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SHORTWOOD BUSINESS PARK, HOYLAND, BARNSLEY

NOISE ASSESSMENT REPORT

for

TAPTON ESTATES LTD

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NOISE ASSESSMENT REPORT

1. INTRODUCTION

This noise assessment has been made on behalf of Tapton Estates Ltd (formerly Hepworth Properties Ltd) for the proposed development of the Shortwood Business Park, Hoyland, Barnsley for mixed industrial use.

The assessment was commissioned after planning permission was granted in 1996 and following questions raised by Barnsley MBC at a meeting with Tapton Estates Ltd on 23 November 2001. A subsequent discussion with Barnsley MBC Environmental Health has allowed their views to be taken into consideration.

In carrying out the assessment reference has been made to the following publications:

1. British Standards Institution. BS 4142: 1990. *"Method for rating industrial noise affecting mixed residential and industrial areas"*. BSi, 1990.
2. Department of the Environment. *Planning Policy Guidance PPG24: "Planning and Noise"*. HMSO, 1994.
3. World Health Organisation. *"Environmental Health Criteria 12 – Noise"*. WHO, 1980.
4. World Health Organisation. *"Guidelines for Community Noise"*. WHO, 1999.
5. British Standards Institution. BS 5228: 1997. *"Noise and vibration control on construction and open sites"*. BSi, 1997.

Reference has also been made to drawings produced by Wm. Saunders Partnership, including Nos. SL7313(SY)01A "Measurement of Land and Levels", SL7313(D)05B "Site Layout showing Proposed Levels" and SL7313(D)01C "Site Layout".

2. EXISTING CONDITIONS

2.1. Site Details

The Shortwood Business Park site is located north of the A6195 Dearne Valley Parkway and approximately 1 km to the north east of junction 36 of the M1 motorway. The site is accessed from a roundabout on the A6195 via an adopted road initially traveling in a northwesterly direction and then turning to the east to High Royd Farm. High Royd Farm is located close to the northeast facing site perimeter. From the point where the road turns to the east there is a short section of road that continues to join a private road that terminates at 11 semi detached and detached cottages, known as Shortwood Villas, abutting a dismantled railway line. These cottages are 40m to 50m distant from the northwest site boundary

The cottages and the farm were the only residential properties in close proximity to the site when Barnsley MBC granted planning permission in 1996 for industrial development of the site. Since that time, the old barns attached to High Royd Farm have been converted to provide a residential accommodation complex with nine properties in total. One of these properties is close to the boundary.

Historically, the site was used for heavy industry, originally it was a brickworks and subsequently used for other industry before being cleared for the now proposed industrial development in the late 1990's.

2.2. Noise Levels

A Glossary of Acoustical Terminology is given in Appendix 1 attached.

The site was visited in the morning (10.00 to 12.00 hours) of the 28 November 2001 when the conditions were dry, the temperature 5.5^{0}C and a breeze from the west. Traffic on the Dearne Valley Parkway was very light and apart from a short period when a lorry was loading concrete blocks at High Royd Farm, the only audibly apparent noise on the site was from the M1 motorway.

Noise measurements were made at the time of the visit at three positions on a line across the centre of the site and parallel to the A6195. The measured noise levels were all of the same order circa 54 dB L_{Aeq} and did not increase as the distance to the M1 decreased, this was probably because noise from the M1 appears to have two paths to the site, from the southwest and the northwest, either side of Birdwell. The measured noise levels were steady hence, the background noise levels in terms L_{A90} were the same order as the ambient noise levels in terms of L_{Aeq}.

3. NOISE ASSESSMENT

3.1 Noise from the Business Park

The first stage in carrying out the assessment was to establish the expected level of noise from the completed Business Park. Until such time that the occupants of the estate and full details of the type of industries are known it is not possible to predict the final noise levels. To obtain a good indication of the likely noise levels on completion, data from measurements on other industrial estates in areas with similar background noise levels have been reviewed. Some of this information was from data held by the author and some from recent measurements specifically made for this project. For reasons of expediency the measurements were made on industrial

estates in the southeast, however, it should be noted these were all at higher occupancy densities than that proposed at Shortwood. This noise data is given in Table 1 attached.

It will be seen from Table 1 that there is little difference between the noise levels measured at the four different sites and at different times. The range in noise levels is from 56 to 58 dB L_{Aeq} with a corresponding range in the L_{A90} levels from 51 to 55 dB. The closeness of these results show that the general noise from the four industrial estates is reasonably steady in nature for most of the time, and the variations between the different estates is small. There are times when higher noise levels were apparent, particularly due to vehicle loading in the near vicinity and audible reverse warning signals.

There are three main sources of noise from most industrial estates that are also expected to arise from the proposed Shortwood Business Park. These are:

1. Noise from cars when the workforce arrive and depart at the beginning and end of each working day. This noise is not usually perceived as a nuisance unless car parks are in very close proximity to residential property.
2. Noise from individual industrial units when these are used for manufacturing. Any noise will depend on the manufacturing process, sound insulation of the building fabric and the need for exhaust ventilation. The latter item is often the most noticeable noise source.
3. Loading/unloading of materials/product with the associated use of forklift trucks and audible reverse warning signals. These activities usually take place in the service areas adjacent to the built units and when in close proximity to properties the random higher noise levels are the most noticeable.

In order to avoid unnecessary restrictions or controls that could inhibit subsequent prospective occupiers of the estate, careful consideration has been given to the layout design to control any potential noise impact on the nearest residential properties. The design is shown on the WSP layout drawing No.SL7313(D)01 version C amended December 2001 and shows the following:

- The nearest 929 m^2 (10,000 ft^2) unit to High Royd Farm has been removed. The nearest units to the Farm are now Unit 3 (279 m^2 or 3,000 ft^2 unit) at about 40 m distance and Unit 11 (2,323 m^2 or 20,000 ft^2 unit) at about 50 m from the barn conversions.
- The area of existing established landscaping to the northwest of the barn conversions has been retained and used to maximise the natural screening of Unit 11. This unit will be more than 10 m lower than High Royd Farm
- Most of the service yards are located so that the industrial units or site topography provide acoustic barriers between them and the nearby residential dwellings.
- There are two service yards that are not screened from residential properties, these are Unit 1 and Unit 12. Although these service yards are 150 m and 80 m distant from Shortwood Villas and High Royd Farm respectively, 2 m high earth bund noise barriers have been included to enhance the noise attenuation and avoid any direct line of sight.
- A 2 m high acoustic barrier has been included at the eastern end of the common service yard between Unit 3 and Unit 4 near High Royd Farm. This will be of masonry construction to provide an effective barrier to noise from the service yard impacting on the farm.
- Wherever possible car park areas have been located in the shadow zones of industrial units.

In addition to the above, as the ground falls away from High Royd Farm towards the west, a 2m high earth bund has been included on the 10 m wide landscaping strip north of the farm access road. This bund will provide additional noise attenuation between the barn conversions and the proposed development.

All of the above will be positive in controlling noise from the application site, particularly the random noises from the service yards, and reducing the noise received at the nearest residential properties.

Although it is not practicable to calculate the noise level expected from the completed Business Park with any accuracy, the typical noise levels given above and in Table 1 have been compared with the background noise levels measured on site and current UK guidance as to acceptability.

BS 4142: 1990[1]

This Standard is the appropriate guidance for assessing new noise from industry as it affects existing residential areas. The Standard recommends that the noise level from the industry under consideration should be obtained by measurement or calculation, for the reasons given above this was not possible, hence the assessment made according to the Standard can only be regarded as approximate guidance.

The assessment made is shown in Table 2 and as the Rating Level is only 2 dB above the measured background level it can be concluded that noise should only be of marginal significance in respect of potential complaints about noise. The Rating Level is the measured ambient noise level corrected for character and for any noise barriers, but distance corrections have not been included to obtain a worst case scenario.

PPG 24: 1994[2]

This Planning Policy Guidance document is for assessing sites where it is proposed to build new dwellings in an area where there is an existing noise source. However, it does contain useful guidance on acceptable "free field" noise levels during the daytime and night-time. These noise levels are in terms of absolute levels and are based on World Health Organisation publications[3,4].

The guidance given in PPG 24 states that daytime noise levels below 55 dB L_{Aeq} need not be considered as a determining factor in granting planning permission. This level is based on the WHO work that concluded, "general daytime outdoor noise levels of less than 55 dB L_{Aeq} are desirable to prevent any significant community annoyance". At higher noise levels of 55 – 63 dB L_{Aeq} the PPG suggest some noise control should be applied

Assuming that the industrial estate noise levels measured at other locations, given in Table 1, are representative and similar noise levels will arise from the application site, allowing for distance attenuation the received noise level at the barn conversions adjoining High Royd Farm will be in the order of 55 dB L_{Aeq}. This is the same level as the acceptability criteria given in the guidance, in practice the noise will be further reduced by the proposed screening, although randomly occurring higher noise levels from the service yards may counter this. The received noise level at Shortwood Villas will be lower due to the greater distance from source to receiver and the topography. Consequently, using the guidance on acceptability in PPG 24, there is a strong indication noise will not give rise to problems to the local residents.

It is recognized that the methodologies adopted in the above two assessments cannot be regarded as precise for the reasons given, but both give a strong indication that noise should not be a problem and under normal operations on the Business Park noise will be of marginal significance to the occupants of High Royd Farm and Shortwood Villas.

3.2 Noise from Site Construction

At this stage of the proposed development, before contracts are let and details of construction methods and programme are known, the likely noise levels cannot be predicted with any accuracy. As is general with sites of this type, development is not rapid and is usually

programmed to coincide with the rate of occupation, this means there is no concentration of site activity using large numbers of items of plant in limited areas that could give rise to high levels of noise.

It is assumed that the most noticeable work will be the construction of the earth bund noise screen on the landscape strip close to the residential property of High Royd Farm. As the purpose of this screen is for subsequent protection of the local resident this short-term impact is unavoidable. The type of construction plant employed, excavator or loader and dump trucks, will have a similar noise level to mobile agricultural machinery and will not be out of character in the locality.

Controlling noise from the site construction in general will be best achieved by adopting techniques and controls in accordance with best practice, including the following:

- The guidance given in BS 5228: 1997[5].
- Employing good site management practice.
- Restricting hours of work to 0800 to 1800 hours on weekdays, 0800 to 1300 hours on Saturdays and avoiding work on Sundays and Bank Holidays other than in emergency situations when noisy activities, such as earth moving, take place near to residential property.
- Constructing the earth bund noise screen adjacent to High Royd Farm early in the construction cycle to attenuate noise from other construction activities.

Once the contractor has been appointed it would be appropriate to re-visit the construction phase and if high noise levels are perceived from any part of the construction cycle that will impact on local residents, then the methodology should be discussed and agreed with Barnsley MBC.

4. SUMMARY AND CONCLUSIONS

This report covers the assessment of noise from the proposed Shortwood Business Park development at a site at Hoyland on the A6195 Dearne Valley Parkway and the potential impact, if any, on residential property of Shortwood Villas and the High Royd Farm complex. From this report it can be concluded as follows:

1. The design of the Park has been to maximise the benefits of the layout and topography to provide barriers to screen any noise from the residential properties.
2. The service yards attached to the industrial units are possibly a source of random noise. These have all been screened in the site layout or by specific noise barriers and the nearest service yard to any of the residential properties is at a distance of more than 50 m.
3. As the occupants of the Business Park and types of industry are not yet available, noise data from other similar industrial estates has been reviewed. This data has been used to assess the likely impact on the dwellings and, according to BS 4142:1990, noise will be of marginal significance.
4. Although not entirely appropriate, comparison of the estimated noise levels at the dwellings has been made with the acceptability criteria in PPG 24. Again this would indicate noise should not be problem.
5. There will be noise during the construction phase, most notably during construction of the earth mound noise screens. However good site management in accordance with best practice will do much to minimise any impact.

In general, with the actions proposed, noise from the proposed Shortwood Business Park development should not be a significant impact on the local residential dwellings.

TABLE 1

NOISE LEVELS FROM OTHER SIMILAR INDUSTRIAL ESTATES

INDUSTRIAL ESTATE	MOTORWAY, PROXIMITY and OTHER NOISE SOURCES	NOISE LEVELS IN dB	
		L_{A90}	L_{Aeq}
Holmethorpe, Frenches Road, Redhill, Surrey	M23/M25 at 2 km and 1.5 km London to Brighton railway line	54	58
Vale, Tolpits Lane, Watford, Hertfordshire	M25 at 2.5 km London to Aylesbury railway line	52	57
North Watford Industrial Area, Hertfordshire	M 1 at 1 km West Coast railway line and Watford link road	54	58
Watford Industrial Park, Hertfordshire	M 25 at 3 km	51	56

NOTES:

1. All measurements were made on roads within the industrial estates. The sites were predominantly level without any purpose designed acoustic barriers or earth bund noise screens.

2. As the measurements were "manned", close vicinity road traffic noise was excluded to obtain representative and comparable data.

3. All measurements were made in the daytime on weekdays with dry and calm weather conditions.

4. All sites were typical industry mixes containing distribution, manufacturing and storage.

TABLE 2

BS 4142: 1990 – ASSESSMENT

The following assessment is for High Royd Farm and the associated residential properties during the daytime.

Typical noise level from measurements on other industrial estates	57 dB L_{Aeq}
Character correction to allow for impulsive and reverse signal noise	+ 5 dB
Barrier correction to allow for noise screening (note this is a minimum and could be greater)	-6 dB
Rating Level	56 dB L_{Aeq}
Measured background noise level	54 dB L_{A90}
Assessment level	56 – 54 = +2
Conclusion	Marginal significance

NOTES:

1. The measured noise levels on other estates were made within the estates, however, to represent the worst case no correction has been made to the measured noise levels for distance attenuation and the higher measured noise levels have been used, corrected for background noise.

2. The barrier correction is to allow for partial screening between the estate and the barn conversion properties at High Royd Farm.

APPENDIX 1

GLOSSARY OF ACOUSTICAL TERMINOLOGY

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GLOSSARY OF ACOUSTICAL TERMINOLOGY

1. Sound Pressure Level (L_p)

The basic unit of sound measurement is the sound pressure level, based on pressure measurement. As the pressures to which the human ear responds can range from 20 mPa to 200 Pa, a linear measurement of sound levels would involve very large numbers. To avoid this, the pressures are converted to a logarithmic scale and expressed in decibels (dB) as follows:

$$L_p = 20 \log (p/p_0)$$

where L_p = sound pressure level in dB; p = rms sound pressure level; and p_0 = reference sound pressure (20 mPa).

2. Sound Level (L_{pA})

Sound level is the value measured with a sound level meter, which incorporates frequency weighting networks. These attenuate the signal at some frequencies and amplify it at others. Sound levels measured with the A-weighting network are expressed in dB(A). The A-weighting network approximately corresponds to the frequency response of the human ear.

3. Sound Power Level (L_W)

The sound power level of a source is an absolute measure of the sound output, but it cannot be measured directly. It is usually calculated from a sound pressure level and the distance from the source at which that sound pressure level is measured. For sound radiating uniformly and hemispherically from a point source on a flat reflecting surface, the equation is:

$$L_W = L_p + 20 \log r + 8$$

where L_W = sound power level in dB re 10 W^{-12}; and L_p = sound pressure level in dB re 20 mPa at a distance r metres from the source.

4. Equivalent Continuous Sound Level (L_{Aeq})

Sound levels invariably fluctuate. A summation can be made of the sound energy in the fluctuating sound and a steady level of the same total energy calculated. This steady level is termed the equivalent continuous sound level. L_{Aeq} can be determined over any time period, which is indicated as $L_{Aeq,T}$ where T is the time period (e.g. $L_{Aeq,1\ hour}$, $L_{Aeq,12\ hour}$, etc).

In mathematical terms, L_{Aeq} is given by:

$$L_{Aeq} = 10 \log \{1/T \int_{t=0}^{t=T} (p_{A(t)}/p_0)^2 \, dt\}$$

where L_{Aeq} = equivalent continuous sound level in dB over a time period T; $P_A(t)$ = instantaneous sound pressure in Pa varying with time t; and p_0 = reference sound pressure (20 mPa).

5. Background Noise ($L_{A90,T}$)

Background noise is the noise level exceeded for 90% of the time over the specified period T. It is the basic noise level in a locality and does not include the effects of short duration noise.

6. Ambient Noise ($L_{Aeq,T}$)

Ambient noise is a measure of the average noise level over the specified time period T and includes contributions of all noise sources

7. Maximum Noise (L_{Amax})

This is the highest A-weighted sound pressure level recorded by the sound level meter during the measurement period.

8. Level Exceeded for 10% of the Time ($L_{A10,T}$)

This is a measure of the higher noise levels to which a locality is exposed during time T. The noise produced from road traffic is generally expressed in terms of $L_{A10,18\ hour}$.

9. Sound Exposure Level (SEL)

The level at the reception point which, if maintained for a constant period of 1 second, would cause the same A-weighted sound energy to be received as is actually received from a given noise event.