WYG Environment
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Proposed Residential Development

Moston

Site 5

Noise Assessment

February 2010

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1.0 Introduction

WYG Environment Planning Transport Ltd (WYG) has been commissioned by Redrow Homes in order to address noise considerations at a proposed residential development site located off Kenyon Lane, Moston, Manchester.

Consultation has been undertaken with Clare Stratford, Public Protection Officer (PPO), Environmental Health Department at Manchester City Council, who has agreed the proposed assessment methodology to be appropriate. This report is to be submitted in support of a detailed planning application.

The methodology, findings and conclusions of this assessment are presented below. WYG Report Conditions are presented in Appendix A.

2.0 Methodology

The guidance provided in PPG 24[1] will form the basis for assessing the potential effects of noise upon the proposed residential elements of the development. PPG 24 specifies the requirements for development proposals to address noise issues, including recommended standards for noise exposure to which new residential dwellings should comply. In addition, guidance provided in BS 8233[2] and by the World Health Organisation has been used in order to recommend levels of insulation required by the building façade of the proposed residential dwellings.

The recommendations made in this report will be based on achieving a daytime (07.00 – 23.00 hours) indoor ambient noise level of 40 dB $L_{Aeq,T}$[3] within living areas and a night-time level of 30 dB $L_{Aeq,T}$ within bedrooms. These levels are in line with the requirements of the PPO.

In addition to the internal noise level recommendations above, this report will also make reference to the PPO requirements and BS 8233 recommendations of:

- Ensuring that maximum night-time internal noise levels within bedrooms do not regularly exceed 45 dB L_{Amax}[4] from individual events; and
- Ensuring that average noise levels within external amenity areas (balconies, terraces and outdoor living areas) do not exceed 55 dB L_{Aeq} between 07:00 and 23:00 hours.

[1] Planning Policy Guidance 24: Planning and Noise (1994)

[2] BS 8233: Sound Insulation and Noise Reduction for Buildings – Code of Practice, 1999

[3] $L_{Aeq,T}$ – 'A' Weighted average integrating sound level over the time period 'T'

[4] L_{AMax} – The maximum noise level during the measurement sample

3.0 Baseline Conditions

3.1 Site Description

The proposed development site is located off Hugo Street in Moston, Manchester and currently comprises areas of grassland which are traversed by a number of local roads. These roads are proposed to remain.

The site is irregular in shape with the southern part bounded by Hugo Street to the south with Adrian Street to the west. A small day care centre is located immediately beyond Adrian Street to the west of the site. Hanson Road bounds the site to the east and existing residential properties partially bound the site to the north. The northern part of the site is predominantly surrounded by residential properties with Kenyon Lane, which continues to a dead end, bounding the site to the north. The site is located in a predominantly residential area with Lightbowne Road located approximately 50m to the west of the southern area of the site and a railway line located approximately 220m to the southeast of the nearest point of the site. A rail depot is located immediately beyond the rail line.

During the night-time the noise climate at the site is primarily influenced by road traffic noise from Lightbowne Road, particularly in the south western part of the site. In the northern part of the site, infrequent vehicle movement and the distant drone of road traffic noise from the west influence the noise climate. Infrequent train movement on the rail line to the southeast of the site is also just audible. No activity was observed to occur at the rail depot during the night-time period.

During the daytime the noise climate was dominated by road traffic noise from Lightbowne Road, particularly in the southern part of the site. In the northern part of the site, infrequent vehicle movement and the distant drone of road traffic noise from the west influence the noise climate. Infrequent train movement was just audible at the site, whilst a distant drone from the rail depot was also audible in the south eastern part of the site for certain parts of the day. Noise from the day care centre comprised infrequent vehicle movement.

3.2 Noise Monitoring Survey

A noise survey was undertaken by Neil Turnbull (MIOA[5]) of WYG in order to obtain ambient daytime and night-time noise level data at the site and details of the monitoring are as follows.

This survey was undertaken on 19th January 2010 between the period of 05:51 and 10:12 hours. Therefore captured data during both the daytime and night-time periods (PPG 24 separates the daytime and night time periods as 07:00 - 23:00 hrs and 23:00 - 07:00 hrs respectively).

The survey comprised collecting noise data at the following locations:

- Location 1 – In the north eastern corner of the site, approximately 5m from Kenyon Lane.
- Location 2 – In the south western corner of the site, approximately 3m from Adrian Street. Noise level data at this location was collected during peak road traffic periods on Lightbowne Road and therefore, constitutes a worst case scenario.
- Location 3 – In the south western corner of the site, approximately 4m from Hugo Street.

A visual representation of the noise monitoring locations are presented as Fig 01 in Appendix B.

A further site visit was undertaken on 26th January 2010 at approximately 21:25, and 22:45 during which no noise was audible from the rail depot.

3.3 Instrumentation

During the noise survey, measurements were obtained using the following instrumentation:

- Norsonic Integrating Sound Level Meter (Type 118 – Serial Number 28972).

The sound level meter was appropriately calibrated using a Norsonic Type 1251 calibrator - Serial Number 25010. The microphone was mounted on a tripod to extend to 1.5m above the ground and was fitted with the manufacturer's windshield. Measurements were obtained with 'A' weighting for $L_{Aeq,T}$, L_{Amax}, L_{A1T}, $L_{A90,T}$, and $L_{A10,T}$.

[5] Member of the Institute of Acoustics

3.4 Weather Conditions

Weather conditions during the noise survey undertaken on 19th January were generally calm with no rain. Wind speeds were measured to be no greater than 2m/s. It should be noted, however, that the roads were wet which elevated noise attributable to road traffic noise.

4.0 Results

A summary of the noise monitoring results are provides in Tables 1 and 2 below. The full data sets are presented in Appendix C.

Table 1: Measured noise levels during the night-time period

Monitoring Position	Time	Average Measured Noise Level L_{Aeq} (dB)	Average Measured Noise Level L_{A90} (dB)
1	05:51 – 06:37	45.3	41.2
2	06:42 – 07:02	55.9	48.4

Table 2: Measured noise levels during the daytime period

Monitoring Position	Time	Average Measured Noise Level L_{Aeq} (dB)	Average Measured Noise Level L_{A90} (dB)
2	07:03 – 07:30 08:18 – 09:03 09:09 – 09:54	57.3	52.4
3	07:38 – 08:08 09:57 – 10:12	53.2	47.8

5.0 PPG 24 Assessment

Table 3 below presents the noise levels within each of the Noise Exposure Categories (NECs) A-D for road traffic, rail traffic, air traffic and mixed sources as stated in PPG 24. As the site is located within an area which is primarily influenced by road traffic and industrial noise the site has been assessed against the road traffic source criterion.

Table 3: Recommended NECs for dwellings near existing noise sources

Noise Levels Corresponding to NECs for New Dwellings $L_{Aeq,T}$ dB					
		Noise Exposure Category (NEC)			
Noise Source	Time	A	B	C	D
Road traffic	**07.00 – 23.00**	<55	55 – 63	63 – 72	>72
	23.00 – 07.00	<45	45 – 57	57 – 66	>66
Rail traffic	**07.00 – 23.00**	<55	55 – 66	66 – 74	>74
	23.00 – 07.00	<45	45 – 59	59 – 66	>66
Air traffic	**07.00 – 23.00**	<57	57 – 66	66 – 72	>72
	23.00 – 07.00	<48	48 – 57	57 – 66	>66
Mixed sources	**07.00 – 23.00**	<55	55 – 63	63 – 72	>72
	23.00 – 07.00	<45	45 – 57	57 – 66	>66

The resultant noise levels and corresponding NECs are presented in Tables 4 and 5 below.

Table 4: NEC for the proposed development during the night-time

Monitoring Position	Average Measured Noise Level L_{Aeq} (dB)	NEC (Road)
1	45.3	A / B
2	55.9	B

Table 5: NEC for the proposed development during the daytime

Monitoring Position	Average Measured Noise Level L_{Aeq} (dB)	NEC (Road)
2	57.3	B
3	53.2	A

When noise levels fall within NEC A, PPG 24 states for planning purposes that:

> 'Noise need not be considered as a determining factor in granting planning permission, although the noise level at the high end of the category should not be regarded as desirable'.

When noise levels fall within NEC B, PPG 24 states for planning purposes that:

> 'Noise should be taken into account when determining planning applications, where appropriate, conditions imposed to ensure an adequate level of protection against noise'.

6.0 Recommendations

The principle noise source at the proposed development site comprises road traffic noise on Lightbowne Road The recommendations of the report are based on the proposed site layout plan provided by Baldwins Design Consultancy Ltd (Ref: RED / M / S5 / 01 D).

The proposed building envelope must provide adequate insulation against the measured noise levels and most standard external wall and roof constructions will do so if correctly designed. The glazing is generally the weak spot of the building envelope, in acoustic terms, and the recommendations below present the glazing specifications required to achieve the required internal noise levels presented in Table 1.

Comment is also given on whether natural ventilation (i.e. open windows) would be adequate or whether alternative ventilation methods (which would need to achieve a sound reduction level equivalent to that recommended for the glazing) need to be considered. In accordance with PPG 24 an open window provides between 10 and 15 dB attenuation. Given the predominantly residential location of the proposed development site, where alternative ventilation is recommended, it has agreed with the PPO that acoustic trickle vents would be acceptable (the M&E engineer would need to advise on suitability). Where applicable, the level of sound insulation provided by the proposed ventilation system should achieve the same performance of the glazing units unless specified otherwise.

The following recommendations are based on data collected at the measurement locations specified in Section 3.2.

Further to the data collected at location 1, consideration is also given to noise level data collected at Locations 2 and 3 as well as observations made at the site.

During the night-time it is the average (L_{Aeq}) and maximum (L_{Amax}) noise levels in the proposed bedrooms which need considering. BS 8233 and WHO guidelines recommend that, to avoid sleep disturbance, individual 'A' weighted average noise levels (L_{Aeq}) do not exceed 30 dB (A), whilst maximum noise levels (L_{Amax}) do not regularly exceed 45 dB (A) in bedrooms at night. The criteria is based on achieving the internal L_{Aeq} criteria as the resultant required sound insulation will mitigate against the vast majority of L_{Amax} noise levels. It should be noted that the L_{AMax} noise levels recorded during the initial 10 minute period during the survey at location 1 relate to local vehicle movement and noise made by the site consultant. Table 6 below provides recommendations with regard to the sound insulation for bedrooms facing Kenyon Lane.

Table 6: Glazing and ventilation recommendations for bedrooms

Location	Noise Criteria	Measured Noise Level	Glazing specification required (R_{tr}[6] (dB))	Proposed ventilation type
1	30 dB L_{Aeq}	45 dB L_{Aeq}	4 / 16 / 4* (26 R_{tr})	Openable windows
2	30 dB L_{Amax}	55.9 dB L_{Aeq}	4 / 16 / 4* (26 R_{tr})	Alternative ventilation

* mm glass/mm air/mm glass

The glazing specification presented in Table 6 relates to standard double glazing.

As demonstrated by the data collected at location 2 noise levels at the proposed development site fall on the limit of NEC A. For the vast majority of the site, given the measured noise levels and screening from identified noise sources, openable windows would be acceptable. Alternative ventilation will be required for bedrooms facing Lightbowne Road in the southern western part of the site. Figure N02 in Appendix B, provides a visual representation for rooms where alternative ventilation is recommended.

Table 8 below provides recommendations with regard to the sound insulation for living rooms facing Kenyon Lane.

Table 8: Glazing and ventilation recommendations for living rooms

Location	Noise Criteria	Measured Noise Level	Glazing specification required (R_{tr}[7] (dB))	Proposed ventilation type
2	40 dB L_{Aeq}	57.3 dB L_{Aeq}	4 / 16 / 4* (26 R_{tr})	Openable windows
3	40 dB L_{Aeq}	53.2 dB L_{Aeq}	4 / 16 / 4* (26 R_{tr})	Openable windows

* mm glass/mm air/mm glass

[6] Rtr – Sound reduction index for road traffic noise, chosen as the most stringent R value

[7] Rtr – Sound reduction index for road traffic noise, chosen as the most stringent R value

As with bedrooms, openable windows will be an acceptable means of ventilation for the vast majority of the proposed living spaces. As a worst case the noise levels are only predicted to exceed the criteria by approximately 2 dB(A) for which opennable windows would be acceptable. This is based on the marginal exceedance of the required criteria and that data was collected during peak traffic periods.

External amenity areas

BS 8233 recommends a limit of 55 dBL_{Aeq} for the noise criteria in external amenity areas. Only one garden (proposed Plot 123) is located in a position unscreened from Lightbowne Road. The data collected at location 2 is representative of this garden and only marginally exceeds the required criteria. A 1.8m high fence aligns the boundary of this garden and it is recommended that an acoustic fence is installed to reduce noise in this area although it should be noted that this would only provide a small amount of attenuation. Given, however, that noise data was collected during a period when vehicle movements on the adjacent road network was at its peak it is considered that there is no requirement for the provision of an acoustic fence or other form of mitigation at this location. This has been confirmed as being acceptable by the PPO.

All other gardens are located at further distances or are screened by proposed and existing buildings from Lightbowne Road and will fall within the required criteria.

7.0 Conclusion

WYG was commissioned by Redrow Homes to undertake a noise assessment at a site off Kenyon Lane, Moston proposed to redeveloped for residential end-use. The noise climate at the site was dominated by road traffic noise from Lightbowne Road.

The noise report demonstrates that acceptable noise levels can be achieved in relation to the proposed scheme design to adhere to the requirements of the Local Authority. Where specified, the recommended mitigation measures should be adhered to in order to achieve the said criteria. Such measures include the provision alternative ventilation for bedrooms orientated towards Lightbowne Road in the south western part of the site.

Furtehr to consultation with the PPO the expected noise levels in proposed external areas are acceptable.

Appendices

Appendix A – Report Conditions

WYG Environment Planning Transport Ltd

Site 5, Moston – Noise Assessment

This report is produced solely for the benefit of *Redrow Homes.* and no liability is accepted for any reliance placed on it by any other party unless specifically agreed in writing otherwise.

This report is prepared for the proposed uses stated in the report and should not be used in a different context without reference to WYG. In time improved practices, fresh information or amended legislation may necessitate a re-assessment. Opinions and information provided in this report are on the basis of WYG using due skill and care in the preparation of the report.

This report refers, within the limitations stated, to the environment of the site in the context of the surrounding area at the time of the inspections. Environmental conditions can vary and no warranty is given as to the possibility of changes in the environment of the site and surrounding area at differing times.

This report is limited to those aspects reported on, within the scope and limits agreed with the client under our appointment. It is necessarily restricted and no liability is accepted for any other aspect. It is based on the information sources indicated in the report. Some of the opinions are based on unconfirmed data and information and are presented as the best obtained within the scope for this report.

Reliance has been placed on the documents and information supplied to WYG by others but no independent verification of these has been made and no warranty is given on them. No liability is accepted or warranty given in relation to the performance, reliability, standing etc of any products, services, organisations or companies referred to in this report.

Whilst skill and care have been used, no investigative method can eliminate the possibility of obtaining partially imprecise, incomplete or not fully representative information. Any monitoring or survey work undertaken as part of the commission will have been subject to limitations, including for example timescale, seasonal and weather related conditions.

Although care is taken to select monitoring and survey periods that are typical of the environmental conditions being measured, within the overall reporting programme constraints, measured conditions may not be fully representative of the actual conditions. Any predictive or modelling work, undertaken as part of the commission will be subject to limitations including the representativeness of data used by the model and the assumptions inherent within the approach used. Actual environmental conditions are typically more complex and variable than the investigative, predictive and modelling approaches indicate in practice, and the output of such approaches cannot be relied upon as a comprehensive or accurate indicator of future conditions.

The potential influence of our assessment and report on other aspects of any development or future planning requires evaluation by other involved parties.

The performance of environmental protection measures and of buildings and other structures in relation to acoustics, vibration, noise mitigation and other environmental issues is influenced to a large extent by the degree to which the relevant environmental considerations are incorporated into the final design and specifications and the quality of workmanship and compliance with the specifications on site during construction. WYG accept no liability for issues with performance arising from such factors

November 2008

WYG Environment Planning Transport Ltd

Appendix B – Figures

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Key

1 Approximate Noise Monitoring Location

Arndale Court
Headingley
Leeds
LS6 2UJ

Tel: 0113 278 7111
Fax: 0113 275 0623
email: enviro.leeds@wyg.com

Project
Site 5, Moston

Client
Redrow Homes

Site Address
Open-land to the east of Hugo Street, Moston

Drawing Title
Noise Monitoring Location Plan

Figure No.
N01

Project No. A061239

Scale at A4: NTS

Checked By: JP

Approved By: SM

Office 4104 | Type Env | Approval ☐ Information

DO NOT SCALE: CONTRACTOR TO CHECK ALL DIMENSIONS AND REPORT ANY OMISSIONS OR ERRORS

KEY

ALTERNATIVE VENTILATION RECOMMENDED FOR BEDROOMS

N

0 10 20 30 40 50 m

SCALE 1:1000

REV	DESCRIPTION	BY	CHK	APP	DATE

Client:

REDROW HOMES

ARNDALE COURT
HEADINGLEY
LEEDS
LS6 2UJ

TEL: +44 (0)113 278 7111
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Project: A061239

SITE 5
MOSTON

Drawing Title:

PLAN SHOWING LOCATIONS WHERE MITIGATION IS RECOMMENDED

Scale @ A3	Drawn Date	Checked Date	Approved Date
1:1000	CM 29.01.10	SAM 29.01.10	NT 29.01.10

Project No.	Office	Type	Drawing No.	Revision
A061239	4104	552	02	

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Appendix C –Noise Monitoring Raw Data

Night-time

Location 1

Date / Time	L_{Aeq} (dB)	L_{Amax} (dB)	L_{A1} (dB)	L_{A10} (dB)	L_{A90} (dB)
(2010/01/19 05:51:49.00)	48.5	74.2	57.8	45.6	41.6
(2010/01/19 05:56:52.00)	47.0	68.0	59.0	47.1	40.3
(2010/01/19 06:01:55.00)	43.0	48.4	46.5	44.5	40.8
(2010/01/19 06:06:57.00)	43.9	56.2	48.3	45.7	41.4
(2010/01/19 06:12:00.00)	42.6	49.0	47.0	44.5	40.2
(2010/01/19 06:17:03.00)	42.3	48.4	46.3	44.5	39.8
(2010/01/19 06:22:06.00)	47.1	60.9	58.9	47.2	42.6
(2010/01/19 06:27:09.00)	43.8	51.9	49.7	45.6	41.6
(2010/01/19 06:32:12.00)	45.1	57.3	51.3	47.5	42.2
Average	**45.3**		**51.6**	**45.8**	**41.2**

Location 2

Date / Time	L_{Aeq} (dB)	L_{Amax} (dB)	L_{A1} (dB)	L_{A10} (dB)	L_{A90} (dB)
(2010/01/19 06:42:31.00)	56.0	73.8	65.8	58.8	47.4
(2010/01/19 06:47:34.00)	56.1	70.3	66.6	58.3	47.9
(2010/01/19 06:52:37.00)	56.0	68.7	64.9	58.7	48.9
(2010/01/19 06:57:40.00)	55.5	67.2	63.5	58.5	49.3
Average	**55.9**		**65.2**	**58.6**	**48.4**

Daytime

Location 2

Date / Time	L_{Aeq} (dB)	L_{Amax} (dB)	L_{A1} (dB)	L_{A10} (dB)	L_{A90} (dB)
(2010/01/19 07:03:43.00)	55.5	74.1	62.2	57.7	50.5
(2010/01/19 08:18:46.00)	56.8	76.3	65.2	59.3	51.8
(2010/01/19 08:33:49.00)	57.1	69.9	64.6	60.2	52.7
(2010/01/19 08:48:52.00)	57.7	69.5	65.5	61.5	52.2
(2010/01/19 09:09:18.00)	58.6	75.2	68.4	61.6	53.2
(2010/01/19 09:24:21.00)	56.9	70.1	64.1	58.7	53.6
(2010/01/19 09:39:24.00)	58.0	75.3	68.4	59.5	52.5
Average	**57.3**		**65.5**	**59.8**	**52.4**

* Denotes 30 minute measurement

Location 3

Date / Time	L_{Aeq} (dB)	L_{Amax} (dB)	L_{A1} (dB)	L_{A10} (dB)	L_{A90} (dB)
(2010/01/19 07:38:22.00)	52.7	76.2	63.8	51.7	45.7
(2010/01/19 07:53:25.00)	53.2	72.2	62.7	54.1	47.1
(2010/01/19 09:57:41.00)	53.6	72.7	60.7	55.1	50.7
Average	**53.2**		**62.4**	**53.6**	**47.8**