Philip Acoustics Ltd.

Consultants in Noise & Vibration
Building Regulations Certification Sound Insulation Testing

REPORT TITLE: NOISE ASSESSMENT FOR MECHANICAL SERVICES PLANT TO SERVE A PROPOSED CHANGE OF USE HOT FOOD TAKEAWAY AT 194 WAKEFIELD ROAD, SCISSETT, HUDDERSFIELD HD8 9JL

REPORT REF: 25020-002

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DATE: May 2025

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SUMMARY

- This report provides a noise assessment for mechanical services plant to serve a proposed change of use at an existing vacant commercial property 194 Wakefield Road, Scissett, Huddersfield HD8 9JL. The proposed development is to operate as a pizza format hot food takeaway.

- The plant (equipment) comprises a supply air system fan and oven extract system fan plus external air conditioning and cold room condenser units.

- As part of the assessment a plant noise criterion (limit) is set with reference to the Local Planning Authority requirement and guidance of relevant British Standard BS4142.

- Full title of the current edition of this standard is BS4142:2014+A1:2019 "*Methods for rating and assessing industrial and commercial sound*". Unless stated otherwise, reference throughout this report to BS4142 / BS4142:2014 relates to this current edition document. As an aid to clarity, this report retains use of the more familiar term *"noise"* as opposed to the replacement term *"sound"* of BS4142:2014, both terms are interchangeable in the context of the assessment.

- In accordance with the noise assessment procedures of BS4142 a survey has been conducted to establish existing minimum / lower value background noise levels during the range of operational times of the plant, as representative of externally at nearest noise sensitive (residential) properties.

- Based on results of the background noise survey and acoustic calculations using plant manufacturer's data, noise from the plant (with the specified noise reduction treatment fitted) will be below existing background noise levels and compliant with the noise criterion / limit.

- The specified noise reduction treatment comprises conventional atmosphere side duct silencers (attenuators) to the supply air and oven extract fan systems plus acoustic lagging to the oven extract fan casing body. Specification details for the noise reduction treatment are provided in sub-section 7.1 of the report.

- The report also considers plant vibration. It is advised as good practice the plant is installed using proprietary vibration isolators. Outline specification details for suitable vibration isolators are provided in sub-section 7.2 of the report.

1. INTRODUCTION

A change of use to hot food takeaway (Sui-Generis) development is proposed at an existing vacant commercial property 194 Wakefield Road, Scissett, Huddersfield HD8 9JL.

The development is for a pizza format hot food takeaway with sought operating times 11am to 11pm.

The takeaway will require installation of mechanical plant (equipment), comprising a supply air system fan and oven extract system fan, plus an external air conditioning condenser unit and cold room condenser unit.

Philip Acoustics has been commissioned to assess noise from the proposed mechanical services plant. The assessment is to determine specifications for noise reduction treatment and vibration isolation measures to the plant, in the interest of safeguarding the amenity of neighbouring residential occupiers.

This report presents results of the noise assessment and includes:

- Qualifications & experience;
- Noise assessment methodology & criterion; with reference to the Local Planning Authority requirement *(Kirklees Metropolitan Council typically imposed planning approval plant noise condition)* & current edition British Standard BS4142;
- Measurement survey of existing background noise levels;
- Details of proposed plant including location & noise data;
- Calculation & assessment of plant noise levels;
- Consideration of vibration from the plant;
- Specification as necessary for noise reduction treatment & vibration isolation measures.

***Informative 1*: Existing Plant Precedent**

As forward to this noise assessment report, it is noted by the author that the items of mechanical plant to serve the proposed change of use pizza format hot food takeaway are of same and similar function to existing installed plant / equipment (ventilation systems & condenser units) serving other commercial / retail use premises in the local and wider vicinity including along Wakefield Road.

Much of this existing plant / equipment is in similar proximity (or closer) to noise sensitive / residential properties as that proposed at the application site 194 Wakefield Road.

Notwithstanding this, assessment of noise from plant to serve the proposed hot food takeaway in this report is only with reference to the noise criterion (limit) set with reference to the Local Planning Authority requirement and guidance of the current edition BS4142.

This report and noise assessment takes no account of precedent there is existing similar plant / equipment already installed serving other commercial / retail use premises in the vicinity.

2. QUALIFICATIONS & EXPERIENCE

This report is prepared and issued by David Philip. David Philip graduated in 1989 from The University of Salford Department of Applied Acoustics with a BEng Honours degree in Electroacoustics. David Philip has been since 1995, and continues to be, a fully elected Member of the Institute of Acoustics (MIOA).

David Philip has been the owner / managing director of Philip Acoustics since the firm was formed in 2002. Prior to the formation of Philip Acoustics, David Philip held senior acoustic consultant positions at Sound Research Laboratories (London office) and Spectrum Acoustic Consultants.

Philip Acoustics has held full membership of the Association of Noise Consultants (ANC) since 2003 and is also a full member of the ANC Registration Scheme of approved independent organisations to undertake Building Regulations Approved Document Part E pre-completion certification sound insulation testing.

David Philip has over 30 years' experience as an Acoustic Consultant both in the UK and internationally and has considerable experience undertaking noise surveys and noise assessments for a wide range of commercial uses and also residential developments.

This experience includes a substantial quantity of noise assessments specifically associated with mechanical plant (including extraction and ventilation equipment) serving commercial uses including hot food takeaways in mixed use commercial / retail and residential areas.

David Philip is fully familiar with the provisions of the current (and previous) editions of British Standard BS4142, as well as other acoustics related standards and guidance documents.

The opinions expressed in this report are the true and professional opinions of David Philip. Neither David Philip nor Philip Acoustics is appointed on any incentive fee basis.

3. NOISE ASSESSMENT METHODOLOGY & CRITERION *(BS4142)*

Details of the Local Planning Authority noise requirement, relevant British Standard BS4142 and noise criterion for plant (equipment) to serve the proposed change of use takeaway are provided in the following sub-sections.

3.1 Local Planning Authority Requirement

In granting planning approval for the installation of new plant / equipment (including to serve hot food takeaway use premises), Kirklees Metropolitan Council typically impose a standard condition including with noise criterion as the recent example reproduced below.

The condition reason includes to ensure 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.

> 3. The combined noise from any fixed mechanical services and external plant and equipment shall be effectively controlled so that the combined rating level of noise from all such equipment shall be 5dB below the lowest measured background sound level at any time. "Rating level" and "background sound level" are as defined in BS 4142:2014+A1:2019.
> **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.

In summary overview terms, the Council's example condition sets a criterion (limit) that noise from proposed plant / equipment shall be at least 5dB below the lowest background noise level with reference to the measurement and assessment methodology of the current edition British Standard BS4142.

The Council's example condition as above is used as noise criterion for assessment of plant (equipment) to serve the proposed change of use takeaway.

Additional information and clarification details associated with the noise assessment methodology and criterion with reference BS4142 as applicable for plant (equipment) to serve the proposed change of use takeaway are provided in Sub-Sections 3.2 & 3.3 on the following pages.

It is the author's experience of undertaking many noise assessments in similar contexts to 194 Wakefield Road, Scissett, that compliance with Kirklees Metropolitan Council's example condition noise requirement as above, and as the clarification points in Sub-Section 3.3, would mean noise from plant (equipment) would not be expected to be of detrimental impact, or otherwise affect, the amenity of occupiers of neighbouring noise sensitive premises.

3.2 BS4142

Full title of the current edition of this standard is BS4142:2014+A1:2019 "*Methods for rating and assessing industrial and commercial sound*". Unless stated otherwise, reference throughout this report to BS4142 / BS4142:2014 relates to this current edition standard.

As an aid to clarity this report retains use of the more familiar term "*noise*" as opposed to the replacement term "*sound*" of BS4142:2014. The two terms are interchangeable in the context of this assessment report.

BS4142 provides a well-established methodology to assess the likely effect (impact) to people regarding noise of an "industrial" nature from commercial or other premises / developments.

Consequently, in requesting noise assessments for mechanical plant, including equipment such as ventilation system external apertures and air conditioning / refrigeration units serving such as hot food takeaways or similar, most Local Planning Authorities refer to BS4142.

In this scenario of new mechanical services plant, the BS4142 assessment methodology requires that source noise data for the plant be established, and pre-existing background noise levels be measured. The assessment is then carried out by comparing the overall plant noise Rating Level with background noise levels, at assessment positions (normally to outside windows of nearest residential properties or similar).

The (plant noise) Rating Level in this scenario is the Specific (actual) Noise Level of the plant plus with any corrections applied to account for subjective characteristics of the noise that might mean it is more noticeable and potentially have more impact.

The BS4142 assessment method then provides guidance on the likely noise impact (effect) to people depending on the magnitude of the excess of the (plant noise) Rating Level over the pre-existing background noise; the higher the excess the more likely there would be an adverse impact and correspondingly, the lower the excess (or no excess) the less likely there would be an adverse impact.

BS4142:2014 does not provide any specific guidance on suitable noise limits / criteria or standards including for proposed new plant / equipment, only guidance on how to determine the likelihood of adverse impact.

In terms of likelihood of adverse (noise) impact, BS4142 advises the following dependent upon context:

i) Where the (plant noise) Rating Level is around +10dB or more above the background, this is likely to be an indication of significant adverse impact;

ii) Where the (plant noise) Rating Level is around +5dB above the background then this is likely to be an indication of adverse impact;

iii) Where the (plant noise) Rating Level does not exceed the background then this is an indication of low impact.

It is important to note the BS4142 assessment methodology does not have a “no impact” indication categorisation. “Indication of low impact” for where the Rating Level does not exceed the pre-existing background is the lowest / least likely noise impact categorisation of BS4142.

Different Local Planning Authorities interpret and apply the guidance of BS4142 differently, some require the noise Rating Level of proposed new plant / equipment be not higher than +5dB above the pre-existing background level, majority require not higher than the background and some require a certain amount below the background. Some do not have a set requirement and consider each situation individually.

It is the author’s experience that most Local Authorities for this context of new plant to serve an existing albeit proposed change of use commercial premises, apply the guidance of BS4142 with a requirement that the noise Rating Level of plant be not higher than the background noise; applicable to positions outside nearest noise sensitive (residential) properties and applicable to the representative lower level background noise for times of plant operation.

Notwithstanding the above, in accordance with the Council’s example condition a noise criterion / limit at least 5dB below the background noise level is applied for assessment of plant to serve the proposed change of use hot food takeaway at 194 Wakefield Road, Scissett.

3.3 Application of Plant Noise Criterion (Limit)

Additional clarification points in respect to the assessment and application of the noise criterion are provided below:

a) Plant Operating Conditions

The assessment and noise criterion is cautiously/robustly applied to all proposed plant items operating cumulatively at full (100%) duty and during times as relevant; all plant operating during opening times of the premises, and with the cold room unit operable over 24 hours.

b) Rating Noise Level

The noise criterion is applied in terms of a noise Rating Level ($L_{Ar,Tr}$ dB) and thus with any corrections (such as for tonal character noise) applied as necessary to the plant noise at the assessment position as per the BS4142 assessment methodology.

c) Assessment Position

As per normal noise assessment procedures / convention (plus with reference to BS4142), the plant noise criterion is applied to an assessment position directly outside nearest noise sensitive (residential) properties.

Details of nearest residential properties are provided in sub-section 4.2 of the report.

d) Background Noise Level

The noise criterion is cautiously / robustly as “worse case” applied to the measured representative minimum (lowest) pre-existing background noise level $L_{A90,T}$ dB as representative of at the assessment position for times of operation of the plant.

e) <u>Very Low Background Noise Levels</u> *(for information only – item e not applied for assessment)*

In accordance with the guidance and assessment provisions of BS4142, then for scenarios of very low background noise it is generally unreasonable / unnecessary to apply a Rating Level noise limit directly relative to the background level, in terms of ensuring amenity protection such that noise from plant / equipment does not cause disturbance or is otherwise of adverse impact.

This simply due to that there is a lower threshold level at which plant noise would become inaudible / not noticeable to neighbouring residential occupiers and thus it being unreasonable and unnecessary to further reduce the plant noise below that level.

BS4142 advises "*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 background levels are very low it is instead appropriate to apply a minimum (lower level) threshold cap plant Rating Level limit of $L_{Ar,Tr}$ 30dB at assessment positions. BS4142:1997 advised that noise Rating Levels of below 35dB be considered very low.

Thus a minimum threshold cap plant noise limit (Rating Level) set at $L_{Ar,Tr}$ 30dB is significantly below (i.e. as 5dB betterment to) this guidance and for scenarios of very low background noise levels (i.e. regardless of the low background noise) will maintain surety of protection for the occupants of neighbouring properties from loss of amenity due to noise disturbance.

4. BACKGROUND NOISE SURVEY

To assess noise from plant to serve the proposed change of use it is necessary to establish pre-existing background noise levels during the range of operational times for the plant.

4.1 Survey Instrumentation

Details of instrumentation used for the noise survey are provided in Appendix A. The sound level meter was calibration verified before and after the survey.

4.2 Survey Details & Procedure

The supply air system, oven extract system and air conditioning unit will operate as required during opening times of the premises (11am to 11pm). The cold room unit provides an essential refrigeration function and is required to be operable over 24-hours.

A fully attended background noise survey was conducted by the author for the period approximately 9:30pm to 4am of 07 May 2025 through 08 May 2025 to include sample late evening and night periods as “worse case” when representative minimum (lowest) levels of background noise will occur for operational times of the plant.

Weather conditions were monitored and were suitable for the background noise survey in accordance with BS4142; dry (nil precipitation) and with calm / light wind (wind speed circa 0 to 1m/s recorded at the site and survey position), i.e. not affecting or otherwise detrimentally influencing the survey measurements.

Location of the site, plant and nearest noise sensitive properties are indicated on an aerial image, site location plan and block plan drawing plus proposed layout plan / elevations drawings in Appendix B.

Nearest and least naturally screened noise sensitive properties to the site and proposed plant locations are residential dwellings on New Street; north-east from the site off Wakefield Road to rear of The Crown public house and Saffron takeaway.

There are other residential properties within the general area in various directions from the site, including farther along Wakefield Road and on Crown Street. However, residential dwellings on New Street north-east from the site are the physically nearest, and/or least naturally screened, thus potentially the most noise affected neighbouring residential properties.

The background noise survey position was externally to the rear yard area of the adjacent commercial premises House of Oak, selected as best practicably accessible plus directly adjacent to, and representative of, outside the nearest residential properties on New Street.

The survey position is indicated on the site aerial image in Appendix B.

Measurements of background noise were in accordance with the procedural guidance of BS4142:2014; as free-field levels 1.5m above ground level, facilitated by positioning the survey instrumentation microphone on telescopic boom arrangement, recorded continually in terms of consecutive samples of overall $L_{A90,T}$ dB values *(T= 15 minutes)* throughout the survey duration.

4.3 Survey Results, Observations & Plant Noise Limits

Complete raw data results of the background noise survey are provided in Appendix C.

Background noise levels during the late evening and night period are low reducing to very low and predominantly due to intermittent passing traffic along the A636 Wakefield Road.

It was observed there is also some low level (faintly audible / barely noticeable - not dominant) noise from existing plant / equipment expected to be serving various commercial / industrial premises in wider proximity to the site.

The background noise profile is normal for this location, with levels reducing gradually during the late evening and into the night as traffic reduces, lowest during the night between circa 1am to 3am, before gradually starting to rise after about 4am as traffic in the wider vicinity starts to increase slightly.

Summary of measured representative minimum background noise levels and the associated plant noise limit requirements are shown in Table 1.

Background noise levels and noise limits are split into opening hours values (range 11am to 11pm) and night period values such that all plant as operating during opening hours is assessed using representative minimum background noise during that time range, whilst the cold room unit operable over 24 hours is assessed using the representative minimum background noise during the night.

Description	**Plant Operating Times**	**Representative Minimum Background Noise Level $L_{A90,\ 15\ min}$**	**Plant Noise Limit 5dB Below Background *(Rating Level)***
Assessment to outside nearest noise sensitive (residential) properties	All Plant: Operating during opening hours *(range 11am to 11pm)*	35dB	$L_{Ar,Tr} \leq$ 30dB
	Cold Room Unit: Operable over 24 hours *(including during the night)*	29dB *(occurs circa 1am to 3am)*	$L_{Ar,Tr} \leq$ 24dB

Table 1: Measured representative minimum background noise & associated plant noise limits

5. NOISE FROM MECHANICAL SERVICES PLANT

The proposed mechanical services plant comprises the following items as indicated on the drawings in Appendix B:

- **Supply (Make-Up) Air System Fan:** S&P CBM/6-320/240-550W fan, located internally with fresh air intake via ducting (incorporating a silencer) from an external roof cowl to the rear flat roof of the property;
- **Oven Extract System Fan:** S&P TCBBx2/4-450 fan, located externally to the rear flat roof area of the property, with exhaust to atmosphere via ducting (incorporating a silencer) to a vertical discharge aperture;
- **Air Conditioning Unit:** Mitsubishi FDC140VNA-W condenser unit (cooling mode operation), located externally at ground level to the side elevation wall of the property;
- **Cold Room Unit:** Tecumseh Wintsys WINAJ4517Z -FZ condenser unit, located externally at ground level to the side elevation wall of the property (adjacent to air conditioning unit).

Copy of available manufacturer noise data for the plant is provided in Appendix D.

Summary of noise data for the plant items in terms of equivalent overall dBA and linear dB octave band sound power levels is shown in Table 2. The summary noise data is without any noise reduction treatment applied (i.e. is for un-silenced manufacturer noise data).

Description	Overall dBA	Octave Band Centre Frequency (Hz) Lin dB							
		63	125	250	500	1k	2k	4k	8k
Supply Air System Fan: S&P CBM/6-320/240-550W *Inlet – Induct Sound Power Level* (1)	79	80	78	76	75	74	71	67	63
Oven Extract System Fan: S&P TCBBx2/4-450									
Outlet – Induct Sound Power Level (2)	92	89	91	95	88	87	81	73	68
Casing Breakout Sound Power Level (3)	68	78	73	73	65	60	53	51	44
Air Conditioning Unit: Mitsubishi FDC140VNA-W *(unit configured cooling mode)*	66	77	72	65	63	62	57	52	52
Cold Room Unit: Tecumseh Wintsys WINAJ4517Z -FZ (4)	61	63	61	59	57	56	53	49	41

Note (1): *Sound power level overall dBA & linear dB octave band values for supply air system fan S&P CBM/6-320/240-550W based on limited available manufacturer noise data which is in terms of overall sound pressure level 67dBA at 1.5m from the fan inlet side (free field) & example operating curve.*

Note (2): *Manufacturer octave band noise data for oven extract system fan S&P TCBBx2/4-450 outlet is in terms of "A-Weighted" dBA octave band sound power level values. The values stated above are equivalent linear dB octave band values (i.e. not "A-Weighted").*

Note (3): *No manufacturer noise data for oven extract system fan S&P TCBBx2/4-450 casing breakout. The values stated above are as typical for this type and size / capacity extract system fan.*

Note (4): *No manufacturer octave band noise data for cold room unit; linear dB octave band sound power levels are based on octave band sound pressure level measurements undertaken by the author of this same make / model cold room unit as installed at other premises.*

Table 2: Summary plant noise data *(sound power levels based on manufacturers' noise data)*

To calculate the overall noise contribution from the plant to the assessment position outside nearest residential properties a spreadsheet noise model calculation has been used.

The model takes account of the accumulation of noise from the worse-case scenario of all plant items operating simultaneously, distance between the plant locations and assessment position, acoustic directivity, acoustic reflections (i.e. non-free-field conditions) and any natural / default line of sight acoustic screening due to orientation and intervening buildings / structures etc. where applicable.

The calculation model also takes account of the specified noise reduction treatment applied to the plant as detailed in sub-section 7.1 of the Report.

Noise assessment position and plant noise model calculation details are provided in Appendix E.

Noise model overall calculated noise Rating Levels from the plant to the assessment position (nearest residential properties) compared with the noise limits are shown in Table 3. Noise from the plant to other residential properties in the vicinity that are farther away, and/or more naturally screened from the site and plant locations, will be lower.

Although the noise reduction treatment will tend to supress any tonal noise characteristics of the supply air and oven extract systems, plus noise of the air conditioning unit and cold room unit is nominally broadband in nature, the assessment cautiously includes a +2dBA correction as BS4142:2014, added to the overall calculated plant noise levels – to give the plant noise Rating Levels, to account that residual noise from the plant could potentially have a just perceptible tonal characteristic.

Description	**Plant Operating Times**	**Plant Overall Noise Level** ***(Rating Level)***	**Noise Limit** ***(Rating Level)***	**Comment**
Assessment Position: Nearest noise sensitive properties – nearest residential dwellings on New Street	All Plant Items : Operating during opening hours *(range 11am to 11pm)*	$L_{Ar,Tr}$ 30dB	$L_{Ar,Tr} \leq$ 30dB	Complies
	Cold room unit: Operable over 24 hours *(including during the night)*	$L_{Ar,Tr}$ 14dB	$L_{Ar,Tr} \leq$ 24dB	Complies

Table 3: Plant noise assessment

The assessment demonstrates that with the specified noise reduction treatment fitted as detailed in sub-section 7.1, noise from the proposed plant will be low, below minimum background noise levels and compliant with the limit / criterion set with reference to the Council's requirement and guidance of BS4142:2014.

6. VIBRATION FROM MECHANICAL SERVICES PLANT

Location of the plant is at distance from, and not directly structurally linked / physically connected to, neighbouring noise sensitive / residential properties. There will be no plant vibration transfer to noise sensitive / residential properties.

Notwithstanding this, it is advised the plant is installed using proprietary vibration isolators as good practice and to mitigate possible plant vibration to the development itself plus adjoining other commercial uses.

Outline specification details for suitable vibration isolators are provided in sub-section 7.2 of the report.

7. SPECIFICATIONS FOR NOISE & VIBRATION TREATMENTS

***Informative 2*: Proposed Plant**

This report is based on the specific proposed make and models of plant as detailed in Section 5.

If during later design stages, during installation or as part of future plant / equipment replacement, an alternative make and model of plant item is selected, it is important that noise levels for the alternative item be checked by Philip Acoustics or another acoustic consultant to ensure the treatments specified below remain valid and noise emissions remain compliant with the noise limit.

7.1 Noise Reduction

To comply with the noise criterion limit it is necessary to specify noise reduction treatment to the supply air and oven extract systems.

Specification details for the noise reduction treatment are provided in the sub-sections below and are as included in the noise model calculation in Appendix E.

7.1.1 Supply Air System

A silencer (attenuator) is to be fitted within the supply air fan system atmosphere side (intake) duct, between the fan and external inlet aperture, i.e. to reduce fan noise transmission externally out of the intake air aperture.

The proposed silencer is a conventional circular type; Alnor Ventilation Systems product code SIL-50 500-1000, 500mm internal diameter and 1000mm length.

Specification for the silencer is shown in Table 4, data sheet for the silencer is provided in Appendix F.

Description	Octave Band Centre Frequency (Hz)							
	63	125	250	500	1k	2k	4k	8k
Supply Air System: Circular type silencer Alnor Ventilation Systems product code SIL-50 500-1000								
Silencer Insertion Loss (attenuation dB)	4 (1)	7	11	17	21	15	14	15
***Note* (1):** *No manufacturer data available for 63Hz octave band. Stated value is as typical for the specified type circular silencer*								

Table 4: Specification details for Supply Air System silencer

7.1.2 Oven Extract System

Silencer

As for the supply air system, a silencer (attenuator) is to be fitted within the oven extract system atmosphere side (outlet) duct, between the extract fan and discharge aperture, i.e. to reduce oven extract fan noise transmission externally out of the discharge aperture.

The proposed silencer is a conventional circular type; Alnor Ventilation Systems product code SIL-50 450-1500, 450mm internal diameter and 1500mm length.

Specification for the silencer is shown in Table 5, data sheet for the silencer is provided in Appendix F.

Description	Octave Band Centre Frequency (Hz)							
	63	125	250	500	1k	2k	4k	8k
Oven Extract System: Circular type silencer Alnor Ventilation Systems product code SIL-50 450-1500								
Silencer Insertion Loss (attenuation dB)	8 (1)	11	16	23	25	20	19	19
Note (1): *No manufacturer data available for 63Hz octave band. Stated value is as typical for the specified type circular silencer*								

Table 5: Specification details for Oven Extract System silencer

The normal build-up of deposits inside kitchen / oven extract ductwork can degrade the performance of silencers over time. It is important therefore to clean the inside of the oven extract system silencer at regular intervals depending up on the level of deposit build up. This would normally take place during routine oven extract fan and ductwork cleaning.

Acoustic Lagging To Fan Body

Whilst the dominant noise contribution externally from the oven extract fan system is from the discharge aperture, there is also noise generated externally from the fan casing body (fan unit located externally), often referred to as casing breakout noise.

It is advised that normal/standard acoustic lagging be installed around the oven extract fan unit body to reduce casing breakout noise levels, the lagging to be removable as necessary for fan access maintenance.

In non-technical terms the acoustic lagging essentially forms an insulated high mass “soundproof” layer to around the fan body and is sometimes referred to as an acoustic lagging “jacket”.

There are many differing types of acoustic lagging available, however acoustic performance of lagging is generally defined by its mass layer (typically 5kg/m^2 or 10kg/m^2) and whether there is an insulation spacer (usually mineral wool or glass fibre type insulation typically 25 or 50mm thick) to the lagging mass layer such that the mass layer is separated from a fan casing body and/or ductwork by this insulation spacer.

For this application it is advised that the acoustic lagging be minimum 10kg/m^2 and with a mineral wool or similar insulation spacer minimum 25mm thick.

As example, a typically suitable proprietary acoustic lagging would be as or equivalent to Acoustic Fan Jacket Type AFJ-1080 as available from Wilhams Insulation Group and in overall terms would typically provide in the region 10 to 14dB noise reduction. Product data sheet for this example acoustic lagging "Acoustic Fan Jacket" is provided in Appendix F.

Other suppliers' equivalent acoustic lagging minimum 10kg/m^2 and with a mineral wool or similar insulation spacer minimum 25mm thick would also be suitable for fitment around the extract fan unit body.

7.1.3 Air Conditioning Unit & Cold Room Unit

The air conditioning unit and cold room unit located externally at ground floor to the side elevation of the property as indicated on the proposed layout and elevation drawings in Appendix B do not require noise reduction treatment.

7.2 Vibration Isolation

As detailed in Section 6, it is advised as good practice the plant is installed using proprietary vibration isolators. Outline specification detail for suitable vibration isolators are provided below.

7.2.1 Supply Air Fan & Oven Extract Fan Systems

It is advised the supply air fan and oven extract fan be installed using proprietary rubber or neoprene turret type vibration isolator mountings.

The isolators selected to each have a static deflection ≥3mm under the installed total weights of the fan units.

Four isolators are normally required per fan unit, one for each corner support position.

The vibration isolator mounts should only take weight of the supply air fan and oven extract fan. Associated ductwork either side (including silencers) should be supported by other separate rubber or neoprene vibration isolator mountings.

The supply air fan and oven extract fan would also typically have ductwork flexible connections fitted. To be effective the flexible connections need to be "loose" (not taught) when installed and would be typically formed using rubber or neoprene sheet material. Standard size flexible connections are available from most duct component suppliers.

7.2.2 Air Conditioning Unit & Cold Room Unit

It is advised the air conditioning unit & cold room unit are installed mounted from the ground (or wall brackets) on proprietary rubber or neoprene turret type vibration isolator mountings.

The isolators selected to each have a static deflection ≥3mm under the installed total weights of the units. Four isolators are required per unit (one to each corner mounting foot position).

APPENDIX A

Noise Survey Instrumentation

Site: 194 Wakefield Road, Scissett, Huddersfield HD8 9JL

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Date: May 2025

NOISE SURVEY INSTRUMENTATION

Instrumentation Used:

- Bruel & Kjaer sound level meter type 2260 Class 1, Bruel & Kjaer preamplifier type ZC0026, Bruel & Kjaer microphone type 4189, Bruel & Kjaer windshield type UA 0237, Bruel & Kjaer microphone extension cable type AO-0441 and tripod / boom arrangement;
- Bruel & Kjaer calibrator type 4231;
- Speedtech Instruments Skymaster model SM-28 serial number 19370 (weather conditions data).

Instrumentation Calibration Certification:

Description	Type Number	Manufacturer	Date of Calibration Expiration	Calibration Certificate Number
Class 1 Sound Level Meter *s/n 2497368*	2260	Bruel & Kjaer	08/02/2027	TCRT25/1115
Microphone *s/n 2625249*	4189			
Preamplifier *s/n 3268*	ZC0026			
Calibrator *s/n 2454786*	4231	Bruel & Kjaer	04/02/2027	TCRT25/1079

Instrumentation On-Site Calibration Check:

Description	Calibrator Reference Level	Measured Level	Comment
Before survey measurements	94.0dB	94.0dB	Pass
After survey measurements		94.0dB	Pass *(nil drift)*

APPENDIX B

Aerial Image, Site Location Plan, Block Plan & Proposed Layout Plan / Elevations Drawings

Site: 194 Wakefield Road, Scissett, Huddersfield HD8 9JL

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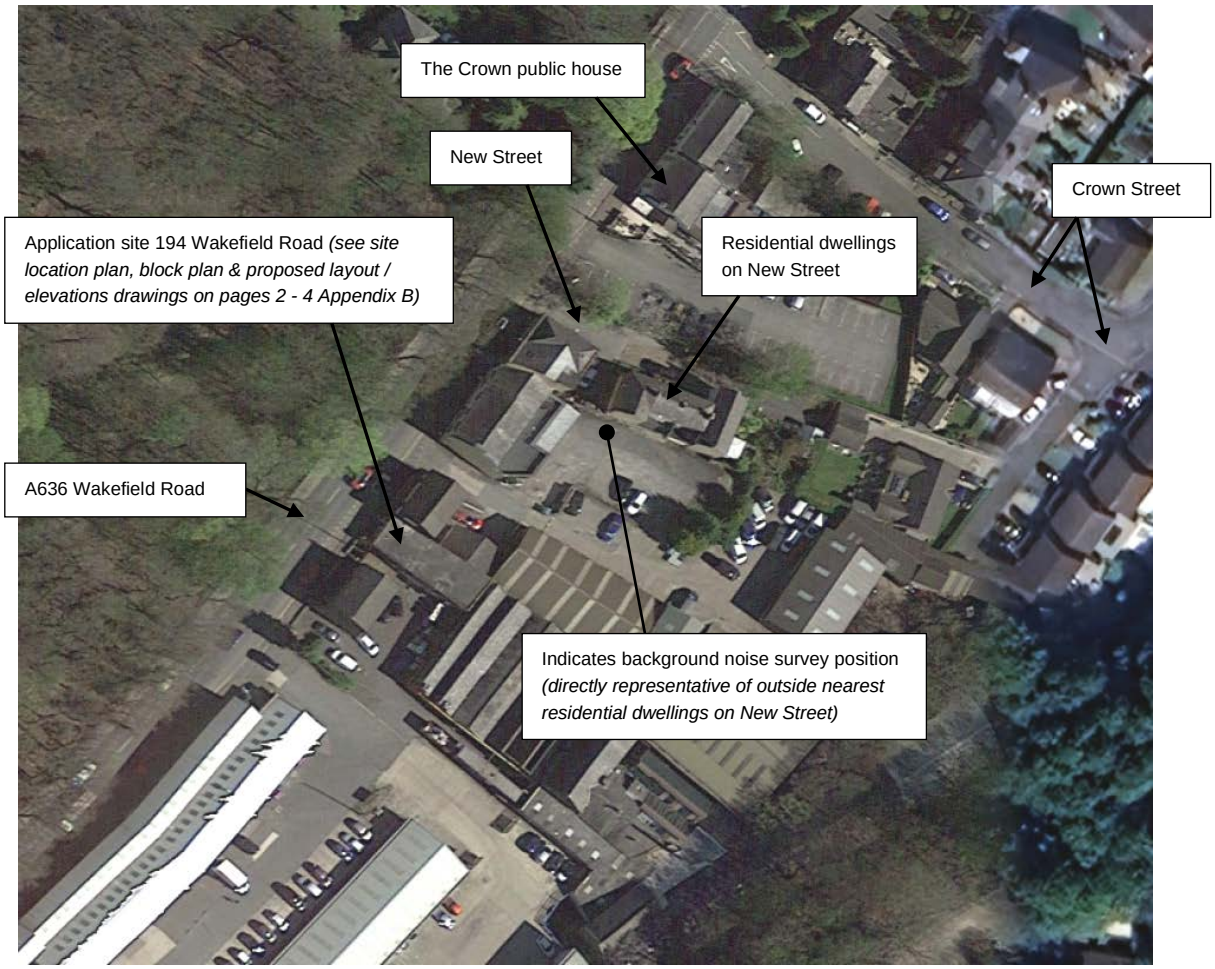
Date: May 2025

AERIAL IMAGE

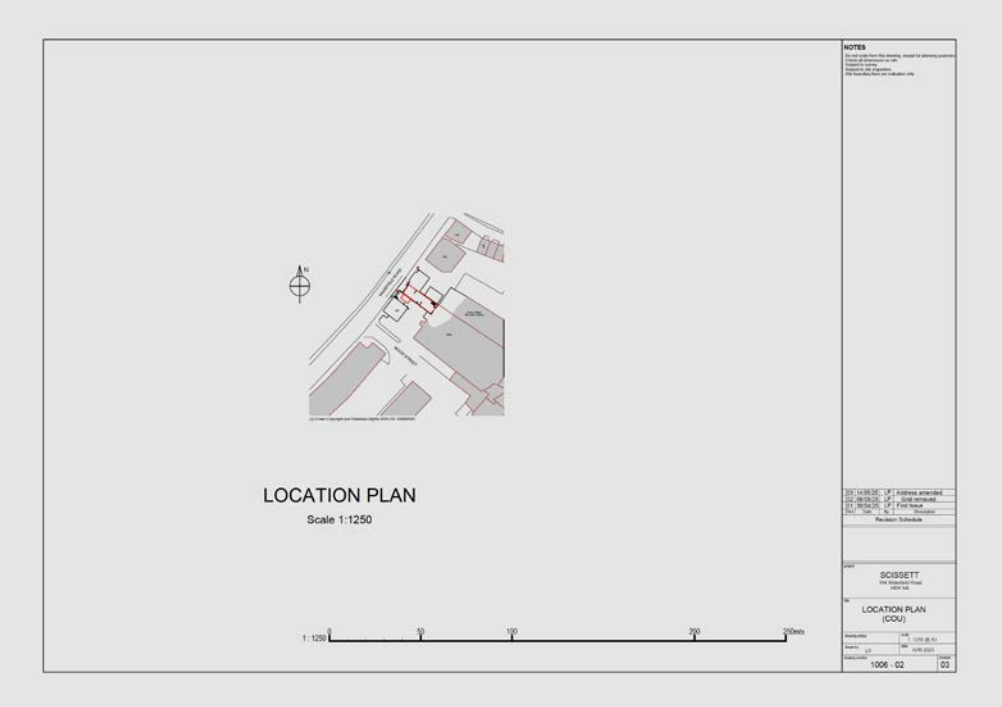


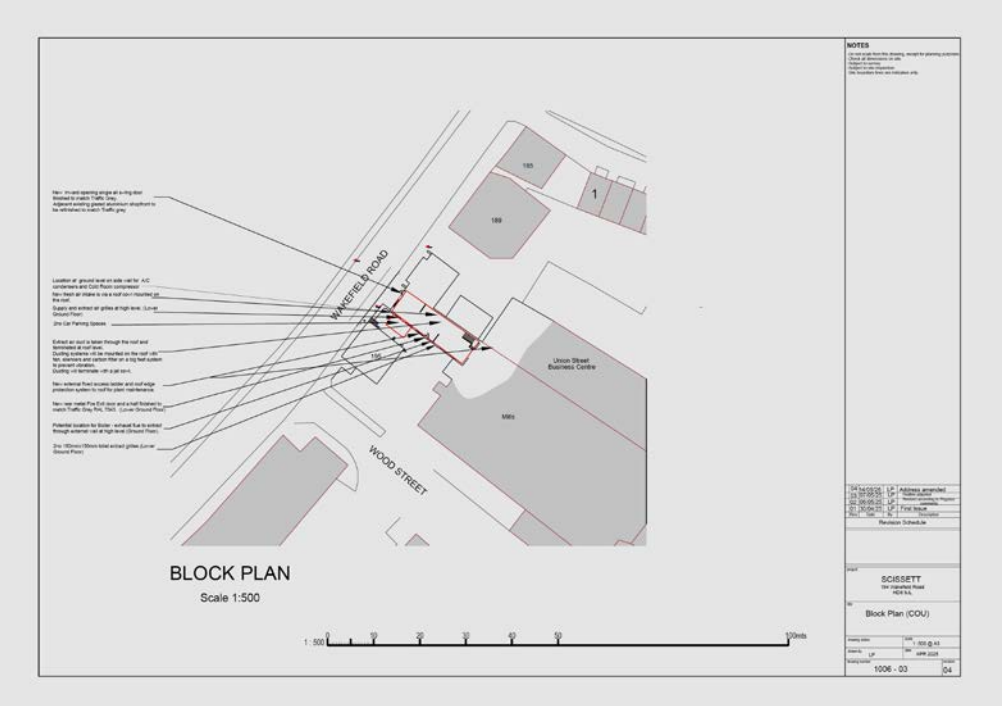
Site: 194 Wakefield Road, Scissett, Huddersfield HD8 9JL

Report: 25020-002 Appendix B *(page 2 of 4)*

Date: May 2025

SITE LOCATION PLAN & BLOCK PLAN





Site: 194 Wakefield Road, Scissett, Huddersfield HD8 9JL

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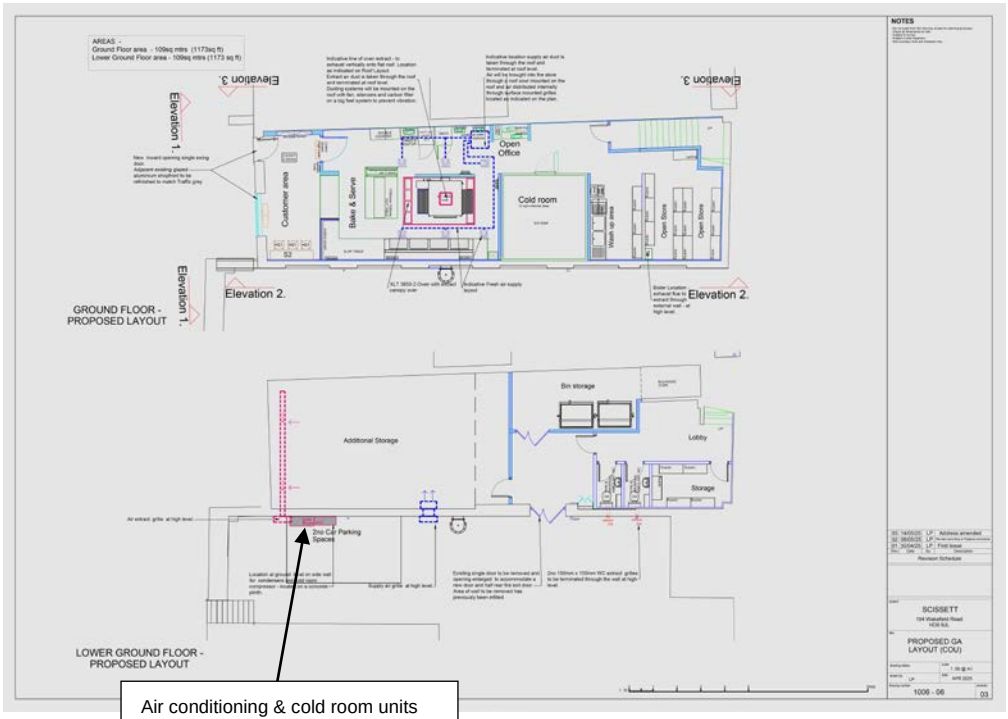
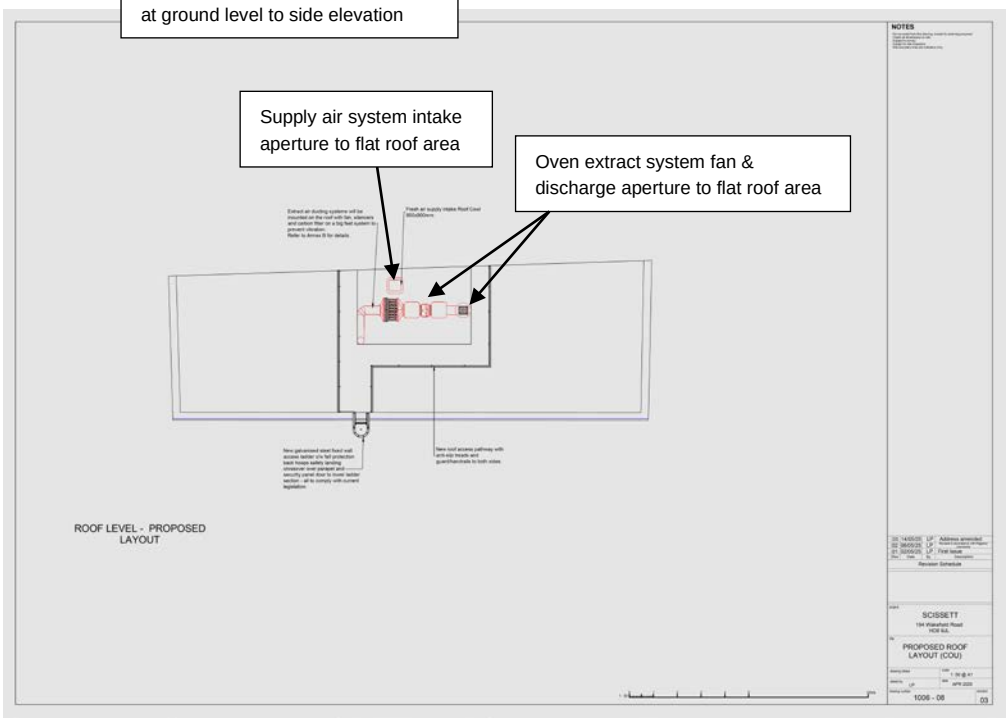
Date: May 2025

PROPOSED LAYOUT PLAN / ELEVATION DRAWINGS



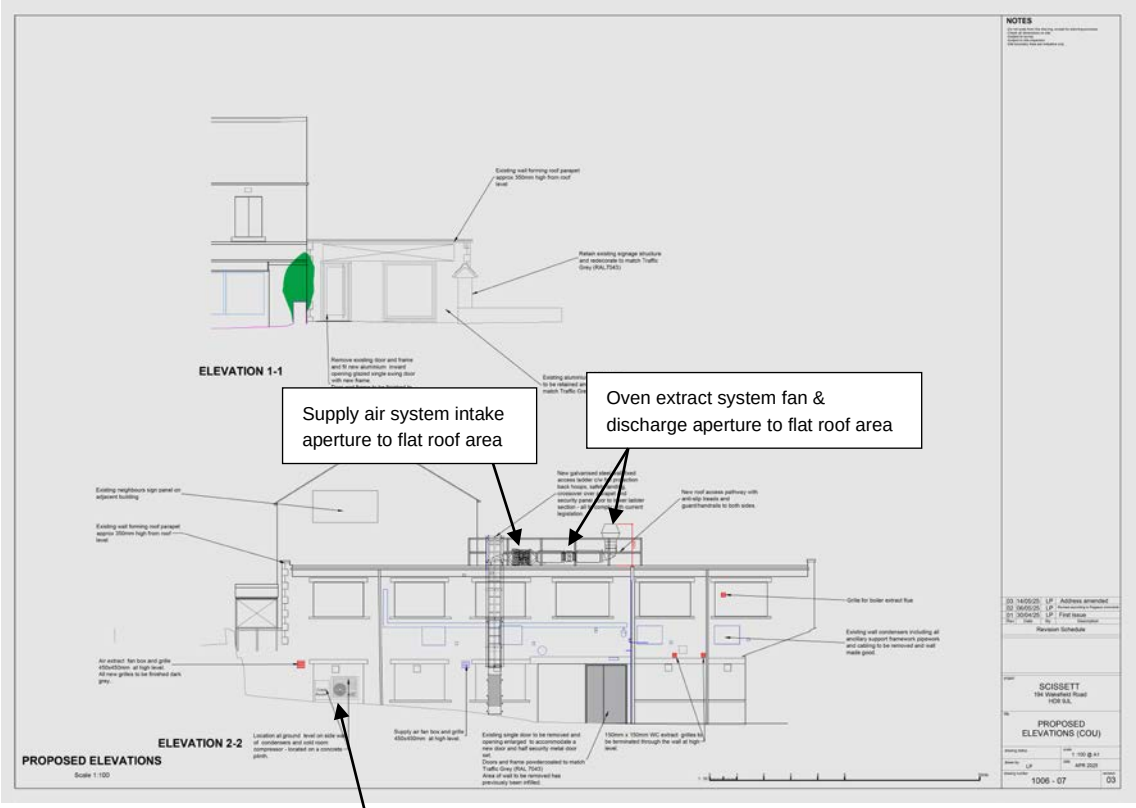


Site: 194 Wakefield Road, Scissett, Huddersfield HD8 9JL

Report: 25020-002 Appendix B *(page 4 of 4)*

Date: May 2025

PROPOSED LAYOUT PLAN / ELEVATION DRAWINGS



APPENDIX C

Background Noise Survey Results

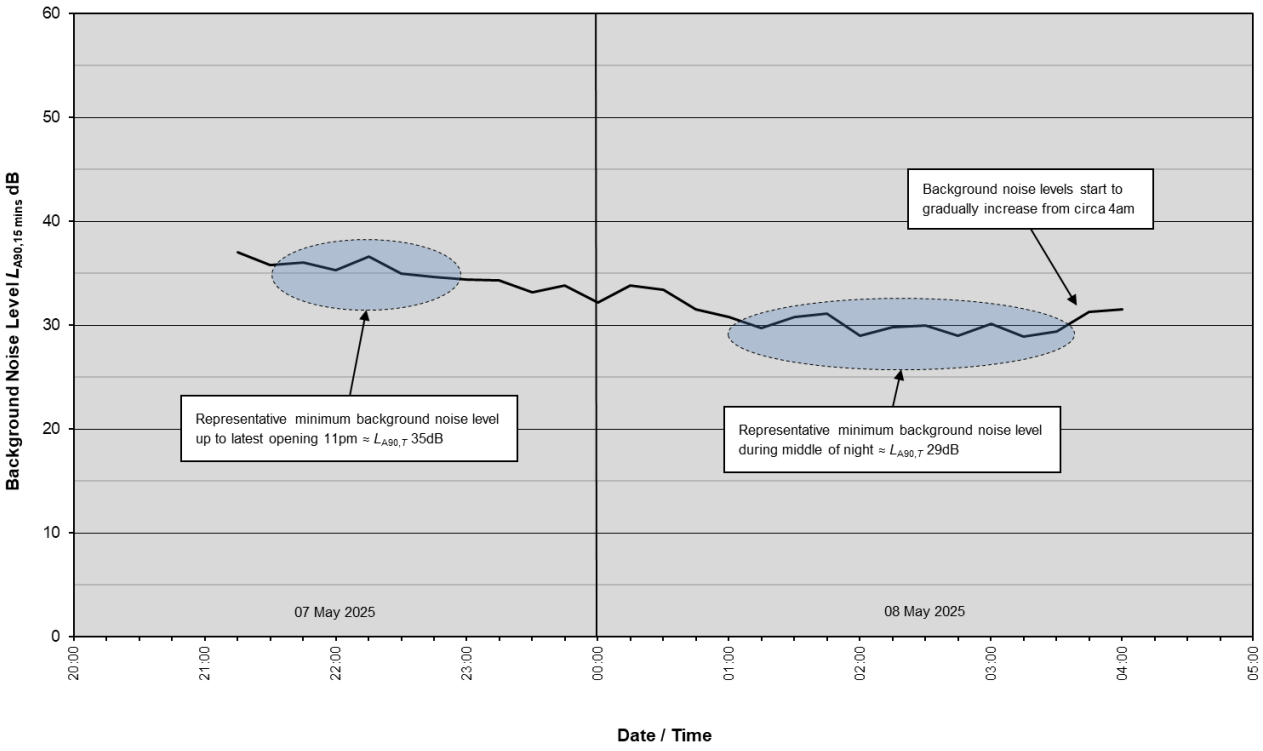
Site: 194 Wakefield Road, Scissett, Huddersfield HD8 9JL

Report: 25020-002 Appendix C *(page 1 of 1)*

Date: May 2025

BACKGROUND NOISE SURVEY RESULTS

Raw Data Survey Results *(representative externally outside nearest residential dwellings on New Street)*



APPENDIX D

Manufacturer's Plant Noise Data

Site: 194 Wakefield Road, Scissett, Huddersfield HD8 9JL

Report: 25020-002 Appendix D *(page 1 of 4)*

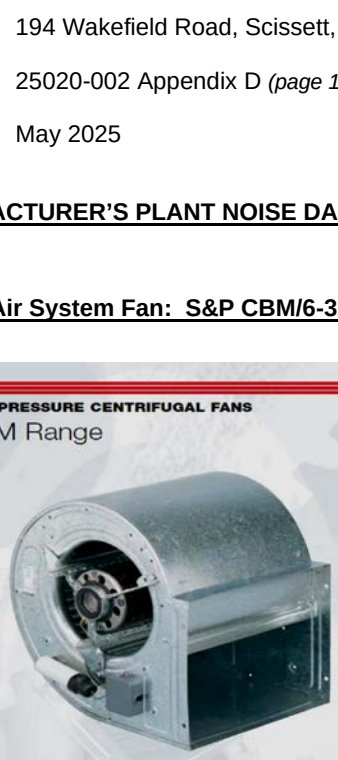
Date: May 2025

MANUFACTURER'S PLANT NOISE DATA

Supply Air System Fan: S&P CBM/6-320/240-550W

LOW PRESSURE CENTRIFUGAL FANS

CBM Range



Range of double inlet direct drive low pressure centrifugal fans manufactured from **galvanised sheet steel.**
All the models are fitted with forward curved centrifugal impellers manufactured from galvanized sheet steel.
Available, depending upon the model, with single phase or three phase motors, in 4 or 6 poles.

Motors
All standard motors (1) are IP10, Class B, equipped with thermal protection and ball bearings greased for life.
Electrical supply:
Single phase 230V-50Hz (capacitor fitted on the fan housing).
Three phase 230/400V-50Hz .
(See characteristics chart).
(1) Except CBM-380/560 fitted with an aluminium housing closed motor IP44 class F.

Additional Information
Mounting feet as accessory, allowing 4 different positions.

On request
Aluminium housing closed motors, IP44, class F (T version).
Coupling flange fitted at the fan outlet (B version).

Anti-vibration mounts

All motors are fitted with support including rubber antivibration mounts **reducing the noise** transmitted to the installation

Impeller dynamically balanced

Impeller **dynamically balanced,** according to ISO 1940 standard, providing vibration free operation

APPLICATIONS

Incorporation in ventilation cabinets

Air conditioning equipment

Technical characteristics

Before installation check that the product electrical characteristics listed on the data plate label (Voltage, power, frequency etc) match those of the intended electrical supply.

Model	Motor power (W)	Motor power (PK)	Equiv. in inches	Poles	Speed (r.p.m.)	Capacitor (µF / V)	Maximum current absorbed 230/1/50 (A)	Maximum current absorbed 230-400/3/50 (A)	Airflow (m³/h)	Sound pressure level * (dB(A))	Weight (kg)
CBM/6-180/180-72W	72	1/10	7/7	6	960	4/400	1,0	–	1400	56	9
CBM/4-180/180-147W	150	1/5	7/7	4	1350	6/400	1,5	–	1565	59	10
CBM/6-240/180-122W	120	1/6	9/7	6	900	8/500	2,1	–	2430	63	15
CBM/6-240/180-245W	250	1/3	9/7	6	920	10/450	2,45	–	2680	65	16
CBM/6-240/240-122W	120	1/6	9/9	6	850	8/500	2,1	–	2500	61	16
CBM/6-240/240-245W	250	1/3	9/9	6	900	10/450	2,75	–	2900	63	17
CBM/4-240/240-373W	370	1/2	9/9	4	1350	10/400	3,8	–	2650	65	19
CBM/6-270/200-245W	250	1/3	10/8	6	900	10/400	3,0	–	3480	65	18
CBM/6-270/200-373W	370	1/2	10/8	6	970	15/400	4,0	–	4000	68	19
CBM/4-270/200-373W	370	1/2	10/8	4	1300	12/400	5,0	–	3150	66	21
CBM/6-270/270-245W	250	1/3	10/10	6	900	10/400	3,0	–	3550	63	20
CBM/6-270/270-373W	370	1/2	10/10	6	900	15/400	4,0	–	4500	67	21
CBM/4-270/270-550W	550	3/4	10/10	4	1400	15/400	5,9	–	3540	66	23
CBM/6-320/240-550W	550	3/4	12/9	6	900	18/400	5,8	–	4700	67	28
CBM/6-320/240-1100W (trif.)	1100	1,5 (3f)	12/9	6	900	–	–	7,0/4,2	7000	75	28
CBM/6-320/320-550W	550	3/4	12/12	6	900	18/400	5,8	–	5250	66	30
CBM/6-320/320-1100W (trif.)	1100	1,5 (3f)	12/12	6	900	–	–	7,0/4,0	7900	78	30
CBM-RTC/6-380/380-2200W (trif.)	2200	3 (3f)	15/15	6	940	–		10,4/6,0	9000	70	45

* Measured at 1,5 meters at the fan inlet side in free field.

Manufacturer data in terms of overall sound pressure level 67dBA at 1.5m distance (free field) from fan inlet side

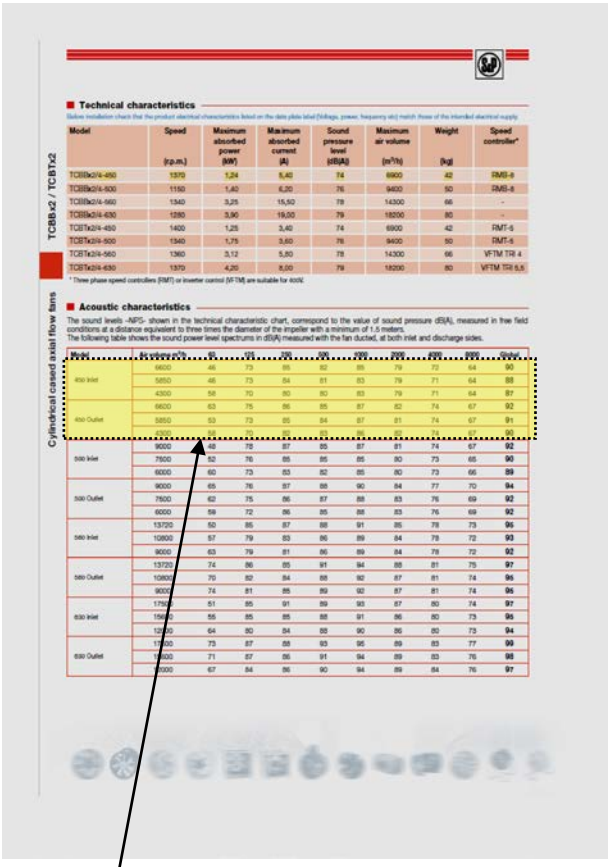
Site: 194 Wakefield Road, Scissett, Huddersfield HD8 9JL

Report: 25020-002 Appendix D *(page 2 of 4)*

Date: May 2025

MANUFACTURER'S PLANT NOISE DATA

Oven Extract System Fan: S&P TCBBx2/4-450



Manufacturer noise data

Acoustic characteristics

The sound levels -NPS- shown in the technical characteristic chart, correspond to the value of sound pressure dB(A), measured in free field conditions at a distance equivalent to three times the diameter of the impeller with a minimum of 1.5 meters.
The following table shows the sound power level spectrums in dB(A) measured with the fan ducted, at both inlet and discharge sides.

Model	Air volume m³/h	63	125	250	500	1000	2000	4000	8000	Global
450 Inlet	6600	46	73	85	82	85	79	72	64	**90**
	5850	46	73	84	81	83	79	71	64	**88**
	4300	58	70	80	80	83	79	71	64	**87**
450 Outlet	6600	63	75	86	85	87	82	74	67	**92**
	5850	53	73	85	84	87	81	74	67	**91**
	4300	58	70	82	83	86	82	74	67	**90**

Site: 194 Wakefield Road, Scissett, Huddersfield HD8 9JL

Report: 25020-002 Appendix D *(page 3 of 4)*

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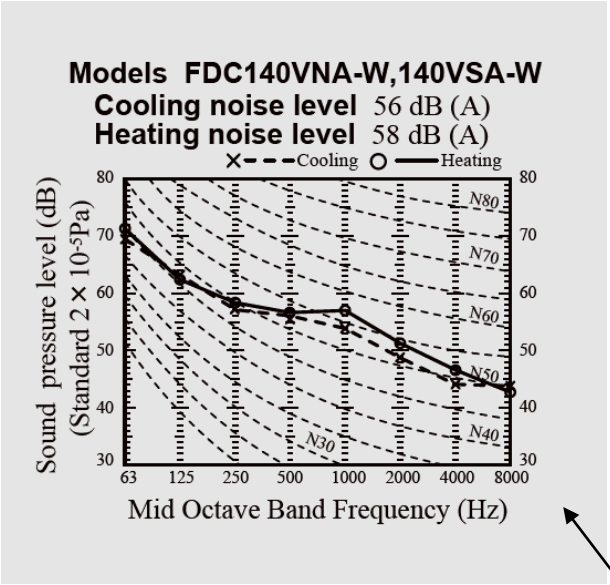
MANUFACTURER'S PLANT NOISE DATA

Air Conditioning Unit: Mitsubishi FDC140VNA-W *(configured cooling mode)*



Manufacturer noise data is in terms of overall dBA & octave band linear dB sound pressure levels at 1m distance from the unit.

Note the manufacturer stated octave band values equate to slightly higher equivalent overall dBA values (example: for cooling mode 58dBA as opposed to the stated value 56dBA).

For purpose of the noise assessment, it is cautiously/robustly taken the octave band data values are correct, thus with slightly higher equivalent overall dBA value than the manufacturer stated value.

Site: 194 Wakefield Road, Scissett, Huddersfield HD8 9JL

Report: 25020-002 Appendix D *(page 4 of 4)*

Date: May 2025

MANUFACTURER'S PLANT NOISE DATA

Cold Room Unit: Tecumseh Wintsys WINAJ4517Z-FZ

Tecumseh

Condensing unit
Voltage Code : FZ

WINAJ4517Z-FZ

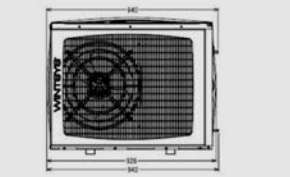
High Temp. Commercial (HP)

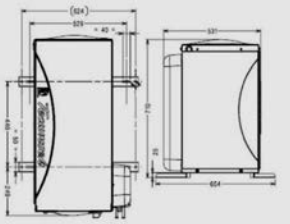
220 - 240V 1~ 50 Hz

R452A / R404A / R448A / R449A

WINAJ4517Z-FZ

Conditions	Frequency	Nominal Cooling Capacity Watts	Nominal Cooling Capacity BTU/h	Sound Power ISO3745 / ISO 3743-1
EN13215 / R452A	50 Hz	2190	7470	61 dBA
EN13215 / R404A	50 Hz	2296	7830	61 dBA
EN13215 / R448A	50 Hz	2003	6831	61 dBA
EN13215 / R449A	50 Hz	2004	6835	61 dBA





Net Weight (Kg)	65.0
Expansion device	Expansion_Valve
Air Flow (m³/h)	1650
Compo Data Sheet	224LT-FZ
Elec Comp Type	CSR
Current (Amp)	
Load Rated Amp	7.6
Max Cont Current	13.2
Lock Rotor Amp	39
Fan	
Speed (rpm)	546
Power (W)	65.0
Diameter (mm)	360
Protection	Overload
IP Level	IP44
Condenser	360/14100
Liquid Receiver	
Capacity (L)	2.35
Maximum Pressure (Bars)	32.0
Suction Line	
Suction Type	Tube / Tube
For Tubing Out Diam	15.9 (5/8")
Suction Connection Type	Brased
Liquid Line	
Liquid Line Type	Tube
For Tubing Out Diam	9.5 (3/8")
Liquid Connecton Type	Brased
Connection Type	TT
Fan Guard	maille < à 8mm

* EN13215 : T°Ambient 32.0°C / T°Evap. -10.0°C / T°Return gas temp.. 20.0°C T°Subcooling. 3.0K

Note : Tecumseh reserves the right to change information contained in this document without notification.

Selection program - V4.6_2020072 - 06/05/2020

Manufacturer noise data is in terms of overall dBA sound power level

APPENDIX E

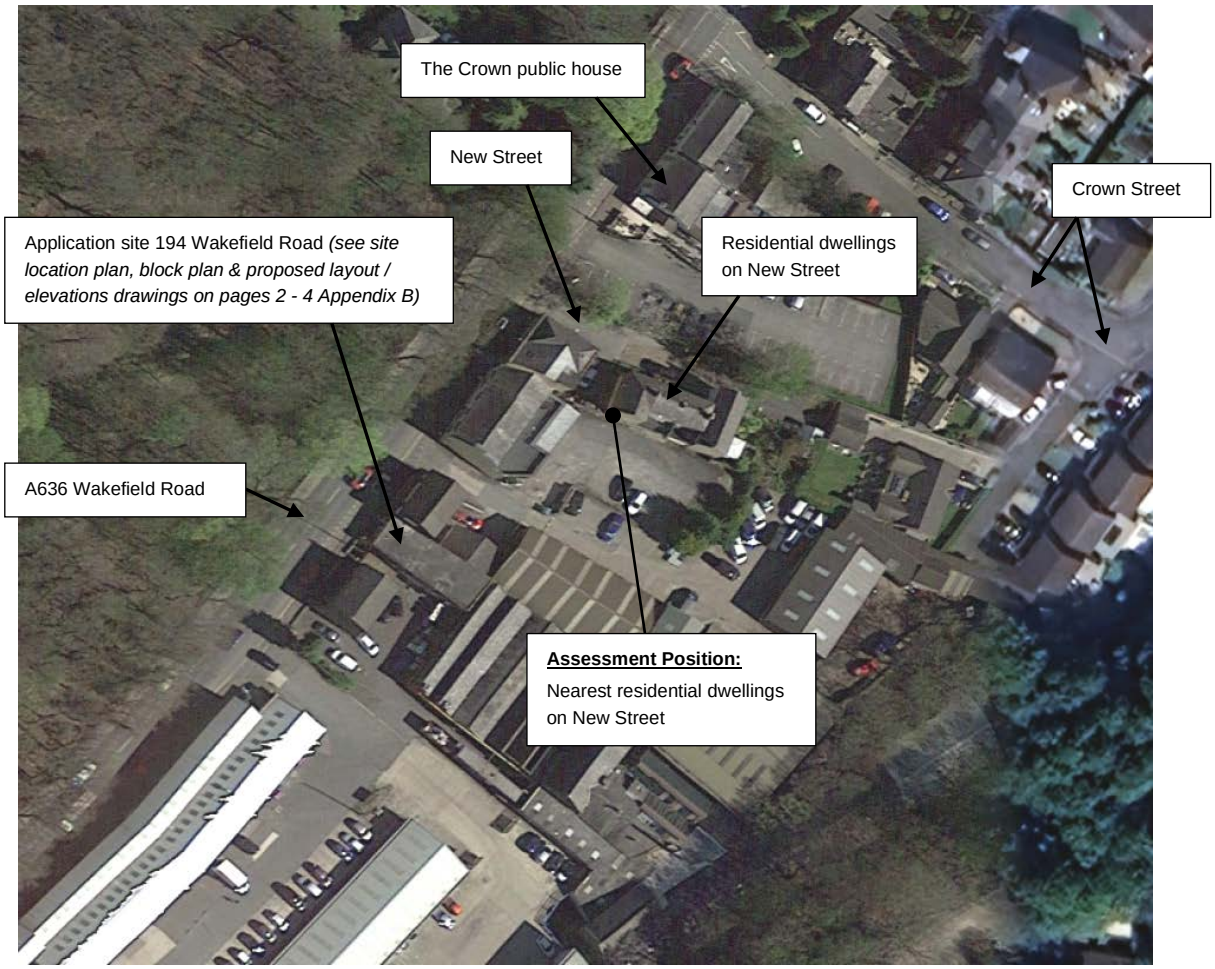
Noise Assessment Position & Plant Noise Model Calculation

Site: 194 Wakefield Road, Scissett, Huddersfield HD8 9JL

Report: 25020-002 Appendix E *(page 1 of 2)*

Date: May 2025

NOISE ASSESSMENT POSITION



Site: 194 Wakefield Road, Scissett, Huddersfield HD8 9JL

Report: 25020-002 Appendix E *(page 2 of 2)*

Date: May 2025

PLANT NOISE MODEL CALCULATION

ASSESSMENT POSITION: Nearest residential dwellings on New Street

NOISE CONDITION: Opening hours; all plant items operating full duty

NOISE MITIGATION: Duct silencers (attenuators) to supply air & oven extract fan systems, plus acoustic lagging to oven extract fan casing *(see Section 7.1 Report 25020-002)*

		Lin dB at Octave Band Centre Frequency Hz							
Plant & Description	**Overall dBA**	**63**	**125**	**250**	**500**	**1k**	**2k**	**4k**	**8k**
SUPPLY AIR SYSTEM - INTAKE APERTURE: S&P CBM/6-320/240-550W Fan									
Sound power level Lw dB; *induct inlet Lw*	79	80	78	76	75	74	71	67	63
Duct Loss; *duct length between fan & aperture (excluding silencer) - allow ≈3m 500mm Ø*		0	0	0	0	0	0	0	0
Duct Loss; *duct bends between fan & aperture - allow 1 x 90° radius bend 500mm Ø*		0	0	0	-1	-2	-3	-3	-3
Duct Loss; *aperture end reflection 500mm Ø duct to external fresh air intake aperture roof cowl*		-9	-5	-2	0	0	0	0	0
Noise Mitigation; *atmosphere side silencer to system (Alnor SIL-50 500-1000 circular silencer)*		-4	-7	-11	-17	-21	-15	-14	-15
Sound power level Lw dB; *external aperture Lw*	61	67	66	63	57	51	53	50	45
Distance; *free-field correction ≈40m from aperture to assessment position*		-40	-40	-40	-40	-40	-40	-40	-40
Screening; *nil line of sight screening correction applicable*		0	0	0	0	0	0	0	0
Directivity; *nil off-axis aperture directivity applicable for "roof cowl" type intake aperture*		0	0	0	0	0	0	0	0
Non Free-Field / Reflections; *nil correction applicable for intake aperture on flat roof area*		0	0	0	0	0	0	0	0
Individual contribution at assessment position	21	27	26	23	17	11	13	10	5
OVEN EXTRACT SYSTEM - DISCHARGE APERTURE: S&P TCBBx2/4-450 Fan									
Sound power level Lw dB; *induct outlet Lw*	92	89	91	95	88	87	81	73	68
Duct Loss; *duct length between fan & aperture (excluding silencer) - allow ≈1m 450mm Ø*		0	0	0	0	0	0	0	0
Duct Loss; *duct bends between fan & aperture - allow 1 x 90 ° radius bend 450mm Ø*		0	0	0	-1	-2	-3	-3	-3
Duct Loss; *aperture end reflection 450mm Ø duct to external vertical discharge aperture*		-10	-6	-2	0	0	0	0	0
Noise Mitigation; *atmosphere side silencer to system (Alnor SIL-50 450-1500 circular silencer)*		-8	-11	-16	-23	-25	-20	-19	-19
Sound power level Lw dB; *external aperture Lw*	70	71	74	77	64	60	58	51	46
Distance; *free-field correction ≈40m from aperture to assessment position*		-40	-40	-40	-40	-40	-40	-40	-40
Screening; *nil line of sight screening correction applicable*		0	0	0	0	0	0	0	0
Directivity; *≈90° off-axis aperture directivity applicable (vertical discharge), limit to -10dB*		-1	-2	-3	-4	-6	-10	-10	-10
Non Free-Field / Reflections; *nil correction applicable for vertical discharge aperture over flat roof*		0	0	0	0	0	0	0	0
Individual contribution at assessment position	26	30	32	34	20	14	8	1	-4
OVEN EXTRACT SYSTEM - FAN CASING BREAKOUT NOISE SOURCE: S&P TCBBx2/4-450 Fan									
Sound power level Lw dB; *casing breakout Lw*	68	78	73	73	65	60	53	51	44
Noise Mitigation; *acoustic lagging to fan unit, (limit noise reduction benefit to -10dB)*		-4	-8	-10	-10	-10	-10	-10	-10
Distance; *free-field correction for ≈40m from fan unit to assessment position*		-40	-40	-40	-40	-40	-40	-40	-40
Screening; *nil line of sight screening correction applicable*		0	0	0	0	0	0	0	0
Directivity; *nil directivity correction applicable (fan casing noise propagates equally all directions)*		0	0	0	0	0	0	0	0
Non Free-Field / Reflections; *nil correction applicable for fan located on flat roof area*		0	0	0	0	0	0	0	0
Individual contribution at assessment position	18	34	25	23	15	10	3	1	-6
AIR CONDITIONING UNIT: Mitsubishi FDC140VNA-W									
Sound power level Lw dB *(unit configured cooling mode operation)*	66	77	72	65	63	62	57	52	52
Noise Mitigation; *non applied*		0	0	0	0	0	0	0	0
Distance; *free-field correction ≈47m from unit to assessment position*		-41	-41	-41	-41	-41	-41	-41	-41
Screening; *complete line of sight screening correction applicable (intervening building), limit to -10dB*		-10	-10	-10	-10	-10	-10	-10	-10
Directivity; *nil directivity correction applicable (unit noise propagates equally all directions)*		0	0	0	0	0	0	0	0
Reflections / Non Free-Field; *+3dB correction applied for unit located against wall*		3	3	3	3	3	3	3	3
Individual contribution at assessment position	18	29	24	17	15	14	9	4	4
COLD ROOM UNIT: Tecumseh Wintsys WINAJ4519Z -FZ									
Sound power level Lw dB	61	63	61	59	57	56	53	49	41
Noise Mitigation; *non applied*		0	0	0	0	0	0	0	0
Distance; *free-field correction ≈47m from unit to assessment position*		-41	-41	-41	-41	-41	-41	-41	-41
Screening; *complete line of sight screening correction applicable (intervening building), limit to -10dB*		-10	-10	-10	-10	-10	-10	-10	-10
Directivity; *nil directivity correction applicable (unit noise propagates equally all directions)*		0	0	0	0	0	0	0	0
Reflections / Non Free-Field; *+3dB correction applied for unit located against wall*		3	3	3	3	3	3	3	3
Individual contribution at assessment position	12	15	13	11	9	8	5	1	-7
Cumulative Plant Noise (Specific Noise Level) At Assessment Position									
All Plant: Operating during opening hours (range 11am to 11pm)	**28**	**37**	**34**	**35**	**23**	**19**	**16**	**12**	**8**
Cold Room Unit: Operable over 24 hours (including through the night)	**12**	**15**	**13**	**11**	**9**	**8**	**5**	**1**	**-7**

The overall cumulative sound pressure (noise) level at the assessment position due to all plant items operating is 28dBA. For only the cold room unit operating through the night, the noise level of plant at the assessment position is 12dBA.

Although the specified noise reduction treatment will tend to supress any tonal characteristics of the plant, plus noise of the air conditioning & cold room units is nominally broadband in nature, a +2dBA penalty (correction) as per the assessment guidance of the current edition BS4142 is cautiously added to the overall calculated plant noise levels to give plant noise Rating Levels to account that residual noise from the plant could potentially have a just perceptible tonal characteristic.

APPENDIX F

Noise Reduction Treatment For Plant

Site: 194 Wakefield Road, Scissett, Huddersfield HD8 9JL

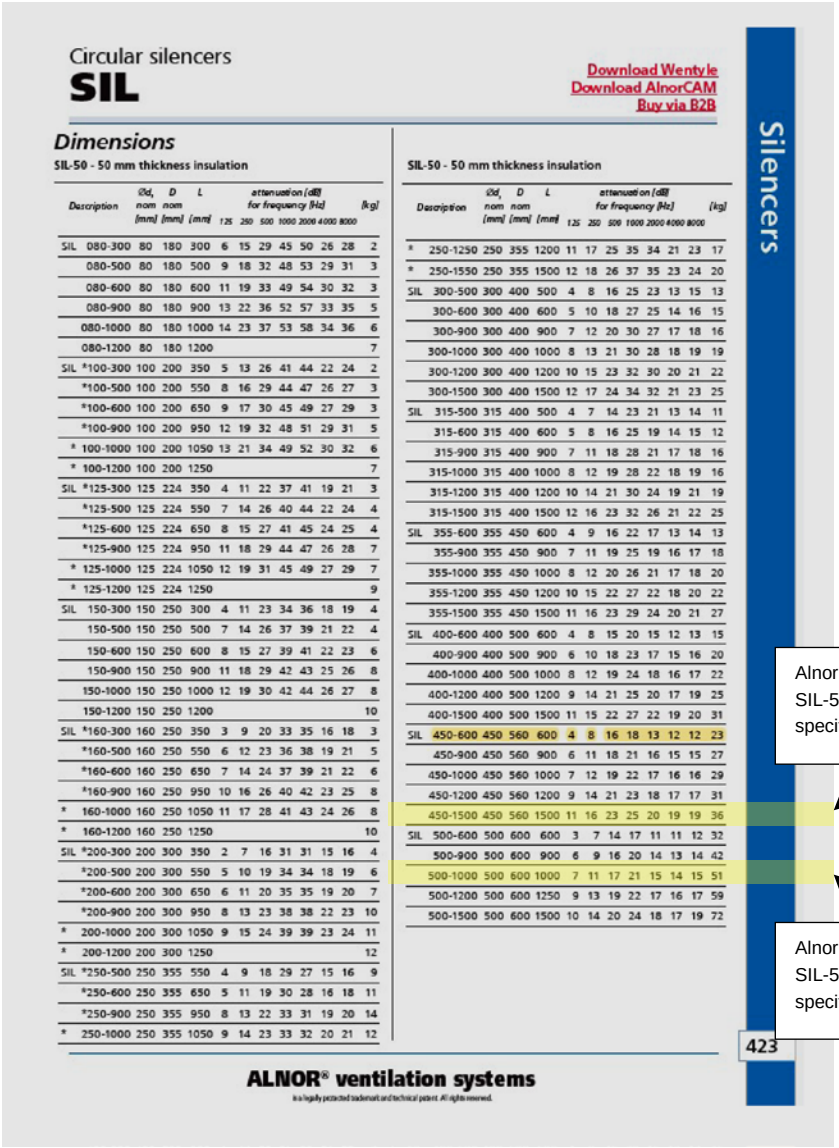
Report: 25020-002 Appendix F *(page 1 of 2)*

Date: May 2025

NOISE REDUCTION TREATMENT FOR PLANT

Supply Air System & Oven Extract System Silencers:

Data sheet for specified circular type silencers; Alnor Ventilation Systems product code SIL-50 ***-****



Circular silencers
SIL

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Silencers

Dimensions

SIL-50 - 50 mm thickness insulation

Description	Ød1 nom [mm]	D nom [mm]	L [mm]	attenuation [dB] for frequency [Hz] 125	250	500	1000	2000	4000	8000	[kg]
SIL 080-300	80	180	300	6	15	29	45	50	26	28	2
080-500	80	180	500	9	18	32	48	53	29	31	3
080-600	80	180	600	11	19	33	49	54	30	32	3
080-900	80	180	900	13	22	36	52	57	33	35	5
080-1000	80	180	1000	14	23	37	53	58	34	36	6
080-1200	80	180	1200								7
SIL *100-300	100	200	350	5	13	26	41	44	22	24	2
*100-500	100	200	550	8	16	29	44	47	26	27	3
*100-600	100	200	650	9	17	30	45	49	27	29	3
*100-900	100	200	950	12	19	32	48	51	29	31	5
* 100-1000	100	200	1050	13	21	34	49	52	30	32	6
* 100-1200	100	200	1250								7
SIL *125-300	125	224	350	4	11	22	37	41	19	21	3
*125-500	125	224	550	7	14	26	40	44	22	24	4
*125-600	125	224	650	8	15	27	41	45	24	25	4
*125-900	125	224	950	11	18	29	44	47	26	28	7
* 125-1000	125	224	1050	12	19	31	45	49	27	29	7
* 125-1200	125	224	1250								9
SIL 150-300	150	250	300	4	11	23	34	36	18	19	4
150-500	150	250	500	7	14	26	37	39	21	22	4
150-600	150	250	600	8	15	27	39	41	22	23	6
150-900	150	250	900	11	18	29	42	43	25	26	8
150-1000	150	250	1000	12	19	30	42	44	26	27	8
150-1200	150	250	1200								10
SIL *160-300	160	250	350	3	9	20	33	35	16	18	3
*160-500	160	250	550	6	12	23	36	38	19	21	5
*160-600	160	250	650	7	14	24	37	39	21	22	6
*160-900	160	250	950	10	16	26	40	42	23	25	8
* 160-1000	160	250	1050	11	17	28	41	43	24	26	8
* 160-1200	160	250	1250								10
SIL *200-300	200	300	350	2	7	16	31	31	15	16	4
*200-500	200	300	550	5	10	19	34	34	18	19	6
*200-600	200	300	650	6	11	20	35	35	19	20	7
*200-900	200	300	950	8	13	23	38	38	22	23	10
* 200-1000	200	300	1050	9	15	24	39	39	23	24	11
* 200-1200	200	300	1250								12
SIL *250-500	250	355	550	4	9	18	29	27	15	16	9
*250-600	250	355	650	5	11	19	30	28	16	18	11
*250-900	250	355	950	8	13	22	33	31	19	20	14
* 250-1000	250	355	1050	9	14	23	33	32	20	21	12

SIL-50 - 50 mm thickness insulation

Description	Ød1 nom [mm]	D nom [mm]	L [mm]	attenuation [dB] for frequency [Hz] 125	250	500	1000	2000	4000	8000	[kg]
* 250-1250	250	355	1200	11	17	25	35	34	21	23	17
* 250-1550	250	355	1500	12	18	26	37	35	23	24	20
SIL 300-500	300	400	500	4	8	16	25	23	13	15	13
300-600	300	400	600	5	10	18	27	25	14	16	15
300-900	300	400	900	7	12	20	30	27	17	18	16
300-1000	300	400	1000	8	13	21	30	28	18	19	19
300-1200	300	400	1200	10	15	23	32	30	20	21	22
300-1500	300	400	1500	12	17	24	34	32	21	23	25
SIL 315-500	315	400	500	4	7	14	23	21	13	14	11
315-600	315	400	600	5	8	16	25	19	14	15	12
315-900	315	400	900	7	11	18	28	21	17	18	16
315-1000	315	400	1000	8	12	19	28	22	18	19	16
315-1200	315	400	1200	10	14	21	30	24	19	21	19
315-1500	315	400	1500	12	16	23	32	26	21	22	25
SIL 355-600	355	450	600	4	9	16	22	17	13	14	13
355-900	355	450	900	7	11	19	25	19	16	17	18
355-1000	355	450	1000	8	12	20	26	21	17	18	20
355-1200	355	450	1200	10	15	22	27	22	18	20	22
355-1500	355	450	1500	11	16	23	29	24	20	21	27
SIL 400-600	400	500	600	4	8	15	20	15	12	13	15
400-900	400	500	900	6	10	18	23	17	15	16	20
400-1000	400	500	1000	8	12	19	24	18	16	17	22
400-1200	400	500	1200	9	14	21	25	20	17	19	25
400-1500	400	500	1500	11	15	22	27	22	19	20	31
SIL 450-600	450	560	600	4	8	16	18	13	12	12	23
450-900	450	560	900	6	11	18	21	16	15	15	27
450-1000	450	560	1000	7	12	19	22	17	16	16	29
450-1200	450	560	1200	9	14	21	23	18	17	17	31
450-1500	450	560	1500	11	16	23	25	20	19	19	36
SIL 500-600	500	600	600	3	7	14	17	11	11	12	32
500-900	500	600	900	6	9	16	20	14	13	14	42
500-1000	500	600	1000	7	11	17	21	15	14	15	51
500-1200	500	600	1250	9	13	19	22	17	16	17	59
500-1500	500	600	1500	10	14	20	24	18	17	19	72

Alnor Ventilation Systems product code SIL-50 450-1500 circular silencer (attenuator) specified for oven extract system

Alnor Ventilation Systems product code SIL-50 500-1000 circular silencer (attenuator) specified for supply air system

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ALNOR® ventilation systems

Site: 194 Wakefield Road, Scissett, Huddersfield HD8 9JL

Report: 25020-002 Appendix F *(page 2 of 2)*

Date: May 2025

NOISE REDUCTION TREATMENT FOR PLANT

Oven Extract System Fan Acoustic Lagging:

Data Sheet For Example Typically Suitable Acoustic Lagging "Jacket" For Extract Fan Body

WILHAMS

WILHAMS INSULATION LTD. www.wilhams.co.uk

ACOUSTIC FAN JACKETS TYPE AFJ

Data sheet 8/02

Advantages
- Flexible and easy to handle and install.
- Available in two product formats.
- Provides a cost effective sound barrier solution.
- Durable and wear resistant.
- Resistant to oils and water etc.

Applications
Wilhams AFJ acoustic fan jackets are employed to efficiently reduce the noise breakout from axial flow fan casings.

Description
Wilhams AFJ acoustic fan jackets are manufactured from polymeric barrier supported by a 25mm or 50mm acoustic foam space layer. The polymeric barrier is backed with a hessian substrate for strength and dimensional stability with the following options:

AFJ-1060 is a standard acoustic fan jacket, manufactured from 5 kg/m² polymeric barrier.

AFJ-1080 is a high performance acoustic fan jacket, manufactured from 10 kg/m² polymeric barrier.

Both fan jackets are available with a choice of foams:
- Wilhams WH25/1FR fire retardant acoustic foam.
- Wilhams PUNF Class 'O' foam.

The acoustic foam thickness 25mm or 50mm, should be selected to match the duct flange height.

Jackets are supplied with either Velcro straps or buckle and straps and Class 'O' foil facing.

Technical Information
Wilhams AFJ acoustic fan jackets conform to the following specifications:

AFJ–1060
- Barrier material surface density – 5kg/m²
- Barrier material flammability – FMVSS 302 : self extinguishing
- Operating temperature – -30 to +65°C
- Acoustic foam technical data – see data sheets 1/03 (type -A) and 1/01 (type –B).

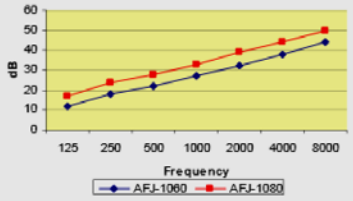
AFJ–1080
- Barrier material surface density – 10kg/m²
- Barrier material flammability – FMVSS 302 : self extinguishing
- Operating temperature – -30 to +65°C
- Acoustic foam technical data – see data sheets 1/03 (type –A) and 1/01 (type –B).

Physical Information
Dimensions
Made to measure.

Acoustic Performance
Wilhams AFJ acoustic fan jackets have the following acoustic performance data.

Transmission Loss Data (tabulated and graphical)

Material \ Frequency	125	250	500	1k	2k	4k	8k
AFJ-1060	12	18	22	27	32	38	44
AFJ-1080	17	24	28	33	39	44	50



Wilhams acoustic fan jackets typically provide the following reduction after installation:
AFJ – 1060 type product will provide 7 to 9 dB reduction
AFJ – 1080 type product will provide 10 to 14 dB reduction

Recommendations
To further reduce duct work noise we recommend:

Breakout noise –
Wilhams WB barrier (data sheet 2/01) to the external walls of the duct work, alternatively lag the duct work with a Wilhams WIL-LAG (data sheets 4/01 & 4/02).

Internally line –
Wilhams Acoustic Foam (data sheet 1/01 or 1/03).

Fan connections –
Wilhams FDC flexible duct connectors (data sheet 8/01).

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