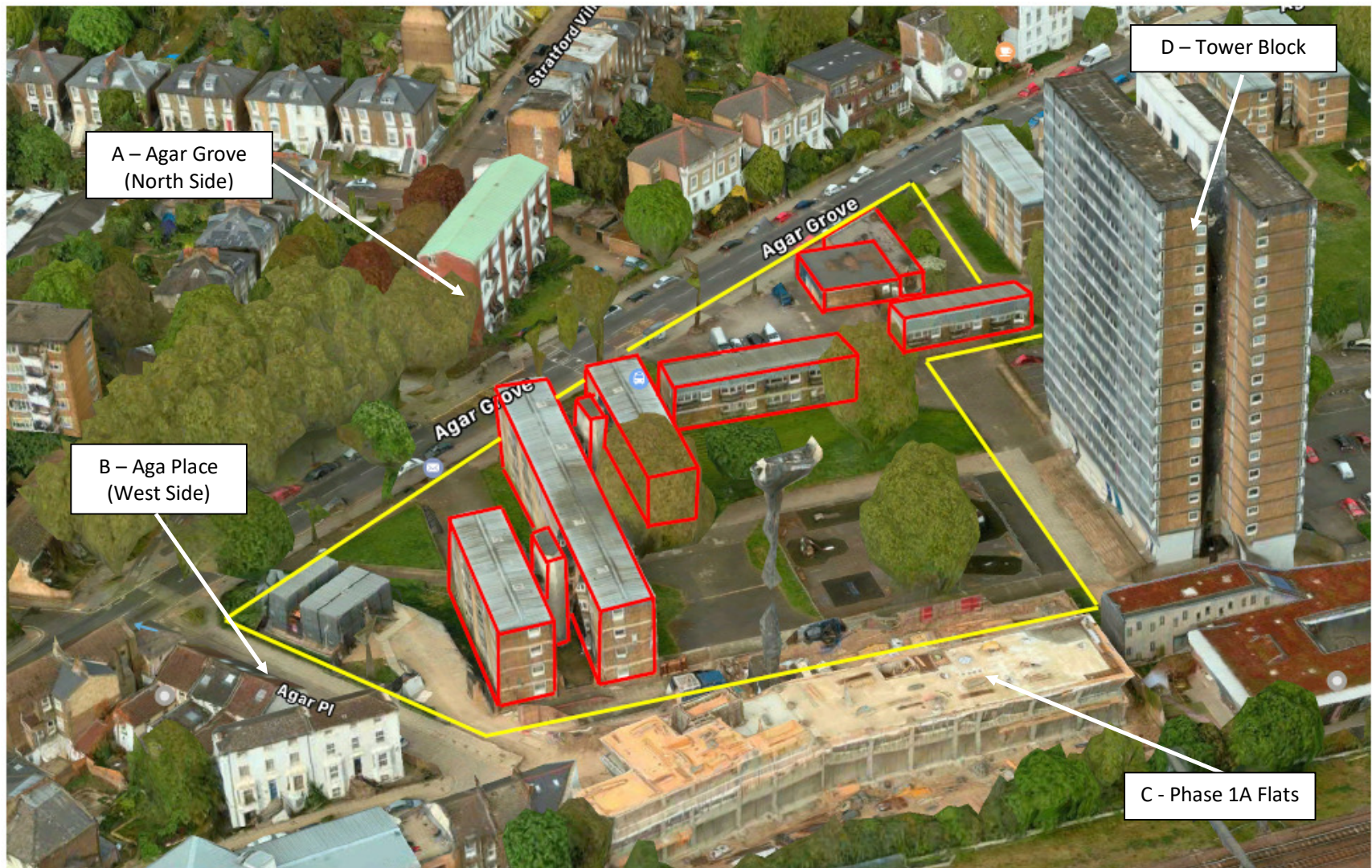
- 6.3 It is noted in the Standard that the above velocity levels above relate to transient vibration. The equivalent threshold for continuous vibration may need to be reduced by 50%, due to the possibility of resonance in the structures

- 6.4 It is evident that the greatest risk of an adverse impact from vibration during the project will occur during the piling works.
- 6.5 Taking reference data from Tables D6 and D7 in BS5228: 2009 Part 2, it is likely that velocity levels from a CFA bored piling operation could be between 0.3 and 1 mm/s, assessed as distances of 5 - 10m from the piling rig.
- 6.6 At worst, this would suggest that vibration might be just perceptible in residential environments. Considering the noise sensitive neighbours for this project, all are further removed than the 10m reference distance quote, and vibration levels should be therefore be attenuated in these properties.
- 6.7 It is also noted that the worst-case velocity levels during normal piling would be significantly below the threshold for cosmetic damage to buildings.
- 6.8 It is possible that individual events during the demolition and construction works could give rise to an individual peak which is higher 1 mm/s, but any such events would be exceptional - limited both in the number of occasions they might occur and the duration. Whilst potentially perceptible in the short term, levels would still be likely to remain comfortably below the thresholds for cosmetic damage.

7. VIBRATION MITIGATION

- 7.1 It is recognised that the options for the attenuation of ground borne vibration is limited in practical terms. The selection of CFA piling will clearly minimise effects, compared to driven piles.
- 7.2 As discussed earlier, all equipment should be maintained and operated by trained personnel to minimise adverse effects.

FIGURE 1 - AGAR 1B, AGAR GROVE, LONDON



APPENDIX 1 - PROPOSED PLANT SCHEDULES

Typical Plant Selection	Assumed Acoustic Data	
	Sound Pressure Level	Sound Power Level
35T Demolition Excavator		106 dB(A)
22T Demolition Excavator		106 dB(A)
55T Concrete Crusher	77 dB(A) @10m	
Hand Tools	70 dB(A) @10m	
Sledge Hammers	70 dB(A) @10m	
110V Receptroctting saws	80 dB(A) @10m	
110V Light Demo Hammers	70 dB(A) @10m	
Wolffkran 166N	77 dB(A) @10m	
KLEMM KR709-2		111 dB(A)
JCB Ecodig 80854 ZTS		98 dB(A)
Thwaites Alldrive 3T Power Swivel		101 dB(A)
Bobcat T40180		106 dB(A)
CIFA K48	75 dB(A) @10m	
JCB Vibromax VM115	75 dB(A) @10m	
Hanson	79 dB(A) @10m	
Lievers P14-B Power	79 dB(A) @1m	
Perkins M-P450	92 dB(A) @7m open	
JCB Model	70 dB(A) @10m	
JCB Model		106 dB(A)

Noise levels in red are extracted from BS5228:2009 Part 1, other values are manufacturer's ratings

APPENDIX 2 - PLANT/PHASE MATRIX

Machine Type/Phase	Equivalent LAeq @10m, dB(A)	Strip-out / Demolition	Substructure	RC Frame	External Envelope	Internal Fit-out	Landscaping
High Reach Demolition Machine	75	3 (80%)					
Mini Excavator	68	2 (60%)					
Loader	78	2 (80%)					
Crusher	77	1 (80%)					
Hand Tools	70	2 (50%)					
Sledge Hammers	70	2 (50%)					
110v Reciprocating Saws	70	2 (50%)					
110v Light Hammer	70	2 (50%)					
Tower Crane	77			2 (80%)	2 (60%)	1 (60%)	
Hydraulic Sheet Piling	66		1 (80%)				
Excavator	70		2 (60%)				
Dumper	73		2 (60%)				1 (60%)
Telehandler	78		1 (50%)	1 (50%)	1 (50%)	1 (80%)	1 (50%)
Concrete Pump	75		1 (80%)	1 (80%)			
Roller	75		1 (40%)				1 (40%)
Concrete Mixer Lorry	79		2 (80%)	2 (80%)			
Concrete Vibrator	59		1 (80%)	1 (80%)			1 (50%)
Generators	89	1(100%)	1(100%)	1(100%)	1(100%)	1(100%)	1(100%)
Handheld Breakers	78			1 (50%)		1 (25%)	1 (25%)
Disc Cutters	79				1 (25%)	1 (25%)	1 (25%)
Core Drill	85				1 (25%)	1 (25%)	1 (25%)
Vibratory Plates	80						1 (50%)

APPENDIX 3 - PREDICTIONS OF NOISE EMISSIONS

1 - Agar Grove

Demolition Phase											
Plant Description, General Operating Noise Levels	Reference Noise Level, LAeq, t dB(A) @10m	Quantity	Distance to Receptor, m	Distance Attenuation, dB	Screening Loss, dB	% On time	On Time Correction, dB	Facade Correction, dB	Resultant SPL at Facade, dB(A)	Combined Noise Level at Facade	
High Reach Demolition Machine	75	3	30	-10	0	80%	-1	3	72		
Mini Excavator	68	2	30	-10	0	60%	-2	3	62		
Crusher	77	1	30	-10	0	80%	-1	3	69		
Hand Tools	70	2	30	-10	-5	50%	-3	3	58		
Sledge Hammers	70	2	30	-10	-5	50%	-3	3	58		
110v Reciprocating Saws	70	2	30	-10	-5	50%	-3	3	58		
110v Light Hammer	70	2	30	-10	-5	50%	-3	3	58	75	
Mobile	LwA	Quantity per day / hr	Traverse Distance, m	Min. Distance to Houses, m	Distance Adjustment, dB	Screening Loss, dB	% On time	Corrected On-Time, due to Distance	On Time Correction, dB	Facade Correction, dB	Resultant SPL at Facade, dB(A)
Loader	106	2	40	30	-38	-5	80%	68%	-2	3	68
Delivery/Collection Lorries	LwA	Quantity per day / hr	Min. Distance to Houses, m	Distance Adjustment, dB	Correction for No. Of Vehicles, dB	Average Speed, km/h	Speed Correction, dB	Screening Loss, dB	Facade Correction, dB	Resultant SPL at Facade, dB(A)	Combined Noise Level at Facade
Lorries In	108	1	20	-13	0	15	-12	-5	3	48	
Lorries Out	108	1	20	-13	0	15	-12	-5	3	48	51
	Measured Ambient Noise Level, LAeq, t dB(A)	Fixed Plant Noise Level dB(A)	Mobile Plant Noise Level dB(A)	Delivery / Collection Lorries dB(A)	Combined Noise Level dB(A)						
Summary of Levels	60	75	68	51	76						

Substructure											
Plant Description, General Operating Noise Levels	Reference Noise Level, LAeq, t dB(A) @10m	Quantity	Distance to Receptor, m	Distance Attenuation, dB	Screening Loss, dB	% On time	On Time Correction, dB	Facade Correction, dB	Resultant SPL at Facade, dB(A)	Combined Noise Level at Facade	
CFA Piling	83	2	30	-10	-10	80%	-1	3	68		
Concrete Pump	75	1	40	-12	-5	80%	-1	3	60		
Concrete Mixer Lorry	79	2	40	-12	-5	80%	-1	3	67		
Concrete Vibrator	59	1	30	-10	-5	75%	-1	3	46		
Generators	60	1	40	-12	-5	100%	0	3	46	71	
Mobile	Lwa	Quantity per day / hr	Traverse Distance, m	Min. Distance to Houses, m	Distance Adjustment, dB	Screening Loss, dB	% On time	Corrected On-Time, due to Distance Ratio	On Time Correction, dB	Facade Correction, dB	Resultant SPL at Facade, dB(A)
Excavator	106	2	25	30	-38	-5	60%	48%	-3	3	66
Dumper	106	2	25	30	-38	-5	60%	48%	-3	3	66
Telehandler	106	1	25	30	-38	-5	50%	40%	-4	3	62
Roller	106	1	50	25	-36	-5	40%	13%	-9	3	59
Delivery/Collection Lorries	Lwa	Quantity per day / hr	Min. Distance to Houses, m	Distance Adjustment, dB	Correction for No. Of Vehicles, dB	Average Speed, km/h	Speed Correction, dB	Screening Loss, dB	Facade Correction, dB	Resultant SPL at Facade, dB(A)	Combined Noise Level at Facade
Lorries In	108	2	20	-13	3	15	-12	-5	3	51	
Lorries Out	108	2	20	-13	3	15	-12	-5	3	51	54
	Measured Ambient Noise Level, LAeq, t dB(A)	Fixed Plant Noise Level dB(A)	Mobile Plant Noise Level dB(A)	Delivery / Collection Lorries dB(A)	Combined Noise Level dB(A)						
Summary of Levels	55	71	70	54	74						

RC Frame											
Plant Description, General Operating Noise Levels	Reference Noise Level, LAeq, t dB(A) @10m	Quantity	Distance to Receptor, m	Distance Attenuation, dB	Screening Loss, dB	% On time	On Time Correction, dB	Facade Correction, dB	Resultant SPL at Facade, dB(A)	Combined Noise Level at Facade	
Tower Crane	77	1	50	-14	0	80%	-1	3	65		
Tower Crane	77	1	60	-16	0	80%	-1	3	63		
Concrete Pump	75	1	40	-12	-5	80%	-1	3	60		
Concrete Mixer Lorry	79	2	40	-12	-5	80%	-1	3	67		
Concrete Vibrator	59	1	30	-10	-5	80%	-1	3	46		
Generators	60	1	40	-12	-5	100%	0	3	46	71	
Mobile	Lwa	Quantity per day / hr	Traverse Distance, m	Min. Distance to Houses, m	Distance Adjustment, dB	Screening Loss, dB	% On time	Corrected On-Time, due to Distance Ratio	On Time Correction, dB	Facade Correction, dB	Resultant SPL at Facade, dB(A)
Telehandler	106	1	25	30	-38	-5	50%	40%	-4	3	62
Delivery/Collection Lorries	Lwa	Quantity per day / hr	Min. Distance to Houses, m	Distance Adjustment, dB	Correction for No. Of Vehicles, dB	Average Speed, km/h	Speed Correction, dB	Screening Loss, dB	Facade Correction, dB	Resultant SPL at Facade, dB(A)	Combined Noise Level at Facade
Lorries In	108	2	20	-13	3	15	-12	-5	3	51	
Lorries Out	108	2	20	-13	3	15	-12	-5	3	51	54
	Measured Ambient Noise Level, LAeq, t dB(A)	Fixed Plant Noise Level dB(A)	Mobile Plant Noise Level dB(A)	Delivery / Collection Lorries dB(A)	Combined Noise Level dB(A)						
Summary of Levels	55	71	62	54	71						

External Envelope											
Plant Description, General Operating Noise Levels	Reference Noise Level, LAeq, t dB(A) @10m	Quantity	Distance to Receptor, m	Distance Attenuation, dB	Screening Loss, dB	% On time	On Time Correction, dB	Facade Correction, dB	Resultant SPL at Facade, dB(A)	Combined Noise Level at Facade	
Tower Crane	77	1	50	-14	0	60%	-2	3	64		
Tower Crane	77	1	60	-16	0	60%	-2	3	62		
Disc Cutters	79	1	30	-10	-5	25%	-6	3	61		
Core Drill	85	1	30	-10	-5	25%	-6	3	67		
Generators	60	1	40	-12	-5	100%	0	3	46	70	
Mobile	Lwa	Quantity per day / hr	Traverse Distance, m	Min. Distance to Houses, m	Distance Adjustment, dB	Screening Loss, dB	% On time	Corrected On-Time, due to Distance Ratio	On Time Correction, dB	Facade Correction, dB	Resultant SPL at Facade, dB(A)
Telehandler	106	1	25	30	-38	-5	50%	40%	-4	3	62
Delivery/Collection Lorries	Lwa	Quantity per day / hr	Min. Distance to Houses, m	Distance Adjustment, dB	Correction for No. Of Vehicles, dB	Average Speed, km/h	Speed Correction, dB	Screening Loss, dB	Facade Correction, dB	Resultant SPL at Facade, dB(A)	Combined Noise Level at Facade
Lorries In	108	1	20	-13	0	15	-11.76091259	-5	3	48	
Lorries Out	108	1	20	-13	0	15	-11.76091259	-5	3	48	
	Measured Ambient Noise Level, LAeq, t dB(A)	Fixed Plant Noise Level dB(A)	Mobile Plant Noise Level dB(A)	Delivery / Collection Lorries dB(A)	Combined Noise Level dB(A)						
Summary of Levels	55	70	63	51	71						

Internal Fit-out											
Plant Description, General Operating Noise Levels	Reference Noise Level, LAeq, t dB(A) @10m	Quantity	Distance to Receptor, m	Distance Attenuation, dB	Screening Loss, dB	% On time	On Time Correction, dB	Facade Correction, dB	Resultant SPL at Facade, dB(A)	Combined Noise Level at Facade	
Handheld Breakers	78	1	25	-8	-5	25%	-6	3	62		
Disc Cutters	79	1	25	-8	-5	25%	-6	3	63		
Core Drill	85	1	25	-8	-5	25%	-6	3	69		
Generators	60	1	40	-12	-5	100%	0	3	46	71	
Mobile	Lwa	Quantity per day / hr	Traverse Distance, m	Min. Distance to Houses, m	Distance Adjustment, dB	Screening Loss, dB	% On time	Corrected On-Time, due to Distance Ratio	On Time Correction, dB	Facade Correction, dB	Resultant SPL at Facade, dB(A)
Telehandler	106	1	25	30	-38	-5	80%	64%	-2	3	65
Delivery/Collection Lorries	Lwa	Quantity per day / hr	Min. Distance to Houses, m	Distance Adjustment, dB	Correction for No. Of Vehicles, dB	Average Speed, km/h	Speed Correction, dB	Screening Loss, dB	Facade Correction, dB	Resultant SPL at Facade, dB(A)	Combined Noise Level at Facade
Lorries In	108	1	20	-13	0	15	-12	-5	3	48	
Lorries Out	108	1	20	-13	0	15	-12	-5	3	48	
	Measured Ambient Noise Level, LAeq, t dB(A)	Fixed Plant Noise Level dB(A)	Mobile Plant Noise Level dB(A)	Delivery / Collection Lorries dB(A)	Combined Noise Level dB(A)						
Summary of Levels	55	71	65	51	72						

Landscaping											
Plant Description, General Operating Noise Levels	Reference Noise Level, LAeq, t dB(A) @10m	Quantity	Distance to Receptor, m	Distance Attenuation, dB	Screening Loss, dB	% On time	On Time Correction, dB	Facade Correction, dB	Resultant SPL at Facade, dB(A)	Combined Noise Level at Facade	
Concrete Vibrator	59	1	25	-8	-5	50%	-3	3	46		
Handheld Breakers	78	1	25	-8	-5	25%	-6	3	62		
Disc Cutters	79	1	25	-8	-5	25%	-6	3	63		
Core Drill	85	1	25	-8	-5	25%	-6	3	69		
Vibratory Plates	80	1	25	-8	-5	50%	-3	3	67		
Generators	60	1	40	-12	-5	100%	0	3	46	72	
Mobile	Lwa	Quantity per day / hr	Traverse Distance, m	Min. Distance to Houses, m	Distance Adjustment, dB	Screening Loss, dB	% On time	Corrected On-Time, due to Distance Ratio	On Time Correction, dB	Facade Correction, dB	Resultant SPL at Facade, dB(A)
Dumper	106	1	25	30	-38	-5	60%	48%	-3	3	63
Telehandler	106	1	25	30	-38	-5	50%	40%	-4	3	62
Roller	103	1	50	25	-36	-5	40%	13%	-9	3	56
Delivery/Collection Lorries	Lwa	Quantity per day / hr	Min. Distance to Houses, m	Distance Adjustment, dB	Correction for No. Of Vehicles, dB	Average Speed, km/h	Speed Correction, dB	Screening Loss, dB	Facade Correction, dB	Resultant SPL at Facade, dB(A)	Combined Noise Level at Facade
Lorries In	108	1	20	-13	0	15	-12	-5	3	48	
Lorries Out	108	1	20	-13	0	15	-12	-5	3	48	
	Measured Ambient Noise Level, LAeq, t dB(A)	Fixed Plant Noise Level dB(A)	Mobile Plant Noise Level dB(A)	Delivery / Collection Lorries dB(A)	Combined Noise Level dB(A)						
Summary of Levels	55	72	66	51	73						

2- Agar Place

Demolition Phase											
Plant Description, General Operating Noise Levels	Reference Noise Level, LAeq, t dB(A) @10m	Quantity	Distance to Receptor, m	Distance Attenuation, dB	Screening Loss, dB	% On time	On Time Correction, dB	Facade Correction, dB	Resultant SPL at Facade, dB(A)	Combined Noise Level at Facade	
High Reach Demolition Machine	75	3	20	-6	0	80%	-1	3	76		
Mini Excavator	68	2	20	-6	0	60%	-2	3	66		
Crusher	77	1	20	-6	0	80%	-1	3	73		
Hand Tools	70	2	20	-6	0	50%	-3	3	67		
Sledge Hammers	70	2	20	-6	0	50%	-3	3	67		
110v Reciprocating Saws	70	2	20	-6	0	50%	-3	3	67		
110v Light Hammer	70	2	20	-6	0	50%	-3	3	67	79	
Mobile	LwA	Quantity per day / hr	Traverse Distance, m	Min. Distance to Houses, m	Distance Adjustment, dB	Screening Loss, dB	% On time	Corrected On-Time, due to Distance Ratio	On Time Correction, dB	Facade Correction, dB	Resultant SPL at Facade, dB(A)
Loader	106	2	40	20	-34	-10	80%	80%	-1	3	67
Delivery/Collection Lorries	LwA	Quantity per day / hr	Min. Distance to Houses, m	Distance Adjustment, dB	Correction for No. Of Vehicles, dB	Average Speed, km/h	Speed Correction, dB	Screening Loss, dB	Facade Correction, dB	Resultant SPL at Facade, dB(A)	Combined Noise Level at Facade
Lorries In	108	1	80	-19	0	15	-12	-10	3	37	
Lorries Out	108	1	80	-19	0	15	-12	-10	3	37	40
	Measured Ambient Noise Level, LAeq, t dB(A)	Fixed Plant Noise Level dB(A)	Mobile Plant Noise Level dB(A)	Delivery / Collection Lorries dB(A)	Combined Noise Level dB(A)						
Summary of Levels	60	79	67	40	79						

Substructure											
Plant Description, General Operating Noise Levels	Reference Noise Level, LAeq, t dB(A) @10m	Quantity	Distance to Receptor, m	Distance Attenuation, dB	Screening Loss, dB	% On time	On Time Correction, dB	Facade Correction, dB	Resultant SPL at Facade, dB(A)	Combined Noise Level at Facade	
CFA Piling	83	2	15	-4	-10	80%	-1	3	75		
Concrete Pump	75	1	20	-6	-10	80%	-1	3	61		
Concrete Mixer Lorry	79	2	20	-6	-10	80%	-1	3	68		
Concrete Vibrator	59	1	20	-6	-10	75%	-1	3	45		
Generators	60	1	30	-10	-10	100%	0	3	43	76	
Mobile	Lwa	Quantity per day / hr	Traverse Distance, m	Min. Distance to Houses, m	Distance Adjustment, dB	Screening Loss, dB	% On time	Corrected On-Time, due to Distance Ratio	On Time Correction, dB	Facade Correction, dB	Resultant SPL at Facade, dB(A)
Excavator	106	2	30	20	-34	-10	60%	38%	-4	3	64
Dumper	106	2	30	20	-34	-10	60%	38%	-4	3	64
Telehandler	106	1	30	20	-34	-10	50%	32%	-5	3	60
Roller	106	1	80	15	-32	-10	40%	4%	-14	3	53
Delivery/Collection Lorries	Lwa	Quantity per day / hr	Min. Distance to Houses, m	Distance Adjustment, dB	Correction for No. Of Vehicles, dB	Average Speed, km/h	Speed Correction, dB	Screening Loss, dB	Facade Correction, dB	Resultant SPL at Facade, dB(A)	Combined Noise Level at Facade
Lorries In	108	2	80	-19	3	15	-12	-10	3	40	
Lorries Out	108	2	80	-19	3	15	-12	-10	3	40	43
	Measured Ambient Noise Level, LAeq, t dB(A)	Fixed Plant Noise Level dB(A)	Mobile Plant Noise Level dB(A)	Delivery / Collection Lorries dB(A)	Combined Noise Level dB(A)						
Summary of Levels	55	76	68	43	76						

RC Frame											
Plant Description, General Operating Noise Levels	Reference Noise Level, LAeq, t dB(A) @10m	Quantity	Distance to Receptor, m	Distance Attenuation, dB	Screening Loss, dB	% On time	On Time Correction, dB	Facade Correction, dB	Resultant SPL at Facade, dB(A)	Combined Noise Level at Facade	
Tower Crane	77	1	40	-12	0	80%	-1	3	67		
Tower Crane	77	1	100	-20	0	80%	-1	3	59		
Concrete Pump	75	1	20	-6	-10	80%	-1	3	61		
Concrete Mixer Lorry	79	2	20	-6	-10	80%	-1	3	68		
Concrete Vibrator	59	1	20	-6	-10	80%	-1	3	45		
Generators	60	1	30	-10	-10	100%	0	3	43	71	
Mobile	Lwa	Quantity per day / hr	Traverse Distance, m	Min. Distance to Houses, m	Distance Adjustment, dB	Screening Loss, dB	% On time	Corrected On-Time, due to Distance Ratio	On Time Correction, dB	Facade Correction, dB	Resultant SPL at Facade, dB(A)
Telehandler	106	1	30	20	-34	-10	50%	32%	-5	3	60
Delivery/Collection Lorries	Lwa	Quantity per day / hr	Min. Distance to Houses, m	Distance Adjustment, dB	Correction for No. Of Vehicles, dB	Average Speed, km/h	Speed Correction, dB	Screening Loss, dB	Facade Correction, dB	Resultant SPL at Facade, dB(A)	Combined Noise Level at Facade
Lorries In	108	2	80	-19	3	15	-12	-10	3	40	
Lorries Out	108	2	80	-19	3	15	-12	-10	3	40	43
	Measured Ambient Noise Level, LAeq, t dB(A)	Fixed Plant Noise Level dB(A)	Mobile Plant Noise Level dB(A)	Delivery / Collection Lorries dB(A)	Combined Noise Level dB(A)						
Summary of Levels	55	71	60	43	72						

External Envelope											
Plant Description, General Operating Noise Levels	Reference Noise Level, LAeq, t dB(A) @10m	Quantity	Distance to Receptor, m	Distance Attenuation, dB	Screening Loss, dB	% On time	On Time Correction, dB	Facade Correction, dB	Resultant SPL at Facade, dB(A)	Combined Noise Level at Facade	
Tower Crane	77	1	40	-12	0	60%	-2	3	66		
Tower Crane	77	1	100	-20	0	60%	-2	3	58		
Disc Cutters	79	1	20	-6	-10	25%	-6	3	60		
Core Drill	85	1	20	-6	-10	25%	-6	3	66		
Generators	60	1	30	-10	-10	100%	0	3	43	70	
Mobile	Lwa	Quantity per day / hr	Traverse Distance, m	Min. Distance to Houses, m	Distance Adjustment, dB	Screening Loss, dB	% On time	Corrected On-Time, due to Distance Ratio	On Time Correction, dB	Facade Correction, dB	Resultant SPL at Facade, dB(A)
Telehandler	106	1	30	20	-34	-10	50%	32%	-5	3	60
Delivery/Collection Lorries	Lwa	Quantity per day / hr	Min. Distance to Houses, m	Distance Adjustment, dB	Correction for No. Of Vehicles, dB	Average Speed, km/h	Speed Correction, dB	Screening Loss, dB	Facade Correction, dB	Resultant SPL at Facade, dB(A)	Combined Noise Level at Facade
Lorries In	108	1	80	-19	0	15	-12	-10	3	37	
Lorries Out	108	1	80	-19	0	15	-12	-10	3	37	
	Measured Ambient Noise Level, LAeq, t dB(A)	Fixed Plant Noise Level dB(A)	Mobile Plant Noise Level dB(A)	Delivery / Collection Lorries dB(A)	Combined Noise Level dB(A)						
Summary of Levels	55	70	60	40	70						

Internal Fit-out											
Plant Description, General Operating Noise Levels	Reference Noise Level, LAeq, t dB(A) @10m	Quantity	Distance to Receptor, m	Distance Attenuation, dB	Screening Loss, dB	% On time	On Time Correction, dB	Facade Correction, dB	Resultant SPL at Facade, dB(A)	Combined Noise Level at Facade	
Tower Crane	77	1	20	-6	0	60%	-2	3	72		
Handheld Breakers	78	1	20	-6	-10	25%	-6	3	59		
Disc Cutters	79	1	20	-6	-10	25%	-6	3	60		
Core Drill	85	1	20	-6	-10	25%	-6	3	66		
Generators	60	1	30	-10	-10	100%	0	3	43	73	
Mobile	Lwa	Quantity per day / hr	Traverse Distance, m	Min. Distance to Houses, m	Distance Adjustment, dB	Screening Loss, dB	% On time	Corrected On-Time, due to Distance Ratio	On Time Correction, dB	Facade Correction, dB	Resultant SPL at Facade, dB(A)
Telehandler	106	1	30	20	-34	-10	80%	50%	-3	3	62
Delivery/Collection Lorries	Lwa	Quantity per day / hr	Min. Distance to Houses, m	Distance Adjustment, dB	Correction for No. Of Vehicles, dB	Average Speed, km/h	Speed Correction, dB	Screening Loss, dB	Facade Correction, dB	Resultant SPL at Facade, dB(A)	Combined Noise Level at Facade
Lorries In	108	1	80	-19	0	15	-11.76091259	-10	3	37	
Lorries Out	108	1	80	-19	0	15	-11.76091259	-10	3	37	
	Measured Ambient Noise Level, LAeq, t dB(A)	Fixed Plant Noise Level dB(A)	Mobile Plant Noise Level dB(A)	Delivery / Collection Lorries dB(A)	Combined Noise Level dB(A)						
Summary of Levels	55	73	62	40	73						

Landscaping											
Plant Description, General Operating Noise Levels	Reference Noise Level, LAeq, t dB(A) @10m	Quantity	Distance to Receptor, m	Distance Attenuation, dB	Screening Loss, dB	% On time	On Time Correction, dB	Facade Correction, dB	Resultant SPL at Facade, dB(A)	Combined Noise Level at Facade	
Concrete Vibrator	59	1	15	-4	-10	50%	-3	3	45		
Handheld Breakers	78	1	15	-4	-10	25%	-6	3	61		
Disc Cutters	79	1	15	-4	-10	25%	-6	3	62		
Core Drill	85	1	15	-4	-10	25%	-6	3	68		
Vibratory Plates	80	1	15	-4	-10	50%	-3	3	66		
Generators	60	1	30	-10	-10	100%	0	3	43	72	
Mobile	Lwa	Quantity per day / hr	Traverse Distance, m	Min. Distance to Houses, m	Distance Adjustment, dB	Screening Loss, dB	% On time	Corrected On-Time, due to Distance Ratio	On Time Correction, dB	Facade Correction, dB	Resultant SPL at Facade, dB(A)
Dumper	106	1	30	20	-34	-10	60%	38%	-4	3	61
Telehandler	106	1	30	20	-34	-10	50%	32%	-5	3	60
Roller	103	1	30	15	-32	-10	40%	16%	-8	3	57
Delivery/Collection Lorries	Lwa	Quantity per day / hr	Min. Distance to Houses, m	Distance Adjustment, dB	Correction for No. Of Vehicles, dB	Average Speed, km/h	Speed Correction, dB	Screening Loss, dB	Facade Correction, dB	Resultant SPL at Facade, dB(A)	Combined Noise Level at Facade
Lorries In	108	1	80	-19	0	15	-12	-10	3	37	
Lorries Out	108	1	80	-19	0	15	-12	-10	3	37	
	Measured Ambient Noise Level, LAeq, t dB(A)	Fixed Plant Noise Level dB(A)	Mobile Plant Noise Level dB(A)	Delivery / Collection Lorries dB(A)	Combined Noise Level dB(A)						
Summary of Levels	55	72	64	40	72						

3. Agar 1A Flats

Demolition Phase											
Plant Description, General Operating Noise Levels	Reference Noise Level, LAeq, t dB(A) @10m	Quantity	Distance to Receptor, m	Distance Attenuation, dB	Screening Loss, dB	% On time	On Time Correction, dB	Facade Correction, dB	Resultant SPL at Facade, dB(A)	Combined Noise Level at Facade	
High Reach Demolition Machine	75	3	20	-6	0	80%	-1	3	76		
Mini Excavator	68	2	20	-6	0	60%	-2	3	66		
Crusher	77	1	20	-6	0	80%	-1	3	73		
Hand Tools	70	2	20	-6	0	50%	-3	3	67		
Sledge Hammers	70	2	20	-6	0	50%	-3	3	67		
110v Reciprocating Saws	70	2	20	-6	0	50%	-3	3	67		
110v Light Hammer	70	2	20	-6	0	50%	-3	3	67	79	
Mobile	LwA	Quantity per day / hr	Traverse Distance, m	Min. Distance to Houses, m	Distance Adjustment, dB	Screening Loss, dB	% On time	Corrected On-Time, due to Distance Ratio	On Time Correction, dB	Facade Correction, dB	Resultant SPL at Facade, dB(A)
Loader	106	2	50	20	-34	0	80%	32%	-5	3	73
Delivery/Collection Lorries	LwA	Quantity per day / hr	Min. Distance to Houses, m	Distance Adjustment, dB	Correction for No. Of Vehicles, dB	Average Speed, km/h	Speed Correction, dB	Screening Loss, dB	Facade Correction, dB	Resultant SPL at Facade, dB(A)	Combined Noise Level at Facade
Lorries In	108	1	60	-18	0	15	-12	0	3	48	
Lorries Out	108	1	60	-18	0	15	-12	0	3	48	51
	Measured Ambient Noise Level, LAeq, t dB(A)	Fixed Plant Noise Level dB(A)	Mobile Plant Noise Level dB(A)	Delivery / Collection Lorries dB(A)	Combined Noise Level dB(A)						
Summary of Levels	60	79	73	51	80						

Substructure											
Plant Description, General Operating Noise Levels	Reference Noise Level, LAeq, t dB(A) @10m	Quantity	Distance to Receptor, m	Distance Attenuation, dB	Screening Loss, dB	% On time	On Time Correction, dB	Facade Correction, dB	Resultant SPL at Facade, dB(A)	Combined Noise Level at Facade	
CFA Piling	83	2	15	-4	-10	80%	-1	3	75		
Concrete Pump	75	1	25	-8	-5	80%	-1	3	64		
Concrete Mixer Lorry	79	2	25	-8	-5	80%	-1	3	71		
Concrete Vibrator	59	1	15	-4	-5	75%	-1	3	52		
Generators	60	1	75	-18	-5	100%	0	3	40	76	
Mobile	Lwa	Quantity per day / hr	Traverse Distance, m	Min. Distance to Houses, m	Distance Adjustment, dB	Screening Loss, dB	% On time	Corrected On-Time, due to Distance Ratio	On Time Correction, dB	Facade Correction, dB	Resultant SPL at Facade, dB(A)
Excavator	106	2	33	20	-34	-5	60%	34%	-5	3	68
Dumper	106	2	33	20	-34	-5	60%	34%	-5	3	68
Telehandler	106	1	33	20	-34	-5	50%	29%	-5	3	65
Roller	106	1	50	15	-32	-5	40%	10%	-10	3	62
Delivery/Collection Lorries	Lwa	Quantity per day / hr	Min. Distance to Houses, m	Distance Adjustment, dB	Correction for No. Of Vehicles, dB	Average Speed, km/h	Speed Correction, dB	Screening Loss, dB	Facade Correction, dB	Resultant SPL at Facade, dB(A)	Combined Noise Level at Facade
Lorries In	108	2	60	-18	3	15	-12	-5	3	46	
Lorries Out	108	2	60	-18	3	15	-12	-5	3	46	49
	Measured Ambient Noise Level, LAeq, t dB(A)	Fixed Plant Noise Level dB(A)	Mobile Plant Noise Level dB(A)	Delivery / Collection Lorries dB(A)	Combined Noise Level dB(A)						
Summary of Levels	55	76	73	49	78						

RC Frame											
Plant Description, General Operating Noise Levels	Reference Noise Level, LAeq, t dB(A) @10m	Quantity	Distance to Receptor, m	Distance Attenuation, dB	Screening Loss, dB	% On time	On Time Correction, dB	Facade Correction, dB	Resultant SPL at Facade, dB(A)	Combined Noise Level at Facade	
Tower Crane	77	1	60	-16	0	80%	-1	3	63		
Tower Crane	77	1	60	-16	0	80%	-1	3	63		
Concrete Pump	75	1	25	-8	-5	80%	-1	3	64		
Concrete Mixer Lorry	79	2	25	-8	-5	80%	-1	3	71		
Concrete Vibrator	59	1	15	-4	-5	80%	-1	3	53		
Generators	60	1	75	-18	-5	100%	0	3	40	73	
Mobile	Lwa	Quantity per day / hr	Traverse Distance, m	Min. Distance to Houses, m	Distance Adjustment, dB	Screening Loss, dB	% On time	Corrected On-Time, due to Distance Ratio	On Time Correction, dB	Facade Correction, dB	Resultant SPL at Facade, dB(A)
Telehandler	106	1	33	20	-34	-5	50%	29%	-5	3	65
Delivery/Collection Lorries	Lwa	Quantity per day / hr	Min. Distance to Houses, m	Distance Adjustment, dB	Correction for No. Of Vehicles, dB	Average Speed, km/h	Speed Correction, dB	Screening Loss, dB	Facade Correction, dB	Resultant SPL at Facade, dB(A)	Combined Noise Level at Facade
Lorries In	108	2	60	-18	3	15	-12	-5	3	46	
Lorries Out	108	2	60	-18	3	15	-12	-5	3	46	49
	Measured Ambient Noise Level, LAeq, t dB(A)	Fixed Plant Noise Level dB(A)	Mobile Plant Noise Level dB(A)	Delivery / Collection Lorries dB(A)	Combined Noise Level dB(A)						
Summary of Levels	55	73	65	49	74						

External Envelope											
Plant Description, General Operating Noise Levels	Reference Noise Level, LAeq, t dB(A) @10m	Quantity	Distance to Receptor, m	Distance Attenuation, dB	Screening Loss, dB	% On time	On Time Correction, dB	Facade Correction, dB	Resultant SPL at Facade, dB(A)	Combined Noise Level at Facade	
Tower Crane	77	1	60	-16	0	60%	-2	3	62		
Tower Crane	77	1	60	-16	0	60%	-2	3	62		
Disc Cutters	79	1	20	-6	-5	25%	-6	3	65		
Core Drill	85	1	20	-6	-5	25%	-6	3	71		
Generators	60	1	75	-18	-5	100%	0	3	40	73	
Mobile	Lwa	Quantity per day / hr	Traverse Distance, m	Min. Distance to Houses, m	Distance Adjustment, dB	Screening Loss, dB	% On time	Corrected On-Time, due to Distance Ratio	On Time Correction, dB	Facade Correction, dB	Resultant SPL at Facade, dB(A)
Telehandler	106	1	33	20	-34	-5	50%	29%	-5	3	65
Delivery/Collection Lorries	Lwa	Quantity per day / hr	Min. Distance to Houses, m	Distance Adjustment, dB	Correction for No. Of Vehicles, dB	Average Speed, km/h	Speed Correction, dB	Screening Loss, dB	Facade Correction, dB	Resultant SPL at Facade, dB(A)	Combined Noise Level at Facade
Lorries In	108	1	60	-18	0	15	-12	-5	3	43	
Lorries Out	108	1	60	-18	0	15	-12	-5	3	43	
	Measured Ambient Noise Level, LAeq, t dB(A)	Fixed Plant Noise Level dB(A)	Mobile Plant Noise Level dB(A)	Delivery / Collection Lorries dB(A)	Combined Noise Level dB(A)						
Summary of Levels	55	73	65	46	73						

Internal Fit-out											
Plant Description, General Operating Noise Levels	Reference Noise Level, LAeq, t dB(A) @10m	Quantity	Distance to Receptor, m	Distance Attenuation, dB	Screening Loss, dB	% On time	On Time Correction, dB	Facade Correction, dB	Resultant SPL at Facade, dB(A)	Combined Noise Level at Facade	
Tower Crane	77	1	60	-16	0	60%	-2	3	62		
Handheld Breakers	78	1	20	-6	0	25%	-6	3	69		
Disc Cutters	79	1	20	-6	-5	25%	-6	3	65		
Core Drill	85	1	20	-6	-5	25%	-6	3	71		
Generators	60	1	75	-18	-5	100%	0	3	40	74	
Mobile	Lwa	Quantity per day / hr	Traverse Distance, m	Min. Distance to Houses, m	Distance Adjustment, dB	Screening Loss, dB	% On time	Corrected On-Time, due to Distance Ratio	On Time Correction, dB	Facade Correction, dB	Resultant SPL at Facade, dB(A)
Telehandler	106	1	33	20	-34	-5	80%	46%	-3	3	67
Delivery/Collection Lorries	Lwa	Quantity per day / hr	Min. Distance to Houses, m	Distance Adjustment, dB	Correction for No. Of Vehicles, dB	Average Speed, km/h	Speed Correction, dB	Screening Loss, dB	Facade Correction, dB	Resultant SPL at Facade, dB(A)	Combined Noise Level at Facade
Lorries In	108	1	60	-18	0	15	-12	-5	3	43	
Lorries Out	108	1	60	-18	0	15	-12	-5	3	43	
	Measured Ambient Noise Level, LAeq, t dB(A)	Fixed Plant Noise Level dB(A)	Mobile Plant Noise Level dB(A)	Delivery / Collection Lorries dB(A)	Combined Noise Level dB(A)						
Summary of Levels	55	74	67	46	75						

Landscaping											
Plant Description, General Operating Noise Levels	Reference Noise Level, LAeq, t dB(A) @10m	Quantity	Distance to Receptor, m	Distance Attenuation, dB	Screening Loss, dB	% On time	On Time Correction, dB	Facade Correction, dB	Resultant SPL at Facade, dB(A)	Combined Noise Level at Facade	
Concrete Vibrator	59	1	15	-4	-5	50%	-3	3	50		
Handheld Breakers	78	1	15	-4	-5	25%	-6	3	66		
Disc Cutters	79	1	15	-4	-5	25%	-6	3	67		
Core Drill	85	1	15	-4	-5	25%	-6	3	73		
Vibratory Plates	80	1	15	-4	-5	50%	-3	3	71		
Generators	60	1	75	-18	-5	100%	0	3	40	77	
Mobile	Lwa	Quantity per day / hr	Traverse Distance, m	Min. Distance to Houses, m	Distance Adjustment, dB	Screening Loss, dB	% On time	Corrected On-Time, due to Distance Ratio	On Time Correction, dB	Facade Correction, dB	Resultant SPL at Facade, dB(A)
Dumper	106	1	33	20	-34	-5	60%	34%	-5	3	65
Telehandler	106	1	33	20	-34	-5	50%	29%	-5	3	65
Roller	103	1	50	15	-32	-5	40%	16%	-8	3	62
Delivery/Collection Lorries	Lwa	Quantity per day / hr	Min. Distance to Houses, m	Distance Adjustment, dB	Correction for No. Of Vehicles, dB	Average Speed, km/h	Speed Correction, dB	Screening Loss, dB	Facade Correction, dB	Resultant SPL at Facade, dB(A)	Combined Noise Level at Facade
Lorries In	108	1	60	-18	0	15	-12	-5	3	43	
Lorries Out	108	1	60	-18	0	15	-12	-5	3	43	
	Measured Ambient Noise Level, LAeq, t dB(A)	Fixed Plant Noise Level dB(A)	Mobile Plant Noise Level dB(A)	Delivery / Collection Lorries dB(A)	Combined Noise Level dB(A)						
Summary of Levels	55	77	69	46	77						

4 – Tower Block (east side of site)

Demolition Phase											
Plant Description, General Operating Noise Levels	Reference Noise Level, LAeq, t dB(A) @10m	Quantity	Distance to Receptor, m	Distance Attenuation, dB	Screening Loss, dB	% On time	On Time Correction, dB	Facade Correction, dB	Resultant SPL at Facade, dB(A)	Combined Noise Level at Facade	
High Reach Demolition Machine	75	3	20	-6	0	80%	-1	3	76		
Mini Excavator	68	2	20	-6	0	60%	-2	3	66		
Crusher	77	1	20	-6	0	80%	-1	3	73		
Hand Tools	70	2	20	-6	0	50%	-3	3	67		
Sledge Hammers	70	2	20	-6	0	50%	-3	3	67		
110v Reciprocating Saws	70	2	20	-6	0	50%	-3	3	67		
110v Light Hammer	70	2	20	-6	0	50%	-3	3	67	79	
Mobile	LwA	Quantity per day / hr	Traverse Distance, m	Min. Distance to Houses, m	Distance Adjustment, dB	Screening Loss, dB	% On time	Corrected On-Time, due to Distance Ratio	On Time Correction, dB	Facade Correction, dB	Resultant SPL at Facade, dB(A)
Loader	106	2	25	30	-38	0	80%	80%	-1	3	73
Delivery/Collection Lorries	LwA	Quantity per day / hr	Min. Distance to Houses, m	Distance Adjustment, dB	Correction for No. Of Vehicles, dB	Average Speed, km/h	Speed Correction, dB	Screening Loss, dB	Facade Correction, dB	Resultant SPL at Facade, dB(A)	Combined Noise Level at Facade
Lorries In	108	1	30	-15	0	15	-11.76091259	0	3	51	
Lorries Out	108	1	30	-15	0	15	-11.76091259	0	3	51	54
	Measured Ambient Noise Level, LAeq, t dB(A)	Fixed Plant Noise Level dB(A)	Mobile Plant Noise Level dB(A)	Delivery / Collection Lorries dB(A)	Combined Noise Level dB(A)						
Summary of Levels	60	79	73	54	80						

Substructure											
Plant Description, General Operating Noise Levels	Reference Noise Level, LAeq, t dB(A) @10m	Quantity	Distance to Receptor, m	Distance Attenuation, dB	Screening Loss, dB	% On time	On Time Correction, dB	Facade Correction, dB	Resultant SPL at Facade, dB(A)	Combined Noise Level at Facade	
CFA Piling	83	2	20	-6	-5	80%	-1	3	77		
Concrete Pump	75	1	20	-6	-5	80%	-1	3	66		
Concrete Mixer Lorry	79	2	20	-6	-5	80%	-1	3	73		
Concrete Vibrator	79	1	20	-6	-5	75%	-1	3	70		
Generators	60	1	90	-19	-5	100%	0	3	39	79	
Mobile	Lwa	Quantity per day / hr	Traverse Distance, m	Min. Distance to Houses, m	Distance Adjustment, dB	Screening Loss, dB	% On time	Corrected On-Time, due to Distance Ratio	On Time Correction, dB	Facade Correction, dB	Resultant SPL at Facade, dB(A)
Excavator	106	2	30	20	-34	-5	60%	48%	-3	3	70
Dumper	106	2	30	20	-34	-5	60%	48%	-3	3	70
Telehandler	106	1	30	20	-34	-5	50%	40%	-4	3	66
Roller	106	1	80	20	-34	-5	40%	8%	-11	3	59
Delivery/Collection Lorries	Lwa	Quantity per day / hr	Min. Distance to Houses, m	Distance Adjustment, dB	Correction for No. Of Vehicles, dB	Average Speed, km/h	Speed Correction, dB	Screening Loss, dB	Facade Correction, dB	Resultant SPL at Facade, dB(A)	Combined Noise Level at Facade
Lorries In	108	2	30	-15	3	15	-12	0	3	54	
Lorries Out	108	2	30	-15	3	15	-12	0	3	54	57
	Measured Ambient Noise Level, LAeq, t dB(A)	Fixed Plant Noise Level dB(A)	Mobile Plant Noise Level dB(A)	Delivery / Collection Lorries dB(A)	Combined Noise Level dB(A)						
Summary of Levels	55	79	74	57	80						

RC Frame											
Plant Description, General Operating Noise Levels	Reference Noise Level, LAeq, t dB(A) @10m	Quantity	Distance to Receptor, m	Distance Attenuation, dB	Screening Loss, dB	% On time	On Time Correction, dB	Facade Correction, dB	Resultant SPL at Facade, dB(A)	Combined Noise Level at Facade	
Tower Crane	77	1	30	-10	0	80%	-1	3	69		
Tower Crane	77	1	60	-16	0	80%	-1	3	63		
Concrete Pump	75	2	20	-6	-5	80%	-1	3	69		
Concrete Mixer Lorry	79	1	20	-6	-5	80%	-1	3	70		
Concrete Vibrator	59	1	20	-6	-5	80%	-1	3	50		
Generators	60	1	90	-19	-5	100%	0	3	39	75	
Mobile	Lwa	Quantity per day / hr	Traverse Distance, m	Min. Distance to Houses, m	Distance Adjustment, dB	Screening Loss, dB	% On time	Corrected On-Time, due to Distance Ratio	On Time Correction, dB	Facade Correction, dB	Resultant SPL at Facade, dB(A)
Telehandler	106	1	30	20	-34	-5	50%	40%	-4	3	66
Delivery/Collection Lorries	Lwa	Quantity per day / hr	Min. Distance to Houses, m	Distance Adjustment, dB	Correction for No. Of Vehicles, dB	Average Speed, km/h	Speed Correction, dB	Screening Loss, dB	Facade Correction, dB	Resultant SPL at Facade, dB(A)	Combined Noise Level at Facade
Lorries In	108	2	30	-15	3	15	-12	0	3	54	
Lorries Out	108	2	30	-15	3	15	-12	0	3	54	57
	Measured Ambient Noise Level, LAeq, t dB(A)	Fixed Plant Noise Level dB(A)	Mobile Plant Noise Level dB(A)	Delivery / Collection Lorries dB(A)	Combined Noise Level dB(A)						
Summary of Levels	55	75	66	57	75						

External Envelope											
Plant Description, General Operating Noise Levels	Reference Noise Level, LAeq, t dB(A) @10m	Quantity	Distance to Receptor, m	Distance Attenuation, dB	Screening Loss, dB	% On time	On Time Correction, dB	Facade Correction, dB	Resultant SPL at Facade, dB(A)	Combined Noise Level at Facade	
Tower Crane	77	1	30	-10	0	60%	-2	3	68		
Tower Crane	77	1	60	-16	0	60%	-2	3	62		
Disc Cutters	79	1	20	-6	-5	25%	-6	3	65		
Core Drill	85	1	20	-6	-5	25%	-6	3	71		
Generators	60	1	90	-19	-5	100%	0	3	39	74	
Mobile	Lwa	Quantity per day / hr	Traverse Distance, m	Min. Distance to Houses, m	Distance Adjustment, dB	Screening Loss, dB	% On time	Corrected On-Time, due to Distance Ratio	On Time Correction, dB	Facade Correction, dB	Resultant SPL at Facade, dB(A)
Telehandler	106	1	30	20	-34	-5	50%	40%	-4	3	66
Delivery/Collection Lorries	Lwa	Quantity per day / hr	Min. Distance to Houses, m	Distance Adjustment, dB	Correction for No. Of Vehicles, dB	Average Speed, km/h	Speed Correction, dB	Screening Loss, dB	Facade Correction, dB	Resultant SPL at Facade, dB(A)	Combined Noise Level at Facade
Lorries In	108	1	30	-15	0	15	-11.76091259	0	3	51	
Lorries Out	108	1	30	-15	0	15	-11.76091259	0	3	51	
	Measured Ambient Noise Level, LAeq, t dB(A)	Fixed Plant Noise Level dB(A)	Mobile Plant Noise Level dB(A)	Delivery / Collection Lorries dB(A)	Combined Noise Level dB(A)						
Summary of Levels	55	74	66	54	75						

Internal Fit-out											
Plant Description, General Operating Noise Levels	Reference Noise Level, LAeq, t dB(A) @10m	Quantity	Distance to Receptor, m	Distance Attenuation, dB	Screening Loss, dB	% On time	On Time Correction, dB	Facade Correction, dB	Resultant SPL at Facade, dB(A)	Combined Noise Level at Facade	
Tower Crane	77	1	30	-10	0	60%	-2	3	68		
Handheld Breakers	78	1	20	-6	-5	25%	-6	3	64		
Disc Cutters	79	1	20	-6	-5	25%	-6	3	65		
Core Drill	85	1	20	-6	-5	25%	-6	3	71		
Generators	60	1	90	-19	-5	100%	0	3	39	74	
Mobile	Lwa	Quantity per day / hr	Traverse Distance, m	Min. Distance to Houses, m	Distance Adjustment, dB	Screening Loss, dB	% On time	Corrected On-Time, due to Distance Ratio	On Time Correction, dB	Facade Correction, dB	Resultant SPL at Facade, dB(A)
Telehandler	106	1	30	20	-34	-5	80%	64%	-2	3	68
Delivery/Collection Lorries	Lwa	Quantity per day / hr	Min. Distance to Houses, m	Distance Adjustment, dB	Correction for No. Of Vehicles, dB	Average Speed, km/h	Speed Correction, dB	Screening Loss, dB	Facade Correction, dB	Resultant SPL at Facade, dB(A)	Combined Noise Level at Facade
Lorries In	108	1	30	-15	0	15	-12		3	51	
Lorries Out	108	1	30	-15	0	15	-12		3	51	
	Measured Ambient Noise Level, LAeq, t dB(A)	Fixed Plant Noise Level dB(A)	Mobile Plant Noise Level dB(A)	Delivery / Collection Lorries dB(A)	Combined Noise Level dB(A)						
Summary of Levels	55	74	68	54	75						

Landscaping											
Plant Description, General Operating Noise Levels	Reference Noise Level, LAeq, t dB(A) @10m	Quantity	Distance to Receptor, m	Distance Attenuation, dB	Screening Loss, dB	% On time	On Time Correction, dB	Facade Correction, dB	Resultant SPL at Facade, dB(A)	Combined Noise Level at Facade	
Concrete Vibrator	59	1	15	-4	-5	50%	-3	3	50		
Handheld Breakers	78	1	15	-4	-5	25%	-6	3	66		
Disc Cutters	79	1	15	-4	-5	25%	-6	3	67		
Core Drill	85	1	15	-4	-5	25%	-6	3	73		
Vibratory Plates	80	1	15	-4	-5	50%	-3	3	71		
Generators	60	1	90	-19	-5	100%	0	3	39	77	
Mobile	Lwa	Quantity per day / hr	Traverse Distance, m	Min. Distance to Houses, m	Distance Adjustment, dB	Screening Loss, dB	% On time	Corrected On-Time, due to Distance Ratio	On Time Correction, dB	Facade Correction, dB	Resultant SPL at Facade, dB(A)
Dumper	106	1	30	20	-34	-5	60%	48%	-3	3	67
Telehandler	106	1	30	20	-34	-5	50%	40%	-4	3	66
Roller	103	1	30	15	-32	-5	40%	16%	-8	3	62
Delivery/Collection Lorries	Lwa	Quantity per day / hr	Min. Distance to Houses, m	Distance Adjustment, dB	Correction for No. Of Vehicles, dB	Average Speed, km/h	Speed Correction, dB	Screening Loss, dB	Facade Correction, dB	Resultant SPL at Facade, dB(A)	Combined Noise Level at Facade
Lorries In	108	1	30	-15	0	15	-12	0	3	51	
Lorries Out	108	1	30	-15	0	15	-12	0	3	51	
	Measured Ambient Noise Level, LAeq, t dB(A)	Fixed Plant Noise Level dB(A)	Mobile Plant Noise Level dB(A)	Delivery / Collection Lorries dB(A)	Combined Noise Level dB(A)						
Summary of Levels	55	77	70	54	78						