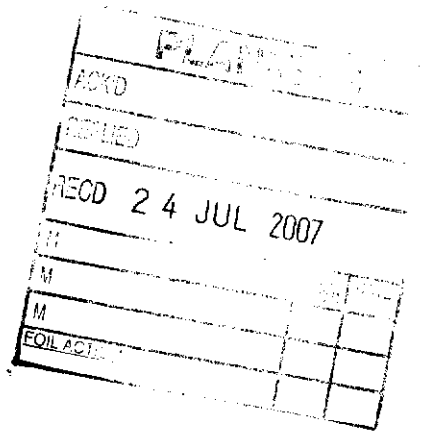

PROPOSED EXTENSION TO BROOKWAY RETAIL PARK, ALTRINCHAM ROAD, BAGULEY

NOISE ASSESSMENT

On behalf of:

King Sturge LLP

Report No. 4676.1v1
June 2007

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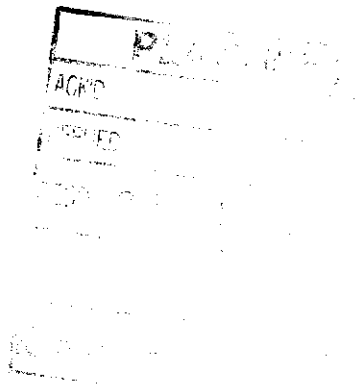

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1.0 INTRODUCTION

1.1 Hepworth Acoustics has been commissioned by King Sturge LLP to carry out a noise assessment in relation to a proposed extension to Brookway Retail Park, Altrincham Road, Baguley.

1.2 The noise assessment has included:

- Measurement of the existing noise climate at appropriate locations on the site during the day and night on a weekday and on a Sunday afternoon;
- Assessment of potential noise impact of car park noise, deliveries and building services equipment to the relevant standards; and
- If necessary/feasible, recommendation of appropriate noise mitigation measures for the development.

1.3 The various noise units and indices referred to in this report are described in Appendix I. All results referred to in the text are rounded to the nearest decibel as fractions of decibels are imperceptible.

2.0 SITE DESCRIPTION AND PROPOSALS

2.1 The site is located off Altrincham Road (A560), Baguley which is a busy dual carriageway road between Altrincham and Stockport. Brookway Retail Park features large "Wickes" and "Matalan" retail units with smaller "JJB Sports" and "Pets at Home" units. The surrounding area is a mix of residential and commercial land-uses with a large 24 hour Tesco Extra store with associated car parking and petrol station located on the opposite side of Altrincham Road. There is an existing timber acoustic fence of approximately 2 metres height along the western boundary of the site.

2.2 The proposed extension comprises a small area of 25 additional car parking spaces to the west of the existing Wickes unit and four small/medium sized commercial units located with 20 associated car parking spaces at the south west of the site adjacent to Altrincham Road.

2.3 The nearest dwellings to the proposed extension are on Gateacre Walk and Arden Lodge Road to the west of the site.

2.4 The assessment has been based on layout drawing ref: MB/501 dated May 2007, provided by King Sturge LLP. Site plans are shown in Figure 1.

3.0 AMBIENT NOISE SURVEY

3.1 Measurements of existing noise levels were taken at two locations at the site boundary between 13:45 hours and 16:30 hours on Friday 8th June 2007; 13:00 hours and 15:45 hours on Sunday 10th June 2007; and between 02:00 hours and 02:45 hours on Thursday 14th June 2007.

3.2 The two locations (as shown in Figure 1) were as follows:

i) At the side of the Wickes unit

ii) At the boundary of the site with the rear garden of 99 Gateacre Drive

3.3 It was not possible to get access to the disused petrol station during the noise surveys. However, noise levels at the petrol station are considered to be broadly similar to those measured at Location 2.

3.4 All noise measurements were carried out using a Brüel & Kjaer 2260 'Type 1' Integrating Sound Level Meter (serial number 02467015). A windshield was fitted to the microphone during all noise measurements and a calibration check was carried out before and after each of the noise surveys with no variance observed. Weather conditions during the noise measurement surveys were generally dry, warm and calm or with a light breeze (< 5m/s).

3.5 The survey results are shown in Appendix II at the end of this report and are summarised in Table 1 below.

Table 1: Summary of Measured Existing Noise Levels (dB)

Location	Weekday Daytime		Weekday Night		Sunday Afternoon	
	L_{Aeq}	L_{A90}	L_{Aeq}	L_{A90}	L_{Aeq}	L_{A90}
1	51	44	38	34	52	44
2	59	51	47	42	58	52

3.6 Noise levels at Locations 2 were mainly due to road traffic noise from Altrincham Road. At Location 1, further back from Altrincham Road, noise levels were lower as one would expect. The Sunday afternoon noise levels were similar to weekday daytime noise levels.

4.0 ASSESSMENT OF NOISE IMPACT

Car Park Noise

4.1 One noise source associated with the proposed extension will be will be due to use of the additional car parking. Whilst noise levels of manoeuvring cars in car parks is usually modest, higher noise levels can be generated during the closing of car doors and starting up of car engines. It is possible to calculate the typical $L_{Aeq,1hour}$ noise levels that are likely to be experienced at the nearest houses from such activities based upon measured source noise levels from car engines and doors that have been measured previously in car parks.

4.2 Noise calculations during a busy hour have been carried out in terms of L_{Aeq} for the nearest dwellings. We have assumed that, on a 'worst case' basis, during a busy daytime period, that for each new parking space, two cars will arrive and depart during the hour period. The equivalent average one-hour noise level for one car parking space has been calculated as 43 dB $L_{Aeq,1hour}$ at a distance of 10 metres.

4.3 The calculated noise level outside 99 Gateacre Walk from the 20 new proposed car parking spaces between the proposed commercial units is 51 dB $L_{Aeq,1hour}$. This is equal to the existing daytime background L_{A90} noise level and approximately 7 dB below the existing daytime ambient L_{Aeq} noise level. However, if the existing acoustic fence along the western boundary of the site is extended along the boundary between the proposed new car parking spaces and dwellings in Gateacre Drive (as shown in Figure 2), the car parking noise levels will be at least 10 dB lower.

4.4 Taking into account the existing timber acoustic fence along the western boundary of the site, the calculated noise level outside 51 Gateacre Walk from the 25 new proposed car parking spaces at the side of Wickes is 43 dB $L_{Aeq,1hour}$. This is 1 dB below the existing daytime background L_{A90} noise level and 8 dB below the existing daytime ambient L_{Aeq} noise level.

4.5 Therefore, we conclude that noise from car parking would not give rise to any unacceptable noise impact on residential amenity.

Deliveries

4.6 Due to the proximity of dwellings, we recommend that deliveries are limited to daytime (i.e. 08:00 – 19:00) only. It is anticipated that there will be a small number of deliveries to the proposed commercial units. For the purposes of this assessment, we have assumed a worst case of up to two HGVs visiting the site in any given 1 hour period during the daytime. Based on two HGVs arriving and two HGVs departing in a one hour period, the calculated resulting noise level for HGV noise is 50 dB $L_{Aeq,1hour}$. This is 1 dB below the existing daytime background L_{A90} noise level and 8 to 9 dB below the existing daytime ambient L_{Aeq} noise level.

4.7 Nevertheless, we recommend that an acoustic fence (similar in height and construction to that already installed along the western boundary) is installed along the boundary of the site between the proposed retails units and dwellings on Gateacre Drive as shown in Figure 2.

Mechanical Services Plant

4.8 It is assumed that some mechanical ventilation and/or refrigeration equipment will be required and this equipment may operate throughout 24 hours. However, no details relating building services equipment is available at this time. Therefore, we have provided noise limits for such equipment in order to protect residential amenity.

4.9 Guidance for assessing noise impact of industrial plant and fixed machinery on existing residential areas is set out in BS 4142 'Method for rating industrial noise affecting mixed residential and industrial areas', 1997. This requires the noise from the proposed equipment (in L_{Aeq}) to be compared with the existing background noise level (L_{A90}). A 5 dB penalty is added for operations which give rise to intermittent peaks of noise or discrete tones.

4.10 BS 4142 states that if the rated noise level exceeds the L_{A90} background noise level by 10 dB or more then complaints would be likely. An excess of 5 dB over the background noise level is viewed as being 'of marginal significance'. A rated noise level more than 10 dB below the background noise level is regarded as a positive indication that complaints are unlikely.

4.11 We consider that, in order to protect residential amenity, the rating level of building services equipment must not exceed the background noise level measured outside the nearest dwellings.

4.12 Based on the measured background noise levels, we recommend that the noise rating level of all plant combined must not exceed 42 dB $L_{Aeq,5mins}$ outside the dwellings on Gateacre Drive. This needs to be taken into account by the Tenant's mechanical services contractor at the detailed design stage.

5.0 SUMMARY AND CONCLUSION

5.1 A noise assessment has been carried out for a proposed extension to Brookway Retail Park, Altrincham Road, Baguley.

5.2 We have recommended that, in order to minimise noise from the development outside the nearest dwellings, the existing acoustic fence along the western boundary of the site is extended along the boundary between the proposed commercial units and the rear gardens of dwellings on Gateacre Drive.

5.3 The assessment has shown that with the proposed acoustic fence noise associated with the proposed additional car parking spaces and from HGV deliveries will be fairly modest and wuill be below existing daytime background noise levels outside the nearest dwellings. Therefore, there will be no unacceptable impact from vehicle noise associated with the proposed extension to Brookway Retail Park.

5.4 No details relating to proposed building services equipment is available at this time. Therefore, we have recommended appropriate noise design limits in order to protect residential amenity.

FIGURE 1 – NOISE MEASUREMENT LOCATIONS

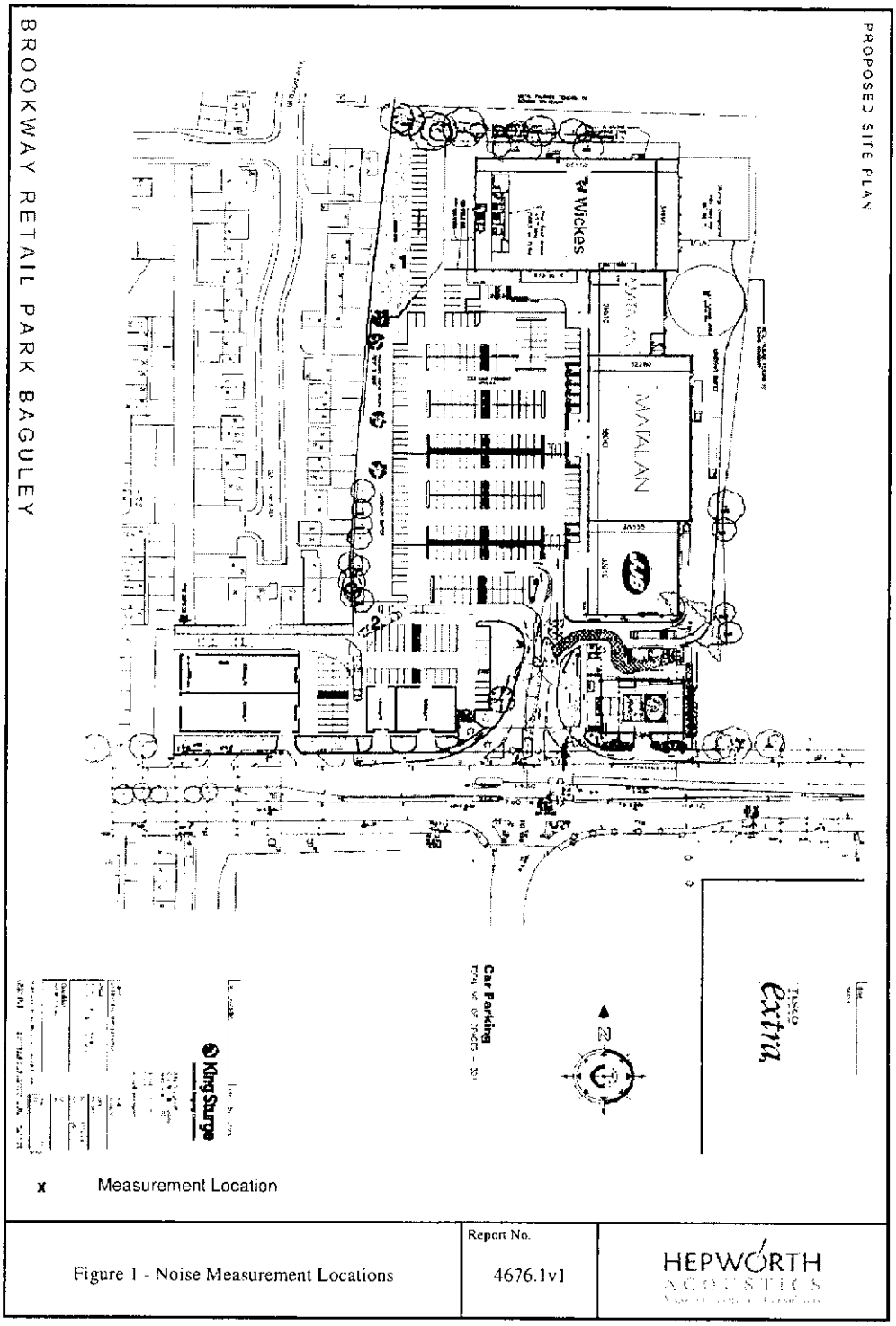

FIGURE 2 – ACOUSTIC BARRIER LOCATION

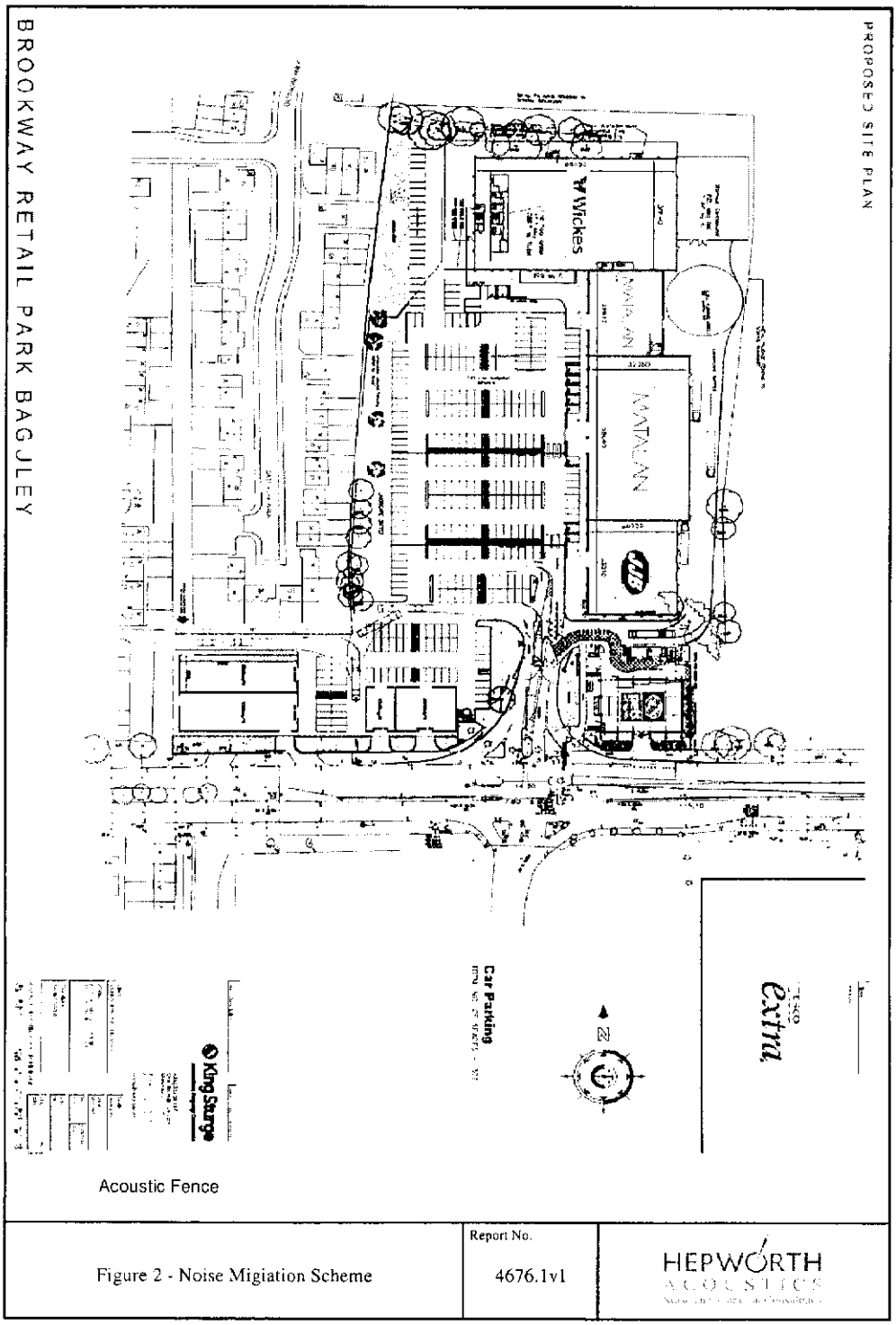

Figure 2 - Noise Migiation Scheme	Report No. 4676.1v1	HEPWORTH ACOUSTICS

Appendix I – Noise Units and Indices

a) Sound Pressure Level and the decibel (dB)

A sound wave is a small fluctuation of atmospheric pressure. The human ear responds to these variations in pressure, producing the sensation of hearing. The ear can detect a very wide range of pressure variations. In order to cope with this wide range of pressure variations, a logarithmic scale is used to convert the values into manageable numbers. Although it might seem unusual to use a logarithmic scale to measure a physical phenomenon, it has been found that human hearing also responds to sound in an approximately logarithmic fashion. The dB (decibel) is the logarithmic unit used to describe sound (or noise) levels. The usual range of sound pressure levels is from 0 dB (threshold of hearing) to 120 dB (threshold of pain).

b) Frequency and hertz (Hz)

As well as the loudness of a sound, the frequency content of a sound is also very important. Frequency is a measure of the rate of fluctuation of a sound wave. The unit used is cycles per second, or hertz (Hz). Sometimes large frequency values are written as kilohertz (kHz), where 1 kHz = 1000 Hz.

Young people with normal hearing can hear frequencies in the range 20 Hz to 20,000 Hz. However, the upper frequency limit gradually reduces as a person gets older.

c) Glossary of Terms

When a noise level is constant and does not fluctuate, it can be described adequately by measuring the dB level. However, when the noise level varies with time, the measured dB level will vary as well. In this case it is therefore not possible to represent the noise climate with a simple dB value. In order to describe noise where the level is continuously varying, a number of other indices can be used. The index used in this report is described below together with a glossary of terms.

L_{Aeq} This is the A–weighted 'equivalent continuous noise level' which is an average of the total sound energy measured over a specified time period. In other words, L_{Aeq} is the level of a continuous noise which has the same total (A–weighted) energy as the real fluctuating noise, measured over the same time period. It is increasingly being used as the preferred parameter for all forms of environmental noise.

L_{Amax} This is the maximum A–weighted noise level that was recorded during the monitoring period.

L_{A10} This is the A–weighted noise level exceeded for 10% of the time period. L_{A10} is usually used as a measure of traffic noise.

L_{A90} This is the A–weighted noise level exceeded for 90% of the time period. L_{A90} is used as a measure of background noise.

Appendix II – Results of Noise Survey at Rear of Site

Date: Friday 8th June (daytime); Wednesday 13th June (evening); Wednesday 13th June (night); Sunday 10th June (weekend)

Equipment: B&K 2260 'Type 1' Integrating Sound Level Meter (sn : 2370580), tripod, calibrator.

Weather: Dry and calm or light breeze. Hot in the daytime.

All results are free field noise measurements in dB (A), frequency analysis was also carried out.

DAYTIME

Location 1 – Adjacent to Wickes

Time		L_{Amax}	L_{A10}	L_{Aeq}	L_{A90}	Comments
13:48	14:03	70.3	53.6	51.0	44.4	Road traffic in car park, distant road traffic on Altrincham Road.
14:44	14:59	69.2	52.2	50.0	43.2	Road traffic in car park, distant road traffic on Altrincham Road.
15:45	16:00	71.4	53.0	51.7	44.0	Road traffic in car park, distant road traffic on Altrincham Road.

Location 2 – Opposite JJB Sports

Time		L_{Amax}	L_{A10}	L_{Aeq}	L_{A90}	Comments
14:07	14:22	74.1	61.0	58.2	52.0	Road traffic in car park and on Altrincham Road
15:05	15:20	76.5	62.4	59.7	50.4	Road traffic in car park and on Altrincham Road
16:07	16:22	73.0	59.8	57.6	51.8	Road traffic in car park and on Altrincham Road

NIGHT-TIME

Location 1 – Adjacent to Wickes

Time		L_{Amax}	L_{A10}	L_{Aeq}	L_{A90}	Comments
02:01	02:06	54.9	38.4	38.1	34.4	Distant road traffic and building services (Tesco), occasional road traffic, leaf rustle
02:20	02:25	48.9	38.8	37.4	33.6	Distant road traffic and building services (Tesco), occasional road traffic, leaf rustle
02:41	02:46	49.5	38.8	37.5	34.8	Distant road traffic and building services (Tesco), occasional road traffic, leaf rustle

Location 2 – Opposite JJB Sports

Time		L_{Amax}	L_{A10}	L_{Aeq}	L_{A90}	Comments
02:07	02:12	52.2	46.4	44.1	41	Road traffic and building services (Tesco), occasional road traffic, leaf rustle
02:27	02:32	65.3	51.8	49.9	43	Road traffic and building services (Tesco), occasional road traffic, leaf rustle

WEEKEND

Location 1 – Adjacent to Wickes

Time		L_{Amax}	L_{A10}	L_{Aeq}	L_{A90}	Comments
13:01	13:16	72.3	51.8	50.7	44.0	Road traffic in car park, distant road traffic on Altrimcham Road.
14:04	14:19	69.7	54.6	52.1	45.2	Road traffic in car park, distant road traffic on Altrimcham Road.
15:00	15:15	80.7	51.6	51.6	44.2	Road traffic in car park, distant road traffic on Altrimcham Road.

Location 2 – Opposite JJB Sports

Time		L_{Amax}	L_{A10}	L_{Aeq}	L_{A90}	Comments
13:30	13:45	71.6	60.0	57.3	51.4	Road traffic in car park, road traffic on Altrincham Road.
14:25	14:40	81.9	59.0	57.6	51.8	Road traffic in car park, road traffic on Altrincham Road.
15:25	15:40	78.9	60.4	58.6	52.8	Road traffic in car park, road traffic on Altrincham Road.