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**WEST STREET
HAVANT
HAMPSHIRE
PO9 1LA**

DISCHARGE OF PLANNING CONDITION 19

Client:
MANSELL HOMES

Pavilion B
Ashwood Park
Ashwood Way
Basingstoke
RG23 8BG

15 July 2016
Ref: M3462-S1

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1. SUMMARY

- 1.1 An assessment of internal noise has been undertaken at West Street, Havant, to assess the acoustic efficacy of the facade of a new residential development by Mansell Homes.
- 1.2 Noise levels have been measured in a bedroom overlooking the adjacent road, West Street, to determine the impact of external noise sources
- 1.3 The table below confirms the recommended targets and the range of measured levels over a 3 day period:

	Day Time L_{Aeq}, 16hrs dB(A)	Night Time L_{Aeq}, 8 hr dB(A)
Target Values	≤35	≤30
Measured Levels	34 - 36*	26 - 27

*including the contribution of ongoing site/construction activity

- 1.4 Peak noise levels in the bedroom have been assessed by attended measurements of passing traffic. During 50 vehicle movements, only 3 exceeded the target of 45 dB(A) L_{Amax,f}. It is noted that these three measurements ranged from 46 - 47 dB(A) only, and that the guidance on peak noise levels at night does allow for a number of exceedances.
- 1.5 It is therefore concluded that the internal noise levels within the houses on the site will comply with the targets confirmed here in Paragraph 2.3

2. INTRODUCTION

- 2.1 An assessment of internal noise has been conducted within apartments of the new residential development at West Street Havant. The scheme, by Mansell Homes, comprises some 16 houses, five of which overlook West Street, and a block of 8 converted flats.
- 2.2 The exercise has been conducted to demonstrate that internal noise within apartments meets the limits specified in Condition 15 of the Planning Consent. This states:

19 Construction work shall not begin until a scheme for protecting the dwellings against noise from surrounding uses, has been submitted to and approved by the Local Planning Authority; for each applicable dwelling all works which form part of the scheme for that dwelling shall be completed before the dwelling is occupied and a completion acoustical report shall be provided to the Local Planning Authority to confirm the noise expected within the proposal is achieved, this to protect the resident of the proposed development once built

- 2.3 For the purposes of this exercise reference is made to BS8233:2014 'Guidance on sound insulation and noise reduction for buildings', which advises the following limits represent an appropriate standard for residential amenity:

Day Time $L_{Aeq, 0700-2300}$	35 dB(A)
Night Time $L_{Aeq, 0700-2300}$	30 dB(A)
Night Time $L_{Amax, 0700-2300}$	Typically < 45 dB(A)

- 2.4 The properties are now nearing completion and the current exercise has been commissioned to confirm the residual noise levels within one of the houses overlooking West Street.

3. SURVEY OF EXISTING NOISE LEVELS

- 3.1 The noise survey was undertaken from Tuesday 5th July 2016 to Friday July 2016.
- 3.2 A Rion NL52 environmental monitor was positioned within the first floor bedroom of Plot 12, overlooking West Street. The room was carpeted in each case, but otherwise bare.
- 3.3 The microphone was positioned on a tripod in the centre of the room, approximately 1.2m above the floor level.
- 3.4 In each survey, the equipment was configured to measure 5 minute samples of the following acoustic parameters:
- | | |
|-----------|---|
| L_{Aeq} | The A-weighted equivalent continuous sound pressure level which, over the sample period, contains the same acoustic energy as the time-varying signal being recorded. |
| L_{A90} | A statistical parameter representing the A-Weighted noise level exceeded for 90% of each sample period. This is commonly used to describe background noise levels. |
- 3.5 The equipment was calibrated before and after each survey and showed no significant variance. Weather conditions through each survey period are provided in Appendix B, and were deemed appropriate for the exercise being undertaken.
- 3.6 The measured variation in noise within each room is shown in Figures 2.
- 3.7 It is noted that the houses were not furnished at the time of the survey. It was agreed that levels within the rooms surveyed would therefore be higher than would be found once the apartments were occupied and furnished.
- 3.8 A furnished bedroom of the size here would typically have a Reverberation Time of c.0.35 seconds. Measurements were therefore made to record the Reverberation Time as found at the time of the tests. These values are summarised in Appendix C, along with the correction which should therefore be made to the levels as measured, to reflect the expected additional acoustic absorption on occupation. Typically, this correction was found to be 2 - 3 dB.
- 3.9 In addition to the long term survey, an attended survey was conducted to clarify the likely levels of peak noise affecting the bedrooms at night. It was determined that passing traffic would be the primary source of peak noise events.
- 3.10 Readings of some 50 vehicles were made over a 30 minute period between 16.00 and 16.30 on Wednesday 13th July 2016. The parameter of interest was the L_{Amax} , which formally is the A-weighted maximum sound pressure level recorded during each sample period (as measured on fast response).
- 3.11 The results of this exercise are discussed above.

4. ASSESSMENT OF MEASURED LEVELS

Overall Day Time and Night Time Noise Levels

4.1 The table below reflects the corrected noise levels measured across the survey period:

Room / Date	Day Time L_{Aeq}, 16 hrs dB(A)	Night Time L_{Aeq}, 8 hrs dB(A)
<i>Target Level</i>	<35	<30
Tuesday 5/7	34.1	27.4
Wednesday 6/7	35.2	26.7
Thursday 7/7	35.8	26.1*

- 4.2 It should be recognised that the construction on site was ongoing during the survey period. Day time measurements would therefore be affected to a degree by atypical activities and noise sources.
- 4.3 Readings were fully compliant on two days, and less than 1 dB above the British Standard target on the third. Whilst such a difference would not be subjectively perceptible, it is suggest that, had the survey been conducted without construction works taking place, the measurements would have been numerically compliant.
- 4.4 At night, the situation appears to be fully compliance. It is noted that, on the last morning (Friday 8/7), significant activity started at 05.00, with the preparation and removal of the site cabins (close to Plot 12). Figure 2 indicates a noticeable uplift in levels from 05.00. The value of 26.1 dB(A) represents the noise level, L_{Aeq}, between 2300 and 0500.

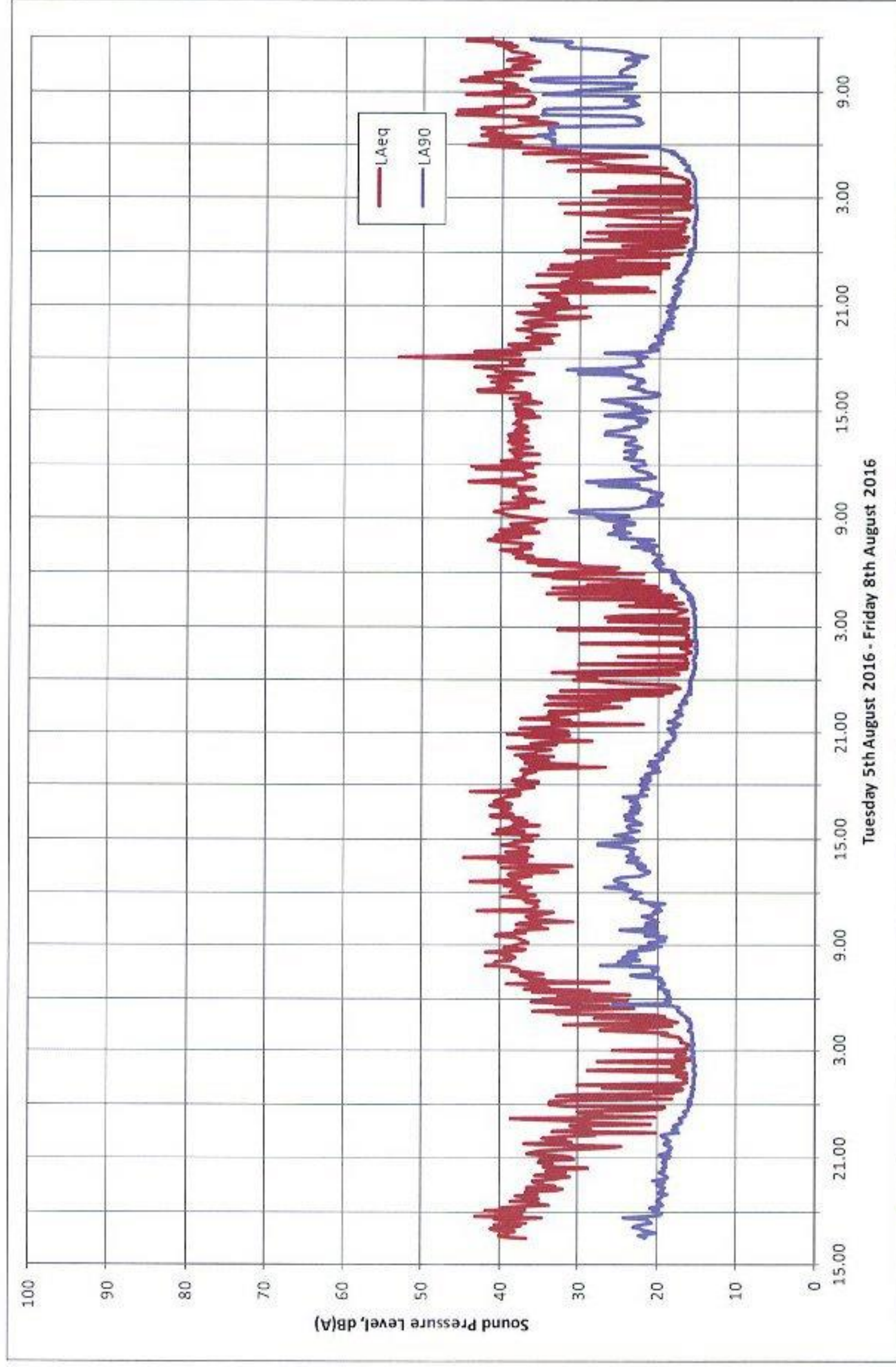
Peak Noise Limits

- 4.5 The table below indicates the corrected peak noise levels arising from 50 vehicles driving past the site on West Street. Whilst these measurements were taken during the day, there is no reason to suggest levels would be significantly different at night. Only, the volume of traffic may be lower.

Samples of Peak Noise, $L_{Amax,f}$ dB(A)				
44.5	37.6	43.7	40.9	42.9
43.0	44.1	36.5	42.5	38.5
38.4	43.4	44.5	42.4	35.5
40.5	46.5	35.8	43.1	44.8
37.5	41.6	44.1	35.8	35.3
42.6	45.9	42.9	41.3	41.3
46.1	39.5	42.1	40.6	37.1
42.5	42.2	40.2	45.0	44.6
45.1	38.2	40.1	37.8	40.6
41.9	35.5	43.9	40.6	35.5

- 4.6 Of the fifty drive-pasts, only 3 evens gave rise to a residual noise level above 45 dB(A) L_{Amax} within the bedroom.
- 4.7 From this, it would be concluded that some 95% of all traffic movements at night would remain below the 45 dB(A) L_{Amax} target.

Figure 2 - Measured (Uncorrected) Noise Levels in Plot 12 Front Bedroom



Appendix A - Sound Level Meter Calibration

Set	Manufacture	SLM/Serial No.	Pre-Amp/Serial No.	Microphone/Serial No.	Date of Last Calibration
1	Rion	NL52/142660	NH-25/32688	UC-59/06111	24/07/2015

Appendix B - Weather Conditions During Surveys

Date	Average Temperature (°C)	Rainfall mm	Average Wind Speed (m/s)	Prevailing Direction
Tue 5/7/16	17	0	3.3	N/W
Wed 6/7/16	14	0	1.4	Var
Thur 7/7/16	15	0	2.2	S/W
Fri 8/7/16	15	0	2.2	S/W

Appendix C - Measured Reverberation Times & SPL Corrections

Frequency (Hz)	63	125	250	500	1K	2K	4K	8K	dB(A)	Overall Correction, dB(A)
Average of 6 Reverberation Time Measurements, secs										
12 Fr Bedroom	0.53	0.52	0.58	0.51	0.67	0.53	0.56	0.46		
Correction, dB, to a Reverberation Time of 0.4 secs										
12 Fr Bedroom	1.2	1.2	1.6	1.1	2.2	1.2	1.4	0.6		
Reference Spectra										
Typical Leq	23.6	23.9	26.2	20.0	28.6	20.7	12.5	14.0	30	
Typical L _{max}	48.2	47.2	45.3	36.6	48.0	32.9	29.5	17.6	48	
Leq, net of Correction										
12 Fr Bedroom	22.4	22.7	24.6	18.9	26.4	19.5	11.1	13.4	28	-2
Lmax, net of Correction										
12 Fr Bedroom	47.0	46.0	43.7	35.5	44.8	31.7	28.1	17.0	46	-2

* Where reverberation times were measured less than 0.5 seconds, no increase is made, since the occupation of the flat will only reduce reverberant levels, not increase them