



**ACOUSTIC**  
CONSULTANTS LTD

# Noise Impact Assessment

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**Specsavers Holmfirth  
71 Huddersfield Road, Holmfirth**

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**Reference: 11899/OP**

**Client**



**Document Control**

<b>Version:</b>	<b>Revision Description:</b>	<b>Date:</b>	<b>Author:</b>	<b>Reviewed by:</b>	<b>Approved by:</b>
1.0	First Issue	16/02/2026	Ollie Platts, AMIOA	Blake Lucas, MIOA	Blake Lucas, MIOA

The report has been prepared in good faith, with all reasonable skill and care, based on information provided or available at the time of its preparation and within the scope of work agreement with the Client. We disclaim any responsibility to the Client and others in respect of any matters outside the scope of the above. The report is provided for the sole use of the named Client and is confidential to them and their professional advisors. No responsibility is accepted to other parties.

The report limits itself to addressing solely on the noise, acoustic, and vibration aspects as included in this report. We provide advice only in relation to noise, vibration and acoustics. It is recommended that appropriate expert advice is sought on all the ramifications (e.g. CDM, structural, condensation, fire, legal, etc.) associated with any proposals in this report or as advised and concerning the appointment. It should be noted that noise predictions are based on the current information as we understand it and, on the performances noted in this report. Any modification to these parameters can alter the predicted level. All predictions are in any event subject to a degree of tolerance of normally plus or minus three decibels. If this tolerance is not acceptable, then it would be necessary to consider further measures.

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# 1. Introduction

Specsavers appointed Acoustic Consultants Limited to undertake a noise impact assessment of external plant associated with the proposed Specsavers store to be located at 71 Huddersfield Road, Holmfirth, HD9 3AZ.

This report provides a noise impact assessment of the proposed store plant at the nearest existing noise sensitive receivers (NSRs).

The noise impact assessment is based on the results of an on-site noise survey and sound level predictions using manufacturer's plant data.

The noise impact assessment has been undertaken in accordance with the guidance in the National Planning Policy Framework (NPPF), Noise Policy Statement for England (NPSE), Planning Practice Guidance (PPG), British Standard 4142:2014+A1:2019 (BS4142) and British Standard 8233:2014 (BS8233).

## 2. Site and Location

The proposed site is located at 71 Huddersfield Road, Holmfirth. One condenser unit is being proposed, the unit will be located in a timber bin store on the side elevation of the premises at ground floor level.

Noise from the condenser unit has the potential to affect the existing residential dwellings surrounding the proposed store, particularly the first-floor flats above.

The nearest NSRs to the plant are understood to be the first-floor dwellings located directly above the store as well as the dwellings located to the rear on Carr House Road and Hightown Lane.

The following figure shows the site location, plant locations and location of the nearest NSRs.

Figure 1: Site Location, Plant Locations and NSR locations



## 3. Planning and Noise

### 3.1. National Planning Policy Framework

The National Planning Policy Framework (NPPF) was published in March 2012 and revised in December 2024. Section 15 entitled 'Conserving and enhancing the natural environment' addresses noise as a requirement of planning. Paragraph 187 states:

*"187. Planning policies and decisions should contribute to and enhance the natural and local environment by:*

*e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans; and."*

Paragraph 198 states:

*"198. 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; and*
- c) limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation. "*

The document does not prescribe any assessment methodology or criteria to assess the adverse effect of noise and refers you to the NPSE.

### 3.2. Noise Policy Statement for England

The NPPF refers to the Noise Policy Statement for England (NPSE). This was published in March 2010 and aims to provide clarity regarding current policies and practices to enable noise management decisions to be made within the wider context, at the most appropriate level, in a cost-effective manner and in a timely fashion and applies to all forms of noise including environmental noise, neighbour noise and neighbourhood noise.

The NPSE sets out the long term vision of Government noise policy. This long term vision is supported by three noise policy aims as follows:

*"Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:*

- *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."*

The NPSE introduces the concept of "Significant adverse" and "Adverse" impacts of noise which relate to the noise policy aims. These are applied as follows:

#### NOEL – No Observed Effect Level

This is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise.

#### LOAEL – Lowest Observed Adverse Effect Level

This is the level above which adverse effects on health and quality of life can be detected.

#### SOAEL – Significant Observed Adverse Effect Level

This is the level above which significant adverse effects on health and quality of life occur.

The Noise Policy Statement for England (NPSE) states that noise levels above the Lowest Observed Adverse Effect Level are acceptable in planning where reduced to a minimum.

With regard to where there is potential for noise impact it states the following in relation to the second noise policy aim:

*"The second aim of the NPSE refers to the situation where the impact lies somewhere between LOAEL and SOAEL. It requires that all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life while also taking into account the guiding principles of sustainable development (paragraph 1.8). This does not mean that such adverse effects cannot occur."*

The NPSE does not provide any assessment criteria for the noted effect levels and each case must be considered on its merits.

The NPSE does, however, emphasise that in dealing with noise Local Planning Authorities are required to take a balanced approach in considering the benefits of development as against any adverse effects which arise. Paragraph 2.18 of the NPSE is particularly relevant in this respect and states:

*"There is a need to integrate consideration of the economic and social benefits of the activity or policy under examination with proper consideration of the adverse environmental effects, including the impact of noise on health and quality of life. This should avoid noise being treated in isolation in any particular situation, i.e. not focusing solely on the noise impact without taking into account other related factors."*

The planning need is outside the scope of noise and acoustics and will need to be addressed by others.

### **3.3. Planning Practice Guidance, Noise**

The Planning Practice Guidance (PPG) on noise referred to here is based on the current version (July 2019) as provided on the Planning Guidance Website. It states that, *"Noise needs to be considered when new developments may create additional noise and when new developments would be sensitive to the prevailing acoustic environment."*

It provides generic guidance on how to determine the noise impact and what factors could be a concern.

It includes the option types to mitigate any adverse effects of noise stating that there are four broad types of mitigation. These are engineering, layout, using planning conditions or obligations and noise insulation.

Paragraph 5 of the PPG provides a table identifying the effect level and examples of effect relating to the impact effect levels provided in the NPSE. The table is duplicated below:

Table 1: PPG Noise – Perception of Effect Levels

Perception	Examples of Outcomes	Increasing Effect Level	Action
<b>No Observed Effect Level</b>			
Not present	No Effect	No Observed Effect	No specific measures required
<b>No Observed Adverse Effect Level</b>			
Present and not intrusive	Noise can be heard, but does not cause any change in behaviour, attitude or other physiological response. Can slightly affect the acoustic character of the area but not such that there is a change in the quality of life	No Observed Adverse Effect	No specific measures required
<b>Lowest Observed Adverse Effect Level</b>			
Present and intrusive	Noise can be heard and causes small changes in behaviour, attitude or other physiological response, 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 small actual or perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
<b>Significant Observed Adverse Effect Level</b>			
Present and disruptive	The noise causes a material change in behaviour, attitude or other physiological response, 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	Extensive and regular changes in behaviour, attitude or other physiological response and/or an inability to mitigate effect of noise leading to psychological stress, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory.	Unacceptable Adverse Effect	Prevent

The table does not provide any objective assessment which equates to the noted effect levels. However, the PPG identifies that where noise is audible, it is not necessarily intrusive. The effect and impact on people are based primarily on the level of noise.

## 4. Assessment Criteria

### 4.1. British Standard 4142:2014

The following section identifies guidance which is considered to provide noise criteria equivalent to or below the LOAEL described in the PPG and NPSE, i.e. *"Noise can be heard, but does not cause any change in behaviour, attitude or other physiological response. Can slightly affect the acoustic character of the area but not such that there is a change in the quality of life."*

For industrial and commercial noise, the most relevant guidance is provided within British Standard 4142:2014+A1:2019. The methods described in the British Standard use outdoor sound levels to assess the likely effects of sound upon people who might be inside or outside a dwelling or other premises used for residential purposes.

The initial estimate principle is that of establishing the 'difference' between the 'rating level' and the 'background sound level'. The 'rating level' is the 'specific sound level' of the source over a period of one hour during the day (07:00 to 23:00 hours) and over a period of 15 minutes during the night (23:00 to 07:00 hours). Clause 9 entitled 'Rating Level' states:

*"Certain acoustic features can increase the significance of impact over that expected from a basic comparison between the specific sound level and the background sound level. Where such features are present at the assessment location, add a character correction to the specific sound level to obtain the rating level."*

An acoustic character correction should be added to the 'specific sound level' if it exhibits any tonality, impulsivity, other specific characteristics and/or intermittency at the assessment location. The value of the character correction varies, dependent on the prominence of the character of the sound source at the assessment location. In Clause 11 of the Standard, entitled 'Assessment of the Impacts', it states:

*"Obtain an initial estimate of the impact of the specific sound by subtracting the measured background sound level (see Clause 8) from the rating level (see Clause 9), and consider the following."*

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

Based on the initial assessment outcomes of BS4142, and depending on context, it is our opinion that the NOEL, LOAEL and SOAEL levels stated in the Noise Policy Statement for England would generally fall within the following categories when considered in conjunction with the effect levels of the PPG Noise.

Table 2: BS4142 Difference in Relation to Effect Levels

<b>BS4142 Assessment Difference</b>	<b>Corresponding Effect Level*</b>	<b>Action*</b>
≤-10 dB	No Observed Effect	No specific measures required
-9.9 dB to 0 dB	No Observed Adverse Effect	No specific measures required
	Lowest Observed Adverse Effect Level	
0.1 dB to 5 dB	Observed Adverse Effect	Mitigate and reduce to a minimum
	Significant Observed Adverse Effect Level	
5.1 dB to 10 dB	Significant Observed Adverse Effect	Avoid
≥10.1 dB	Unacceptable Adverse Effect	Prevent

\* BS4142 states that “where the initial estimate of the impact needs to be modified due to the context, take all pertinent factors into consideration”. Therefore, the assessment levels and effect levels above are not definitive and can be modified due to context.

It should be noted that the numerical outcome only represents the initial estimate of impact, as stated in the first paragraph of Clause 11, and that contextual matters should be considered before determining what the potential impact is. This paragraph states:

*The significance of sound of an industrial and/or commercial nature depends upon both the margin by which the rating level of the specific sound source exceeds the background sound level and the context in which the sound occurs. An effective assessment cannot be conducted without an understanding of the reason(s) for the assessment and the context in which the sound occurs/will occur. When making assessments and arriving at decisions, therefore, it is essential to place the sound in context.*

*Obtain an initial estimate of the impact of the specific sound by subtracting the measured background sound level (see Clause [8](#)) from the rating level (see Clause [9](#)).*

*NOTE 1 More than one assessment might be appropriate.*

The second part of Clause 11 sets out three contextual matters that should be taken into account once the initial numerical estimate has been determined. It is important to note that the three listed are not exhaustive and all pertinent factors should be considered. BS 4142:2014 states:

*"Where the initial estimate of the impact needs to be modified due to the context, take all pertinent factors into consideration, including the following.*

- 1) Where background sound levels and rating levels are low, absolute levels might be as, or more, relevant than the margin by which the rating level exceeds the background. This is especially true at night. Where residual sound levels are very high, the residual sound might itself result in adverse impacts or significant adverse impacts, and the margin by which the rating level exceeds the background might simply be an indication of the extent to which the specific sound source is likely to make those impacts worse.*
- 2) The character and level of the residual sound compared to the character and level of the specific sound. Consider whether it would be beneficial to compare the frequency spectrum and temporal variation of the specific sound with that of the ambient or residual sound, to assess the degree to which the specific sound source is likely to be distinguishable and will represent an incongruous sound by comparison to the acoustic environment that would occur in the absence of the specific sound. Any sound parameters, sampling periods and averaging time periods used to undertake character comparisons should reflect the way in which sound of an industrial and/or commercial nature is likely to be perceived and how people react to it.*

*NOTE 3 Consideration ought to be given to evidence on human response to sound and, in particular, industrial and/or commercial sound where it is available. A number of studies are listed in the "Effects on humans of industrial and commercial sound" portion of the "Further reading" list in the Bibliography.*

## **4.2. Local Authority Guidance**

The following was provided by the Local Planning Authority, Kirklees Council:

*'Before construction work commences, a noise assessment report by a suitably competent person shall be submitted to and approved in writing by the Local Planning Authority. The report shall include:*

- 1. An assessment of all noise emissions from the proposed development.*
- 2. Details of existing background and predicted future noise levels at the boundary of the nearest noise-sensitive premises.*
- 3. A written scheme of how the occupants of the above-mentioned noise-sensitive premises will be protected from noise from the proposed development, including details of all necessary noise attenuation.*

*The development shall not be brought into use until all works comprised within the approved report have been carried out in full and such measures shall be thereafter retained.*

*Reason:*

*To ensure the proposed development does not cause harmful noise pollution within neighbouring noise-sensitive locations, in the interest of amenity, to comply with the aims and objectives of Policies LP24 and LP52 of the Kirklees Local Plan and Chapters 12 and 15 of the National Planning Policy Framework'*

### **4.3. Proposed Assessment Methodology**

Based on the correspondence with the Local Authority, our proposed methodology is to assess the cumulative rating level of the plant to BS4142:2014. As the plant is only operational during store opening hours, a shorter attended baseline noise survey has been completed and is expected to be sufficient to determine a representative background sound level.

## 5. Baseline Noise Monitoring

The plant will only operate during day hours only, as such baseline noise monitoring was undertaken at the site between 11:15hrs and 13:15hrs on Monday 9<sup>th</sup> February 2026 at the nearest accessible noise sensitive location.

### 5.1. Monitoring Equipment

Sound Pressure Levels were measured using a Class 1 sound level meter with a half-inch condenser microphone, using the 'fast' setting. The equipment is checked regularly using a Quality System meeting the requirements of British Standard EN ISO/IEC 17025:2017 "General requirements for the competence of testing and calibration laboratories"; in accordance with British Standard EN 10012:2003 "Measurement management systems. Requirements for measurement processes and measuring equipment"; and traceable to the National Standards.

This equipment was checked and calibrated as noted below and the certificates are available for inspection.

Table 3: Equipment Used and Calibration Dates

Equipment Description / Manufacturer / Type	Serial Number	Date of Calibration	Calibration Certification Number
SLM, NTI, XL3	A3A-02236-F0	06/01/2026	UK-26-001
Pre-Amp, NTI, MA230	2369	06/01/2026	UK-26-001
Microphone, NTI, MC230A	A32951	06/01/2026	UK-26-001
Calibrator, Cirrus Research, CR:515	84377	16/08/2024	220541

The measuring systems were checked for calibration before and after the tests and had no significant drift.

### 5.2. Weather Conditions

The weather during the survey was mostly dry with some intermittent light rain at the beginning of the measurement procedure. The temperature was approximately 9 degrees Celsius. Wind speed typically ranged from 3-5 m/s.

The weather conditions are not expected to have adversely affected the measured noise data.

### 5.3. Monitoring Procedure

A two-hour long attended noise survey was undertaken between 11:15 and 13:15 hours on Monday 9<sup>th</sup> February 2026 to determine the background sound levels in a location representative of the nearest NSRs to the proposed external plant.

The measurement was undertaken on Hightown Lane using a microphone mounted on a tripod at a height of 1.5m. The main noise source in the surrounding area originated from road traffic along Huddersfield Road, ~30m from the measurement position. The survey location was shielded from Huddersfield Road and as such representative of the NSRs close to the site.

The monitoring location is given in the figure below:

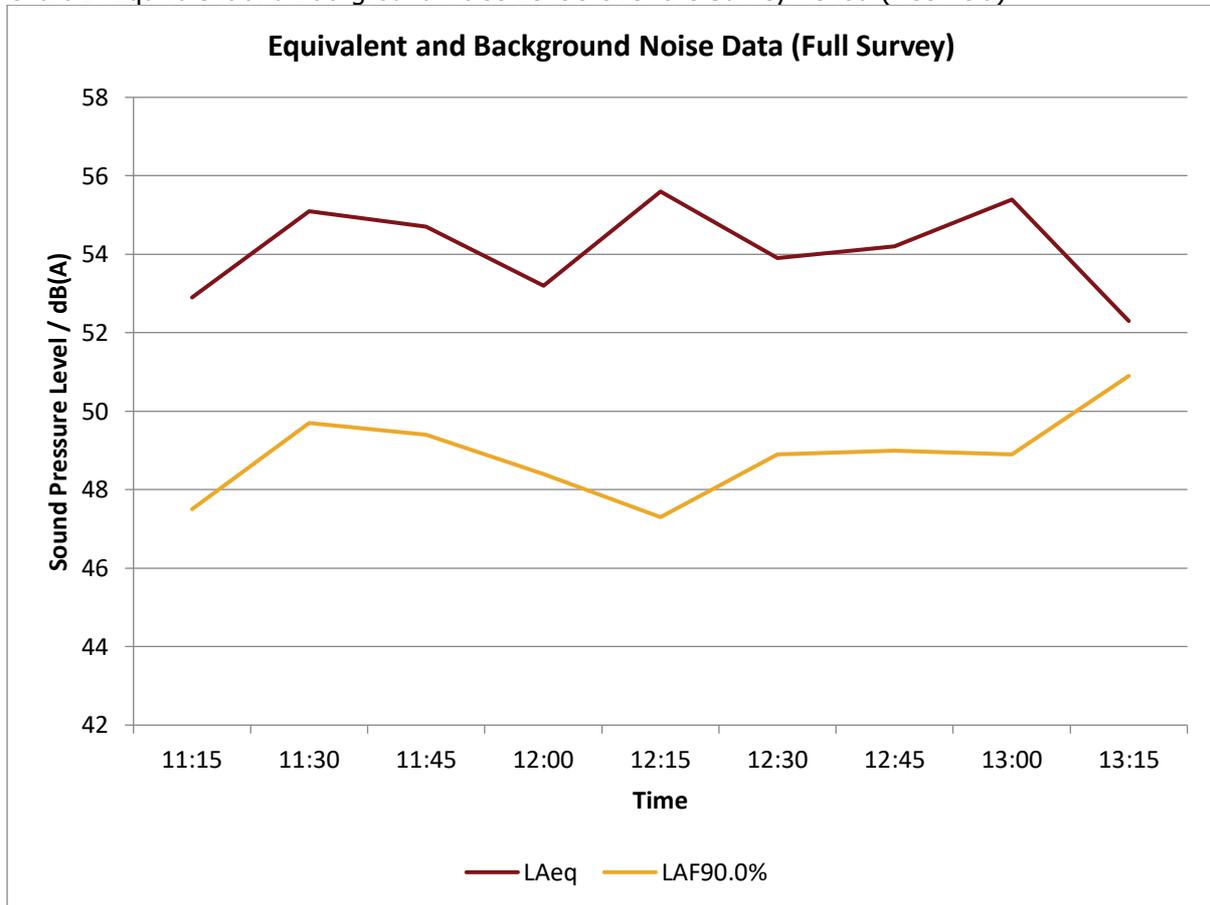
Figure 2: Monitoring Location



## 5.4. Measured Baseline Noise Levels

The chart below details the measured equivalent noise levels over the duration of the survey period.

Chart 1: Equivalent and Background Noise Levels Over the Survey Period (free-field)



The summary of measured data for the baseline noise survey consists of the equivalent noise level ( $L_{Aeq,15min}$ ) and background noise level ( $L_{A90,15min}$ ) in dB(A). These results are displayed in the table below.

Table 4: Measured Range and Modal Values of the Equivalent and Background (free-field level)

Period	dB $L_{A90,15min}$		dB $L_{Aeq,15min}$	
	Range	Mode	Range	Mode
Daytime (11:15 to 13:15)	47-51	49	52-56	54

We have determined a representative background sound level of 49 dB  $L_{A90(1hour)}$  at the nearest NSR during store opening hours.

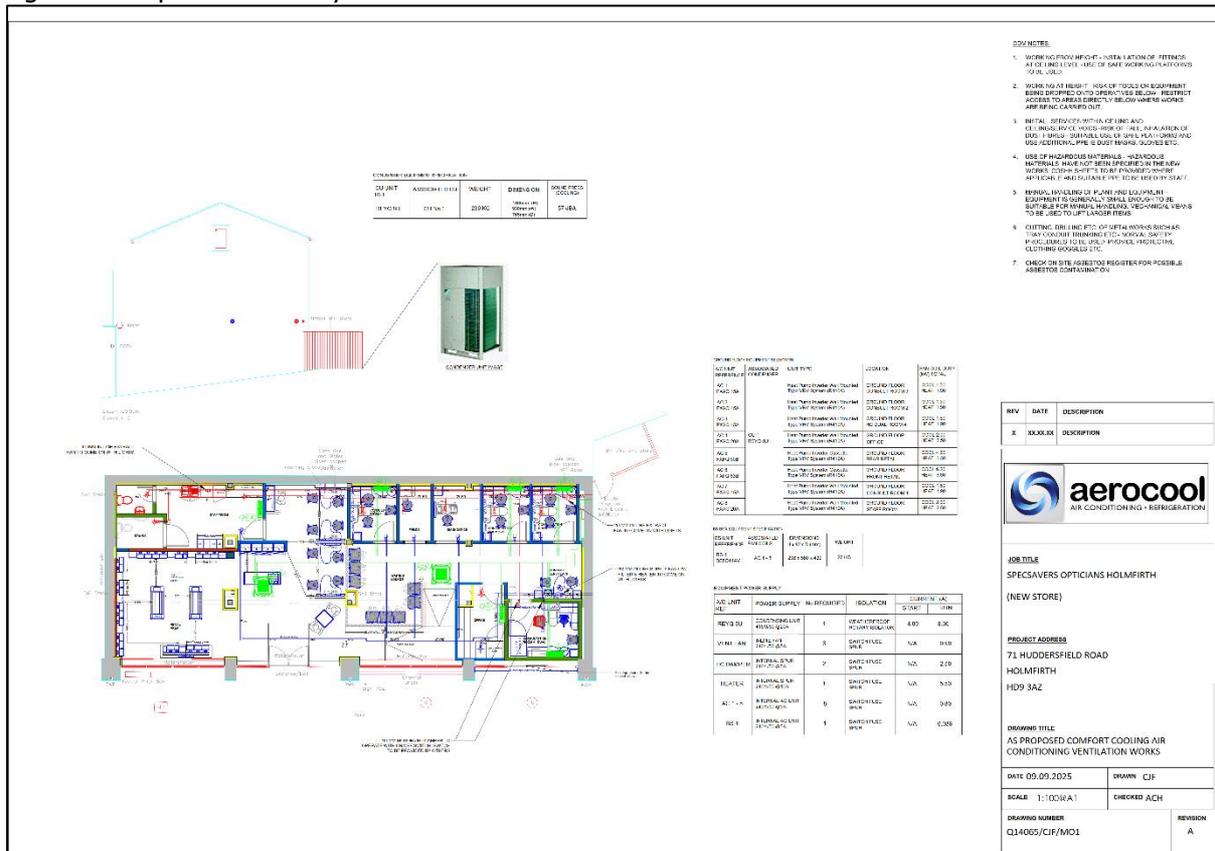
## 6. Plant Noise Predictions

### 6.1. Location of Plant

There is 1no. condenser unit proposed; this unit shall be located within an existing timber bin store on the side elevation of the store at ground floor level.

The following figure shows the proposed plant location.

Figure 3: Proposed Plant Layout



### 6.2. Proposed Plant

The following table shows the make, model and sound power level of the proposed condenser unit at the site:

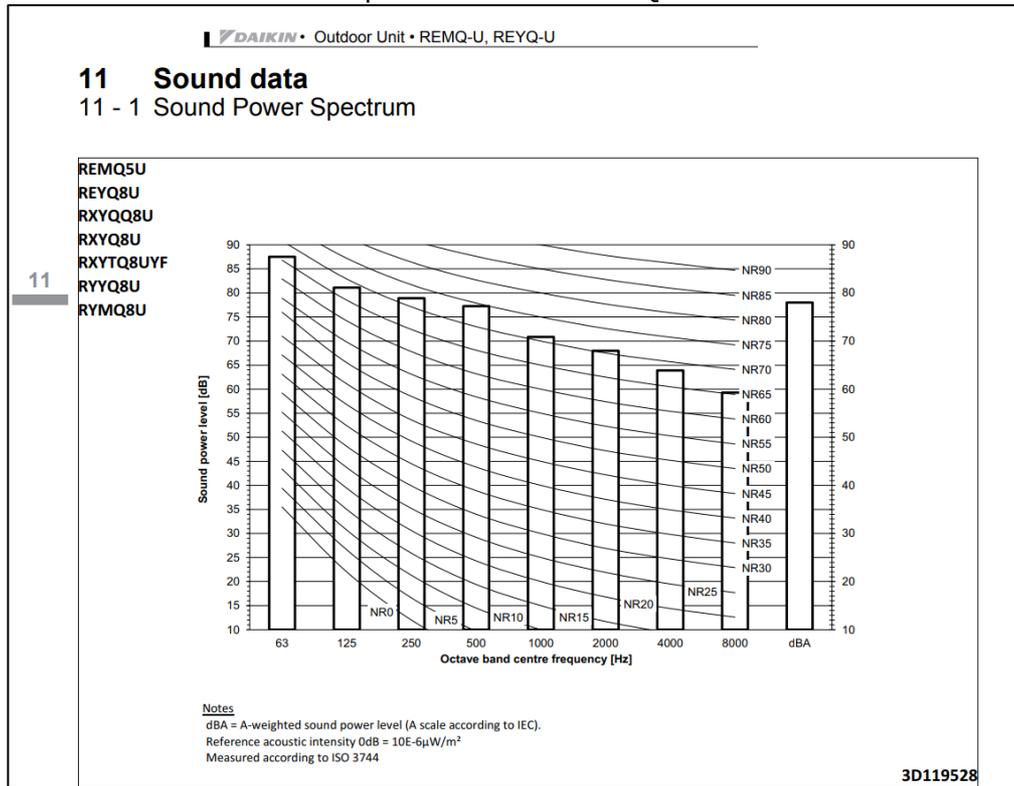
Table 5: Proposed Plant Model and Sound Power Level

Location	Proposed Plant Model	Quantity	Unit Sound Power Level (dB L <sub>WA</sub> ) <sup>1</sup>
External Bin Store	Daikin REYQ-8U	1	78

<sup>1</sup> The noise data is taken from the unit type on the supplied drawings and published manufacturer's sound power data for the units.

The octave band sound power spectrum for the unit can be seen below.

Figure 4: Octave Band Sound Power Spectrum for Daikin REYQ-U



It should be noted that any changes to the schedule, location or layout of the plant will affect the predicted levels at the receiver points around the site and, as such, will need reassessing. The plant is understood to only operate during the store opening hours.

### 6.3. Noise Modelling

To determine noise levels across the site, noise modelling has been undertaken using computer modelling package Cadna:A by DataKustik and the plant noise data noted above. The following parameters have been used in the model:

- All buildings are considered reflective, and third order reflections have been calculated.
- The heights of the buildings are based on the provided drawings, Google Earth 3D imagery and on-site observations.
- The ground surrounding the site has been modelled as hard and reflective.
- The site layout follows the provided plans.
- The predicted noise map is at 4.5 metres above ground.
- The building evaluation is showing the maximum level at the façade of the NSRs.
- All plant has been considered to be operating continuously.
- Night-time plant noise levels are not considered as the plant should only operate during store operating hours.

The following figure shows a noise map of the cumulative plant specific sound levels (dB  $L_{Aeq,T}$ ):

Figure 5: Predicted Specific Sound Level of Plant, dB  $L_{Aeq,T}$



## 7. Noise Assessment

A British Standard 4142:2014 assessment has been undertaken at the sensitive receivers on the site.

### 7.1. Initial Estimate of Impact

#### 7.1.1. Background Sound Level

We have determined a representative background sound level of 49dB  $L_{A90}(1 \text{ hour})$  at the nearest NSR during daytime hours (07:00 – 23:00).

#### 7.1.2. Predicted Specific Sound Level

The predicted specific sound level of the plant is 60dB  $L_{Aeq,T}$  at the most noise-sensitive dwellings located directly above the store at first floor level. This is the level with no character corrections applied.

The predicted noise levels at noise-sensitive dwellings located further afield are typically between 41-45dB  $L_{Aeq,T}$ .

#### 7.1.3. Character Corrections

Character corrections should be added to the 'specific sound level' if it exhibits any *tonality, impulsivity, other specific characteristics and/or intermittency* at the assessment location. The corrections are as follows:

*Tonality* – Plant of this type is not normally tonal in our experience. The supplier should ensure this is the case for the installed plant.

*Intermittency* – We have not included a correction for intermittency. We have considered all plant to be operating continuously for our assessment.

*Impulsivity* – Plant of this type is not normally impulsive in nature.

*Other Sound Characteristics* – We do not believe any correction is necessary for other sound characteristics. The specific character of plant noise is not new to the area considering the previous plant in the same location.

### 7.1.4. Initial Estimate

Therefore, the British Standard 4142:2014 initial estimate at the most sensitive location is as follows:

Table 6: British Standard 4142:2014 Initial Estimate for NSR

Parameter	Sound Level / dB
Background Sound Level, $L_{A90,1\text{hour}}$	49
Specific Sound Level, $L_{Aeq,1\text{hour}}$	54
Character Correction	+0
Rating Sound Level, $L_{Ar,1\text{hour}}$	54
Excess of Rating Over Background Level	+5

This means that the plant rating noise level will have a minor adverse noise impact when assessed to British Standard 4142:2014+A1:2019.

## 7.2. Context

With regard to context, British Standard 4142:2014+A1:2019 states:

### 7.2.1. Absolute Levels

*"Where the initial estimate of the impact needs to be modified due to the context, take all pertinent factors into consideration, including the following".*

*"1) Where background sound levels and rating levels are low, absolute levels might be as, or more, relevant than the margin by which the rating level exceeds the background. This is especially true at night. Where residual sound levels are very high, the residual sound might itself result in adverse impacts or significant adverse impacts, and the margin by which the rating level exceeds the background might simply be an indication of the extent to which the specific sound source is likely to make those impacts worse."*

With regard to 'absolute levels', the most relevant guidance is British Standard 8233:2014. Section 7.7.2 Table 4 of the British Standard provides internal ambient noise levels for dwellings from noise sources 'without a specific character' and are based on existing guidelines issued by the World Health Organisation in 1999. We would advise the rating level is considered to allow for the character of the source. Internally to a dwelling during the day, the internal ambient noise levels should not exceed 35 dB  $L_{Aeq(16hr)}$ .

The internal level is approximately 15 dB quieter than the external free-field level (as stated by the BS8233:2014 and WHO 1999) allowing for the attenuation of a partially open window. Therefore, based on the predicted rating levels noted above, the internal absolute levels are as follows.

Table 7: Assessment of daytime impact against BS8233/WHO Internal Noise Criteria

Predicted External Rating Level dB L <sub>Ar(T)</sub>	Open Window Correction dB(A)	Predicted Internal Level dB(A)	Within Criteria?
54	-15	39	No

As can be seen from the table above, the internal rating sound level is clearly above the British Standard 8233:2014 equivalent noise level with the criteria for daytime rooms. We would therefore consider plant noise to be of Unacceptable Adverse Effect Level when absolute levels are considered.

### 7.2.2. Residual Sound Levels

British Standard 4142:2014+A1:2019 also states:

*"Where the initial estimate of the impact needs to be modified due to the context, take all pertinent factors into consideration, including the following".*

- 1) The character and level of the residual sound compared to the character and level of the specific sound. Consider whether it would be beneficial to compare the frequency spectrum and temporal variation of the specific sound with that of the ambient or residual sound, to assess the degree to which the specific sound source is likely to be distinguishable and will represent an incongruous sound by comparison to the acoustic environment that would occur in the absence of the specific sound. Any sound parameters, sampling periods and averaging time periods used to undertake character comparisons should reflect the way in which sound of an industrial and/or commercial nature is likely to be perceived and how people react to it.*

*NOTE 3 Consideration ought to be given to evidence on human response to sound and, in particular, industrial and/or commercial sound where it is available. A number of studies are listed in the "Effects on humans of industrial and commercial sound" portion of the "Further reading" list in the Bibliography.*

The daytime typical free-field residual sound level is 54 dB L<sub>Aeq(15min)</sub>

The specific sound level is 54 dB L<sub>Aeq(T)</sub>, this is 0 dB above the residual sound level. As such, we would consider that the plant noise will be just audible at the nearest NSR window during daytime operational hours.

### 7.3. Summary of Assessment

The cumulative plant rating level is 5dB above the representative background sound level. When this level is compared to the representative background sound level, and contextual matters are considered, the plant noise results in a adverse noise impact when assessed to BS4142:2014.

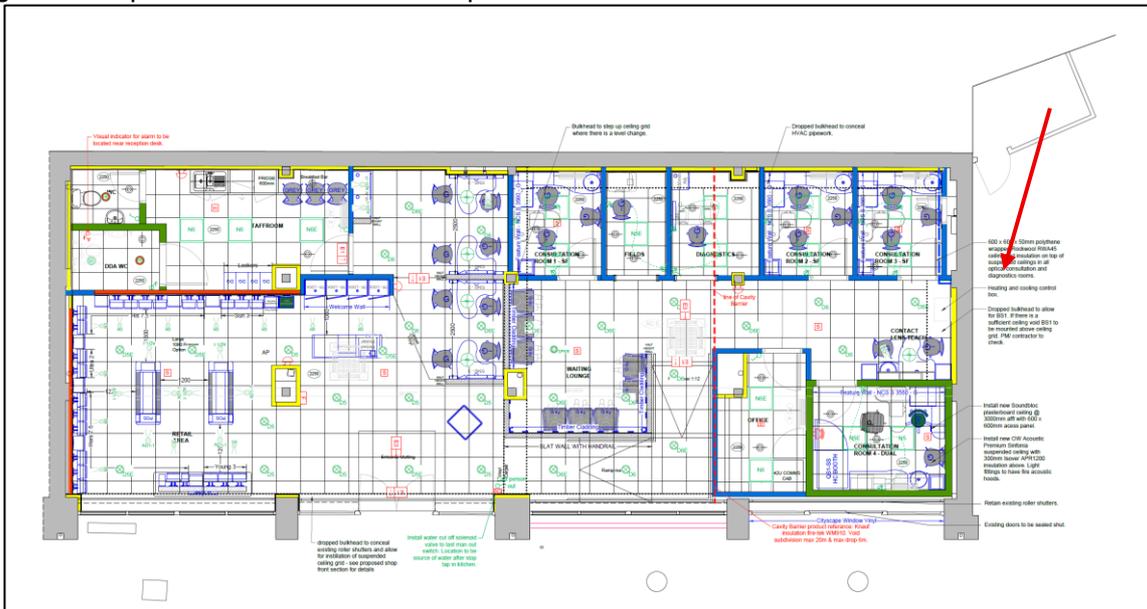
## 8. Noise Mitigation

Due to exceedances of both the background and residual noise levels further mitigation will be required in order to mitigate noise impacts at the nearest worst-case noise sensitive receptors, namely the first-floor flats above the proposed store. These noise levels will have to be reduced by at least 5dB. The following options with a means to reducing noise impacts to a minimum should be considered:

### 8.1. Relocation of External Plant

The relocation of the external plant to the location highlighted below would provide additional screening from the noise source at the nearest receptors via the building façade.

Figure 6: Proposed relocation of external plant



This relocation would likely result in noise levels of approx. 49dB at the nearest receptor and, as such, would produce low noise impacts as per BS4142:2014.

### 8.2. Acoustic Enclosure

Alternatively, noise impacts could be reduced using an acoustic enclosure to house the external plant in its originally proposed location. Examples of companies that may be able to provide the enclosure include Wakefield Acoustics and IAC Acoustics.

The enclosure should cover the top as well as the side of the condenser unit to ensure that the nearest first-floor flat is protected from noise. The manufacturer/supplier of the acoustic enclosure must demonstrate that the required sound level attenuation of at least 5dBA can be achieved.

## 9. Summary and Conclusions

Specsavers appointed Acoustic Consultants Limited (ACL) to undertake a noise impact assessment of external plant associated with the proposed Specsavers store to be located at 71 Huddersfield Road, Holmfirth, HD9 3AZ.

This report provides a noise impact assessment of the proposed plant at the nearest existing noise sensitive receivers (NSRs) during daytime hours. These receptors are located at first-floor level above the proposed Specsavers store.

The noise impact assessment has been undertaken in accordance with the guidance in the National Planning Policy Framework (NPPF), Noise Policy Statement for England (NPSE), Planning Practice Guidance (PPG), British Standard 4142:2014+A1:2019 (BS4142) and local authority guidance from Barnet Council.

The cumulative plant rating level is 5dBA above the representative background sound level. When this level is compared to the representative background sound level, and contextual matters are considered, the plant noise results in a significant noise impact when assessed to BS4142:2014.

As such, we have provided options for noise mitigation. These options include:

- Relocation of external plant to side elevation to use existing building façade for screening.
- Housing external plant in acoustically rated enclosure.

## 10. Appendix 1 – Glossary of Acoustic Terminology

*A-weighted sound pressure  $p_A$*  – value of overall sound pressure, measured in pascals (Pa), after the electrical signal derived from a microphone has been passed through an A-weighting network.

*A-weighted sound pressure level,  $L_{pA}$*  - quantity of A-weighted sound pressure given by the following formula in decibels (dBA)

$$L_{pA} = 10 \log_{10} (p_A/p_0)^2$$

where:

$p_A$  is the A-weighted sound pressure in pascals (Pa);  
 $p_0$  is the reference sound pressure (20  $\mu$ Pa)

*Background sound level,  $L_{A90,T}$*  – A-weighted sound pressure level that is exceeded by the residual sound assessment location for 90% of a given time interval, T, measured using weighting F and quoted to the nearest whole number of decibels

*Break-in* - noise transmission into a structure from outside.

*Decibel (dB)* – The decibel is the unit used to quantify sound pressure levels. The human ear has an approximately logarithmic response to acoustic pressure over a very large dynamic range (typically 20 micro-Pascals to 100 Pascals). Therefore, a logarithmic scale is used to describe sound pressure levels and also sound intensity and power levels. The logarithms are taken to base 10. Hence an increase of 10 dB in sound pressure level is equivalent to an increase by a factor of 10 in the sound pressure level (measured in Pascals). Subjectively, this increase would correspond to a doubling of the perceived loudness of sound.

*Equivalent continuous A-weighted sound pressure level,  $L_{Aeq,T}$*  – value of the A-weighted sound pressure level in decibels of continuous steady sound that, within a specified time interval,  $T = t_2 - t_1$ , has the same mean-squared sound pressure as a sound that varies with time, and is given by the following equation:

$$L_{Aeq,T} = 10 \log_{10} \left\{ (1/T) \int_{t_1}^{t_2} [p_A(t)^2 / p_0^2] dt \right\} \quad (1)$$

where:

$p_0$  is the reference sound pressure (20  $\mu$ Pa); and

$p_A(t)$  is the instantaneous A-weighted sound pressure (Pa) at time t

*NOTE* The equivalent continuous A-weighted sound pressure level is quoted to the nearest whole number of decibels.

*Facade level* – sound pressure level 1 m in front of the façade. Facade level measurements of  $L_{pA}$  are typically 1 dB to 3 dB higher than corresponding free-field measurements because of the reflection from the facade.

*Free-field level* – sound pressure level away from reflecting surfaces. Measurements made 1.2 m to 1.5 m above the ground and at least 3.5 m away from other reflecting surfaces are usually regarded as free-field. To minimize the effect of reflections the measuring position has to be at least 3.5 m to the side of the reflecting surface (i.e. not 3.5 m from the reflecting surface in the direction of the source).

*Octave and Third Octave Bands* – The human ear is sensitive to sound over a range of frequencies between approximately 20 Hz to 20 kHz and is generally more sensitive to medium and high frequencies than to low frequencies within the range. There are many methods of describing the frequency content of a noise. The most common methods split the frequency range into defined bands, in which the mid-frequency is used as the band descriptor and in the case of octave bands is double that of the band lower. For example, two adjacent octave bands are 250 Hz and 500 Hz. Third octave bands provide a fine resolution by dividing each octave band into three bands. For example, third octave bands would be 160 Hz, 250 Hz, 315 Hz for the same 250 Hz octave band.

*Sound pressure level* – Sound pressure level is stated on many of the charts. It is the amplitude of the acoustic pressure fluctuations in a sound wave, fundamentally measured in Pascals (Pa), typically from 20 micro-Pascals to 100 Pascals, but commonly simplified onto the decibel scale.

*Sound reduction index, R* – laboratory measure of the sound insulating properties of a material or building element in a stated frequency band.

*Specific sound level,  $L_s = L_{Aeq,T_r}$*  – equivalent continuous A-weighted sound pressure level produced by the specific sound source at the assessment location over a given reference time interval,  $T_r$ .

*Structure-borne noise* – audible noise caused by the vibration of elements of a structure, the source of which is within a building or structure with common elements.

*Rating level,  $L_{A_r,T_r}$*  – Specific sound level plus any adjustment for the characteristic features of the sound.

*Reverberation Time, T* – The reverberation time is defined as the time taken for a noise level in an enclosed space to decay by 60 dB from a steady level once the noise source has stopped. It is measured in seconds. Often a 60 dB decay cannot be measured so the reverberation time is measured over a lesser range and corrected back to the time for a 60 dB drop assuming a constant decay rate. Common parameters are T20 (time taken for a 20 dB decay multiplied by three) and T30 (time taken for a 30 dB decay multiplied by two).

*Vibration Dose Value, VDV* – measure of the total vibration experienced over a specified period of time.

*Estimated Vibration Dose Value, eVDV* – estimation of the total vibration experienced over a specified period of time. This is usually based on the number of events and shortened measurement data.

*Weighted sound reduction index,  $R_w$*  – Single-number quantity which characterizes the airborne sound insulating properties of a material or building element over a range of frequencies. The weighted sound reduction index is used to characterize the insulation of a material or product that has been measured in a laboratory (see BS EN ISO 717-1).



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