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**TOWN AND COUNTRY PLANNING ACT 1990
(AS AMENDED BY THE PLANNING AND COMPENSATION ACT 1991)**

**LAND AT HARRIS LANE, SHENLEY,
PROOF OF EVIDENCE ON NOISE**

R PECKHAM BENG MPHIL CENG MIOA

Technical Report: R9913-1 Rev 2

Date: 9th March 2023

For: Shenley Parish Council

SUMMARY

I have been retained by Shenley Parish Council to provide technical advice and acoustic consultancy services in relation to the planning appeal by Griggs (Options) Limited against the refusal of outline planning consent for the erection of up to 37 homes with associated landscaping and open space and access at Land Adjacent and to the Rear of 52 Harris Lane, Shenley.

The Parish Council has been awarded Rule 6 status and, I understand, object to the proposals on a number of grounds. Gristwood & Toms, who provide tree and arboriculture services, operate from a depot to the immediate north of the Appeal Site. Their operations are noise-generating and there is potential for the noise from their operations to cause disturbance to the future occupants of the proposed dwellings. As a result, they have an interest in the planning application and are being supported by the Parish Council.

There should be no doubt about the significance of Gristwood & Toms' operation. They operate a number of heavy items of plant and machinery which includes wood chippers and screens. This is a significant industrial operation, established at the site for in excess of 30 years, and which emits significant levels of environmental noise.

In my opinion, the Appellant did not adequately assess the noise impact of the Gristwood & Toms operations upon the Appeal Scheme. The Borough Council's environmental health department initially objected to the proposals on these grounds but withdrew their objection at a late stage during the determination process having determined that the noise impact could be mitigated by design at reserved matters stage. However, the Appellant never demonstrated that the noise impacts associated with the Gristwood & Toms' operation upon the proposed housing to be provided by the Appeal Scheme could be satisfactorily mitigated.

I have carried out my own noise impact assessment. This is based upon noise measurements of the plant operated by Gristwood & Toms and acoustic modelling to determine the noise impact at the Appeal Scheme. My assessment includes the acoustic benefit of a 2.4 m high acoustic barrier fence at the boundary between the two Appeal Site and the Gristwood & Toms site which was tentatively proposed by the Appellant during the planning application (but may not be viable on visual impact grounds) and, regardless of this, indicates that the noise impact from Gristwood & Toms' operations at the nearest properties highlighted in both indicative masterplans presented as part of the planning application on the northern Appeal Site boundary will be greater than 'significant adverse' as defined in British Standard 4142.

National planning policy, including the Noise Policy Statement for England, National Planning Policy Framework and Planning Practice Guidance all emphasise that a significant adverse noise impact associated with a development proposal should be avoided/ prevented. Furthermore, the Agent of Change Principle advocated in Paragraph 187 of the NPPF states:

'existing businesses and facilities should not have unreasonable restrictions place on them as a result of development permitted after they were established'.

It continues:

'Where the operation of an existing business or community facility could have a significant adverse effect on new development in its vicinity, the applicant (or 'agent of change') should be required to provide suitable mitigation before the development has been completed.'

This principle is directly relevant to the Appeal Site and it puts the onus on the Appellant to manage and mitigate any noise impact to ensure that the Appeal Scheme does not experience a significant adverse effect from Gristwood & Toms operations.

It is clear that the noise impact on the Appeal Scheme, as presented in the indicative masterplans, will be unacceptably high and the Appellant has not considered the agent of change principle as part of their operation. The Appellant has also failed to offer an alternative scheme which would result in an acceptable noise impact upon the proposed dwellings and hence there is no clear evidence that this can be achieved at the reserved matters stage.

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1.0 INTRODUCTION

- 1.1 I have been retained by Shenley Parish Council (the "Parish Council") to provide technical advice and acoustic consultancy services in relation to the planning appeal by Griggs (Options) Limited (the "Appellant") and allocated reference APP/N1920/W/22/3311193 (the "Appeal") against the refusal of outline planning consent for the erection of up to 37 homes with associated landscaping and open space and access from Harris Lane (with all matters reserved except access) ("Appeal Scheme") at Land Adjacent and to the Rear of 52 Harris Lane, Shenley ("Appeal Site").
- 1.2 The Parish Council has been awarded Rule 6 status (of the Inquiries Procedure Rules) and, I understand, object to the proposals on a number of grounds. Gristwood & Toms (who describe themselves as a 'full service arboriculture company') operate from a depot to the immediate north of the Appeal Site. Their operations are noise-generating and there is potential for the noise from their operations to cause disturbance to the future occupants of the proposed dwellings. As a result, they have an interest in the planning application and are being supported by the Parish Council.
- 1.3 All noise levels in this report are provided in dB relative to 20 μ Pa. A glossary of the acoustic terminology used is provided in Appendix A.

2.0 SITE DESCRIPTION, PROPOSED DEVELOPMENT AND BACKGROUND

- 2.1 The Appeal Site is located to the north of the centre of the village of Shenley and accessed off Harris Lane. Whilst the Appeal Site is understood to be within the Green Belt, the surrounding area is mixed comprising a number of residential properties and agricultural land. Gristwood & Toms are located to the immediate north of the Appeal Site and operate an arboriculture/tree surgeon business. Their site acts as a depot for the storage of their plant and vehicles; however, they also import material and chip/shred it for use in footpaths, as biomass fuel and mulch.
- 2.2 An aerial image showing the location of the Appeal Site and surroundings is provided in Figure 1.
- 2.3 In June 2022 the Appellant applied for the Appeal Scheme. Planning consent was refused at planning committee in October 2022 on the basis that the proposals were considered inappropriate development in the Green Belt.

2.4 Noise was not cited as a reason for refusal, however, a review of the planning file indicates that Hertsmere Borough Council's (the "Borough Council") Environmental Health Department did have concerns/ object to the proposals on noise grounds until quite late in the planning consultation process. I summarise the timeline of events (as available in the public record) relating to this in brief below:

- June 2022 planning application submitted;
- 8 September 2022. A noise impact assessment was submitted by TRC on behalf of Griggs (Options Ltd) [Reference 1] (the "TRC report"). This addressed the impact of existing sources of ambient noise on the proposed housing (including road traffic using Harris Lane and noise from the Gristwood & Toms operation);
- Consultation response from Hertsmere Borough Council's Environmental Health and Licensing Department (dated 16 September) [Reference 2] effectively stated that the TRC report was inadequate in terms of the survey duration and, in terms of the noise impact from the Gristwood & Toms operation, *'the information within the report raises more questions, and we would want to see a full BS 4142 assessment before we are confident that the development would not result in complaints against the existing business (agent of change principle)'*;
- As a result of the consultation response a further noise survey and updated noise impact assessment was undertaken by TRC [Reference 3]. This, however, provided the details of a new noise survey which addressed the impact of noise from road traffic using Harris Lane at the proposed housing closest to the road, but did not address the comments raised by the EHO (above) relating to the noise impact from Gristwood & Toms' operations.
- The case officer's report to the planning committee (for the meeting of 20 October 2022) [Reference 4] states:
 - Paragraph 7.14.13 *'the submitted Noise Impact Assessment [SIC] has failed to demonstrate that the development could provide a suitable quality of accommodation for future residents in terms of noise levels. There are concerns that internal and external noise levels would exceed acceptable levels, and the proposed mitigation strategy has not been fully detailed to demonstrate how it would reduce these noise level to an acceptable level'*.

- Paragraph 8.3 *'In any event, the development is considered to result in an unacceptable level of harm to the amenity of future occupiers, due to noise levels arising from the adjacent Gristwood and Toms site. The submitted Noise Impact Assessment (SIC) has failed to provide a suitable mitigation strategy to demonstrate how these noise levels could be reduced to an acceptable level'*.
- On the back of the above noise grounds were cited as a recommended reason for refusal (no 2), as follows:

The development is considered to result in an unacceptable level of harm to the amenity of future occupiers, due to noise levels arising from the adjacent Gristwood and Toms site. The submitted Noise Impact Assessment has failed to provide a suitable mitigation strategy to demonstrate how these noise levels could be reduced to an acceptable level.

Therefore, the proposed development is considered to be contrary to the NPPF (2021) and Policy SADM30 of the Site Allocations and Development Management Policies Plan (2016)

- There is no further public record of any communication from the applicant/ their consultants regarding noise impact. However, an 'Update Sheet' to the planning committee (dated 19 October 2022) [Reference 5] quotes the following response from Environmental Health (which is not available on the public record)

Having reviewed the most recent information I am happy to remove my objection on noise grounds.

This is on the basis that the master plan is indicative at the moment and there is scope for good acoustic design, such as not having windows to habitable rooms facing towards the commercial site to the North.

At the reserved matters stage, I will want to see a master plan which protects the proposed development from noise.

In terms of noise levels from the commercial site I would want to see the design achieve 10dB below the levels in BS8233 for habitable rooms with an open window."

2.5 Planning consent was duly refused by committee on 20 October 2022, however, as stated above, noise was not cited as a reason for refusal.

2.6 From my review of the documents detailed above it is my opinion that the noise impact from the Gristwood & Toms site upon the proposed housing was not adequately assessed by the Appellant. Whilst I agree that there are measures that may be taken at reserved matters such as property orientation (internally and externally etc), provision of screening etc in order to mitigate the noise impact from their operations, there is no clear evidence that such measures would reduce any noise impact to acceptable levels.

3.0 SCOPE OF ASSESSMENT

3.1 My assessment has considered the potential noise impact from Gristwood & Toms' operations upon the proposed new housing. It is relevant to note that I have considered the impact of their operations as they stand at the current time, however, they could intensify (and generate a greater noise impact at the Appeal Site) providing this is undertaken within the bounds of their consents for the site and without causing nuisance to occupants of existing residential properties in the area.

3.2 I have undertaken the assessment by liaising with Gristwood & Toms to fully understand the nature of their operations. I have undertaken noise surveys of their operations, some background noise surveys and I have also used some of the data in the TRC report in order to determine background noise levels.

3.3 I have used the rating methodology of British Standard 4142:2014+A1:2019 *Methods for rating and assessing industrial and commercial noise* [Reference 6] to assess the noise impact and have given consideration to the potential benefit of good acoustic design/mitigation measures upon the noise impact of their operations.

4.0 PLANNING AND NOISE IMPACT ASSESSMENT CRITERIA

4.1 The National Planning Policy Framework ("NPPF") [Reference 7] states (paragraph 174) that planning policies and decisions should contribute to and enhance the natural and local environment by:

- *preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by matters including unacceptable levels of noise pollution.*

4.2 Paragraph 187 of the NPPF defines the principle of the 'agent of change'. It states:

"Planning policies and decisions should ensure that new development can be integrated effectively with existing businesses and community facilities (such as places of worship, pubs, music venues and sports clubs). Existing businesses and facilities should not have unreasonable restrictions placed on them as a result of development permitted after they were established. Where the operation of an existing business or community facility could have a significant adverse effect on new development (including changes of use) in its vicinity, the applicant (or 'agent of change') should be required to provide suitable mitigation before the development has been completed."

4.3 This principle is directly relevant to the Appeal Site and it puts the onus on the Appellant to manage and mitigate any noise impact to ensure that the Appeal Scheme does not experience a significant adverse effect from Gristwood & Toms operations.

4.4 The NPPF refers to the Noise Policy Statement for England ("NPSE") [Reference 8] which is intended to apply to all forms of noise, including environmental noise, neighbour noise and neighbourhood noise. The NPSE sets out the Government's long-term vision to '*promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development*' which is supported by the following aims:

- Avoid significant adverse impacts on health and quality of life;
- Mitigate and minimise adverse impacts on health and quality of life;
- Where possible, contribute to the improvement of health and quality of life.

- 4.5 The NPSE defines the concept of a 'significant observed adverse effect level' ("SOAEL") as 'the level above which significant adverse effects on health and quality of life occur'. The following guidance is provided within the NPSE:

"It is not possible to have a single objective noise-based measure that defines SOAEL that is applicable to all sources of noise in all situations. Consequently, the SOAEL is likely to be different for different noise sources, for different receptors and at different times. It is acknowledged that further research is required to increase our understanding of what may constitute a significant adverse impact on health and quality of life from noise. However, not having specific SOAEL values in the NPSE provides the necessary policy flexibility until further evidence and suitable guidance is available."

- 4.5 The NPPF is supported by the Planning Practice Guidance (PPG) [Reference 9] with more specific guidance. It states that noise should be considered when development may create additional noise or would be sensitive to the prevailing acoustic environment. It stresses the requirement for good acoustic design to be considered early in the planning process to ensure that the most appropriate and cost-effect solutions are identified from the outset.
- 4.6 The PPG explains that decision making needs to take account of the acoustic environment and in doing so consider:
- whether or not a significant adverse effect is occurring or likely to occur;
 - whether or not an adverse effect is occurring or likely to occur; and
 - whether or not a good standard of amenity can be achieved.
- 4.7 The PPG expands further upon the concept of SOAEL (together with Lowest Observable Adverse Effect Level("LOAEL") and No Observed Effect Level ("NOEL") as introduced in the NPSE and provides a table of noise exposure hierarchy for use in noise impact assessments in the planning system. The table is reproduced below.

Response	Examples of Outcomes	Increasing Effect Level	Action
No Observed Effect Level			
Not present	No Effect	No Observed Effect	No specific measures required
Present and not intrusive	Noise can be heard, but does not cause any change in behaviour or attitude. Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life	No Observed Adverse Effect	No specific measures required
Lowest Observable Adverse Effect Level (LOAEL)			
Present and intrusive	Noise can be heard and causes small changes in behaviour and/or attitude, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a perceived change in the quality of life	Observed Adverse Effect	Mitigate and reduce to a minimum
Significant Observed Adverse Effect Level (SOAEL)			
Present and disruptive	The noise causes a material change in behaviour and/or attitude, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant Observed Adverse Effect	Avoid
Present and very disruptive	Extension and regular changes in behaviour and/or an inability to mitigate effect of noise leading to psychological stress or physiological effects, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory	Unacceptable Adverse Effect	Prevent

Table 1: PPG Noise Exposure Hierarchy

- 4.8 In general terms it is considered that a noise level with an effect level which is lower than SOAEL may be acceptable (providing the effect is mitigated to a minimum).
- 4.9 The PPG also sets out factors which influence whether noise could be a concern. These include the source and level of the noise, its character (whether it has tonal, impulsive or intermittent characteristics) and the time of day that it occurs.
- 4.10 In circumstances in which the 'agent of change' needs to put mitigation measures in place the PPG also recommends consideration of the following measures:
- Noise reduction at source;
 - Layout, optimising the distance between the noise source and noise-sensitive receptors and/ or incorporating good design to minimise noise transmission through the use of screening etc;
 - The use of planning conditions/ obligations to restrict activities where appropriate;
 - Mitigation the impact on areas likely to be affected by noise using sound insulation measures in buildings;
- 4.11 At the Appeal Site I am concerned only with the noise impact of the existing industrial uses on the proposed new residential dwellings. It is my opinion that the relevant assessment standard to determine external noise impact at the proposed new dwellings during the day is British Standard 4142:2014+A1:2019 (the "Standard") [Reference 6].
- 4.12 The Standard advocates a comparison between the typical measured L_{A90} background noise (sound) level and L_{Aeq} (sound) noise level from the source being considered. The Standard is applied externally to dwellings. However, for rating purposes, if the noise source is tonal, impulsive or intermittent in character, a rating correction of up to 18 dBA is applied. Several methods of determining the rating penalty are described. The Standard states that a difference between the rating level and the background level of around +10 dBA is an indication of a 'significant adverse impact', depending on the context and a difference of around +5 dBA is likely to be an indication of an adverse impact again depending on the context. Where the rating level does not exceed the background noise (sound) level, this is an indication of the specific sound source having a low impact (depending upon the context).

Local Policy

- 4.13 The Hertsmere Local Plan [Reference 10] recognises (paragraph 4.66) that noise can cause stress to people and have a significant effect on the quality of the environment. It states that the planning system can play a role in protecting new noise-sensitive development from existing sources of noise.
- 4.14 Paragraph 4.66 states that where development is proposed next to an existing noise source¹, an assessment of the noise exposure will need to be undertaken by a competent person and submitted as part of the development proposal. It states that an assessment in accordance with BS 4142:1997² should be submitted with the development proposal.

5.0 GRISTWOOD & TOMS- ACTIVITIES AND NOISE LEVELS

Nature of Operations

- 5.1 I visited Gristwood & Toms at their premises off Harris Lane on Wednesday 8 February. Mr Dave Gristwood showed me around the site and briefed me about the full nature of their operations. I also undertook source-term noise surveys on all significant noise-generating plant. I was able to view the Appeal Site from Gristwood & Toms' premises and from Harris Lane.
- 5.2 Gristwood & Toms provide a tree surgeon business from their depot off Harris Lane. The depot is used for the storage of their plant and vehicles and also to process timber to produce mulch, chippings and biomass fuel. I am informed that they have operated from the site for in excess of 30 years.
- 5.3 Mr Gristwood described a typical day to me which would commence at around 06.30 hours with vehicles leaving the premises to attend their worksites. This typically involves around 15 Ford Transit sized vans, 8-10 7.5 tonne HGVs and 2 18 tonne HGVs fitted with Hiabs. These vehicles typically return between 15.00 and 16.30 and bring waste material with them from the work sites.

¹ Whilst not specifically stated the spirit of this requirement is for new development adjacent to existing sources of industrial or commercial noise.

² Now superseded by BS 4142:2014+A1:2019

- 5.4 The site processes the waste timber which is imported from the work sites using a chipping machine and two screeners. These are serviced by a wheeled loader and 360 degree loader. The site also uses smaller loaders, log splitters and chainsaws as required to process material efficiently. All are substantial items of industrial plant. The timber is shredded and screened and then stockpiled prior to export from site in bulk by 40 tonne articulated lorries. It is my understanding that, on average, two articulated HGVs attend site per day to collect the processed material.
- 5.5 Operations on the site are unconstrained, however, as part of their commitment to be a good neighbour Gristwood & Toms currently restrict use of the heavy plant (chipper and screeners) to between 8.30 am and 12.00 pm Monday to Friday. No work is undertaken at weekends.
- 5.6 It should be registered that the Gristwood & Toms site is 18 acres in size and has sizeable vacant space within it. There is room for the business to expand if required, and within the scope of their existing planning consent and limitations imposed by their proximity to existing residential neighbours. This could include intensification of operational hours and/or additional plant.

Source-Term Noise Surveys

- 5.7 During my site visit on 8 February I undertook source-term noise surveys on all dominant noise-generating plant and from this derived the sound power level of each plant item using standard acoustical theory.
- 5.8 The following instrumentation was used:
- Norsonic Nor-118 Class 1 accuracy sound level meter;
 - Bruel and Kjaer 4231 acoustic calibrator.
- 5.9 The sound level meter was calibrated before and after the surveys in accordance with the manufacturers' instructions. The calibration certificates of the instrumentation used are provided in Appendix B. The weather during the surveys was fine and dry with negligible wind and an ambient temperature of approximately 4 degrees C.
- 5.10 Appendix C provides a photograph of each plant item tested together with associated sound power level in full. Table 2 below summarises the derived sound power levels.

Plant	Derived Sound Power Level, dB L _{WA}
Chipper- Jenz Hem 561	119
Chainsaw- Stihl MS5001	116
Screen- Komptech Crimbus 5000E	105
Screen- Hurstmann Twister	105
Volvo Wheeled Loader HO61	96

Table 2: Plant Sound Power Levels

6.0 NOISE IMPACT ASSESSMENT

Background Noise Level

- 6.1 An assessment in accordance with the rating methodology of BS4142:2014+A1:2019 requires the 'representative' L_{A90} background noise level to be derived. 'Representative' is not defined objectively in the standard, however, some parties use an average (which in my view represents an inappropriately high level) and some use the mode of the range of values. My practice, through experience, tends to use the (arithmetic) average of the range of noise levels less one standard deviation. In order to determine the representative background noise level I have referred to the data recorded in the September TRC report and have also undertaken my own, indicative background noise survey on the site.
- 6.2 It is considered that Location U1, as defined in Figure 3.1 of the TRC report, is most likely indicative of background noise from the Gristwood & Toms operations (at times when there was little/ no noise out from their activities). This survey data was obtained on an unattended basis for a week between 21 and 28 July 2022. Table 3.3 of the TRC report indicates a typical background noise level of 41 dB L_{A90,16 hour}. TRC do not, however, describe how the typical level was derived. It is relevant to note that they describe Gristwood & Toms as one of the dominant sources of ambient noise and therefore I believe that their typical background noise level quoted includes contributions from Gristwood & Toms.
- 6.3 Appendix A of the TRC report provides the results of the noise survey graphically. Gristwood & Toms generally only operate their significant noise-generating plant in the mornings (before 12 pm) and it can be seen that background noise levels in the afternoon are lower than in the mornings. My view, from reviewing this data, is that a background noise level of around 39 dB L_{A90, 1 hour} is therefore representative.

6.4 I can further substantiate this position following a brief background noise survey undertaken at approximately the same location during my site visit of 8 February (when the site was shut down for a lunchtime break). The area is relatively quiet in nature, commensurate with a semi-rural location with background noise controlled by distant traffic and occasional aircraft movements. I recorded a background noise level of 38 dB $L_{A90, 30 \text{ mins}}$ between 12.00 and 12.30 hours.

6.5 On this basis I consider that, for the purposes of assessment my earlier derived background noise level of 39 dB $L_{A90, 1 \text{ hour}}$ is representative.

Noise from Gristwood & Toms Operations

6.6 The noise survey information referenced in Section 5 above has been used to populate an acoustic model of the operations from Gristwood & Toms. This has determined the noise level from their plant within the Appeal Site across the proposed development as put forward in the illustrative masterplan (Option 1) submitted with the planning application. Immiv 2022 noise-mapping software has been used. The model uses the noise propagation methodology of ISO 9613 [Reference 10] and takes into account the effects of geometric divergence, ground and atmospheric absorption and acoustic screening.

6.7 BS 4142:2014+A1:2019 requires an assessment over a representative hourly period. In a worst-case hour it is feasible that all plant could operate for 100% of the time, however, I have taken a more realistic/ typical scenario and assumed that all plant will be operational for 30 mins in each hourly assessment period (50% 'on time'). Furthermore, much of the plant is inherently screened on site via the presence of stockpiles, concrete storage bays and buildings. The model has included these obstacles (which will effectively act as acoustic barriers).

6.8 The model has used the following parameters:

- Ambient temperature: 10 degrees C;
- Relative humidity: 70%;
- 100% soft-ground effects ($G=1$);
- Receiver height of 1.5 m for external amenity areas/ ground floor of the proposed dwellings and 4 m for the first floor.

- 6.9 Figure 4.4 of the TRC report makes a recommendation for a 2.4 m acoustic barrier fence at the boundary between the Appeal Site and Gristwood & Toms. I do not know if this will be a feasible (for example as a result of the landscape and visual impact consequences), however, for completeness my model includes a barrier of this height along the entire boundary between the two sites, at the location shown in Figure 2. The model also assumes that the 1.8 m high garden boundary fences will be upgraded to sufficient surface density (greater than 12 kg/m²) meaning that they will act as an acoustic barrier.
- 6.10 Figure 3 shows the operational noise contours across the site at 1.5 and 4 m height (ground and first floor level) of the (Option 1) illustrative masterplan. Table 3 below summarises the estimated noise level at the closest proposed new dwellings to Gristwood & Toms.

Receptor	Location and Operational Noise Level from Gristwood & Toms, dB L _{Aeq, 1 hour}		
	Garden	Ground Floor Facade	First Floor Facade
Plot 4	48	48	53
Plot 5	48	49	54
Plot 6	49	51	56
Plots 32-37	49	49	54
Plot 31	50	49	55
Plot 24	50	51	56

Table 3: Estimated (External) Noise Levels from Gristwood & Toms' Operations at Proposed New Dwellings

Noise Impact Assessment

- 6.11 The data recorded above has been used to determine the noise impact upon the proposed dwellings using the rating methodology of British Standard 4142:2014+A1:2019. The noise from the operations is both intermittent and impulsive in nature at times and, for this reason, I have added a (modest) + 3 dB rating correction for noise character in accordance with the requirements of the standard.
- 6.12 The full assessment, undertaken in accordance with BS 4124 is provided at each applicable proposed dwelling and shown in Appendix C. A summary is provided in Table 4 below.

Receptor	Location and Difference between BS 4142 Rating and Background Noise Levels, dB		
	Garden	Ground Floor- Facade	First Floor- Facade
Plot 4	+12	+12	+17
Plot 5	+12	+12	+18
Plot 6	+13	+15	+20
Plots 32-37	+13	+13	+18
Plot 31	+14	+13	+19
Plot 24	+14	+15	+20

Table 4: Predicted Difference Between Rating and Background Noise Levels

6.13 The assessment indicates a difference between the background noise level and the rating noise level substantially in excess of + 10 dB at all receptors and hence indicates that Gristwood & Toms' operations will have a significant adverse noise impact upon the proposed new dwellings. Although I have based this assessment on the Option 1 indicative masterplan put forward I can confirm a very similar/ higher level of impact on the Option 2 scheme (which will have a greater number of gardens backing on to the Gristwood & Toms site).

Assessment Uncertainty

6.14 BS 4142:2014 requires uncertainty to be considered as part of the assessment. I have not formally calculated the likely level of uncertainty but have given consideration to the different aspects that make up the assessment below:

- Accuracy of noise measuring instrumentation: Class 1 accuracy instrumentation has been used throughout in all surveys. Calibration conformance checks were undertaken on site using a Class 1 accuracy hand-held sound level meter. All sound level meters are calibrated bi-annually and all acoustic calibrators annually in accordance with both good practice and the requirements of BS 4142:2014. It is considered that instrumentation tolerances are acceptable and will have minimum influence on the outcome of the assessment;
- Variability in background noise level. I have used the TRC data and substantiated this with my own noise survey and site observations. I consider the background noise level used in the assessment to be robust;

- Accuracy of acoustic modelling. The acoustic modelling has been undertaken using the propagation methodology advocated in ISO 9613. This assumes light downwind conditions in all directions and 100% hard ground effects have also been assumed. It is therefore considered that worst-case propagation conditions have been applied. Regardless of this it should be noted that ISO 9613 states a calculation accuracy of +/- 3 dB;

6.15 I am confident that my work has been undertaken with sufficient skill and precision to minimise uncertainty. Regardless, however, my assessment indicates a noise impact which will be substantially greater than 'significant adverse' (as defined in BS 4142:2014+A1:2019) and hence it is my opinion that there is sufficient margin within the assessment to allow for a degree of uncertainty without it compromising upon the outcome of the assessment.

7.0 CONCLUSIONS

7.1 Gristwood & Toms run an arboricultural/tree surgery business from a depot to the immediate north of the Appeal Site and have done so since 1991. Gristwood & Toms have operated a number of large industrial machines from their depot which are used for the processing of timber and production of mulch and biomass fuel. These machines are noise generating and offer significant potential to cause disturbance to the future residents of the proposed development.


7.2 A review of the planning file identifies that Hertsmere Borough Council withdrew their noise-related objection to the proposals on noise grounds very late in the planning process. There appears to be no robust technical justification for this and I can see no evidence from the Appellant that demonstrates that the proposed housing would be compatible with the noise impact generated by Gristwood & Toms.

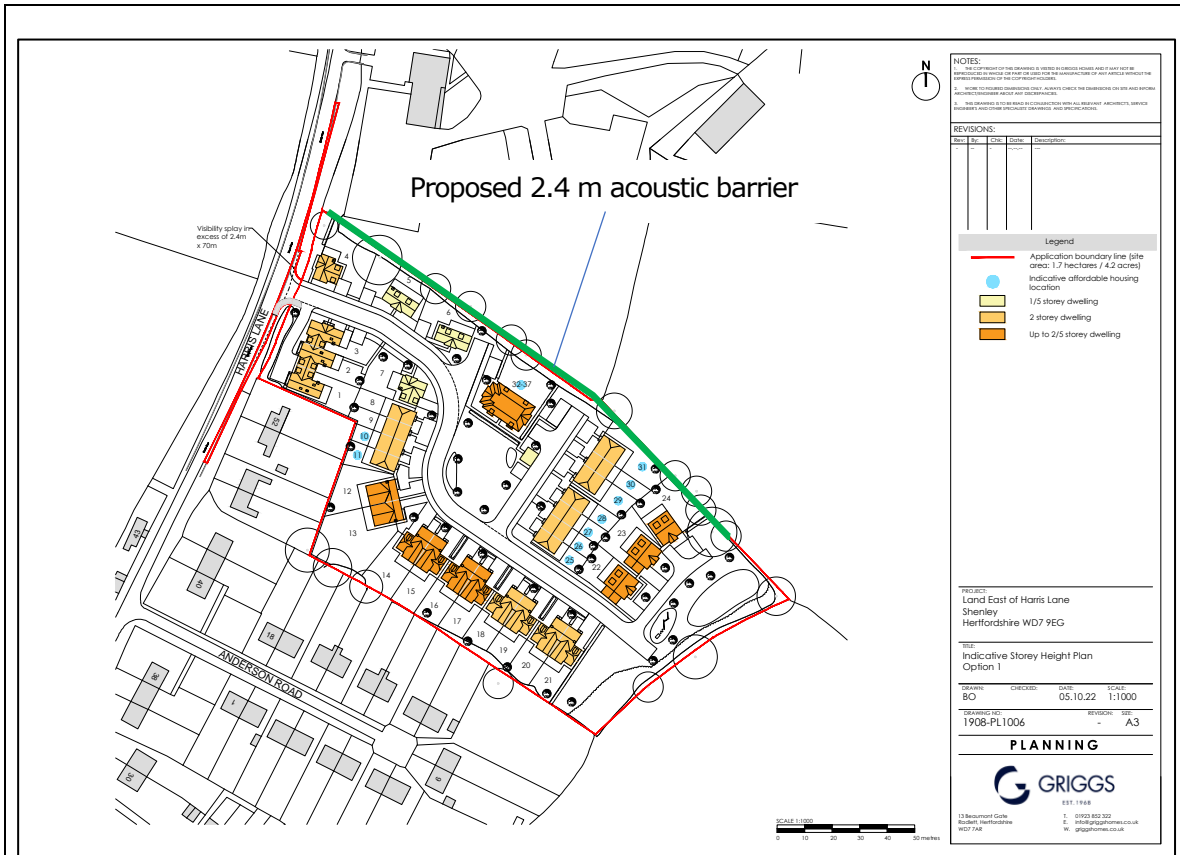
7.3 I have undertaken my own assessment of the impact of the noise from Gristwood & Toms upon the proposed housing. My assessment has assumed that the 2.4m high acoustic barrier at the boundary between the two sites will be constructed yet still demonstrates beyond reasonable doubt a 'significant adverse' impact at the proposed housing.

REFERENCES

- 1 TRC. Noise Impact Assessment, Harris Lane, Shenley, 486302.0002.0000 September 2022.
- 2 Consultation from Hertsmere BC EHO 16 Sept.
- 3 TRC Harris Lane, Shenley- Additional Noise Monitoring, October 2022.
- 4 Hertsmere District Council. Land adjacent and to the rear of 52 Harris Lane, Shenley, Hertfordshire. Officer Report to Committee Meeting of 20 October 2022
- 5 Hertsmere District Council. Land adjacent and to the rear of 52 Harris Lane, Shenley, Hertfordshire. Officer Report to Committee Meeting of 20 October 2022 UPDATE SHEET
- 6 British Standards Institution. British Standard 4142:2014+A1:2019
7. Ministry of Housing, Communities & Local Government, National Planning Policy Framework, July 2021.
8. DEFRA Noise Policy Statement for England 2010.
9. Department for Levelling Up, Housing and Communities & Ministry of Housing, Communities & Local Government, Planning Practice Guidance (PPG) July 2019.
10. Hertsmere Borough Council, Hertsmere Local Plan, Site Allocations and Development Policies Plan, July 2015.
11. International Standards Organisation - ISO 9613. Parts 1 and 2. Acoustics - Attenuation of Sound During Propagation Outdoors (1993).



Project: Harris Road, Shenley	Title: Site Location		
DWG No: Figure 1	Scale: N.T.S.	Rev: -	
Date: February 2023	Drawn By: RP	Job No: 9913	



NOTES:
 1. ALL INFORMATION ON THE DRAWINGS IS VERIFIED TO BE CORRECT AND IS NOT TO BE
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 2. THE DRAWING IS FOR INFORMATION ONLY AND DOES NOT REPRESENT A CONTRACT.
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 4. THE DRAWING IS FOR INFORMATION ONLY AND DOES NOT REPRESENT A CONTRACT.

REVISIONS:

No.	By	Date	Description

Legend

- Application boundary line (site area: 1.7 hectares / 4.2 acres)
- Indicative affordable housing location
- 1/5 storey dwelling
- 2 storey dwelling
- Up to 2/5 storey dwelling

PROJECT:
 Land East of Harris Lane
 Shenley
 Hertfordshire WD7 9EG

TITLE:
 Indicative Storey Height Plan
 Option 1

DATE: 9/02/23 **CHECKED:** 05.10.22 **SCALE:** 1:1000

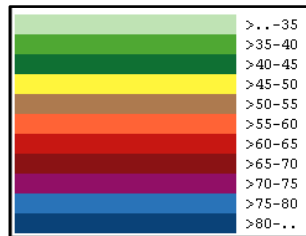
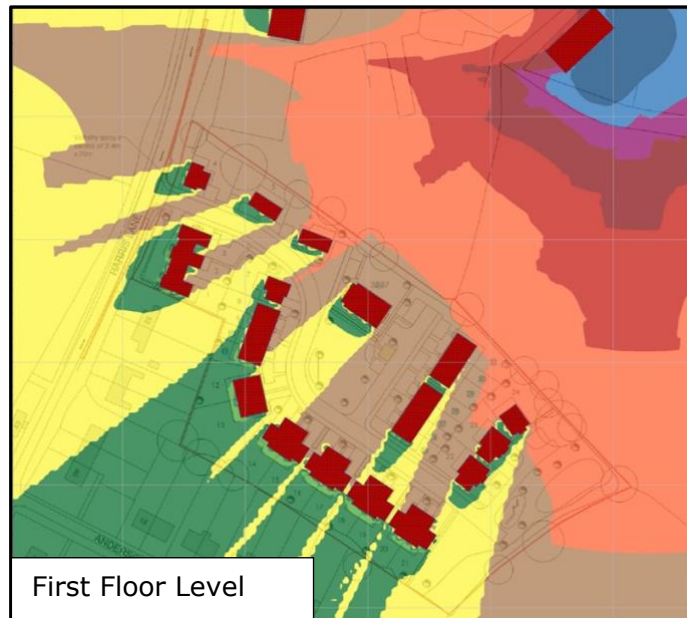
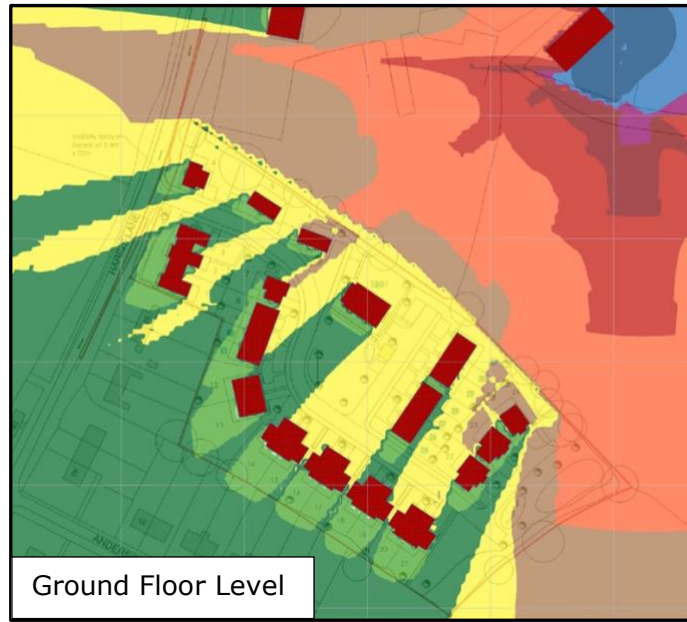
DESIGNED BY: 1908-PL1006 **REVISION:** 002 **SHEET:** A3


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Project: Harris Road, Shenley	Title: Proposed Development Indicative Masterplan (option 1) and indicative acoustic barrier location		
DWG No: Figure 2	Scale: N.T.S.	Rev: -	
Date: February 2023	Drawn By: RP	Job No: 9913	



Project: Harris Road, Shenley	Title: Site Noise Contours		 24Acoustics
DWG No: Figure 3	Scale: N.T.S.	Rev: -	
Date: February 2023	Drawn By: RP	Job No: 9913-1	

APPENDIX A – Acoustic Terminology

Noise is defined as unwanted sound. The range of audible sound is from 0 to 140 dB. The frequency response of the ear is usually taken to be around 18 Hz (number of oscillations per second) to 18000 Hz. The ear does not respond equally to different frequencies at the same level. It is more sensitive in the mid-frequency range than the lower and higher frequencies and because of this, the low and high frequency components of a sound are reduced in importance by applying a weighting (filtering) circuit to the noise measuring instrument. The weighting which is most widely used and which correlates best with subjective response to noise is the dBA weighting. This is an internationally accepted standard for noise measurements.

For variable sources, such as traffic, a difference of 3 dBA is just distinguishable. In addition, a doubling of traffic flow will increase the overall noise by 3 dBA. The 'loudness' of a noise is a purely subjective parameter, but it is generally accepted that an increase/ decrease of 10 dBA corresponds to a doubling/ halving in perceived loudness.

External noise levels are rarely steady, but rise and fall according to activities within an area. In attempt to produce a figure that relates this variable noise level to subjective response, a number of noise indices have been developed. These include:

- i) The L_{Amax} noise level

This is the maximum noise level recorded over the measurement period.

- ii) The L_{Aeq} noise level

This is "equivalent continuous A-weighted sound pressure level, in decibels" and is defined in British Standard BS 7445 as the "value of the A-weighted sound pressure level of a continuous, steady sound that, within a specified time interval, T, has the same mean square sound pressure as a sound under consideration whose level varies with time".

It is a unit commonly used to describe construction noise and noise from industrial premises and is the most suitable unit for the description of other forms of environmental noise. In more straightforward terms, it is a measure of energy within the varying noise.

iii) The L_{A10} noise level

This is the noise level that is exceeded for 10% of the measurement period and gives an indication of the noisier levels. It is a unit that has been used over many years for the measurement and assessment of road traffic noise.

iv) The L_{A90} noise level

This is the noise level that is exceeded for 90% of the measurement period and gives an indication of the noise level during the quieter periods. It is often referred to as the background noise level and is used in the assessment of disturbance from industrial noise.

APPENDIX B: Instrumentation Calibration Certificates

Calibration Certificate

Calibration undertaken by Noise and Vibration Calibration Services Ltd
The Old Kennels Building, 3 Bassett Avenue, Southampton, SO16 7DP
+44 (0)23 8155 5020 hello@nvcal.co.uk



IEC 61672-3:2006 Calibration


Procedures from IEC 61672-3:2006 were used to perform the periodic tests on **1st February 2022** for the following sound level meter:

Norsonic Type 118, serial number 31529

The following tests were undertaken:

Acoustical signal tests of a frequency weighting	PASS
Electrical signal tests of frequency weightings	PASS
Frequency and time weightings at 1 kHz	PASS
Long-term stability	PASS
Level linearity on the reference level range	PASS
Level linearity including the level range control	PASS
Toneburst response	PASS
Peak C sound level	PASS
Overload indication	PASS

Calibration result	
Sound level meter: Norsonic Type 118, serial 31529	PASS
Performance Specification: IEC 61672-3:2006 Class 1	
Date: 1st February 2022	
Certificate Number: C00385	

Approved Signatory: 

Notes

No information on the uncertainty of measurement, required by 11.7 of IEC 61672-3:2006, of the adjustment data given in the instruction manual or obtained from the manufacturer or supplier of the sound level meter, or the manufacturer of the microphone, or the manufacturer of the multi-frequency sound calibrator was published in the instruction manual or made available by the manufacturer or supplier. The uncertainty of measurement of the adjustment data has therefore been assumed to be numerically zero for the purpose of this periodic test. If these uncertainties are not actually zero, there is a possibility that the frequency response of the sound level meter may not conform to the requirements of IEC 61672-1:2002.

This certificate provides traceability of measurement to the SI system of units and to units of measurements realised at the National Physical Laboratory or other recognised national metrology institutes. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory.

Calibration Certificate

Calibration undertaken by Noise and Vibration Calibration Services Ltd
 The Old Kennels Building, 3 Bassett Avenue, Southampton, SO16 7DP
 +44 (0)23 8155 5020 hello@nvcal.co.uk



IEC 60942:2003 Calibration

Periodic tests were performed in accordance with procedures from Annex B of IEC 60942:2003 (using the Insert Voltage Technique) on **9th January 2023** for the following sound calibrator:

Brüel & Kjær 4231, serial number 2253117

<p>Calibration result</p> <p>Sound Calibrator: Brüel & Kjær 4231, serial 2253117 Performance Specification: IEC 60942:2003 Class 1 Date: 9th January 2023 Certificate Number: C00418</p> <p style="text-align: right; font-size: 2em; color: green;">PASS</p>
--

Approved Signatory: 

Test results

Level		93.91	dB re 20 µPa	+/- 0.091 dB
		113.95	dB re 20 µPa	+/- 0.091 dB
Frequency	@ 94 dB	999.97	Hz	+/- 0.01 Hz
	@ 114 dB	999.97	Hz	+/- 0.01 Hz
Distortion	@ 94 dB	0.36	%	+/- 0.016 %
	@ 114 dB	0.16	%	+/- 0.011 %

Notes

As public evidence was available, from a testing organisation (PTB) responsible for approving the result of pattern evaluation tests, to demonstrate that the model of sound calibrator fully confirmed to the requirements for pattern evaluation described in Annex A of IEC 60942:2003, the sound calibrator tested is considered to confirm to all the class 1 requirements of IEC 60942:2003.

This certificate provides traceability of measurement to the SI system of units and to units of measurements realised at the National Physical Laboratory or other recognised national metrology institutes. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory.

Certificate Number: C00418

Page 1 of 2

APPENDIX C: Plant Sound Power Levels

**Chipper- Jenz Hem 561
Serviced by JCB JS220 360 Loader**



Overall	Octave Band Centre Frequency, Hz and Sound Power Level, dB								
	31.5	63	125	250	500	1 k	2 k	4 k	8 k
L _{WA}	115	120	124	116	115	113	111	108	101

Chainsaw- Stihl MS5001



Overall	Octave Band Centre Frequency, Hz and Sound Power Level, dB								
	31.5	63	125	250	500	1 k	2 k	4 k	8 k
L _{WA}	79	89	112	111	111	113	105	106	99

**Screen- Komptech 1 Crimbus 5000E
Serviced by Volvo H061 Wheeled Loader**



Overall	Octave Band Centre Frequency, Hz and Sound Power Level, dB								
	L _{WA}	31.5	63	125	250	500	1 k	2 k	4 k
105	101	111	107	100	100	100	98	94	86

Screen- Hurstmann Twister



Overall LWA	Octave Band Centre Frequency, Hz and Sound Power Level, dB								
	31.5	63	125	250	500	1 k	2 k	4 k	8 k
105	104	107	109	104	102	99	97	93	86

Volvo H061 Wheeled Loader



Overall	Octave Band Centre Frequency, Hz and Sound Power Level, dB								
	31.5	63	125	250	500	1 k	2 k	4 k	8 k
L _{WA}	112	120	125	120	116	113	108	103	97

APPENDIX D: Full Noise Impact Assessment

	Location and Noise Level		
	Garden	Ground Floor Facade	First Floor Façade
Representative background noise level, dB $L_{A90, 1 \text{ hour}}$	39		
Site specific noise level, noise level dB $L_{Aeq, 1 \text{ hour}}$	48	48	53
BS4142 Rating correction, dB	+3	+3	+3
Site rating level noise level, dBA	51	51	56
Difference between rating and background noise level, dB	+12	+12	+17
BS 4142 Assessment Semantic	Significant Adverse		

Table D1: BS 4142 Noise Impact Assessment, Plot 4

	Location and Noise Level		
	Garden	Ground Floor Facade	First Floor Façade
Representative background noise level, dB $L_{A90, 1 \text{ hour}}$	39		
Site specific noise level, noise level dB $L_{Aeq, 1 \text{ hour}}$	48	49	54
BS4142 Rating correction, dB	+3	+3	+3
Site rating level noise level, dBA	51	51	57
Difference between rating and background noise level, dB	+12	+12	+18
BS 4142 Assessment Semantic	Significant Adverse		

Table D2: BS 4142 Noise Impact Assessment, Plot 5

	Location and Noise Level		
	Garden	Ground Floor Facade	First Floor Façade
Representative background noise level, dB $L_{A90, 1 \text{ hour}}$	39		
Site specific noise level, noise level dB $L_{Aeq, 1 \text{ hour}}$	49	51	56
BS4142 Rating correction, dB	+3	+3	+3
Site rating level noise level, dBA	52	54	59
Difference between rating and background noise level, dB	+13	+15	+20
BS 4142 Assessment Semantic	Significant Adverse		

Table D3: BS 4142 Noise Impact Assessment, Plot 6

	Location and Noise Level		
	Garden	Ground Floor Facade	First Floor Façade
Representative background noise level, dB $L_{A90, 1 \text{ hour}}$	39		
Site specific noise level, noise level dB $L_{Aeq, 1 \text{ hour}}$	49	49	54
BS4142 Rating correction, dB	+3	+3	+3
Site rating level noise level, dBA	52	52	57
Difference between rating and background noise level, dB	+13	+13	+18
BS 4142 Assessment Semantic	Significant Adverse		

Table D4: BS 4142 Noise Impact Assessment, Plot 32-37

	Location and Noise Level		
	Garden	Ground Floor Facade	First Floor Façade
Representative background noise level, dB $L_{A90, 1 \text{ hour}}$	39		
Site specific noise level, noise level dB $L_{Aeq, 1 \text{ hour}}$	50	49	55
BS4142 Rating correction, dB	+3	+3	+3
Site rating level noise level, dBA	53	52	58
Difference between rating and background noise level, dB	+14	+13	+19
BS 4142 Assessment Semantic	Significant Adverse		

Table D5: BS 4142 Noise Impact Assessment, Plot 31

	Location and Noise Level		
	Garden	Ground Floor Facade	First Floor Façade
Representative background noise level, dB $L_{A90, 1 \text{ hour}}$	39		
Site specific noise level, noise level dB $L_{Aeq, 1 \text{ hour}}$	50	51	56
BS4142 Rating correction, dB	+3	+3	+3
Site rating level noise level, dBA	53	54	59
Difference between rating and background noise level, dB	+14	+15	+20
BS 4142 Assessment Semantic	Significant Adverse		

Table D6: BS 4142 Noise Impact Assessment, Plot 24