INDUSTRIAL NOISE SERVICES

Working For ISO 9002

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Noise Surveys for Health & Safety -- BS 4142 -- BS 14001 -- IPPC

Screening Audiometry --- Work Force Noise Awareness Training

IPPC NOISE SURVEY

FOR

Brockoor Foundry Company Limited
Leys Road
BRIERLEY HILL

All measurements made on the 5 & 6 February 2003.

Survey by WD Robinson.

Results

Introduction

The Brockmoor Foundry site is a complex one for IPPC measurements. The site is split into two halves by Leys road with the fettling / machine shop & office block side also bordering Moor street. The Foundry faces housing on both roads. The site and measuring locations are clearly indicated on the attached site plan.

Instrumentation

A precision grade 1 integrating, data logging, sound level meter was used. The calibrator / meter combination have been calibrated in an approved test house to traceable national standards. These calibrations are carried out every 4 years for precision grade 1 meters (next due 13 / 04 / 2003). Interim calibration checks are carried out every three months using a B&K Pistonphone retained exclusively for this purpose. (Copies of current SLM and calibrator certificates attached).

Instruments Used For Noise Survey

QUEST TECH	Sound Level Meter (IS)	Type 1900	Serial No.CC6010018
QUEST TECH	Octave Filter	Type OB 100	Serial No.HW3090033
B & K	Microphone	Type 4155	Serial No. 1287573
B & K	Calibrator	Type 4230	Serial No. 724728
B & K	Pistonphone	Type 4220	Serial No. 422749

Meter calibration and atmospheric pressure variation

The meter was calibrated immediately before measurements started, however changes in atmospheric pressure can effect sound levels. This is checked by recalibrating the meter every 2 hours during the programme of measurements.

Microphone Position

The microphone was mounted on a tripod at a height of 1.2 metres above ground level. There were no vertical reflecting surfaces within 3.5 metres of the microphone.

Other Considerations

The Sound Level Meter can data log selected parameters (LAeq & LA90) at various time intervals. It also gives the levels of the selected parameters for the full measurement period. In this exercise data was logged every 30 seconds By synchronizing the observers watch and the SLM internal clock it is possible to locate specific noise events. This enables noise events that are not part of the sites normal working practices to be excluded. Regrettably the volume of traffic on both Leys road and Moor street was so great that exclusion was not a practical option.

Measurement Location

Measurement locations are indicated on the accompanying site plan. This was provided by site and is unfortunately somewhat dated.

1) The North gateway to the Foundry site.
2) Opposite the door of electricity sub station No. 11569, 5 metres back from Leys road.
3) Behind the Fettling shop, by the end post of the yellow heavy duty barrier nearest to the road.
4) In the yard, in line with the Fettling shop frontage and 5 metres from the door of the disused building in the diesel compound. This was the most accessible location in that corner of the site, it over looked the building shown on the map..
5) Behind the machine shop in line with the wooden doors of the out building and 5 metres from Moor street.

Weather Conditions (Site Working)

The weather was fine, clear and windless with some cloud. There was a sprinkling of fallen snow (approximately 5mm deep). For some time during measurements at location 2 there was a light snow fall. The SLM microphone was fitted with a windshield.

Weather Conditions (Site Not Working)

The weather was fine, clear, windless and very cold (-2 C).
The SLM microphone was fitted with a windshield.

Results - Location 1			
Measurements made on 5 February 2003.			
Measurement times: Site working 09.24 to 10.27 hours. Site not working 23.39 to 23.45 hours			
Description	Required IPPC Parameter	Value	Comment
Measured noise level Site working	LAeq, 63 min dB	64	
Residual noise level Site shutdown	LAeq, 6 min dB	50	
Residual noise Correction	dB	0	Correction needed if residual noise is within 10 dB of measured noise
Corrected measured level	LAeq, 63 min dB	64	
Acoustic feature correction	dB	5	Extraction & cooling fans have tonal features
Rating level	LAeq, 63 min dB	69	
Background level Site shutdown	LA90, 6 min dB	43	
Excess of rating level over background	dB	26	Assessed very high

Results - Location 2			
Measurements made on 5 February 2003.			
Measurement times: Site working 10.35 to 11.37 hours. Site not working 23.50 to 23.56 hours			
Description	Required IPPC Parameter	Value	Comment
Measured noise level Site working	LAeq, 62 min dB	74	
Residual noise level Site shutdown	LAeq, 6 min dB	54	
Residual noise Correction	dB	0	Correction needed if residual noise is within 10 dB of measured noise
Corrected measured level	LAeq, 62 min dB	74	
Acoustic feature correction	dB	5	Extraction & cooling fans have tonal features
Rating level	LAeq, 62 min dB	79	
Background level Site shutdown	LA90, 6 min dB	54	
Excess of rating level over background	dB	25	Assessed very high

Results - Location 3			
Measurements made on 5 & 6 February 2003.			
Measurement times: Site working 12.17 to 12.48 hours. Site not working 00.05 to 00.11 hours			
Description	Required IPPC Parameter	Value	Comment
Measured noise level Site working	LAeq, 31 min dB	79	Dust extraction was the only audible noise
Residual noise level Site shutdown	LAeq, 6 min dB	44	
Residual noise Correction	dB	0	Correction needed if residual noise is within 10 dB of measured noise
Corrected measured level	LAeq, 31 min dB	79	
Acoustic feature correction	dB	5	Extraction has tonal features
Rating level	LAeq, 31 min dB	84	
Background level Site shutdown	LA90, 6 min dB	37	
Excess of rating level over background	dB	47	Assessed exceptionally high

Results - Location 4			
Measurements made on 5 & 6 February 2003.			
Measurement times: Site working 12.58 to 13.57 hours. Site not working 00.20 to 00.26 hours			
Description	Required IPPC Parameter	Value	Comment
Measured noise level Site working	LAeq, 59 min dB	61	
Residual noise level Site shutdown	LAeq, 6 min dB	46	
Residual noise Correction	dB	0	Correction needed if residual noise is within 10 dB of measured noise
Corrected measured level	LAeq, 59 min dB	61	
Acoustic feature correction	dB	0	There are no acoustic features
Rating level	LAeq, 59 min dB	61	
Background level Site shutdown	LA90, 6 min dB	38	
Excess of rating level over background	dB	23	Assessed very high

Results - Location 5			
Measurements made on 6 February 2003.			
Measurement times: Site working 11.04 to 12.06 hours. Site not working 00.30 to 00.36 hours			
Description	**Required IPPC Parameter**	**Value**	**Comment**
Measured noise level Site working	LAeq, 62 min dB	66	
Residual noise level Site shutdown	LAeq, 6 min dB	42	
Residual noise Correction	dB	0	Correction needed if residual noise is within 10 dB of measured noise
Corrected measured level	LAeq, 62 min dB	66	
Acoustic feature correction	dB	0	There are no acoustic features
Rating level	LAeq, 62 min dB	66	
Background level Site shutdown	LA90, 6 min dB	39	
Excess of rating level over background	dB	25	Assessed very high

IPPC noise guidance

1) The operator should employ basic good practice measures for the control of noise, including adequate maintenance of any parts of plant or equipment whose deterioration may give rise to increases in noise.

2) The operator should also employee such other noise control techniques to ensure that the noise from the installation does not give rise to reasonable cause for annoyance, ***in the view of the Regulator*** and, in particular, should justify where Rating Levels (LAeq,T) from the installation exceed the numerical value of the Background Sound Level (LA90,T).

3) Further justification will be required should the resulting field rating level exceed 50 dB by day and a facade rating level exceed 45 dB by night, with day being defined as 07.00 to 23.00 and night 23.00 to 07.00.

4) In some circumstances "creeping background" may be an issue. Where this has been identified in pre application discussions or in previous discussions with the local authority, the operator should employ such noise control techniques as are considered appropriate to minimize problems to an acceptable level within the BAT (Best Available Technique) criteria.

5) IPPC guidance includes the concept of 'Residual BAT'. This can be summarised by the statement: If it is reasonable and practical to reduce any site noise emission it should be done.

6) The methodology of BS4142:1997 is to be followed. The definitions used when working with BS 4142:1997 are appended to this report.

Comment

1) At all measuring locations the Rating Level LAeq exceeds the Background Sound Level LA90 by amounts that produce rating levels of very high to exceptionally high impact. For measuring positions 1,2 & 5 we are simply rating the traffic flow in Leys road and Moor street. The noise from the site during the measurements 1 & 2 was constant fan noise with very little impulse or site vehicle noise. At measurement position 2 the occasional FLT passed carrying patterns to and from the Foundry. At measurement position 5 there was occasional FLT noise but it was operating much further away from the meter than Moor street. A much better measure of site noise would be to use the LA90 level instead of the LAeq level. For interest the following table provides this comparison.

Measuring Location	Site Working Noise Levels (dBA)	Night Noise Levels (dBA)
1	LAeq - 64 LA90 - 57 Difference 7 dB	LA90 - 43
2	LAeq - 74 LA90 - 61 Difference 13 dB	LA90 - 48
3	LAeq - 79 LA90 - 77 Difference 2 dB	LA90 - 37
4	LAeq - 61 LA90 - 52 Difference 9 dB	LA90 - 38
5	LAeq - 66 LA90 - 54 Difference 12 dB	LA90 - 39

The results in the table show very clearly how traffic noise dominates site noise at locations 1, 2 & 5. Location 4 is all site noise, it shows the same large difference in LAeq and LA90 as 1, 2 & 5 because it is a similar type of noise, site traffic noise, with lorries and FLTs moving around the site. These noise sources will not be a problem as they are masked by the road traffic noise.

Location 3 is the most serious noise problem. This is the noise from the dust extraction with very little contribution from other sources. The occasional clatter from the fettling shop could be heard but most other noises were masked by the extraction unit. This extraction unit is the most easily identifiable day time site noise source. It may also contribute to the daytime noise levels at location 2.

I believe pragmatic considerations should dictate further action. There have been few complaints and these have been concerned with fan noise at night. The table shows that allowing 5 dBA for tonal qualities only at measuring location 2 does the site seriously exceed the IPPC guidance level of 45 dBA.

I would therefore recommend that the site draw up an action plan along the following lines:

1) Tackle the night time fan noise.

The only fans that run at night are the furnace cooling fans which are located on a raised platform. This brings the fans upto the height of Leys road. If these fans could be moved to ground level and enclosed the night time fan noise problem would be much reduced.

2) Tackle the Fettling shop extraction unit.

Consideration should be given to building a screen but more preferably an enclosure around the dust extraction unit behind the fettling shop. The site should count itself lucky that there have been no day time complaints about this noise source.

3) Improve the Fettling shop end wall.

The end wall of the fettling shop should be acoustically improved. Windows should be bricked up. There is an opening facing the shot blast machine which does not appear to have any purpose. This should be bricked up. The end wall is only brick upto the eves it then changes to sheet material. The sheet should be acoustically lined with 50 mm slabs of mineral wool.

Conclusion

As stated earlier, the IPPC Regulator will decide if the plant gives reasonable cause for annoyance.

APPENDIX I - BS4142:1997 Definitions

Specific noise source
The noise source under investigation for assessing the likelihood of complaints.

Reference time interval, Tr
The specified interval over which an equivalent continuous A-weighted sound pressure level is determined.

Specific noise level, LAeq,Tr
The equivalent continuos A-weighted sound pressure level at the assessment position produced by the specific noise source over a given reference time interval.

Measurement time interval, Tm
The total time over which measurements are taken. This may consist of the sum of a number of noncontiguous, short term measurement time intervals.

Rating noise level, LAr,Tr
The specific noise level plus any adjustments for the characteristic features of the noise.
A correction of +5 dB is required if the noise contains a distinguishable, discrete, continuous sound, a distinct impulse or if the noise is irregular enough to attract attention.

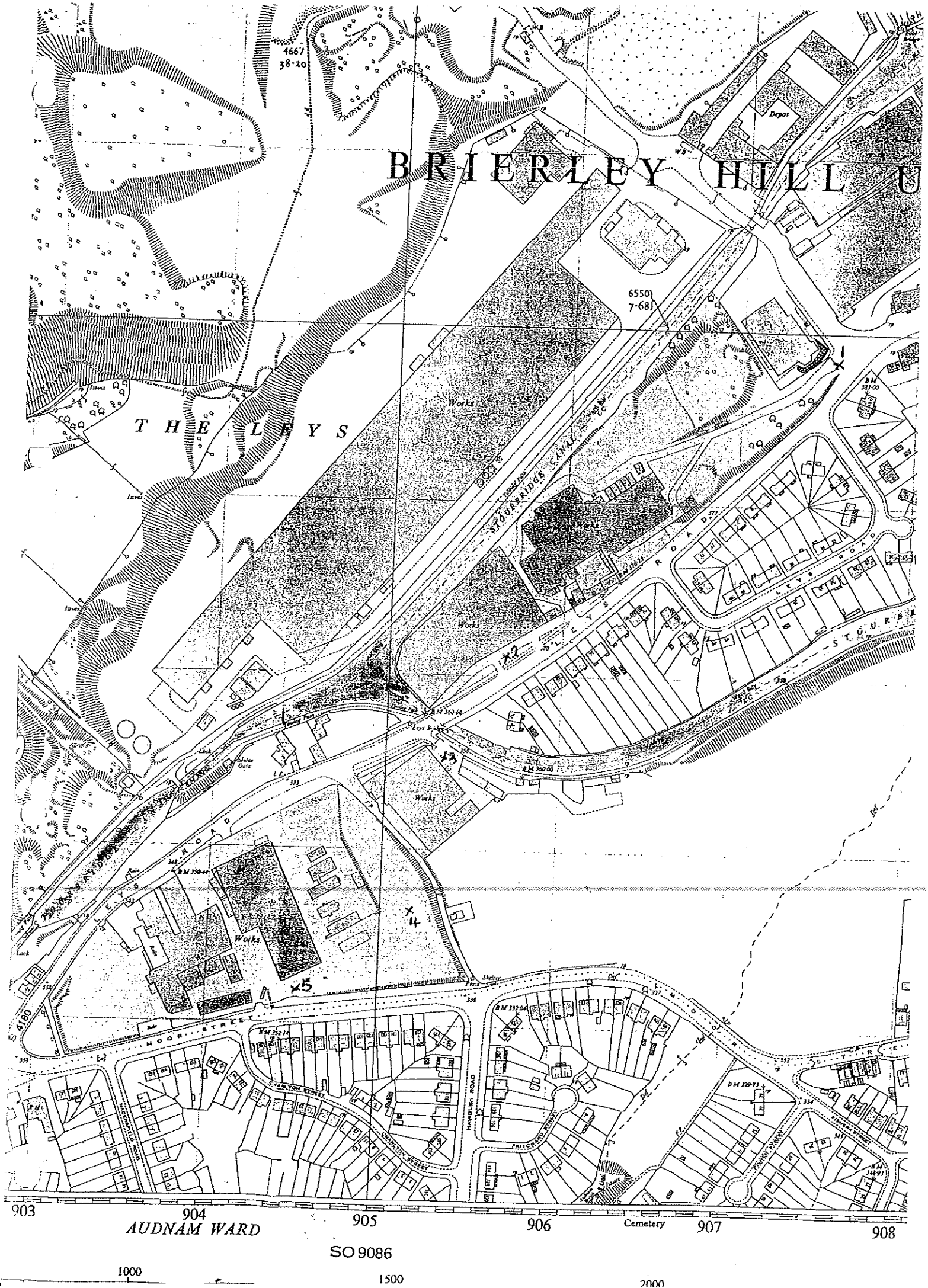
Ambient noise
Totally encompassing sound in a given situation at a given time usually composed of sound from many sources near and far.

Residual noise
The ambient noise remaining at a given position in a given situation when the specific noise source is suppressed to a degree that it does not contribute to the ambient noise.

Residual noise level, LAeq,T
The equivalent continuous A-weighted sound pressure level of the residual noise.

Background noise level, LA90,T
The A-weighted sound pressure level of the residual noise at the assessment position that is exceeded for 90% of a given time interval, T and quoted to the nearest whole number of decibels.

Impact assessment
The Rating level minus the Background noise level indicates the likely impact on the noise environment.
10 dB or greater, high impact.
5 dB marginal impact.
-10 dB or less, no impact.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European Service and Calibration Laboratory

Certificate No: 714149
Reference: R263601
Date: 13 April 1999

Certificate of Calibration

Description	Model	Serial No.
ACOUSTIC CALIBRATOR	B&k Type 4230	724728

Test and Measurements

The frequency and output level of the test calibrator were determined by comparison with the reference calibrator detailed below and adjusted as necessary.
Three determinations were made and the mean values are recorded.

	Output Condition	Frequency (Hz)	Output Level (dB SPL)
Output Level of Test Calibrator	94 dB @ 250 Hz	N/A	N/A
	94 dB @ 1 kHz	1000	94.0
	104 dB @ 1 kHz	N/A	N/A
	110 dB @ 125 Hz	N/A	N/A
	110 dB @ 250 Hz	N/A	N/A
	110 dB @ 500 Hz	N/A	N/A
	110 dB @ 1 kHz	N/A	N/A
	110 dB @ 2 kHz	N/A	N/A
	114 dB @ 250 Hz	N/A	N/A
	114 dB @ 1 kHz	N/A	N/A

REFERENCE CALIBRATOR QUEST Type CA-15B Serial No. H0090011

NATIONAL PHYSICAL LABORATORY Certificate of Calibration Ref. S4101

Signed

for P. C. WERTH Ltd

BS EN ISO 9001 BS EN 46001

Measurements reported here are traceable to the above NPL Certificate of Calibration.
We strongly recommend that this equipment is calibrated at least once every twelve months.

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for Industrial Noise Services Limited
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European Service and Calibration Laboratory

Certificate No: 714147
Reference: R263601
Date: 13 April 1999

Certificate of Calibration

Description	Model	Serial No.
SOUND LEVEL METER	Quest Type 1900	CC6010018
with MICROPHONE	B&K Type 4155	1287573

Test and Measurements

The test sound level meter was adjusted to give a reading of 110.0 dB using the reference calibrator detailed below set for an output of 110 dB at 1 kHz. The response of the test sound level meter to the reference calibrator was determined using the 60 - 120 dB indicator range. The test sound level meter was set to LIN, FAST and SPL during all reported measurements. Three determinations were made and the mean value is recorded.

	Calibrator Output Condition	Indicated Level (dB SPL)	Indicated Level (dB) Relative to True SPL (re. S4101)
Response of Test Sound Level Meter	110 dB @ 125 Hz	N/A	N/A
	110 dB @ 250 Hz	N/A	N/A
	110 dB @ 500 Hz	N/A	N/A
	110 dB @ 1 kHz	110.0	0.0
	110 dB @ 2 kHz	N/A	N/A

REFERENCE CALIBRATOR QUEST Type CA-15B Serial No. H0090011

NATIONAL PHYSICAL LABORATORY Certificate of Calibration Ref. S4101

Signed

for P. C. WERTH Ltd

BS EN ISO 9001 BS EN 46001

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Fig 1

THE BROCKMOOR FOUNDRY CO LTD

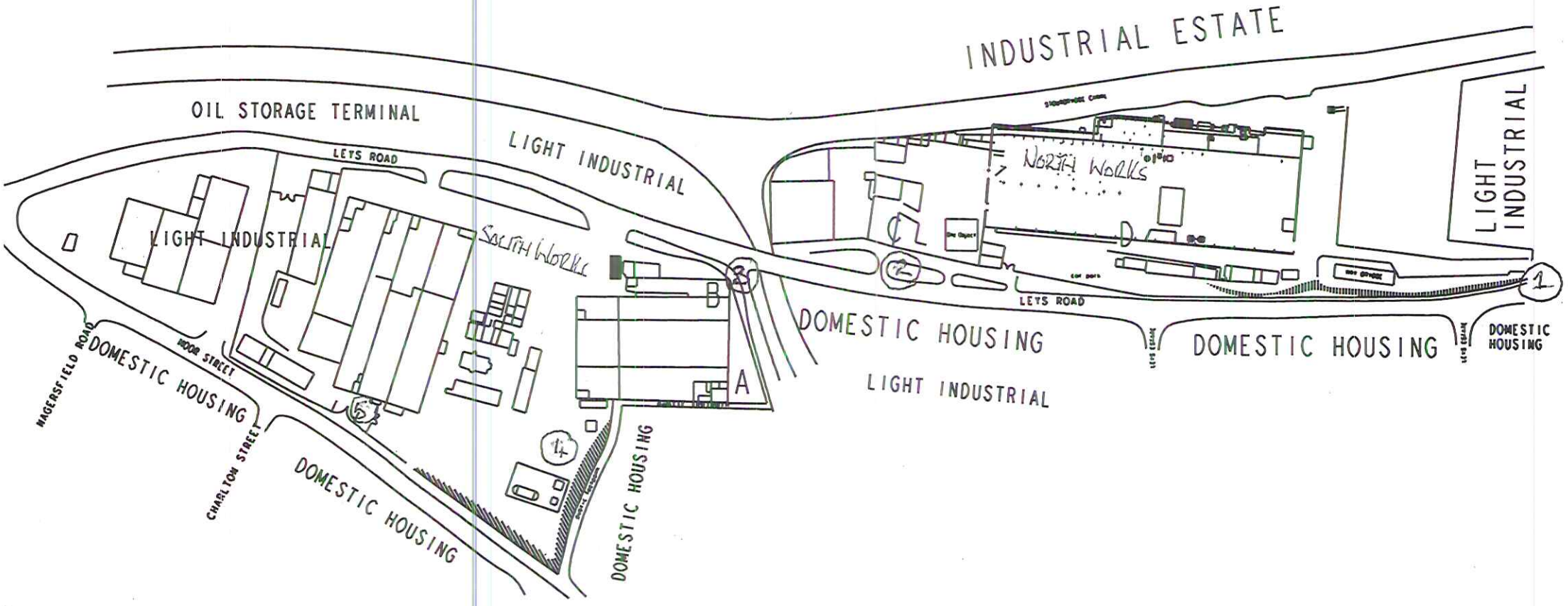

Table 1. De .ption of Noise Sources

Fig 2 Ref	Noise Source Description	Continuous or Intermittent ?	If intermittent, How Frequent ?	Fixed or Mobile ?	Hours of Operation	Noise Character description	Contribution to site Emission
1	Presspour Cooling Fan	Continuous		Fixed	24 Hours per day 365 Days per year	Hum	High
2	Fettling Shop Extraction A6	Continuous		Fixed	7.00 a.m. - 4.30 p.m.	Hum	High
3	WheelAbrator Fettling Shop	Intermittent	Every 15 Minutes	Fixed	7.00 a.m. - 4.30 p.m.	Rumbling	High
4							
5							
6							
7							
8							
9							
10							

NOISE & VIBRATION

The potential significant source of Environmental Noise from the installation are listed in table 1 and shown on site plan Fig II. No source of vibration have been identified as a source of environmental nuisance to receptors further investigative work may be required if found necessary.

Potential Receptors, North Site

The installation is situated in a mixture of industrial estates and residential housing. To the North of the North Site there is a large industrial estate between this estate and the main foundry the Stourbridge Canal. South of North Site, Leys Road, there is a large residential estate within a distance of 30 Metres of the main Foundry.

Potential Receptors, South Site

To the North of the site is Leys Road and Light Industrial Unit, with an oil storage depot next to it; to the North East residential housing within 35 Metres to the South is Moor Street and residential housing.

A noise survey has been carried out and we have established 3 potential noisy points, 2 are on the South Site indicated on site plan fig 1. and 1 is located on North Site indicated on fig 1. The company is committed to over come these issues using B.A.T. the 2 found on South Site within 6 months and North Site within 12 months.

Traffic : North and South Site

Traffic noise on site includes Fork Lift truck movements, collection of goods and deliveries should not cause a major problem. They are masked by road traffic noise from both Leys Road and Moore Street. Incoming goods are not expected before 7.00 am or after 18.00 hours. Forklift truck movements are controlled to minimise noise before 7.00 am and after 18.00 hours.