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Technical Report 3923/3

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08 August 2011

Aggregates Bagging Depot, Shoreham-by-Sea

Noise of Vehicle Movements 6 am to 7 am

Day Group Limited is required to monitor noise levels in connection with a planning permission for an aggregates bagging depot at Brighton Road, Shoreham-by-Sea, West Sussex. A 1 hour duration noise measurement was carried out between about 7 am and 8 am on Thursday 14 July 2011 near Quay Court and opposite No. 176 Harbour Way. This location was selected as it is representative of the nearest residential premises to the site. The noise monitoring, which took place within the currently permitted hours of operation, showed compliance with the site noise limit.

The opportunity was taken to undertake noise measurements opposite No. 176 Harbour Way before 7 am on Thursday 14 July 2011 and to observe vehicle movements associated with the Day Group aggregates bagging depot as well as at the adjacent haulage company site.

A summary of the measured noise results and comments are detailed below. Operations that were taking place on the Day Group site in the period 6 am to 7 am included three heavy goods vehicle movements out of the site, with bags of aggregate loaded onto the lorries the day before. The lorry movements were just audible at the monitoring location opposite No. 176 Harbour Way.

Summary of Noise Survey Results and Comments

A visit was made by Dr Cockcroft to the site access gates at about 5.30 am on Thursday 14 July 2011 to view the site layout and to confirm that the gates were locked. Dr Cockcroft then drove to Harbour Way on the far side of the water from the aggregate bagging depot for noise monitoring and corresponding observations about the noise climate at this position before 7 am.

The noise monitoring location was situated opposite No. 176 Harbour Way, about 45 metres to Quay Court, on the pavement about 2 metres to metal railings and about 6 metres from the edge of the road. The monitoring location is marked "A" on the plan in Appendix 3.

Noise monitoring took place between about 5.45 am and 6 am and between about 6 am and 7 am on Thursday 14 July 2011. Although the site boundary adjacent to the water was clearly visible from the monitoring location, the presence of timber barriers on the boundary prevents a clear view into most of the site. However, from what could be seen from the noise monitoring location there was no activity on the Day Group site before 6 am. In the period 6 am to 7 am three heavy goods vehicle movements out of the Day Group site were noted, loaded with bags of aggregate. During the period 6 am to 7 am heavy good vehicle movements were noted at the adjacent haulage company site which shares access gates with the bagging plant.

The measured noise levels are set out in the table below.

Date: 14 July 2011 Opposite No. 176 Harbour Way, Shoreham-by-Sea Weather Conditions: Dry, moderate cloud, 13°C, northerly breeze ~ 2 m/s				
Measurement Results	**dB $L_{A10,T}$**	**dB $L_{A90,T}$**	**dB $L_{Aeq,T}$**	**dB $L_{Aeq,Max,\ Fast}$**
Time: 05:44-05:59	53	47	52	68
Time: 06:01-07:01	54	49	53	73

A description of Noise Units is included as Appendix 1. The instrumentation and calibration details are set out in Appendix 2. A plan showing the site and the monitoring location is included as Appendix 3.

In the 15-minute period before 6 am the noise climate was affected by road traffic on the A259 main road immediately north of the site, train movement, gulls, water and a van on Harbour Way.

In the 1-hour period between about 6 am and 7 am the noise climate at the monitoring location was dominated by increasing A259 road traffic, train movements, gulls, water craft and local vehicle movements on Harbour Way. Lorry movements leaving the aggregate bagging depot were just audible briefly at the noise monitoring location opposite No. 176 Harbour Way.

The attended noise measurement of 1-hour duration was set with a 1 second resolution which allows a trace of noise level over the measurement period to be plotted. A Noise Level versus Time Graph is included in Appendix 4, showing the measured 1 second $L_{AMax, Fast}$ values at the monitoring location. The highest peaks, above 60 dB $L_{AMax, Fast}$ were attributable mainly to local vehicle movements. The three Day Group HGV movements are indicated on the graph, for identification purposes, by short marks on the 50 dB line.

At about 6.03 am a double trailer lorry left the aggregate bagging depot and was briefly just audible as the lorry pulled away on the A259. For the period identified with this Day Group HGV movement the 1 second values are in the range 52 to 58 dB $L_{AMax, Fast}$.

At about 6.09 am a double trailer lorry left the aggregate bagging depot and was briefly just audible, followed directly by a heavy goods vehicle leaving the adjacent haulage site which was briefly audible at the monitoring location. For the period identified with this Day Group HGV movement the 1 second values are in the range 51 to 57 dB $L_{AMax, Fast}$.

At about 6.37 am a lorry left the aggregate bagging depot but was not noted as being audible at this time. For the period identified with this Day Group HGV movement the 1 second values are in the range 51 to 55 dB $L_{AMax, Fast}$.

During the period 6 am to 7 am three heavy good vehicle movements were noted leaving the adjacent haulage company site, with rigs entering the haulage site 5 to 10 minutes earlier and fixing onto the trailers. These movements were just audible, with maximum noise levels in the range 50 to 60 dB $L_{AMax, Fast}$.

Whilst individual lorry movements were just audible at the monitoring location on Harbour Way in the period 6 am to 7 am, the noise climate was dominated by A259 road traffic, train movements, gulls, water craft and local vehicle movements on Harbour Way.

During the same time as the noise monitoring and observations undertaken by WBM, a member of Day Group staff on site was making observations about vehicle movements to and from the Day Group bagging plant site and to and from the adjacent haulage company. The details of the vehicle movements are summarised in a table in Appendix 5 of this report for the period 6 am to 7 am.

The three heavy goods vehicle movements out of the Day Group site are noted, with bags of aggregate loaded onto the lorries the day before, along with six cars and one van into the Day Group site. Six vehicle movements associated with the HGV at the adjacent haulage site are also noted. From the noise measurement location selected by WBM no car movements on to the site in the period 6 am to 7 am were either audible or visible.

The noise level generated at the monitoring location, by the vehicle movements on the site in the period 6 am to 7 am, is estimated to be less than 50 dB $L_{Aeq,\ 1\ hour,\ free\ field}$ which is below the site noise limit of 55 dB $L_{Aeq,\ 1\ hour,\ free\ field}$ at the nearest residential properties for the period after 7 am. Due to extraneous noise, for example from general road traffic and train movements it is not possible to provide an accurate determination of the site noise level at the assessment location.

Based on the direct measurements and observations between 6 am and 7 am on Thursday 14 July 2011, it is considered that pre-loaded lorries leaving the Day Group aggregates bagging plant site and cars arriving on site represent a negligible noise impact for the nearest dwellings on Harbour Way.

Dr Paul Cockcroft

Appendix 1

Noise Units

Noise is continuously varying and it is therefore difficult to describe the overall picture with a single figure. It is also necessary when attempting to correlate noise levels with human response to bear in mind that the human ear is not uniform in its sensitivity.

Noise levels are measured in **decibels**, which is the logarithmic ratio of the sound pressure to a reference pressure. The decibel scale gives a reasonable approximation to the human perception of relative loudness.

Historically, noise measurements concerned with human reaction have been made through various filters, which reasonably match human hearing response at different sound pressure levels. The filter most commonly used for environmental noise is known as the **A weighting** filter and all measurements are then expressed in dB(A) terms, i.e. A weighted decibels.

The equivalent continuous sound pressure level $\mathbf{L_{Aeq,T}}$, is the preferred unit for assessing noise sources. It is the value whose continuous steady state level would have the same energy as a varying noise signal over the specified period "T" and is measured electronically by integrating all noise received by the meter. Because decibels are logarithmic units, the $L_{Aeq,T}$ unit is dominated by the higher levels. For example, the $L_{Aeq,T}$ average of two equal periods at 70 dB(A) and 50 dB(A) is not 60 dB(A) but 67 dB(A). The unit was commended by the Noise Advisory Council and is the chosen unit of BS5228 for Construction and Open Site Noise; MPS 2 for Minerals Extraction Sites; PPG 24 Planning and Noise and BS 7445 for the Description and Measurement of Environmental Noise.

In order to cover the time variability aspects, noise is analysed into various statistical parameters. $\mathbf{L_{A10,T}}$ is the level exceeded for 10% of the time T and is often used to denote free-flowing road traffic noise. $\mathbf{L_{A90,T}}$ is the level exceeded for 90% of the time T, and is often used to denote the underlying background noise level. It is defined in British Standard 4142 as the background unit and is used for establishing the reference against which new noises are assessed.

Appendix 2

Survey, Instrumentation and Calibration Details

Dates and Location of Survey

Thursday 14 July 2011

Bagging Plant Shoreham

Monitoring Location on Harbour Way

Survey carried out by

Dr Paul Cockcroft

Instrumentation used (Serial Number)

Norsonic 140 Sound Level Meter (1403137)

Norsonic 1251 Calibrator (31993)

Calibration

The sensitivity of the meter was verified on site immediately before and after the measurements with readings of 113.9 dB(A) and 113.9 dB(A) respectively.

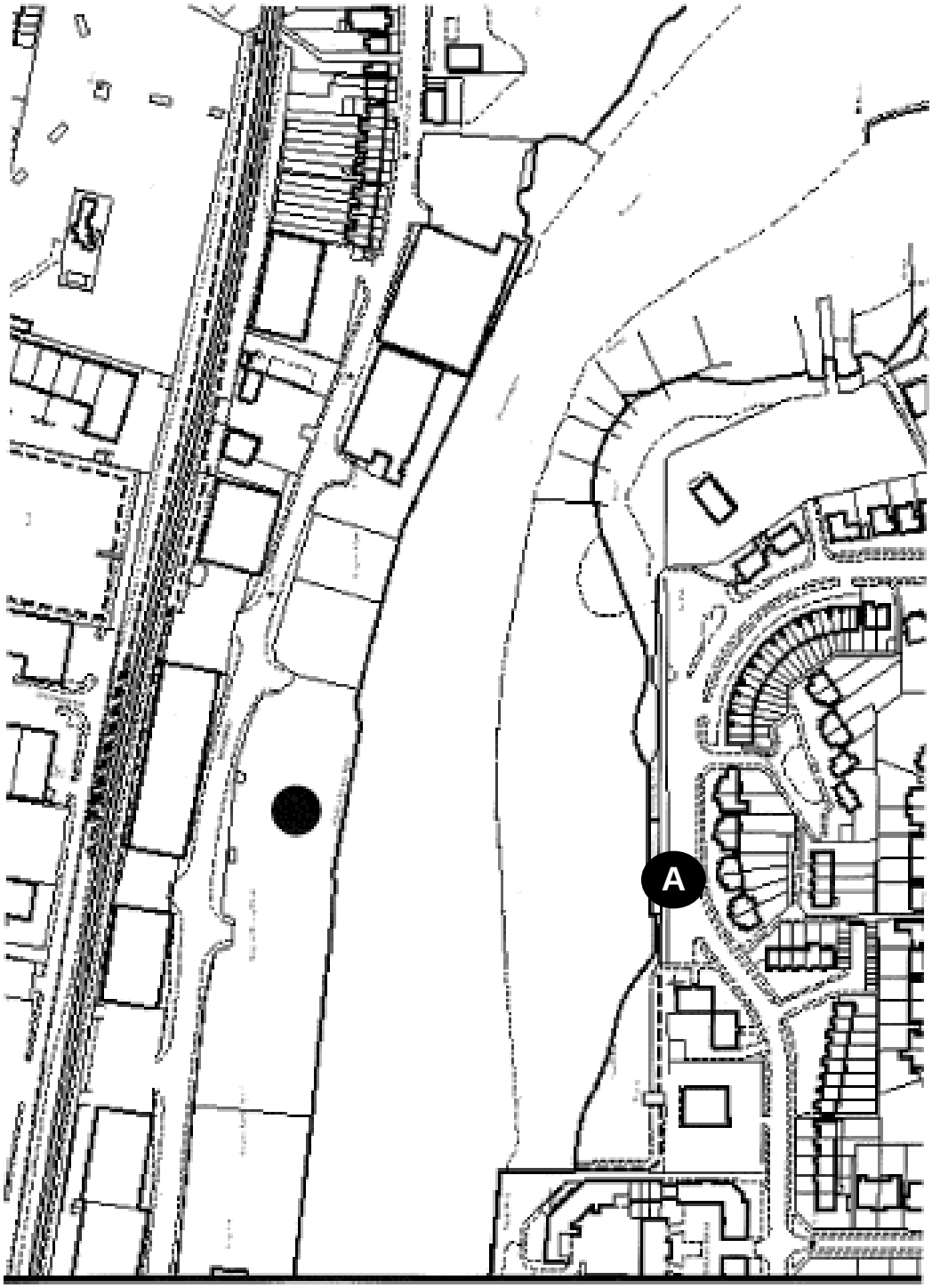
The meter and calibrator are tested monthly against two Laboratory Standard Brüel & Kjær Pistonphones, type 4220 (serial numbers 375806 and 196953), and a Norsonic Calibrator, type 1253 (serial number 22906) all with UKAS approved laboratory certificate of calibration.

Survey Details

The measurement was taken in the vicinity of the residential property closest to site activity.
The attended noise measurements were of 15-minute 1-hour duration, with a 1 second resolution.
The microphone was at a height of about 1.4 metres above local ground level, with a windshield used throughout the survey.

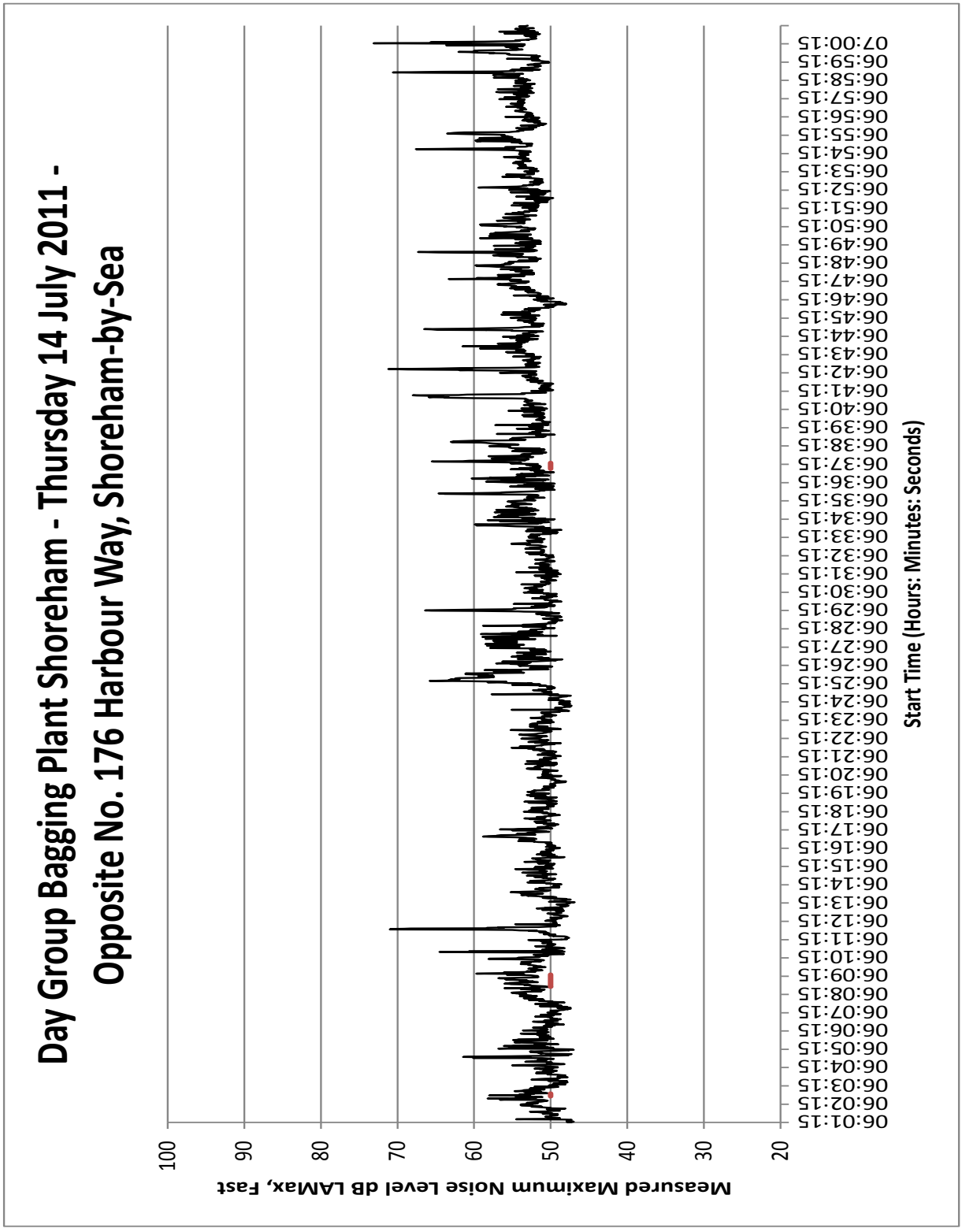
Appendix 3

Plan of Site and Monitoring Location



Appendix 4

Noise Level versus Time Graph



WBM

Appendix 5

Record of Vehicle Movements

Thursday 14 July 2011

Reg No.	In/out	Time	Company	Comments
P277 JVV	In	6.01	Day	Car
BF60 DAY	Out	6.03	Day	HGV
EU55 AHL	In	6.05	Axtra	Collect Trailer, HGV
BL60 DAY	Out	6.09	Day	HGV
EU55 AHL	Out	6.09	Axtra	HGV
BF02 MRA	In	6.19	Day	Car
GP04 WUA	In	6.19	Day	Car
BU53 AMK	In	6.28	Axtra	Collect Trailer, HGV
MK07 SKZ	In	6.32	Day	Car
BU53 AMK	Out	6.35	Axtra	HGV
CS11 DAY	Out	6.37	Day	HGV
W301 PCD	In	6.37	Day	Car
CN54 BUF	In	6.38	Axtra	Collect Trailer, HGV
FE04 2ST	In	6.43	Day	Car
665 DAY	In	6.45	Day	Van
CN54 BUF	Out	6.48	Axtra	HGV