Churchfields Road, Beckenham

Noise Assessment

31st March 2025

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This document has been prepared and checked in accordance with
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Comments

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Revision		Status	
P*nn*	Preliminary (shared; non-contractual)	S1	Coordination
C*nn*	Contractual	S2	Information
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1. Introduction

1.1 Retrospective planning permission (application 24/00815/FULL2) *"for the temporary (5 years) change of use from SUI Generis formed of an electricity undertaker's depot to a dual use of Class B8 (to provide a scaffolding equipment storage/distribution yard) and SUI Generis retaining the existing electricity undertaker's depot. Installation of 2 no. single storey cabins and CCTV/lighting"*, was refused.

1.2 One of the reasons for refusal stated in the Decision Notice (DC/24/00815/FULL2) dated 17th October 2024, was noise. Specifically it stated that the operation *"represents a significantly more intensive use of the site which has a detrimental impact on the general residential amenities of the area, resulting in additional noise and disturbance associated with the comings and goings to and from the site, as well as activities upon the site itself, and insufficient information has been provided to demonstrate that the impact of the use on the residential amenities of the area and with regards to highways safety could be successfully mitigated and controlled."*

1.3 A Noise Impact Assessment in support of the application was undertaken by Clement Acoustics (document reference 18865-NIA-01 RevB.docx, dated 12 March 2024). The assessment was based on operational source noise measurements at a proxy site (Masons Scaffolding, Southwark), as the proposed Site at Churchfields Road was not in operation at this time. Baseline noise measurements at the proposed Application Site (Churchfields Road) were also undertaken to establish prevailing ambient and background noise levels within the vicinity of the nearest residential receptors to the Application Site, in the absence of noise the proposed Development.

1.4 Clements Acoustics undertook a BS4142 assessment based on the above. A key operational noise source at the proxy site was noted to be from 2 no. diesel engine forklift trucks (FLTs) used to load scaffolding poles onto a HGV. The Site at Churchfields Road does not use diesel engine FLTs which are inherently noisy, it uses two electric FLT (EP Li-ion ELECTRIC Forklift Truck 2.5T). On this basis an updated noise impact assessment of Masons Scaffolding operating at Churchfields Road has been undertaken by Waterman Infrastructure & Environment Limited and is the subject of this report. Further to this, additional noise assessment information is provided, which includes an assessment of HGV movements between 06:30 and 07:00 associated with the B8 usage.

1.5 A glossary of Acoustic Terminology used in this report is presented in **Appendix A**.

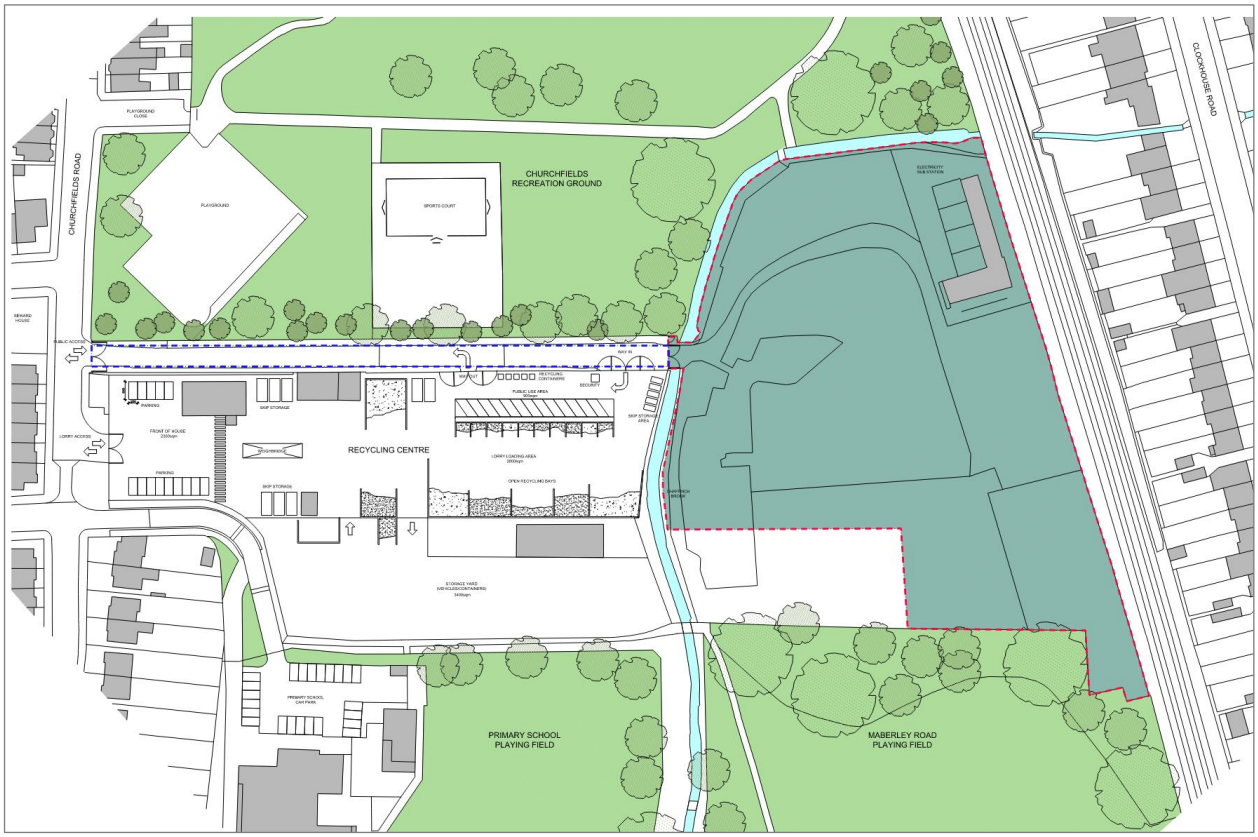
Site Description

1.6 The application site lies to the east of the London Borough of Bromley Churchfields Road Reuse and Recycling Centre, to south of the Churchfields Recreation Ground and to the north of the Maberley Road Playing Field (each of which comprise areas of Urban Open Space). To the west of the site, beyond the nominally separate land which has been excluded from the red line site area and on the other side of the Chaffinch Brook is the site of Churchfields Primary School. To the east of the application site is a railway line, beyond which lie the rear gardens of dwellings fronting Clockhouse Road. The site is accessed via a two-way but reasonably narrow access road which is gated at the entrance to Churchfields Road and which serves the existing recycling centre and the London Electricity Board sui generis site. **Figure 1-1** presents the Site Location Plan.

1.7 The operational hours of the Class B8 usage is 06:30 – 18:30 Monday to Friday, but with no yard operations before 07:00 only vehicles leaving Site. Saturday and Sunday operational hours are the same as Churchfields Reuse & Recycling facility, 07:30-16:00 and 08:00-13:00, although is it understood that Saturday yard operations are infrequent, and Sundays are only required if a

vehicle returns late on a Friday or a Saturday i.e. it will be loaded during Sunday hours (08:00-13:00) ready for departure Monday morning. Generally, no yard activities are undertaken other than loading at weekends.

Figure 1-1: Site Location Plan



2. Planning Policy & Guidance

2.1 This section presents the key planning policy and guidance documents pertaining to noise within England relevant to the proposed Class B8 development. These documents set out the aims, many of which are comparable, without providing details on specific noise levels.

National Planning Policy Framework

2.2 The National Planning Policy Framework[1] (NPPF) promotes 'good design' as part of 'sustainable development' and advocates 'preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of …….noise pollution…'

2.3 Paragraph 198 of NPPF states *'Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:*

a) mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life;

b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason;'

2.4 Paragraph 200 of the NPPF introduces the '*Agent of change principle'*. *'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*.'

2.5 The NPPF reflects advice within Noise Policy Statement for England (NPSE) in that they promote the avoidance of significant adverse impacts and reduction of other adverse impacts on health and quality of life; set within the context of the Government's policy on sustainable development.

Noise Policy Statement for England

2.6 Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development the Noise Policy Statement For England[2] (NPSE) aims to:

- avoid significant adverse impacts on health and quality of life;
- mitigate and minimise adverse impacts on health and quality of life; and
- where possible, contribute to the improvement of health and quality of life.

2.7 It introduces the concept of noise "*effect levels*" although it does not equate these to a specific level of noise as this is likely to be different for different noise sources, receptors and time of day. The effect levels are as follows:

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1 Ministry of Housing Communities & Local Government. (December 2024) National Planning Policy Framework. HMSO. Available at https://assets.publishing.service.gov.uk/media/675abd214cbda57cacd3476e/NPPF-December-2024.pdf

2 Defra. (2010) Noise Policy Statement For England (NPSE).

- NOEL – No Observed Effect Level: Level below which no effect on health and quality of life due to noise can be detected;
- LOAEL – Lowest Observed Adverse Effect Level: Level above which adverse effects on health and quality of life can be detected;
- SOAEL – Significant Observed Adverse Effect Level: Level above which significant adverse effects on health and quality of life occur.

2.8 Predominantly, guidance is drawn from the World Health Organisation (WHO) when setting specific noise levels to the above effect levels, which essentially have been transposed into various British Standards, Policy and Guidance.

Regional & Local Planning Policy, Guidance

London Plan 2021

2.9 The London Plan 2021[3] is the Spatial Development Strategy for Greater London. It sets out a framework for how London will develop over the next 20-25 years and the Mayor's vision for Good Growth.

2.10 Policy D13 – Agent of Change states:

A. 'The Agent of Change principle places the responsibility for mitigating impacts from existing noise and other nuisance-generating activities or uses on the proposed new noise-sensitive development. Boroughs should ensure that Development Plans and planning decisions reflect the Agent of Change principle and take account of existing noise and other nuisance-generating uses in a sensitive manner when new development is proposed nearby.

B. Development should be designed to ensure that established noise and other nuisance-generating uses remain viable and can continue or grow without unreasonable restrictions being placed on them.

C. New noise and other nuisance-generating development proposed close to residential and other noise-sensitive uses should put in place measures to mitigate and manage any noise impacts for neighbouring residents and businesses.'

2.11 Policy D14 – Noise states:

A. "In order to reduce, manage and mitigate noise to improve health and quality of life, residential and other non-aviation development proposals should manage noise by:

1. avoiding significant adverse noise impacts on health and quality of life

2. reflecting the Agent of Change principle as set out in Policy D13 Agent of Change

3. mitigating and minimising the existing and potential adverse impacts of noise on, from, within, as a result of, or in the vicinity of new development without placing unreasonable restrictions on existing noise-generating uses

4. improving and enhancing the acoustic environment and promoting appropriate soundscapes (including Quiet Areas and spaces of relative tranquillity

[3] https://www.london.gov.uk/programmes-strategies/planning/london-plan/london-plan-2021 [accessed 22/3/2025]

5. separating new noise-sensitive development from major noise sources (such as road, rail, air transport and some types of industrial use) through the use of distance, screening, layout, orientation, uses and materials – in preference to sole reliance on sound insulation

6. where it is not possible to achieve separation of noise-sensitive development and noise sources without undue impact on other sustainable development objectives, then any potential adverse effects should be controlled and mitigated through applying good acoustic design principles

7. promoting new technologies and improved practices to reduce noise at source, and on the transmission path from source to receiver."

Bromley Local Plan

2.12 Bromley's Local Plan[4] was adopted on 16th January 2019. Policy 37 – General Design of Development states:

"All development proposals, including extensions to existing buildings, will be expected to be of a high standard of design and layout. Developments will be expected to meet all of the following criteria where they are relevant: e - Respect the amenity of occupiers of neighbouring buildings and those of future occupants, providing healthy environments and ensuring they are not harmed by ***noise*** *and disturbance, inadequate daylight, sunlight, privacy or by overshadowing;"*

2.13 Policy 119 - Noise Pollution states:

"In order to minimise adverse impacts on noise sensitive receptors, proposed developments likely to generate noise and or vibration will require a full noise/ vibration assessment to identify issues and appropriate mitigation measures.

In most cases where there is a risk of cumulative impact on background level over time or where an area is already subject to an unsatisfactory noise environment, applicants will be required to ensure that the absolute measured or predicted level of any new noise source is 10dB below the existing typical background LA90 noise level when measured at any sensitive receptor."

Noise Technical Guidance - Planning requirements for noise

2.14 The Pollution Team of London Borough of Bromley has produced a Noise Technical Guidance[5] titled 'Planning requirements for noise'. Within it states:

'A noise generating or noise sensitive development should include an assessment to demonstrate how it prevents, or minimises to an acceptable level, all adverse noise impacts. Assessment of these impacts should have regard to the advice contained within the Department for Environment Food and Rural Affairs (DEFRA) Noise Policy Statement for England (NPSE), March 2010, or its recognised replacement. Development will not be permitted where levels above the Significant Observed Adverse Effect Level (SOAEL) exist, and mitigation measures have not been proposed that will reduce impacts to as near to the Lowest Observed Effect Level (LOAEL) as is reasonably possible. Mitigation measures should not render the design and amenity spaces unacceptable.'

[4] https://www.bromley.gov.uk/downloads/file/51/bromley-local-plan [accessed 22/3/2025]
[5] London Borough of Bromley. (n.d.) Noise Technical Guidance – Planning requirements for noise. https://www.bromley.gov.uk/downloads/file/2408/noise-technical-guidance-planning-requirements-for-noise [accessed 23/3/2025]

2.15 Section 7 of the Noise Technical Guidance specifically covers 'Industrial and Commercial Noise Sources'. It states that BS4142 should be used to assess the potential noise impact and where the Rating Level does not exceed the prevailing background sound level, this is an indication of the specific sound source having a low impact, depending on context.

2.16 Further to this it states:

'*The design objective should be that the development is designed to achieve a rating level of 10dB (L_{Aeq}) below the typical background (L_{A90}) level at the nearest noise sensitive location. Where uses generate high noise levels of a short duration (e.g., loud bangs) on a regular basis, these should aim to be controlled so as not to exceed 60 dB (L_{Amax}) at the façade of nearest noise sensitive location. Where this criterion cannot be achieved, the various noise control measures considered as part of the assessment should be fully explained (i.e., relocation of noise sources, use of quieter equipment, enclosures, screening, restriction of the hours of operation etc.) and the achievable noise level should be identified. This information will allow the council to make a judgement regarding the application and its likely impact on the surrounding area. In addition to the above, maximum noise levels should also be adequately controlled.*'

2.17 With regard to deliveries and collections it states:

'*Deliveries and collections are usually controlled by restricting operational hours but depending on the extent of these activities, a Noise Management Plan (NMP) may be required, which would include an assessment of noise. This would usually involve assessing the noise upon arrival, loading/unloading period and then departure. Where applicable, the noise assessment will take account of multiple noise sources operating simultaneously and the cumulative level of these.'*

2.18 Regarding noise from 'Fixed Plant' it states:

'The noise assessment should be based on BS 4142:2014+A1:2019 and ideally should demonstrate that the plant is designed to achieve a rating level of 10dB(L_{Aeq}) below the typical background (L_{A90}) level at the nearest noise sensitive location. The use of NR curves may also assist to demonstrate that the proposed plant will be acceptable in terms of frequency characteristics. Where available, product specification data for new items should be submitted with the acoustic report. Consultants should be using these to compare with data from the noise survey and propose mitigation where the levels are above objective levels. Where this information is not available, a consultant may choose to measure the noise levels generated by comparable equipment already installed elsewhere (and in accordance with the guidance in BS 4142).'

3. Noise Assessment Criteria

BS4142 Methods for Rating and Assessing Industrial and Commercial Sound

3.1 BS 4142:2014+A1:2019[6] 'Methods for Rating and Assessing Industrial and Commercial Sound', provides an assessment and rating method to assess the potential impact from a range of commercial and industrial noise sources, including fixed building services plant, within site HGV movements and loading and unloading of goods and materials.

3.2 The measured or predicted noise level from the source in question, the 'specific sound level' ($L_{Aeq,T}$), immediately outside dwellings or at proposed new dwellings is compared with the 'background sound level' ($L_{A90,T}$). Where the sound contains certain acoustic features at the assessment location (e.g. tones, impulses, intermittency etc.), then a scaled character correction is added to the specific sound level to obtain the 'rating level ($L_{Ar,Tr}$). These acoustic feature corrections are presented as **Table 3-1** and are based on perception at the sensitive receptor location and not at source location.

Table 3-1: BS4142 Subjective Rating Penalties

Characteristic	Description	Penalty
Tonality	Just perceptible	+2
	Clearly perceptible	+4
	Highly perceptible	+6
Impulsivity	Just perceptible	+3
	Clearly perceptible	+6
	Highly perceptible	+9
Intermittency	Identifiable on/off conditions over assessment period and readily distinctive against the residual acoustic environment	+3
Neither tonal, impulsive or intermittent	Readily distinctive against the residual acoustic environment	+3

3.3 Typically, the greater the difference between the rating level and the background sound level, the greater the potential of an adverse impact. BS 4142 states:

- A difference of +10dB or more is likely to be an indication of a significant adverse impact, depending on the context;
- A difference of +5dB or more is likely to be an indication of an adverse impact, depending on the context; and
- The lower the rating level is in relation to the background level, the less likely it is that a specific sound source will have an adverse impact. Where the rating level does not exceed

[6] British Standards Institution (2019). BS 4142:2014+A1:2019 Methods for Rating and Assessing Industrial and Commercial Sound. BSI.

the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.

3.4 BS 4142 further states:

'Adverse impacts include, but are not limited to, annoyance and sleep disturbance. Not all adverse impacts will lead to complaints and not every complaint is proof of an adverse impact.'

3.5 Context is an important consideration of a BS 4142 assessment, and the impact may require modification due to context, which may include:

- The absolute level of sound.
- The character and level of the residual sound compared to the character and level of the specific sound.
- Receptor sensitivity but taking account of screening, sound insulation, design measures.

3.6 It should be noted that the BS 4142 standard is not intended to be applied to the assessment of indoor sound levels.

3.7 **Table 3-2** presents noise assessment criteria for the proposed Class B8 usage based on BS4142 and NPSE noise effect levels.

Table 3-2: Noise Assessment Criteria

Potential Magnitude of Impact Without Context	**Rating Level dB $L_{Ar,Tr}$ (without context) Compared to Background Sound Level (L_{A90})**	**Definition**
None	Rating Level ≤ L_{A90} - 10	London Borough of Bromley's preference
Negligible (low[1])	Rating Level ≤ L_{A90}	The rating level is not of concern. ≤NOEL.
Small	Rating Level ≤ L_{A90}+5dB	The rating level is undesirable but of limited concern. >NOEL ≤LOAEL.
Medium	Rating Level > L_{A90}+5dB	The rating level gives rise to some concern but is likely to be tolerable depending on scale, duration and period of operation (day/night). >LOAEL <SOAEL.
Large	Rating Level ≥ L_{A90}+10dB	The rating level gives rise to serious concern and it should be considered unacceptable. ≥SOAEL.

Note: 1 BS4142 terminology.

3.8 London Borough of Bromley's preference is for the Rating Level to be 10dB below typical background level at the nearest sensitive receptor. Within the Noise Technical Guidance it does recognise that '*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***.' Further to this with regard to deliveries and collections – including loading and unloading – it indicates that this could be controlled through operational hours.

4. Environmental Baseline Conditions

4.1 An environmental baseline noise survey was undertaken by Clements Acoustics at the Application Site between 10:50 on Tuesday 16th January to 10:55 on Thursday 18th January 2024. The location of the noise monitor was within the southern corner of the Site approximately 15 metres from the railway line.

4.2 During the survey period the Application Site was not being used for B8 usage. The measured noise levels are therefore considered to be representative of prevailing background noise conditions without B8 usage at the nearest sensitive receptors east of the railway line on Clock House Road.

4.3 **Table 4-1** presents a summary of the measured noise levels reproduced from Table 4-1 of report document reference 18865-NIA-01 RevB.docx, dated 12 March 2024.

Table 4-1: Summary of Measured Baseline Noise Levels Without B8 Usage (Clements Acoustics)

Position	Time Period	Average Ambient Noise Level dB $L_{Aeq,T}$	Typical Background Sound Level dB $L_{A90,5min}$
Southern Corner Location (approximately 15m from railhead)	Daytime (07:00-23:00)	56	42
	Night-Time (23:00-07:00)	51	30
	Operational Hours (06:30-18:30)	56	42

4.4 The dominant source at this location is considered to be rail noise given the proximity to the railway line. It should be noted that noise from the Churchfields Re-use and Recycling facility is discernible on the Application Site and therefore is also likely to contribute to the noise climate at this location, but not to the same extent as rail noise.

4.5 A short-term noise measurement was undertaken adjacent to Churchfields Road on Tuesday 11th March 2025 between 11:28 and 11:58. The monitoring location was approximately 55 metres east of the access road. During this period the following vehicles were recorded; 138 cars, 2 buses and 2 HGVs. None of the vehicles were associated with the B8 usage on the Application Site. **Table 4-2** presents a summary of the measured noise levels.

Table 4-2: Summary of Measured Noise Levels Adjacent to Churchfields Road (ST1)

Period	dB $L_{Aeq,T}$	dB L_{AFmax}	dB L_{A10}	dB $L_{A90, mode}$
Week Day 11:28-11:58	64	82	73	47

4.6 The results of the short-term noise measurements adjacent to Churchfields Road demonstrates that residents on Churchfields Road are exposed to higher noise levels than the rear facades of residents on Clock House Road.

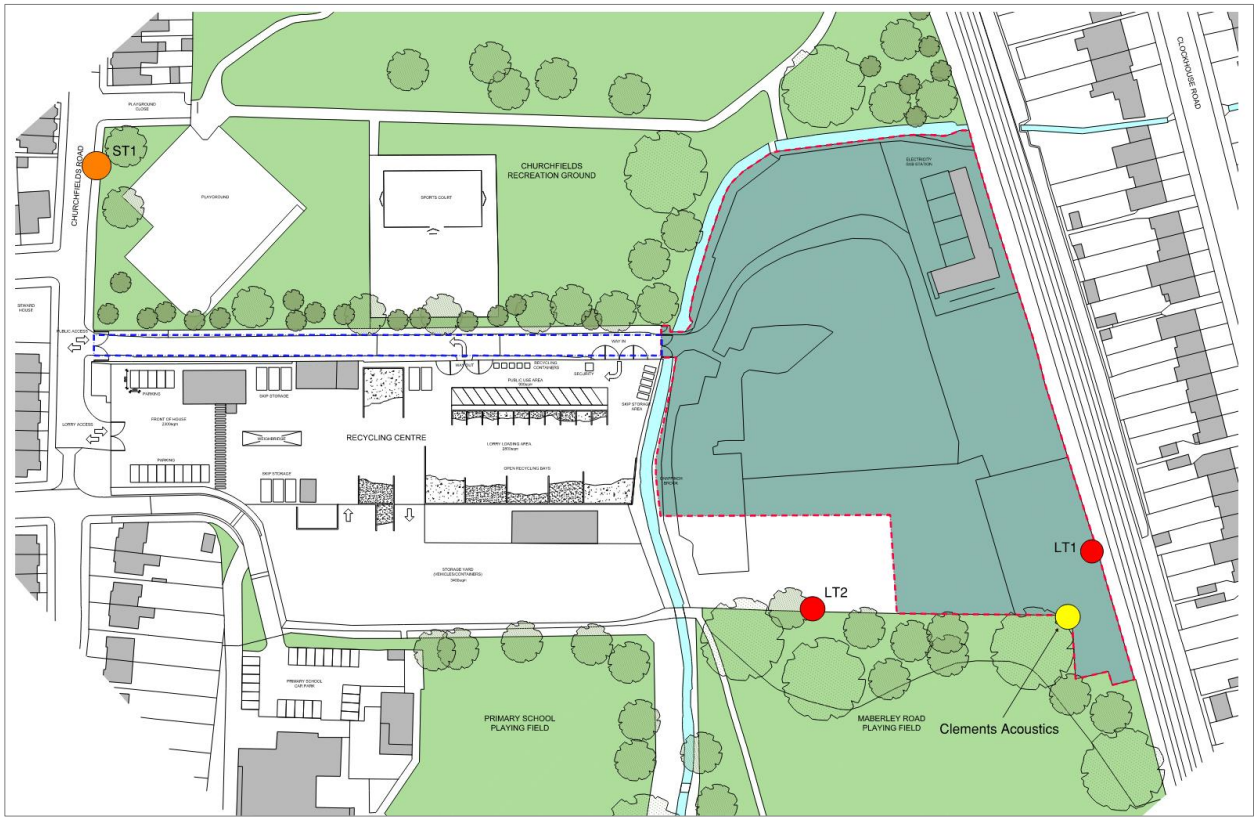
4.7 Additional baseline surveys were conducted at the Application Site between Friday 7th March to Thursday 13th March 2025. The measurement data has been used to establish background and ambient noise levels on a Saturday and Sunday. The period before start of operations has been used as an indication of prevailing ambient and background noise levels on which to base the assessment of weekend operations. **Table 4-3** presents a summary of the measured noise levels during the weekend period with full details in **Appendix B**.

4.8 **Figure 4-1** illustrates the noise monitoring locations.

Table 4-3: Summary of Measured Noise Levels - Weekend Period Pre Site Operations

Period	dB $L_{Aeq,T}$	dB L_{AFmax}	dB L_{A10}	dB $L_{A90, mode}$
Location LT1 Rail Boundary				
Saturday 07:00-07:30	63	84	53	41
Sunday 07:30-08:00	59	80	51	40
Location LT2 Southern Boundary (Maberley Road Playing Field)				
Saturday 07:00-07:30	50	69	52	43
Sunday 07:30-08:00	49	66	49	40

Figure 4-1: Noise Monitoring Locations



Sensitive Receptors

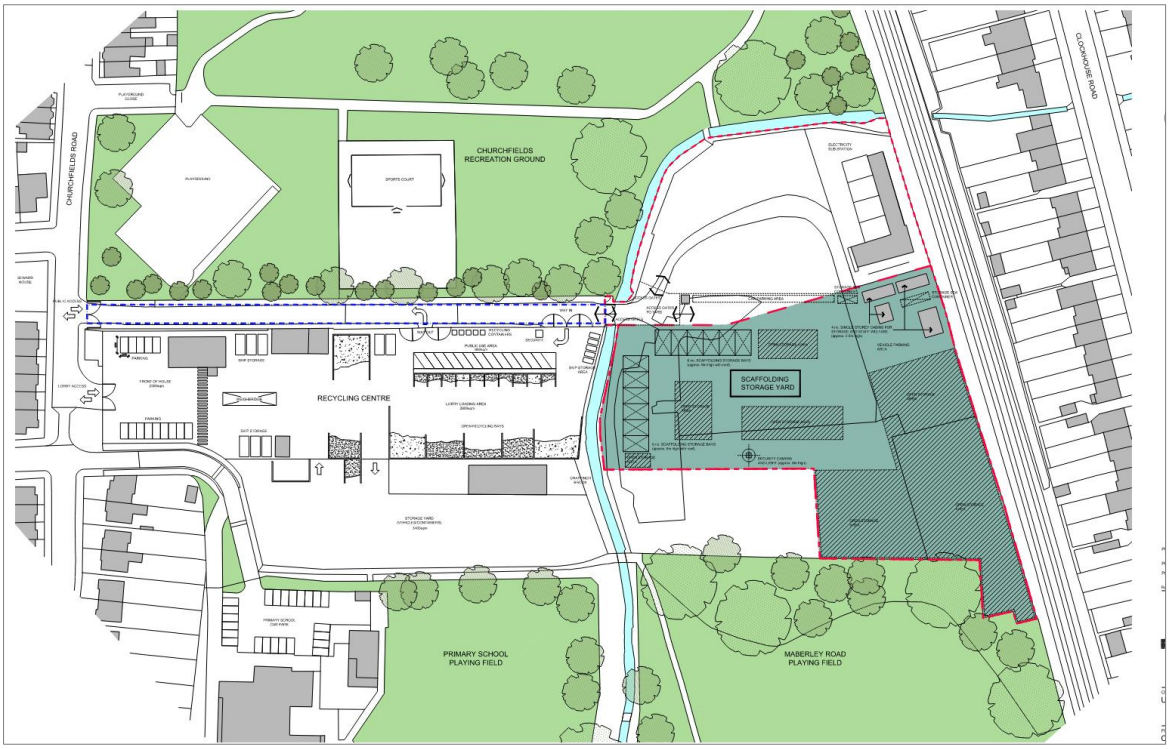
4.9 The nearest sensitive receptors to the Application Site are residents on Clock House Road, located approximately 35 to 40 metres from the site boundary and approximately 25 metres from the nearest railhead.

4.10 The other residential receptors to the Application Site are residents on Churchfield Road located approximately 150 metres from the Application Site with the nearest house being approximately 15 metres from the access road, which is shared with Churchfields Road Re-use & Recycling centre and London Electricity Depot.

5. Operational Activity & Noise Levels

5.1 **Figure 5-1** presents the Application Site Layout. As illustrated in **Figure 5-1**, the scaffolding storage bays are directly east of Churchfields Road Reuse & Recycling facility, which operates 07:00-17:30 Monday to Friday, 07:30-16:00 Saturday and 08:00-13:00 Sunday. It should be noted that the Reuse & Recycling facility operates a JCB which uses it's bucket move material and also to push material down into the skip (refer to **Photograph 5-1**). The noise from this operation is clearly audible at the Application Site. This together with operations at the Reuse & Recycling facility already contribute to the noise climate at this locality.

Figure 5-1: Application Site Layout



5.1 The loading bay and loading areas where LGVs and HGVs are loaded/unloaded, are directly adjacent to the scaffolding storage areas and therefore within an area of the Site furthest away from the nearest sensitive receptors east of the railway line on Clock House Road.

5.2 Receptors on Churchfields Road benefit from both distance attenuation and intervening screening to yard operations.

Photograph 5-1: JCB Using Bucket at Churchfields Reuse & Recycling Centre

Operational Details

5.3 The operational hours of the B8 usage (scaffolding equipment storage/distribution yard) is 06:30 to 18:30 Monday to Friday. No yard operations occur before 07:00. Loading and unloading operations are only undertaken between 07:00-18:30.

5.4 At the weekends operational hours are the same as the Churchfields Re-Use & Recycling facility; Saturday 07:30-16:00 and Sunday 08:00-13:00. With regard to weekend working, it is understood that Saturday working is infrequent and Sundays are required if a vehicle returns late on a Friday or Saturday to allow loading during 08:00-13:00 ready for departure Monday morning. Generally yard activities are not undertaken other than loading at weekends.

5.5 The operators have a fleet of 10 LGVs/HGVs as follows:

- 1 No HGV Arocs tractor unit with Hi-Ab that operates with 3 No trailers on a delivery basis.
- 4 No HGV 18 tonne flatbed rigid vehicles that are used both for deliveries and also for driver / scaffolders to attend site.
- 2 No HGV 25 tonne flatbed rigid vehicles that are used on a delivery basis for scaffold erects and dismantles.
- 2 No LGV 7.5 tonne flatbed rigids with 1 No used for deliveries and 1 No used by scaffolder / drivers.
- 1 No LGV 1 tonne flatbed for small drop offs and collections.

5.6 As already stated, vehicle movements can occur between 06:30-07:30 Monday to Friday. On this basis, some LGVs/HGVs are loaded the day before during operational hours to allow vehicles to leave site from 06:30 onwards Monday to Friday.

5.7 Based on a survey by the transport engineers SLR, the typical number of LGVs/HGVs leaving site between 06:30-07:30 in a 15-minute period is 3. During the daytime period the average LGV/HGV movement per hour is 1, with a maximum of 4 movements.

5.8 The site has two FLTs which are electric (EP Li-ion ELECTRIC Forklift Truck 2.5T).

5.9 During the daytime period various operations are undertaken within the yard which comprise:

- Loading/Unloading LGVs/HGVs using FLTs
- Manual loading/unloading of scaffolding poles
- Cutting poles using bench saw located ground floor of scaffolding storage bay directly east of Churchfields Road Reuse & Recycling facility
- FLTs moving stillages
- LGVs/HGVs leaving/arriving (1 movement per hour – max 4)

Operational Noise Levels

5.10 To allow a BS4142 assessment of operational noise from the Class B8 usage (scaffolding equipment storage/distribution yard), noise measurements of key activities were undertaken on Tuesday 11th March 2025.

5.11 **Table 5-1** presents a summary of the measured broad-band operational noise levels and **Table 5-2** presents the measured octave noise levels (1/3 octave presented in Appendix B). Further details of the operational noise measurements are presented in **Appendix B**.

Table 5-1: Summary of Measured Operational Noise Levels of Key Activities

Operation	L_{Aeq}	L_{AFmax}	Measurement Distance (m)	Typical Minutes per 1-hour
FLT loading wooden planks onto HGV	56.1	70.8	6 average	30-45
Manual loading poles onto HGV	63.8	73.8	4.1	30-45
Cutting scaffolding poles using table saw	90.0	97.0	3.7	5-10
FLT picking up stillages laden with poles	55.6	64.8	4.4	30-45
FLT loading poles onto HGV	53.0	58.5	6 average	30-45
FLT unloading poles off HGV	56.4	64.5	6 average	30-45
FLT drive by	58.7	63.1	4.0	Not applicable
Scaffolding HGV drive by OUT	65.2	73.3	4.0	Not applicable
Scaffolding HGV drive by IN	64.3	73.1	4.0	Not applicable

Table 5-2: Measured Octave Noise Levels of Key Activities

Operational Activity	Octave Measured Noise Levels dB Leq							
	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz
FLT loading wooden planks onto HGV	58	56	51	55	48	50	42	39
Manual loading poles onto HGV	60	61	62	59	60	57	51	45
Cutting scaffolding poles using table saw	57	57	65	77	79	82	86	83

Operational Activity	Octave Measured Noise Levels dB Leq							
	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz
FLT picking up stillages laden with poles	54	51	56	53	49	48	45	39
FLT loading poles onto HGV	57	53	52	51	48	44	40	34
FLT unloading poles off HGV	57	56	58	56	49	45	42	35
FLT drive by	58	55	55	55	57	48	43	38
Scaffolding HGV drive by OUT	64	62	61	59	61	60	53	47
Scaffolding HGV drive by IN	65	63	61	58	59	59	52	45

5.12 None of the measured operational noise levels were tonal, as defined in Annex C of BS4142 (refer to Appendix B).

6. Noise Assessment

6.1 CadnaA 3D noise modelling software has been used to predict operational noise at receptor locations (including gardens) for the following four operational scenarios:

- A) Operations 06:30-07:00 Monday to Friday
    - Assessment over a 15-minute period
    - Assumes 3 HGVs leaving site (moving point source, 10 mph)
    - Assumes no yard operations are undertaken
- B) Operations between 07:00-18:30 Monday to Friday
    - Assessment over a 1-hour period
    - Assumes 4 HGV movements in/out (moving point source, 10 mph)
    - FLT loading HGV (30 mins)
    - FLT moving stillages (30 mins)
    - FLT movements around site.
    - Manual loading/unloading poles (30 mins, 4 personnel)
    - Cutting of poles (5 mins, 1 personnel)
- C) Out of hours (OOH) operations between 22:00-05:00
    - Assessment over a 15-minute period
    - Assumes 1 HGVs leaving or returning to site (moving point source, 10 mph)
    - Assumes no yard operations are undertaken
- D) Weekend Operations Saturday 07:30-16:00, Sunday 08:00-13:00
    - Assessment over a 1-hour period
    - 2 no. FLT loading HGV (1-hour)

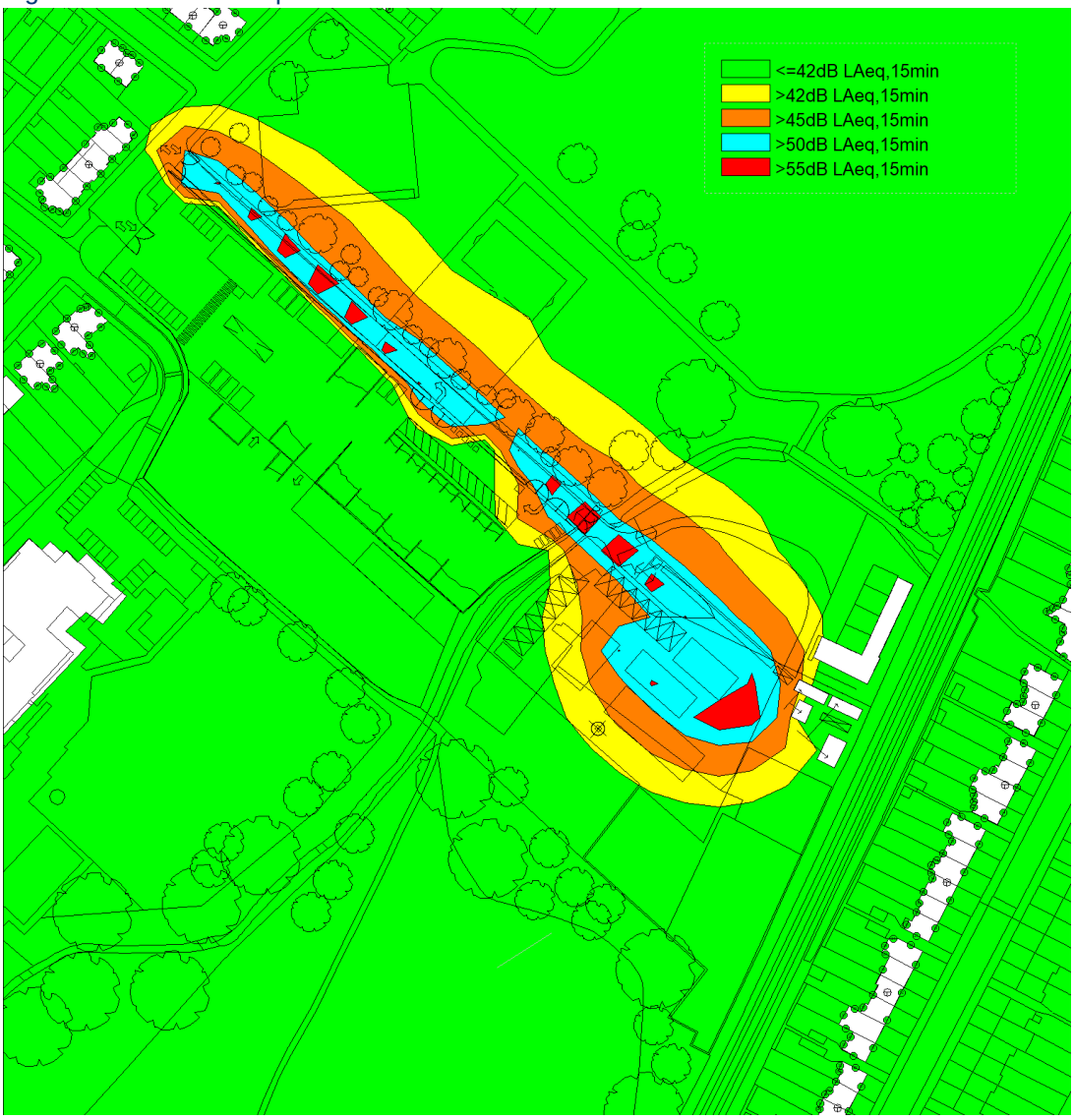
6.2 It should be noted that WIE have used historic data taken at an industrial recycling facility for a HGV by-pass event (82dB L_{AFmax} @ 2m) as it was only possible to measure a by-pass event from a 1 tonne LGV flatbed vehicle at the time of the survey.

Operational Noise Levels 06:30-07:00 Monday - Friday

6.3 **Figure 6-1** presents the predicted operational noise levels over a 15-minute period between 06:30-07:00. As detailed above there are no yard operations during this time period only LGVs/HGVs leaving Site.

6.4 The predicted specific sound levels at receptor locations are not predicted to exceed 42dB $L_{Aeq,15min}$. At receptors on Clock House Road the predicted noise levels at receptor locations range from 31 to 35dB $L_{Aeq,15min}$. At receptors on Churchfields Road the predicted noise levels at receptor locations range from 29 to 42dB $L_{Aeq,15min}$.

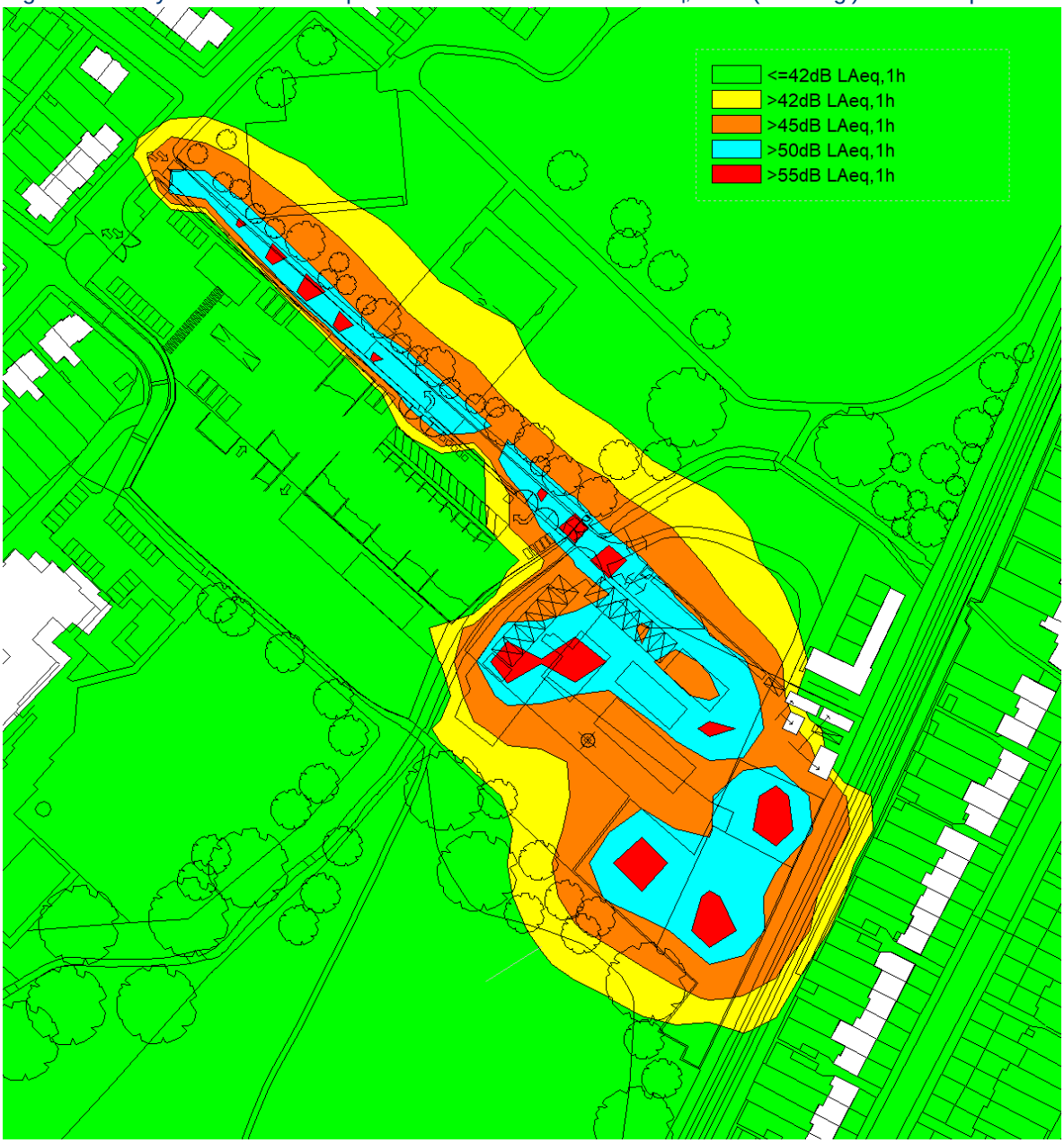
Figure 6-1: Predicted Operational Noise Levels 06:30-07:30



Operational Noise Levels 07:00-18:30

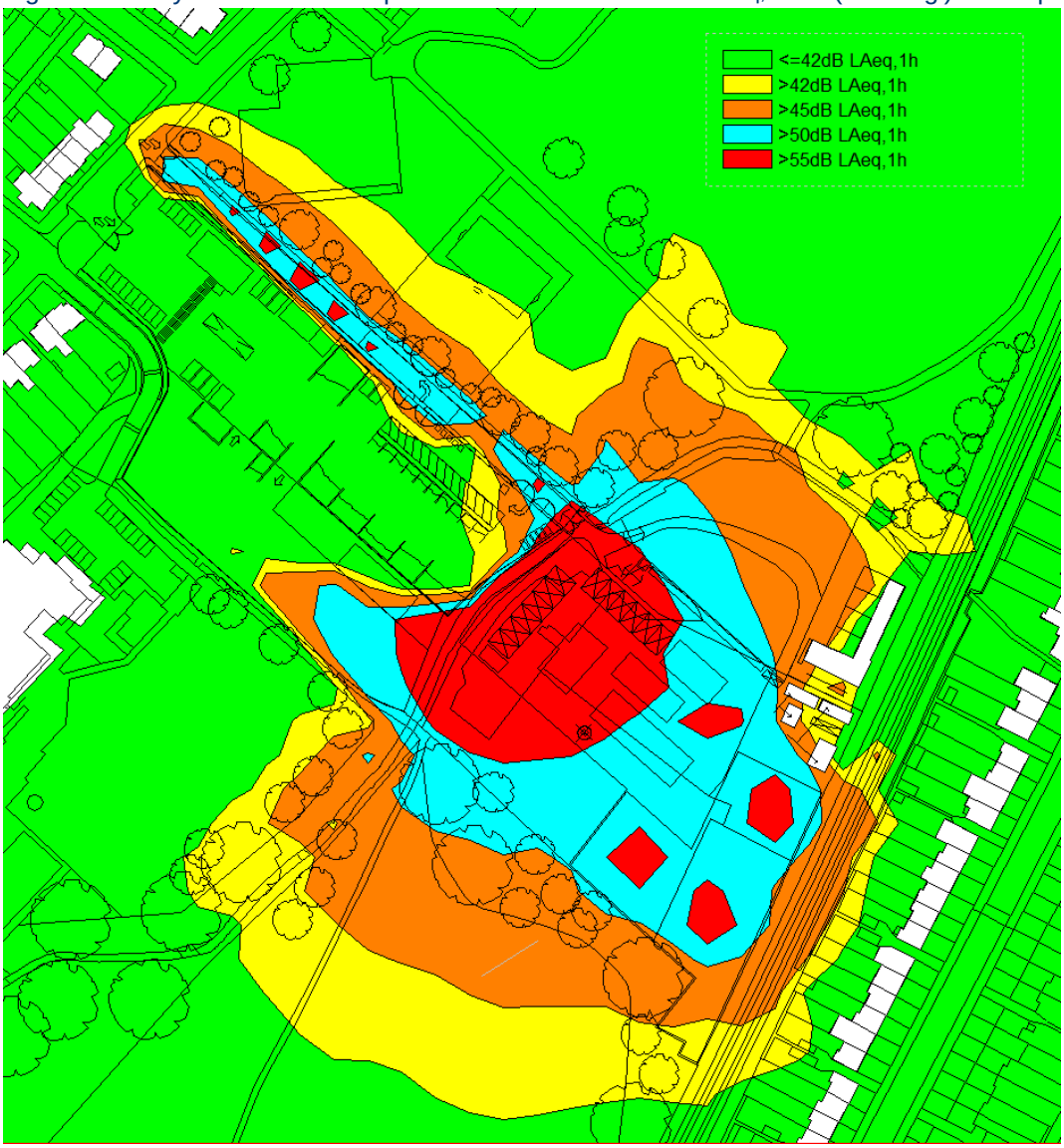
6.5 **Figure 6-2** presents the predicted operational noise levels over a 1-hour period between 07:00-18:30 without pole cutting operations. The predicted specific sound levels at all sensitive receptors is less than 42dB $L_{Aeq,1\ hour}$.

Figure 6-2: Daytime Predicted Operational Noise Levels dB $L_{Aeq,1\ hour}$ (1.5m agl) – without pole cutting



6.6 **Figure 6-3** presents the predicted daytime operational noise levels including pole cutting operations. The assessment assumes 5-minute pole cutting operation within a 1-hour period and has therefore been adjusted for on-time. It should also be noted that manual loading/unloading within each of the storage areas has been assumed as well as FLT movements. The predicted noise levels at receptor locations is predicted not to exceed 42dB $L_{Aeq,1\ hour}$, except in some garden areas of houses on Clock House Road where an operational noise level of 43dB $L_{Aeq,1hour}$ is predicted.

Figure 6-3: Daytime Predicted Operational Noise Levels dB $L_{Aeq,1\ hour}$ (1.5m agl) – with pole cutting

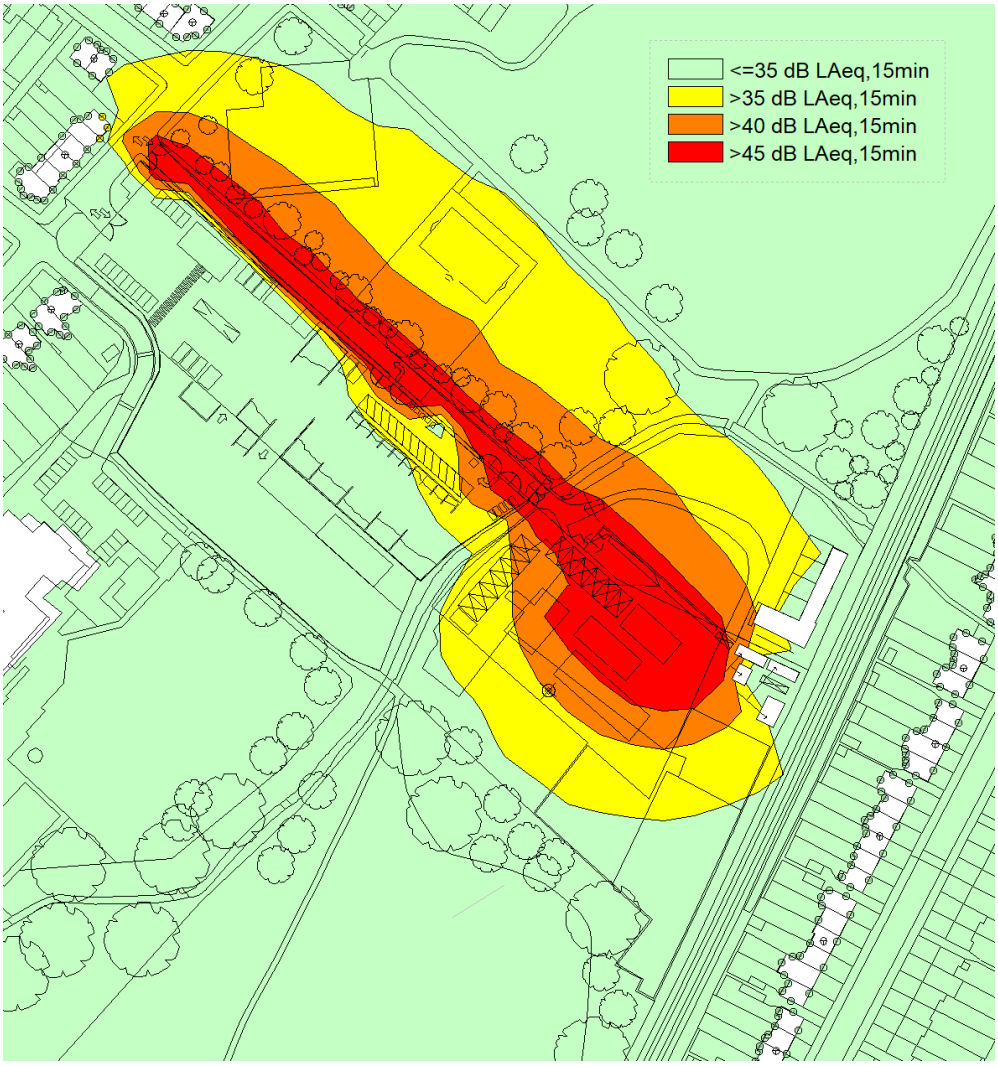


Out of Operational Hours (22:00-05:00) – Works

6.7 **Figure 6-4** presents the predicted noise levels from out of operational hours (OOH) works. The predicted specific sound level is predicted not to exceed 35dB $L_{Aeq,15min}$ at receptors on Clock House Road. The predicted noise levels at building locations range from 28 to 31dB $L_{Aeq,15min}$. This is also the same for receptors on Churchfields Road, except at houses immediately adjacent to the access road where specific sound levels of 38dB $L_{Aeq,15min}$ are predicted.

6.8 It should be noted that this only comprises one LGV/HGV leaving within the OOH period or returning within the OOH period. No yard operational works would occur as the LGV/HGV is loaded within poles during the daytime operational period (07:00-18:30).

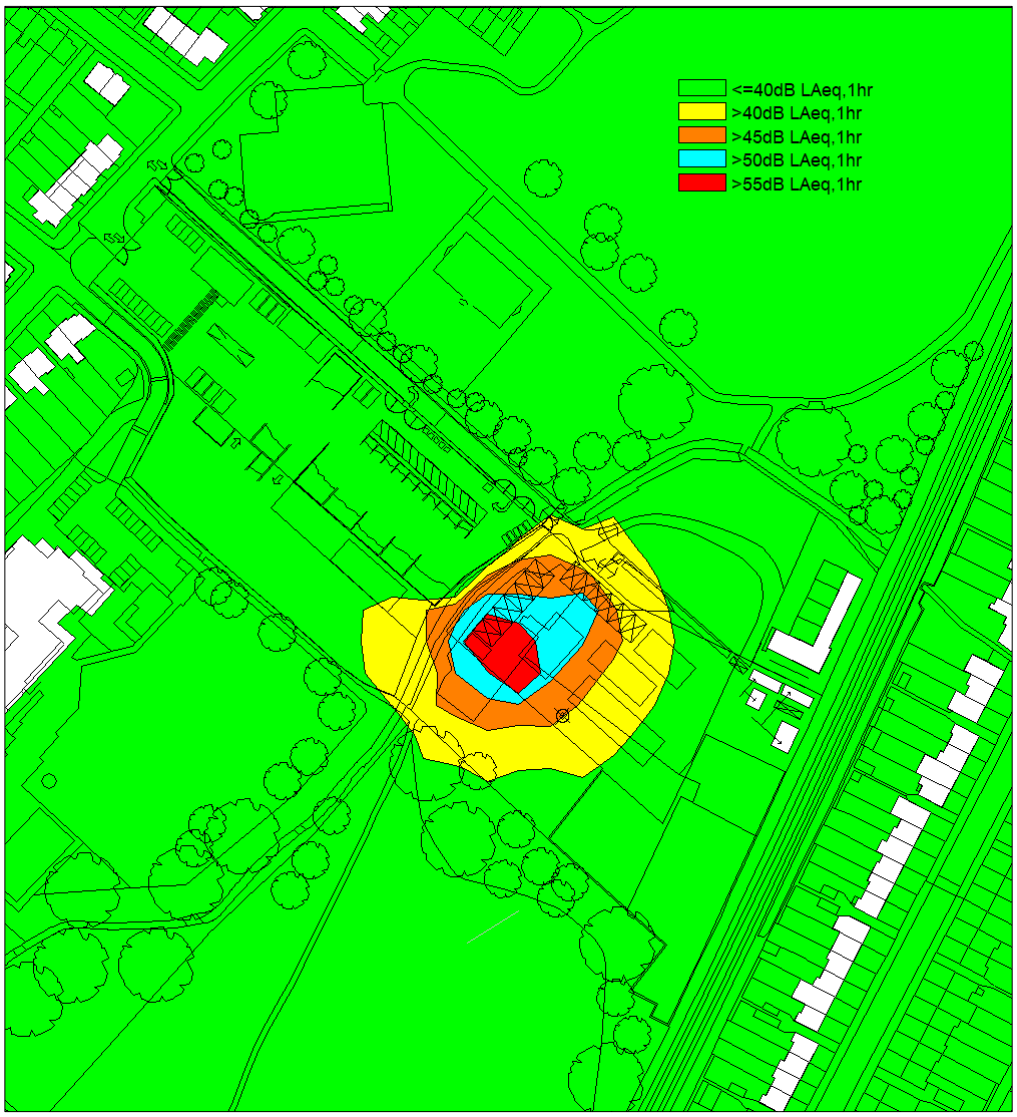
Figure 6-4: Out of Operational Hour Predicted Noise Levels



Weekend Operations Saturday 07:30-16:00, Sunday 08:00-13:00

6.9 **Figure 6-5** presents the predicted operational noise levels during loading operations undertaken on weekends. At all receptors the predicted operational noise levels from loading operations does not exceed 40dB $L_{Aeq,1h}$.

Figure 6-5: Weekend Loading Operations dB $L_{Aeq,1h}$ (1.5m agl)



BS4142 Assessment

6.10 **Table 6.1** present the BS4142 assessment for each of the four assessed operational periods allowing for acoustic feature corrections as required under BS4142:2014+A1:2019.

Table 6-1: BS4142 Assessment

Operational Period	Predicted Specific Sound Level	Rating Level	LA90	Difference Rating Level minus LA90	Impact (with context)
Clock House Road					
06:30-07:00 Monday to Friday	31 to 35 dB $L_{Aeq,15\ min}$	+0dB 31 to 35dB $L_{Ar,15min}$	42	-7 to -11	Negligible (Low)
07:00-18:30 (without pole cutting) Monday to Friday	39 to 42 dB $L_{Aeq,1h}$	+3dB 42 to 45 dB $L_{Ar,1h}$	42	0 to +3	Negligible to Small
07:00-18:30 (with pole cutting) Monday to Friday	43 to 45 dB $L_{Aeq,1h}$	+6dB 49 to 51 dB $L_{Ar,1h}$	42	+7 to +9	Medium With localised screening reduces to Small
22:00-05:00 OOH	28 to 31 dB $L_{Aeq,15\ min}$	+0dB 28 to 31dB $L_{Ar,15min}$	30	-2 to +1	Negligible
Weekend Saturday 07:30-16:00 Sunday 08:00-13:00	27 to 32dB $L_{Aeq,1h}$	+0dB 27 to 32dB $L_{Ar,1h}$	40	-8 to >-10	None to Negligible (Low)
Churchfields Road					
06:30-07:00 Monday to Friday	29 to 42 dB $L_{Aeq,15\ min}$	+0dB 29 to 42dB $L_{Ar,15min}$	42	0 to -13	None to Negligible (Low)
07:00-18:30 (without pole cutting) Monday to Friday	29 to 42 dB $L_{Aeq,1h}$	+0dB 29 to 42 dB $L_{Ar,1h}$	42	0 to -13	None to Negligible (Low)
07:00-18:30 (with pole cutting) Monday to Friday	29 to 42 dB $L_{Aeq,1h}$	+0dB 29 to 42 dB $L_{Ar,1h}$	42	0 to -13	None to Negligible (Low)
22:00-05:00 OOH	25 to 38 dB $L_{Aeq,15\ min}$	+0dB 25 to 38dB $L_{Ar,15min}$	30	-5 to +8	Negligible to small
Weekend Saturday 07:30-16:00 Sunday 08:00-13:00	20 to 28dB $L_{Aeq,1h}$	+0dB 20 to 28 dB $L_{Ar,1h}$	40	>-10	None

BS4142 06:30-07:30 Monday to Friday

6.11 During 06:30-07:00 Monday to Friday when vehicles are leaving the Application Site, zero rating penalty has been applied. Firstly, the predicted Specific Sound Level at Clock House receptors is

significantly below prevailing noise levels, which is dominated by rail noise. Secondly at receptors on Churchfields Road, the predicted Specific Sound Level is significantly below prevailing noise levels and the source is no different to LGVs/HGVs currently travelling along Churchfields Road.

6.12 During 06:30-07:30 a maximum of 3 LGVs/HGVs movement would occur during a 15-minute period and it is on this basis that the BS4142 assessment has been undertaken. Based on the difference between rating level and L_{A90}, the potential impact at both locations is considered to be none to negligible (low).

Normal Operational Hours Monday to Friday (07:00-18:30)

6.13 During normal operational hours Monday to Friday (07:00-18:30), a rating penalty of +3dB has been applied to the Specific Sound Level to take account of the potential of **'just'** impulsive at Clock House Road receptors/garden. This is considered an onerous approach when account is taken of the measured L_{AFmax} of operational noise and prevailing L_{AFmax} due to rail events. When pole cutting operations are occurring then a rating penalty of +6dB has been applied (+3 impulsivity and +3 intermittency).

6.14 When pole cutting operations are not occurring then the predicted BS4142 impact ranges from negligible to small. The predicted operational noise levels are significantly below prevailing noise levels and therefore mitigation is not proposed.

6.15 When pole cutting operations are occurring then the predicted BS4142 impact increases to medium. On this basis localised screening around the table saw would adequately reduce this BS4142 impact to small. This is considered acceptable in terms of the absolute predicted operational noise level and prevailing ambient noise levels.

6.16 During normal operational hours Monday to Friday (07:00-18:30), a zero rating penalty has been applied to the Specific Sound Level to receptors on Churchfields Road. Noise from the Application Site yard operations is unlikely to be discernible to that from Churchfields Re-use & Recycling facility. It is only noise from vehicles entering or exiting the access road that are really of any potential significance. The frequency of vehicle movements together with the overall number is low (1 LGV/HGV per hour with maximum of 4 LGVs/HGVs per hour) with a maximum of 20 movements per working day. Movement of LGVs/HGVs is no different to those already travelling along Churchfields Road.

6.17 During normal operational hours Monday to Friday the potential impact on receptors on Churchfields Road, taking account of the absolute predicted noise level and prevailing noise levels is none to negligible (Low). This is unchanged when pole cutting operations are being undertaken.

Out of Hours Works (22:00-05:00)

6.18 Out of hours works only involve vehicle movements and no yard operations. Generally, this only involves 1 LGV/HGV vehicle – leaving to go to site then returning. The poles are loaded during normal operational hours only.

6.19 At Clock House Road receptors the predicted Specific Sound Level ranges from 28 to 31dB $L_{Aeq,15mins}$. When account is taken of prevailing noise level at that residents would be indoors, zero rating penalty has been applied. The predicted BS4142 impact with context is considered to be negligible.

6.20 At Chuchfields Road receptors the predicted Specific Sound Level ranges from 25 to 38dB L_{Aeq}, 15min. When account is taken of prevailing noise level at that residents would be indoors, zero

rating penalty has been applied. The predicted BS4142 impact with context is considered to be negligible.

Weekend Operations Saturday 07:30-16:00, Sunday 08:00-13:00

6.21 During weekend operations where vehicles are loaded the predicted Specific Sound Levels are predicted to not exceed 40dB $L_{Aeq,1h}$ at receptor locations. Taking account of the absolute sound level and prevailing ambient noise levels zero rating penalty has been applied.

6.22 The predicted impact from loading operations during the weekend period at Clock House Road receptors is predicted to be none to negligible (low) and at Churchfields Road none.

L_{AFmax}

6.23 Although not specifically part of BS4142, consideration has been given to L_{AFmax} during the night-time period and potential for sleep disturbance. The World Health Organisation (WHO) recommend that L_{AFmax} should not exceed 45dB L_{AFmax} internally more than 10-15 time per night to avoid sleep disturbance.

6.24 During the night-time period, the only operations are vehicle movements. No yard operations are undertaken during the night-time period.

6.25 The measured L_{AFmax} from on-site measurement of LGV 1 tonne flatbed vehicle was 62dB L_{AFmax} at 4 metres. For assessment purpose and within the CadnaA noise model was historic noise measurement data of a HGV by-pass measured at an industrial waste facility (82dB L_{AFmax} @ 2m). Based on this historic data this would result in an L_{AFmax} noise level at the nearest receptor on Churchfields Road located at approximately 15m from the access road of 64dB L_{AFmax}. This would result in an internal noise level of +4dB above the WHO criteria should the bedroom be facing the road and window open. This is no different to a HGVs currently travelling along Churchfields Road. Further to this, the number of HGV movements during the night-time period is low, ranging from 1 to 4. Movement of the LGV 1 tonne flatbed vehicle would be significantly below this level.

6.26 At receptors on Clock House Road, located approximately 65 metres from on-site LGV/HGV movements, the predicted L_{AFmax} noise level is 52dB L_{AFmax}. This is lower than prevailing L_{AFmax} levels due to rail movements and also would not result in exceedance of the WHO criteria of 45dB L_{AFmax} within bedrooms during the night-time period.

7. Summary & Conclusions

7.1 A BS4142 assessment has been undertaken of the operations associated with the scaffolding equipment storage/distribution yard at Churchfield Road east of Churchfields Re-Use & Recycling facility. The assessment is based on baseline noise measurements undertaken by Clements Acoustics prior to the operation of the scaffolding equipment storage/distribution yard and source noise measurements at the Site undertaken by Waterman Infrastructure & Environment (WIE). This has been further informed by baseline noise measurements undertaken by WIE covering the weekend period outside of operation of the scaffolding equipment storage/distribution yard.

7.2 The baseline survey undertaken by Clements Acoustics established a background sound level of 42dB(A) during the operational hours of the facility and 30dB(A) during the night-time period. Additional baseline noise measurements by WIE established a background sound level of 40dB(A) during the daytime weekend operational hours period. It is against these background sound levels that the BS4142 assessment has been undertaken.

7.3 The BS4142 assessment has been revised to that undertaken by Clements Acoustics, which was based on a diesel-powered FLT and measurements conducted at a different scaffolding facility. The revised assessment undertaken by WIE is based on current operations at the Site which includes the use of 2 electric FLTs. With regard to HGV movements, WIE have used historic data taken at an industrial recycling facility as it was only possible to measure by-pass events from a 1 tonne LGV flatbed vehicle at the time of the survey.

7.4 The nearest sensitive receptors to the Site are houses on Clock House Road located east of the railway line and houses on Churchfields Road. At Clock House Road the dominant source is rail noise whereas at Churchfields Road the dominant source is road traffic noise together with noise from Churchfields Re-Use & Recycling facility. Noise from the Re-Use and Recycling facility which uses a JCB to move material and push it down into skips was clearly discernible at the Application Site.

7.5 The assessment is of 4 operational periods:

- Vehicle movements between 06:30-07:00 Monday to Friday (max of 3 vehicles in 15 minutes) – **None to negligible impact.**
- Yard operations Monday to Friday 07:00-18:30 (includes max of 4 vehicle movements in 1-hour) – **None to negligible at Churchfields Road and negligible to small impact at Clock House Road. This assumes localised screening provided around cut-saw bench.**
- Out side of operational hours works 22:00-05:00, (1 LGV/HGV movement in a 15-minute period, no yard operations). **Negligible impact at Clock House Road and negligible to small impact at Churchfields Road.**
- Weekend works loading LGVs/HGVs, Saturday 07:30-16:00 and Sunday 08:00-13:00 (Same hours as Re-Use & Recycling facility). **None to negligible (low) impact during loading operations at the weekend.**

7.6 With regard to L_{AFMax} levels during the night-time period, at the nearest receptor to the access road there is the potential for WHO criteria of 45dB L_{AFmax} to be exceeded (+4dB) in a bedroom facing the road with an open window. This would only occur a maximum of 4 times and is comparable to current exposure from HGVs moving along Churchfields Road during the night-time period. At Clock House Road this is not predicted to be exceeded.

7.7 It should be noted that the BS4142 assessment results are comparable to that established by Clements Acoustics, essentially a low impact when context is taken into account.

7.8 In conclusion, taking account of the prevailing noise levels, predicted source noise levels at receptor locations based on noise measurements of current operations on-site, with provision of localised screening around the cut-saw bench, which is used infrequently, this B8 usage operations does not adversely affect the existing residential amenity of the area.

Appendices

A. Glossary of Acoustic Terminology

AAWT-18h	Annual Average Week Day Traffic over the time period 0600-0000. Only includes Monday to Friday data.
Ambient sound	The totally encompassing sound in a given situation at a given time, usually composed of sound from all sources near and far.
Assessment period	The period in a day over which assessments are made.
A-weighting	A frequency weighting applied to measured or predicted sounds levels in order to compensate for the non-linearity of human hearing.
Background noise	Background noise is the term used to describe the noise measured in the absence of the noise under investigation. It is described as the average of the minimum noise levels measured on a sound level meter and is measured statistically as the A-weighted noise level exceeded for ninety percent of a sample period. This is represented as the L_{90} noise level (see below).
Background Sound Level dB $L_{A90,T}$	A-weighted sound pressure level that is exceeded by the residual sound at the assessment location for 90% of a given time interval, T, measured using time weighting F and quoted to the nearest whole number of decibels.
Broadband	Containing the full range of frequencies.
C_{TR}	An adjustment to the Rw scale to take account of the lower performance against a typical spectrum of road traffic noise dominated by low frequencies.
Decibel [dB]	The level of noise is measured objectively using a Sound Level Meter. This instrument has been specifically developed to mimic the operation of the human ear. The human ear responds to minute pressure variations in the air. These pressure variations can be likened to the ripples on the surface of water but of course cannot be seen. The pressure variations in the air cause the eardrum to vibrate and this is heard as sound in the brain. The stronger the pressure variations, the louder the sound that is heard. The range of pressure variations associated with everyday living may span over a range of a million to one. On the top range may be the sound of a jet engine and on the bottom of the range may be the sound of a pin dropping. Instead of expressing pressure in units ranging from a million to one, it is found convenient to condense this range to a scale 0 to 120 and give it the units of decibels. The following are examples of the decibel readings of every day sounds: Four engine jet aircraft at 100m 120 dB Riveting of steel plate at 10m 105 dB Pneumatic drill at 10m 90 dB Circular wood saw at 10m 80 dB Heavy road traffic at 10m 75 dB Telephone bell at 10m 65 dB Male speech, average at 10m 50 dB Whisper at 10m 25 dB Threshold of hearing, 1000 Hz 0 dB
dB(A): A-weighted decibels	The ear is not as effective in hearing low frequency sounds as it is hearing high frequency sounds. That is, low frequency sounds of the same dB level are not heard as loud as high frequency sounds. The sound level meter replicates the human response of the ear by using an electronic filter which is called the 'A' filter. A sound level measured with this filter switched on is denoted as dB(A). Practically all noise is measured using the A filter. The sound pressure level in dB(A) gives a close indication of the subjective loudness of the noise.
$D_{ne,w}$	Weighted element normalised level difference.
Façade Noise Level	A noise level measured or predicted at the façade of a building, typically at a distance of 1m, containing a contribution made up of reflections from the façade itself (+3 dB).
Free Field Noise Level	A noise level measured or predicted which is unaffected by reflections, generally taken as being 3m from any reflecting surface excepting the ground.

L_{Amax} noise level	This is the maximum noise level recorded over the measurement period.
L_{Amin} noise level	This is the lowest level during the measurement period.
$L_{Aeq,T}$ noise level	This is the 'equivalent continuous A-weighted sound pressure level, in decibels' and is defined in British Standard 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, noise from industrial premises and is the most suitable unit for the description of other forms of environmental noise.
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 quieter periods. It is often referred to as the background noise level and is used in the assessment of disturbance from industrial noise.
L_{A10} noise level	This is the noise level which is achieved for 10% of the monitoring period and is often used to describe road traffic noise.
PPV	Ground vibration is measured in terms of Peak Particle Velocity (PPV) with units in mm/s. It should be noted that the PPV refers to the movement within the ground of molecular particles and not surface movement. The displacement value in mm refers to the movement of particles at the surface (surface movement).
Rating Level, dB $L_{Ar,Tr}$	Specific sound level plus any adjustment for the characteristic features of the sound.
Residual Sound	Ambient sound remaining at the assessment location when the specific sound source is supressed to such a degree that it does not contribute to the ambient sound source.
Sound Reduction Index (R)	The sound reduction index is a single-number rating of the sound reduction through a wall or other building element. Since the sound reduction may be different at different frequencies, test measurements are subjected to a standard procedure which yields a single number that is about equal to the average sound reduction in the middle of the human hearing range.
Specific Sound Level, $LA_{eq,Tr}$	Equivalent continuous A-weighted sound pressure level produced by the specific sound source at the assessment location over a given time interval T.
Weighted Sound Reduction Index dB R_w	Single number rating used to describe the laboratory airborne sound insulation properties of a material or building element over a range of frequencies, typically 100-3150Hz.

B. Environmental Noise Levels

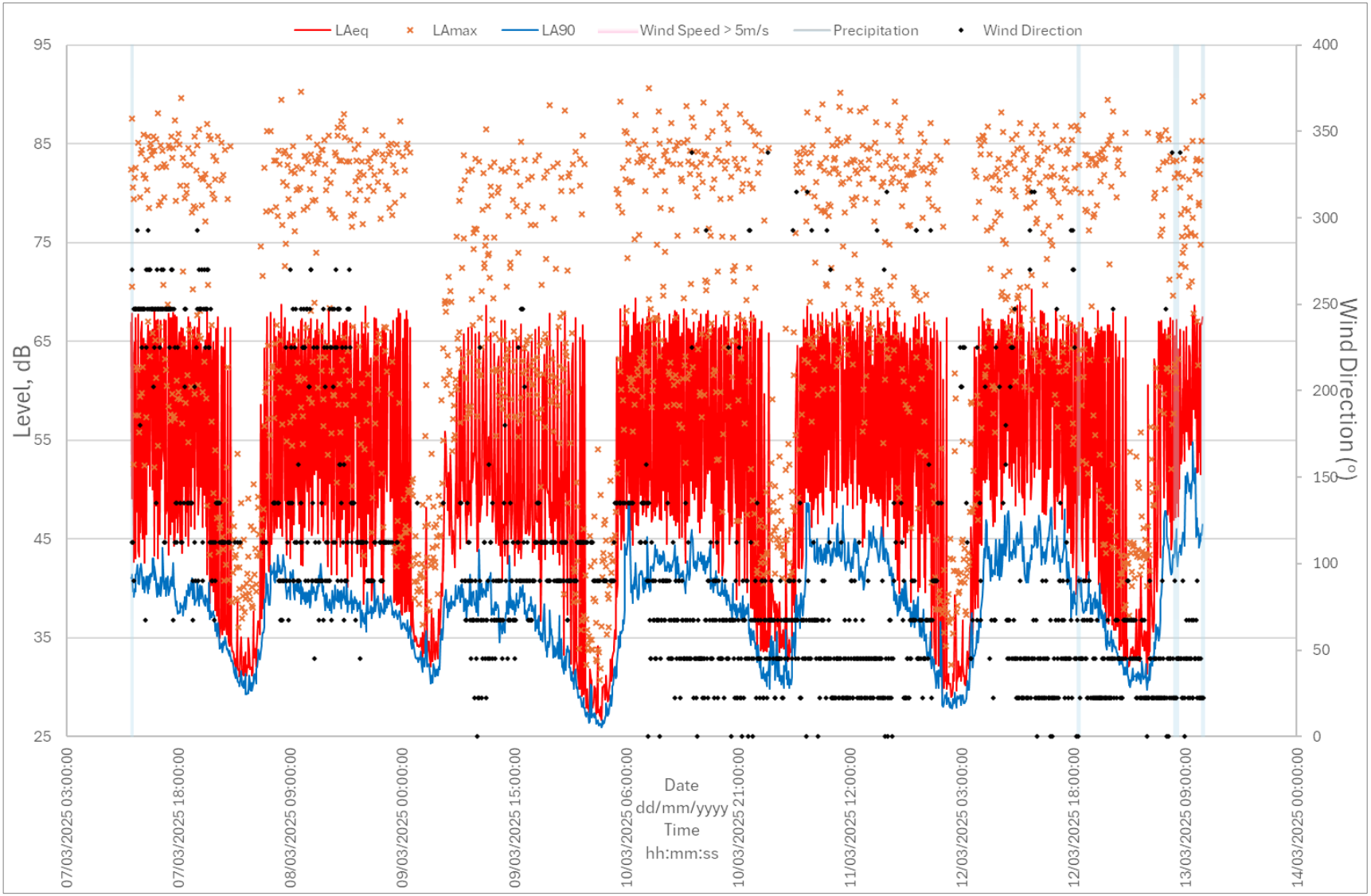
Table B-1 presents the equipment detail used in the environmental baseline noise survey.

Table B-1: Equipment Detail For Environmental Baseline Survey

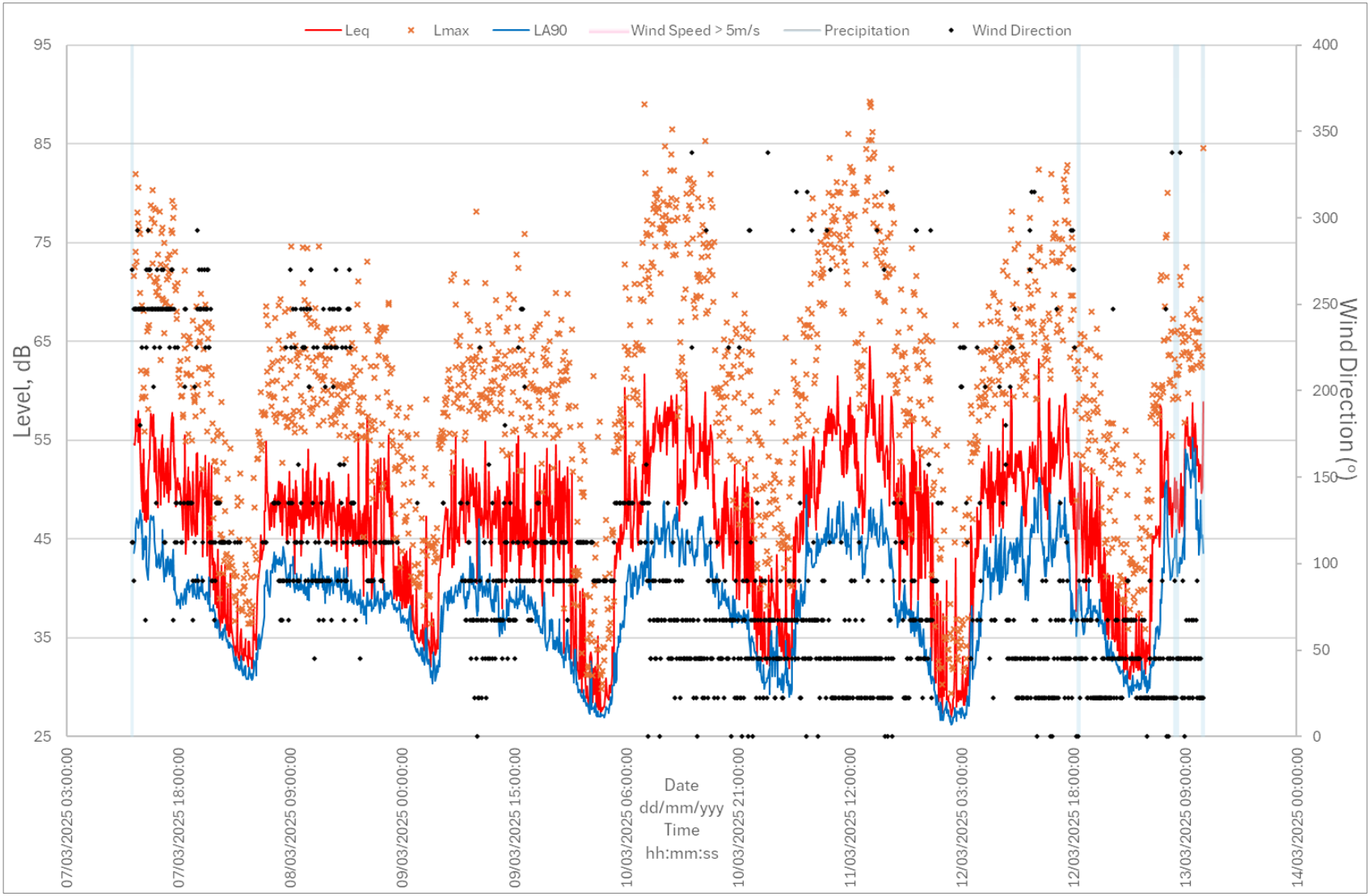
Location	Description	Serial Number	Date of Last Calibration
LT1 Eastern Rail Boundary	Rion NL-52 Type 1 Sound Level Meter	231657	21st April 2023 Certificate Number 1505168-1
	Rion NH-25 Pre-amplifier	21601	
	Rion UC-59 Microphone	04702	
LT2 Southern Maberley Road Playing Field Boundary	Rion NL-52 Type 1 Sound Level Meter	564807	11th April 2024 Certificate Number 1508401-3
	Rion NH-25 Pre-amplifier	64932	
	Rion UC-59 Microphone	09445	
LT1 & LT2	Acoustic Calibrator Rion NC-75	35270123	2nd December 2024 Certificate Number 1510597-3
ST1 Churchfields Road	Rion NL-52 Type 1 Sound Level Meter	00142643	18th November 2024 Certificate Number TCRT24/1834
	Rion NH-25 Pre-amplifier	32671	
	Rion UC-59 Microphone	06087	
ST1	Acoustic Calibrator Rion NC-74	35173533	18th November 2024 Certificate Number TCRT24/1834

Graph B1 presents the time history plot of measured noise levels and weather details for LT1 Rail Boundary.

Graph B1: Time History Plot LT1 Eastern Rail Boundary & Weather Details



Graph B2: Time History Plot LT2 Southern Maberley Road Playing Field Boundary & Weather Details



C. Operational Noise Levels

Table C-1 presents details of the equipment used for measurement of operational noise.

Table C-1: Equipment Detail of Noise Measurement Equipment

Location	Description	Serial Number	Date of Last Calibration
All	Rion NL-52 Type 1 Sound Level Meter	00142643	28th November 2024 Certificate Number TCRT24/1874
	Rion NH-25 Pre-amplifier	32671	
	Rion UC-59 Microphone	06087	
All	Acoustic Calibrator Rion NC-74	35173533	18th November 2024 Certificate Number TCRT24/1834

BS4142 Annex C (informative) Objective method for assessing the audibility of tones in sound: One-third octave method states:

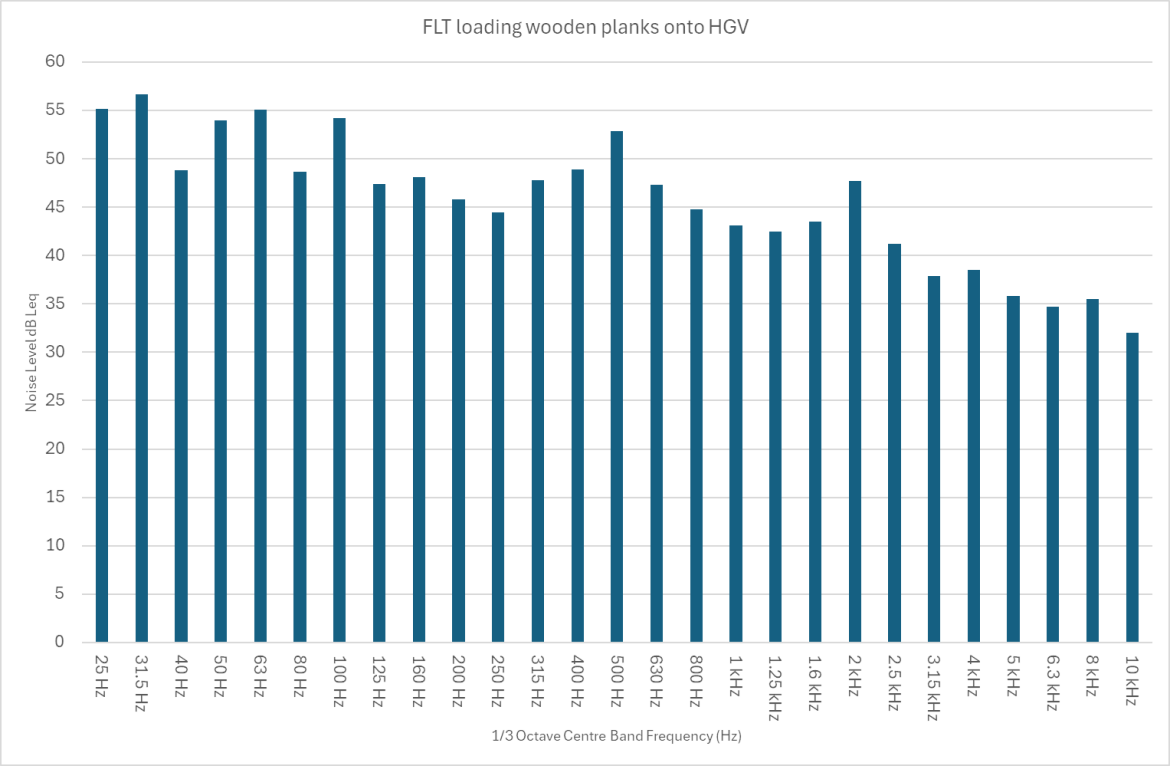
For a prominent, discrete tone to be identified as present, the time-averaged sound pressure level in the one-third-octave band of interest is required to exceed the time-averaged sound pressure levels of both adjacent one-third-octave bands by some constant level difference.

The level differences between adjacent one-third-octave bands that identify a tone are:

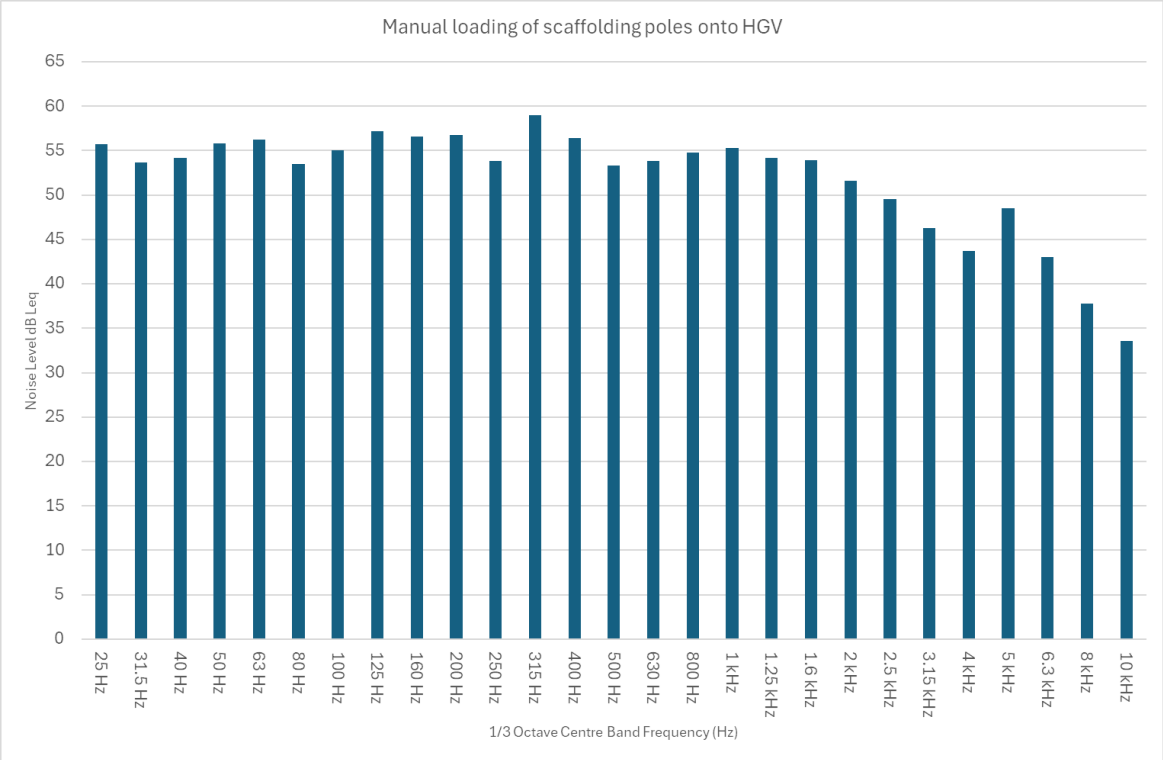
- *15 dB in the low-frequency one-third-octave bands (25 Hz to 125 Hz);*
- *8 dB in middle-frequency one-third-octave bands (160 Hz to 400 Hz);*
- *5 dB in high-frequency one-third-octave bands (500 Hz to 10 000 Hz).*

The following graphs present the measured 1/3 octave Leq noise levels for the various operational activities. None exhibit a significant tone as defined in Annex C of BS4142.

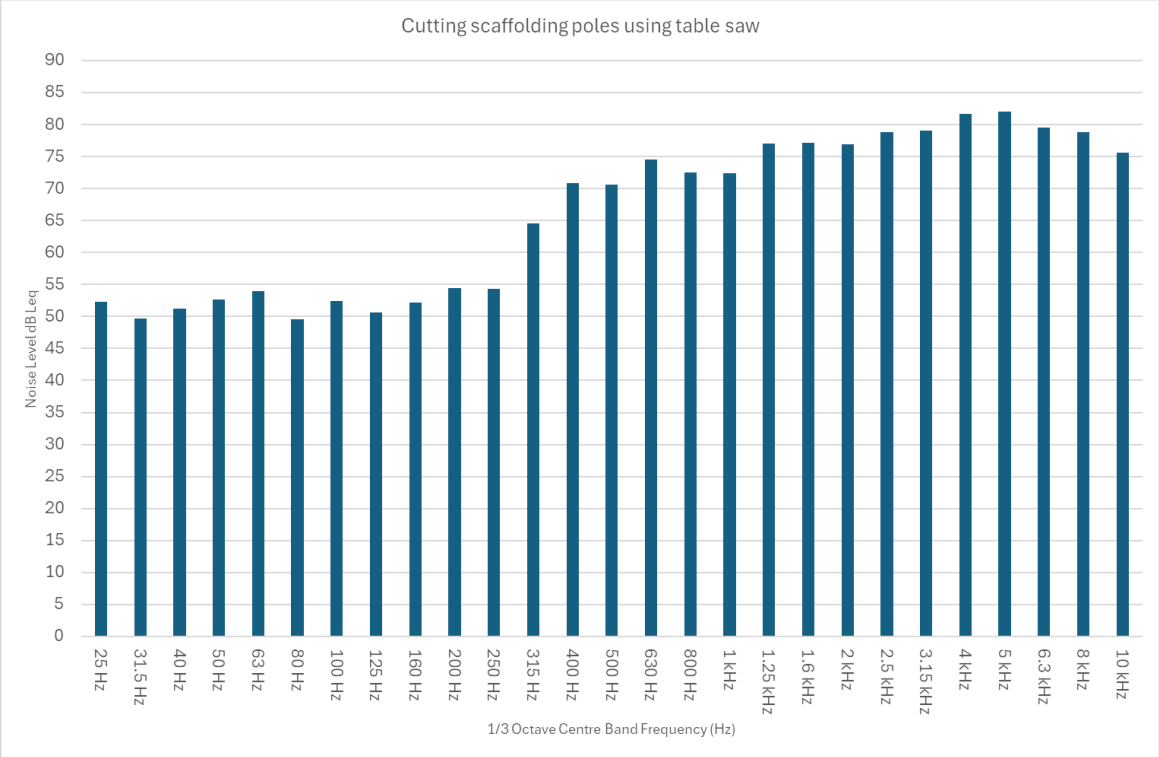
Graph C1: 1/3 Octave FLT Loading Wooden Planks Onto HGV



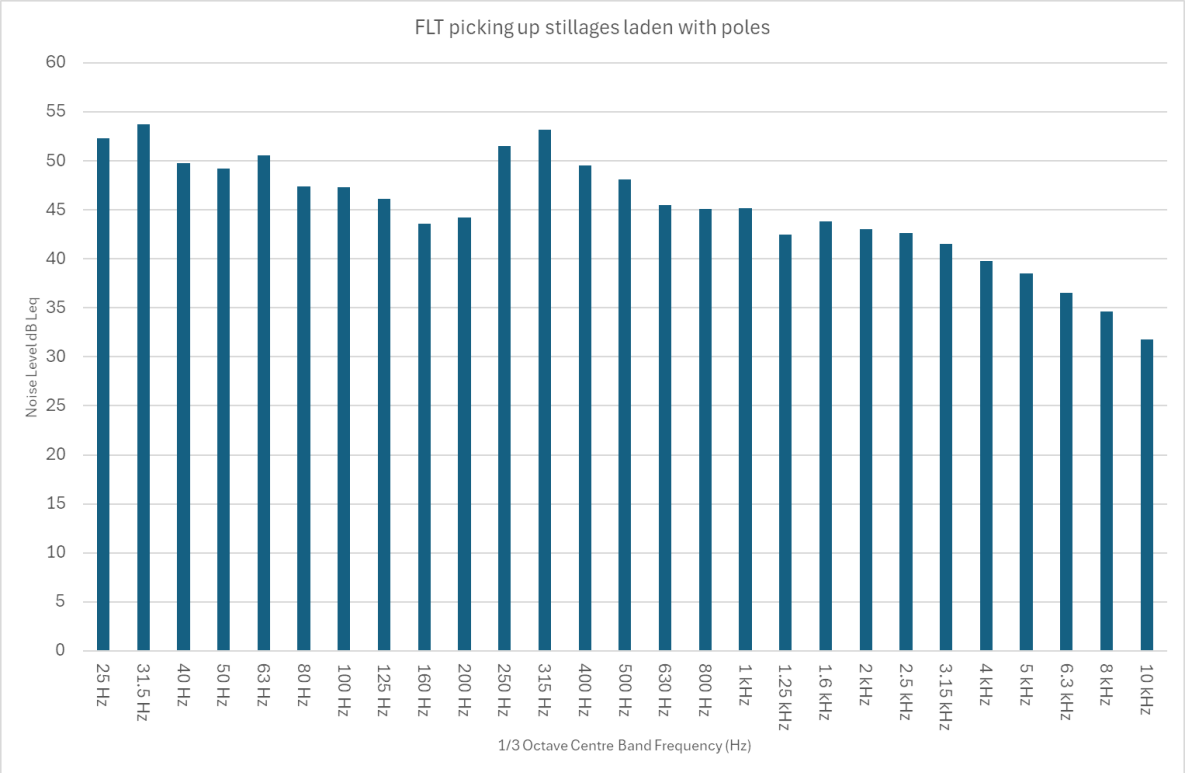
Graph C-2: Manual Loading of Scaffolding Poles Onto HGV



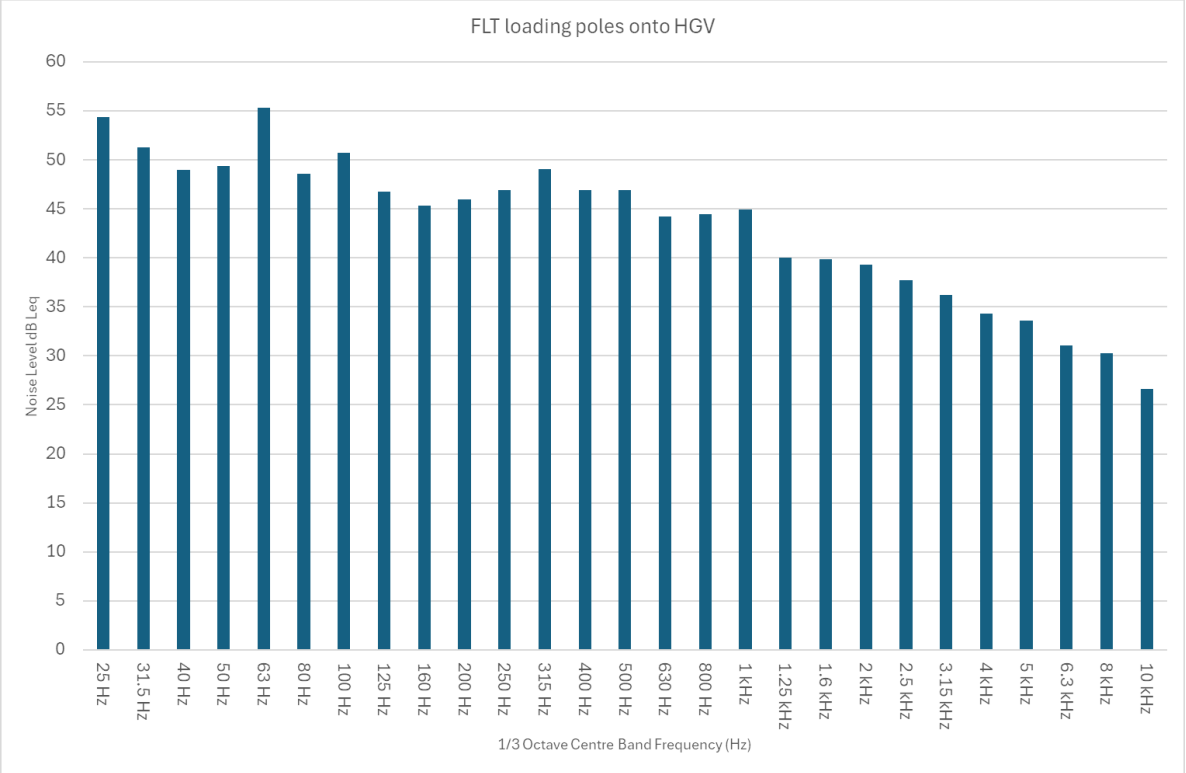
Graph C-3: Cutting Scaffolding Poles Using Table Saw



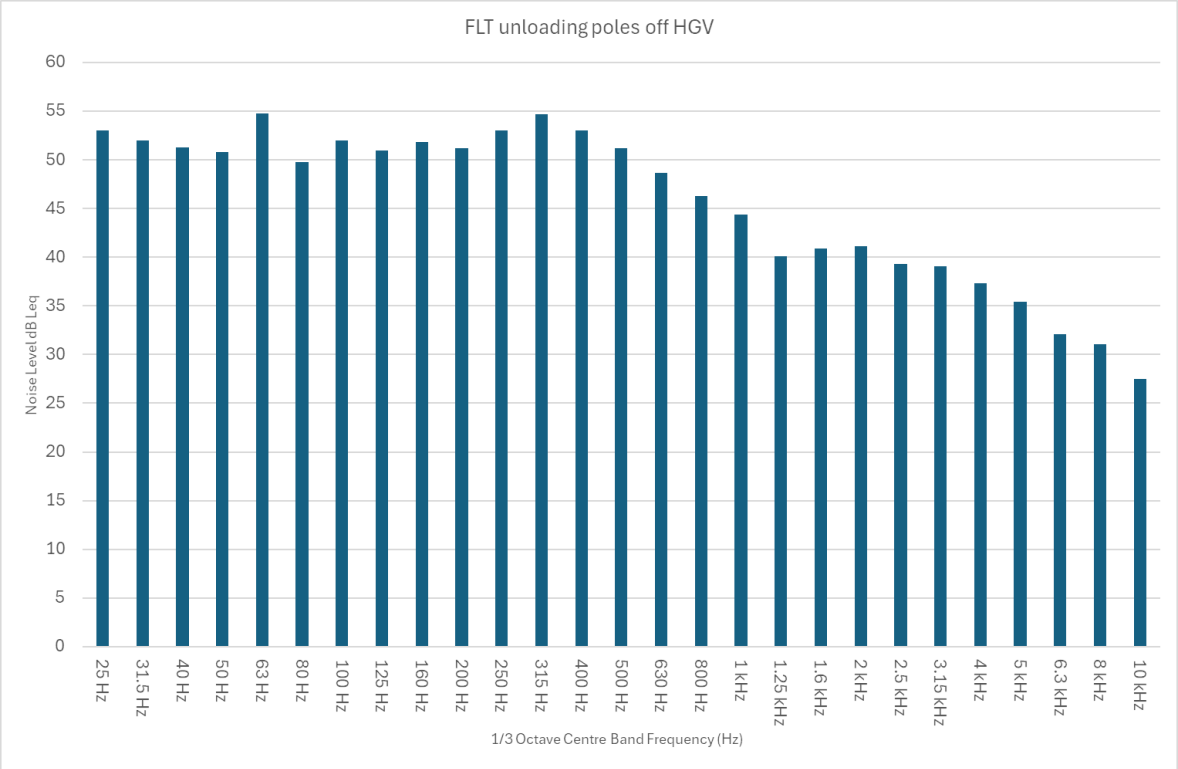
Graph C-4: FLT Picking Up Stillage Laden With Poles



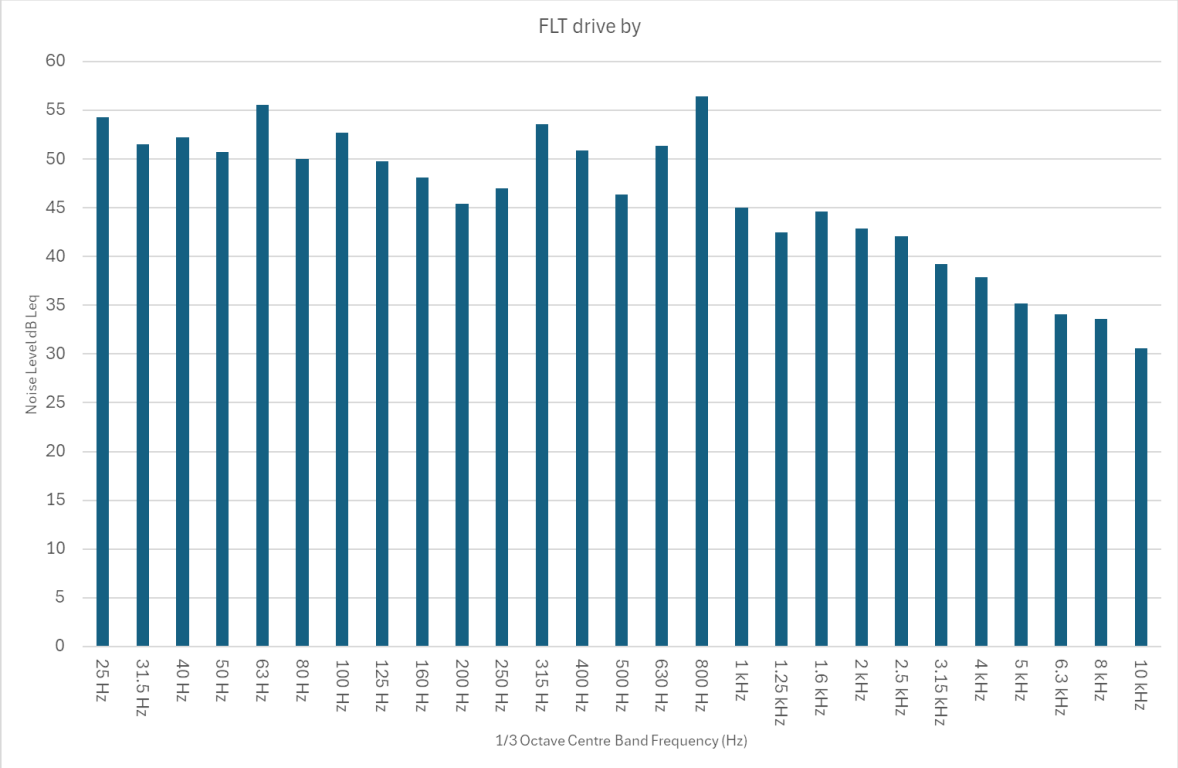
Graph C-5: FLT Loading Poles Onto HGV



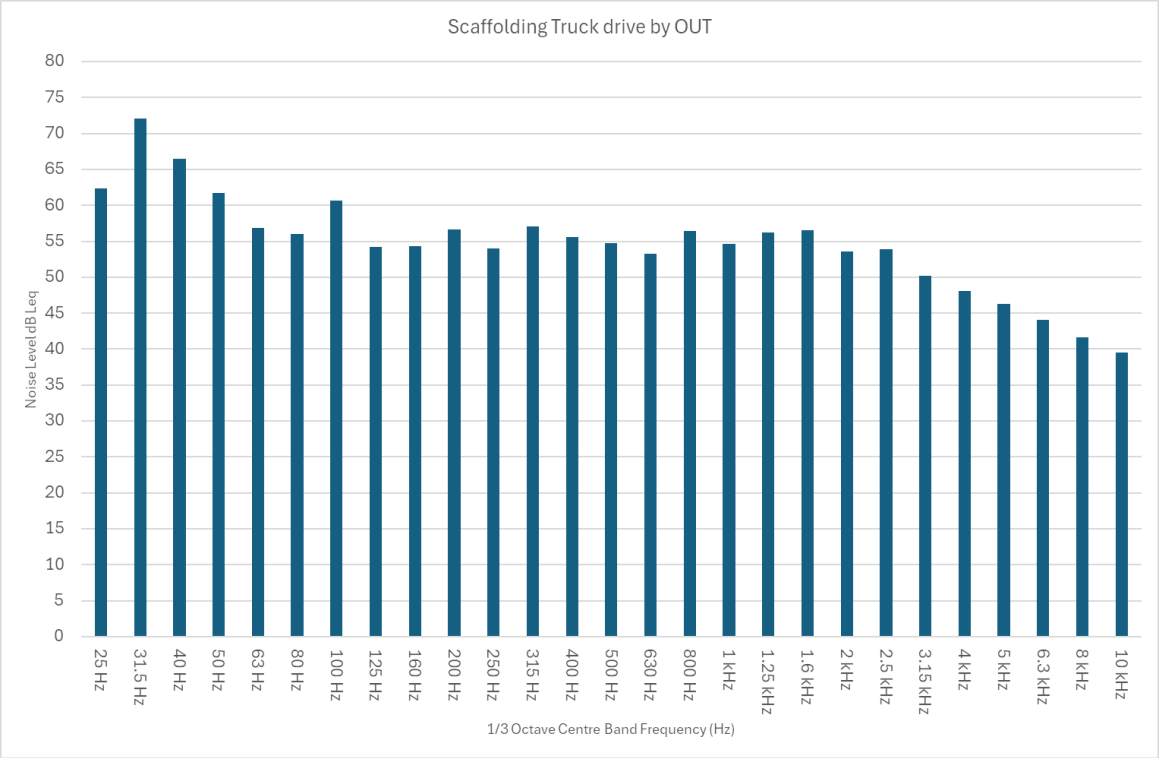
Graph C-6: FLT Unloading Poles Off HGV



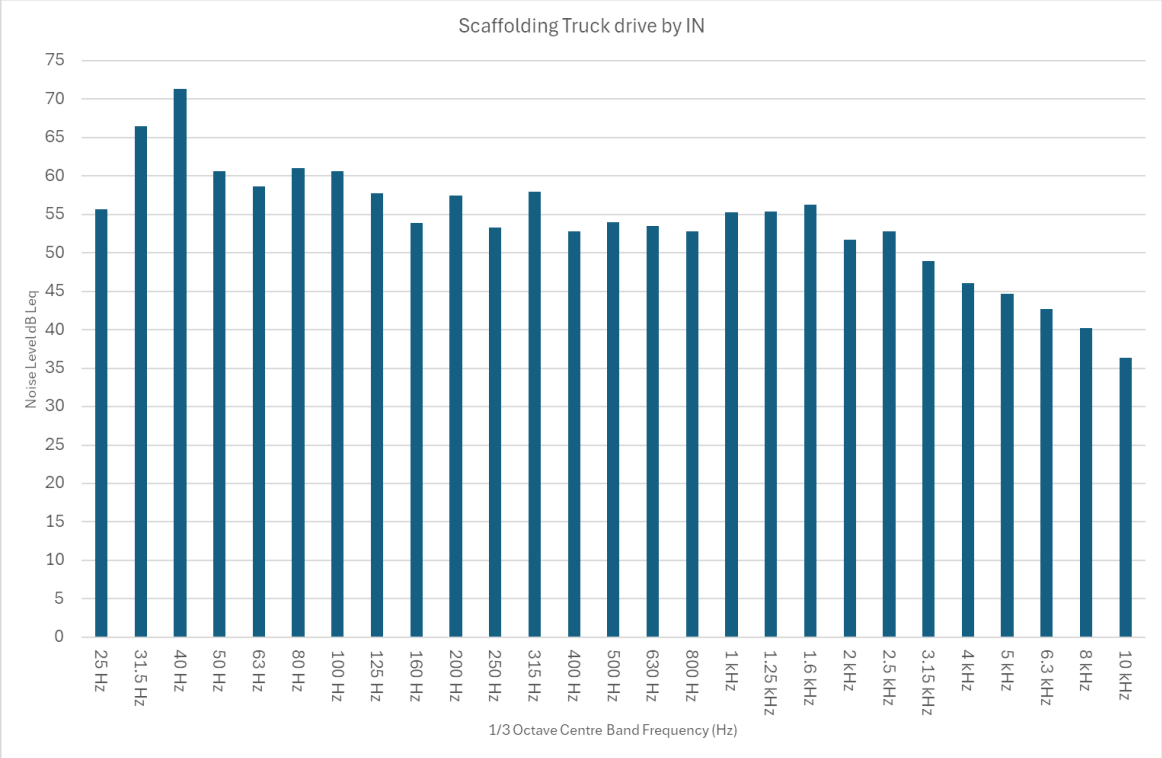
Graph C-7: FLT Drive By



Graph C-8: Scaffolding 1 Tonne LGV Flatbed Vehicle Drive By Out



Graph C-9: Scaffolding 1 Tonne LGV Flatbed Vehicle Drive By In



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