ACOUSTIC DESIGN TECHNOLOGY
Noise and Vibration Consultants

ADT 2690

22 March 2018

Westwood Sporting Clays Ltd.
1 - 3 Eastgate
Barnsley
South Yorkshire
S70 2EP

WESTWOOD SPORTING CLAYS

ENVIRONMENTAL NOISE IMPACT ASSESSMENT

ACOUSTIC CONSULTANCY REPORT ADT 2690/ENIA

Revision	Date	Issued By	Checked by	Revision Notes
-	22 Mar 2018	Andrew Lockwood	-	

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1.0 SUMMARY

Planning application is being sought for a weekly clay pigeon shoot at a site known as Westwood, near Tankersley in South Yorkshire.

Acoustic Design Technology undertook environmental noise monitoring in the surrounding area during the Sunday morning shoot on 11 February 2018.

In the surrounding villages of Howbrook, Bromley, Pilley and Tankersley, noise from gunshot was generally indistinguishable from the otherwise prevailing ambient noise levels.

Analysis of the data following the guidance in *Clay Target Shooting: Guidance on the Control of Noise* shows the mean shooting noise level to be between 40 and 55 dB in the vicinity of the residential dwellings in the surrounding villages.

The conclusion of this assessment is therefore that the noise levels resulting from clay target shooting on the application site are reasonable, when assessed in accordance with the relevant guidance.

2.0 BASIS OF ASSESSMENT

2.1 Site Location

The application site is an isolated area of woodland located in the south-west quadrant of the intersection between the A616 and the A61 in South Yorkshire. The nearest villages in the Metropolitan Borough of Barnsley to the site boundary are:-

Bromley	–	approximately 0.5 km to the west
Howbrook	–	approximately 1.0 km to the south west
Tankersley	–	approximately 1.0 km to the north-east
Pilley	-	approximately 1.0 km to the north

2.2 Proposed Development

The application site is currently used for clay pigeon shoots on up to 28 days per year under permitted development rights. Planning permission is being sought for change of use to formalise the arrangement and allow weekly shoots, normally on a Sunday between 10:00 and 15:00 hours.

2.3 Complaints

The site has been used under the 28 day rule for purposes of clay pigeon shooting for around 6 months. It is understood that during that time, the Council have received two complaints about the associated noise, both from residents in Pilley living around 1.5 km to the north.

2.4 Strategy for Noise Impact Assessment

Barnsley Council have requested an assessment to be undertaken following the methodology of the CIEH publication "Clay Target Shooting: Guidance on the Control of Noise".

3.0 NOISE SURVEY

3.1 Introduction

Attended noise monitoring was undertaken on Sunday 11 February between 10:30 and 13:00 hours.

3.2 Instrumentation

The survey was conducted using the instrumentation detailed in Appendix A of this report. The sound level meters were calibrated prior to use and also on completion of the survey period and drifted by 0.1 dB as recorded in the table. The clocks on the two meters were synchronized at the outset to facilitate direct comparison of the data logged concurrently at different positions.

3.3 Procedure

Measurements were recorded at a total of six measurement positions as indicated on the attached site plan 2690/SP1 and described below:-

1. at junction of Chapel Road and Pilley Lane
2. on Pilley Lane just before bridge over the M1
3. in Pilley village centre at junction of Pilley Green and Chapel Road
4. outside Tankersley Primary School in Westwood New Road
5. Storrs Lane
6. Carr House Court

At each position, the noise levels were logged continuously for a period of at least 30 minutes with the meter being set to store the octave band and 'A' weighted 100ms short-term L_{eq} for subsequent post processing.

Periodic audio recordings were also undertaken to assist with the analysis of the recorded data.

3.4 Weather Conditions

The weather conditions were variable during the survey, with periods of bright sunshine interspersed with rain, hail and snow. It was breezy throughout, the prevailing wind coming from the west.

3.5 Description of the Acoustic Environment

The application site and the neighbouring villages are in relatively close proximity to three major trunk roads, namely the A616, the A61 and the M1. Consequently, the daytime ambient noise levels in the vicinity are controlled by the sound of local and more distant road traffic.

At two of the positions (5 and 6), the sound of gunshot was clearly audible. At positions 3 and 4, it was occasionally noticeable but at positions 1 and 2, it was inaudible to the surveyor.

3.6 Results

The data logged at the six measurement locations has been post-processed into 1 second L_{Amax} values, and these are presented on the attached time history graphs 2690/TH1 to TH6 for positions 1 to 6 respectively.

As can be seen, measurements were taken concurrently at positions 1 and 5, and at positions 2 and 6, the ones at positions 5 and 6 being primarily intended to be a datum against which the levels measured at positions 1 and 2 could be compared.

4.0 NOISE IMPACT ASSESSMENT

4.1 Relevant Guidance

The Council have asked for an assessment undertaken in accordance with the guidance in the document "*Clay Target Shooting: Guidance on the Control of Noise"* published by the Chartered Institute of Environmental Health in 2003.

4.1 Logged Data

This document advises that annoyance due to clay pigeon shooting should be assessed by considering the mean Shooting Noise Level (SNL) which is defined as the logarithmic average of the 25 highest shot levels, from the shoot in question, over a 30 minute measurement period.

The difficulty is, however, that in the vicinity of the complainants' properties (positions 1 and 2), gunshot was inaudible, and cannot be identified in the measured data. It is therefore not possible to accurately determine the SNL at these locations.

At positions 3 and 4 gunshot was just just discernable at times, but again, they cannot be identified in the logged noise data, as the shots were quieter than the ambient noise levels due to road traffic and other local activity.

By comparison, the noise levels logged at position 5 were largely dominated by gunshot noise; virtually every "spike" on the graph is the result of a gunshot. It can therefore be clearly seen that at this position, the peak levels generally range between around 65 and 75 dB(A).

At position 6, gunshot was again audible and the "spikes" can be seen in the logged data. However, the levels were much quieter than at position 5,

What the graphs clearly show, therefore, is that the pattern of very frequent gunshot shown on graph 2690/TH5 is not replicated at positions 1 to 4, and is much less apparent at position 6.

This therefore demonstrates that the levels of gunshot noise at positions 1 to 4 were lower than the ambient levels and therefore indistinguishable from them.

4.2 Shooting Noise Levels (SNL)

4.2.1 Junction of Chapel Road and Pilley Lane (Position 1)

A more detailed comparison of the levels measured concurrently at positions 1 and 5 re-enforces the point that gunshot noise levels are very low in the village of Pilley.

The attached graph 2690/TH7 compares at maximum resolution (100 ms) the levels measured at positions 1 and 5 between 10:53 and 10:55, during a lull in the ambient levels at position 1.

During that period, there were at least 30 clearly identifiable gunshots (shown by the red line). But even during a particularly quiet couple of minutes at position 1, there is nothing in the green trace that remotely resembles regular gunshot. The only possible conclusion to draw from this is therefore that noise due to gunshot at position 1 is no higher than around 40 dB(A), and may be even lower.

The SNL at this position is therefore no more than 40 dB.

4.2.2 Pilley Lane (Position 2)

The ambient noise levels due to the motorway are relatively high in this area, rarely dropping below 60 dB(A).

Detailed scrutiny of the logged data shows again that gunshot cannot be identified in the logged data. But because the ambient levels are high anyway, all this demonstrates is that the SNL is no more than 60 dB.

However, as this position is, if anything, slightly further away from the application site than position 1, it is reasonable to assume that the SNL at this position will be no higher than at position 1.

In other words, there is nothing to indicate that the SNL is higher than 40 dB at this position either.

4.2.3 Junction of Pilley Green and Chapel Road (Position 3)

As at position 1, the logged data shows that the ambient levels dropped below 50 dB(A) quite regularly, but even in those quiet periods, there is no evidence of any gunshot noise. And indeed, the surveyor noted that only occasionally did he hear one.

The logged data therefore demonstrates that the SNL is no higher than 45 dB at this position.

4.2.4 Outside Tankersley Primary School (Position 4)

As at position 2, the ambient noise levels in this area are relatively high due to the proximity of the M1. However, since it is at least as far away from the shooting area as position 3, it is reasonable to conclude that the SNL is no higher than 45 dB in this area.

4.2.5 Storrs Lane (Position 5)

This is the only measurement location at which gunshot was clearly audible and measureable. The calculated SNL is 75 dB. However, this is of academic interest only since there are no houses in the vicinity to be affected by it.

4.2.6 Carr House Court

Though less than 200 metres from position 5, there is a significant change in height, and the houses in this area are therefore partially screened and protected from the application site by the topography.

Thus, whilst gunshot was still audible at this position, the levels were considerably lower. Reference to graph 2690/TH6 shows that there are lots of regular "spikes" at around 50 - 55 dB(A), which correspond to the gunshots. The higher levels were due to occasional vehicular movement both on the Bromley Carr Road and in Carr House Court itself.

The logged data therefore indicates that the SNL is no higher than about 55 dB.

4.3 Summary

In summary then, on the morning of the survey, the sound of gunshot was largely inaudible in the villages of Tankersley and Pilley and the associated noise levels cannot be identified in the logged data.

Since it is known that the shoot was taking place, and that there was regular gunfire for the duration of the survey, the only possible conclusion is therefore that in this area, the noise generated by gunshot is quieter than the ambient levels due to road traffic and other local noise sources and activities.

To the south-west, in the vicinity of Bromley and Howbrook, gunshot is more noticeable, but the only measurement position at which the levels could be clearly identified in the logged data was position 5, where there are no houses to be affected by it.

The following table summarises the SNL for the six monitoring locations; except at position 5, these are only estimations as the actual levels could not be measured above the ambient noise levels in the area:-

Location / Area	SNL
Junction of Chapel Road and Pilley Lane	40
Pilley Lane	40
Junction of Pilley Green and Chapel Road	45
Outside Tankersley Primary School	45
Storrs Lane	75
Carr House Court	55

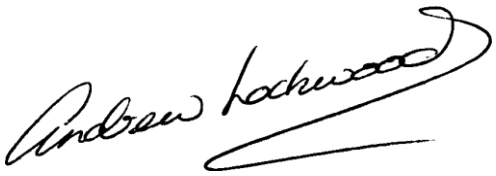
To quote from Section 6.1 of the document "*Clay Target Shooting: Guidance on the Control of Noise":-*

> *The BRE research suggests that there is no fixed shooting noise level at which annoyance starts to occur. Annoyance is less likely to occur at a mean shooting noise level (mean SNL) below 55 dB(A), and highly likely to occur at a mean shooting noise level (mean SNL) above 65dB(A).*

In other words, the SNL in the various residential areas covered by this assessment are at or below the level at which the guidance says that *"annoyance is less likely to occur*".

4.4 Conclusion

It is inevitable that an activity like clay target shooting will generate noise. This assessment has demonstrated, however, that due to distances involved and the noise attenuation measures already put in place by the applicant, the resultant noise levels in the vicinity of the residential dwellings in Bromley, Howbrook, Tankersley and Pilley are reasonable when assessed in accordance with the relevant guidance.



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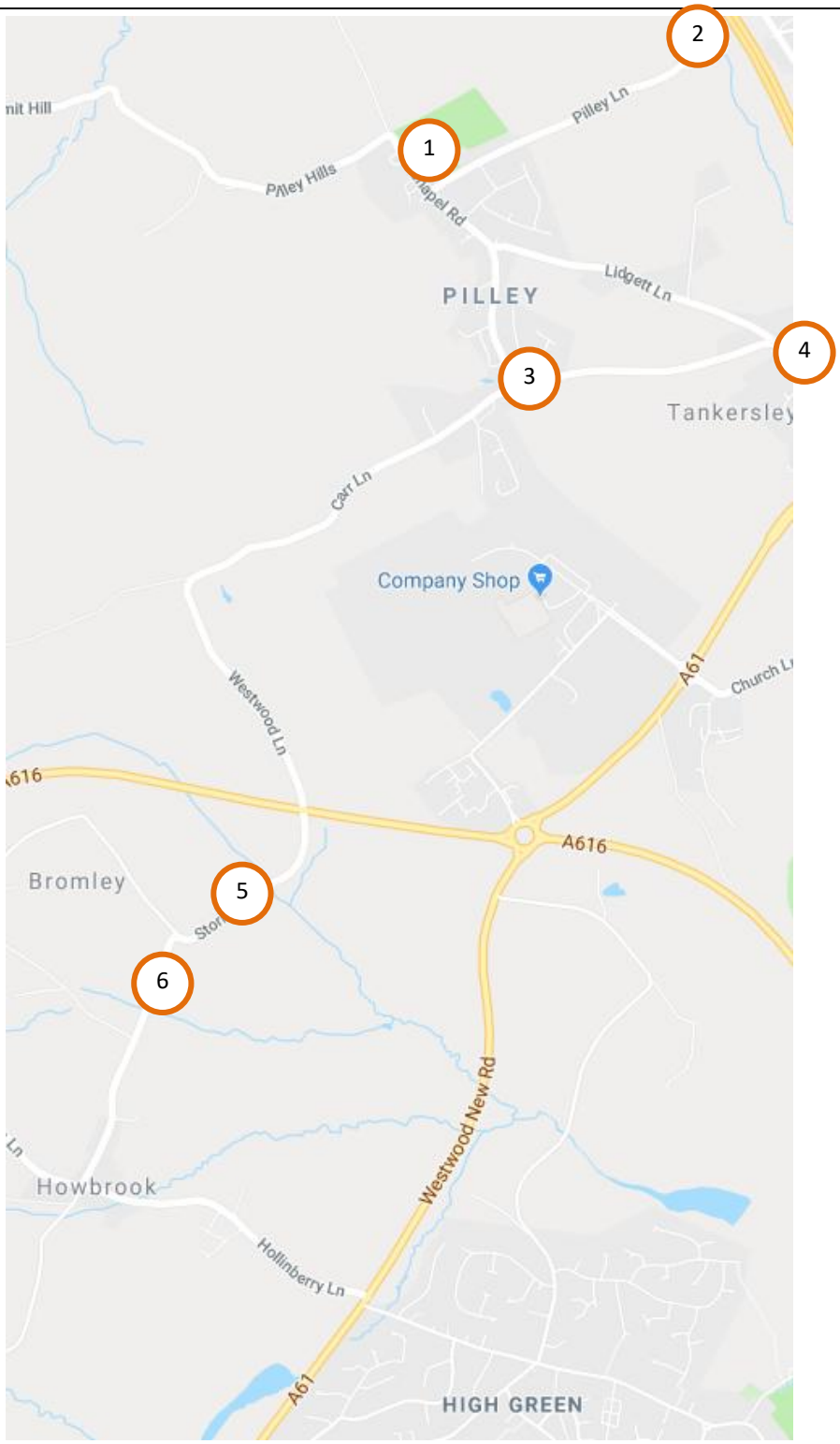

	Description Site Plan to Show Noise Monitoring Locations	
	Project Westwood Sporting Clays	
	Date 22 March 2018	**Drawing No.** 2690/SP1

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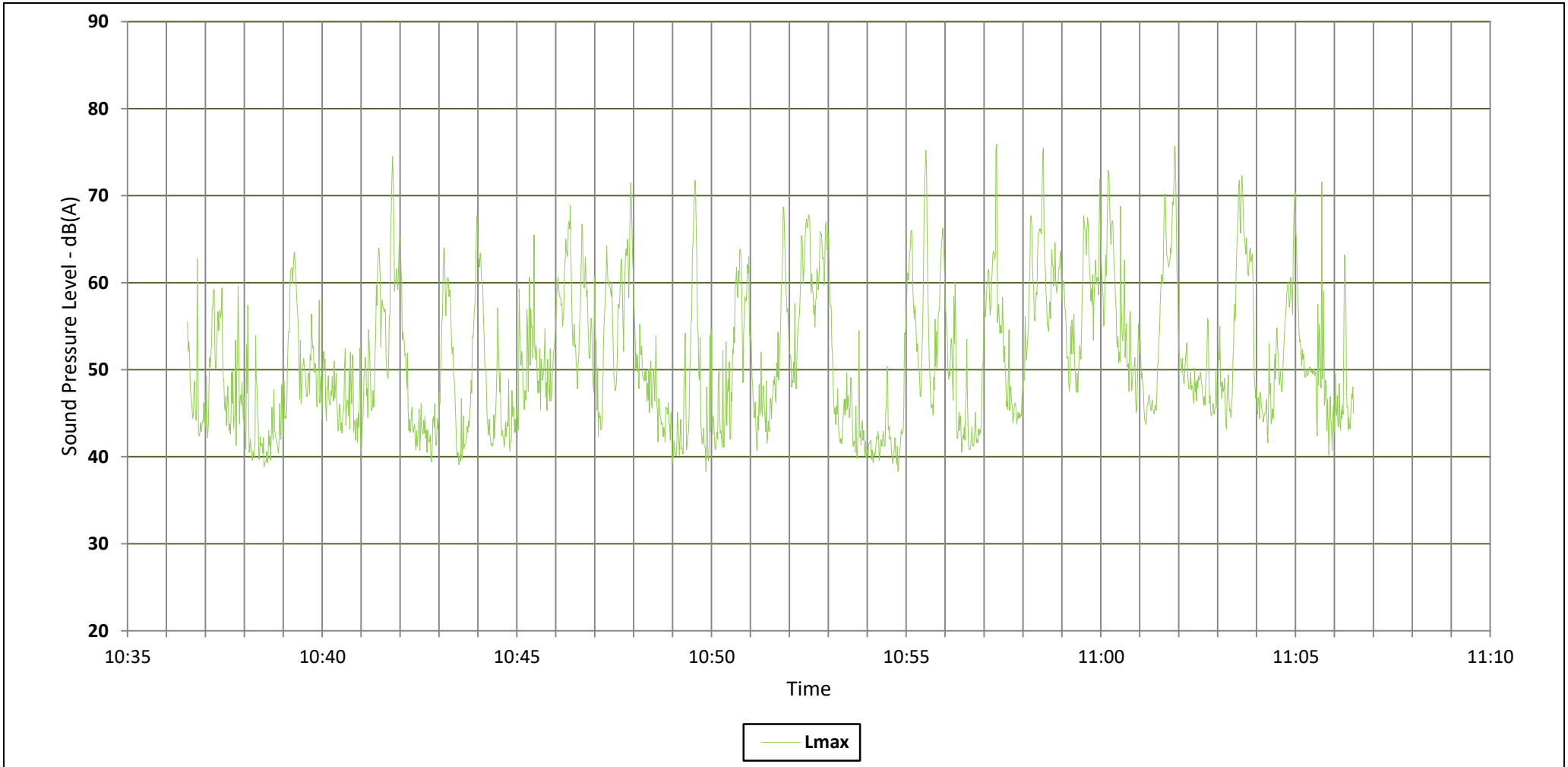

2552Notes	**Description** Time History Graph - Position 1 – Junction of Chapel Road and Pilley Lane	
	Project Westwood Sporting Clays	
	Survey Date 11 February 2018	**Drawing No.** 2690/TH1

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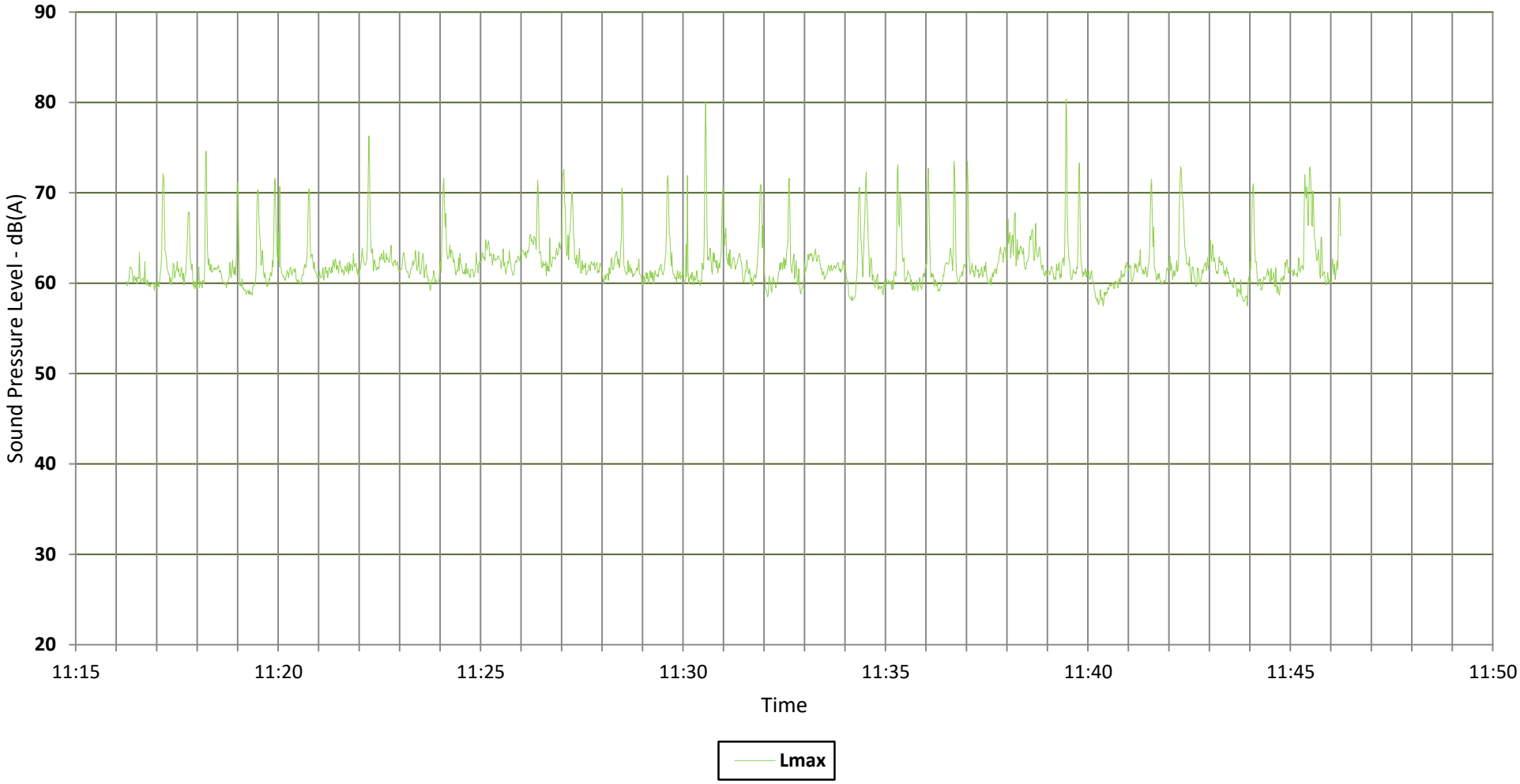

2552Notes	**Description** Time History Graph - Position 2 – Pilley Lane adjacent M1	
	Project Westwood Sporting Clays	
	Survey Date 11 February 2018	**Drawing No.** 2690/TH2

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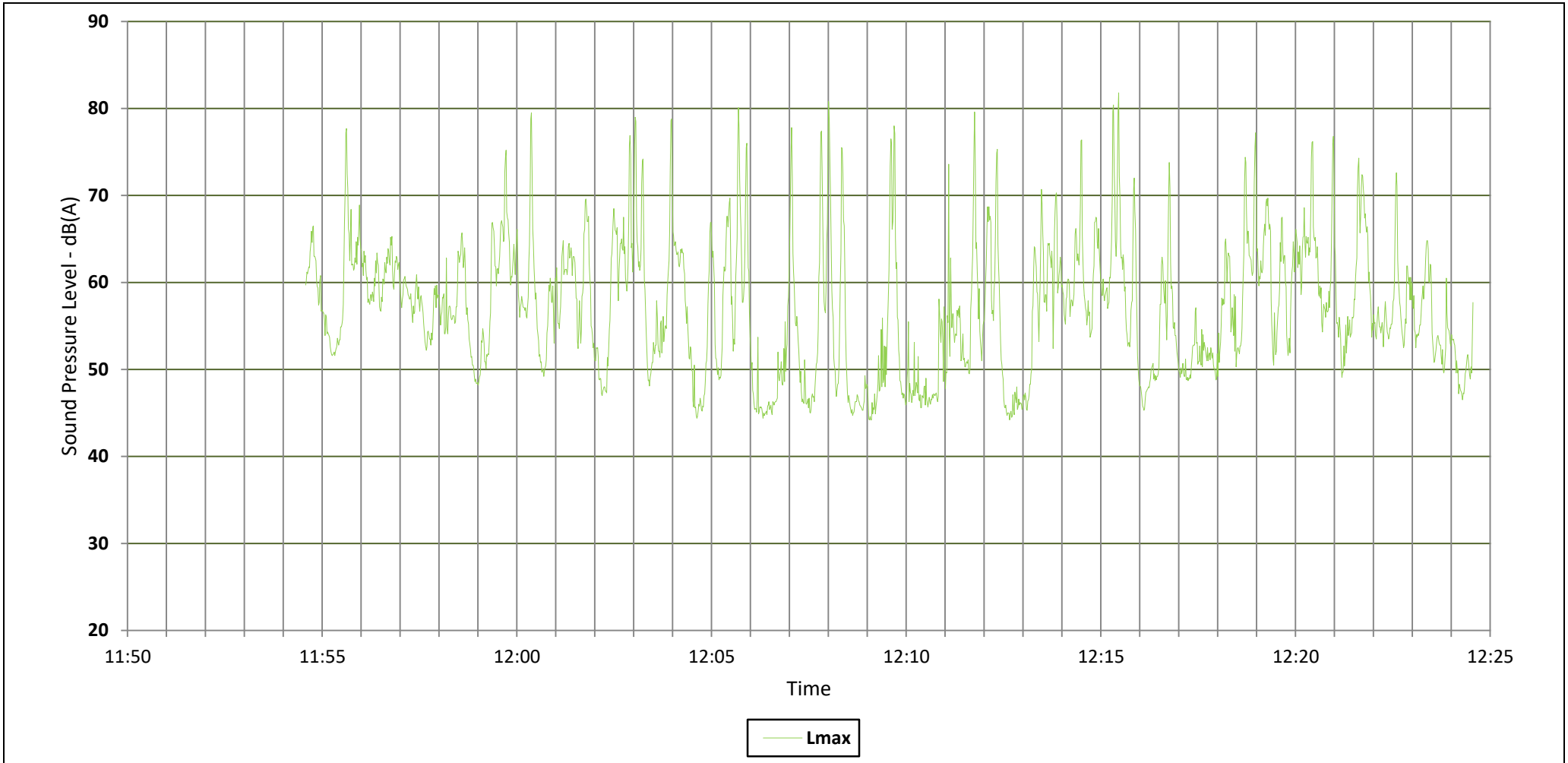

2552Notes	**Description** Time History Graph - Position 3 – Junction of Pilley Green and Chapel Road	
	Project Westwood Sporting Clays	
	Survey Date 11 February 2018	**Drawing No.** 2690/TH3

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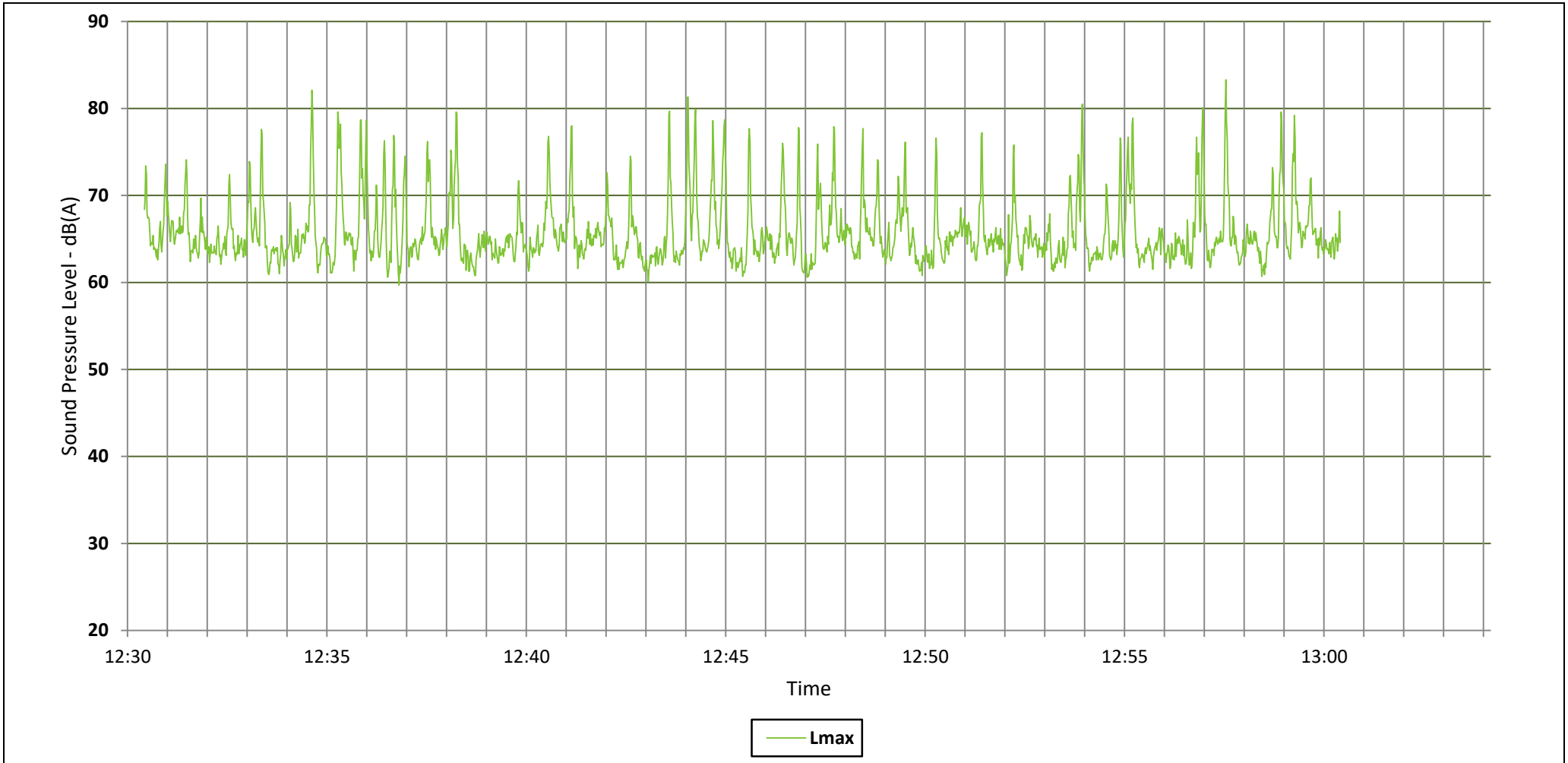

2552Notes	**Description** Time History Graph - Position 4 - Tankersley Primary School	
	Project Westwood Sporting Clays	
	Survey Date 11 February 2018	**Drawing No.** 2690/TH4

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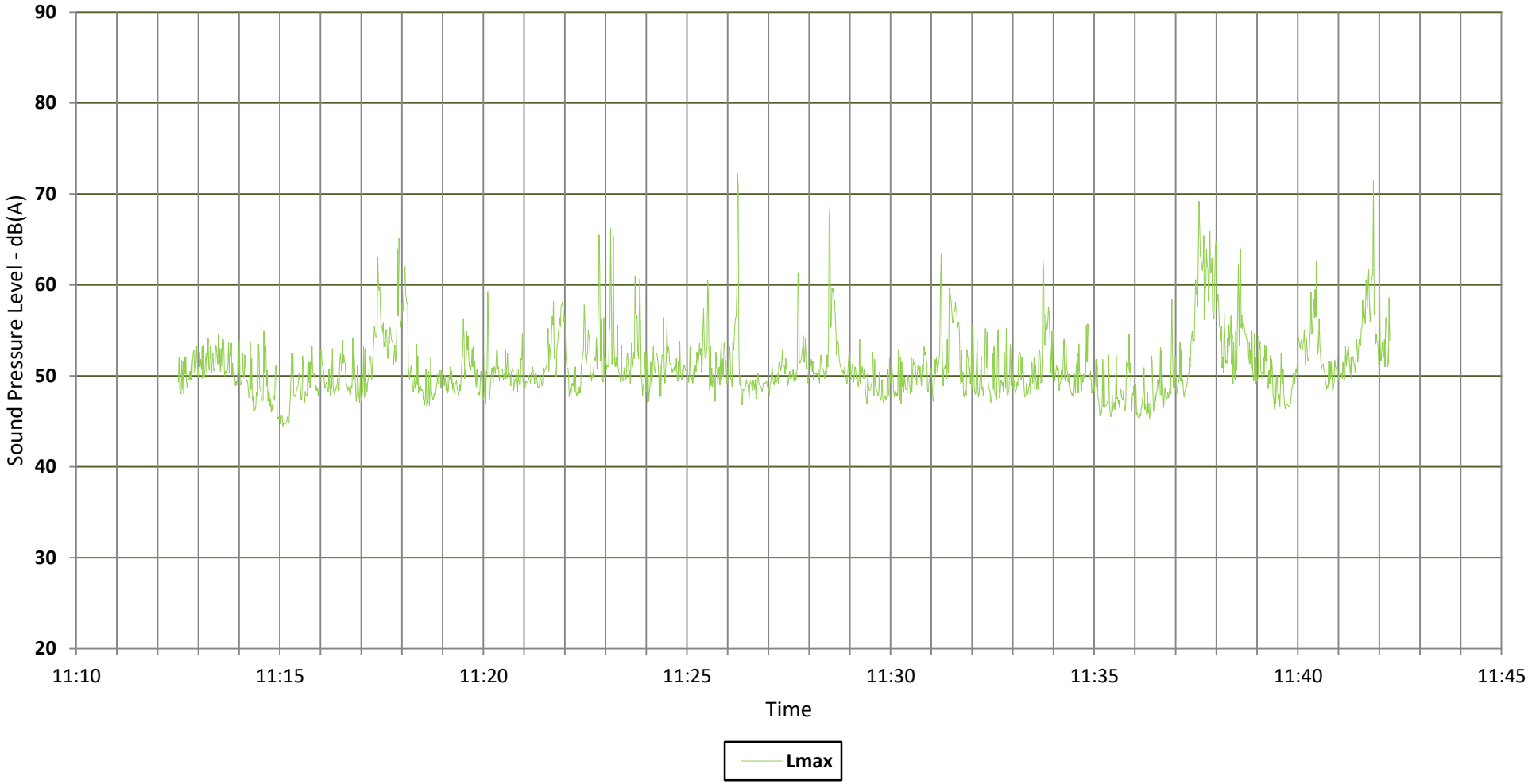

2552Notes	**Description** Time History Graph - Position 5 – Storrs Lane	
	Project Westwood Sporting Clays	
	Survey Date 11 February 2018	**Drawing No.** 2690/TH5

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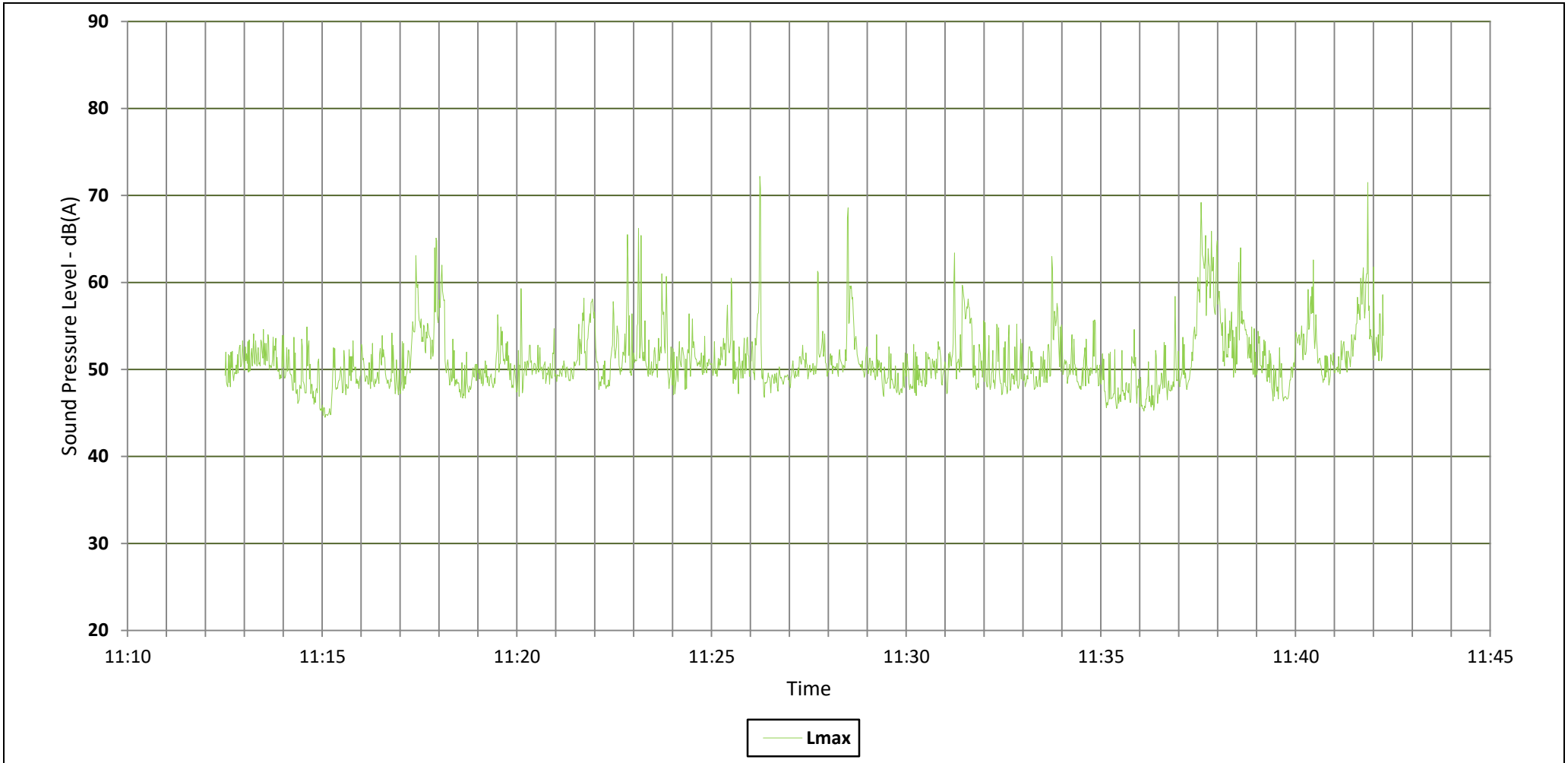

2552Notes	**Description** Time History Graph - Position 6 - Carr House Court	
	Project Westwood Sporting Clays	
	Survey Date 11 February 2018	**Drawing No.** 2690/TH6

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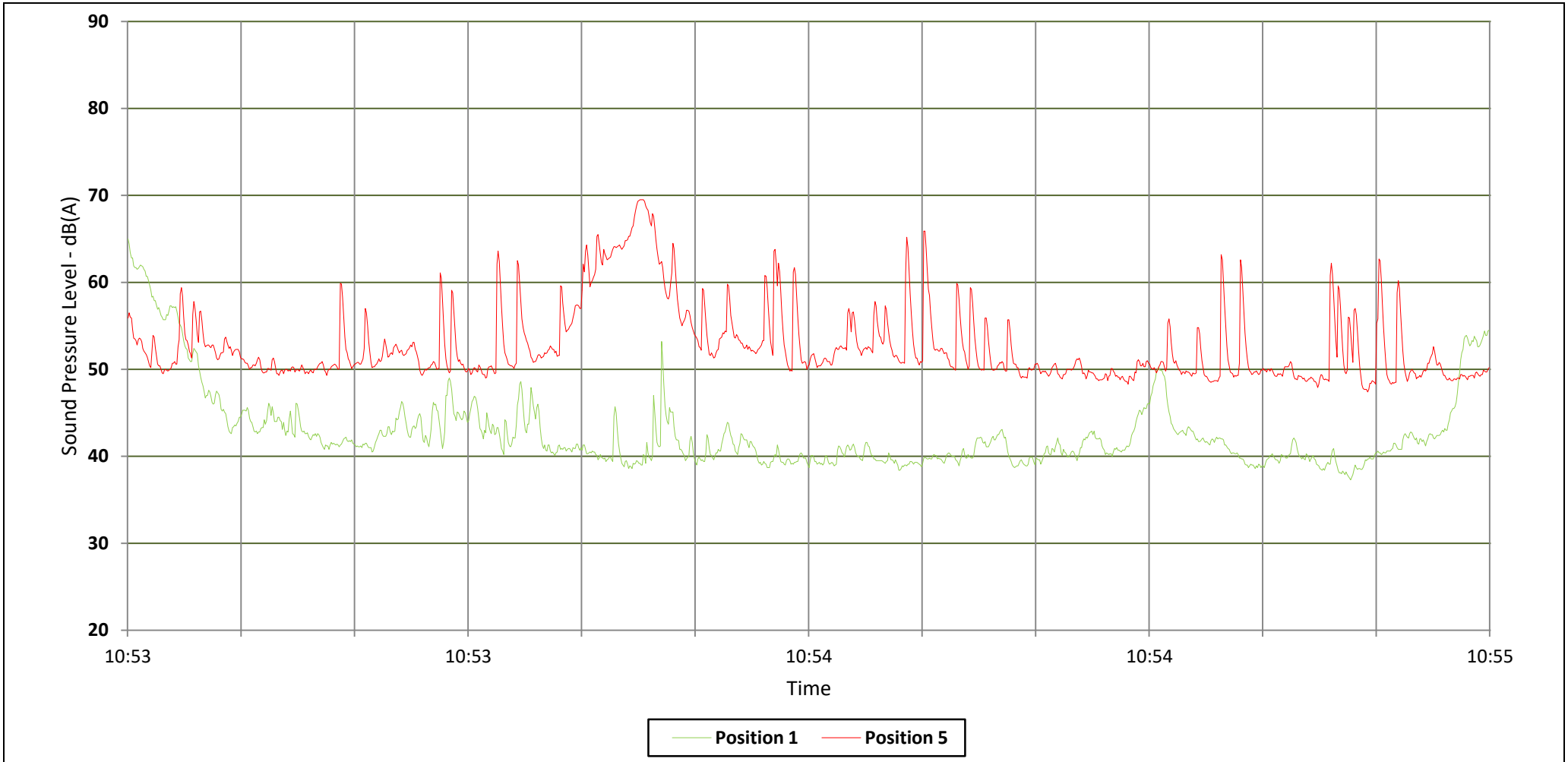

2552Notes	**Description** Comparison of Levels Logged at Positions 1 and 5	
	Project Westwood Sporting Clays	
	Survey Date 11 February 2018	**Drawing No.** 2690/TH7

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APPENDIX A - INSTRUMENTATION

Manufacturer	Type and / or Model	Serial Number	Last Laboratory Calibration	Calibrator Output (dB)	Free Field Correction (dB)	Initial reading (dB)	Final reading (dB)
01dB	(Black) Solo Class 1 Sound Level Meter	65201	October 2017				
01dB	PRE 21 S Pre-Amplifier	15619	October 2017	114.1	-0.1	114.0	114.1
01dB	MCE 212 ½ inch Microphone	101204	October 2017				
01dB	(Blue) Solo Class 1 Sound Level Meter	60320	April 2017				
01dB	PRE 21 S Pre-Amplifier	16866	April 2017	114.1	-0.1	114.0	114.1
01dB	MCE 212 ½ inch Microphone	90549	April 2017				

APPENDIX B

Acoustic Terminology

The annoyance produced by noise is dependent upon many complex interrelated factors such as 'loudness', its frequency (or pitch) and any variations in its level. In order to have some objective measure of the annoyance, scales have been derived to allow for these subjective factors.

A-weighting — The human ear is more susceptible to mid-frequency noise than the high and low frequencies. To take account of this when measuring noise, the A-weighting scale is used so that the measured noise corresponds roughly to the overall level of noise that is discerned by the average person. It is also possible to calculate the A-weighted noise level by applying certain corrections to an un-weighted spectrum.

When the noise being measured has variable amplitude, such as traffic noise, it is necessary to qualify the basic dB unit. This may be done using a statistical index L_n dB, where n is any value between 0 and 100, and is the percentage of the sample time for which the stated level is exceeded. In defining the use of the index, both the value of n and the length of the sample period must be stated.

L_{10} — L_{10}, being the level exceeded for 10% of the time, has been shown to be a good indicator for traffic noise intrusion, and is used in assessing the effect of traffic noise on residential or commercial premises.

L_{90} — L_{90} is the level exceeded for 90% of the time, and is used as a measure of background noise level, as it excludes the effects of occasional transient levels, such as individual passing cars or aircraft.

In addition to the statistical noise indices defined above, the following noise units are also used to define variable amplitude noise sources:

$L_{eq,T}$ — $L_{eq,T}$ is defined as the notional steady sound pressure level which, over a stated period of time, would contain the same amount of acoustical energy as the actual fluctuating sound measured over the same period. In other words, it is a measure of the "average" noise level

L_{max} — L_{max} is the maximum time-weighted sound pressure level recorded over the stated time period