

Acoustic assessment of a new forestry facility

Robin Lodge Nursery, Part Lane, Swallowfield, Wokingham



Client: E T Planning Limited

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-	17/04/2023	Tommy Burn BSc (Hons) MIOA	Rob Cant MIOA MEnvSc
A	14/02/2025	Tommy Burn BSc (Hons) MIOA	Rob Cant MIOA MEnvSc
B	14/04/2025	Tommy Burn BSc (Hons) MIOA	Rob Cant MIOA MEnvSc

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Head Office
12 Sheep Street
Highworth
Wiltshire
SN6 7AA

London
3 Shortlands
Hammersmith
London
W6 8DA

Manchester
Colony
5 Piccadilly Place
Manchester
M1 3BR

Birmingham
11 Brindley Place
Brunswick Square
Birmingham
B1 2LP

Email: info@aca-acoustics.co.uk

Website: www.aca-acoustics.co.uk

Tel: 01793 766 324

Tel: 0203 609 8733

Tel: 0161 327 1681

Tel: 0121 769 3422

Registered in England & Wales No: 08228154

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0. SUMMARY

- 0.1. ACA Acoustics Limited has been commissioned to carry out an assessment of external noise emissions from a new forestry facility to be formed at Robin Lodge Nursery, Part Lane, Swallowfield.
- 0.2. A sound level survey was carried out between the 31st January – 1st February 2023. Representative background sound levels were measured at LA90 43dB during operating times of the new facility between 07:00 – 17:00 hours.
- 0.5. Calculations for the new facility, allowing for the recommendations as set out in this report, confirm that when assessed in accordance with BS 4142:2014+A1:2019 the cumulative rating level from all equipment operating simultaneously to 1m outside windows of the most-affected receptor is LAr 43dB. This does not exceed the measured background sound level and indicates a low likelihood of adverse impact.
- 0.3. Noise from the proposed industrial and commercial noise sources at the site will not be disturbing or detrimental to the amenity of any nearby residential occupants and complies with guidance within relevant British standards.

1. INTRODUCTION

The client is preparing an application seeking consent to develop a new timber processing facility at Robin Lodge Nursery, Part Lane, Swallowfield.

ACA Acoustics Limited has been commissioned to carry out a survey and assessment of noise emissions from the proposed development, and, where necessary, to make recommendations for a suitable sound mitigation scheme.

This report presents results of the sound level survey, assessments, and a scheme for sound mitigation measures.

2. ACOUSTIC CRITERIA

ACA Acoustics understand that Wokingham District Council requires an assessment of sound emissions from the industrial and commercial operations at the proposed site should be carried out in accordance with BS 4142:2014+A1:2019.

The assessment method of BS 4142:2014+A1:2019 corrects the specific noise from the source under investigation (the new mechanical plant) to account for operating time periods and any tonal or intermittent features of the noise source to obtain a rating level. This rating level is compared against the prevailing background sound level outside the noise-sensitive property. Section 11 of the Standard provides a commentary of the assessment result and states that:

- *Typically, the greater this difference [between the rating level and background sound level], the greater the magnitude of the impact;*
- *A difference of around +10dB or more is likely to be an indication of a significant adverse impact, depending on the context;*
- *A difference of around +5dB is likely to be an indication of an adverse impact, depending on the context;*
- *The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.*

3. REVIEW OF SITE LOCATION & DEVELOPMENT PROPOSALS

The development site is at Robin Lodge Nursery, Part Lane, Swallowfield.

The proposals include forming a new timber processing facility. This will include the installation of new mechanical equipment and landscaping of the site, along with the erection of building units.

The proposed operations will incorporate a new woodchipper and splitter, along with heavy plant storage for excavators and a material loading area to the south-eastern entrance of the site. Two new buildings will be incorporated into the scheme, Unit A, around which the log splitter and woodchipper will operate, and Unit B, which will be an administration building.

Closest noise-sensitive properties are to the north and south of the development site. A drawing showing the locations of the proposals, along with the sound level survey measurement locations is included in Figure 1.

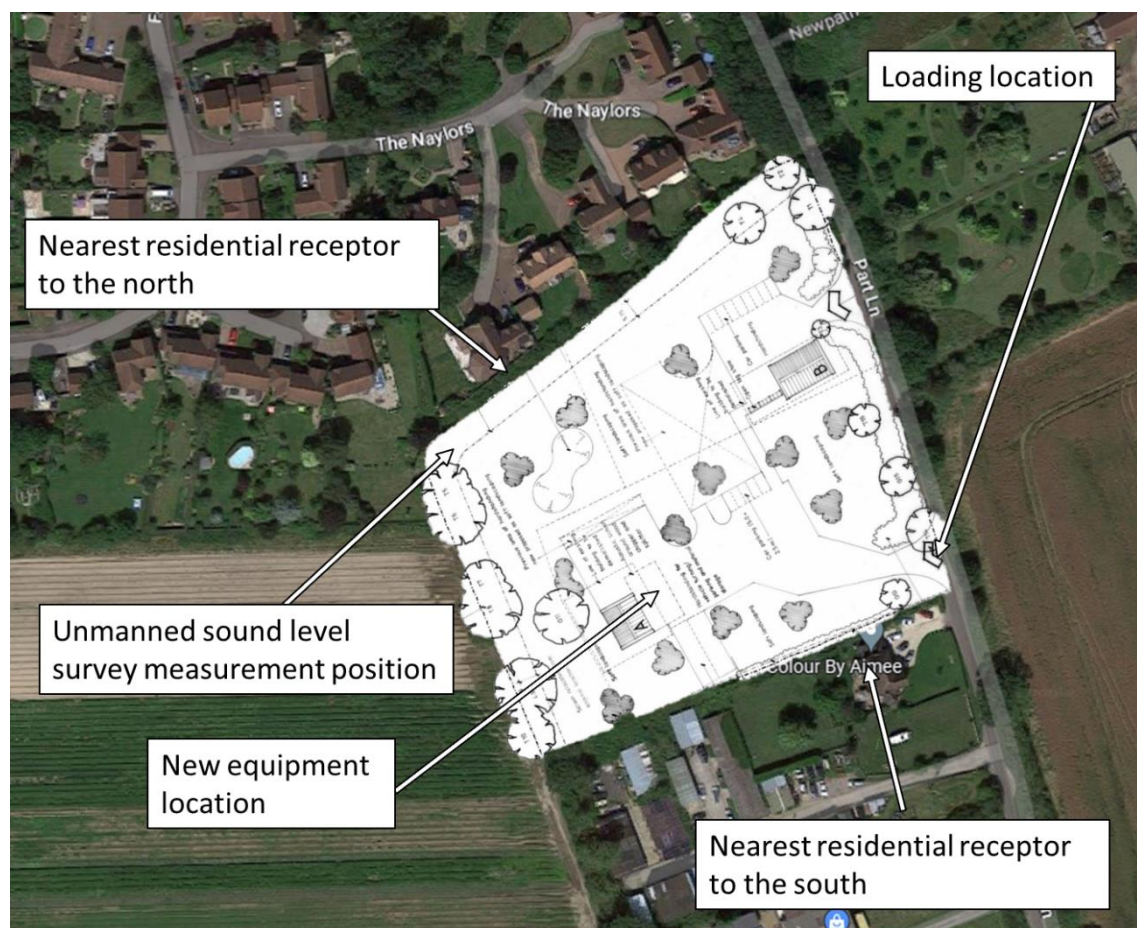


Figure 1: Site Survey measurement location and proposals

4. SOUND LEVEL SURVEY

To assess sound levels from the new proposals it is necessary to establish existing background sound levels in the vicinity. Details of the sound level surveys carried out by ACA Acoustics are provided below.

A background survey measurement position was selected as shown in Figure 1 above, away from the primary noise source of Part Lane to ensure a robust assessment to residential properties. The survey was conducted typically following procedures set out in BS 4142:2014+A1:2019 and undertaken over a 24-hour period, between the 31st January – 1st February 2023.

The following equipment was used during the survey; the sound level meter was calibrated before the survey and checked after with no deviation noted.

Equipment	Serial Number
Svantek Class 1 sound level meter type SVAN971, complete with MOLES weatherproof and lockable outdoor environmental kit	84045
Svantek calibrator type SV33B. Compliant to IEC 60942-1:2003	83826

Table 1: Equipment used

Weather conditions recorded while setting up the survey were warm, dry, clear, and calm. Meteorological conditions over the full duration of the survey have been reviewed at www.worldweatheronline.com and are not considered to have impacted the outcome of the assessment.

Results of the survey are shown in Figure 2.

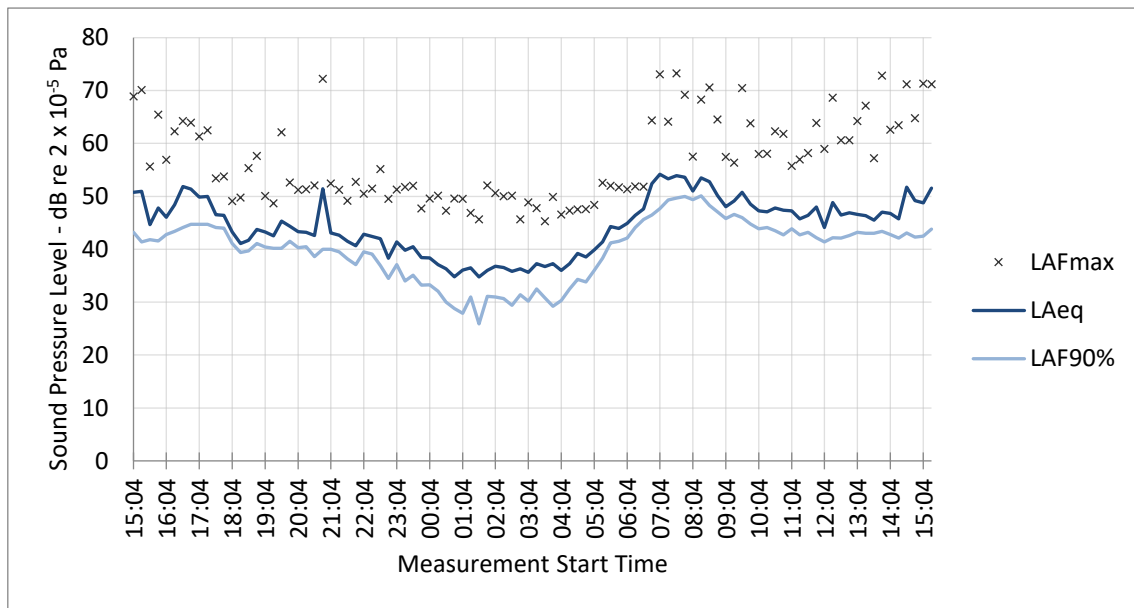


Figure 2: Sound level survey results

For assessment of noise from industrial and commercial sources it is necessary to determine the background sound level. In accordance with BS 4142:2014+A1:2019, the prevailing background sound level is not necessarily taken to be the lowest recorded values, but rather the level that best represents the typical background sound level in the area over a defined period.

A statistical analysis of the measured background sound levels has been carried out, generally following suggested guidance contained in Section 8 of the Standard. A histogram of measured sound levels are shown below for use within the assessment.

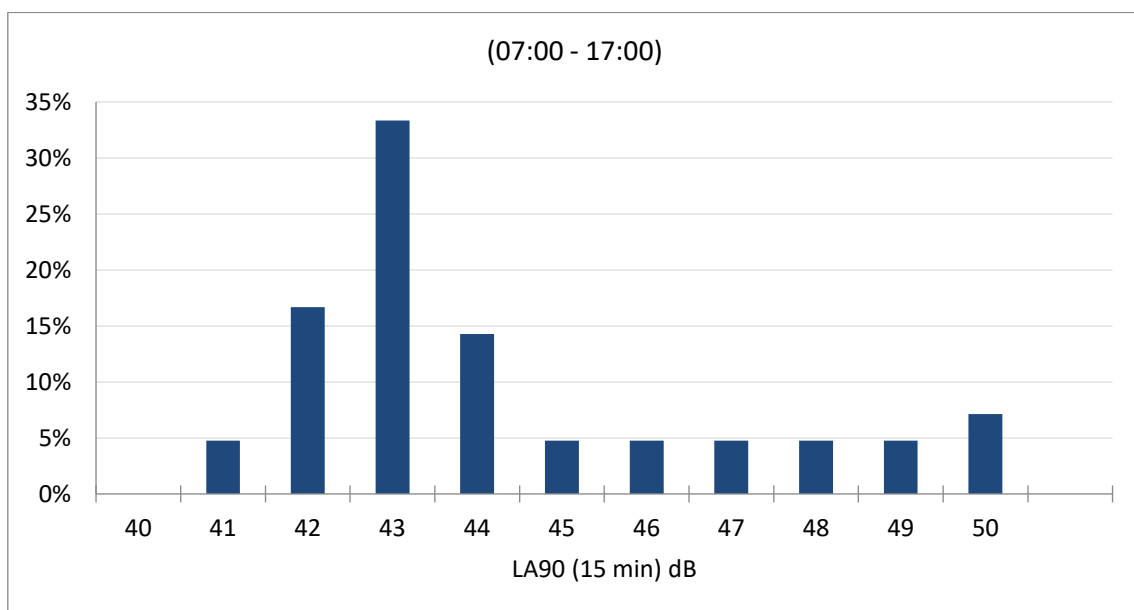


Figure 3: Statistical analysis of measured LA90 sound levels over the proposed operating period

From results in Figure 3 sound levels taken as being representative of the background during the facility operating period are LA90 43dB. Summary results are shown in Table 2 below.

Position	LA90
Nearest noise sensitive windows to the development site	43dB

Table 2: Summary of background sound level survey results for use within the assessment

5. ASSESSMENT OF MECHANICAL SERVICES EQUIPMENT

The new facility will incorporate a woodchipper and log splitter, in addition to the storage of excavators and a loading facility near to Part Lane. Confirmation of the equipment models used in the assessment is provided in Table 3 below.

Reference	Equipment Model	Sound Level
Woodchipper	ARJES Shredder IMPAKTOR E PU	LwA 96dB
Wood splitter	Varo POWXG6490	LwA 74dB
Materials loading	N/A	LwA 80dB
Movement of Excavator	N/A	LwA 86dB

Table 3: Proposed new industrial and commercial noise sources used in the assessment

Sound emissions from the chipper and splitter can be determined from manufacturer's published data. In the case of loading materials and the movement of the excavator ACA Acoustics have measured source sound levels from equivalent activities on previous sites, and sound levels have been used within this assessment.

A computer model has been used to calculate sound emissions from the site activities to outside the closest noise-sensitive properties. The computer calculation model uses iNoise proprietary noise mapping software, based on the calculation procedures of ISO 9612-1/2 standards and the associated ISO 17534 quality standard.

The following data and assumptions have been included within the computer model:

- The computer model uses source sound power levels as described above.
- The model includes acoustic screens to the north and south boundaries of the site and around the woodchipper and splitter.
- The assessment assumes moderate downwind propagation from the source to all receptors.

- Ground absorption coefficient assumed to be 0 (fully reflective hard ground) over tarmacked areas, and absorbent over soft landscaped areas.
- The sound reflection coefficient from existing buildings is assumed to be 0.8, equating to traditional buildings with windows, small additions, or bays.

Printouts from the calculation model are included in Appendix A. Summary of calculated sound emissions to outside residential properties are shown in Table 4 below.

The assessment includes the mitigation scheme outlined in Section 6 of this report.

Receptor Location	Calculated Equipment Sound Level (All plant operating)
Southern residential property habitable windows	37dBA
Northern residential property windows	40dBA

Table 4: Calculated cumulative specific sound levels at 1m outside noise-sensitive windows

Assessment of the calculated rating levels in accordance with BS 4142:2014+A1:2019 is provided in Table 5 below.

Description	Closest Receptor	Relevant Clause	Commentary
Calculated specific sound level to receptor	LAeq 40dB	7.1 7.3.6	Site industrial sources operating. Refer to calculation sheets in Appendix A.
Background sound level	LA90 43dB	8.1.3 8.3	Prevailing background sound level.
Acoustic feature correction	3dB	9.2	The calculated specific sound levels do not indicate any tonal component, however some impulsivity will be audible at the receptor locations due to the nature of the activities.
Rating level	LAr 43dB	9.2	
Excess of rating level over background sound level	0dB	11	Assessment indicates negligible likelihood of adverse impact

Table 5: BS 4142:2014+A1:2019 Assessment

Table 5 shows the rating level of the proposed new equipment will not exceed the measured background LA90 sound level to outside the closest noise-sensitive properties.

BS 4142:2014+A1:2019 requires an assessment to consider the context of the development, rather than simply adhering to numerical values.

The existing site is currently used by the client for storage and processing of timber. The proposals will not be a material change to the existing use, and will not cause a change to the existing acoustic character of the area.

In addition, considering the calculated numerical value of the specific sound, allowing a reduction through partially open windows of 15dBA, as recommended in BS 8233:2014, sound levels inside the neighbouring dwellings due to the proposed new operations will be approximately 25dBA (40dBA – 15dBA). This is below guideline levels in bedrooms and living rooms during the day of LAeq 35dB, set out in BS 8233:2014 and is further confirmation that sound levels from the new operations should not be detrimental to the amenity of any noise-sensitive receptors in the vicinity.

The author considers that the context of the assessment does not alter the initial estimate of the impact, and that sound levels from the proposals should not be detrimental to the amenity of any residential occupiers in the vicinity.

6. SCHEME OF NOISE MITIGATION MEASURES

As discussed above, the computer model includes the benefit of a scheme of noise mitigation measures. Details of the mitigation scheme are provided below. A drawing showing the locations of these treatments is shown in Figure 4 below.

6.1. Timber Acoustic Screen

An acoustic barrier is proposed to the north, west, and south of the development site to provide acoustic screening from properties with line of sight. The screen should be not less than 2 meters high and would typically be formed of minimum 20mm thick laths, overlapped or tongue & groove jointed with no gaps. The screen must also extend down to the ground with no gaps, and should be designed such that sound transmission through the screen is at least 10dB lower than levels over the top of the screen.

A suitable screen would be Jacksons Fencing's 12K Acoustics Envirofence (<https://www.jacksons-security.co.uk/acoustic-security-barriers/12k-acoustic-envirofence>) or equivalent.

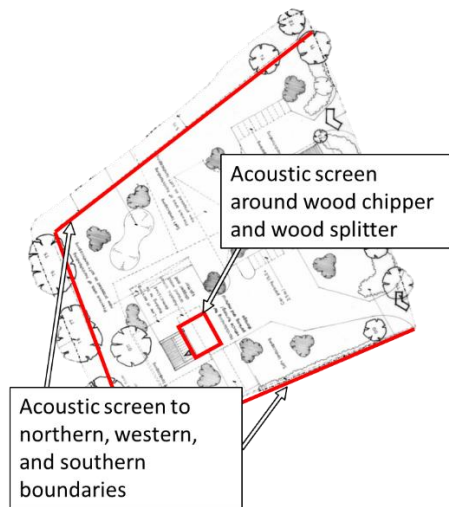


Figure 4: Acoustic Mitigation Layouts

7. CONCLUSION

An application is to be submitted to Wokingham District Council for the development of a nursery timber processing facility at Robin Lodge Nursery, Part Lane, Swallowfield.

ACA Acoustics have undertaken computer modelling of noise emissions from the proposed equipment associated with the site to assess sound levels to outside the closest noise-sensitive properties.

A scheme of noise mitigation measures has been proposed that will ensure noise from the proposals achieves the requirements of Wokingham District Council and will not be detrimental to the amenity of nearby occupants.

Appendix A

Noise Map Printouts

