BS4142 Environmental Noise Assessment

On Behalf of Bellway Homes

Hinckley & Bosworth Borough Council
Planning Services
REFUSED PLAN
13/2/08

07223
November 07

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GLOSSARY

1.0 EXECUTIVE SUMMARY

1.1 BSP Consulting has been commissioned by Bellway Homes to undertake an assessment of the impact of noise generated by the existing warehouse/factory, situated adjacent proposed housing development off Station Road, Market Bosworth. The proposed development is situated on Station Road and is bordered by an existing railway line and disused station to the west, existing works to the east, Station Road to the north, and fields to the south.

1.2 This survey determines what, if any, effect noise generated from the existing industrial unit would have on the residents of the proposed properties. Were the assessment to show that noise concerns would be valid then proposals to help attenuate the received noise levels would be recommended.

1.3 The assessment has been carried out in accordance with 'BS4142 Method for Rating Industrial Noise Affecting Mixed Residential and Industrial Areas', which would enable any possible detrimental effect on the residents of the adjacent proposed dwellings to be determined by means of identifying the possibility of complaints from the residents.

1.4 The assessment demonstrates, that under the current conditions, the proposed site falls into the zone where complaints are unlikely for the daytime period. We therefore consider that the site is suitable for residential development.

2.0 INTRODUCTION

2.1 BSP Consulting has been commissioned by Bellway Homes to undertake an assessment of the impact of noise generated by the existing warehouse/factory, situated adjacent proposed housing development off Station Road, Market Bosworth.

2.2 The assessment has been carried out in accordance with 'BS4142 Method for Rating Industrial Noise Affecting Mixed Residential and Industrial Areas', which enables any possible detrimental effect on the residents of the adjacent proposed dwellings to be determined by means of identifying the possibility of complaints from the residents. The proposed development is situated on Station Road, and is bordered by an existing railway line and disused station to the west, existing works to the east, Station Road to the north, and fields to the south.

2.3 The noise environment of the proposed site is affected by the existing industrial unit. For the purpose of this assessment it is considered that the existing industrial unit is the dominant noise source that will affect the propsoed residents when the site is constructed. The location of the proposed site is shown on Figure 1.

2.4 The assessment determines whether the combined noise levels would be excessive and therefore detrimental to the enjoyment of their properties during the day time period when the unit is operational. Were the assessment to show that noise concerns would be valid then proposals to help attenuate the received noise levels will be recommended.

2.5 To ensure that the assessment was based on the worst case in terms of noise, an assessment of the existing noise environment was carried out during a typical period for the industrial units operations i.e. daytime. It was considered that one noise monitoring position should provide a representative assessment of the noise source affecting the site. The location of the monitoring position is also shown on Figure 2.

3.0 INSTRUMENTATION

3.1 Free-field noise levels were measured at a height of 1.5 metres above the ground using the following Norsonic integrating sound level metre and microphone:

Description	Model Type	Serial Number
Norsonic Sound Level Meter	Nor-118	31497
Weather Protected Microphone	Gras 41AL-S	36024
Acoustic Calibrator	Nor-1251	29215

3.2 The equipment was operated according to the manufacturer's instructions and calibrated before and after use, using the above portable acoustic calibrator, with no significant drifting occurring (not more than 0.5 dB). Calibration certificates are included in Appendix 3.

4.0 NOISE SURVEY

4.1 The noise survey was carried out during the daytime period in accordance with BS4142. A series of readings were taken throughout the period to ensure that the measured noise levels were representative of the worst case scenario in noise terms. The survey was carried out on Thursday 8th November 2007, during daytime period. The weather was dry with minimal cloud cover through out the measurement period. Conditions were calm with a slight breeze. Temperatures varied from around 8-9°C during the daytime.

4.2 For the assessment, readings were taken on the site during a typical daytime period. Firstly, background noise levels, $L_{A90,}$ were taken on the proposed site, ensuring that these readings were not affected by the noise generated by the existing warehouse. Secondly, specific noise readings, L_{Aeq}, were taken adjacent to the existing industrial unit. The results from this assessment were combined and compared as described in BS4142 using both the recorded background $L_{A90,\ 1hr}$ noise levels and specific noise levels, $L_{Aeq,\ 1hr}$. The results of the BS4142 noise survey shown on data sheet 1 in Appendix 1.

4.3 The results of the BS4142 assessment are shown in Appendix 2. The results show that under typical weekend conditions on the site, the lowest external recorded background noise level for the daytime, $L_{A90,\ 1hour}$ 51.0dB(A), with the highest corresponding calculated external specific noise level, $L_{Aeq,\ 1\ hour}$ 57.4dB(A). These results, together with the BS4142 assessment are discussed in detail in the following sections, with the results of the BS4142 noise survey shown on data sheet 1 in Appendix 1.

5.0 DISCUSSION

5.1 The assessment was carried out in accordance with BS4142 Method for Rating Industrial Noise Affecting Mixed Residential and Industrial Areas', using a 1 hour reference time interval for the daytime. The BS4142 assessment would determine whether the potential noise levels emitted from the existing industrial unit would be sufficient to result in complaints from the existing residents of the nearest dwellings to the site.

5.2 The Calculation sheets in Appendix 2 show the BS4142 assessment for site. The results of the assessment indicate that under the existing noise conditions there is a difference between the rating level and the background noise level of -3.5dB(A) during the daytime period. BS4142 states that:

'A difference of around +10dB or more indicates that complaints are likely.

A difference of around +5dB is of marginal significance

If the rating level is more than 10dB below the measured background noise level then this is a positive indication that complaints are unlikely.'

5.3 Therefore, under the current conditions the proposed site falls into the zone where there is an indication that complaints are unlikely for the daytime period.

6.0 CONCLUSIONS

6.1 An assessment has been carried out of the existing noise environment at the site, to calculate the resulting noise levels together with their likely impact on the adjacent proposed dwellings. This assessment has determined whether the combined noise levels would be excessive and therefore detrimental to the enjoyment of the proposed residential properties.

6.2 The assessment has been carried out in accordance with 'BS4142 Method for Rating Industrial Noise Affecting Mixed Residential and Industrial Areas', which enables any possible detrimental effect on the residents of the proposed adjacent dwellings to be determined by means of identifying the possibility of complaints from the residents.

6.3 To ensure that the assessment was based on the worst case in terms of noise, an assessment of the existing noise environment was carried out during the daytime period,. It was considered that one noise monitoring position would provide a representative assessment of the noise source affecting the site.

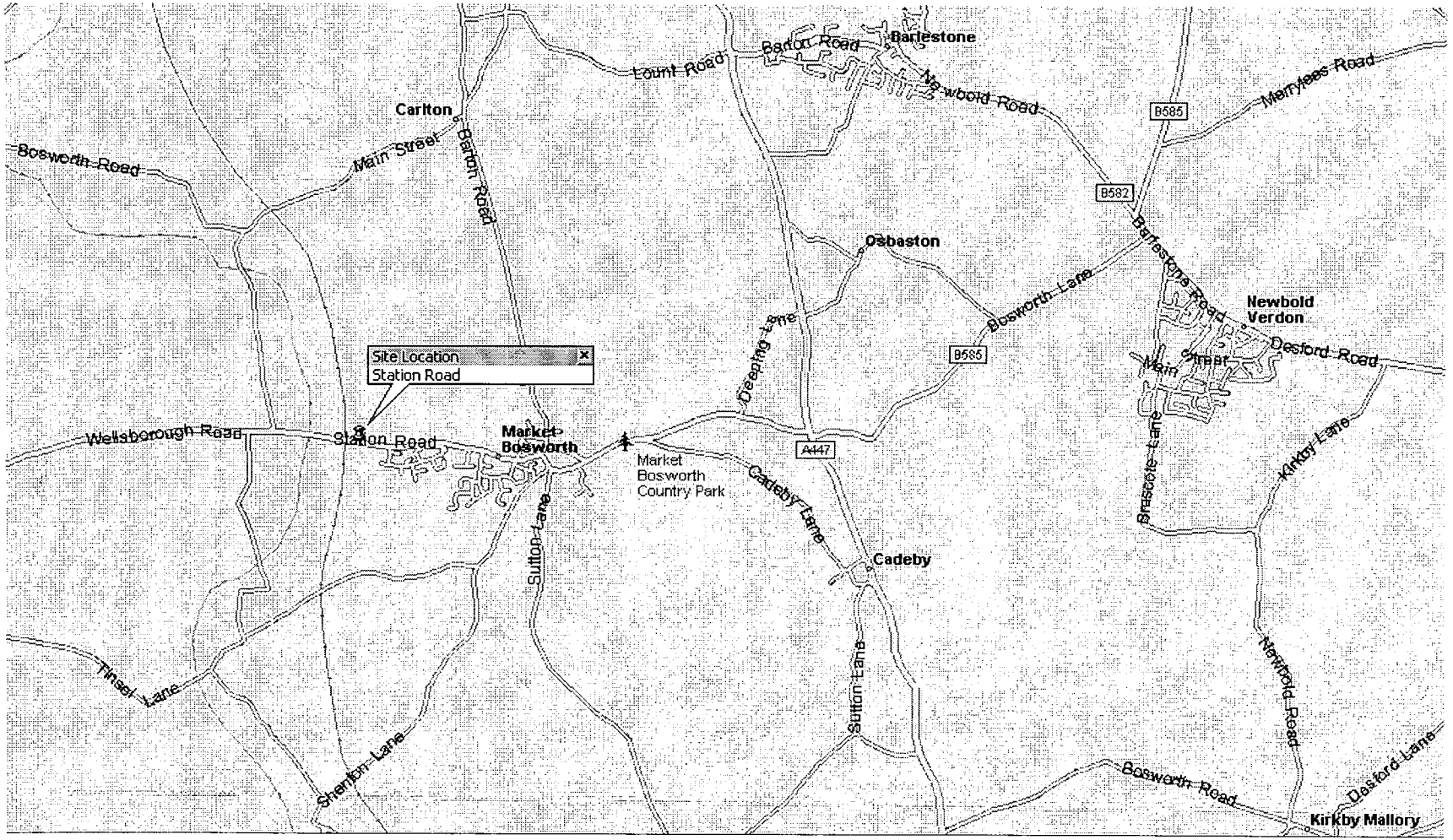
6.4 The assessment demonstrated, that under the current conditions the proposed site falls into the zone where the results indicate that complaints are unlikely for the daytime period. We therefore consider that the site is suitable for residential development.

For and on behalf of BSP Consulting

Fraser Poxon AMIHT
Senior Environmental Noise Technician

J A Davenport BEng (Hons) MIHT
Associate Director

FIGURES 1 - 3



The BSP Risk Assessments for this project must be reviewed PRIOR to the commencement of any works on site

Rev.	Description	Date	Drawn	Appr.

• CIVIL • STRUCTURAL • TRANSPORTATION • GEOTECHNICAL • ENVIRONMENTAL

bsp consulting

12 Oxford Street, Nottingham, NG1 5BG
Tel : (0115) 8402227 - Fax : (0115) 8402228
e-mail : info@bsp-consulting.co.uk

Drawing Status

FOR INFORMATION

Client

BELLWAY HOMES

Project Title

LAND AT STATION HOUSE
STATION ROAD
MKT BOSWORTH

Drawing Title

LOCATION PLAN

Drawn By:	CCF	Checked By:	JAD	Scale:	NTS
Project Engineer:	JAD	Approved By:	MWR	Date:	OCT 2007

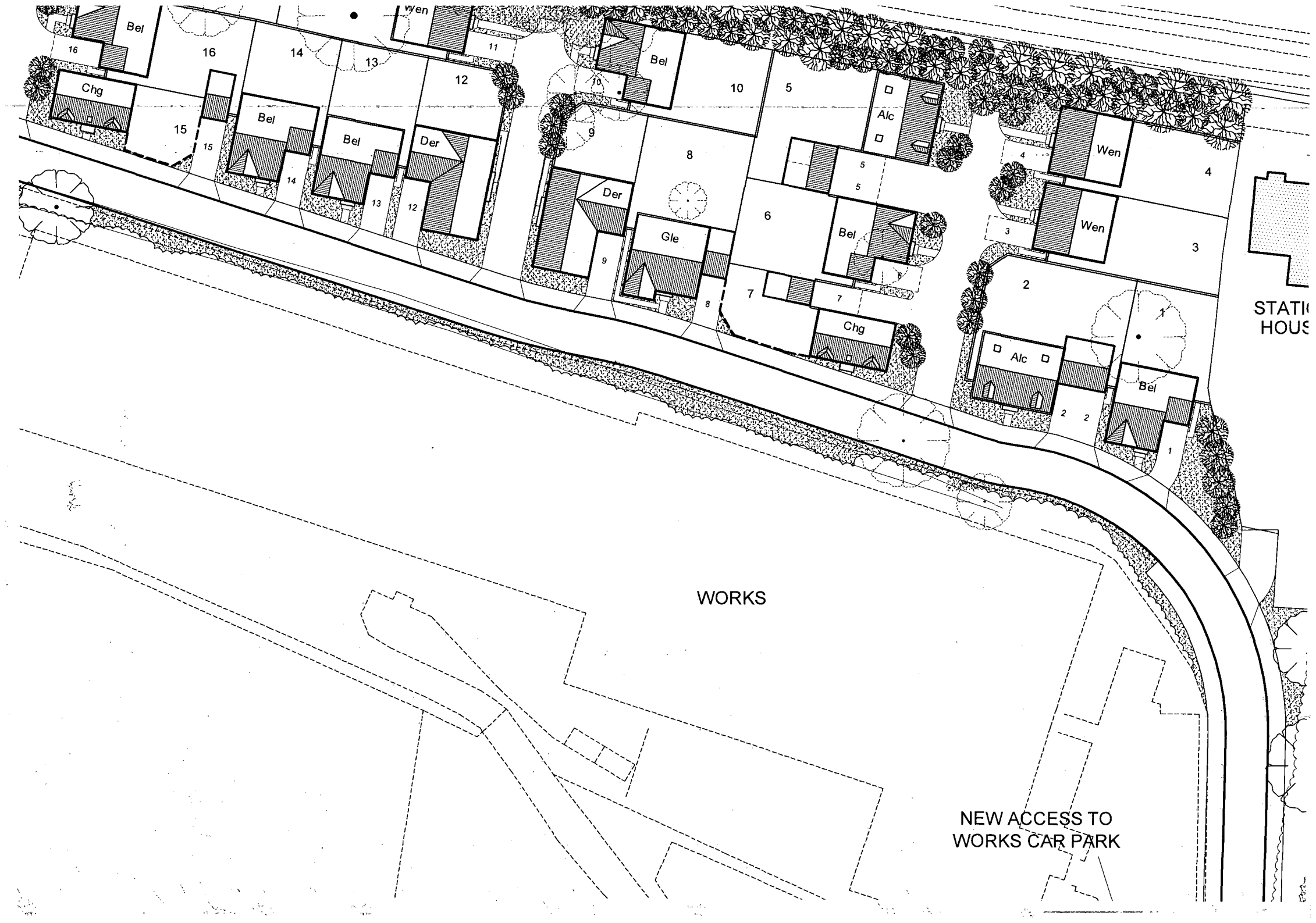
Drawing Number:

FIGURE 1

Revision:

-


(UNABLE TO LOCATE)
BM 101.25m
STATION ROAD
Cattle Grid
STN10
STN9
STN8
STN72
STN7
STN71
NOISE MONITORING POSITION
Station House
SHED
TANK
PETROL PUMP
TARMAC/ HARDSTANDING
TARMAC
GRASS
TREES & BUSHES
HEDGE ROW
PUMP SEWER
SPEED RAMP
HERRIS FENCING
DIRT TRACK
SCRUB/ STONES
CONCRETE
CONIFERS
RAILINGS
MULTI
CBF 1.8H
CLF 1.8H
POST BOX
MH CL:100.501
MH CL:97.337
MH CL:97.575



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APPENDIX 1

DATA SHEET

APPENDIX 1 - DATA SHEET
MEASURED NOISE LEVELS IN dB(A)

Period	Time	Recorded Noise Level		Type of noise recored
		LAeq dB(A)	LA90	
DAYTIME	14.00-15.00		51.0	Background
	15.00-16.00	53.9		Residual
	14.00-15.00	57.4		Specific

APPENDIX 2

CALCULATION SHEETS

12 Oxford Street,
Nottingham.
NG1 5BG

Tel: 0115 8402227
Fax: 0115 8402228
e-mail: info@bsp-consulting.co.uk
website: www.bsp-consulting.co.uk

Project:	Station Rd, Market Bosworth	
Project No:	07233	
Sheet No:	1	**rev**
Date:	Nov-07	
Part of Structure:	Noise Assessment	

Ref	Calculations	Output

BS4142 Assessment - Night-time

Lowest Recorded Night-time Background Noise Level,
$L_{A90, 1hr}$ = 51.0dB(A)

Residual Noise Level, $L_{Aeq, 1hr}$ = 53.9dB(A)

Specific Noise Level, $L_{Aeq, 1hr}$ = 57.4dB(A)

Correction from table 1, BS4142 is:-

(53.9 - 51.0) = 2.9 which equates to

-3dB(A) = 54.4dB(A)

Distance Correction - Centre of nearest garden area

Noise Level Correction to centre of nearest garden area at existing dwelling at a distance of 47m from the existing industrial unit

$\Delta L = 20 \log R_2 / R_1$ R_1 = 15m (Monitoring Position 1)

$\Delta L = 20 \log 47 / 15 = 9.9$

Therefore 57.4 - 9.9 = 47.5dB(A)

Corrected Measured Noise Level = 47.5dB(A)

Specific Noise Level, $L_{Aeq\ 1hr}$ = 47.5dB(A)

Acoustic Feature Correction = 0dB(A)

Rating Level = (47.5 + 0) = 47.5dB(A)

Background Level = 51.0dB(A)

Excess of Rating over background level

=(47.5 - 51.0) = -3.5dB(A)

Therefore the Assessment indicates that as the noise level is below the measured background noise level, then this is an indication that complaints are unlikely.

APPENDIX 3

CALIBRATION CERTIFICATES

Calibration Report

Certificate No.:3434

Norsonic Type : 118 Serial no : 31497

Customer:	Breakwell Sumner Partnership Ltd
Department:	
Place:	12 Oxford Street
City:	Nottingham NG1 5BG
Order No:	BSP/357
Contact Person:	Fraser Poxon
Phone/Mail:	0115 840 2227

Microphone :	Norsonic	Type : 1225	Serial no : 52229	Sens:-25.65dB
Pre amplifier	Norsonic	Type : 1206	Serial no : 30543	
Calibrator :	Norsonic	Type : 1251	Serial no : 29215	Level:114.04dB

Measured with Pre Amplifier

Measurement Results:

Noise Test - IEC 60651 #9.4.1 & 9.4.3	Passed
Level Linearity Test - IEC 60651, #7.9 & 7.10	Passed
Weighting Network Test : A Network - IEC60651 #9.2.2	Passed
Weighting Network Test : C Network - IEC 60651 #9.2.2	Passed
Weighting Network Test : Linear Network - IEC 60651 #9.2.2	Passed
Overload Detector Test : A-Network - IEC 60651 #9.3.1	Passed
Overload Detector Test : Square wave - IEC 60651 #9.3.1	Passed
F/S/I/Peak Test : Steady State Response - IEC 60651 #7.4	Passed
Fast-Slow Test : Overshoot test - IEC 60651 #9.4.1	Passed
Fast-Slow Test: Single Sine Wave Burst - IEC 60651 #9.4.1 & 9.4.3	Passed
Impulse Test : Continuous Sine Wave Burst - IEC 60651 #9.4.3	Passed
Impulse Test : Single Sine Wave Burst - IEC 60651 #9.4.1 & 9.4.3	Passed
Impulse Decay Time Test - IEC 60651 #7.3	Passed
Peak Detector Test, single square wave burst - IEC 60651 #9.4.4	Passed
RMS Detector Test : Crest Factor Test - IEC 60651 #9.4.2	Passed
RMS Detector Test : Continuous Sine Wave Burst - IEC 60651 #9.4.2	Passed
Time Averaging Test: Pulse Range - IEC 60804 #9.3.4	Passed
Time Averaging Test : Averaging Functions - IEC 60804 #9.3.2	Passed
Linearity Test - IEC 804 #9.3.3	Passed

Environmental conditions:

Pressure :	Temperature :	Relative humidity :
101.358 kPa	22.2 °C	43 %RH

Date of calibration: 29/10/07
Date of issue: 30/10/07

Supervisor: Ian Campbell MSc MIOA

Engineer

Darren Batten TechIOA

Campbell Associates
www.campbell-associates.co.uk

GLOSSARY

1. The human ear responds to sound in an approximately logarithmic manner and the logarithmic decibel (dB) scale is used to measure and assess sound. The human ear does not respond equally to sounds at different frequencies. It is more sensitive at the mid-frequency range than it is at the lower and higher frequencies. Therefore, when measuring sound a weighting network, known as >A-weighting= is applied to the frequency spectrum to take account of this differing sensitivity. This unit is termed dB (A).

2. The L_{Aeq} equivalent continuous sound level, is the sound level of a steady sound having the same energy as a fluctuating sound over a specified measuring period. This may be as short as 1 second or as long as 24 hours when used to assess the noise level at a specified location.