Richard Allen Consultants

ENVIRONMENTAL NOISE IMPACT ASSESSMENT

PROPOSED NEW CARE HOME 29 MOORE ROAD, BARWELL

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1.0 INTRODUCTION

This report was carried out to provide an assessment of the existing Environmental Noise and an indication of noise mitigation measures required for the proposed new construction of the 3 storey 38 Bed Residential Care Centre at 29 Moore Road, Barwell.

This report is a pre-planning stage document only without specific knowledge of noise criteria issued by the local authority at this stage, therefore the conclusions and recommendations are drawn from Planning Policy Guidance 24 (PPG 24) and BS 4142 accordingly.

This report has been prepared by a trained Environmental Noise Assessor using calibrated equipment.

2.0 DESCRIPTION OF SITE

The proposed new facility would be located in a residential area at 29 Moore Road, Barwell.

The site has a quiet residential access road to the front, a playground to the rear for young children only, a Vista AVIC Centre (dedicated to assistance for people with impaired vision) to the rear, an existing small 1960's 2 storey Public House with living quarters to the left and existing residential properties to the right.

The properties facing the new site are also residential houses, with a church on the corner adjacent. No other commercial properties exist in the vicinity.

The proposed development site is currently flat ground.

Parking on the road is mainly for people using the residential houses. The public house has a car park for patrons to the front which is used until around 11.30pm most nights. There is space for around 10 cars for the Pub and it is estimated that there are no more than 5 vehicle movements per hour. Patronage for the Pub is generally from people living locally.

The proposed Care Centre has minimal parking arrangements. There are 10 car parking spaces shown, of which 4 are in the undercroft area at ground floor level adjacent to House No.31. A new wall is proposed to screen the car parking and associated noise from No.31. Vehicle movements for the visitors to the new care centre would generally be during daytime and early evening off the main road to the front of the new site.

Deliveries to the proposed Care Centre would be via small commercial vehicles for linen and food stuffs etc. direct from the main road.

Existing residential gardens and properties are directly adjacent to the new building and to the existing Pub.

3.0 DESCRIPTION OF EXISTING NOISE CLIMATE

The noise was typical of a residential area with local enmities present.

We have not been made aware of any complaints of noise from the existing residential properties regarding noise from the Pub or the Play Area however it is assumed that the noise does intrude into the existing 1960's residential properties adjacent. The Pub does not have a function room or

space for live music/dj, however there is a jukebox present which was in use during the measurement period.

Noise from the Public House was worst during Friday evening, a steady chatter of voices/laughter, music from the jukebox and clinking of glasses as would be expected was heard from the measurement location from 7pm to around 11:30pm.

Noise from children in the adjacent the playing field was also prevalent until 10pm on Sunday evening.

Traffic noise was infrequent and low from the road, a quiet residential side road having a 30 mph speed limit that does not appear to a 'through route' for commuter traffic and goods vehicles etc.

No other dominant noise sources were noted.

4.0 WEATHER CONDITIONS

Conditions were dry with a slight breeze, overcast with ambient temperatures of between 12 and 15 ^{0}C.

Wind velocities were below 5 m/s.

Temperature inversion did not occur during the measurement periods.

5.0 ASSESSMENT METHOD

The proposed site has residential areas requiring protection from noise emitted by the local amenities (Pub and Play Area). The noise from the commercial activities in the new Care Centre also has to be considered to protect the adjacent residential properties. This report focuses on both aspects.

Guidance for control of noise affecting new residential areas is contained within PPG24 Planning and Noise.

Noise attenuation through the building fabric shall be controlled in accordance with PPG 24 Planning and Noise, 'WHO' Guidance for noise limits in bedrooms and living areas, and Approved Document E of The Building Regulations.

In addition to the above a good standard as per 'BS 8233 Sound Insulation and Noise Reduction in Buildings' shall be adopted. Guidance on achieving sufficient sound attenuation through the new structure and glazing is included in the summary section of this report.

<u>BS 4142 Assessment Overiew</u>

BS 4142 is suitable for assessing noise from new commercial developments affecting existing residential developments and shall used to set noise control parameters for the commercial activities in the new Residential Care Centre. Noise shall be controlled to be 10 dB below the background levels at the site boundary (as per BS 4142) to negate the risk of complaints from the adjacent existing residential properties.

The background noise level measurement is important to set a base for noise control of the commercial activities. The night time background level shall be used as it is likely that ventilation/cooling fans etc. will run during the night.

The calculation procedure in BS 4142 provides a scale of the likelihood of complaints based on the level that the background is exceeded by. Complaints are likely if the background level is exceeded by 10 dB or more. An increase of 5 dB to the background noise level from the source noise is considered of marginal significance and for levels at 10dB below background complaints are unlikely.

The assessment method for BS 4142 is the rating level minus the background level with corrections applied for the type of noise present (i.e. screeches/bumps etc) which can be annoying even at low levels.

Noise measurements were taken to ascertain the background noise levels $L_{A90(T),}$ which is the A weighted noise level exceeded for 90% of the specified measurement period (T) used to gain a representative sample of the lowest general noise climate at the location.

PPG24 Assessment Overview

The Noise exposure Categories (NEC's) in PPG24 are applicable for new residential construction adjacent to transport and 'mixed' noise sources.

The traffic noise has been assessed to select the correct NEC Band rating level expressed in terms of the $L_{A\ 10\ (T)}$ for each of the periods between 06:00 and 00:00 hours midnight.

The $L_{A\ 10\ (T)}$ is the is the A weighted noise level exceeded for 10% of the specified measurement period (T) and gives and indication of the upper limit of fluctuating noise such as that from road traffic.

In the table below taken from PPG24, the levels are compared with NEC (Noise Exposure Category) bands A to D.

NEC	
A	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 a desirable level.
B	Noise should be taken into account when determining planning applications and, where appropriate, conditions imposed to ensure an adequate level of protection against noise.
C	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.
D	Planning permission should normally be refused.

See appended site layout plan, aerial photograph and copies of calibration certificates for equipment used.

6.0 RESULTS

Measurements were taken on Friday 24th July and Sunday 26th July to ascertain the worst case noise levels whilst the Public House and the Play Area were in use. The traffic noise and the lowest background levels were also measured.

The highest levels recorded for the Pub and Play area occurred between 19:00 hrs and 00:00 hrs midnight.

Measurements were taken in 'free field'. The parameter required is the Leq ($L_{A\,EQ,\,T}$), however this measurement is for information only as the actual noise form the Pub could be as high as 85 dB(A) at the site boundary if live music were to be used.

Maximum measured levels for Public House whilst the Play area was in use:

Date	Time	Run Time	Leq	Lmax	Peak	SEL
24/07/09	20:49	00:15:00	**48.5**	60	94.3	76

After noise had ceased during the night the lowest night time background levels (L_{90}) were:

Date	Time	Run Time	L90
26/07/09	02:35	00:5:00	**39.4**

Due to security and H&S reasons it was not possible to undertake an unattended 24hr measurement of the road traffic noise. However the measurements were carried out to obtain the required levels laid out in Planning Policy Guide 24.

Noise from the road traffic was measured at 'worst case' during Friday morning noting that a 30 mph speed limit is in place. Traffic noise is within NEC Band A of PPG 24. The required parameter is the L_{10}.

Date	Time	Run Time	L10
24/07/09	08:35	00:59:59	**40.5**

The $L_{A\,MAX}$ levels did not exceed 82 dB on the fast response meter setting. The maximum measured $L_{A\,MAX}$ level was 60 dB therefore as per PPG24 this has no effect on the NEC Band level rating. Should levels 82 dB several times in any Band C is applied regardless of the L_{10}.

7.0 MEASUREMENT EQUIPMENT

All measurements were carried out using a Cirrus Research CR:821C Class 1 Environmental Noise Meter with current calibration certificate mounted on a tripod with proprietary foam wind shield and in accordance with BS EN 60651 and BS 7445:1993.

The meter was also calibrated on site using a hand held acoustic calibrator prior to taking measurements. The acoustic calibrator also has a calibration certificate current at the time the measurements were taken.

The acoustic calibrator was used again to check the meter at the end of each measurement period and no significant drift occurred.

8.0 ANALYSIS OF RESULTS

Noise Control parameters for new Care Centre – Noise from Public House

The measured noise level from the Public House, as per BS 4142 : 1997 with a correction of 5 dB added for the type of noise (human voice/music etc.) are 48.5 + 5 = 53.5 dB(A. As the rating is more than 10dB above background level of L_{90} 38.5 dB(A) complaints regarding noise are likely should occupants of the new care centre open their bedroom windows.

The predicted 'worst case' excess of rating over background level with live music in the Pub is 85+5 = 90 - 39 = 51 dB(A) which is far in excess of the background levels.

Attenuation of 61 dB minimum is recommended for the windows and building fabric adjacent to the public house.

Noise Control parameters – Noise from Care Centre affecting existing residential site

The noise from the dining room, kitchen, ventilation fans, cooling fans and plant etc. shall be controlled at 10 dB below background level to negate the possibility of complaints from the nearest existing residential property, as per BS 4142 recommendations.

The background noise level was measured at L_{90} 38.9 dB(A) therefore noise emitted form the new care home should be limited to 29 dB(A) at the site boundary.

Traffic Noise

Traffic noise falls within Band A of PPG24 NEC ratings, which is the expected result for a low use residential minor access road, and therefore no additional noise mitigation measures are required for this rating.

9.0 CONCLUSION AND RECOMMENDATIONS

From the results noted above the noise controlled can be controlled to comply with current planning guidance, although additional noise mitigation measures are required to be implemented by the design and construction team.

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The recommendation is therefore to achieve attenuation of a minimum of 61 dB through the new residential Care Centre walls, ceiling, floor and glazing to achieve a good standard of noise control as indicated in BS 8233 for the areas

In addition to the above the new work would be required to be in accordance with Approved Document E of The Building Regulations, Resistance to Passage of Sound.

The following items shall be implemented to provide adequate control of noise:

- External walls - Dense aggregate concrete block, brick outer leaf, with 75mm fully insulated cavity, dense plaster 19mm thick internally and well sealed. Or similar construction noted in BS 8233 with overall mass not less than 425 kg/sq.m. To provide minimum attenuation of 61 dB.

- Bedroom windows - Double glazed windows with suitable air gap, possibly with additional secondary glazing and air gap, panels to be of suitable thickness (10mm). A specialist glazing design would be required for windows adjacent to the Public House (3 sides of the building) to provide attenuation of 61 dB. Bedroom windows could be standard double glazed with opening lights where facing the existing residential unit.

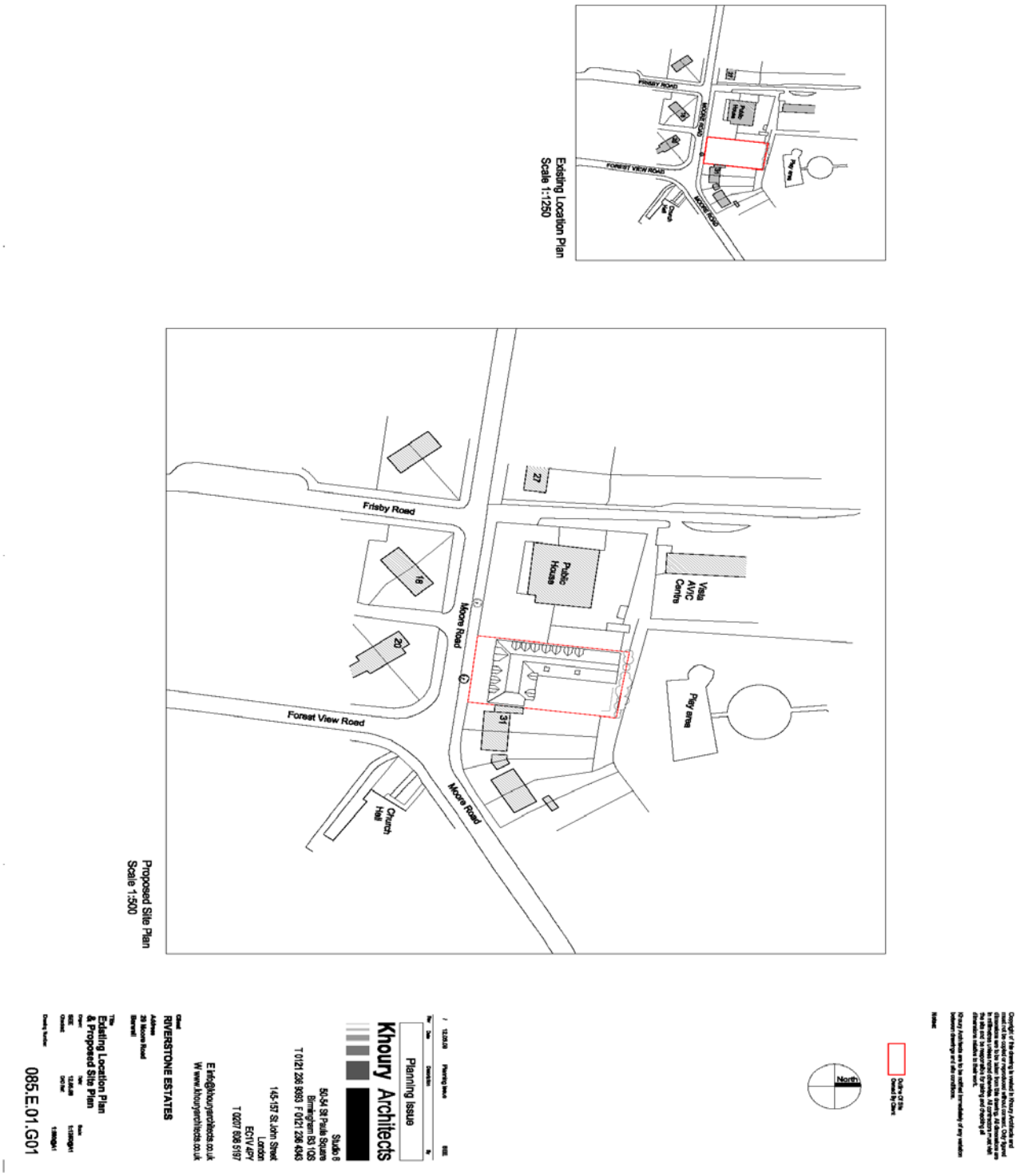
- Ground floor windows to living areas to provide minimum 51 dB attenuation as the 'WHO' guidance for noise intrusion to living spaces allows a higher level than for sleeping areas.

- Enhanced mechanical ventilation is required to the residential bedrooms and living areas. The rooms should be mechanically ventilated to allow windows to be closed during noisy periods in accordance with Part F of the building regulations.

- Noise from building services fans, a/c equipment etc. to be attenuated to 29 dB(A) at the site boundary.

- Barrier wall to be constructed between the new parking area and the adjacent residential house No. 31 as tall as is practical, minimum density of 15 kg/sq.m, with sound absorbent layer on the car park side.

10.0 SITE LAYOUT & CALIBRATION CERTIFICATES



Certificate of Calibration

Cirrus Research plc

Equipment Details

Instrument Manufacturer	Cirrus Research plc
Instrument Type	Sound Level Meter
Model Number	CR:831C
Serial Number	D20878/F

Calibration Procedure

The instrument detailed above has been calibrated to the published test and calibration data as detailed in the instrument handbook, using the techniques recommended in the latest revisions of the International Standards IEC 61672-1:2002, IEC 60651:1979, IEC 60804:2001, IEC 61260:1995, IEC 60942:1997, IEC 61252:1993, ANSI S1.4-1983 and ANSI S1.43-1997 where applicable.

Sound Level Meters: All Calibration procedures were carried out by substituting the microphone capsule with a suitable electrical signal, apart from the final acoustic calibration.

Calibration Traceability

The equipment detailed above was calibrated against the calibration laboratory standards held by Cirrus Research plc. Which are traceable to the appropriate International Standards.

The Cirrus Research plc calibration laboratory standards are:

Microphone Type	B&K4192	Serial Number	1920791	Calibration Ref.	S 5702
Pistonphone Type	B&K4220	Serial Number	613843	Calibration Ref.	S 5626

Calibrated by

Calibration Date 27 April 2009

Calibration Certificate Number 168582

This Calibration Certificate is valid for 12 months from the date above.

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