AIRO

for
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Dated: 9 September 2024

ACOUSTIC FENCE DESIGN REVIEW

FOR

SILVERDALE HOUSE

PUMP LANE

HAYES

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ACOUSTIC FENCE DESIGN REVIEW

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1. INTRODUCTION

AIRO has been appointed to review the current design proposals for an acoustic fence to be located along the site boundary of Silverdale House, Pump Lane, Hayes.

A planning decision notice issued by the Council of the London Borough of Hillingdon, in association with planning application reference 49670/APP/2022/974 and dated 10 June 2022, sets out in Condition 5 that an acoustic fence with height not exceeding 3 metres above ground level is permitted.

This report reviews the effectiveness of the proposed fence, with particular reference to the nearest residential properties that lie to the north west.

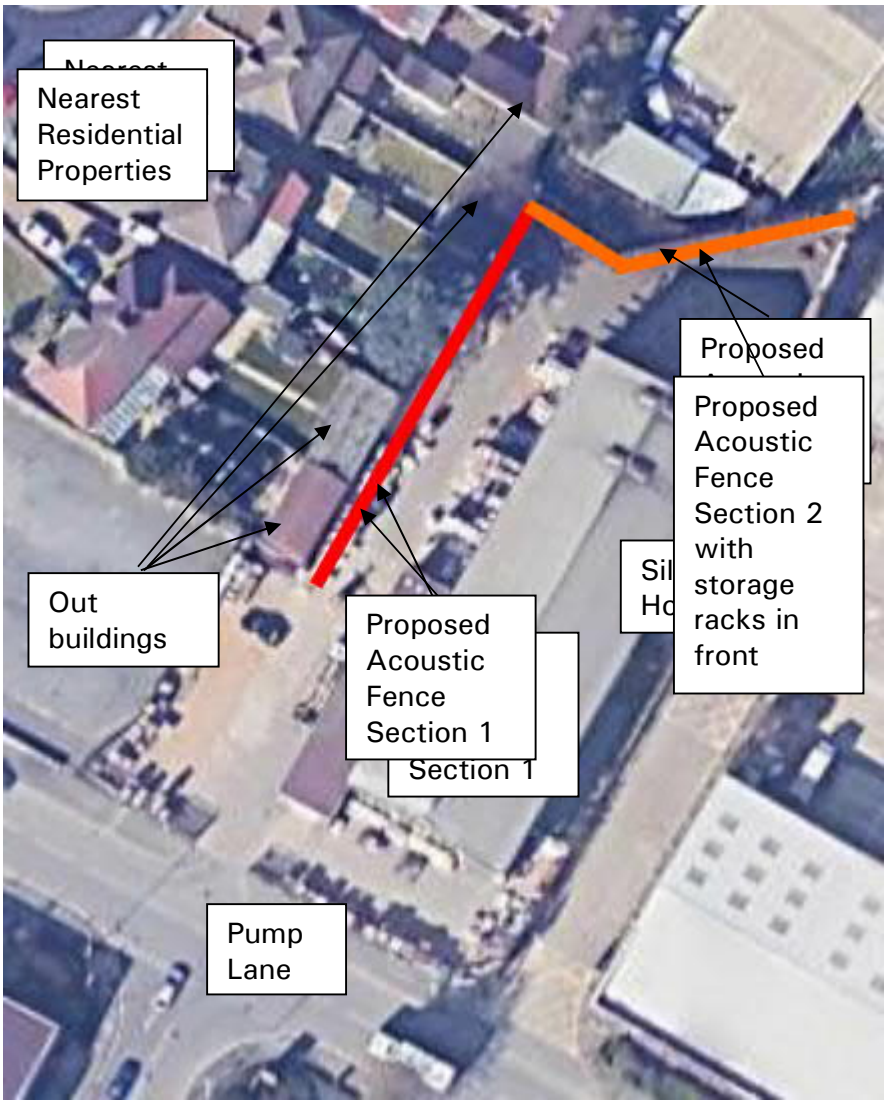
2. SOURCE BEING ASSESSED AND GENERAL VICINITY

It is understood that the acoustic fence is proposed in order to reduce the noise levels generated within boundary of First Choice Building Supplies Limited at the nearest residential properties to the north west. In particular, shelved racking units approximately 6.3 metres in height are located close to the boundary that are used to store metal beams. Activity associated with moving the metal beams on and off the racking generates high noise levels, as reported in the acoustic report submitted with the planning application.

Figure 1 provides a site plan indicating the proposed fence location and the locations of the nearest residential properties.

On the residential side of the boundary are a number of masonry built sheds / outbuildings that are approximately 3.4 metres high. It may be noted that two gardens, adjacent to Section 1 of the proposed fence, do not include outbuildings.

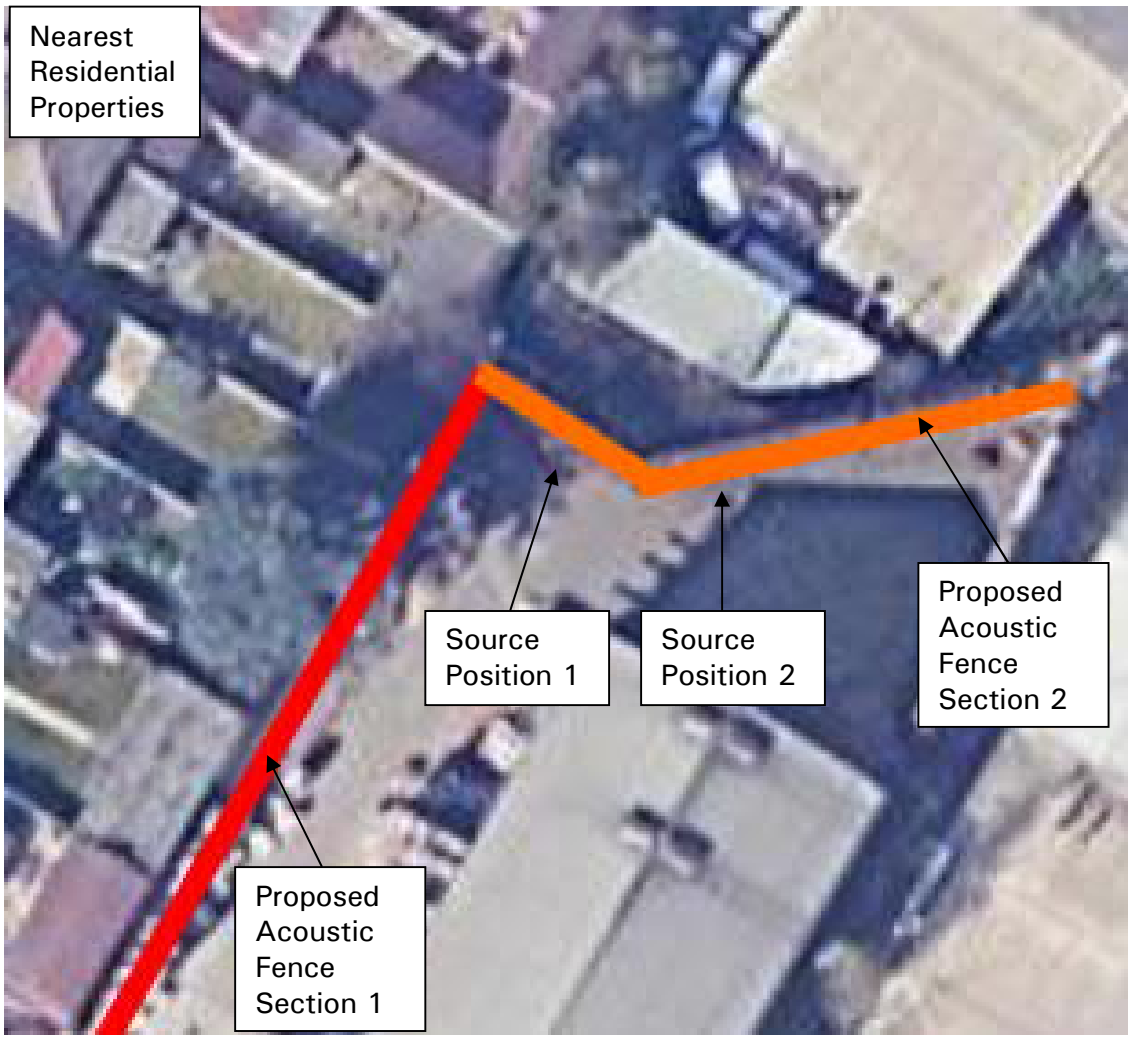
Figure 1 – Location Plan with Proposed Acoustic Fence Position Indicated



3. REVIEW AND ASSESSMENT

In order to assess the effectiveness of the proposed fence against the highest activity noise levels we considered two main source positions. The first position was close to the junction between the two sections of proposed fence, approximately 10 metres from Section 1. The second source position was adjacent to Section 2 only. Figure 2 indicates the assumed source positions.

Figure 2 – Assessment Positions



A model was created in NoiseMap Five, a proprietary software package, that implements the calculation procedure of British Standard 5228:2009 that considers the noise propagation of point sources.

At each position calculations were carried out with a source height of 2 metres (the same as the report included with the planning application) and also 4 metres, in order to provide information regarding how any benefit changes with height. The calculations for receptors at ground floor level (1.5 metres over local ground) were carried out using a receiver grid to produce noise contours for the area. Calculations at first floor level in front of the façade of the nearest residential properties were carried out at two locations. Comparisons between the different scenarios with and without the Section 2 fence were then considered.

For Source Position 1, with a source height of 2 metres and receiver height of 1.5 metres, the results indicated that there would be no change in noise level within the gardens of the nearest residential properties with or without the Section 2 fence. Figure 3 provides the contour difference plot showing the change in noise level. The gardens are located between the outbuildings and nearest residential properties.

For all of the contour difference plots the areas with a white background indicate no change in noise level. Positions denoted as ID = 3 and ID = 4 are at the façade of the nearest residential properties, whilst ID = 1 and ID = 2 are within the gardens.

Figure 4 shows the contour difference plot for a 4 metre high source at Position 1 to receivers at 1.5 metres over local ground. Again, there is no difference in the gardens of the nearest residential properties with the only differences being very close to the Section 2 fence.

For Position 1 the noise levels at ID = 3 and ID = 4, first floor level in front of the façade of the nearest residential properties, there is similarly no change in noise levels with Section 2 of the proposed fence present or absent.

For other source level heights at Position 1 it is expected that there would be no change in noise level in the gardens with or without Section 2 of the proposed fence.

Figure 3 – Noise Level Contour Difference Plot for Position 1 with 2 metre source height and 1.5 metre high receivers

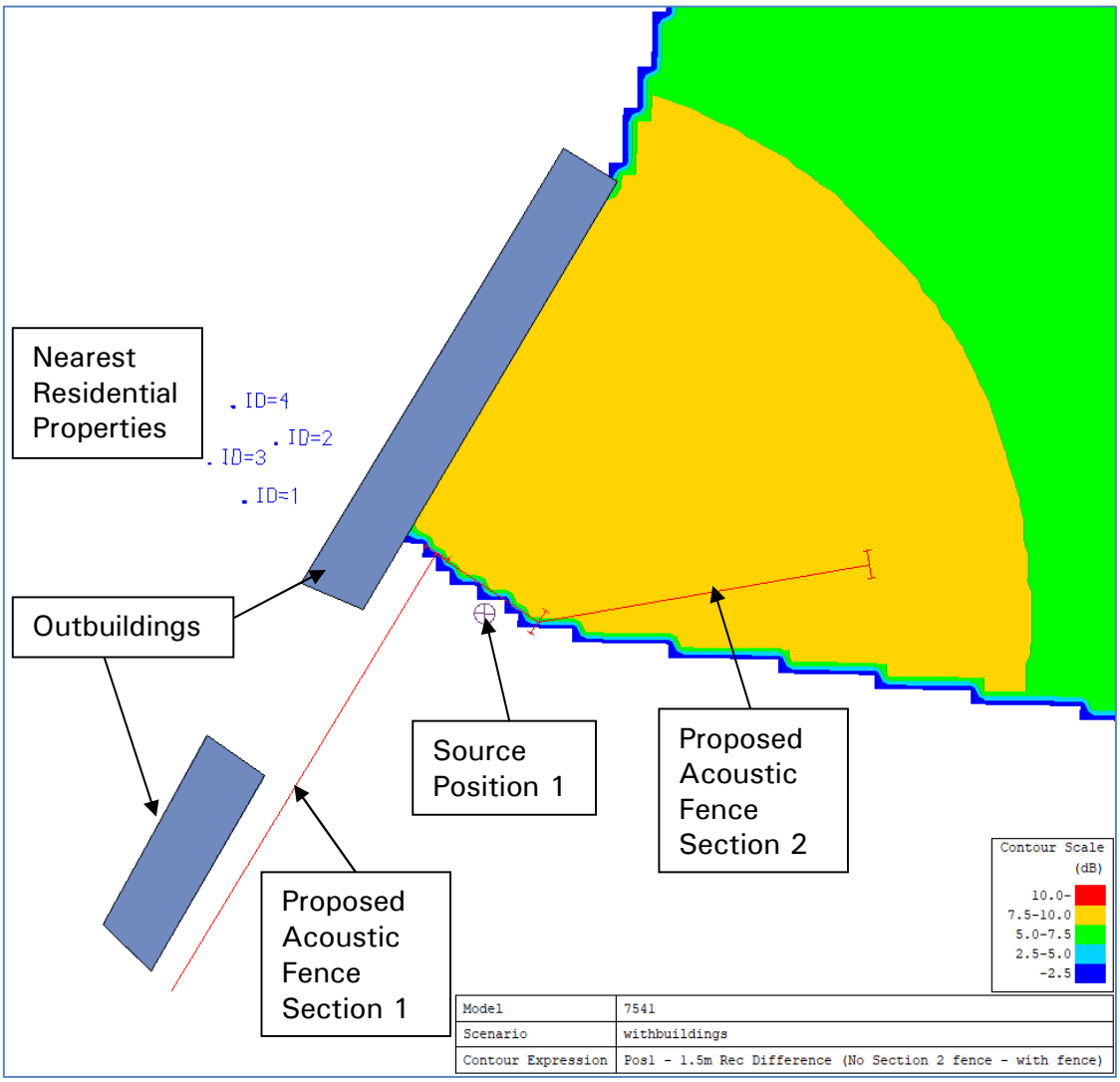
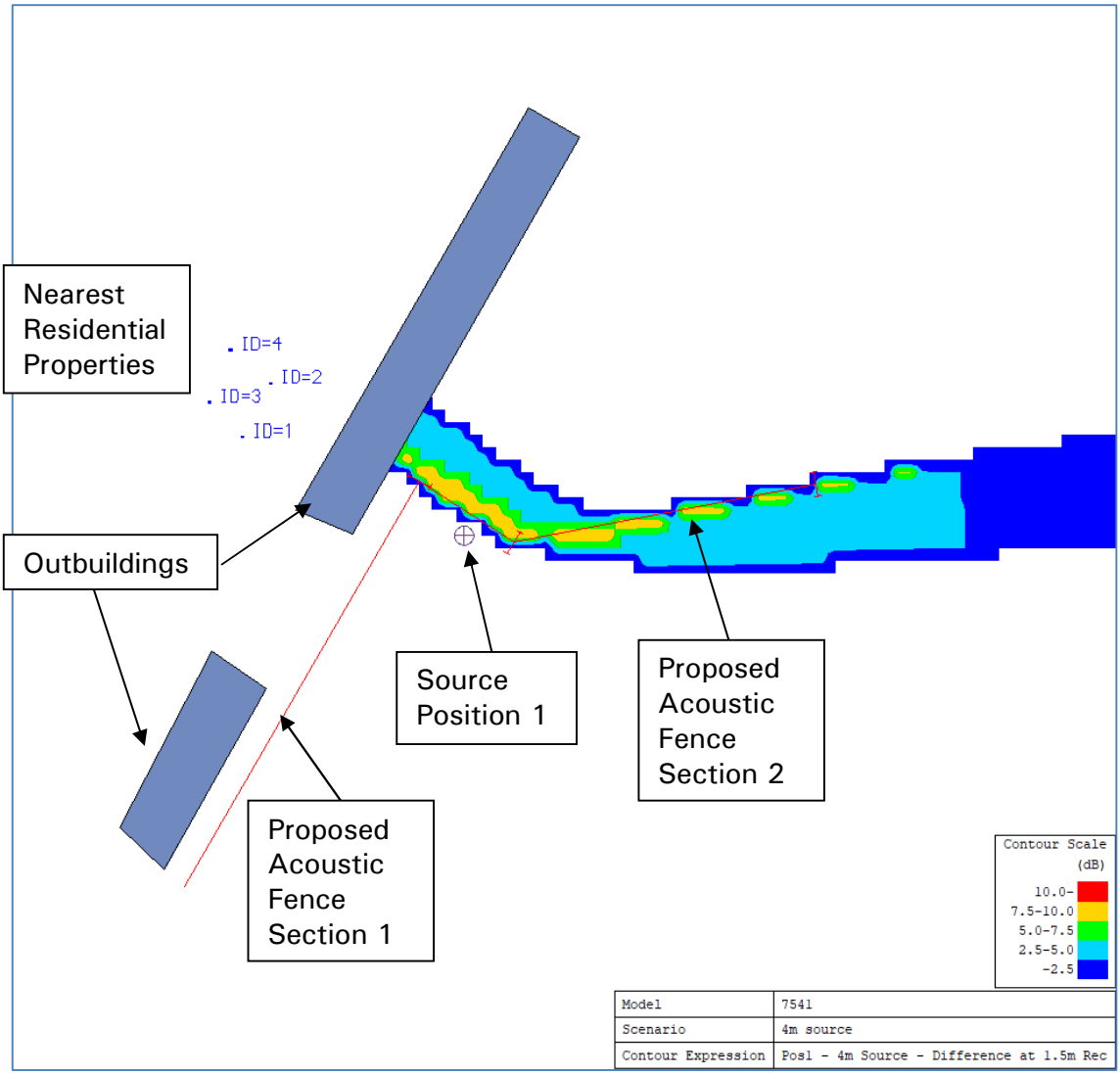
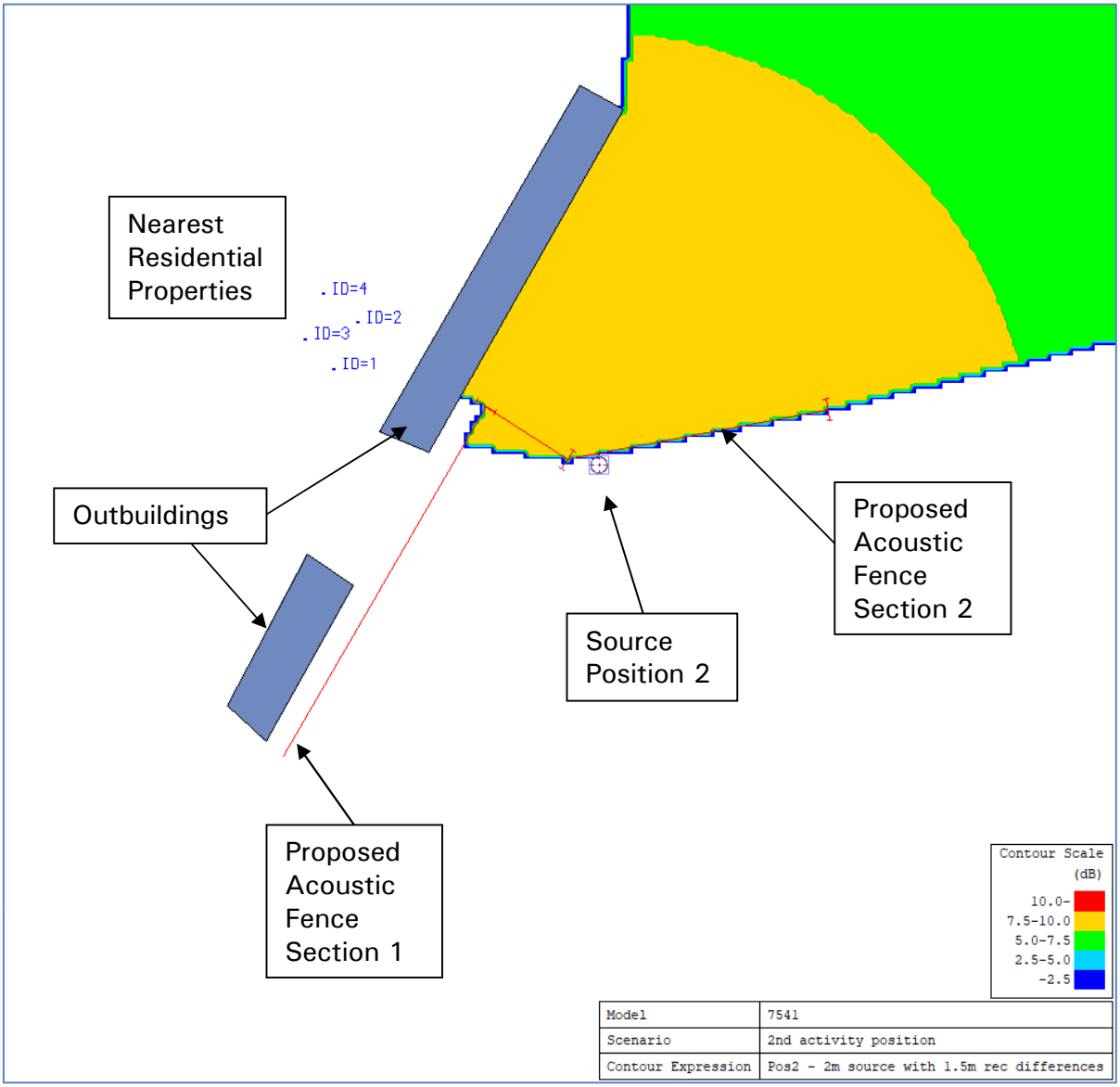


Figure 4 – Noise Level Contour Difference Plot for Position 1 with 4 metre source height and 1.5 metre high receivers



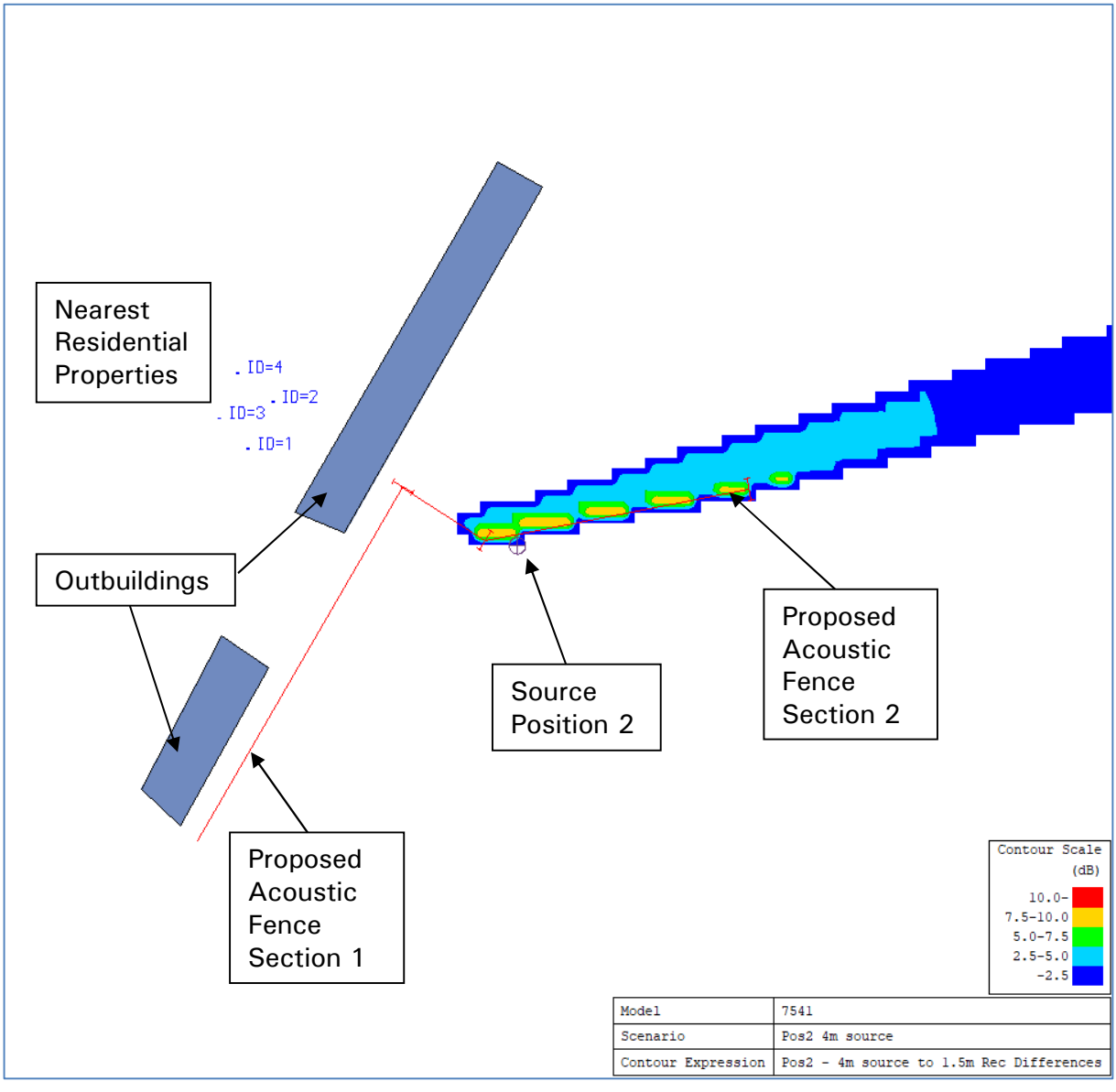
For Source Position 2, with a height of 2 metres and receiver height of 1.5 metres, the results are similar to Position 1, indicating that there would be no change in noise level within the gardens of the nearest residential properties with or without the Section 2 fence. Figure 5 provides the contour difference plot.

Figure 5 – Noise Level Contour Difference Plot for Position 2 with 2 metre source height and 1.5 metre high receivers



With a source height of 4 metres at Position 2 and receivers at 1.5 metres over local ground there is once again no difference in noise level in the gardens of the nearest residential properties, with the only differences being in the area closest to the Section 2 fence. Figure 6 shows the contour difference plot.

Figure 6 – Noise Level Contour Difference Plot for Position 2 with 4 metre source height and 1.5 metre high receivers



For Position 2, with a source height of 2 metres the noise levels at first floor level in front of the façade of the nearest residential properties (ID = 3 and ID = 4) increase by approximately 5 dB with the removal of fence Section 2, in comparison with it being in place. With a source height of 4 metres there is no change in noise levels at ID = 3 and ID = 4.

For other source level heights at Position 2 above 4 metres it is expected that there would be no change in noise level with or without Section 2 of the proposed fence.

5. DISCUSSION

As may be seen from Section 4 above noise levels in the gardens of the nearest residential properties are calculated to be unaffected by the presence or otherwise of section 2 of the proposed fence, in relation to activity at the storage racks where the highest noise levels were measured. This is mainly due to the presence of the outbuildings that form the effective noise barrier.

Where outbuildings are not present, Section 1 of the proposed fence forms the noise barrier and is therefore beneficial.

The assessment indicates that a 5 dB benefit is provided by Section 2 of the proposed fence in relation to noise levels at first floor level at the façade of the nearest residential buildings, in relation to activity on the lower sections of the storage racks. Above the height of the proposed fence the benefit reduces to zero for activity taking place at the higher rack levels.

It is assumed that the rooms at first floor level of the nearest residential properties are likely to be bedrooms and therefore will mainly be in use when there is no activity taking place in the Silverdale House storage yard (operations are understood to be daytime only). Any benefit to the occupiers would therefore be reduced.

Overall it is considered that Section 1 of the proposed fence will provide beneficial reductions in noise level to the nearby residential properties but that Section 2 will provide very limited benefit. We therefore consider that, in noise reduction terms, Section 2 of the proposed fence could be omitted from the proposals.

6. CONCLUSIONS

This report has presented a review of the effectiveness of an acoustic fence proposed for Silverdale House, Pump Lane, Hayes.

The review indicates that Section 1 of the proposed acoustic fence is likely to provide a noise reduction benefit to the nearest residential properties.

The review also indicates that Section 2 of the proposed acoustic fence will provide very limited benefit to the nearby residential properties and therefore consideration should be given to omitting this section from the proposals.

Report Approved by:

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