

Technical Letter

Site Address:	Land to the Rear of 149 Upper Hoyland Road, Barnsley, S74 PNL
Project Reference No:	NP-012665
Title:	Technical Assessment for the Substitution of a Noise Barrier
Client:	Mandale Construction North Ltd.
Reported By:	M. Caley, MSc, MIOA
Date:	18/05/2025

Introduction

A full planning application for the construction of up to 19 dwellings at the above address was approved by Barnsley Metropolitan Borough Council in September 2023 (ref. 2021/1519). NOVA Acoustics produced a noise impact assessment for the development in September 2021 (NOVA report ref. 6504AC) to accompany the application.

In the report, it was recommended that an earth bund should be erected in the northern section of the site between the proposed dwellings and the adjacent A6195 road. It was specified that the bunding should be a minimum of 2m in height, and 2m tall close-board acoustic fencing should be installed on top.

A new application has now been submitted for the development (ref. 2024/0976), and it has been specified that the earth bund / fencing will be substituted with 4m tall standalone acoustic fencing. The purpose of this technical letter is to predict the potential difference in sound reduction due to the updated barrier proposal.

It should be noted that the site plans have been altered since the original application submission, and NOVA Acoustics has not been requested to provide a full updated assessment.

Assessment

Regarding the differences in sound reduction provided by berms and fences, it is thought the most applicable guidance can be found in documents intended to be used for the assessment of noise from road traffic. For example, the following is stated in '*Guidelines for the Use of Earth Berms to Control Highway Noise*' (British Columbia Ministry of Transportation and Highways, 1997):

"The scale model studies have shown the insertion losses of earth berms with typical grass-covered surfaces to be about 2dBA lower than those of equivalent walls. This somewhat counter-intuitive result may be understood when it is realized that while much more sound absorptive than most noise walls, earth berms do not absorb all sound energy which strikes their inclined surfaces. Some is reflected and/or

scattered towards the berm crest, thereby increasing the intensity of sound in this critical zone. In addition, some sound energy is transformed into "surface" waves at the air/berm interface which then travel along the berm's face and over its crest. Both phenomena result in more noise reaching the shadow zone behind the berm. In contrast, with a noise wall on flat ground, no inclined surface exists to redirect sound waves while surface waves are blocked by the wall. Higher insertion losses are therefore obtained with walls than berms with normal surfaces."

From this it is inferred that noise protection walls (or fences) provide very similar levels of attenuation to berms of an equivalent height. This is corroborated in the research paper 'Effectiveness of Novel Shaped Bunds in Reducing Traffic Noise' (G. R. Watts, Institute of Acoustics Transport Research Paper), where it is stated that 3m tall fencing should provide up to 2dB more attenuation than a 3m tall berm at a receiver distance of 40m.

When comparing barriers that include a combination of both earth bunding and fencing with standalone fencing, it is shown that the difference is generally less than 1dB at most receptor positions, which would be considered a negligible and inaudible change in sound pressure level.

Noise Modelling

In order to validate the results of the studies shown in the previous section, an updated noise model has been compiled in SoundPlan 9.1 software. The modelling parameters and specifications can be found in the original acoustic assessment for the development (ref. 6504AC).

The sound maps showing the results of the modelling with the fence/bund combination and the standalone fencing can be seen in the figures below. The maps are shown at a height of 1.5m above ground level.

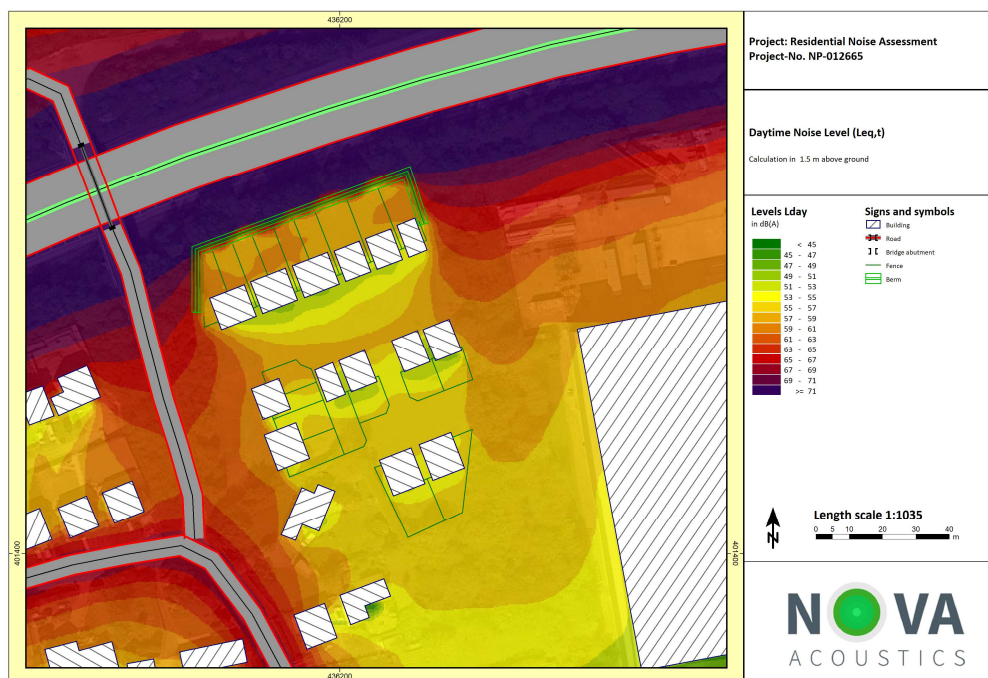


Figure 1 – Sound Level Map – 2m Earth Bunding with 2m Fence

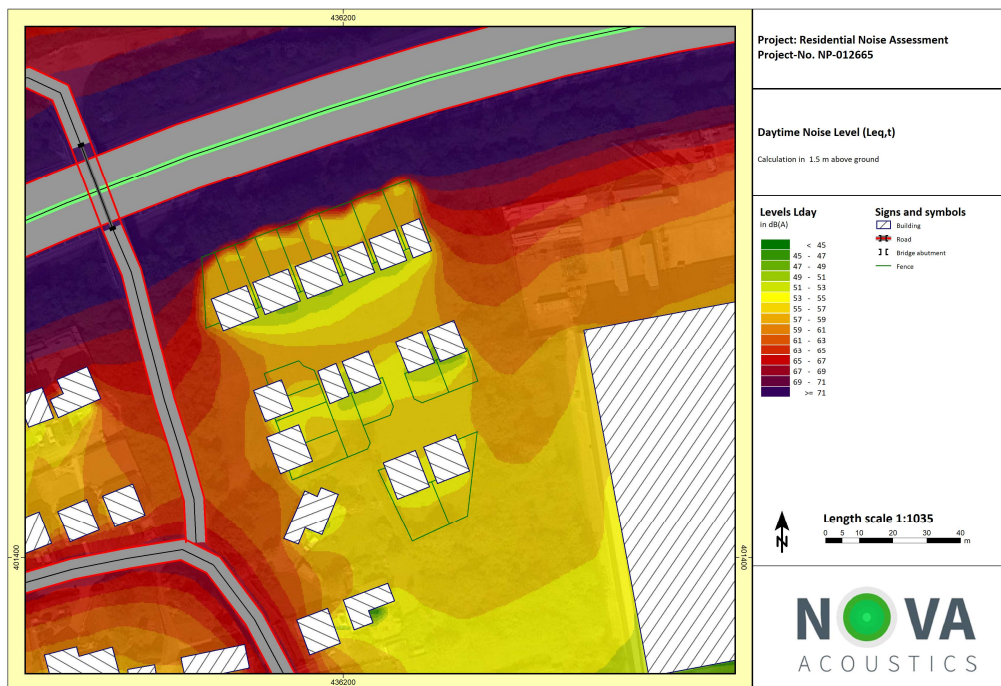


Figure 2 – Sound Level Map – 4m Fence

* It should be noted that only the fencing at the northern perimeter of the site (highlighted in the plans) is 4m in height. All other garden fences are 2m in height, as in the original assessment.

As can be seen, the noise levels are predicted to be 1-2dB quieter in the most affected garden areas with the standalone fencing installed. As such, the external noise levels are predicted to be 1-2dB lower than those shown in the original acoustic assessment (≤ 58 dB(A) in the gardens closest to the A6195 road).

Considering the above, it is thought that substituting the originally proposed barrier with standalone fencing will not adversely impact on the results of the assessment, and the results of the original assessment will still be relevant.

Fencing Specifications

To ensure the proposed fencing is fully effective, it must be of close-board construction with no holes or gaps and must have a minimum surface mass of 10kg/m^2 . This could also be achieved with the installation of a masonry wall. Further advice can be provided by NOVA Acoustics if required.

The fencing must be a minimum of 4m in height and must be installed in the location shown in the original acoustic assessment.

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