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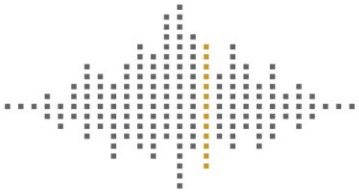

## Report

**Anzio Site Redevelopment, Leek**

Addendum to Original Report

On-Site Mitigation

**Prepared by**
Martin Court MIOA

**Date** 23rd June 2015
**Project No** A1 1414501

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# Appendices

## 1.0 Introduction

1.1 This report takes the form of an addendum to the earlier report submitted to accompany planning application SMD/2014/683, and should be read in conjunction with that report.

1.2 This report is to inform on the remaining noise issues arising from the mixed-use development of the former Anzio site. This report does not look at the detail of the proposal or any review of national planning policy and technical guidance. This was discussed in the original report submitted in October 2014.

1.3 This report will concentrate on addressing the comments raised by the Planning Inspector in the previous appeal decision (APP/B3438/A13/2199515) concerning noise, in particular paragraphs 32, 35 and 36 as these were raised by the Staffordshire Moorland DC Environmental Health Officer with whom there has been extensive and positive co-operation in this case.

1.4 This report will demonstrate through further SoundPLAN modelling that noise levels on the site will not give rise to significant impacts on future occupiers of the site. Models have been produced to demonstrate the effectiveness of on-site mitigation in the form of bunding to the northern and north-eastern boundary of the proposal, as well as localised 2 metre acoustic fencing to 8 properties to the north western boundary as identified in Appendix C, and noise mitigation incorporated into the design of the extra care cottages themselves.

## 2.0 On-site mitigation and noise criteria

2.1 The original report, submitted as part of the planning application, relied upon works to the Leek and District Shooting Centre buildings to provide sufficient attenuation to enable an agreed on-site mean shooting noise level of 63 $dB_{LAmax}$ to be met. Notwithstanding discussions with the shooting club, this addendum focusses solely on mitigation works on land within the Anzio application site boundary and is not reliant on third-party agreements as works to the shooting centre's buildings are not necessary to secure the required sound reduction. The bunding works enable the shooting noise level to be met and the required external daytime level of 55 $dB_{LAeq16hr}$ to be met based on World Health Organisation guidelines and guidance contained within BS 8233:2014 (Sound Insulation and Noise Reduction for Buildings).

2.2 Whilst fundamentally different to a clay target site, the guidance in the Chartered Institute of Environmental Health code has been acknowledged rather than applied directly due to the difference in nature of the shooting club and a clay target site. The decision making process in determining the shooting noise level has been noted and is outlined below as table 1.

2.3 There are additional factors which make the pattern of noise from the Leek and District Shooting Centre site totally different from that found at a clay target site, these are;

- Guns will always face in the same alignment;
- Orientation of shooting will always be horizontal;
- The character of the sound from a .22 rifle often used at the site along with shotguns is different in character to that of sole use of shotguns;
- The shooting pattern is different. At a clay target site, shotguns firing at clays will be almost continuous and high frequency, with typically only a few seconds between shots. When the shooting centre is in use, time periods between shots is considerably longer, and there may be days with no shooting activity at all.

2.4 Our projections have considered the worst case scenario and have taken the $L_{Amax}$ average for highest shots recorded during the sessions held at the Club which were agreed to be representative of the worst case scenario during a Western Society meeting. This data is utilised into SoundPLAN modelling software to consider mitigation design and predicted levels with the construction of a 5m high bund to the northern boundary of the site.

2.5 For this application, SoundPLAN has calculated the $L_{Amax}$ levels at defined receptors in accordance with international Standard ISO 9613 (a universally recognised standard for predicting noise propagation) to predict noise contours around the site. This calculation is based on a number of input parameters, including noise source data, barriers, topography, intervening ground conditions and other buildings in the area. Noise contours can then be plotted at defined intervals and height above ground level.

2.6 The physical elements of the model such as location and dimensions of the buildings, topography and location of noise sources have been taken directly from the site layout drawing and from on-site observations. Source noise levels are based on measurements carried out from previous SR surveys at the shooting centre.

**Table 1: Local influences on target shooting noise level**

| Factors to consider when selecting shooting noise level | Local circumstances in this case | Influence/effect |
|---|---|---|
| The locality and general background noise levels | The area is generally rural in nature and borders farmland and woodland apart from to the west of the site where the site borders the A53 Buxton Road. Ambient noise is dominated by main road traffic noise, together with agricultural machinery and local road traffic. | The relatively high background noise level indicates that the target level may be higher |
| On which day(s) of the week shooting occurs | The shooting centre can operate 7 days a week, although use of the outdoor ranges is restricted. | Since the operation of the site is theoretically 24 hours a day for 7 days a weeks, and outdoor shooting could take place on many days per year, this suggests that the target level should be lowered. However, in practice the centre would normally operate between 1000 and 2100 hours. These times would be further seasonally restricted due to a reduction in daylight hours, which would raise the target level to above the lowest level |
| At which time(s) of day(s) e.g. morning, afternoon, evening | The shooting centre has a certificate of lawfulness which limits use of the outside shooting ranges to hours of daylight | |
| The intensity of shooting – e.g. number of shooting days per year | The Shooting Centre can theoretically operate for 365 days per year. | |
| The type of shoot | The shooting centre has a certificate of lawfulness. The shooting centre use is of a low intensity nature, with intermittent use during the day by often only one or two members. There are often extended times of the day with no outdoor site shooting activity. | Target level may be higher as existing low intensity use is part of the character of the area. |
| The rate of fire | Very low. The daily use of the shooting centre is best described as intermittent and of low intensity. There are often times of long periods of inactivity on the outdoor ranges. There are club events which give higher shooting rates but these are programmed through the year and not part of what could be considered normal daily use. | The low intensity use and very low rates of fire suggests the target level could be higher. The use of this centre is in no way comparable to the intense level of shooting and high rate of fire which can be experienced at a clay target shooting site. |

2.7 Based on all of the above considerations, in particular the type of shoot and the frequency of firing, a suitable, achievable and relevant target level should be considered to be closer to the higher end of the range (SNL, as defined in the CIEH COP). We consider a level of below 63 dB to be reasonable in these circumstances, given the normal light usage of the range and not directly comparable to a Clay Target use SNL. To reiterate, this is an $L_{Amax}$ parameter, and not the 'average' $L_{Aeq}$ level.

2.8 The use of the outdoor firing ranges is restricted to the hours of daylight by the certificate of lawful use that the club operates under. Consequently, only daytime levels are considered in any assessment.

2.9 The models provided show that our target levels can be achieved across the vast majority of the site using the proposed bund. One of the bund models near to the open space in the North West corner gives marginally elevated levels in that corner from isolated shooting at one position from the 100 yard range.

2.10 It is worth noting that $L_{Amax}$ levels resulting from road traffic noise during daytime in that corner were shown to be 79 dB from a noise survey undertaken for a noise chapter for an ES for a former application for the site. This would be as a result of a goods vehicle pass-by. This is approximately up to 10 dB greater than $L_{Amax}$ from the shooting club in that area of the site. This has been addressed in the form of localised 2m acoustic screening to the gardens of these properties in the extract from the masterplan as shown at Appendix C.

2.11 The truncated bund model gives $L_{Amax}$ levels of 67-69 dB from an isolated shot from one particular position on the 100 yard range. To reiterate, our models use worst case scenarios for levels from the shooting club. To keep things in perspective, it is worth noting that $L_{Amax}$ levels from road traffic will mask any contribution from the shooting centre in that area of the site. There will not be a cumulative increase as due to the logarithmic nature of decibels, the addition of two levels with a difference of 10 dB or more will not add to the overall sound level.

2.12 SMDC EHO has raised the issue of the Planning Inspector's comments from the appeal decision as denoted in paragraph 2 above.

Paragraph 32 of the planning inspectors comment concludes that.. "*it is therefore essential that adequate remediation to reduce the gunshot noise levels to an acceptable standard is agreed before any residential development commences on this site"..*

2.13 The remediation shown by the revised models in the form of on-site bunding, 5m high to the northern barrier of the site, reduces gunshot noise to an acceptable standard. This provides sufficient attenuation to enable residential occupation of the site without significant adverse impact from noise.

2.14 Paragraph 35 of the Planning Inspector's comments referred to further mitigation by sound insulation at the shooting ranges. This was discussed at length in my original report and a scheme to undertake works at the shooting club to provide adequate mitigation and attenuation was produced however these works are not necessary to secure the required sound reduction as alterations to the layout of the Anzio site have been undertaken to address this comment and accommodate the bund proposals.

2.15 Paragraph 36 of the Planning Inspector's comments refers to the NPPF requirement to avoid noise from giving significant impact on health and quality of life. The NPPF ethos is set out below:

a. The National Planning Policy Framework (NPPF) sets out the Government's economic, environmental and social planning policies for England and "these policies articulate the Government's vision of sustainable development." In respect of noise, Paragraph 123 of the NPPF states the following:

*"Planning policies and decisions should aim to:*

- *avoid noise from giving rise to significant adverse impacts on health and quality of life as a result of new development;*
- *mitigate and reduce to a minimum other adverse impacts on health and quality of life arising from noise from new development, including through the use of conditions;*
- *recognise that development will often create some noise and existing businesses wanting to develop in continuance of their business should not have unreasonable restrictions put on them because of changes in nearby land uses since they were established; and*
- *identify and protect areas of tranquillity which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason."*

b. The Government's Planning Practice Guidance 2014 considers that it is not expected that noise is considered in isolation, separately from economic, social and other environmental dimensions of the proposed development. It offers guidance on factors that influence whether noise could be a concern. These include the source and absolute level together with the time of day it occurs. The frequency and pattern of the noise is also considered a factor, together with local topography and planned character of the area.

The NPPF reinforces the March 2010 DEFRA publication, "Noise Policy Statement for England" (NPSE), which states three policy aims, as follows:

*"Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:*

- *avoid significant adverse impacts on health and quality of life;*
- *mitigate and minimise adverse impacts on health and quality of life; and*
- *where possible, contribute to the improvement of health and quality of life*."

c. Together, the first two aims require that no significant adverse impact should occur and that, where a noise level which falls between a level which represents the lowest observable adverse effect and a level which represents a significant observed adverse effect, then according to the explanatory notes in the statement:

> *"… all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life whilst also taking into consideration the guiding principles of sustainable development. This does not mean that such effects cannot occur."*

## 3.0 Planning Conditions

3.1 SR and SMDC EHO have worked together to consider possible conditions to control noise in accordance with satisfying the six tests for conditions, that are; necessary, relevant to planning, relevant to the development, enforceable ,precise and reasonable.

3.2 The following conditions are suggested in respect of noise and have been discussed and agreed with Staffordshire Moorland District Council EHO. They are considered robust to comply with the above tests, and to satisfy the concerns of the Planning Inspector on the former application as outlined in 1.3 above.

3.3 **"Sound Insulation –Residential"**

1. "Development shall not commence until a site specific scheme for protecting the proposed residential units from noise, has been submitted to, and approved in writing by the Local Planning Authority (LPA). The submitted scheme shall have due regard for British Standard BS 8233: 2014 Guidance on Sound Insulation for Buildings and World Health Organisation Guidelines for Community Noise 1999 and be designed to achieve noise levels of less than 35 dB $L_{Aeq}$ , less than 40 dB $L_{Aeq}$ in living areas and less than 55 dB$L_{Aeq16hr}$ in outside residential areas.

Pre-completion tests shall be carried out to verify compliance with this scheme/condition. A report shall be produced containing all raw data and showing how calculations have been made. A copy of such report shall be submitted to the LPA for its approval.

**Reason :** To protect occupiers from noise and to safeguard their residential amenities.

2. "Prior to the occupation of the extra care units numbered D1-D23, mitigation works set out in the Sharps Redmore report dated 23rd June 2015 (reference A1 1414501) and on the Landscape Matters plan (reference Landscape Design Proposals, Acoustic Bund Extension LS6155/P/L/111B),shall be fully implemented. The noise mitigation works shall thereafter be maintained in perpetuity, unless any variation to the works is agreed with the LPA.

**Reason:** As above.

## 4.0 Conclusions

4.1 This addendum has been produced to address the remaining noise issues arising from the proposed mixed-use development in the context of its proximity to the Leek and District Shooting Centre. It focusses on the effectiveness of on-site mitigation in the form of bunding to the northern boundary of the site in response to comments made by the Planning Inspector and Staffordshire Moorlands District Councils Environmental Health Officer.

4.2 The noise levels at this proposal will provide compliance with guideline values for WHO Guidelines for Community Noise and BS 8233:2014. The required levels will be achieved for external and internal noise environments.

4.3 This report therefore, draws the conclusion that the proposed residential development with the revised mitigation in the form of on-site bunding and localised screening as outlined above will satisfy the NPPF requirements in that the development will provide residential accommodation that will avoid noise from giving rise to significant adverse impact. The proposed works will be achieved this through the use of suitably worded conditions providing the mitigation and minimising of adverse effects enabling residential occupation without any impact on the health and quality of life for future residents through noise, in accordance with the policy aims of the NPPF, NPSE, WHO guidelines, BS 8233:2014 and local aims.

# APPENDIX A

# ACOUSTIC TERMINOLOGY

## Acoustic Terminology

1 Noise, defined as unwanted sound, is measured in units of decibels, dB. The range of audible sounds is from 0 dB to 140 dB. Two equal sources of sound, if added together will result in an increase in level of 3 dB, i.e. 50 dB + 50 dB = 53 dB. Increases in continuous sound are perceived in the following manner:

1 dB increase - barely perceptible.

3 dB increase - just noticeable.

10 dB increase - perceived as twice as loud.

2 Frequency (or pitch) of sound is measured in units of Hertz. 1 Hertz (Hz) = 1 cycle/second. The range of frequencies audible to the human ear is around 20Hz to 18000Hz (or 18kHz). The capability of a person to hear higher frequencies will reduce with age. The ear is more sensitive to medium frequency than high or low frequencies.

3 To take account of the varying sensitivity of people to different frequencies a weighting scale has been universally adopted called "A-weighting". The measuring equipment has the ability automatically to weight (or filter) a sound to this A scale so that the sound level it measures best correlates to the subjective response of a person. The unit of measurement thus becomes dBA (decibel, A-weighted).

4 The second important characteristic of sound is amplitude or level. Two units are used to express level, a) sound power level - $L_w$ and b) sound pressure level - $L_p$. Sound power level is an inherent property of a source whilst sound pressure level is dependent on surroundings/distance/directivity, etc. The sound level that is measured on a meter is the sound pressure level, $L_p$.

5 External sound levels are rarely steady but rise or fall in response to the activity in the area - cars, voices, planes, birdsong, etc. A person's subjective response to different noises has been found to vary dependent on the type and temporal distribution of a particular type of noise. A set of statistical indices have been developed for the subjective response to these different noise sources.

6 The main noise indices in use in the UK are:

$L_{A90}$: The sound level (in dBA) exceeded for 90% of the time. This level gives an indication of the sound level during the quieter periods of time in any given sample. It is used to describe the "background sound level" of an area.

$L_{Aeq}$: The equivalent continuous sound level in dBA. This unit may be described as "the notional steady noise level that would provide, over a period, the same energy as the intermittent noise". In other words, the energy average level. This unit is now used to measure a wide variety of different types of noise of an industrial or commercial nature, as well as aircraft, environmental noise and trains.

$L_{A10}$: The sound level (in dBA) exceeded for 10% of the time. This level gives an indication of the sound level during the noisier periods of time in any given sample. It has been used over many years to measure and assess road traffic noise.

$L_{AMAX}$: The maximum level of sound measured in any given period. This unit is used to measure and assess transient noises, i.e. gun shots, individual vehicles, etc.

7 Exposure Level. This is the $L_{Aeq}$ level normalised to one second. That is the constant level in dBA which lasting for one second has the same amount of acoustic energy as a given A weighted noise event lasting for a period of time. The use of this unit allows the prediction of the $L_{Aeq}$ level over any period and for any number of events using the equation;

$$L_{AeqT} = SEL + 10 \log n - 10 \log T \text{ dB}.$$

Where

n = Number of events in time period T.

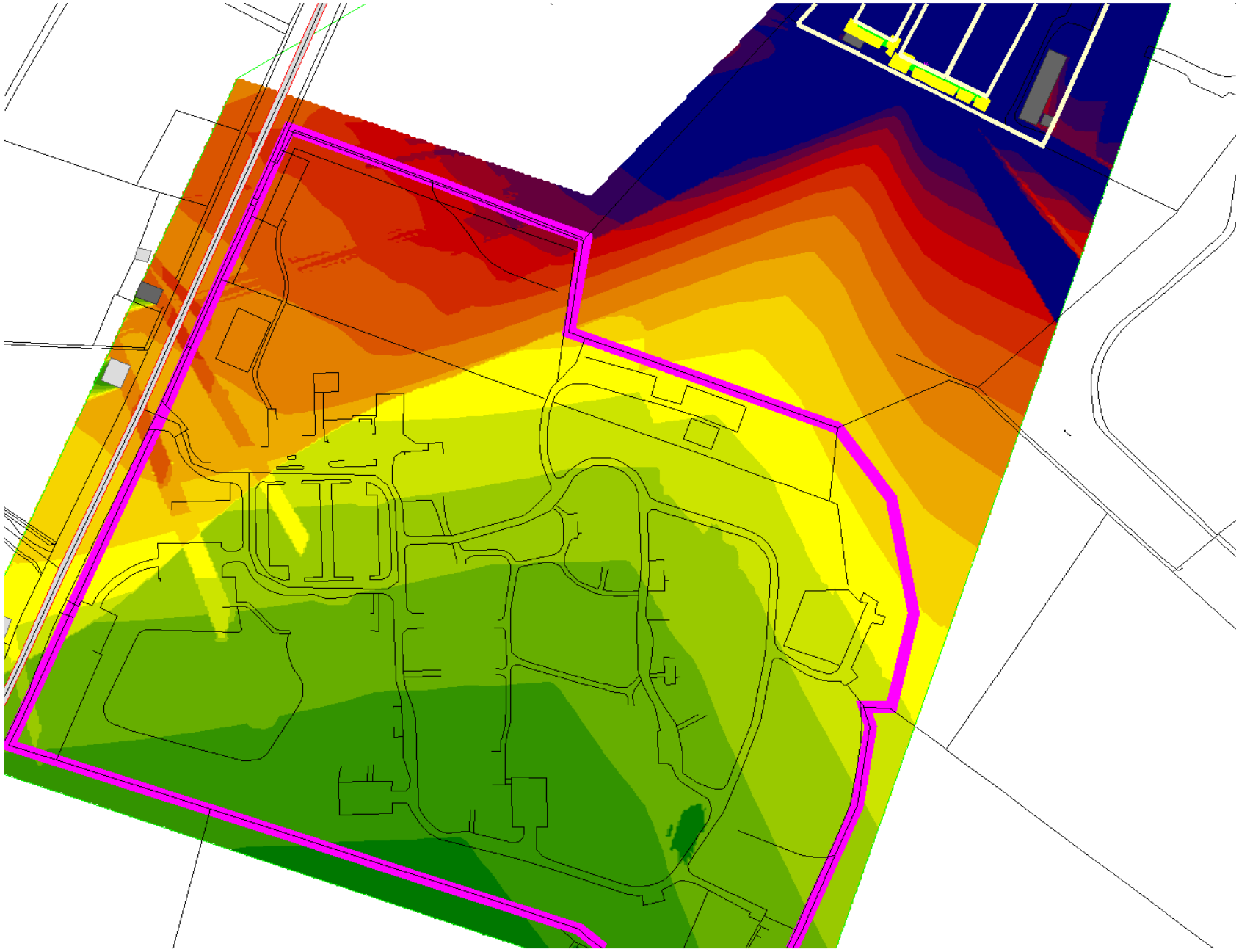
T = Total sample period in seconds.

8 In the open, known as free field, sound attenuates at a rate of 6 dB per each doubling of distance. This is known as geometric spreading or sometimes referred to as the Inverse Square Law. As noise is measured on a Logarithmic scale, this attenuation in distance = 20 Log (ratio of distances), e.g. for a noise level of 60 dB at ten metres, the corresponding level at 160 metres is:

$$60 - 20 \text{ Log } {}^{160}/_{10} = 60 - 24 = 36 \text{ dB}.$$

# APPENDIX B

## SOUNDPLAN MODELS SHOWING 50 AND 100 METRE RANGES WITHOUT MITIGATION AND WITH ON - SITE BUNDING MITIGATION



Noise level
LAmax
(dB)

| | | | |
|---|---|---|---|
| | | <= | 55 |
| 55 | < | <= | 57 |
| 57 | < | <= | 59 |
| 59 | < | <= | 61 |
| 61 | < | <= | 63 |
| 63 | < | <= | 65 |
| 65 | < | <= | 67 |
| 67 | < | <= | 69 |
| 69 | < | <= | 71 |
| 71 | < | <= | 73 |
| 73 | < | <= | 75 |
| 75 | < | <= | 77 |
| 77 | < | <= | 79 |
| 79 | < | <= | 81 |
| 81 | < | <= | 83 |
| 83 | < | | |

ANZIO CAMP
Source = 100yd range B
from 1m in front of shelter.
Mitigation measures:
- None at shooting range
- None at development site

**Figure 3**

Model:- #05 Date: 03.02.2015

Project No: 1414501

Consultant: M Court

Scale 1:2500

0 10 20 40 60 80 m

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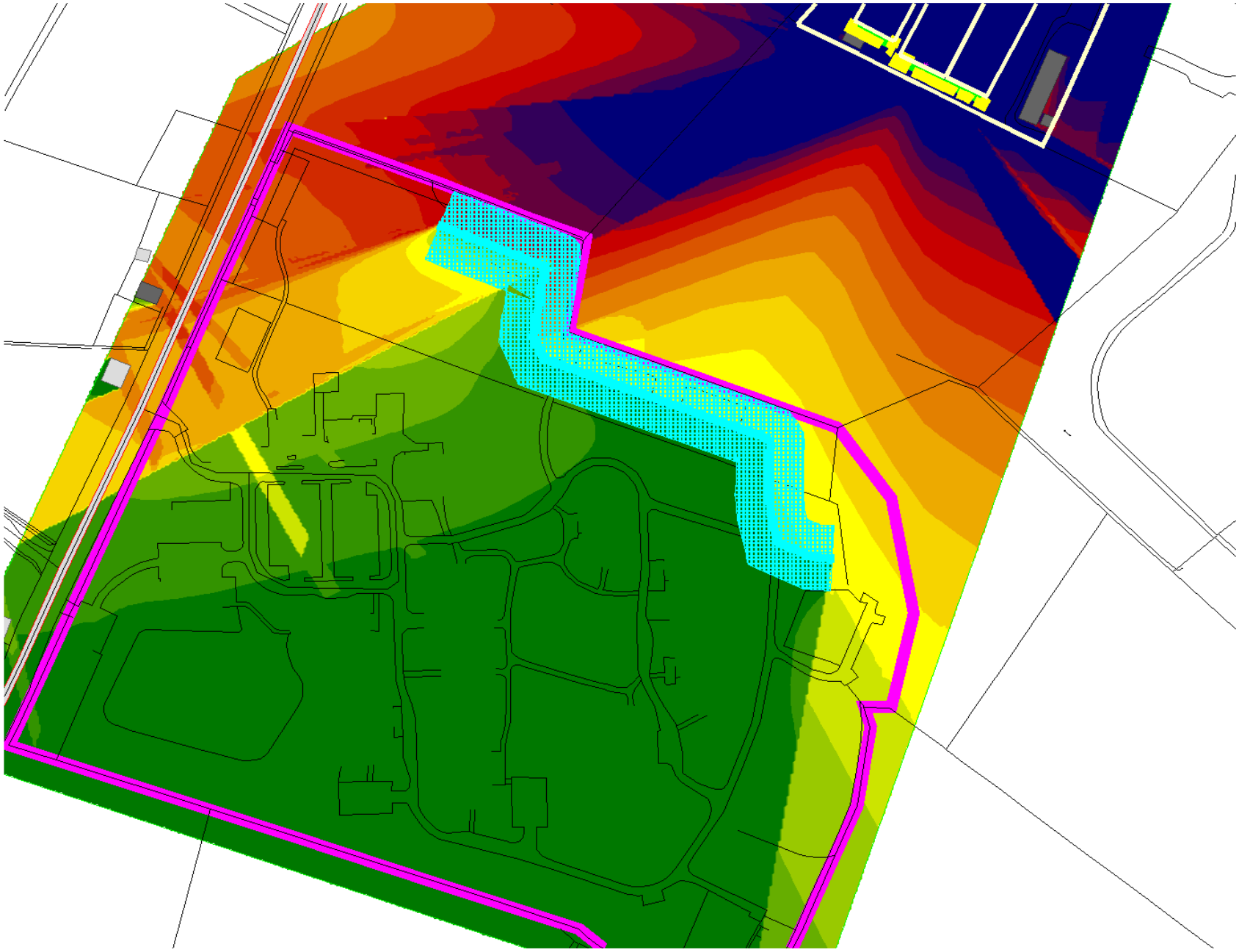

Noise level
LAmax
(dB)

| | | | |
|---|---|---|---|
| | | <= | 55 |
| 55 | < | <= | 57 |
| 57 | < | <= | 59 |
| 59 | < | <= | 61 |
| 61 | < | <= | 63 |
| 63 | < | <= | 65 |
| 65 | < | <= | 67 |
| 67 | < | <= | 69 |
| 69 | < | <= | 71 |
| 71 | < | <= | 73 |
| 73 | < | <= | 75 |
| 75 | < | <= | 77 |
| 77 | < | <= | 79 |
| 79 | < | <= | 81 |
| 81 | < | <= | 83 |
| 83 | < | | |

ANZIO CAMP
Source = 100yd range B
from 1m in front of shelter.
Mitigation measures:
- None at shooting range
- Extended long 5m high
  bund at development site

**Figure 4A**

Model:- #05 Date: 03.02.2015

Project No: 1414501

Consultant: M Court

Scale 1:2500

0 10 20 40 60 80 m

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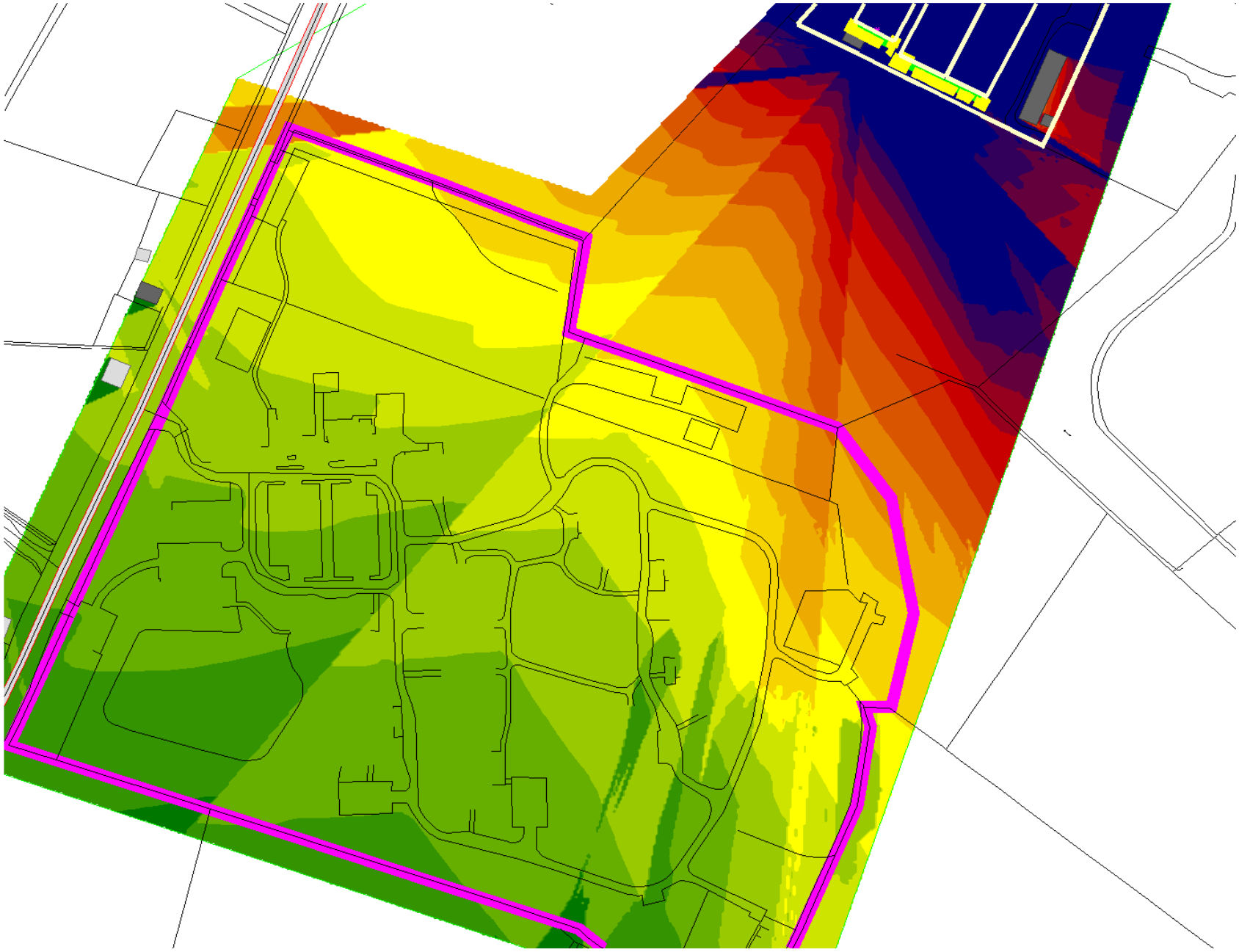

Noise level
LAmax
(dB)

| | | | |
|---|---|---|---|
| | | <= | 55 |
| 55 | < | <= | 57 |
| 57 | < | <= | 59 |
| 59 | < | <= | 61 |
| 61 | < | <= | 63 |
| 63 | < | <= | 65 |
| 65 | < | <= | 67 |
| 67 | < | <= | 69 |
| 69 | < | <= | 71 |
| 71 | < | <= | 73 |
| 73 | < | <= | 75 |
| 75 | < | <= | 77 |
| 77 | < | <= | 79 |
| 79 | < | <= | 81 |
| 81 | < | <= | 83 |
| 83 | < | | |

ANZIO CAMP
Source = 50yd range from 1m in front of shelter.
Mitigation measures:
- None at shooting range
- None at development site

**Figure 5**

Model:- #05 Date: 03.02.2015

Project No: 1414501

Consultant: M Court

Scale 1:2500

0 10 20 40 60 80 m

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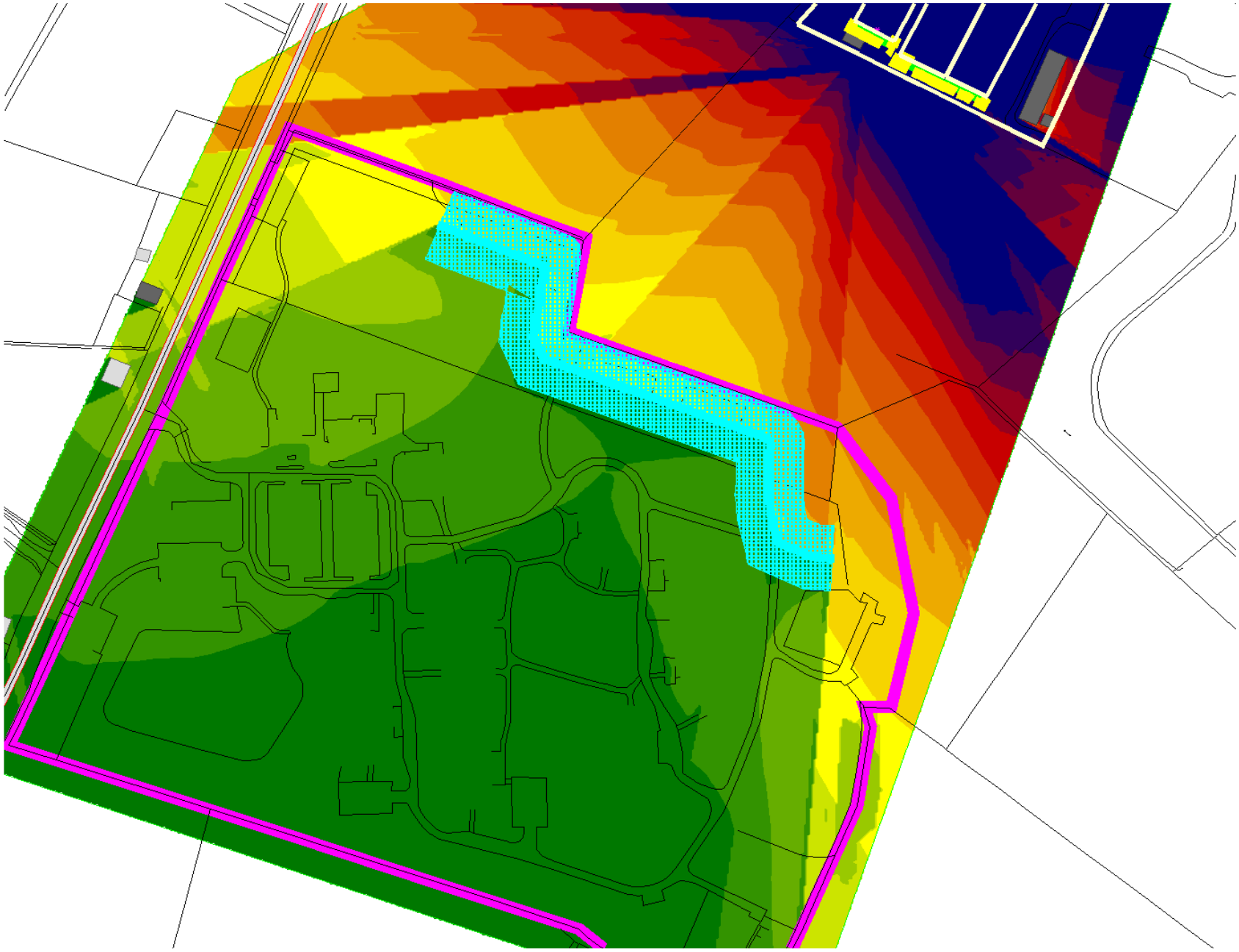

Noise level
LAmax
(dB)

| | | | |
|---|---|---|---|
| | | <= | 55 |
| 55 | < | <= | 57 |
| 57 | < | <= | 59 |
| 59 | < | <= | 61 |
| 61 | < | <= | 63 |
| 63 | < | <= | 65 |
| 65 | < | <= | 67 |
| 67 | < | <= | 69 |
| 69 | < | <= | 71 |
| 71 | < | <= | 73 |
| 73 | < | <= | 75 |
| 75 | < | <= | 77 |
| 77 | < | <= | 79 |
| 79 | < | <= | 81 |
| 81 | < | <= | 83 |
| 83 | < | | |

ANZIO CAMP
Source = 50yd range
from 1m in front of shelter.
Mitigation measures:
- None at shooting range
- Extended long 5m high
  bund at development site

**Figure 6A**

Model:- #05 Date: 03.02.2015

Project No: 1414501

Consultant: M Court

Scale 1:2500

0 10 20 40 60 80 m

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# APPENDIX C

# ILLUSTRATIVE EXTRACT FROM MASTERPLAN


Z
Z
Y
D1
D2
D3
D4
D5
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D7
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