Southmoor Park, Wythenshawe.
Delivery Vehicle Noise Assessment







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Project:	Southmoor Park, Wythenshawe
Site:	Southmoor Park Wythenshawe, Manchester, M23 9XS
For:	CB Richard Ellis Ltd
Status:	Final V001
Date:	November 2011
Author:	Mark Harrison AMIOA
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SUMMARY

Enzygo have been commissioned by CB Richard Ellis Ltd, to undertake a noise assessment to quantify the potential noise impact of a change in servicing hours associated with the industrial site at Southmoor Park, Wythenshawe.

Within the scope of the study undertaken, noise levels have been quantified at a location deemed representative of the residential properties closest to the site, being the properties on Tottenham Drive. Noise levels generated by vehicle movements around the site have then been assessed in line with the impact significance criteria as defined in British Standard 4142:1997 Method for Rating Industrial Noise Affecting Mixed Residential and Industrial Areas.

The study concluded that noise from vehicle movements (HGV, LGV and Vans) within the Southmoor Park Site during the evening period (17:00 – 23:00) was of a level sufficient to be considered to have no significant impact at the nearest residential receptors.

The assessment of the overnight period (23:00 – 07:00) indicates that significant noise impacts may result from the movement of HGV vehicles within the site during this period. However, the assessment indicates that the movement of LGVs and Vans during the overnight period resulted in lower impacts at the nearest residential properties. Further assessment of the overnight noise levels indicates that these impacts would fall within the “Good” criteria of more appropriate BS8233 assessment. It is suggested that such movements are limited in frequency to 1 vehicle per hour.

1.0 INTRODUCTION

1.1 Project Introduction

Enzygo Environmental Consultants (Enzygo) have been commissioned by CB Richard Ellis (CBRE) Ltd to undertake a noise assessment of the Southmoor Park site in order to assess the potential noise impact from a proposed change in delivery hours at the site.

More specifically, this assessment will look at the potential impact of a change to planning condition 6 (planning permission reference 33541), which relates to the movement of vehicles during the evening and overnight period and is summarised in section 3.4.

The purpose of this assessment is to quantify any potential impacts associated with the proposed change in planning condition 6, and to assess whether this would be within acceptable levels and, where appropriate recommend suitable mitigation measures.

This assessment is based upon noise survey information collected at the site between the 31st October and 1st November 2011.

Details regarding the assessment methodology used, together with results of the survey undertaken, and the subsequent conclusions and recommendations drawn are presented within the following report.

1.2 Site Description

1.2.1 General Environment

The site is situated in the north-western corner of the Roundthorne Industrial Estate, within the district of Wythenshawe, 8km to the south west of Manchester City Centre.

The access to the site is via an entrance off Southmoor Road and the site is centred at approximate grid reference SJ 80142 89053.



Figure 1: Southmoor Park Site Plan

The site currently contains 7 industrial/warehouse units with associated office space. The units are of steel frame and brickwork construction and have capacity to receive HGV deliveries through full height shutter doors. Under the planning permission, the site has car parking provision for 83 vehicles.

The site is immediately constrained on all sides by features which govern the noise climate of the area. Detailed below are the area classifications and descriptions in the given directions from the site boundary:

- To the north the site is bounded by railway lines with the A560 Altrincham Road beyond this;
- To the east and south the site is bounded by the Roundthorne Industrial estate with associated vehicle movements and industrial processes;
- To the west the site is bounded by residential properties comprising of 2 storey, buildings with windows on the facades overlooking the site.

Within the area of Roundthorne industrial estate there are numerous HGV movements and associated industrial processes being undertaken at various times throughout the full 24 hour period. This was audible during the overnight noise monitoring as summarised in section 4.0 of this report.

1.3 Proposed Scheme

This assessment has been undertaken in order to quantify the potential impact of removing or changing planning condition 6 to permit 24 hour vehicle access to the site.

Within the scope of this assessment the impacts have been assessed to the most adjacent residential properties, to the west on Tottenham Drive.

1.4 Consultation

Within the scope of this assessment a consultation exercise was undertaken with the local planning authority (LPA), Manchester City Council (MCC).

The initial consultation was undertaken via telephone with Mr Paul Jones, Public Protection Officer at MCC on the 19th October 2011. This was summarised in a subsequent e-mail transmission data 19th October 2011.

The main focus of the consultation exercise related to the following issues, which will be addressed and considered within the scope of this study:

- an appropriate noise monitoring scheme including location, time and duration; and
- Appropriate assessment methodologies and Standards.

Furthermore MCC raised the issue of potential noise impacts of vehicles on the wider road network, specifically the Southmoor Road access where residential receptors are located adjacent to the junction.

1.5 Noise Assessment Methodology

In order to assess the impact of the proposed variation to planning condition 6, a number of elements of work have been completed. These are as detailed below:

- A noise survey has been undertaken in order to quantify the existing ambient noise levels at the Southmoor Park site. Noise levels have been measured during the evening and overnight periods;
- Assessment of the potential impact of the change in planning conditions on the adjacent residential receptors; and
- Quantification of suitable acoustic mitigation measures and strategies that could be employed within the design of the site to control noise to within acceptable levels.

2.0 NOISE UNITS

2.1 Noise

Before presenting the results of the noise assessment, it is considered useful to provide some background information on noise, the units of measurement and perception of changing levels by people.

Noise is defined as unwanted sound. The range of audible sound is taken to be from 0 dB to 140 dB. Examples of typical noise levels relating to everyday occurrences are presented within Table 2-1 below:

Table 2-1 – Typical Noise Levels

Source	Sound Pressure Level in dB(A)	Subjective Level
Traffic at kerb edge	70 – 85	Loud
Raised voice at 1 metre	80	Loud
Normal voice at 1 metre	60	Moderate
Residential area at night	40	Quiet

The frequency response of the human ear to noise is usually taken to be about 18Hz (number of oscillations per second) to 18,000Hz. However, the human ear does not respond equally to different frequencies at the same level, it is more sensitive in the mid-frequency range than the lower and higher frequencies and, because of this, when undertaking the measurement of noise the low and high frequency components of any given sound are reduced in importance by applying a filtering (weighting) circuit to the noise measuring instrument. The weighting which correlates best with the subjective nature of human response to noise and is most widely used to quantify this is the A-weighted filter set. This is an internationally accepted standard for noise measurements.

For variable noise sources within an area an increase of 3 dB(A) would be considered to be the minimum perceptible to the human ear under normal conditions. It is generally accepted that an increase/decrease of 10 dB(A) corresponds to a doubling or halving in perceived loudness. The 'loudness' of a noise is a purely subjective parameter, dependant not only upon the sound pressure of the event but also on the dynamics of the listener's ear, the time of the day and the general mood of the person.

With regard to environmental noise levels (in the open air), these are rarely steady, but rise and fall according to the activities being undertaken within the surrounding area at any given time. In an attempt to produce a figure that relates this variable nature of noise to human subjective response, a number of statistical noise metrics have been developed. These include:

2.1.1 L_{Aeq} Noise Level

This is the 'equivalent continuous A-weighted sound pressure level, in decibels', and is defined in British Standard BS7445 as the 'value of the A-weighted sound pressure level of

a continuous, steady sound that, within a specified time interval, T, has the same mean square sound pressure as a sound under consideration whose level varies with time'. It is the unit most suitable for the description of environmental noise.

2.1.2 L_{A10} Noise Level

The L_{A10} is the noise level that is exceeded for 10% of the measurement period, and gives an indication of the noisier portion of the climate. It is a unit that has been used over many years for the measurement and assessment of road traffic noise.

2.1.3 L_{A90} Noise Level

The L_{A90} is the noise level that is exceeded for 90% of the measurement period and gives an indication of the noise level during the quieter periods. It is often referred to as the 'background' noise level.

3.0 STANDARDS AND GUIDANCE

Within the following section of the report, detail will be presented relating to the guidance documents and assessment methodologies appropriate for noise associated with facilities of an industrial type such as currently occupies the site at Southmoor Park.

3.1 Planning Policy Guidance Note 24: Planning and Noise

Principles and specific guidelines on noise and planning issues are given in the Department of the Environment's Planning Policy Guidance 24: Planning and Noise (PPG24). PPG24 represents published government guidance on planning and noise and sets out details of how local authorities in England can use their planning powers to minimise adverse impacts of noise both relating to noise sensitive developments and those that will ultimately generate noise.

The document PPG24 states the following, with respect to assessing the impact of noise associated with industrial developments such as that at Southmoor Park:

> *"The likelihood of complaint about noise from industrial development can be assessed. Where the standard is appropriate, using the guidance of BS4142: 1990".*

PPG24, however, references the usage of the 1990 edition of the BS4142 Standard; this has since been replaced with a 1997 revision which will form the basis of this assessment.

Furthermore, with regards to industrial developments, PPG24 notes that within paragraph 19 of annex 3 that when considering internal noise levels at sensitive receptors the guidance found in BS8233: 1987 is appropriate for reference. Similarly with this Standard the 1987 edition as referenced in PPG24 has been revised to a 1999 revision which will be reference where appropriate within the scope of this study.

Each of the standards that would inform the basis of this report will be discussed individually below.

3.2 British Standard 4142: 1997

This British Standard provides a methodology for assessing the likelihood of complaints arising from sensitive receptors due to industrial and commercial activities. It states the 'complaints are likely' when a noise from one of these sources, corrected for tonal, impulsive or irregularity characteristics (to provide the 'rating' level), exceeds the existing 'background' level by 10dB(A) or more. Increases of 5dB(A) above existing background are deemed by the standard to be of 'marginal significance', whilst a rating level of more than 10dB(A) below the measured background level provides a 'positive indication that complaints are unlikely'.

The source noise is assessed in terms of $L_{Aeq,T}$, where 'T' is a reference period of one hour during daytime hours (07:00 – 23:00hrs) and five minutes at night-time (23:00 – 07:00hrs).

However, the Standard states that the assessment methodology provided is neither suitable for assessing internal noise levels or where the background and rating noise levels are both very low (i.e below 30dB L_{A90} and approximately 35dB $L_{Ar,T}$ respectively). Where

this occurs it is considered appropriate to reference the guidance provided in British Standard BS 8233: 1999 – Sound Insulation and Noise Reduction for Buildings – Code of Practice.

3.3 British Standard 8233 'Noise Reduction and Sound Insulation for Buildings – Code of Practice'.

When internal residential noise levels are required to be considered PPG24 recommends that suitable guidance can be found within BS8233: 1999.

This standard provides guidance values for a range of design criteria levels within residential properties as shown in Table 3-1 below. These values also reflect the suggested levels surmised from the World Health Organisation (WHO) guideline criteria.

Table 3-1 – BS8233 Guidance Values

Criterion	Typical Situation	Design Range dB $L_{Aeq,T}$	
		Good	Reasonable
Reasonable resting/sleeping conditions	Living rooms	30	40
	Bedrooms	30	35

Furthermore, with regard to the reasonable design criteria appropriate for bedrooms during the overnight period the Standard states that individual noise events should not normally exceed 45dB $L_{A(f)max}$.

3.4 Current Planning Conditions

Currently the site operates under Manchester City Council planning permission ref: 33541 granted in 1989.

A review of the history of the planning permission indicates that a revision to planning condition 6 was proposed in 1993 (Ref: 043552/JO/SOUTH3/93). The revision proposed that the condition restricting vehicle movements be limited to a given area of the site as defined in drawing 92/1601/01 (not available at the time of writing this report). The application was withdrawn.

Further to this, a revision to planning condition 6 was proposed in 1996 (Ref: 051053/JO/SOUTH3/96). This revision proposed a variation to the servicing hour's from 08:00 – 18:00 hours as per the planning permission to 07:00-19:00 hours Monday to Saturday. This variation was limited to units B1 and B2 of the site. The information available indicates that this application was approved and worded thus:

> *"No loading/unloading or movement of articulated/Heavy Goods Vehicles shall take place on site on Sundays and Bank Holidays and on other days shall be confined to:-*
>
> *0800 – 1800 hours Monday to Saturdays"*
>
> *"No loading/unloading or movement of light delivery vehicles/vans shall take place on site on Sundays and Bank holidays and on other days shall be confined to :-*

0700 – 1900 hours Monday to Saturdays"

In 2005 a further application was made to remove planning condition 6 in association with units A2 and A3 of the Southmoor Park site. The condition was varied and restricted in terms of the operator and the hours:

> *"Between the hours of 10:00pm and 07:00am, the vehicles delivering and distributing from the site shall be related to specific operation of the premises by an NHS contractor servicing Wythenshawe Hospital and other local hospitals. The activities of the NHS contractor shall be undertaken in accordance with a scheme of operation, which shall be agreed in writing with the City Council as local planning authority and with local members prior to the occupation of the premises. This scheme shall between the house of 10:00pm and 07:00am as a minimum: limit the number and size of vehicles visiting the site; control reversing warning devices and the use of fork lift trucks and incorporate arrangements for the movement of staff during shift changes. The scheme of operation shall remain in place except in the event of a major incident unless otherwise agreed in writing by the City Council as local planning authority."*

4.0 NOISE MONITORING

This section of the report describes the specifics of the noise survey undertaken at the Southmoor Park site.

4.1 Survey Details

In order to determine the existing noise climate of the area, a noise monitoring survey was undertaken at the site.

Prior to any aspect of the assessment being undertaken, the Local Planning Authority, Manchester City Council were contacted[1] and it was agreed that monitoring would be undertaken associated with the development as follows.

Table 4-1 – Agreed Noise Monitoring Periods

Location	Period	Time Period	Duration
Location 1 (as identified in Figure 2)	Evening	18:00 – 20:00	2 hours
	Night-time	01:00 – 02:00	1 hour

The noise monitoring location is further presented graphically within Figure 2 below for ease of reference.



Figure 2: Monitoring Location Plan (map source Google)

[1] Telephone discussions and subsequent E-mail transmission between Enzygo and Paul Jones (MCC) dated 19th October 2011.

Obtaining baseline ambient noise measurements at the above location on site has assisted in the assessment of potential impacts at the adjacent residential receptor locations as a result of vehicle movements around the Southmoor Park site.

The noise monitoring survey was conducted for the identified periods between the 31st October and 1st November 2011.

All monitoring undertaken in conjunction with this assessment was fully attended by competent field engineers in order to determine typical noise sources operating in the area and to observe the meteorological conditions prevalent.

Weather conditions during the survey periods were noted to be as follows:

Monday 31st October 2011

The weather during the evening period of the 31st October was recorded to be dry with an ambient temperature of approximately 15°C. Wind speeds were light at less than 5mph.

Tuesday 1st November 2011

The weather on the 1st November was noted to be mild with an ambient temperature of 11°C. Though dry during the initial setup, heavy rain was recorded after 01:30. This eased after approximately 10 minutes though precipitation was still noted for the remaining monitoring period.

4.2 Monitoring Equipment

The monitoring of noise was undertaken in line with the guidance set out within BS7445: 1991. The sound level meter was programmed to monitor over 15 minute periods during the evening period and 5 minutes periods during the overnight. The equipment used was set to record the following statistical parameters:

L_{Aeq} in dB
L_{A10} in dB
L_{A90} in dB
L_{Amax} in dB

The following sound level meter equipment was used in order to undertake the noise survey at the Southmoor Park site.

Table 4-2 – Noise Monitoring Equipment

Equipment	Manufacturer	Type	Serial Number
Sound Level Meter	01dB	Blue Solo	61332
Preamplifier	01dB	PRE21	14425
Microphone	GRAS	MCE212	57685
Calibrator	Norsonic	Type 1251	32704

The sound level meter was mounted on a tripod at a height of approximately 1.5m above the ground, a minimum of 3.5m from any reflecting surfaces and was fitted with a relevant manufacturer's specification windshield.

The following set-up parameters were used on the sound level meter during all of the noise measurements undertaken:

Time Weighting: Fast
Frequency Weighting: "A"

The sound level meter used was calibrated using an electronic calibrator prior to commencement and upon completion of the surveys, no significant drift in calibration was observed. The instrumentation calibration documentation for the equipment used are contained within Appendix 2 of this report.

5.0 NOISE SURVEY RESULTS

Presented within Table 5-1 below, is a summary of the evening and night-time noise levels monitored at the site. The full set of measurement data is presented within Appendix 1.

The data presented within Table 5-1 below is averaged from the data monitored during each of the identified periods.

Table 5-1 – Measured Noise Level Data

Location	Period	Statistical Parameters in dB(A)			
		$L_{eq,T}$		$L_{90,T}$	
		Range	Average	Range	Average
Location 1	"T" = 15 Minute averages during the evening period				
	18:00 – 20:00 Evening	49.3 – 51.5	50.0	45.9 – 47.5	46.8
	"T" = 5 Minute averages during the overnight period				
	01:00 – 02:00 Night-time	32.2 – 43.8	39.5	30.8 – 41.1	35.1

During the evening period it was noted that the noise climate was governed primarily by traffic noise on the surrounding road network. This was coupled with HGV movements and industrial processes (fans, cooling units, fork lift trucks etc) at the industrial units adjacent to the Southmoor Park site (but not within the site under consideration). During the evening period it was also noted that occasional bursts of fireworks were audible though these were sporadic in nature and generally at a considerable distance to the monitoring location.

During the night-time period the noise climate was dominated by distant traffic noise from the surrounding road network. Also noticeable were noises from around the wider Roundthorne industrial estate including HGV movements.

6.0 PREDICTIVE NOISE MODELLING ASSESSMENT

This section of the report will detail the calculation methodologies used to predict the noise level at the rear of the properties on Tottenham Drive associated with the movement of vehicles within the Southmoor Park site area.

This section will further detail any assumptions that have been made during the modelling process in order to conclude the predicted noise levels.

6.1 Noise Modelling Protocols

The model of the proposed site was constructed within the commercially available Braunstein + Berndt GmbH computer noise mapping software SoundPLAN 7.1. The SoundPLAN software was set to implement the following assessment and calculation methodologies within the scope of the model.

6.1.1 Prediction Methodology

Within the scope of this modelling exercise, acoustic propagation has been calculated in accordance with the following standards:

- BS5228: 2009 Code of practice for noise and vibration control on construction and open sites; and
- ISO 9613-2: Acoustics – Attenuation of sound during propagation outdoors: Part 2: General method of calculation.

6.2 Foundation of the Model

The model was constructed utilising detailed commercial OS Vector topographical mapping data.

During the site visit, it was noted that the site and surrounding areas were generally flat. Therefore a constant ground elevation of 0m has been assumed within the modelling process. In addition to this a 1m high bund has been introduced between the site and receptor location to reflect the bund and scrub planting between the site area and receptor locations as observed during the site visit.

6.3 Assumptions

Within the scope of the construction of the noise model certain information was required to be assumed. All assumptions embodied within the scope of the modelling exercise are as detailed below;

Noise Levels

Within the predictive assessment undertaken only noise levels generated by vehicle movements around the external areas of the Southmoor Site have been included. It is assumed that any plant operating during these periods will be suitably controlled in accordance with the planning permission limits for the site.

The following assumptions are inherent within the modelling process.:

- The source level for the vehicle movements has been derived based upon the 'Haul Road' methodology of BS5228.
- Source heights for the HGV's and vans have been assumed at 0.5m to represent the approximate height of the exhaust and engine.
- The calculations have been based upon the sound power level limits for maximum permitted noise levels from within EC Directive 92/97/EC. These are as specified below
    - HGV under acceleration is 80 dB at 7.5m.
    - LDV/van under acceleration is 77dB(A) at 7.5m.

Vehicle Frequency and Movements

The number of vehicle movements around the site during the relevant time periods has been assumed as follows;

- Evening – 1 delivery vehicle to and from each unit on the Southmoor site during the hour assessment period; and,
- Night-time – 1 delivery vehicle to unit B1 (being the closest unit to the residential properties on Tottenham Drive) during the 5 minute assessment period.

6.4 Predicted Noise Levels

The noise levels detailed below in Table 6-1, indicate the predicted noise levels resulting from the movement of vehicles around the site during the relevant time periods.

Table 6-1 – Predicted Noise Levels resulting from vehicle movements

Prediction Location	Predicted noise level in dB			
	Evening ($L_{Aeq,1hr}$)		Night ($L_{Aeq,5min}$)*	
	HGV	LDV/Van	HGV	LDV/Van
M01	33.2	22.7	38.7	32.5
M02	38.6	27.1	42.6	36.1
M03	43.5	31.7	47.2	40.2
M04	44.5	32.7	48.0	41.3
M05	44.4	32.4	47.9	41.2
M06	42.3	30.6	46.2	39.2
M07	37.2	26.6	43.3	36.5
M08	33.3	21.9	40.0	33.2

* Note: The night time noise level is predicted as a 5 minute period assuming the vehicle movement occurs within that time frame.

7.0 NOISE IMPACT ASSESSMENT

In this section of the report the results of the noise modelling assessment will be compared to the noise climate of the area to conclude the envisaged noise impact.

As previously stated, the impacts associated with the variation in the planning conditions would be assessed in line with the following standards and guidance;

- BS4142:1997 – Method for rating industrial noise affecting mixed residential and industrial areas; and
- BS8233: 1999 – Sound insulation and noise reduction for buildings. Code of practice.

7.1 BS4142 External Noise Impact Assessment

The assessment in line with BS4142 considers external noise levels.

Within the methodology of BS4142 it is necessary to calculate a specific noise level at each receptor location from the operations/site under consideration. This specific noise level then requires to be converted to a Rating level in order to take account of tonal or noticeable characteristics of the source noise.

It is not considered unreasonable to assume that, based upon the current noise climate of the area surrounding the site, noise associated with HGV movements on the Southmoor site would not be considered to be out with the existing character of the area, therefore it has been assumed that the +5dB BS4142 feature correction would not be appropriate or required to be added to the predicted noise levels.

7.1.1 External Evening Assessment

Within the scope of this assessment, the evening period is defined as the period starting at 18:00 up until 23:00 hours.

Table 7-1 below presents the results of this assessment for each of the identified sensitive receptors during the evening period. As a worst case assessment, the quietest measured L_{A90} has been compared to a peak hour modelled period.

With reference to Table 6-1 it can be seen that the predicted evening noise levels associated with the vehicle movements would be higher associated with HGV's, as such the assessment of the evening period has been initially investigated based upon the possibility of HGV's moving on the site as a worst case.

Table 7-1 – BS4142 Evening Noise Impact Assessment – HGV movements

Location	Period	Measured L_{90} 'background noise level'*	Predicted BS4142 Rating Level*	Difference	Impact Significance Criteria
M01	Evening	46	33	-13	"Positive indication that Complaints are unlikely"
M02	Evening	46	39	-7	"Less than Marginal significance"
M03	Evening	46	44	-2	"Less than Marginal significance"
M04	Evening	46	45	-1	"Less than Marginal significance"
M05	Evening	46	44	-2	"Less than Marginal significance"
M06	Evening	46	42	-4	"Less than Marginal significance"
M07	Evening	46	37	-9	"Positive indication that Complaints are unlikely"
M08	Evening	46	33	-13	"Positive indication that Complaints are unlikely"

***Note:** Noise levels rounded to nearest whole dB in accordance with the guidance of BS4142

It can be seen from the table above that the BS4142 assessment indicates that noise, as a result of HGV vehicle movements around the Southmoor Park site, would be rated by the standard as being:

Evening Period- *Between -1 and -13 below the existing background noise climate of the area.*

This would be considered by the standard to be of less than "marginal Significance" and in some instances provide "positive indication that complaints are unlikely to result"

With reference to Table 6-1 it can be seen that predicted noise levels associated with LDV and Van movements would be expected to be lower than those for HGV movements during the evening period. As such, based upon the results presented within Table 7-1, it is deemed reasonable to assume that the assessment of LDV's/vans at the site, during this time period would be no worse than that for the HGV's.

7.1.2 External Night-time Assessment

During the night-time period, it has been assumed that there would be only 1 vehicle movement during any given 5 minute assessment period. As a 'worst case' within the scope of this assessment it has been assumed that the vehicle movement will be accessing industrial unit B1, which is closest to the noise sensitive receptors.

Table 7-2 below presents the results of this assessment for each of the identified sensitive receptors during the Night-time period. As a worst case assessment, the quietest measured L_{A90} has been compared to a 5 minute modelled period which includes one HGV as defined in section 6.3.

Table 7-2 – BS4142 Night-time Noise Impact Assessment – HGV Movements

Location	Period	Measured L_{90} 'background noise level'*	Predicted BS4142 Rating Level*	Difference	Impact Significance Criteria
M01	Night-time	31	39	+8	"Greater than Marginal Significance"
M02	Night-time	31	43	+12	"Complaints are likely"
M03	Night-time	31	47	+16	"Complaints are likely"
M04	Night-time	31	48	+17	"Complaints are likely"
M05	Night-time	31	48	+17	"Complaints are likely"
M06	Night-time	31	46	+15	"Complaints are likely"
M07	Night-time	31	43	+12	"Complaints are likely"
M08	Night-time	31	40	+9	"Greater than Marginal Significance"

It can be seen from the table above that the BS4142 night-time assessment indicates that the noise from HGV movements around the Southmoor Park site during this period would be rated as:

Night-time — *Between +8 and +17 above the existing background noise climate of the area depending on the assessment location.*

In accordance with the significance criteria of BS4142 this would indicate that "complaints are likely" at the majority of the adjacent receptor locations.

Given the above levels of increase above the existing background noise climate, it is considered that HGV movements around the site, during the night-time period (23:00 – 07:00), would result in complaints at the majority of receptors assessed. It is therefore reasonable to consider that this would adversely affect residential amenity external to these properties.

The night-time scenario has been re-assessed to account for Light Delivery Vehicle/Van movements during the night-time period referencing the predicted noise levels within Table 6-1.

Table 7-3 – BS4142 Night-time Noise Impact Assessment – LDV Movements

Location	Period	Measured L_{90} 'background noise level'*	Predicted BS4142 Rating Level*	Difference	Impact Significance Criteria
M01	Night-time	31	33	+2	"Less than Marginal significance"
M02	Night-time	31	36	+5	"Greater than Marginal significance"
M03	Night-time	31	40	+9	"Complaints are likely"
M04	Night-time	31	41	+10	"Complaints are likely"
M05	Night-time	31	41	+10	"Complaints are likely"
M06	Night-time	31	39	+8	"Complaints are likely"
M07	Night-time	31	37	+6	"Greater than Marginal significance"
M08	Night-time	31	33	+2	"Less than Marginal significance"

It can be seen from the table above that the BS4142 night-time assessment indicates that the noise from LDV/Van movements around the Southmoor Park site would be rated as:

Night-time — *Between +2 and +10 above the existing background noise climate of the area depending on the assessment location.*

At two of the assessment locations, this would be considered to be of "less than Marginal significance". A further two would be considered to be of "greater than marginal significance" with the remaining four receptors indicating that "complaints are likely".

Given the above levels of increase above the existing background noise climate, it is considered that LDV/Van movements around the site, during the night-time period (23:00 – 07:00), would potentially result in complaints at certain receptors assessed. It is therefore reasonable to consider that this would adversely affect residential amenity external to these properties.BS8233 Internal Night-time Noise Assessment

However, notwithstanding the above external assessment undertaken during the overnight period, it is considered more reasonable and representative to assume that in most cases during the overnight period people would be within residences either asleep or trying to sleep rather than being external to the property. The BS4142 document states, within paragraph 1, that the standard is not a suitable methodology for assessing noise within buildings.

As such it would be considered more appropriate to assess the night-time period in accordance with the guidance provided in BS8233 with regard to indoor suitability criteria.

In order to assess internal noise levels as a result of the proposed vehicle movements they must first be predicted. It is stated in PPG24 that an open window (regardless of specification) offers between 10 and 15dB of noise insulation, which is generally taken to

be an average of 13dB. Based on this assumption, internal noise levels at each receptor location can be estimated.

Table 7-4 below details predicted internal noise levels during the overnight period and includes the appropriate criteria of BS8233 for comparison.

Based upon initial calculations undertaken and the predicted HGV noise levels during this period it is not considered that appropriate internal noise levels would be achieved. As such the assessment focuses on LDV/Van movements on the site which result in lower predicted levels.

Table 7-4 – BS8233 Night-time Noise Impact Assessment – LDV Movements

Location	Period	Facade corrected Predicted External noise Level in dB (Predicted L_{Aeq} +3dB(A))	Predicted internal noise level in dB L_{Aeq}	BS8233 Conditions in dB L_{Aeq} Good <30dB Reasonable <35dB
M01	Night-time	36	23	'Good'
M02	Night-time	39	26	'Good'
M03	Night-time	43	30	'Good'
M04	Night-time	44	31	'Reasonable'
M05	Night-time	44	31	'Reasonable'
M06	Night-time	42	29	'Good'
M07	Night-time	40	27	'Good'
M08	Night-time	36	23	'Good'

It can be seen from the table above that LCV/Van movements around the site during the night-time period results in noise levels at the identified receptor locations that would meet the internal design criteria of BS8233.

The noise levels presented within Table 7-4 are based upon a five minute assessment period which includes 1 vehicle movement. Assuming, quite reasonably that the delivery vehicle moves off within a separate 5 minute period, the noise levels presented within Table 7-4 would be applicable for 2 of the 5 minute periods making up each hour during the overnight period. During a typically defined eight hour night time (23:00 – 07:00) this would amount to a total of 16 x 5 minute periods, or 17% of the overnight period.

For the remaining 83% of the overnight (80 x 5 minute periods) much lower levels would be expected akin to the current situation, as no vehicle movements would occur.

As such based upon the internal levels predicted, and the frequency of occurrence it is not considered that the internal noise levels generated by the LDV/Van movements would be significantly detrimental to the internal amenity of the adjacent houses, even assuming open windows for ventilation.

Furthermore, whilst the assessment is, and rightly should be, based upon the attenuation provided by open windows, if the windows be closed (during winter months for example) the resulting internal noise levels would be significantly lower than those presented within Table 7-4. This would be as a result of increased façade attenuation with the windows

closed, which would be in the region of 28dB(A) for single glazed units[2] (33dB(A) assuming thermal double glazed units[2]), an increase of 15 dB (20dB for double glazed units) over that assumed within the calculations informing this assessment. This increase in attenuation would result in a proportionate reduction in internal noise.

[2] PPG24 Annex 6, Table 1.

8.0 CONCLUSIONS

A noise assessment has been undertaken to assess the potential noise impact of a change in the planning conditions attached to the Southmoor Park industrial site, Wythenshawe. The proposed change is associated with condition 6 and relates to vehicle movements at the site during the evening and overnight periods.

A noise survey has been undertaken at the closest residential receptors to the site, which has been used to inform the assessment of potential impacts resulting from vehicle movements on the site during evening and overnight period

Assessment has been undertaken in line with BS4142 and BS8233 as and where appropriate. This guidance is considered suitable and appropriate.

8.1 Off Site Traffic Noise Consideration

Within the consultation phase MCC raised the concern relating to potential noise impacts of vehicles on the wider road network, specifically the Southmoor Road access where residential receptors are located adjacent to the junction.

In response to this concern, it was noted during the overnight noise monitoring survey that transportation noise formed a significant part of the baseline noise climate of the area. Furthermore, the area was noted to contain some significant facilities within the adjacent Roundthorne Industrial Estate which generate vehicle movements through the overnight period which include heavy goods vehicles. HGV movements were also audible from vehicles moving around within the Roundthorne site as a whole and associated access roads.

Given the capacity of the Southmoor site, the existing level of HGV movements in the area and the expected level of HGV/LDV/Van traffic associated with the Southmoor facility, it is not considered that the changing of planning condition 6 will result in significant noise impacts at the residential properties beyond those identified as receptors in this report.

As such we would not deem a detailed assessment of the Southmoor Road junction to be necessary within the scope of this report or to be a material factor requiring consideration within the determination of whether condition 6 can be varied.

8.2 On site Noise Level Assessment

Within the scope of this study the following noise models have been constructed:

1) Evening 1 hour assessment (including 1 HGV movement to and from each of the units within the site during the assessment period);
2) Evening 1 hour assessment (including 1 LDV/Van movement to and from each of the units within the site during the assessment period);
3) Night-time 5 minute assessment (including 1 HGV movement to unit B1 during the assessment period); and,

4) Night-time 5 minute assessment (including 1 LDV movement to unit B1 during the assessment period.

It has been found that, based on the information supplied and the assumptions detailed in section 6.3 of this report that the levels of noise generated by the movement of HGVs/LDV's or Vans during the evening period (18:00 to 23:00) would not result in a significant impact at the assessment locations.

The assessment of the overnight period indicated that external to the properties the movement of HGVs around the site during this period would result in the potential for significant impacts at all the receptors considered. Consideration of LDV and Van movements resulted in slightly lower external impacts at the residential properties adjacent to the site.

However, it was considered more appropriate to consider the impact during the overnight period based upon internal noise criteria. As a result of the predicted external levels it has been concluded that the movement of LDV's/Vans during this period would not result in significant impacts on residential amenity based upon the internal design criteria of BS8233. Furthermore, assuming 1 vehicle delivery per hour during the overnight period the predicted noise levels (Table 7-4) would only account for 17% of the night time period (23:00 to 07:00), and during the remaining 83% significantly lower levels would be expected as vehicles would not be moving around the site.

9.0 RECOMMENDATIONS

Following the conclusions drawn from the assessment undertaken, a number of recommendations have been made.

These recommendations relate the appropriate levels of vehicle activity at the site during the evening and overnight periods taking account of the assumptions embodied within the scope of this report. The recommendations are outlined below;

1) Based upon the assessment undertaken it is concluded that HGV movements around the site would require to be limited to the hours between 07:00 and 23:00, as defined as daytime within BS 4142. This is based upon 1 HGV delivery to each unit per hour (7 HGV's total per hour)

2) During the overnight period (23:00 – 07:00) vehicle movements around the site would require to be limited to 1no. LDV and Van movement per hour in order to protect internal residential amenity.

In order to permit Heavy Goods Vehicles to access the site during the overnight period significant and costly levels of acoustic attenuation would require to be implemented at the site specifically with regard to the western site boundary between the site and the residential properties on Tottenham Drive.

REFERENCES

Department for Communities and Local Government - Planning Policy Guidance Note 24, 1994

British Standards Institution. British Standard 8233: Noise reduction and sound insulation for buildings – Code of practice', 1999.

British Standards Institution. British Standard 5228: Code of practice for noise and vibration control and open sires – part 1 : Noise, 2009

International Organisation for Standardisation 9613 Acoustics – Attenuation of Sound during Propagation Outdoors, 1993

APPENDIX 1

Noise Monitoring Data

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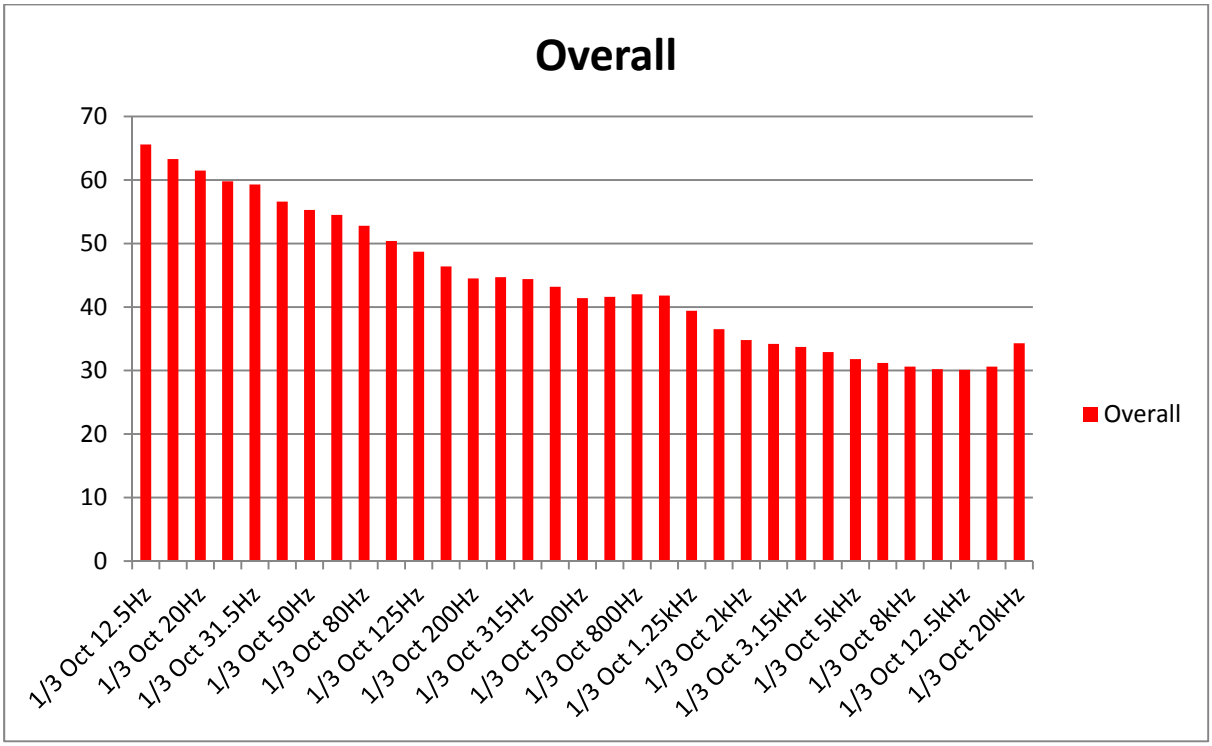
Project	Southmoor Park, Wythenshawe			
Job number	SHF.179.001			
Location	Location 1			
Start Date	31st October 2011	**End Date**	1st November 2011	
Start Time	17:59	**End Time**	19:59	
Calibrated	114.0	**File**	061332_111031_175322000.CMG	
Equipment	**Manufacturer**	**Type**	**Last Calibration Date**	**Serial Number**
Meter	01dB	Blue Solo	4th February 2011	61332
Microphone	GRAS	MCE212	4th February 2011	57685
Preamplifier	01dB	PRE21	4th February 2011	14425
Calibrator	Norsonic	1251	4th February 2011	32704

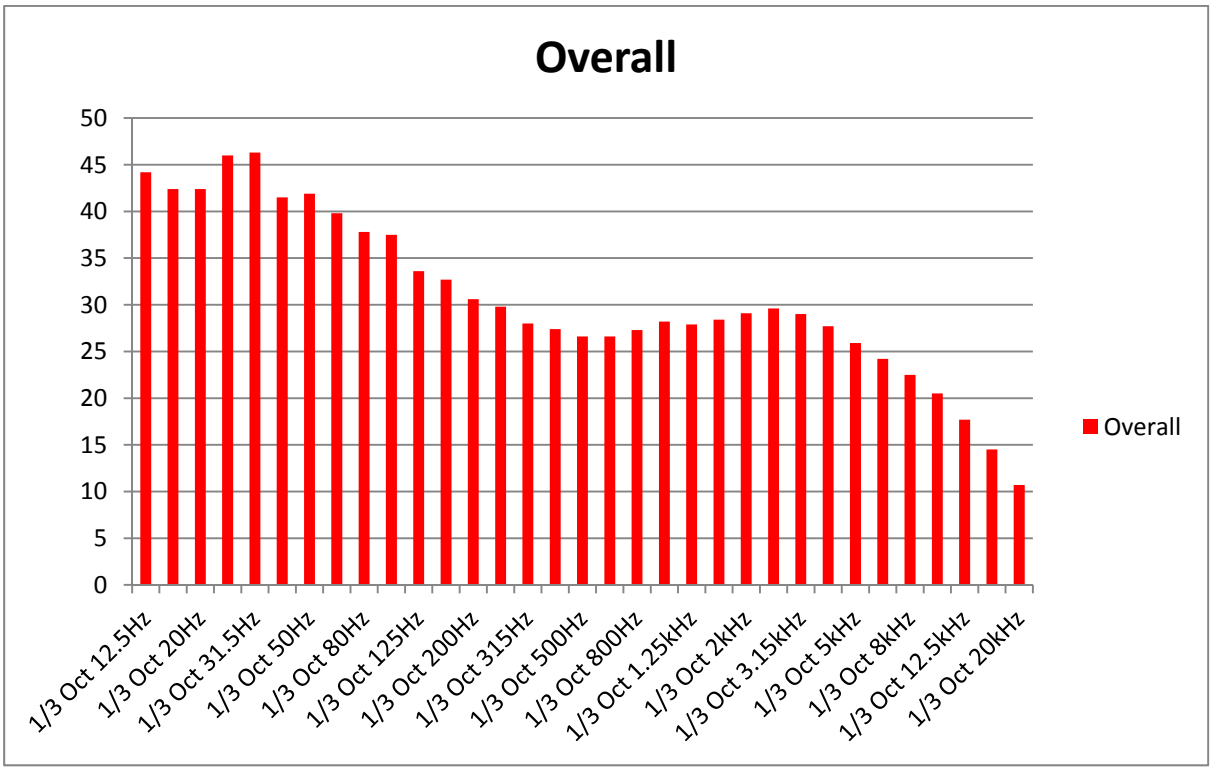
Daytime Noise Monitoring Data				
Period start	**L_{eq}**	**L_{max}**	**L_{90}**	**L_{10}**
31/10/2011 17:59	51.5	64.1	46.7	54.1
31/10/2011 18:14	49.8	60.3	47.5	51.8
31/10/2011 18:29	49.5	60.6	46.9	51.6
31/10/2011 18:44	50.0	57.6	47.4	51.3
31/10/2011 18:59	49.9	62.0	46.7	51.5
31/10/2011 19:14	49.3	62.7	46.9	51.0
31/10/2011 19:29	49.9	63.6	46.3	51.7
31/10/2011 19:44	49.5	65.1	45.9	51.3
Overall	**50.0**	**65.1**	**46.8**	**51.7**



Project	Southmoor Park, Wythenshawe			
Job number	SHF.179.001			
Location	Location 1			
Start Date	31st October 2011	**End Date**	1st November 2011	
Start Time	00:59	**End Time**	01:59	
Calibrated	114.0	**File**	061332_111101_004023000_1.CMG	
Equipment	**Manufacturer**	**Type**	**Last Calibration Date**	**Serial Number**
Meter	01dB	Blue Solo	4th February 2011	61332
Microphone	GRAS	MCE212	4th February 2011	57685
Preamplifier	01dB	PRE21	4th February 2011	14425
Calibrator	Norsonic	1251	4th February 2011	32704

Daytime Noise Monitoring Data

Period start	L_{eq}	L_{max}	L_{90}	L_{10}
01/11/2011 00:59	32.4	36.9	30.8	33.6
01/11/2011 01:04	33.7	41.6	31.2	35.7
01/11/2011 01:09	32.4	39.8	31.0	33.3
01/11/2011 01:14	32.2	38.5	30.9	33.1
01/11/2011 01:19	34.1	44.2	31.2	35.6
01/11/2011 01:24	38.8	44.4	36.4	40.0
01/11/2011 01:29	38.7	41.7	37.2	39.8
01/11/2011 01:34	43.8	48.3	38.0	46.0
01/11/2011 01:39	43.4	47.1	41.1	44.7
01/11/2011 01:44	40.3	45.6	37.7	42.0
01/11/2011 01:49	42.9	46.0	39.6	44.9
01/11/2011 01:54	38.6	53.6	35.7	39.8
Overall	**39.5**	**53.6**	**35.1**	**43.9**



APPENDIX 2

Calibration Certificates

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Certificate of Calibration

Issued by University of Salford (Acoustics Calibration Laboratory)

APPROVED SIGNATORIES

Claire Lomax [✓] Andy Moorhouse [ ]

Gary Phillips [ ] Danny McCaul [ ]

acoustic calibration laboratory

[illegible]
http://www.acoustics.salford.ac.uk

Certificate Number: 00311/1 Date of Issue: 4 February 2011

VERIFICATION OF A SOUND LEVEL METER to BS7580 Part 1

FOR:	Mouchel St John's House Queen Street Manchester M2 5JB
FOR THE ATTENTION OF:	William Neale
CALIBRATION DATE:	4 February 2011
TEST PROCEDURE:	CTP08 (Laboratory Manual)

Sound Level Meter						
Manu:	01dB	Model:	Solo	Serial No:	61332	
Microphone						
Manu:	01dB	Model:	MCE212	Serial No:	57685	
Preamp						
Manu:	01dB	Model:	PRE 21 S	Serial No:	14425	
Associated Calibrator						
Manu:	Norsonic	Model:	1251	Serial No:	32704	Adaptor Type: 1443

Test Engineer (initial): GP Name: Gary Phillips

This certificate provides traceability of measurement to recognised national standards, and to the units of measurement realised at the National Physical Laboratory or other recognised national standards laboratories. This certificate may not be reproduced other than in full except with the prior written approval of the issuing laboratory.

Certificate Number: 00311/1 Date of Issue: 4 February 2011

SET-UP INFORMATION

The instrument was running version was Master 01 v1.400. The reference range, reference SPL, primary indicator range, pulse range and linearity range as specified by the manufacturer have been used. The instrument was adjusted to read 113.8 dB (A) in response to the associated calibrator. This reading was obtained from the calibration certificate of the calibrator, 00312/1 and information in the manufacturer's instruction manual. The instrument was calibrated without a windshield. Consult manufacturer's instructions if using a windshield.

MEASUREMENTS

The levels of self-generated noise were:

A:	**11.9 dB**
B:	**10.7 dB**
C:	**12.5 dB**
Z:	**19.7 dB**

At the end of the tests the indication of the sound level meter in response to the associated sound calibrator was 113.8 dB (A) which corresponds to the following level at 101.325kPa:

Sound Pressure Level 113.8 dB (A)
This reading should be used henceforth to set up the sound level meter for field use.

THE SOUND LEVEL METER WAS VERIFIED ACCORDING TO THE PROCEDURE GIVEN IN BS7580: Part 1 1997 WITH THE FOLLOWING EXCEPTIONS:

A stricter test than that specified 5.5.10 and 5.5.11 of BS 7580 has been used by not applying the low level signal.

STATEMENT OF RESULT:

THE SOUND LEVEL METER CONFORMS TO BS7580: PART1 1997

Instruments used in the verification procedure were traceable to National Standards. The method of acoustic calibration employed a standard sound pressure calibrator for the 1 kHz test whilst the tests at 125 Hz and 8 kHz were performed by the electrostatic actuator method. The uncertainty of the Laboratory's 1 kHz calibrator was ±0.09 dB. The uncertainty of the standard calibrator is not included in the applied tolerances. It is assumed that the sound level meter was manufactured in accordance with BSEN60651: 1994 Type 1, and BSEN60804: 1994 Type 1.

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a level of confidence of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements. All measurement results are retained at the acoustic calibration laboratory for at least four years.

This certificate provides traceability of measurement to recognised national standards, and to the units of measurement realised at the National Physical Laboratory or other recognised national standards laboratories. This certificate may not be reproduced other than in full except with the prior written approval of the issuing laboratory.

Certificate of Calibration

Issued by University of Salford (Acoustics Calibration Laboratory)

APPROVED SIGNATORIES

Claire Lomax [✓] Andy Moorhouse [ ]

Gary Phillips [ ] Danny McCaul [ ]

acoustic calibration laboratory

Certificate Number: 00312/1 Date of Issue: 4 February 2011

CALIBRATION OF A SOUND CALIBRATOR

FOR: Mouchel
St John's House
Queen Street
Manchester
M2 5JB

FOR THE ATTENTION OF: William Neale

DESCRIPTION: Calibrator with housing for one-inch microphones and adaptor type 1443 for half-inch microphones.

MANUFACTURER: Norsonic

TYPE: 1251

SERIAL NUMBER: 32704

DATE OF CALIBRATION: 4 February 2011

TEST PROCEDURE: CTP06 (Laboratory Manual)

Test Engineer (initial): ..... Name: Gary Phillips

This certificate provides traceability of measurement to recognised national standards, and to the units of measurement realised at the National Physical Laboratory or other recognised national standards laboratories. This certificate may not be reproduced other than in full except with the prior written approval of the issuing laboratory.

Certificate Number: 00312/1 Date of Issue: 4 February 2011

MEASUREMENTS

The sound pressure level generated by the calibrator was measured using a calibrated, WS2P condenser microphone as specified in the certificate. The calibration was carried out with the calibrator in the half-inch configuration.

Five determinations of the sound pressure level, frequency and total distortion were made.

The results have been corrected to the reference pressure of 101.325 kPa using manufacturer's data.

RESULTS

Coupler configuration:	Half-inch
Microphone type:	GRAS 40AG
Output level (dB re 20μPa):	113.99 dB ± 0.10 dB
Frequency (Hz):	1000.00 Hz ± 0.12 Hz
Total Harmonic Distortion (%):	0.02 % ± 0.19 %

Average environmental conditions at the time of measurement and maximum deviation from the stated average:

Pressure:	100.153 kPa ± 0.012 kPa
Temperature:	21.7 °C ± 0.1 °C
Relative humidity:	41.8 % ± 0.5 %

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a level of confidence of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

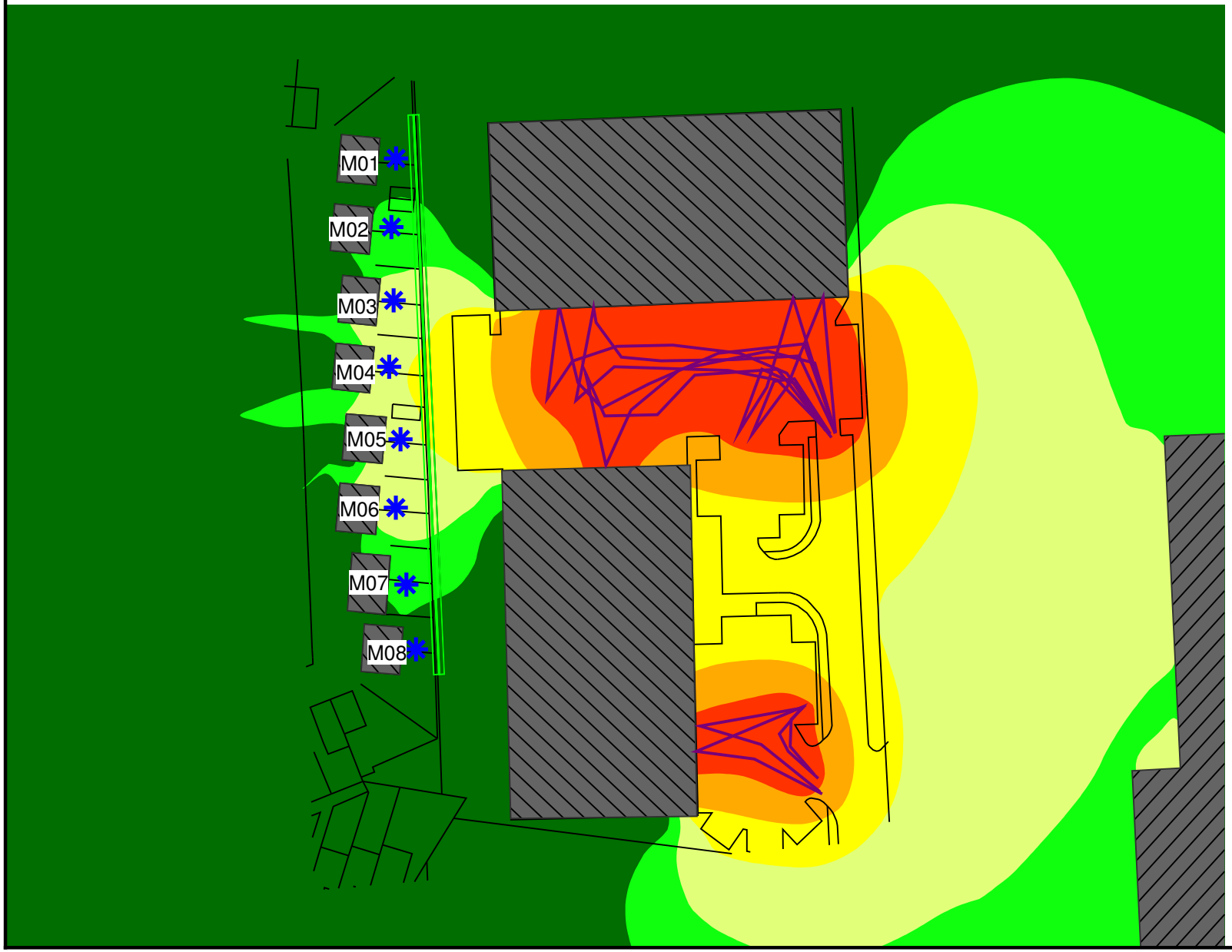
All measurement results are retained at the acoustic calibration laboratory for at least four years.

This certificate provides traceability of measurement to recognised national standards, and to the units of measurement realised at the National Physical Laboratory or other recognised national standards laboratories. This certificate may not be reproduced other than in full except with the prior written approval of the issuing laboratory.

Southmoor Park Industrial Estate, Wythenshawe

Predicted Evening Noise Contours (1 HGV movment to each unit per hour)

Figure 3



L_{Aeq}, 1hour Parameter

55 <=	
50 <=	< 55
45 <=	< 50
40 <=	< 45
35 <=	< 40
	< 35

Signs and symbols

- Line source
- Main building
- Base line
- Berm embankment
- Assessment Location

7th November 2011

Length Scale 1:1200

0 5 10 20 30 40 m

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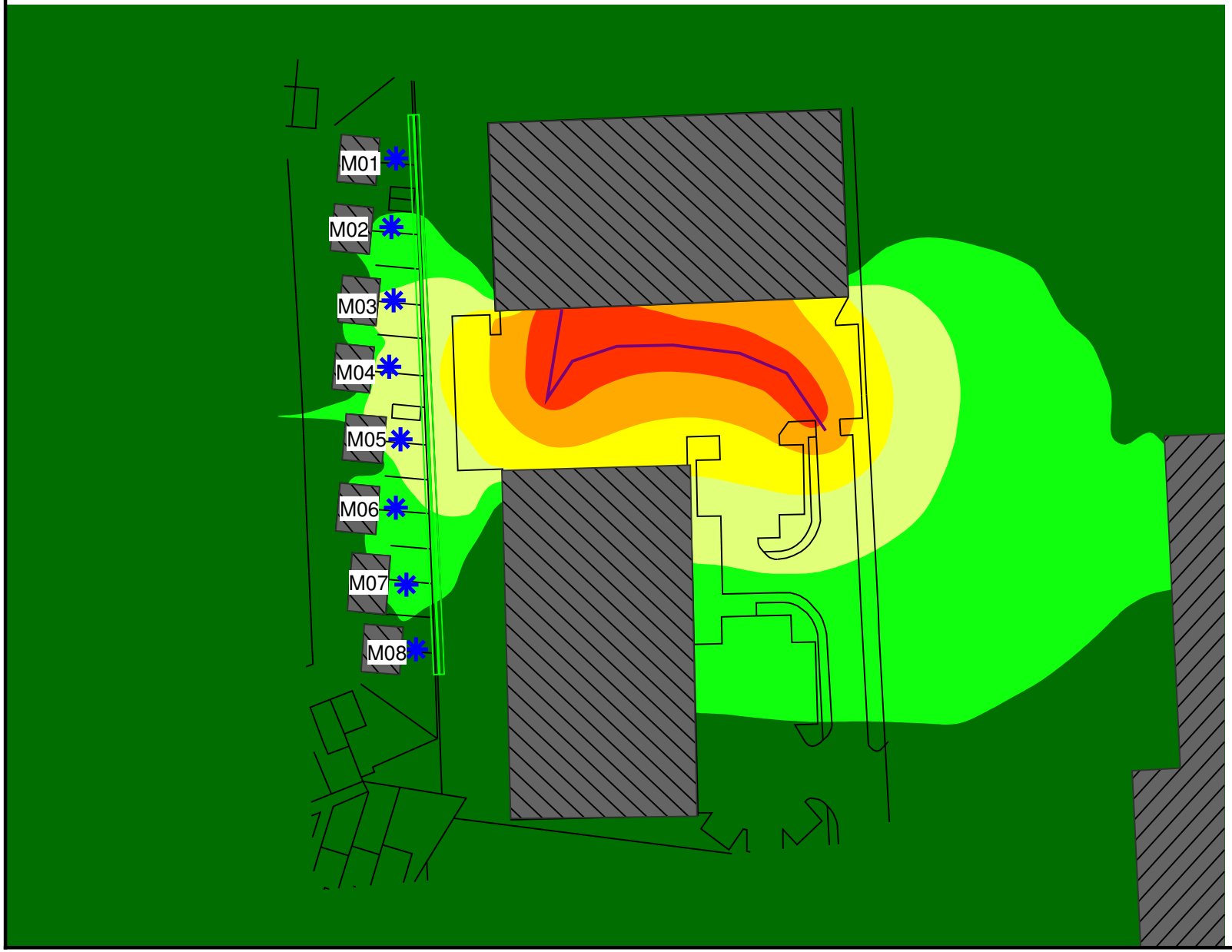
Sheffield, S36 2UH

Southmoor Park Industrial Estate, Wythenshawe

Predicted Night-time Noise Contours (LDV/Van Movement to Unit B1 in a 5min Period)

Figure 4



L_{Aeq} 5min Parameter

55 <=	
50 <=	< 55
45 <=	< 50
40 <=	< 45
35 <=	< 40
	< 35

Signs and symbols

- Line source
- Main building
- Base line
- Berm embankment
- Assessment Location

7th November 2011

Length Scale 1:1200

0 5 10 20 30 40 m

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