17 Middlefield
London

Noise Impact Assessment Report

22408/NIA1

3 September 2015

For:
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Hann Tucker Associates

Road Noise Prediction Report
22408/NIA1

Document Control

Issue	Date	Comment	Prepared by	Authorised by
0	03/09/2015	-		
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Hann Tucker Associates

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Attachments

1.0 Introduction

It is proposed to redevelop the site at 17 Middlefield, Finchley Road, London, NW8 6ND. The Local Authority is concerned about the impact of noise from the surrounding road network will have on the future amenity of the outdoor living area at the site.

Hann Tucker Associates have been commissioned to undertake a computational predictive noise model to inform potential noise mitigation measures and specifications, based on representative environmental noise data from an earlier survey at 23 Middlefield, used for a similar purpose on a neighbouring building.

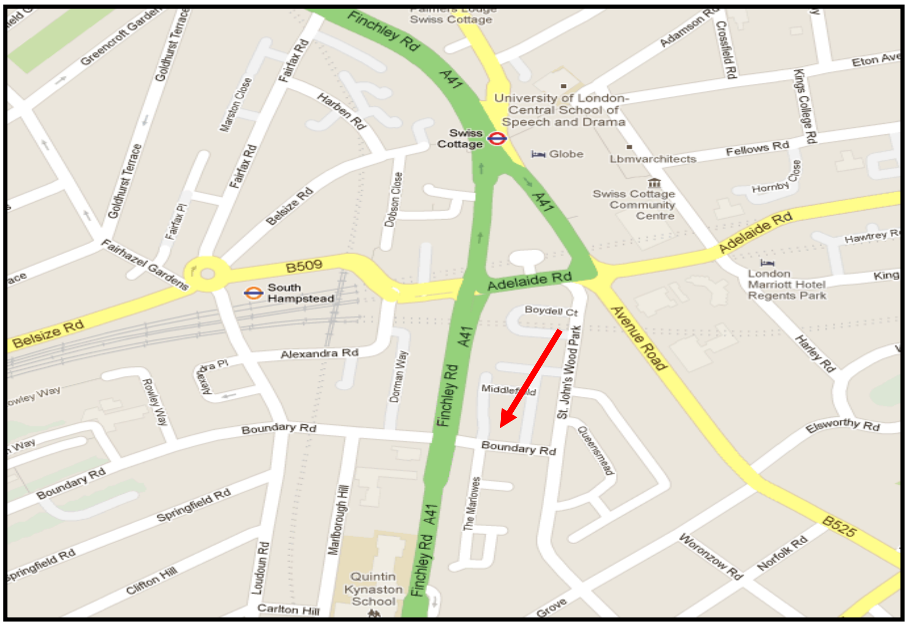
2.0 Objectives

Utilising the results of the earlier environmental noise survey, representative of the site, to produce a computational acoustics model using CadnaA software in order to inform possible noise mitigation scenarios.

3.0 Site Description

3.1 Location

The site is located at 17 Middlefield, Finchley Road, London, NW8 6ND, and falls within the London Borough of Camden's jurisdiction. See Location Map below.



Location Map (maps.google.co.uk)

3.2 Proposals

It is proposed to demolish the existing building at 17 Middlefield and build a new development including a sunken garden at basement level, with the addition of a wall up to 3m above ground level.

The Local Authority have raised concerns that the garden area may not be fit for purpose as a result of excessive traffic noise from Finchley Road.

Our computational model will take into account screening provided by the proposed wall and sunken garden to predict the likely road traffic noise level in the garden.

4.0 Acoustic Terminology

For an explanation of the acoustic terminology used in this report please refer to Appendix A enclosed.

5.0 Environmental Noise Survey Methodology

5.1 Introduction

A similar development also involving a sunken garden and 3m high wall was previously proposed at 23 Middlefield, as detailed in our report 18864/ENS1/RevB dated 6 June 2013. Given the similarities of the redevelopments and surrounding noise environment, we have undertaken our acoustic modelling using data from the previous environmental noise survey for the development at 23 Middlefield.

5.2 Procedure

Fully automated environmental noise monitoring was undertaken from approximately 11:30 hours on 4 April 2013 to 11:30 hours on 5 April 2013.

Due to the nature of the survey, i.e. unmanned, it is not possible to accurately comment on the weather conditions throughout the entire survey period. However at the beginning and end of the survey period the wind conditions were calm and the sky was generally clear. We understand that generally throughout the survey period the weather conditions were similar to this. Measurements were taken continuously of the A-weighted (dBA) L_{90}, L_{max} and octave band L_{eq} sound pressure levels over 15 minute periods.

5.3 Measurement Positions

The noise level measurements were undertaken at 1No. position at the development site. The microphone was located in the rear garden of the property and was positioned at a height of approximately 1.5m above the ground. The monitoring position is shown on the aerial photograph below.

Aerial Photograph Showing Measurement Position (maps.google.co.uk)

5.4 Instrumentation

The instrumentation used during the manned survey is presented in the table below:

Description	Manufacturer	Type	Serial Number	Latest Verification
Position Type 1 Data Logging Sound Level Meter	Larson Davis	824	3542	LD calibration on 24/02/2012
Position Type 1 ½” Condenser Microphone	PCB	377B02	104675	LD calibration on 24/02/2012
Type 1 Calibrator	Larson Davis	CAL200	3082	LD calibration on 02/03/2012

The sound level meter, including the extension cable, was calibrated prior to and on completion of the survey. No significant change was found to have occurred (no more than 0.1 dB).

The sound level meter was located in an environmental case with the microphone connected to the sound level meter via an extension cable. The microphone was fitted with a Larson Davis windshield

6.0 Results

The results of the environmental noise survey have been plotted on Time History Graph 22408/TH1 enclosed presenting the 15 minute A-weighted (dBA) L_{90}, L_{eq} and L_{max} levels throughout the duration of the survey.

The following table presents the octave band L_{eq} results from the manned survey.

Period	Measured $L_{eq,T}$ (dB re 2 x 10^{-5} Pa) at Octave Band Centre Frequency (Hz)								dBA
	63	125	250	500	1k	2k	4k	8k	
Day (07:00-23:00)	71	64	61	60	62	59	49	40	65
Night (23:00-07:00)	67	61	58	57	59	54	44	35	62

7.0 Discussion Of Noise Climate

Due to the nature of the survey, i.e. unmanned, it is not possible to accurately describe the dominant noise sources, or specific noise events throughout the entire survey period. However at the beginning and end of the survey period the dominant noise source was noted to be road traffic noise from Finchley Road (A41).

8.0 World Health Organisation (Who) Criteria

The following table has been extracted from the World Health Organisation's (WHO) "Guidelines for Community noise: 1999".

Specific Environment	Critical Health Effect(s)	L_{Aeq} [dB]	Time Base [hours]	$L_{Amaxfast}$ [dB]
Outdoor Living Area	Serious annoyance, daytime and evening	55	16	-
	Moderate annoyance, daytime and evening	50	16	-

Section 4.2.7 of WHO "Guidelines for Community noise: 1999" also offers the following with regard to human exposure to noise:

"*During the daytime, few people are seriously annoyed by activities with L_{Aeq} levels below 55 dB; or moderately annoyed with L_{Aeq} levels below 50 dB*"

Considering the above WHO advice, a minimum design level of 55 dB $L_{Aeq,16hour}$, as measured at a height of 1.5 metres above the outdoor living area, should be considered as desirable in order to obtain an outdoor living area with a good level of amenity.

9.0 Computational Noise Model

Hann Tucker Associates have created a computational noise model using CadnaA software. CadnaA utilises the procedure set out in "Calculation of Road Traffic Noise" which is the standard process for calculating road traffic noise in the United Kingdom.

The computational noise model has been calibrated such that the noise level in the outdoor living area without any mitigation measures in place is the same as the results of the environmental noise survey. Screen shots of this computational model can be seen in the attachments Cad01 Cad04.

In order to mitigate road traffic noise in the outdoor living area it has been proposed to lower the outdoor living area to basement level (approx. 3m).The results of the computational noise model indicate that lowering the outdoor living area to basement level could reduce the noise level in the outdoor living area by more than approximately 15dB to less than 50dB $L_{Aeq,16hours}$.

10.0 Conclusions

Hann Tucker Associates have undertaken a computational noise model using noise data from a previous environmental noise survey and CadnaA software in order to calculate the likely impact of road traffic noise on the proposed development.

The results of the computational noise model show that reducing the outdoor living area by 3m should bring the external ambient noise levels within the World Health Organisation's recommended levels.

Appendix A

The acoustic terms used in this report are as follows:

dB — Decibel - Used as a measurement of sound pressure level. It is the logarithmic ratio of the noise being assessed to a standard reference level.

dBA — 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 human. It is also possible to calculate the 'A' weighted noise level by applying certain corrections to an un-weighted spectrum. The measured or calculated 'A' weighted noise level is known as the dBA level.

Because of being a logarithmic scale noise levels in dBA do not have a linear relationship to each other. For similar noises, a change in noise level of 10dBA represents a doubling or halving of subjective loudness. A change of 3dBA is just perceptible.

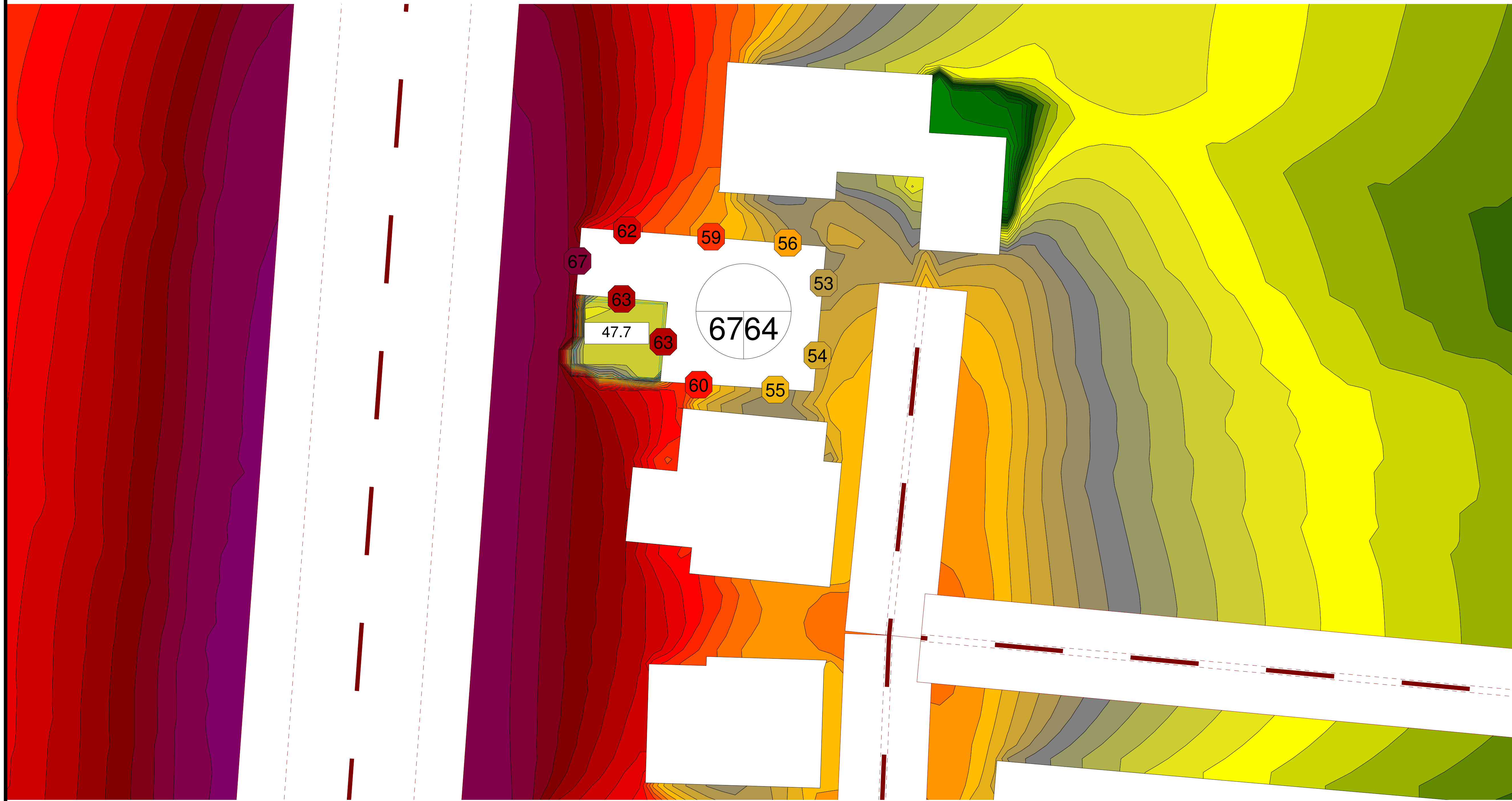
L_{10} & L_{90} — If a non-steady noise is to be described it is necessary to know both its level and the degree of fluctuation. The Ln indices are used for this purpose, and the term refers to the level exceeded for n% of the time, hence L_{10} is the level exceeded for 10% of the time and as such can be regarded as the 'average maximum level'. Similarly, L_{90} is the average minimum level and is often used to describe the background noise.

It is common practice to use the L_{10} index to describe traffic noise, as being a high average, it takes into account the increased annoyance that results from the non-steady nature of traffic noise.

L_{eq} — The concept of L_{eq} (equivalent continuous sound level) is used in defining many types of noise, such as aircraft noise, environmental noise and demolition/construction noise.

L_{eq} is defined as a notional steady sound level which, over a stated period of time, would contain the same amount of acoustical energy as the actual, fluctuating sound measured over that period (e.g. 1 hour).

L_{max} — L_{max} is the maximum sound pressure level recorded over the period stated. L_{max} is sometimes used in assessing environmental noise where occasional loud noises occur, which may have little effect on the L_{eq} noise level.



Hann Tucker Associates
Consultants in Acoustics Noise & Vibration

Title:

Predicted Noise Levels in Basement Garden with Proposed Barrier (Day)

Model Notes:

This noise map has been generated from the results of our baseline survey.

Errors in our working should be brought to our attention as soon as possible.

Receiver Height: 1.8m

> -99.0 dB
> 35.0 dB
> 40.0 dB
> 45.0 dB
> 50.0 dB
> 55.0 dB
> 60.0 dB
> 65.0 dB
> 70.0 dB
> 75.0 dB
> 80.0 dB
> 85.0 dB

Designed by: NG

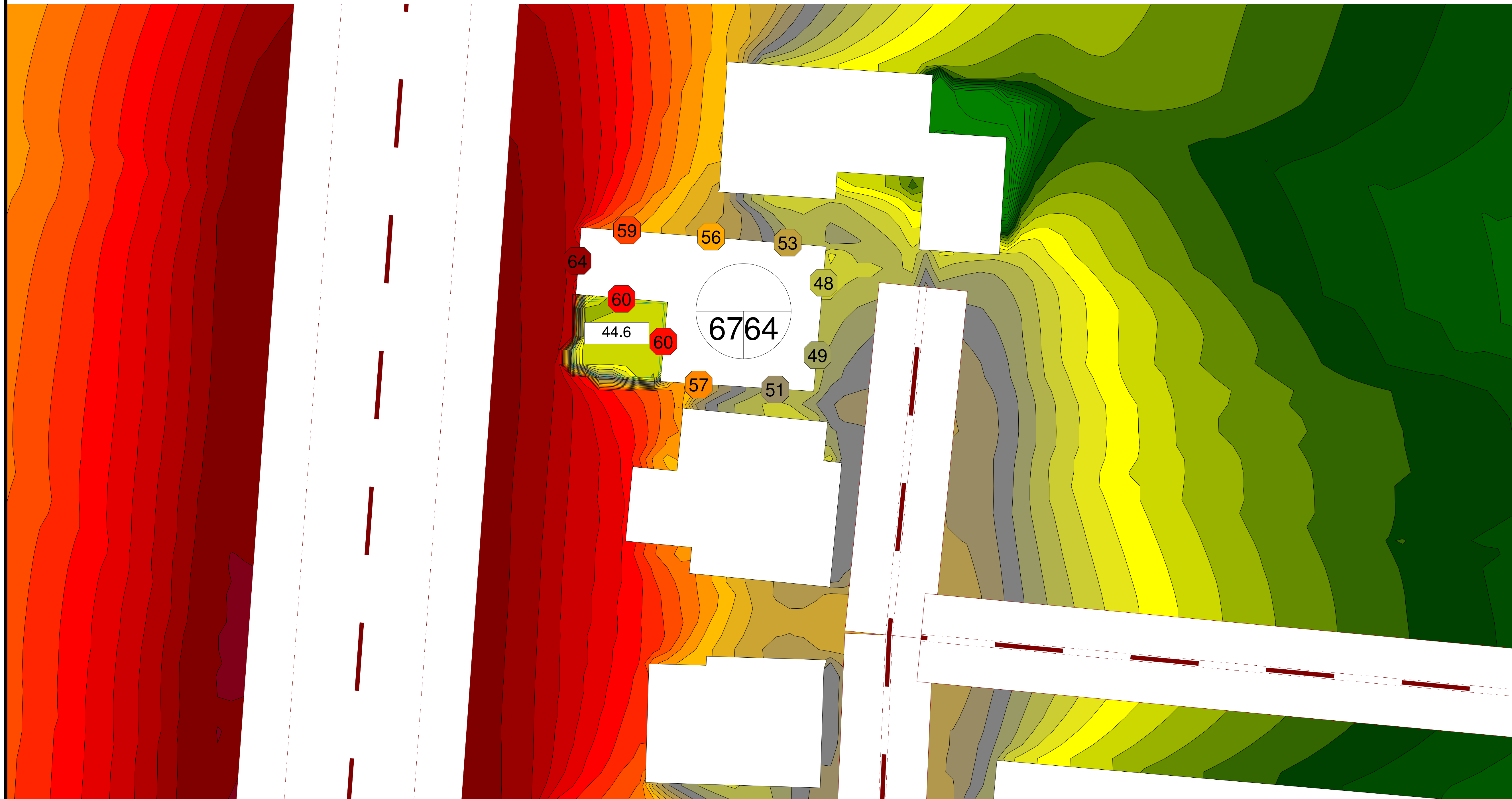
Reviewed by: ADF

Project No: HT: 22408

Date: 03 September 2015

Model No: Cad01

Do not scale



Hann Tucker Associates
Consultants in Acoustics Noise & Vibration

Title:

Predicted Noise Levels in Basement Garden with Proposed Barrier (Night)

Model Notes:

This noise map has been generated from the results of our baseline survey.

Errors in our working should be brought to our attention as soon as possible.

Receiver Height: 1.8m

> -99.0 dB
> 35.0 dB
> 40.0 dB
> 45.0 dB
> 50.0 dB
> 55.0 dB
> 60.0 dB
> 65.0 dB
> 70.0 dB
> 75.0 dB
> 80.0 dB
> 85.0 dB

Designed by: NG

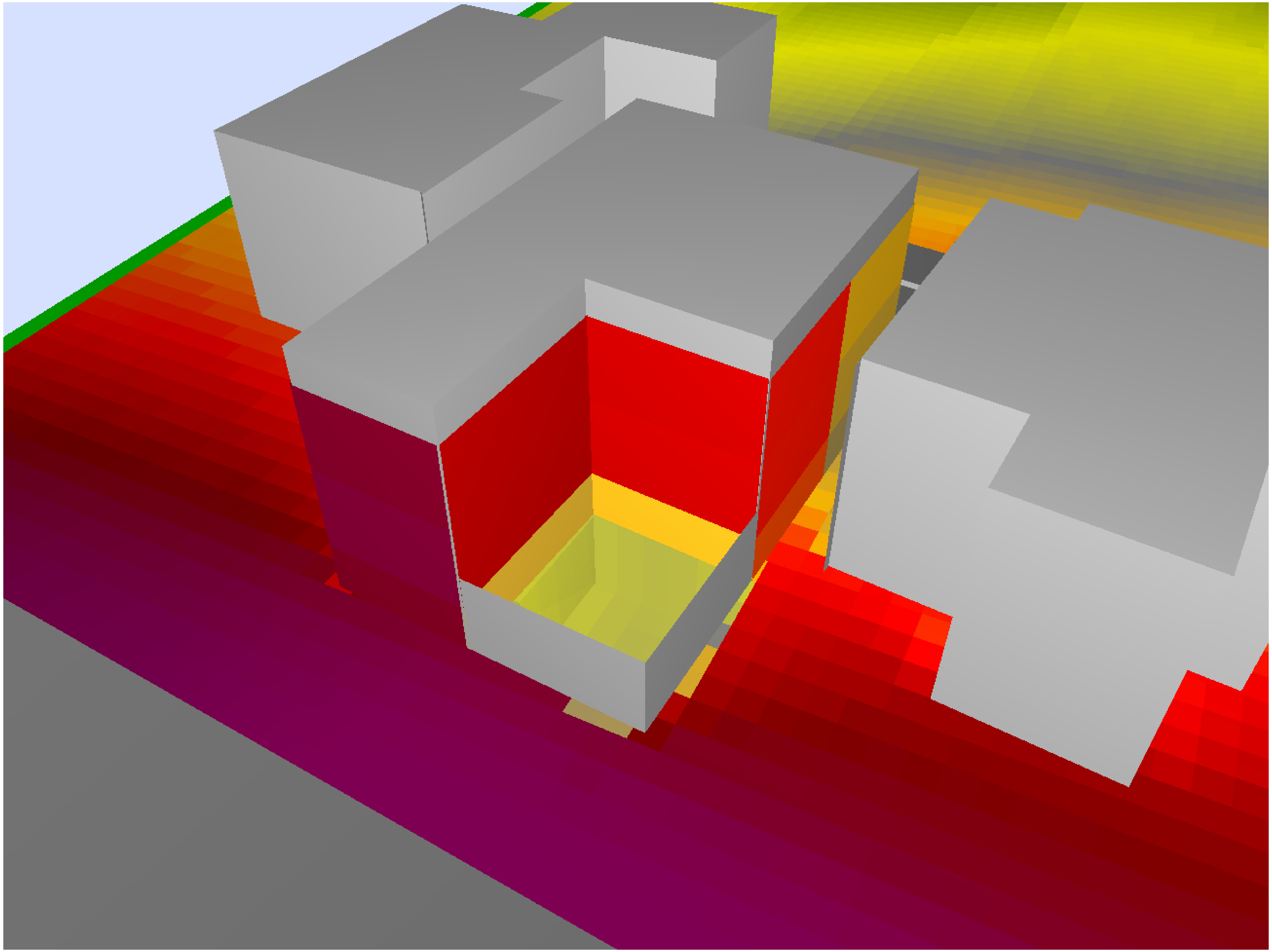
Reviewed by: ADF

Project No: HT: 22408

Date: 03 September 2015

Model No: Cad02

Do not scale



Hann Tucker Associates
Consultants in Acoustics Noise & Vibration

Title:

3D Model - Predicted Noise Levels with Proposed Barrier (Day)

Model Notes:

This noise map has been generated from the results of our baseline survey.

Errors in our working should be brought to our attention as soon as possible.

Receiver Height: 1.8m

> -99.0 dB
> 35.0 dB
> 40.0 dB
> 45.0 dB
> 50.0 dB
> 55.0 dB
> 60.0 dB
> 65.0 dB
> 70.0 dB
> 75.0 dB
> 80.0 dB
> 85.0 dB

Designed by: NG

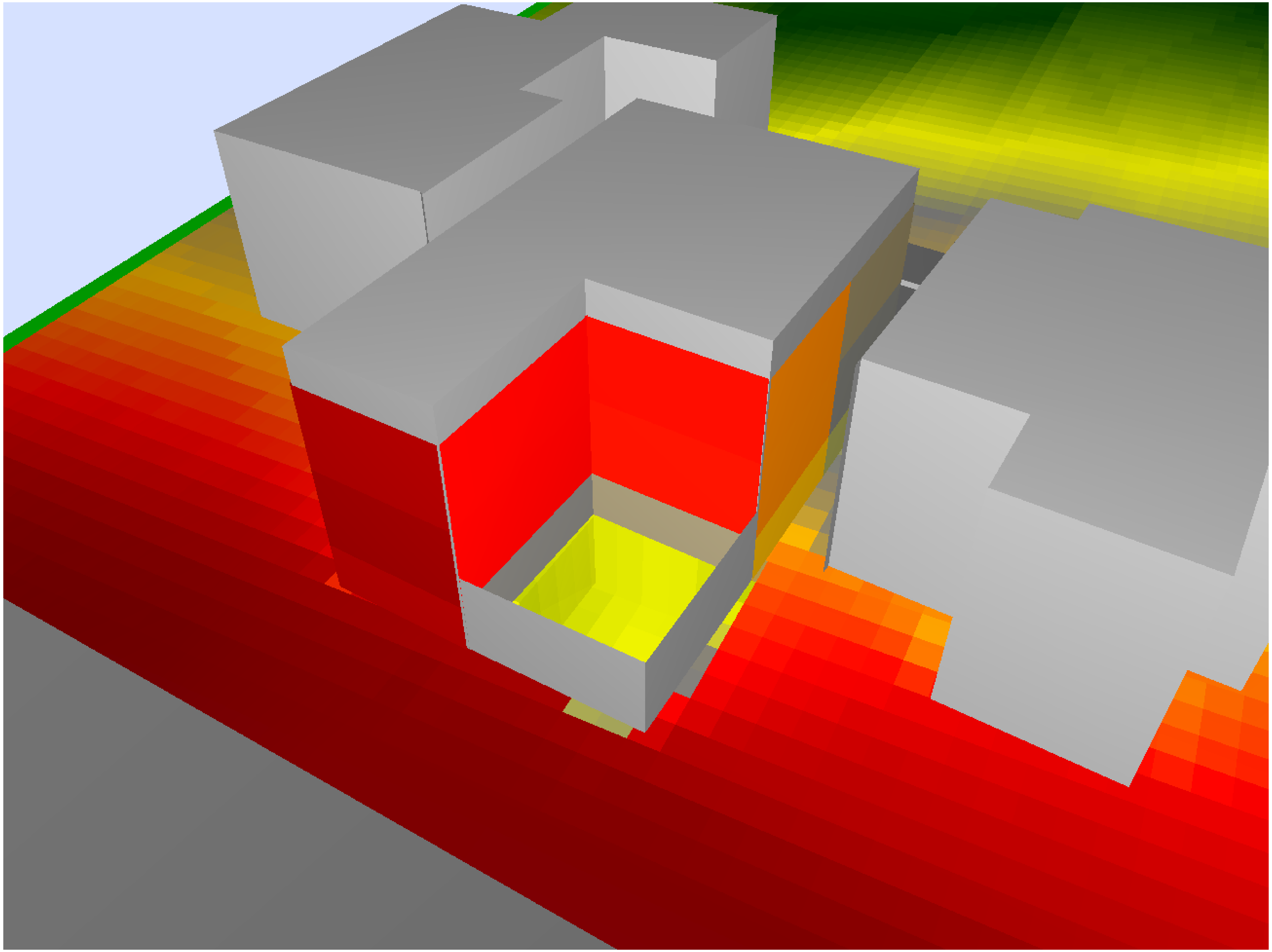
Reviewed by: ADF

Project No: HT: 22408

Date: 03 September 2015

Model No: Cad03

Do not scale



Hann Tucker Associates
Consultants in Acoustics Noise & Vibration

Title:

3D Model - Predicted Noise Levels with Proposed Barrier (Night)

Model Notes:

This noise map has been generated from the results of our baseline survey.

Errors in our working should be brought to our attention as soon as possible.

Receiver Height: 1.8m

	> -99.0 dB
	> 35.0 dB
	> 40.0 dB
	> 45.0 dB
	> 50.0 dB
	> 55.0 dB
	> 60.0 dB
	> 65.0 dB
	> 70.0 dB
	> 75.0 dB
	> 80.0 dB
	> 85.0 dB

Designed by: NG

Reviewed by: ADF

Project No: HT: 22408

Date: 03 September 2015

Model No: Cad04

Do not scale