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ASSESSMENT OF ENVIRONMENTAL NOISE

PARK ROAD SOUTH, HAVANT

HAVANT BOROUGH COUNCIL
DEVELOPMENT CONTROL
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1. SUMMARY

1.1 An assessment of ambient noise has been undertaken on the site of a proposed residential development on Park Road South, Havant

1.2 An acoustic survey was commissioned in 2006 to assess the impact of noise from local activity, and this was completed by RPS Consulting.

1.3 The existing ambient noise climate affecting the site has been previously established (Section 3), and the survey confirmed the levels of noise emanating, primarily, from the traffic on Park Road South.

1.4 An outline assessment of the site's suitability for residential development has been provided (Section 4).

1.5 Means of mitigating the excess have been submitted (Section 5), in the form of a specification for suitable façade glazing.

1.6 It is concluded that, with the recommended measures in place, the occupants of the new flats can be provided with an acceptable acoustic environment.

2. INTRODUCTION

2.1 An assessment of noise has been undertaken at Park Road South, Havant, on behalf of Mansell Construction Services.

2.2 The site lies on a disused petrol station, on the junction of Bulbeck Road and Park Road South. The buildings surrounding the site comprise offices and retail units, with a multi-storey car park behind.

2.3 It is proposed that a four storey block will be constructed on the site, offering a total of 26 self contained flats over ground floor retail space.

2.4 It is recognised that the development could be subject to a significant level of noise from adjacent uses and the Planning Consent includes a condition (No. 8) to ensure that future residents are offered appropriate protection:

> *No development hereby permitted shall commence until the specification of acoustic glazing to be provided for the residential flats has been submitted and approved in writing by the Local Planning Authority. Thereafter all such agreed glazing details shall be implemented and provided for the residential flats prior to occupation and thereafter retained.*

2.5 The current assessment has therefore been commissioned to determine whether the noise affecting the site warrants particular acoustic measures. Formally, the objectives of the current exercise may be summarised as follows:

(i) To determine the existing ambient noise climate affecting the development site;
(ii) To specify measures this will attenuate the external noise, to provide a good standard of accommodation for prospective residents.

2.6 This report details the investigations carried out in respect of each of these objectives and summarises the conclusions which have been reached.

3. SURVEY OF EXISTING NOISE LEVELS

3.1 The first step in the assessment of potential noise impact is to measure and describe the existing noise levels affecting the site.

3.2 A full noise survey has been conducted by RPS, and reference is made to their formal report "Noise Assessment for a Mixed use Development", dated December 2008. This document is attached to this report as Appendix A.

3.3 In summary, the results indicate that the incident noise levels upon the site, and those which the new building structure must attenuate, are as follows:

3 hour sample (10.15 – 13.15) extrapolated to a free-field level at the south façade of the building - 68 dB(A) $L_{Aeq,\ 3\ hrs}$

16 hour day time level - 67 dB(A) $L_{Aeq,\ 0700\ -\ 2300}$

8 hour night time level - 59 dB(A) $L_{Aeq,\ 2300\ -\ 0700}$

Peak noise levels - 82 dB(A) L_{Amax}

3.4 It is noted that these levels are 'free-field' levels, measured away from building facades and the effect of reflections which occur directly in front of such surfaces.

3.5 The significance of these figures will be discussed in the following sections of this report.

4. ASSESSMENT OF AMBIENT NOISE LEVELS

4.1 An indication of the acceptability of the site for residential development could be found in the 1994 Planning Policy Guidance note 24, "Planning and Noise". This gives advice on how planning systems can be used to reduce the impact of noise on people. It outlines the relevant considerations to be taken into account by local planning authorities when determining planning applications for residential developments which will be exposed to existing noise sources. It also sets out three key approaches by which noise impact can be minimised:

"(i) Engineering - the reduction of noise at the point of generation, the containment of noise generated, and protection of surrounding noise sensitive buildings;

(ii) Lay-out - adequate distance between source and noise sensitive building and area; screening by natural barriers, other buildings or non critical rooms in a building;

(iii) Administrative - limiting operating time of source, restricting activities allowed on site, specifying an acceptable noise limit"

4.2 In brief, the methodology of PPG24 involves a calculation of the noise affecting the site during a 16 hour day time period, and an 8 hour night time period. The calculated values are then compared to a set of tables which will categorise the results as being 'A', 'B', 'C' or 'D'. For each of these categories, PPG 24 clarifies the acoustic implications. For areas exposed to predominantly road traffic noise, as here, the categories would be determined as follows:

Noise Levels Corresponding To The Noise Exposure Categories For New Dwellings $L_{Aeq,T}$ dB				
	Noise Exposure Category			
Noise Source	**A**	**B**	**C**	**D**
Road Traffic				
07.00 - 23.00	<55	55 - 63	63 - 72	>72
23.00 - 07.00[1]	<45	45 - 57	57 - 66	>66

4.3 The site survey suggests that the typical noise levels on the site, in the absence of façade reflections would be as follows:

Day Time $L_{Aeq\ 07.00 - 23.00}$	Night Time $L_{Aeq\ 23.00 - 07.00}$
67	59

4.4 The PPG document would classify the day time and night time values as 'Noise Exposure Category C'. This is defined as follows:

> *Planning permission should not normally be granted. Where it is considered that permission should be given, for example because there are no alternative quieter sites available, conditions should be imposed to ensure a commensurate level of protection against noise.*

4.5 In view of the guidance of PPG24, Section 5 will describe measures which may be incorporated into the design to provide an acceptable environment for the residents of the proposed buildings.

5. RECOMMENDATION FOR NOISE ATTENUATION MEASURES

5.1 There is much guidance on the levels of intrusive noise which would be considered acceptable within a residential dwelling. Typical advice is found in British Standard 8233:1999 "Sound Insulation and Noise Reduction for buildings - Code of Practice". This sets out limits for indoor ambient noise levels within living rooms and bedrooms:.

Living Rooms	30 - 40 dB(A) $L_{Aeq,t}$
Bedrooms	30 - 35 dB(A) $L_{Aeq,t}$ 45 dB(A) $L_{Amax,\ fast}$

5.2 These targets correspond to those set out in the Planning Consent condition (see Para 2.4) and it is therefore recommended that the building be designed to achieve the following levels:

Living Rooms: 35 dB (A) $L_{Aeq,\ 0700\ –2300}$

Bedrooms 30 dB (A) $L_{Aeq,\ 2300\ –\ 0700}$, and also

45 dB (A) $L_{Amax,\ fast,\ 2300\ –\ 0700}$

5.3 Table I below defines the outside to inside sound level difference, dB(A), required through each façade of the building. These figures are based on the targets of Para 5.2 and the measured noise levels on site, confirmed earlier in Para. 3.3.

5.4 Levels have been adjusted to account for the façade reflections which will occur in front of the new buildings, and the angle of view to the primary noise source (road traffic on Park Road South).

TABLE I – PREDICTED NOISE LEVELS

Flats / Elevation	External Noise Level	Target Noise Level	Outside to inside level difference
Park Road South Elevation			
Living Rooms	70 dB $L_{Aeq, 16\ hrs}$	35 dB(A) $L_{Aeq, 16hrs}$	35 dB(A)
Bedrooms	62 dB(A) $L_{Aeq, 8hrs}$ 85 dB(A) L_{Amax}	30 dB(A) $L_{Aeq, 8hrs}$ 45 dB(A) L_{Amax}	40 dB(A)
Side (Bulbeck Road) Elevations			
Living Rooms	67 dB $L_{Aeq, 16\ hrs}$	35 dB(A) $L_{Aeq, 16hrs}$	32 dB(A)
Bedrooms	59 dB(A) $L_{Aeq, 8hrs}$ 82 dB(A) L_{Amax}	30 dB(A) $L_{Aeq, 8hrs}$ 45 dB(A) L_{Amax}	37 dB(A)
Rear Elevation			
Living Rooms	60 dB $L_{Aeq, 16\ hrs}$	35 dB(A) $L_{Aeq, 8hrs}$	25 dB(A)
Bedrooms	52 dB(A) $L_{Aeq, 8hrs}$ 75 dB(A) L_{Amax}	30 dB(A) $L_{Aeq, 8hrs}$ 45 dB(A) L_{Amax}	30 dB(A)

5.5 It is confirmed that a timber frame external wall constructions will suffice (with min 100mm masonry outer skin). The overall sound insulation of the façade will, in fact, be dictated by the glazing.

5.6 For the glazing, the following options could therefore be considered. Note, the third column provides evidence of one suitable configuration. Providing the acoustic performance rating (Column 2) is achieved, the Client is at liberty to select other configurations if preferred.

TABLE II – RECOMMENDED GLAZING PERFORMANCE

Elevation	Acoustic Performance for Glazing	Possible Glazing Configuration[1]
Park Road South Elevation		
Living Rooms	33 dB $R_w + C_{tr}$	10 / 12 / 6
Bedrooms	39 dB $R_w + C_{tr}$	(4/12/4) / 150 / 6
Side (Bulbeck Road) Elevations		
Living Rooms	30 dB $R_w + C_{tr}$	10 / 12 / 6
Bedrooms	36 dB $R_w + C_{tr}$	10 / 12 / 8.4
Rear Elevations		
Living Rooms	23 dB $R_w + C_{tr}$	4 / 16 / 4
Bedrooms	29 dB $R_w + C_{tr}$	10 / 12 / 4

5.7 Table III provides a calculation to demonstrate that the proposed wall and glazing configurations will achieve the targets set out in Para 5.2

[1] The configurations provided here are indicative only and the glazing subcontractors should be asked to confirm the performance of the units proposed. It is noted that the central air gap shown above would, in each case, be a minimum – any increase would act only to improve the performance.

TABLE III – CALCULATION OF NOISE BREAK-IN THROUGH PROPOSED FAÇADE

Frequency		Hz	63	125	250	500	1000	2000	4000	8000	dB(A)
1. TRANSMISSION INTO LIVING ROOMS, DAY TIME											
Net Façade Level, Leq, 16hrs		***dB***	***72***	***66***	***63***	***64***	***69***	***60***	***49***	***44***	***70***
SRI Brick/Cavity/25mm plasterboard		dB	-42	-52	-51	-56	-64	-72	-76	-76	
Area of External Wall	10m2	dB	10	10	10	10	10	10	10	10	
Assumed Reverberation Time	secs	dB	1.0	0.8	0.7	0.6	0.5	0.5	0.5	0.5	
Acoustic Absorption		dB	5	7	8	10	11	11	11	11	
Absorptive Correction		dB	-7	-8	-9	-10	-10	-10	-10	-10	
Net SPL Internally		dB	33	16	13	8	5	-12	-27	-32	**12**
SRI Windows	Rw + Ctr 33 dB	dB	-20	-26	-27	-34	-40	-38	-46	-46	
Area of External Windows	3m2	dB	5	5	5	5	5	5	5	5	
Assumed Reverberation Time	secs	dB	1.0	0.8	0.7	0.6	0.5	0.5	0.5	0.5	
Acoustic Absorption		dB	5	7	8	10	11	11	11	11	
Absorptive Correction		dB	-7	-8	-9	-10	-10	-10	-10	-10	
Net SPL Internally		dB	49	36	32	25	23	16	-3	-8	**30**
Theoretical Prediction		**dB**	**50**	**37**	**32**	**25**	**23**	**16**	**-3**	**-8**	**30**
In-situ Prediction		**dB**	**53**	**40**	**35**	**28**	**26**	**19**	**0**	**-5**	**33**
2. TRANSMISSION INTO BEDROOMS, NIGHT TIME											
Net Façade Level, LAmax		***dB***	***87***	***83***	***82***	***81***	***83***	***73***	***66***	***61***	***85***
SRI Brick/Cavity/25mm plasterboard		dB	-42	-52	-51	-56	-64	-72	-76	-76	
Area of External Wall	8m2	dB	9	9	9	9	9	9	9	9	
Assumed Reverberation Time	secs	dB	0.9	0.8	0.7	0.6	0.5	0.5	0.5	0.5	
Acoustic Absorption		dB	4	5	6	7	8	8	8	8	
Absorptive Correction		dB	-6	-7	-7	-8	-9	-9	-9	-9	
Net SPL Internally		dB	48	33	33	26	19	1	-10	-15	**28**
SRI Windows	Rw + Ctr 39 dB	dB	-23	-26	-35	-45	-56	-52	-50	-50	
Area of External Windows	2m2	dB	3	3	3	3	3	3	3	3	
Assumed Reverberation Time	secs	dB	0.9	0.8	0.7	0.6	0.5	0.5	0.5	0.5	
Acoustic Absorption		dB	4	5	6	7	8	8	8	8	
Absorptive Correction		dB	-6	-7	-7	-8	-9	-9	-9	-9	
Net SPL Internally		dB	61	53	43	31	21	15	10	5	**40**
Theoretical Prediction		**dB**	**61**	**53**	**43**	**32**	**23**	**15**	**10**	**5**	**41**
In-situ Prediction		**dB**	**64**	**56**	**46**	**35**	**26**	**18**	**13**	**8**	**44**

5.8 Whichever level of glazing is provided for each facade, it is of course the case that when the windows are opened, the acoustic performance of the windows will be irrelevant. Residual noise levels within bedrooms and living rooms on all elevations would then be above the preferred limits (PPG24 indicates a typical reduction of 10 – 15 dB(A) through an open window.

5.9 It would therefore be necessary to provide alternative means by which habitable rooms may be ventilated whilst keeping the acoustic integrity of the façade. It is understood that, due to air quality issues, each flat will be served by a continuously-running mechanical ventilation (heat recovery) unit. This will allow the flats to be occupied without the necessity of opening windows.

5.10 Fresh air will be ducted into the flats from the roof, and exhaust air taken through the ceiling void to an external grill on the outside wall. There will be no trickle ventilators in the windows.

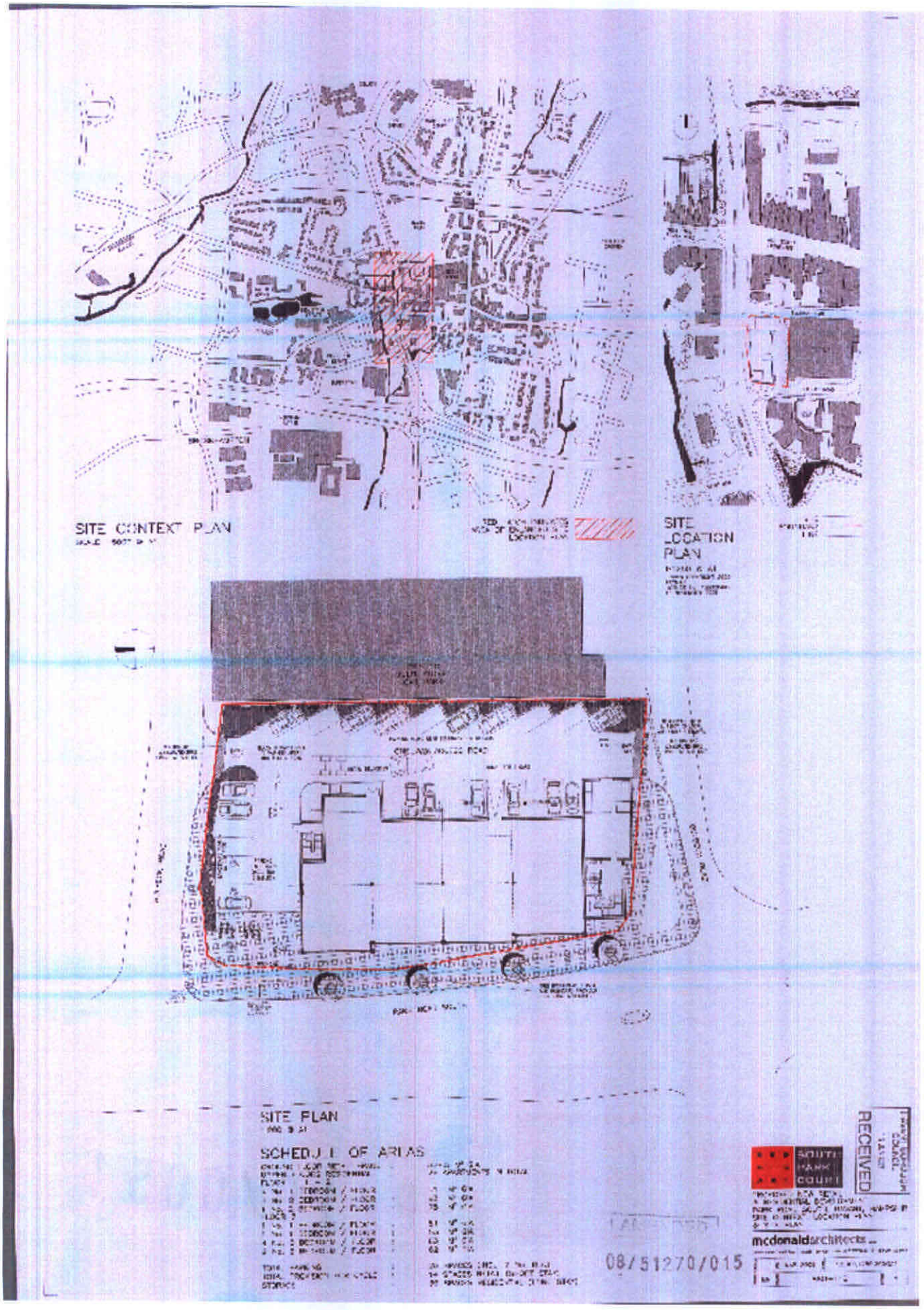
5.11 The exact positioning of the inlet vents on the roof is to be confirmed. If they can be set into a north-facing upstand, for example, shielded from traffic on Park Road South, it is likely that they will require no additional acoustic treatment. However, a formal review will be required. Once the M&E design is completed, details of the ventilation system should be submitted to the Acoustic Consultant for assessment and recommendations.

6. CONCLUSION

6.1 This assessment of noise has looked in detail at the proposed development on Park Road South.

6.2 Whilst the site is clearly subject to a level of road traffic noise, it has been concluded that, by specifying appropriate glazing to the most sensitive rooms, it will be quite possible to ensure that the internal environment within the building is well within normal design standards for such residential use, and will satisfy the conditions of the Planning Consent.

FIGURE 1 – SITE PLAN



APPENDIX A – INITIAL ACOUSTIC REPORT BY RPS