

SHARPS REDMORE

ACOUSTIC CONSULTANTS



Report

Alresford Hall, Essex
Civil War Re-enactment Event
Noise Assessment

Prepared by
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Project No 2623709



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Contents

- 1.0 Introduction
- 2.0 Assessment Methodology and Criteria
- 3.0 Noise Assessment
 - Music noise
 - External activity
- 4.0 Assessment Conclusions

Appendices

Appendix A: SoundPLAN models

This report has been prepared with all reasonable skill, care and diligence commensurate with an acoustic consultancy practice under the terms and brief agreed with our client at that time. Sharps Redmore provides no duty or responsibility whatsoever to any third party who relies upon its content, recommendations or conclusions.

1.0 Introduction

- 1.1 Sharps Redmore (SR) have been instructed to undertake an assessment of noise from a planned civil war re-enactment event at Alresford Hall, Essex. ("the Premises").
- 1.2 The report is to accompany a licensing application for the use of the premises for a civil war battle re-enactment and live music entertainment for the re-enactors. The report contains an assessment of music noise and other noise sources associated with the proposed event. The assessment focusses on comments made by Tendring District Council's Environmental Health team (EHO) further to a Safety Advisory group meeting.
- 1.3 The site layout is shown at Appendix A. The closest residential premises are approximately 350m to the west of the marquee/live music area and approximately 400m to the east. Alresford Hall is also approximately 400m to the east. The battle re-enactment field is approximately 400m from the residential property to the west, and 250m from the property to the east.
- 1.4 Music noise and re-enactment noise have both been considered further to comments made by the EHO. This has been determined by measurement of existing background noise levels over periods of time representative of the times proposed for live music. Sharps Redmore visited the site, in the company of TDC officers and carried out survey work providing typically representative levels of recorded music in the marquee area through a commercial PA speaker, typical of the type likely to be used at the event.
- 1.5 SoundPLAN modelling has been undertaken to demonstrate noise propagation across the site from music and re-enactment activity. Noise levels from artillery used in the re-enactment has been measured at a different site and has informed the SoundPLAN models for this element.

2.0 Assessment Methodology and Criteria

2.1 It is possible to apply objective standards to the assessment of noise and the effect produced by the introduction of a certain noise source may be determined by several methods, as follows:

- i) The effect may be determined by reference to guideline noise values. For example, British Standard (BS) 8233:2014 and World Health Organisation (WHO) *“Guidelines for Community Noise”* contain such guidelines.
- ii) The Noise Council Code of Practice for environmental noise control at concerts, Noise Act 1996 and the Institute of Acoustics good practice guide on the control of noise from pubs and clubs, all provide guidance and suggested criteria.
- iii) Another method is described within BS 4142:2014 to determine the significance of sound impact from sources of industrial and/or commercial nature. The sources that the relatively newly revised standard is intended to assess are sound from industrial and manufacturing processes, sound from fixed plant installations, sound from loading and unloading of goods at industrial and/or commercial premises and the sound from mobile plant and vehicles, such as forklift, train or ship movements. In terms of music noise or re-enactment it is not considered that this standard is appropriate or relevant to the type of noise being considered.
- iv) There is a code of practice for clay target shooting published by the Chartered Institute of Environmental Health in 2003, titled *“Clay Target Shooting – Guidance on the Control of Noise”*. This is not directly relevant to this activity although steps to minimise noise and advice within the document will be considered.

Guideline noise values

- 2.2 There are a number of guidance documents that contain recommended guideline noise values. These are discussed below.
- 2.3 British Standard 8233:2014 is principally intended to assist in the design of new dwellings; however, the Standard does state that it may be used in the assessment of noise from new sources being brought to existing dwellings.
- 2.4 The WHO advice is the most useful, comprehensive, and pertinent advice in this case, because it is not specific to the circumstances of the assessment. Instead, it provides guidance on acceptable limits in, for example, schools, dwellings and offices from noise occurring within the community.
- 2.5 The WHO guideline values are appropriate to what are termed “critical health effects”. This means that the limits are at the lowest noise level that would result in any psychological or physiological effect. They are, as defined by NPSE, set at the Lowest Observed Adverse Effect Level (LOAEL), but do not define the level above which effects are significant (the SOAEL). Compliance with the LOAEL should, therefore, be seen as a robust aim.

- 2.6 The National Physical Laboratory document *“Health Effect based noise assessment methods; a review and feasibility study”, (September 1998)* contains an “interpretation” of the WHO guidelines (then in draft form) for the DETR. The summary of this section of the NPL report states *“In essence, the WHO guidelines represent a consensus view of international expert opinion on the lowest threshold noise levels below which the occurrence rates of particular effects can be assumed to be negligible. Exceedances of the WHO guideline values do not necessarily imply significant noise impact and indeed, it may be that significant impacts do not occur until much higher degrees of noise exposure are reached”* (paragraph 5.4).
- 2.7 The World Health Organisation/BS 8233 guideline noise values are summarised in the Table 2.1 below:

Table 2.1: WHO/BS 8233 guideline noise values

Document	Level	Guidance
World Health Organisation “Community Noise 2000”	$L_{AeqT} = 55 \text{ dB}$	Serious annoyance, daytime and evening. (Continuous noise, outdoor living areas)
	$L_{AeqT} = 50 \text{ dB}$	Moderate annoyance, daytime and evening. (Continuous noise, outdoor living areas).
	$L_{AeqT} = 35 \text{ dB}$	Moderate annoyance, daytime and evening. (Continuous noise, dwellings, indoors)
	$L_{AeqT} = 30 \text{ dB}$	Sleep disturbance, night-time (indoors)
	$L_{Amax} = 60 \text{ dB}$	Sleep disturbance, windows open at night. (Noise peaks outside bedrooms, external level).
	$L_{Amax} = 45 \text{ dB}$	Sleep disturbance at night (Noise peaks inside bedrooms, internal level)
BS 8233:2014 “Sound Insulation and noise reduction for buildings”	$L_{AeqT} = 55 \text{ dB}$	Upper limit for external steady noise. (gardens and patios).
	$L_{AeqT} = 50 \text{ dB}$	Desirable limit for external steady noise. (gardens and patios).
	$L_{Aeq \text{ 16 hours}} = 35 \text{ dB}$	Resting, living room day. (Internal – steady noise)
	$L_{Aeq \text{ 16 hours}} = 40 \text{ dB}$	Dining, dining room day. (Internal – steady noise)
	$L_{Aeq \text{ 16 hour}} = 35 \text{ dB}$	Sleeping, bedroom day (Internal – steady noise)
	$L_{Aeq \text{ 8 hours}} = 30 \text{ dB}$	Sleeping, bedroom night (Internal – steady noise)

- 2.8 For L_{AeqT} criteria the time base (T) given in the documents is 16 hours for daytime limits and 8 hours for night time limits.
- 2.9 There is no firm policy guidance or assessment methodology for noise emissions from venues such as this. Guidance for similar premises is discussed below.

Music noise

- 2.10 The Institute of Acoustics (IoA) produced a “Good Practice Guide on the Control of Noise from Pubs and Clubs” in March 2003. Whilst not directly applicable to this type of venue, it is a useful guide, but did not contain objective noise criteria. To address this, a working group produced a draft annex on criteria and measurement criteria which was published in the IoA Bulletin (Volume 28, No. 6, 2003). It proposed that, for premises where music might occur more than once a week or continue past 2300 hours the L_{Aeq} of the entertainment noise should not exceed the representative background noise level (BNL) L_{A90} (without entertainment noise). This criterion is an internal criterion. The document advises that the zero exceedance guidance given in the criterion would equate to differences of approximately 5 dB outside a partially open window. Less regular events have similar criteria but allow entertainment noise to be 5 dB higher for all parameters.
- 2.11 The Noise Act 1996 (which applies to licensed premises, including those with “temporary event notices”,) created the notion of a ‘permitted level’ for night time noise between 2300 and 0700 hours. The permitted level is exceeded when the measured level is greater than or equal to 34 dB $L_{Aeq5 mins}$ within a complainants premises, and the noise exceeds the ‘underlying level’ by at least 10 dBA. In this instance, it is not expected that the underlying level (which is an internal level, measured with windows closed) would be greater than 24 dB, so the 34 dB lower threshold is the applicable target. This would equate to 44 dB externally (assuming a conservative reduction of 10 dB through a partially open window). The Noise Act 1996 requires the assessment to be undertaken with windows and doors closed, so the internal limit here would equate to at least 54 dB L_{Aeq} outside the premises.
- 2.12 For external areas which may be used in the day and evening periods during an event there is no guidance relating specifically to music noise. The World Health Organisation Guidelines, however, relate to all types of “neighbourhood noise”, including “live or recorded music”. The threshold values in that document (seen as the Lowest Observable Adverse Effect Level (LOAEL) to prevent annoyance during the day) for an outdoor living area are 50 to 55 dB $L_{Aeq,T}$. These levels are significantly higher than the levels being defined above, relating to the lower existing background noise levels. It is considered, therefore, that design to the lower thresholds set out will also ensure no significant impact on amenity enjoyed in outdoor living areas (i.e. gardens).
- 2.13 Further to noise surveys and comments made by TDC EHO we propose to adopt the robust limit, being a Music Noise Level, (MNL) of 15 dB above the background noise level, $L_{A90,15mins}$, all measured externally to the receptor building. This is derived from the “Pop Code” guidance outlined below, this assumes up to 12 marquee events per year.
- 2.14 The Noise Council Document “Code of Practice on Environmental Noise Control at Concerts (1995)” contains guidance that the background noise level (BNL) can be determined from the arithmetic average L_{90} over the last 4 hours of the event. In this case, that would be 19:00 hours to 23:00 hours. This is the approach taken to deriving MNL limits based on the measured BNL.

- 2.15 Table 2.2 below shows the recommended music noise levels level from the Noise Council Guide. Levels are measured 1m from any noise sensitive premises.

Table 2.2: Guideline Music Noise Levels (MNL):

Concert days per year	Venue Category	Guideline
1 to 3	Urban Stadia or Arenas	MNL should not exceed 75 dBA
1 to 3	Other Urban or Rural Venues	MNL should not exceed 65 dBA
4 to 12	All Venues	MNL not to exceed background noise level by more than 15 dBA in a 15 minute period
More than 12 and up to 30	Indoor Venues	MNL not to exceed BNL by more than 5 dBA in a 15 minute period

- 2.16 Background noise levels were established at sites representative of the nearest receptors. over 27th-29th March 2026. Background noise levels (averaged over the four hours between 19:00 and 23:00) ranged between 33 and 37 dB $L_{A90,15mins}$. To provide robust assessment it is considered that the lower level of 33 dB $L_{A90,15mins}$ established by the surveys is used for the area over the final four hours of the evening and can be used to set noise limits for the sound system at the receptors of a music noise level (MNL) of 48 dB L_{Aeq} , being 15 dB above lowest averaged background level.

Re-enactment noise

- 2.17 Again, there is no firm policy guidance or assessment methodology for noise emissions from events such as this. Guidance for similar premises is discussed below.
- 2.18 There is a code of practice for clay target shooting published by the Chartered Institute of Environmental Health in 2003, titled "Clay Target Shooting – Guidance on the Control of Noise".
- 2.19 The Code of Practice for Clay Target Shooting contains advice on the management of clay target shooting grounds. It also contains recommendations for setting noise limit values, and how to apply these. Given the relatively low frequency, and intensity of shooting at a re-enactment, it is considered that this guidance on setting target levels is not directly appropriate in this case, however the application of reasonable steps and guidance contained within the document to minimise noise will result in a robust set of control measures for noise at this site.

3.0 Noise Assessment

Music Noise

Music Noise Mitigation Proposals

- 3.1 Sharps Redmore have been involved in many function venues and have had experience of dance floor sound levels at such events. It is important to be aware that dance floors at events are not comparable to night club levels, due to the nature of the event. Recent projects have shown typical dance floor sound levels to vary between 90-100 dB $L_{Aeq,5'}$.
- 3.2 To assess noise breakout, it is necessary to estimate what the typical, likely operational levels will be within the proposal as an event venue. To show an indication of likely levels, table 3.1 below summarises typical music levels, which SR have experienced for this type of venue, at the internal perimeter of the proposal.

Table 3.1: Typical Internal Perimeter Levels at Event Venues (dBA 5'L_{eq}.)

Octave Band Centre Frequency Hz							
63	125	250	500	1k	2k	4k	8k
95	95	90	88	85	80	78	79

- 3.3 Consideration of attenuation over distance alone to the nearest residential property at approximately 350m from the marquee below in table 3.2, together with an indicative prediction of likely levels at the nearest residential receptor given differing internal levels. The following is considered representative for a conventional PA/Sound system. This is without any consideration of topography or attenuation through the marquee structure which is negligible.

Table 3.2: Indicative attenuation over distance alone to the nearest residential property at 350m and indicative levels from dancefloor levels:

Level inside venue	Distance attenuation	Level at nearest receptor
100 dB $L_{Aeq,5mins}$	50 dB	50 dB $L_{Aeq,5mins}$
95 dB $L_{Aeq,5mins}$	50 dB	45 dB $L_{Aeq,5mins}$
90 dB $L_{Aeq,5mins}$	50 dB	40 dB $L_{Aeq,5mins}$

- 3.4 SoundPLAN modelling has been undertaken to show noise propagation across the site for both 90 and 95 dB dance floor levels. These are shown below in figures 1 and 2. These levels were also created on site on 27th March 2026 using a continuous track played to provide a consistent noise source typical for the proposed marquee through JBL EON 615 Active PA speakers similar to that envisaged for the event.
- 3.5 Whilst both dancefloor levels were within the requirements of the adopted MNL at the receptors, subjectively a 90 dB dancefloor level was virtually inaudible at the receptors and this was considered an acceptable dance floor level by the EHO in attendance. This lower level will provide adequate levels within the marquee and minimise any disturbance to residents.

Figure 1: Music Noise Levels (Dancefloor 95 dBA $L_{Aeq} 5'$)

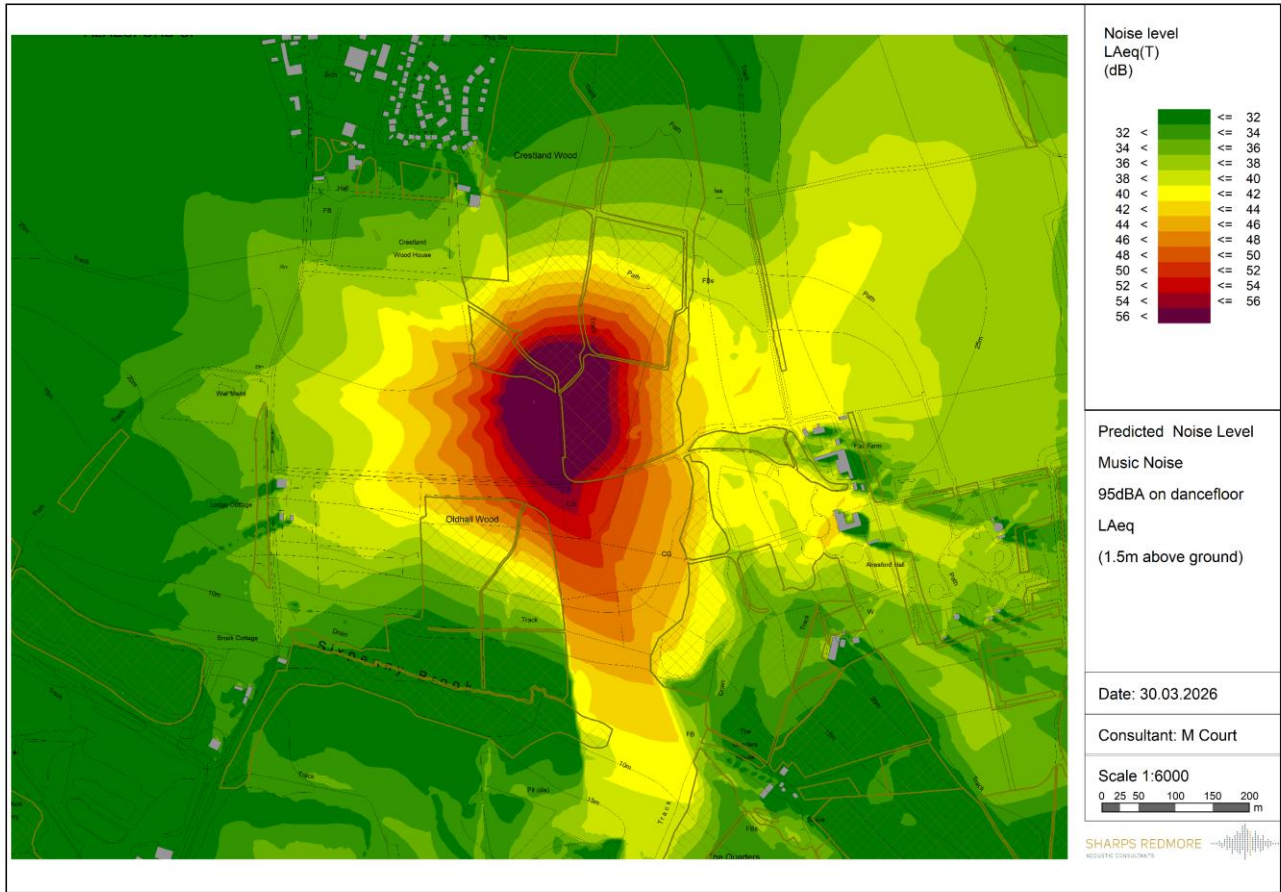
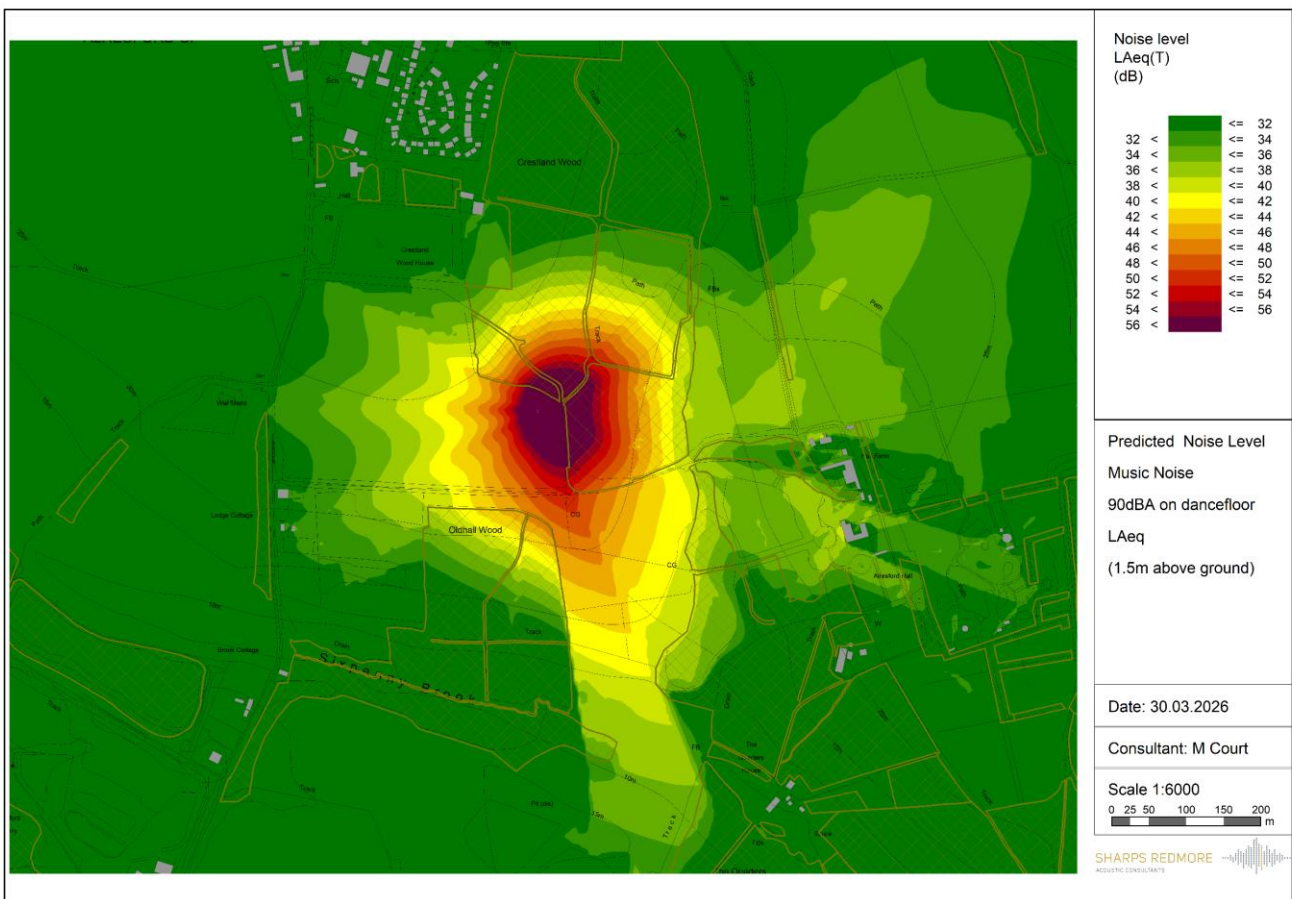


Figure 2: Music Noise Levels (Dancefloor 90 dBA $L_{Aeq} 5'$)



Summary

- 3.6 It is considered that music noise levels from the event, as predicted at the nearest receptors will not exceed the derived noise criterion of 48 dB $L_{Aeq,5mins}$ further to guidance within the Noise Council guide and the likely number of events.

■ Internal music noise limit of no greater than 95 dB $L_{Aeq,5mins}$.

Re-enactment noise

- 3.7 English Civil War re-enactments often include muskets, cannons, drums, and period music to simulate battles authentically. While these events enhance public understanding of history, they also generate high levels of short-term noise that can impact participants, spectators, and nearby communities.
- 3.8 There is no firm policy guidance or assessment methodology for noise emissions from this type of activity. Guidance for premises such as clay target sites is available although this is of limited relevance to re-enactments given the limited duration, frequency and intensity of shooting of events
- 3.9 To establish likely levels from the use of muskets, cannons, and drums a survey was undertaken to measure these over the weekend of 11th April 2026. The survey measured levels resulting from the use of a Falconet 1.75 inch bore cannon, a Matchlock 20-gauge muzzle loading musket and a rope tensioned goat skin marching drum.
- 3.10 3 Sound level meters were placed at points 50m down the line of shooting, at 30m directly to the rear, and at 90 degrees at 30m to provide information on the directivity of shooting noise which can inform orientation of shooting. The meters were synchronised and logged 1-minute samples to capture each noise event from the weapons.
- 3.11 The cannon was loaded with 4 ounces of black gun-powder and dry grass to recreate the use of the firearms at an event. 6 shots were fired to give a typical noise level for the use of the cannon. Similarly, the musket was loaded with black powder and 4 shots measured. The resulting data has been used to inform SoundPLAN modelling data as shown in the figures below in Appendix A. (Full survey data is available upon request)
- 3.12 SoundPLAN calculates $L_{Aeq,T}$ and/or L_{Amax} levels at defined receptors in accordance with the relevant standards. The calculation is based on a number of input parameters including, source noise level data, receptor positions, barriers and screening, topography and intervening ground conditions. The location and dimensions of the physical elements of the model such as location and dimensions of buildings, have been taken directly from architectural drawings, and OS mapping. The topography has been derived from online GIS data.
- 3.13 Noise contours can be plotted at defined intervals, and height above ground level. The results can also be plotted as façade noise maps. This is based on a worst-case scenario of for the number of cannons, muskets and drums all operating during the time period. It is understood that the battle re-enactment will be over a period of 2 hours between 1400 and 1600 hours on both days of the event.
- 3.14 Scenarios showing shooting noise levels from both SW and NE directions have been shown. In terms of mitigation, inevitably the firearms will be clearly audible however, the proposed layout of the battle field is laid out such that any down the line shooting direction will be minimised. The nearest residential properties will be generally at 45 -90 degrees from the direct line of fire minimising impact at these properties.

- 3.15 The Chartered Institute of Environmental Health in 2003, titled “Clay Target Shooting – Guidance on the Control of Noise” contains the following advice in terms of directionality.

“The propagation of sound from a shotgun is directional with the noise “footprint” around a firing point being roughly pear shaped – noise levels in the direction of shooting being much greater than noise levels at the same distance to the sides and rear. Shooting high into the air will also cause a wide dispersion of sound. The propagation of sound from a shotgun is a complex process and simple noise predictions (e.g. based on the inverse square law) can produce erroneous results. Since the propagation of sound from a shotgun is directional, the general shooting orientation should normally be away from the location of noise sensitive premises. This consideration may have to override any preferred orientation to avoid shooting into the sun. Shooting organisers should use careful selection of shooting positions and orientation in order to minimise impact on noise sensitive premises.”

- 3.16 The guidance also considers the following in terms of criteria for shooting noise level at a clay target site. Although it should be noted that the intense level of shooting at a clay target site is not comparable to the infrequent, limited duration of a re-enactment.

- *the locality and general background noise levels;*
- *on which day(s) of the week shooting occurs;*
- *at which time(s) of day(s) e.g. morning, afternoon, evening;*
- *the intensity of shooting – e.g. number of shooting days per year;*
- *the type of shoot – e.g. 28 day or with planning approval;*
- *the rate of fire.*

- 3.17 If these factors are considered for the Alresford site then the criteria for the shooting noise level would be at the higher end given the as previously mentioned limited duration, frequency, intensity and rate of fire. It is understood that each army will have 4 cannons and these will be restricted to 6 shots each with no cumulative volleys planned.

- 3.18 A further SoundPLAN model has been provided to predict noise levels from drummers. This is based on 100 drummers and levels provided across the site.

4.0 Assessment Conclusions

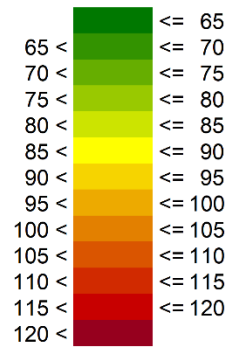
- 4.1 Noise emissions from music and external activity at the venue have been assessed, with the following results:
- Subject to certain mitigation and management measures, music noise breakout can be controlled to meet strict thresholds at the nearest property, such that there would be no significant impact from this source of noise.
 - Noise from external activity from the re-enactment has been mitigated as far as reasonably practical in terms of the alignment of the battlefield and limit on the times firearms will be used together a limit on the number of shots from the cannons which are the major noise source.
- 4.2 The following recommendations and mitigation measures will be implemented:
- Internal music noise limit in the marquee of no greater than 95 dB $L_{Aeq,5mins}$.
 - Perimeter noise monitoring to be undertaken to ensure no excessive noise at the boundary.
 - Firearms to be operated between 1400 and 1600 hours only.
- 4.3 A management plan is proposed outlining control measures which provides practical measures that can be employed to reduce the risk of unacceptable noise.

APPENDIX A

SOUNDPLAN MODELS FOR FIREARMS AND DRUMS

A.2 - APPENDIX A

Noise level
dBA



Predicted Noise Levels

Single Cannon shot
Direction of fire NE

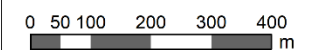
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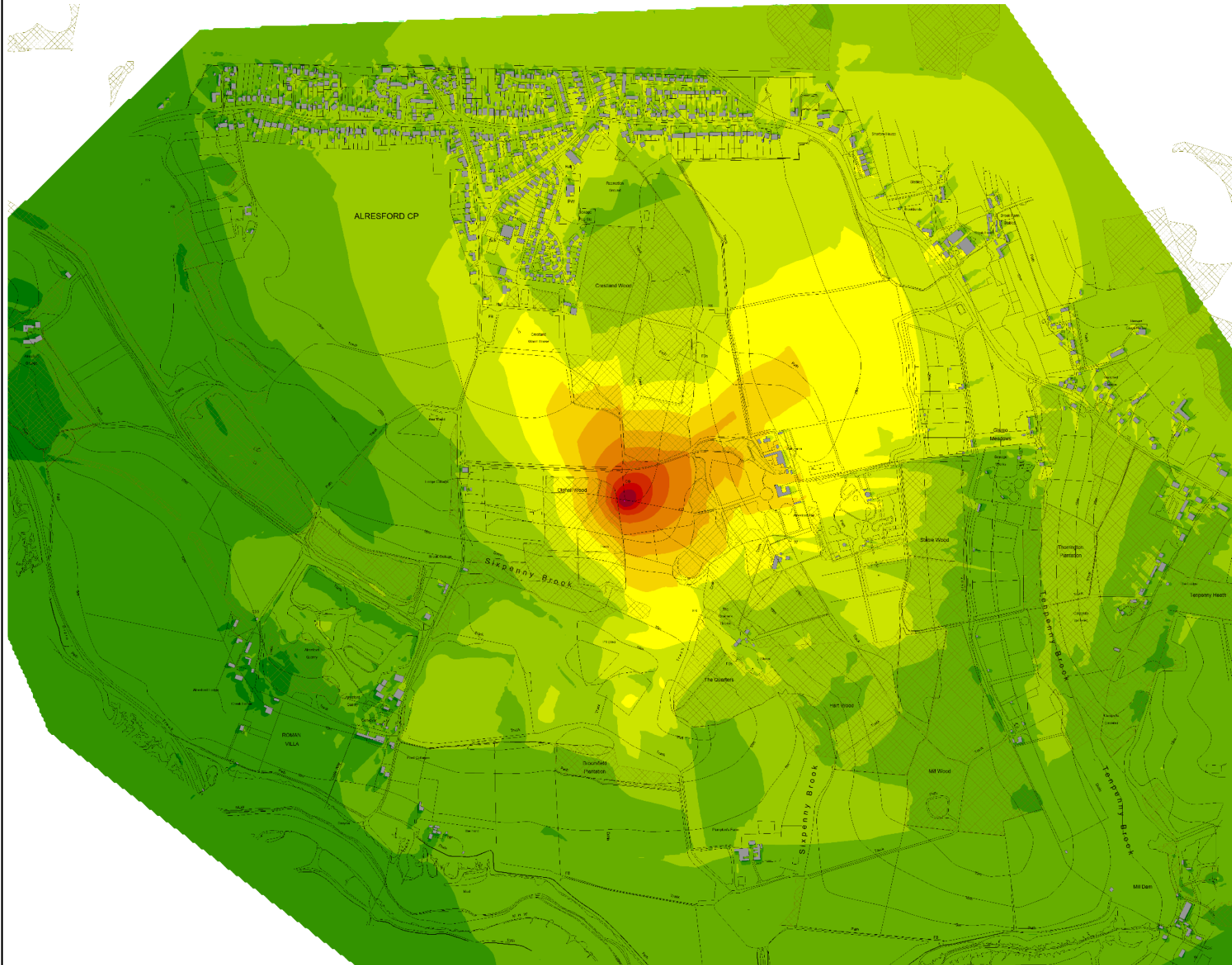
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Consultant: M Court

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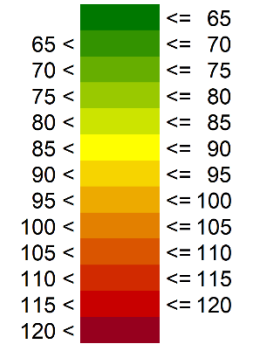


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A.2 - APPENDIX A

Noise level
dBA



Predicted Noise Levels

Single Cannon shot
Direction of fire SW

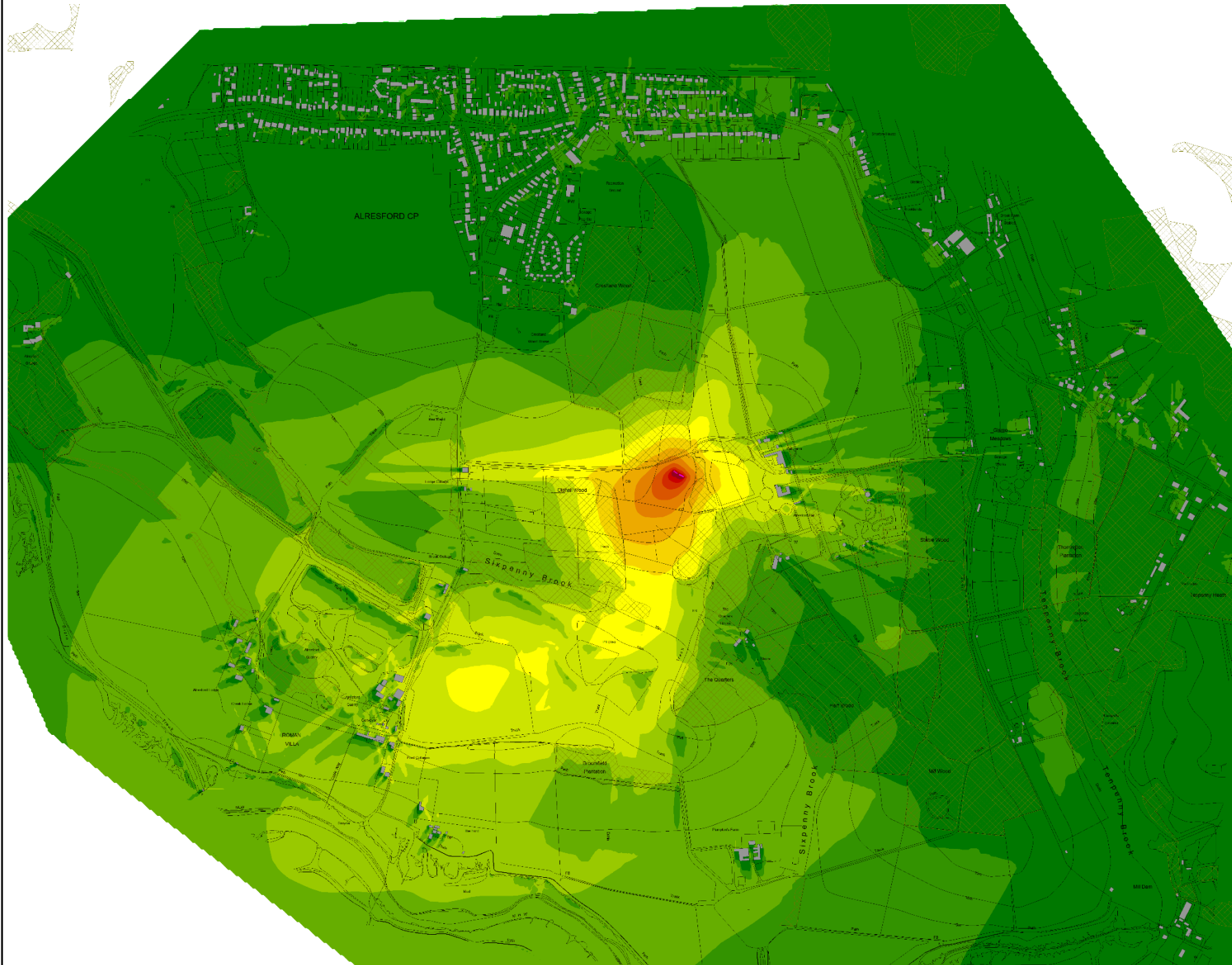
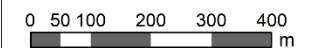
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(Noise contour plot provided
for indicative purposes only)

Date: 15.04.2026

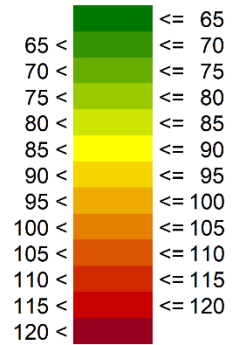
Consultant: M Court

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A.2 - APPENDIX A

Noise level
dBA



Predicted Noise Levels

Single Muskett shot
Direction of fire NE

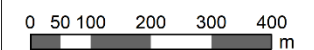
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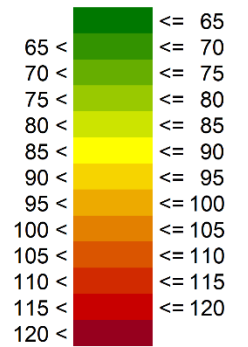
Consultant: M Court

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A.2 - APPENDIX A

Noise level
dBA



Predicted Noise Levels

8 x Muskets together
Direction of fire NE

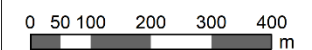
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(Noise contour plot provided for indicative purposes only)

Date: 15.04.2026

Consultant: M Court

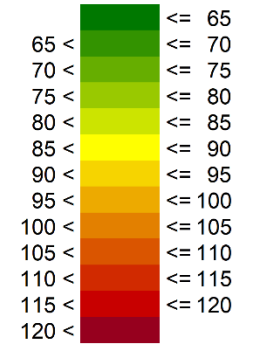
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A.2 - APPENDIX A

Noise level
dBA



Predicted Noise Levels

Single Muskett shot
Direction of fire SW

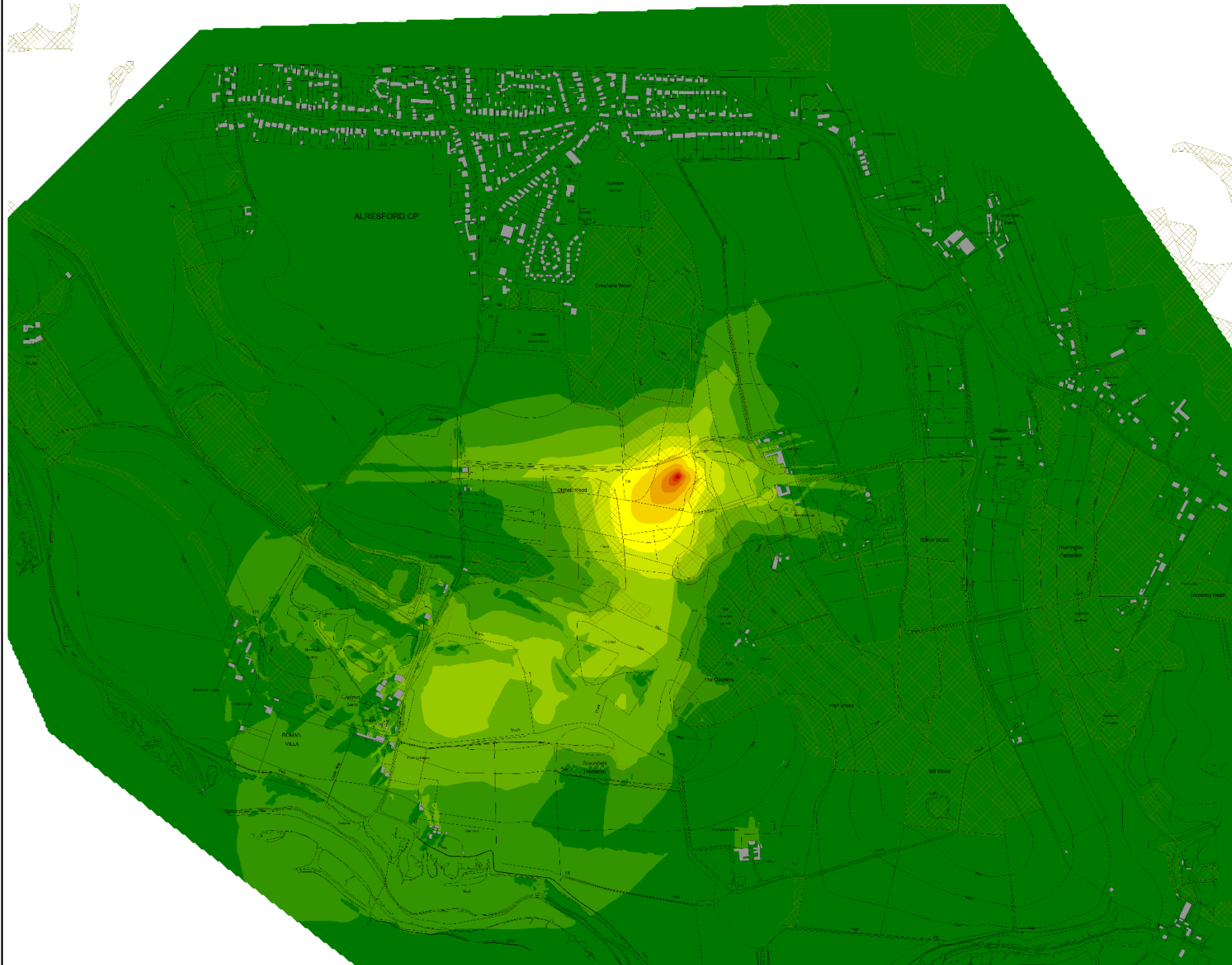
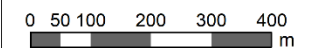
(1.5m above ground)

(Noise contour plot provided
for indicative purposes only)

Date: 15.04.2026

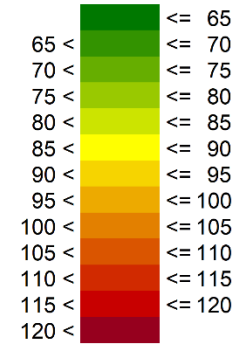
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A.2 - APPENDIX A

Noise level
dBA



Predicted Noise Levels

8 x Musketts together
Direction of fire NE

LAeq

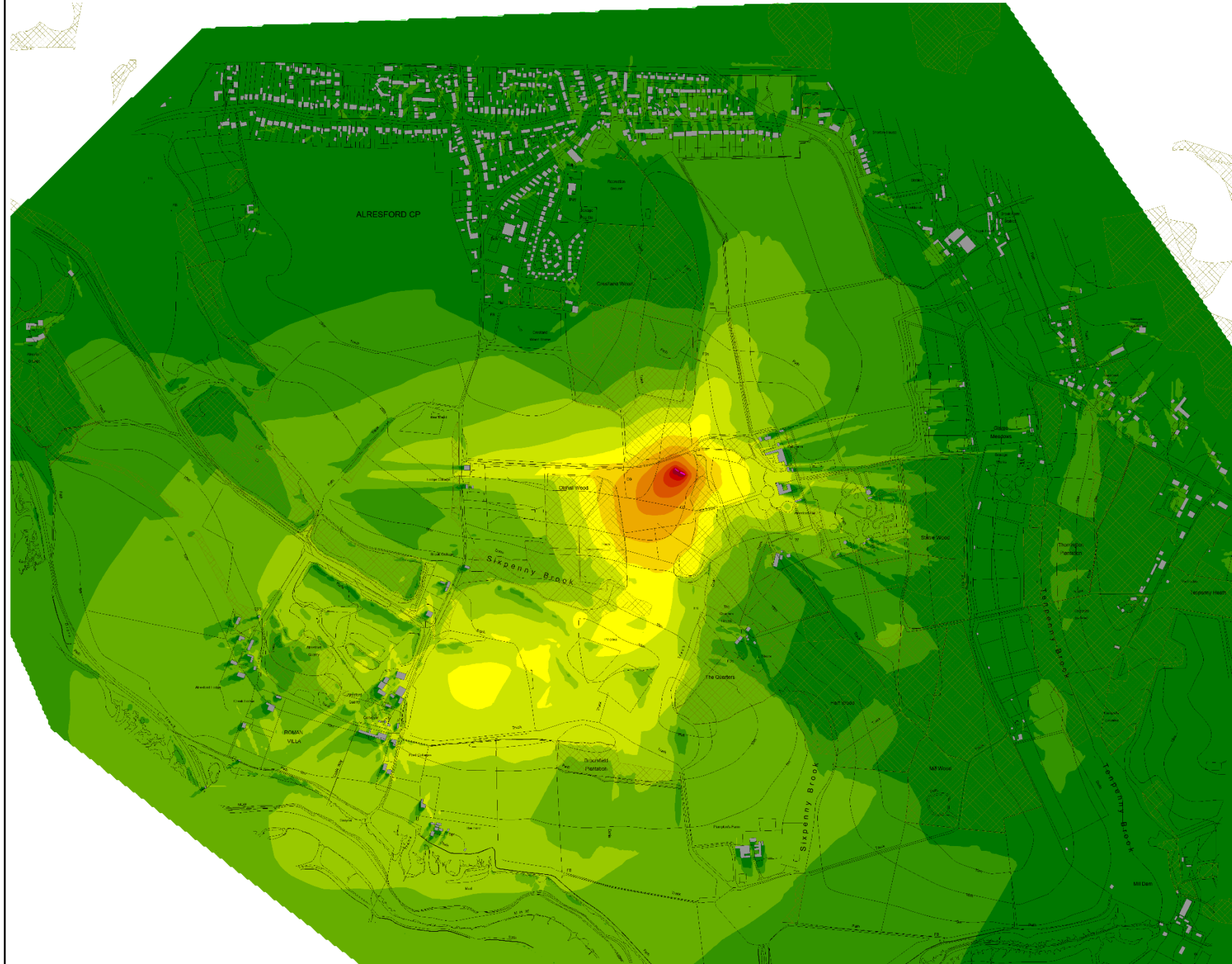
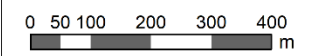
(1.5m above ground)

(Noise contour plot provided
for indicative purposes only)

Date: 15.04.2026

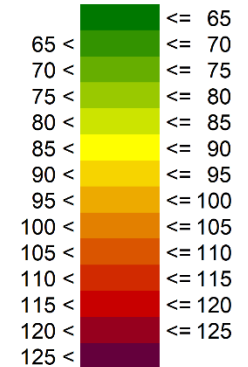
Consultant: M Court

Scale 1:12500



A.2 - APPENDIX A

Noise level
dBA



Predicted Noise Levels
100 x snare drums
(1.5m above ground)

(Noise contour plot provided
for indicative purposes only)

Date: 15.04.2026

Consultant: M Court

Scale 1:7500

