MILLER GOODALL
ACOUSTICS AND AIR QUALITY

ASSESSMENT OF NOISE FROM A SMOKING SHELTER

on behalf of

BAR JYNX LTD

for the site at

JYNX, 4 WITHAM ROAD, SKELMERSDALE, WN8 8HP

REPORT DATE: 31ST MAY 2017

REPORT NUMBER: 101522_3

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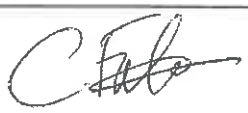
Summary

Miller Goodall Ltd has, on behalf of Bar Jynx Ltd, undertaken a modelling and calculation exercise to estimate the sound attenuation achieved by acoustic screening around an external smoking area.

It is shown that the acoustic screening which has already been installed is predicted to have resulted in a reduction of up to 10 dB L_A at first floor window of residences to the south of site.

An additional barrier has been recommended which is predicted to result in a reduction of up to 10 dB L_A at first floor window of residences to the north of site.

Record of changes

Prepared By	Colin Foster MIOA	Reviewed By	Joanne Miller MIOA
Signed		Signed	
Date	31st May 2017	Date	31st May 2017

Version	Date	Change	Initials
1	16th May 2017	Initial issue	CF
2	31st May 2017	Rev2	CF

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Contents

1 Introduction

1.1 Miller Goodall Ltd has, on behalf of Bar Jynx Ltd, undertaken a modelling and calculation exercise to estimate the sound attenuation achieved by acoustic screening around an external smoking area.

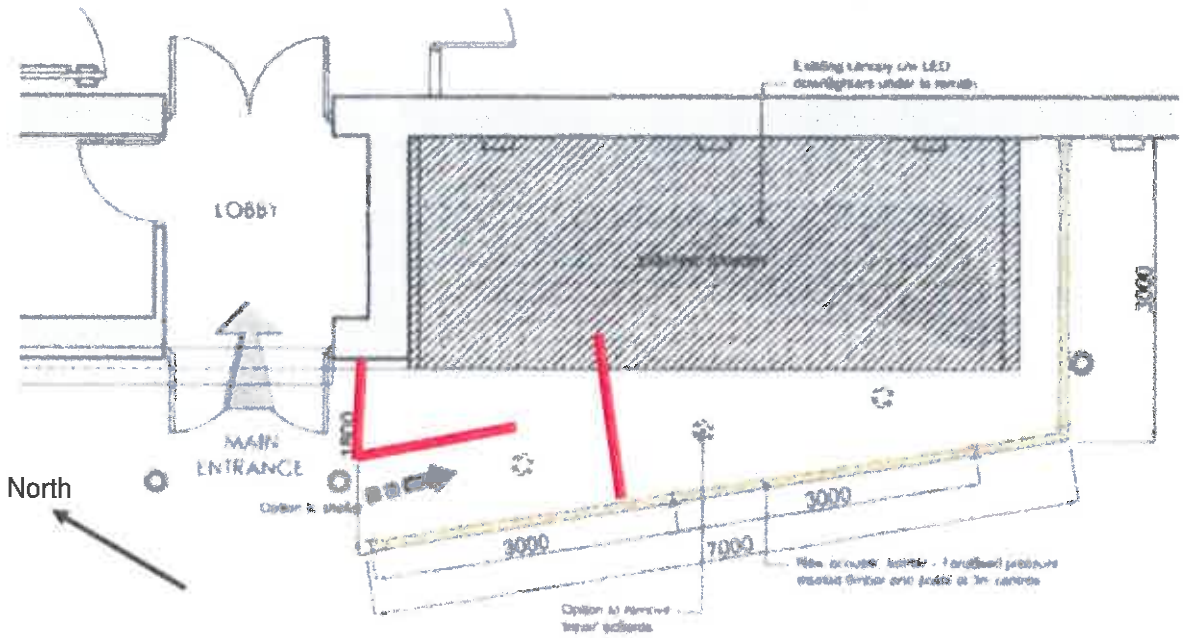
1.2 The acoustic screening surrounding the smoking shelter was recently installed at Jynx, 4 Witham Road, Skelmersdale, WN8 8HP.

2 Acoustic Screen Details

2.1 Appendix 1 shows a drawing of the external smoking area before the screen was erected (labelled as existing) and after the screen was erected (labelled as proposed). The acoustic screens form two sides of an enclosure around an external smoking shelter, with the other 2 walls being formed by the masonry walls of the club. The screens are continuous from the ground to 2.4 m high and of timber construction, with an acoustically absorbent fence to the smoking area.

2.2 Figure 1, below, shows a suggested further addition to the smoking shelter (shown in red). The intention is to remove the line of sight between the shelter and the main entrance, which would reduce noise propagation to residents on the north west. It would also discourage conversations being held between people in the smoking shelter and those gathering around the main entrance.

Figure 1: Proposed alteration to smoking shelter walls (shown in red)



2.3 For security reasons the proposed additional walls (shown in red) would need to be constructed from clear perspex or other suitable transparent material, to allow the doorstaff to see into the smoking shelter. Perspex (acrylic) is denser than most timber and will perform at least as good as timber, provided an identical thickness of product to timber is used.

3 Predicted Sound Attenuation

3.1 Computer Modelling

3.1.1 The CadnaA noise modelling package was used to predict the external noise levels at surrounding receptors with and without the screens being present. Figure 2.1 of Appendix 2 shows a 3D Isometric view of the model.

3.1.2 The model was set up with the following parameters:

- Propagation of noise using algorithms within ISO 9613: 1993 *Acoustics - Attenuation of sound during propagation outdoors.*
- Default ground absorption G = 0. (Equivalent to mostly hard, reflective external surfaces and consistent with the dominant ground cover at the site).
- Ground attenuation: spectral all sources
- No adverse meteorological effects
- Two orders of reflection
- Topographical data and aerial image was obtained using EMap contours.

3.1.3 Receptors were placed at first floor level of the nearest of the surrounding residences.

3.1.4 The model was populated with noise level data for 15 people all gathered close together in the smoking area. It was assumed that each person's voice behaves like a point source and was at a height of 1.8 m above the ground.

3.1.5 The assumed source noise data for the people was taken from the CadnaA database and is given in Table 1. It is assumed that 9 of the people were using normal voices, and 6 were using raised voices.

Table 1: Assumed Sound Power Level of Voices

Description	Free-field sound power level, L_w dB in Octave Band Centre Frequency, Hz								L_{Aeq}
	63	125	250	500	1k	2k	4k	8k	
Normal voice level	61	61	65	69	63	56	50	45	68
Raised voice level	65	65	70	75	72	64	57	49	75

3.1.6 The effect of the lightweight canopy over the smoking shelter was also investigated and it was found that it was having negligible effect on attenuation of noise sources within the smoking area.

3.2 Modelling Results

3.2.1 The results are shown graphically in Figures 2.2 - 2.4 of Appendix 2 and summarised in Table 2, overleaf.

Table 2: Results of predicted noise propagation

Location (all receivers at first floor level)	Predicted Noise Level dB L_{Aeq}		
	Original (no barriers)	With Current Barriers	With Additional Barriers
Hutton Rd property 1; rear window (SW)	49	39	39
Hutton Rd property 2; rear window (SW)	34	26	26
Witham Rd property 1; front window (NW)	48	47	37
Witham Rd property 2; front window (SE)	31	25	25
Corner Witham Rd and Hutton Rd (S)	47	37	37

3.2.2 It can be seen that the smoking barrier which has been installed has had the greatest effect on dwellings to the South West (Hutton Road) where the noise levels are predicted to have reduced the noise from 15 people in the smoking shelter by around 8 dB L_A at first floor window of the closest residence and by around 10 dB L_A at first floor window of residents further along Hutton Road.

3.2.3 However, the smoking barrier which has been installed has had very little effect on properties to the north (Witham Rd). With the suggested modification in place using the Perspex screens, noise to the north is predicted to reduce by a further 10 dB L_A.

3.2.4 With the suggested modification in place, we are of the opinion that the average (L_{Aeq}) noise level inside the properties, as caused by normal use of the smoking shelter, is below the background noise and does not exceed recognised internal noise design limits.

4 Conclusions

4.1 Calculations have been completed to estimate the likely sound attenuation achieved by an acoustic screen which has recently been erected around the external smoking shelter at Jynx, 4 Witham Road, Skelmersdale, WN8 8HP.

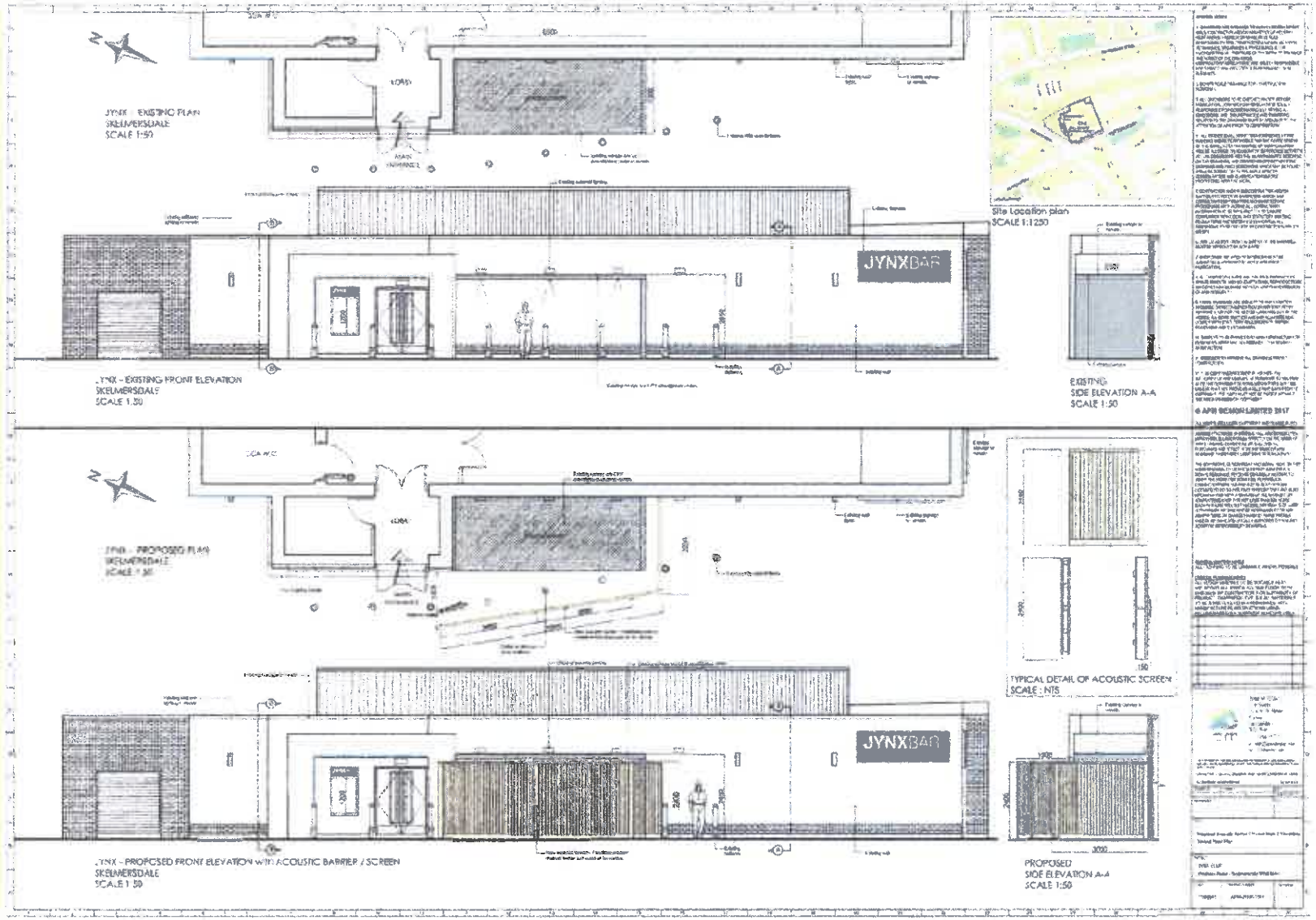
4.2 A computer model was used to calculate the noise levels generated by 15 people in the smoking area at surrounding residents, with and without the acoustic screen.

4.3 The sound attenuation was predicted to be greatest at residences to the south west of site where the reduction were around 8 – 10 dB L_A at first floor window level. However, the design of the acoustic screen is such that it does not provide any significant reductions to properties to the north.

4.3.1 A suggested modification has been detailed which would reduce the noise levels to the north by around 10 dB L_A.

APPENDICES

Appendix 1: Details of Acoustic Screen around Smoking Shelter



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Appendix 2: Computer Modelling

Figure 2.1: 3D Isometric view of model

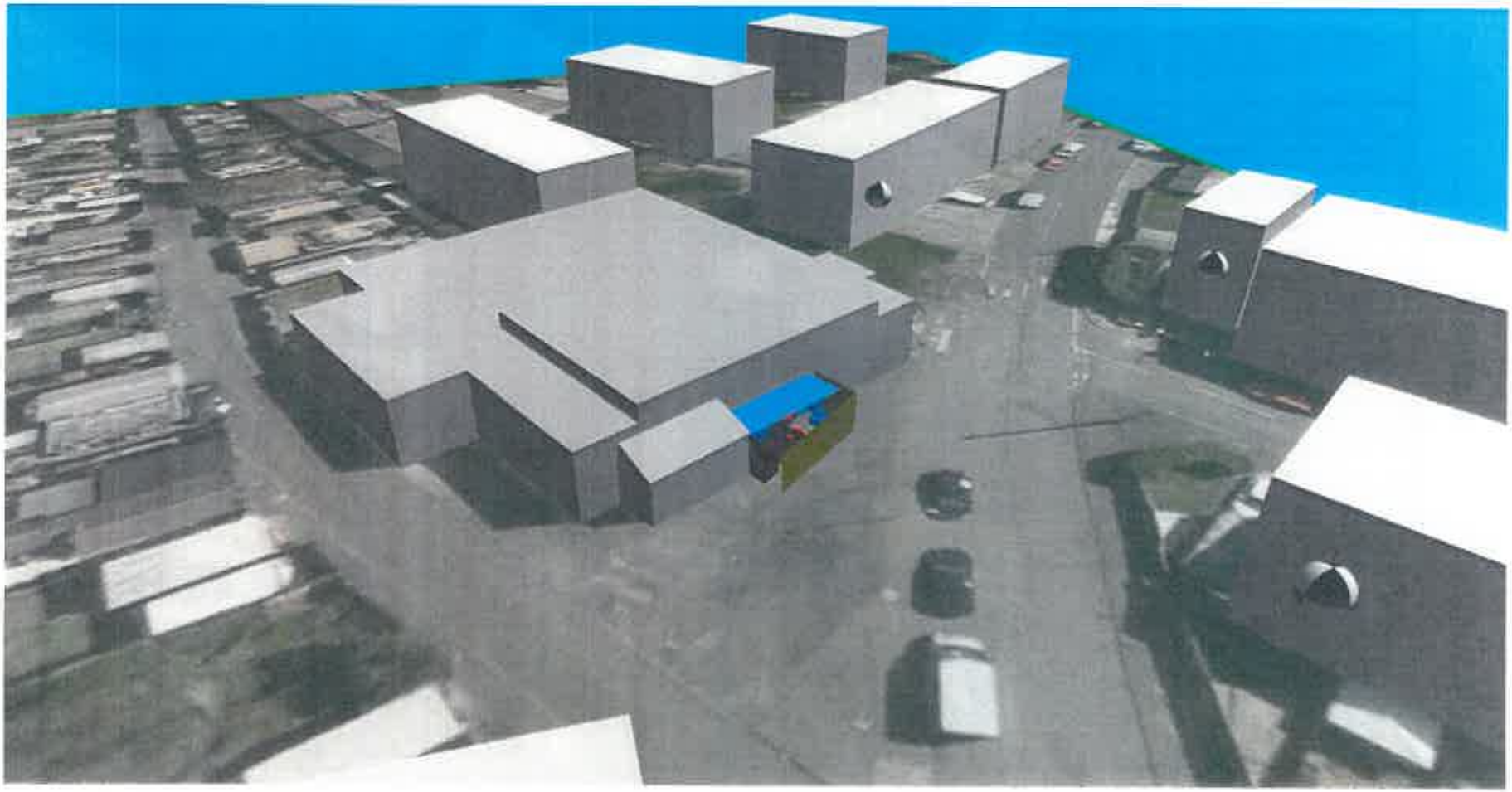

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Figure 2.2: Predicted Noise Levels (dB $L_{Aeq,T}$): No acoustic screening

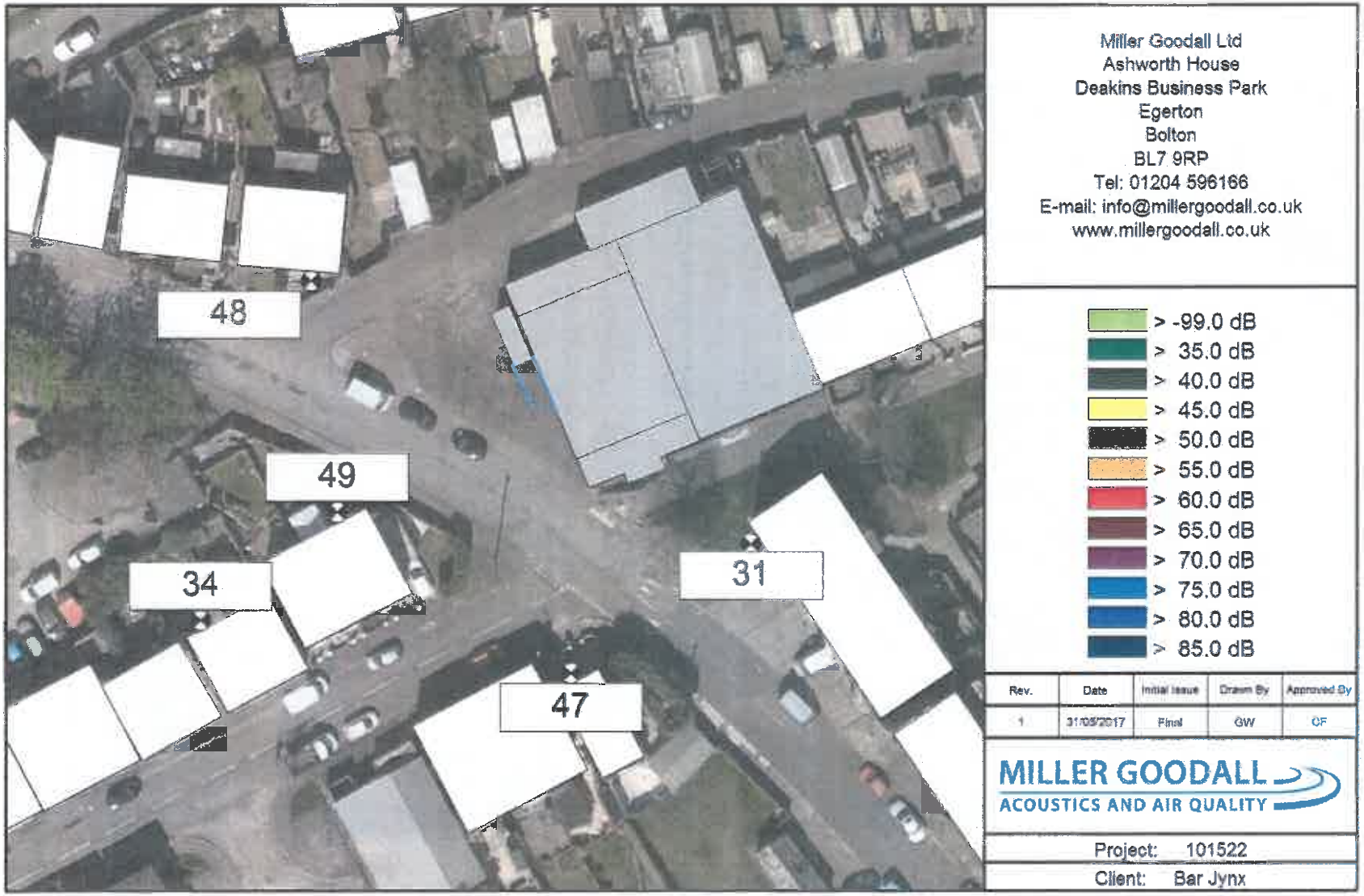

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Figure 2.3: Predicted Noise Levels (dB $L_{Aeq,T}$): With acoustic screening, as currently installed

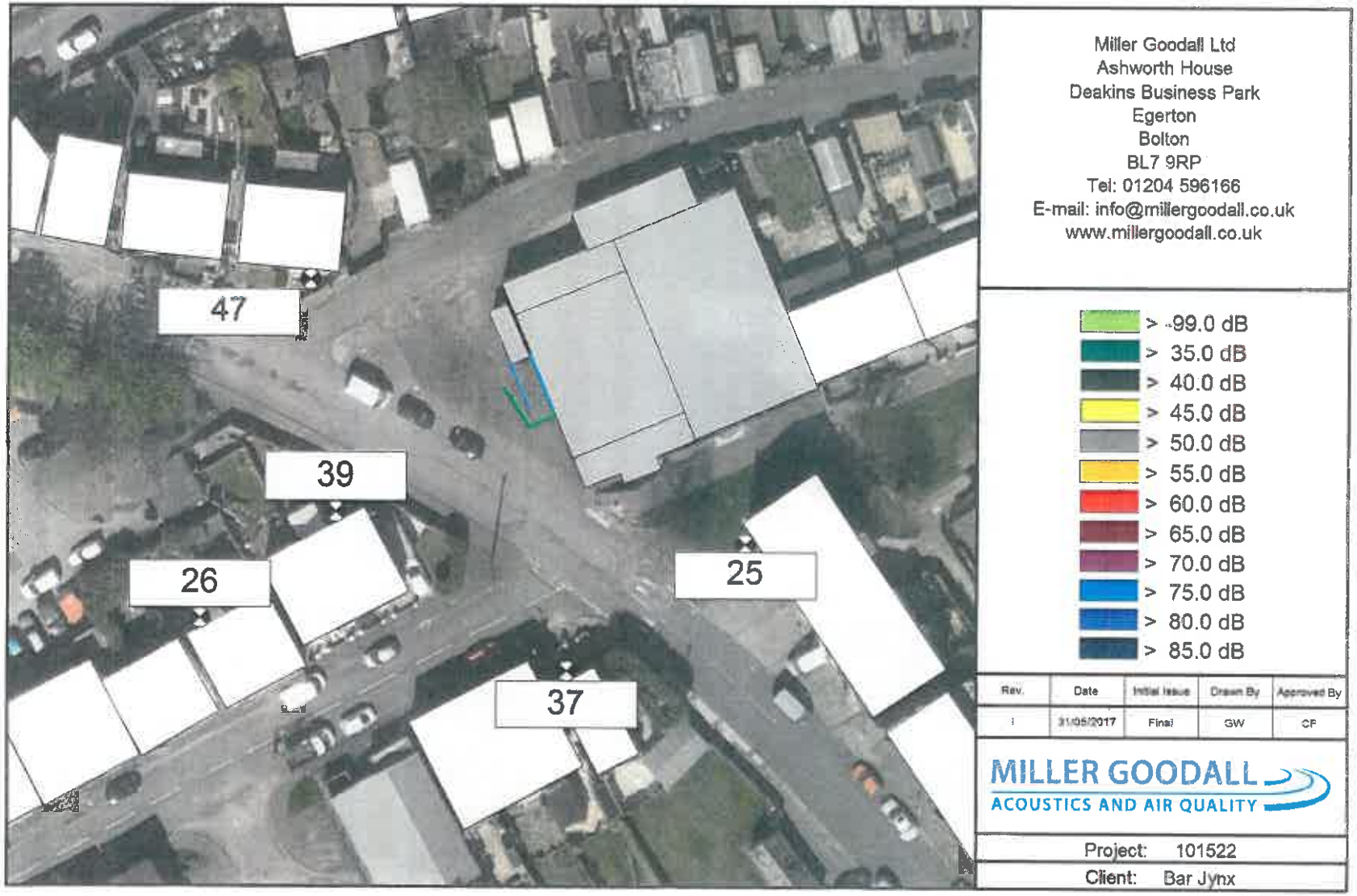

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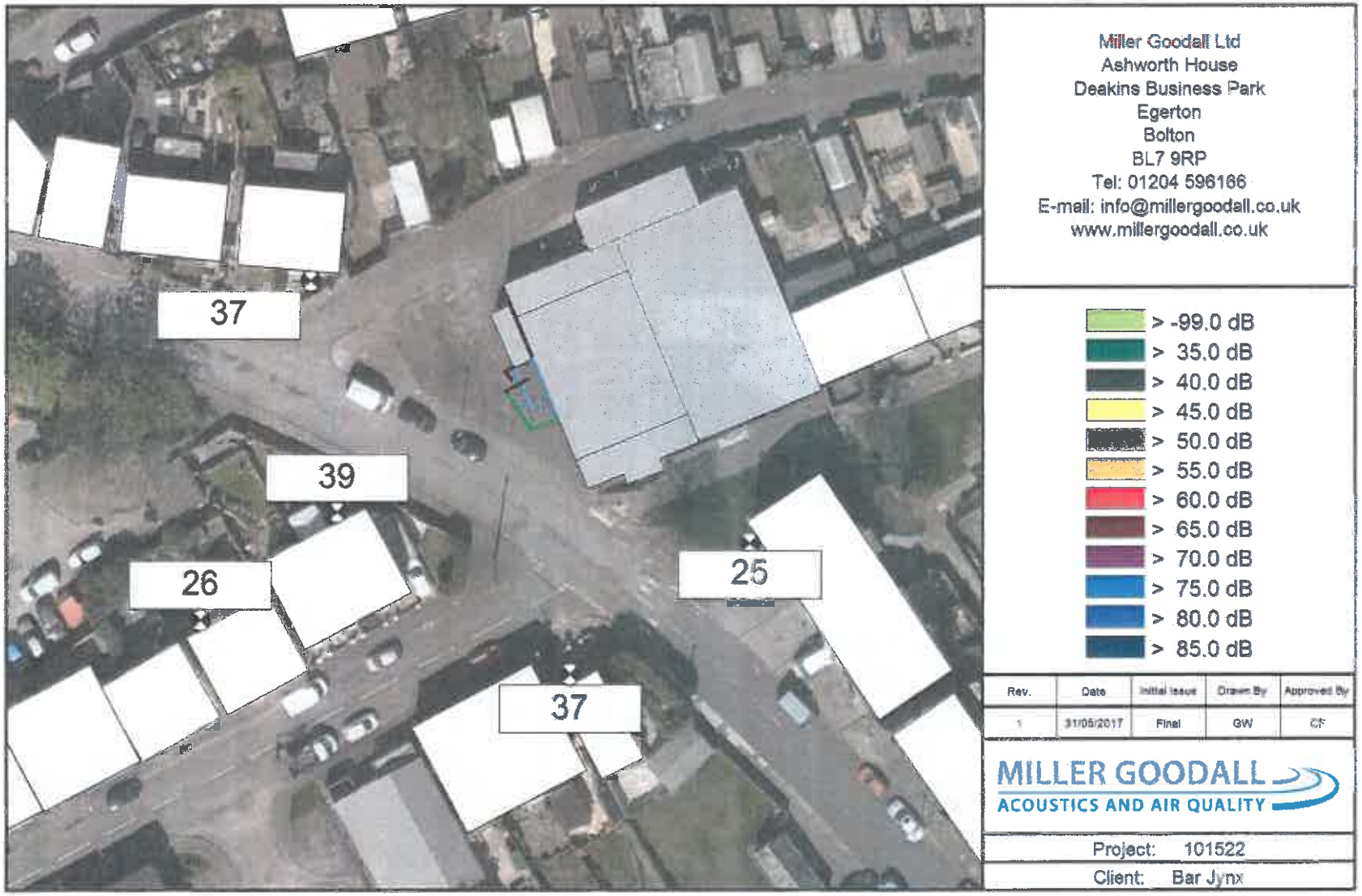
Figure 2.4: Predicted Noise Levels (dB $L_{Aeq,T}$): With acoustic screening, as currently installed with modification



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