

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
6B MARKET STREET, HOYLAND, BARNSELY S74 9QR

REPORT REF: 24063-002

ISSUED TO: Pegasus Planning Group Ltd
First Floor South Wing
Equinox North
Great Park Road
Almondsbury
Bristol
BS32 4QL

ISSUED BY: David R Philip BEng (Hons) MIOA

DATE: August 2024

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SUMMARY

- This report provides a noise assessment for mechanical services plant to serve a proposed change of use to hot food takeaway at an existing vacant commercial property 6b Market Street, Hoyland, Barnsley S74 9QR. The proposed development is to operate as Domino's Pizza.
- The plant (equipment) comprises a supply air system fan and oven extract system fan (both with associated external apertures) 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 assessment methodology 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 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 complies 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. Specification details for the noise reduction treatment are provided in 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. Specification details for suitable vibration isolators are provided in 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 / retail property; 6b Market Street, Hoyland, Barnsley S74 9QR.

The development is for a pizza format hot food takeaway, to operate as Domino's Pizza 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, both with associated external apertures, 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 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 items of mechanical services 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 generally within the Hoyland town centre vicinity including along Market Street, High Street and King Street.

Much of this existing plant / equipment is in similar proximity (or closer) to noise sensitive / residential properties as that proposed at the application site 6b Market Street.

Notwithstanding this, assessment of noise from plant to serve the proposed pizza takeaway in this report is only with reference to the noise criterion (limit) set with reference to 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 plant / equipment serving hot food takeaways and similar commercial uses 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 (BS4142:2014)

Appropriate relevant noise design standards and guidance (i.e. noise assessment methodology & criterion) applicable for proposed new plant to serve the pizza format hot food takeaway are contained within British Standard BS4142:2014.

Full title of the current edition of the standard is BS4142:2014+A1:2019 "*Methods for rating and assessing industrial and commercial sound*". Reference throughout this report to 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

BS4142:2014 provides a well-established methodology to assess the likely effect (impact) to people regarding noise of an "industrial" nature from commercial or other 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, many Local Planning Authorities refer to BS4142:2014.

In this scenario of new mechanical services plant, the BS4142:2014 assessment method requires that source noise data for the plant is 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 nearest residential properties or similar).

The (plant noise) Rating Level in this scenario is the Specific 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 BS4142:2014 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, BS4142:2014 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 BS4142:2014 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 BS4142:2014.

Different Local Planning Authorities interpret and apply the guidance of BS4142:2014 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 allocated commercial use property, apply the guidance of BS4142 with a requirement that the noise Rating Level of plant be not higher than the pre-existing background noise; applicable to (assessment) positions outside windows of nearest noise sensitive (residential) properties and applicable to the representative lower value (minimum) pre-existing background noise during plant operational times.

Based on the above and with consideration of context that the proposed plant is to serve an existing commercial use property, it is appropriate to apply the guidance of BS4142:2014 with the common requirement that the noise Rating Level of proposed plant shall not exceed existing background noise levels.

It is the author's experience of undertaking many noise surveys and assessments of noise from ventilation systems and air conditioning / cold room refrigeration units in similar scenarios and contexts to 6b Market Street, Hoyland, that at this level, noise from the proposed new plant would not be of adverse impact or otherwise affect the amenity of neighbouring properties.

Additional clarification points in respect to the noise assessment and criterion are provided below and on the following page:

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 ($L_{Ar,T}$ 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 BS4142:2014 assessment methodology.

c) Assessment Position

As per normal noise assessment procedures / convention (plus with reference to BS4142:2014), the plant noise criterion is applied to an assessment position directly outside nearest windows of noise sensitive (residential) properties.

Details of nearest residential properties are provided in Section 4.2 of the report.

d) **Background Noise Level**

The noise criterion is cautiously / robustly 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) **Very Low Background Noise Levels** (for information only – not applicable to 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.

BS4142:2014 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,T_r} 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,T_r} 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 06 August 2024 through 07 August 2024 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 light wind (wind speed circa 2 to 3m/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 block plan and proposed layout plan / elevation drawings in Appendix B.

Nearest noise sensitive properties to the site and proposed plant locations are residential dwellings:

- Rear elevation upper floors flats above ground floor commercial premises (Chicken Stop & Desi Massala) at 12 & 14 Market Street, adjacent north from the site;
- Dwellings at St James Square (off West Street), adjacent west beyond rear of the site;
- Rear elevation upper floors flats above ground floor commercial premises (Walkers Newsagents incorporating Post Office) at 22 & 24 High Street, adjacent south from the site.

There are other residential properties in proximity to the site 6b Market Street, including flats / apartments above ground floor commercial uses along Market Street & High Street plus on nearby Duke Street. However, the above listed dwellings are with windows physically nearest, and/or least naturally screened to the proposed plant locations, thus potentially the most noise affected neighbouring residential properties.

The background noise survey position was externally to the rear of the site, selected as best practicably accessible and representative of outside the neighbouring residential properties, conducted in accordance with the procedural guidance of BS4142:2014. The survey position is indicated on the site aerial image in Appendix B.

Measurements of background noise were at equivalent first floor height, facilitated by positioning the survey instrumentation microphone on a 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 moderate / low, predominantly due to underlying noise of traffic in the local and wider vicinity around Hoyland.

The author observed there is also some low level noise through the late evening and night from existing plant / equipment serving commercial premises within Hoyland town centre.

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 $L_{A90, 15 \text{ min}}$	Plant Noise Limit (Rating Level)
Assessment to outside nearest windows of residential properties	All Plant: Operating during opening hours (range 11am to 11pm)	37dB	$L_{A,T} \leq 37\text{dB}$
	Cold Room Unit: Operable over 24 hours (including during the night)	33dB (occurs circa 2am to 4am)	$L_{A,T} \leq 33\text{dB}$

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 Air System Fan:** S&P CBM/6-320/240-550W fan, located internally within the building with fresh air intake via ducting (incorporating a silencer) from an external inlet "mushroom cowl" aperture set above the rear flat roof of the property;
- **Oven Extract System Fan:** S&P TCBT/4-450/H fan, located internally within the building with exhaust to atmosphere via ducting (incorporating a silencer) to a high roof level external vertical discharge aperture to the rear of the property;
- **Air Conditioning Unit:** Toshiba RAV-GM1401ATP-E condenser unit (cooling mode operation), located externally to the rear of the property;
- **Cold Room Unit:** Tecumseh Wintsys WINAJ4519Z -FZ condenser unit, located externally to the rear 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 ⁽¹⁾ (Inlet – induct sound power level)	79	80	78	77	76	74	70	67	63
Oven Extract System Fan: S&P TCBT/4-450/H ⁽²⁾ (Outlet – induct sound power level)	77	72	74	74	74	73	70	66	60
Air Conditioning Unit: Toshiba RAV-GM1401ATP-E ⁽³⁾ (unit configured cooling mode)	63	65	64	63	58	58	55	50	42
Cold Room Unit: Tecumseh Wintsys WINAJ4519Z -FZ ⁽⁴⁾	63	65	63	61	59	58	55	51	43
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 TCBT/4-450/H is in terms of "A-Weighted" dBA octave band values. The values stated above are equivalent linear dB octave band values (i.e. not "A-Weighted"). Note ⁽³⁾: Sound power level overall dBA & linear dB octave band values for air conditioning unit are based on manufacturer noise data free-field sound pressure levels at 1m from the unit. Note ⁽⁴⁾: No manufacturer octave band noise data available 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 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 windows 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 Section 7.1 of the Report.

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

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

Description	Plant Operating Times	Plant Overall Noise Level (Rating Level)	Noise Limit (Rating Level)	Comment
Assessment Position A: Flats above ground floor commercial premises at 12 & 14 Market Street	All Plant Items : Operating during opening hours (range 11am to 11pm)	$L_{A,T} 36\text{dB}$	$L_{A,T} \leq 37\text{dB}$	Complies
	Cold room unit: Operable over 24 hours (including during the night)	$L_{A,T} 32\text{dB}$	$L_{A,T} \leq 33\text{dB}$	Complies
Assessment Position B: Nearest dwellings at St James Square	All Plant Items : Operating during opening hours (range 11am to 11pm)	$L_{A,T} 30\text{dB}$	$L_{A,T} \leq 37\text{dB}$	Complies
	Cold room unit: Operable over 24 hours (including during the night)	$L_{A,T} 24\text{dB}$	$L_{A,T} \leq 33\text{dB}$	Complies
Assessment Position C: Flats above ground floor commercial premises at 22 & 24 High Street	All Plant Items : Operating during opening hours (range 11am to 11pm)	$L_{A,T} 33\text{dB}$	$L_{A,T} \leq 37\text{dB}$	Complies
	Cold room unit: Operable over 24 hours (including during the night)	$L_{A,T} 20\text{dB}$	$L_{A,T} \leq 33\text{dB}$	Complies

Table 3: Noise assessment

Although the noise reduction treatment will tend to suppress 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.

The assessment demonstrates that with the specified noise reduction treatment fitted as detailed in Section 7.1, noise from the proposed plant will be low, below background noise levels and complies with the limit / criterion set with reference to 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 residential properties. There will be no plant vibration transfer to 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.

Outline specification details for suitable vibration isolators are provided in 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 duct, between the fan and external inlet aperture, i.e. to reduce fan noise transmission out of the external intake aperture.

The proposed silencer is a conventional circular type; Alnor Ventilation Systems product code SIL-50 450-600, 450mm internal diameter and 600mm 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-50 450-600								
Silencer Insertion Loss (attenuation dB)	2 ⁽¹⁾	4	8	16	18	13	12	12
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

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

The proposed silencer is a conventional circular type; Alnor Ventilation Systems product code SIL-50 450-600, 450mm internal diameter and 600mm length (same silencer as for the supply air system).

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-50 450-600								
Silencer Insertion Loss (attenuation dB)	2 ⁽¹⁾	4	8	16	18	13	12	12
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.

7.1.3 Air Conditioning Unit & Cold Room Unit

It is advised the air conditioning unit & cold room unit located externally to the rear 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 isolators (hangers or bracket mountings as applicable). The isolators selected to each have a static deflection $\geq 5\text{mm}$ 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 hangers or 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 hangers / 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 (*outdoor units*)

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

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

7.2.3 Air Conditioning Unit & Cold Room Unit (*internal cassette units*)

It is advised the air conditioning and cold room internal cassette units are installed using proprietary rubber or neoprene turret type vibration isolators (hangers or bracket mountings as applicable).

The isolators selected to each have a static deflection $\geq 3\text{mm}$ under the installed total weights of the internal cassette units. Four isolators are required per unit (one to each corner mounting / suspension position).

APPENDIX A

Noise Survey Instrumentation

Site: 6b Market Street, Hoyland, Barnsley S74 9QR

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NOISE SURVEY INSTRUMENTATION

Instrumentation Used:

- Rion sound level meter type NL-31 Class 1, Rion preamplifier type NH-21, Rion microphone type UC-53A, Rion microphone windshield type WS-10, Rion microphone extension cable type EC-04A and tripod / boom arrangement;
- Bruel & Kjaer calibrator type 4231;
- Speedtech Instruments Skymaster model SM-28 serial number 19370 (sample weather conditions data).

Instrumentation Calibration Certification:

Description	Type Number	Manufacturer	Date of Calibration Expiration	Calibration Certificate Number
Class 1 Sound Level Meter s/n 00903983	NL-31	Rion	22/03/2026	TCRT24/1257
Microphone s/n 317502	UC-53A			
Preamplifier s/n 33991	NH-21			
Calibrator s/n 2642929	4231	Bruel & Kjaer	22/03/2026	TCRT24/1156

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 Block Plan & Proposed Layout Plan / Elevation Drawings

Site: 6b Market Street, Hoyland, Barnsley S74 9QR

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AERIAL IMAGE



Site: 6b Market Street, Hoyland, Barnsley S74 9QR

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SITE BLOCK PLAN

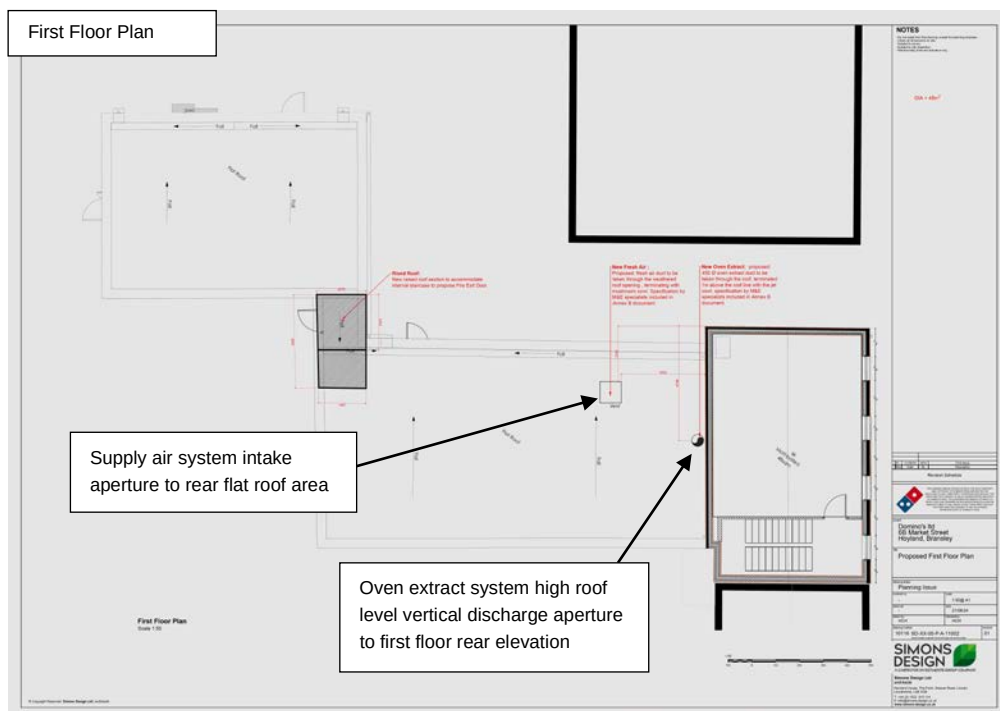
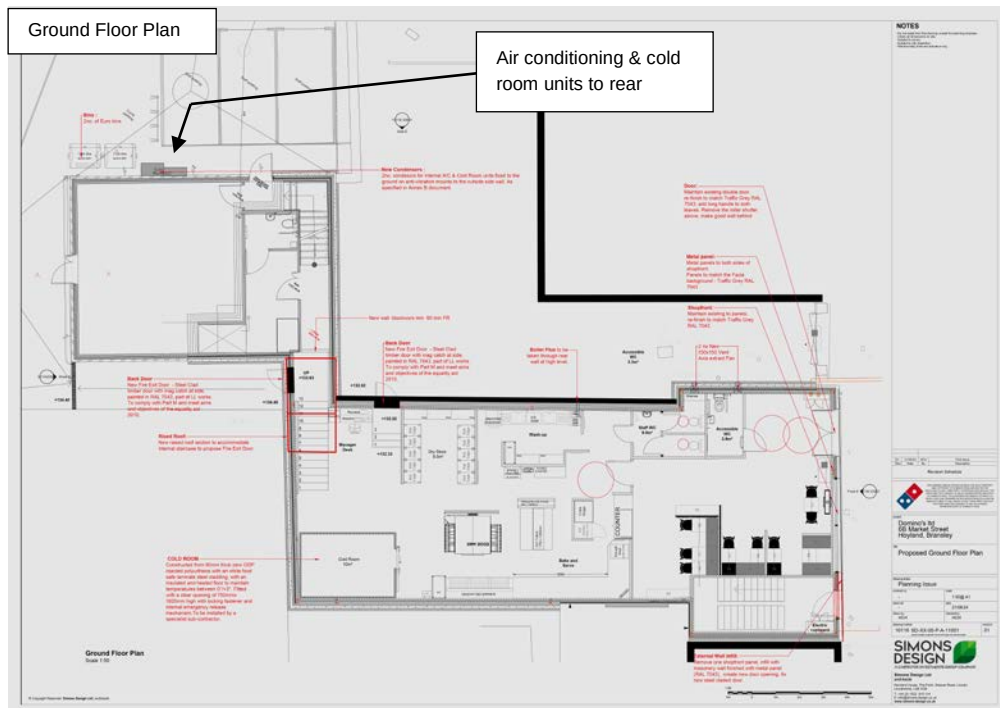


Site: 6b Market Street, Hoyland, Barnsley S74 9QR

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PROPOSED LAYOUT PLAN DRAWINGS

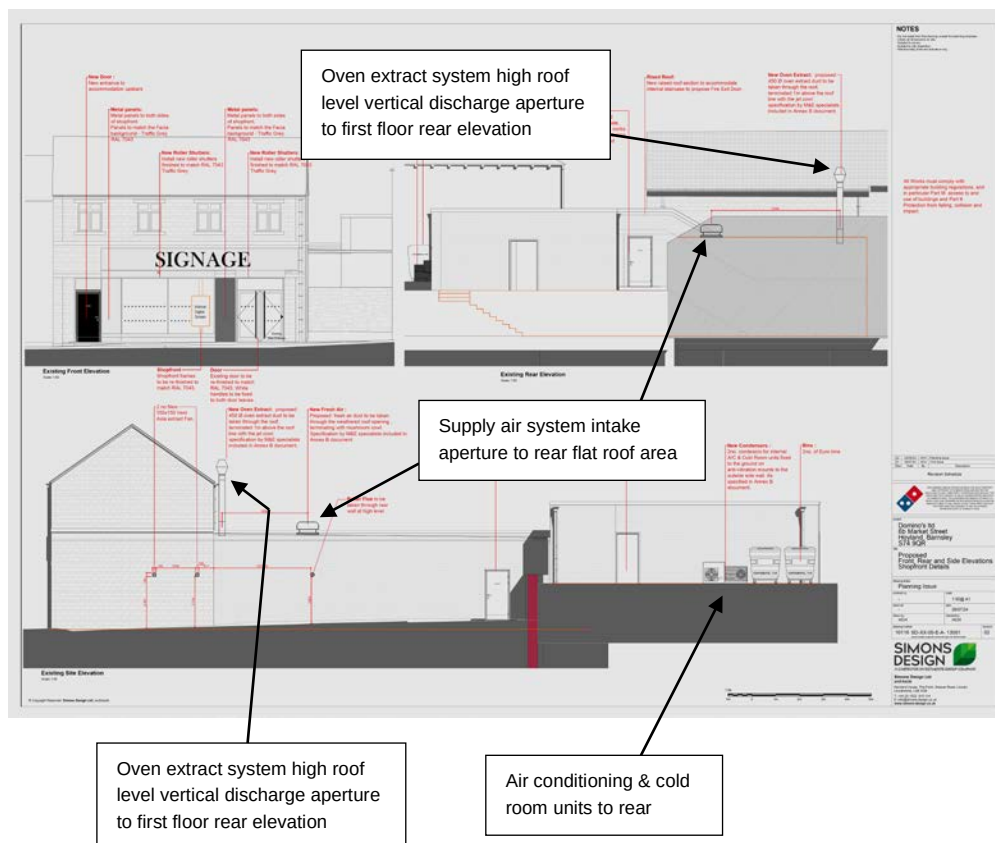


Site: 6b Market Street, Hoyland, Barnsley S74 9QR

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PROPOSED ELEVATIONS DRAWING



APPENDIX C

Background Noise Survey Results

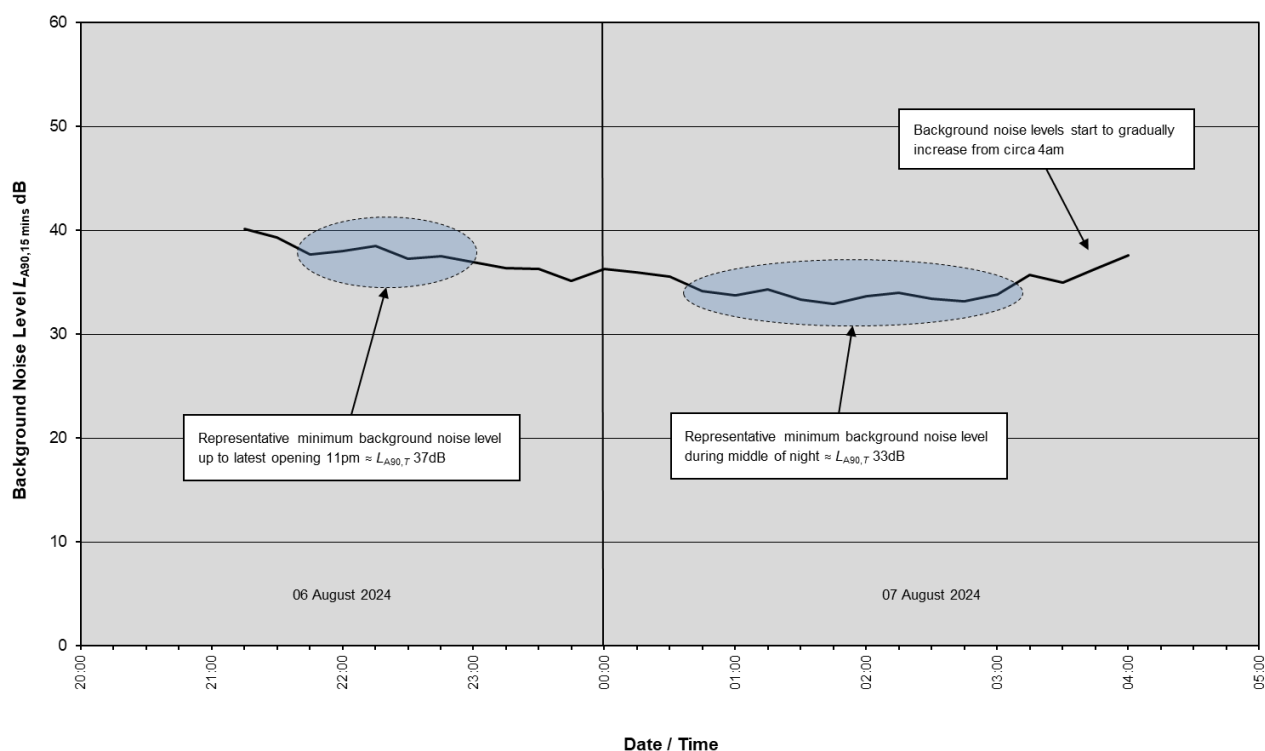
Site: 6b Market Street, Hoyland, Barnsley S74 9QR

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Date: August 2024

BACKGROUND NOISE SURVEY RESULTS

Raw Data Survey Results (rear of site, representative externally outside neighbouring residential properties)



APPENDIX D

Manufacturer's Plant Noise Data

Site: 6b Market Street, Hoyland, Barnsley S74 9QR

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Date: August 2024

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 galvanised 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-300/500 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).

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 (Int.)	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 (Int.)	1100	1,5 (3f)	12/12	6	900	-	-	7,0/4,0	7900	78	30
CBM-RT/C/6-380/2200W (Int.)	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: 6b Market Street, Hoyland, Barnsley S74 9QR

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Date: August 2024

MANUFACTURER'S PLANT NOISE DATA

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

CYLINDRICAL CASED AXIAL FLOW FANS
COMPACT TCBB / TCBT Series - ALUMINIUM IMPELLERS



Range of cylindrical cased axial flow fans fitted with aluminium impellers and manufactured from high grade rolled galvanneal steel and protected against corrosion by catalytic primer and black polyester paint finish. All models are supplied with pre-wired wiring junction box located on the outside of the fan casing for easy wiring access. Available, depending upon the model, with single or three phase motors in 2, 4 or 6 poles.

Motors
Single phase motor (TCBB) or three phase motor (TCBT).
Models 250, 315, 355 and 400: External rotor motor, IP54, Class F, thermal protection, working temperature from -40°C to +40°C.
Models 450, 500, 560, 630 and 6710: IP55, Class F, thermal protection, working temperature from -40°C to +70°C.
Models 4710 and 800: IP55, Class F, working temperature from -40°C to +40°C.

All motors are speed controllable by autotransformer except models J4-560H, J4-630, 710 and T800.
Three phase motors are speed controllable by inverter.
Electrical supplies:
Single phase 220-240V 50Hz.
Capacitor located inside the wiring terminal box.
Three phase 220-240V 50Hz or 380-415V 50Hz.
(See characteristic chart).

Additional information
Standard air direction: form (B) configuration (Impeller over motor).
On request
Air direction: form (A) configuration (Motor over impeller).
From Ø450 to Ø800, three phase motors 2 speed, 4/8 poles.

ATEX versions TCBBT
On request, explosion proof versions in accordance with ATEX Directive, for 3 phase models.
For ambient working temperatures:
From -20°C to +40°C: models TCBBT-315 to 630mm.
models TCBBT-315 to 710mm.
From -20°C to +40°C: models TCBBT-710 to 800mm.
models TCBBT-800mm.

Motors IP55 Class F
-ATEX Flameproof - Ex
In standard ATEX version flameproof motors are without thermal protection.
If used with frequency inverter, flameproof motors with a PTC type thermal protection must be specified at order.
For models TCBBT-710 and 800mm.
Ø models 25 Ex II B T4.
Ø models 25 Ex II B T4 with Ex II C T4 model.
-ATEX increased safety - Ex
Not suitable TCBBT-250H 400V 50Hz.
TCBBT-250H 400V 50Hz.
TCBBT-315H 400V 50Hz.
TCBBT-355H 400V 50Hz.
TCBBT-400H 400V 50Hz.
Available for TCBBT-400H 230V 50Hz and larger sizes.
Ø models 25 Ex II T3.
-ATEX - Dust
In standard ATEX version, ATEX motors for dust are without thermal protection.
If used with frequency inverter, ATEX motors for dust with a PTC type thermal protection must be specified at order.

Corrosion resistance
Rolled steel casings and motor support protected by catalytic primer and black polyester paint finish. Stainless steel screws.

Terminal box
Wiring terminal box with cable gland PG-11 (except ATEX models).

Impeller dynamically balanced
Impellers are dynamically balanced, according to ISO 1940 standard, giving vibration free operation.

Configuration for models J4-710 and 800.

Constructive configuration models 250, 315, 355 and 400 (excepted 6-355, 6-400 and ATEX)

Specific applications
Ex
To select TCBBT ATEX refer to performance curves, or European.
Note electrical data may vary for ATEX motors.

CYLINDRICAL CASED AXIAL FLOW FANS
COMPACT TCBB / TCBT Series - ALUMINIUM IMPELLERS

REFERENCE

1 - T: Cylindrical cased axial flow fan.
2 - C: Series designation.
3 - Impeller type:
B: Ø 250 - Ø 400 Fixed blade impeller manufactured from aluminium sheet.
C: Ø 450 - Ø 800 Adjustable blade aluminium impeller.
4 - Supply type:
T: Three phase.
S: Single phase.
5 - Number of poles:
2: Approx. 2800 rpm - 50 Hz
4: Approx. 1400 rpm - 50 Hz
6: Approx. 950 rpm - 50 Hz

6 - Nominal diameter of fan in mm.
7 - Pitch angle.
8 - Direction of air:
A: Motor over Impeller.
B: Impeller over Motor.
9 - Voltage:
230 V (single phase).
230/400 V (three phase).
400 V (three phase).
10 - Frequency of service: 50 Hz
60 Hz
11 - Special versions:
2 V: Two speed motors.
4/8 poles of motor for models:

Ø 450 up to Ø 800 mm.
Ø 710 up to Ø 800 mm.
C: Condensation drain holes on motor.
EX: Explosion proof and flame proof versions.

SUPPLY VOLTAGES AND FREQUENCIES

Main supply voltage	Motor type	Connection	Speed
SINGLE PHASE 230V 50Hz	230V 50Hz	See wiring diagram	High
THREE PHASE 230V 50Hz	230/400V 50Hz	△	High
THREE PHASE 230V 50Hz	230/400V 50Hz	Y	Low*
THREE PHASE 400V 50Hz	400V 50Hz	△	High
THREE PHASE 400V 50Hz	400V 50Hz	Y	Low*

* For models allowed by speed controller RMT

ACOUSTIC CHARACTERISTICS
The sound levels shown in the technical characteristic chart and performance curves, correspond to the value of sound pressure dBA, measured in free field conditions at a distance equivalent to three times the diameter of the impeller with a minimum of 1.5 meters.
Sound power level spectrum in dBA at the corresponding frequency band in Hz and the point of maximum flow.

Model	63	125	250	500	1000	2000	4000	8000	LwA
J4-250/H	24	37	41	47	52	52	47	41	57
J4-315/H	40	51	45	53	59	59	51	43	63
J4-355/H	24	40	45	55	58	58	49	42	62
J4-400/H	46	53	59	66	69	69	66	58	74
J4-450/H	46	58	65	71	73	71	67	59	77
J4-500/H	50	62	69	75	76	75	70	62	81
J4-560/L	52	64	71	77	78	77	72	64	83
J4-560/H	53	65	72	78	79	78	73	65	84
J4-630/L	56	67	75	80	82	81	76	68	87
J4-630/H	56	67	75	80	82	81	76	68	87
J4-710/L	53	69	79	85	86	84	78	70	91
J4-710/H	60	72	79	85	86	85	80	72	91
J4-800/L	57	73	83	90	91	88	82	74	95
J4-800/H	63	75	82	88	90	88	84	76	94
J4-800/G	64	76	83	89	90	89	84	76	95
J4-800/H	66	77	84	90	92	91	86	78	96

Manufacturer noise data is in terms of overall dBA & A weighted octave band sound power level values

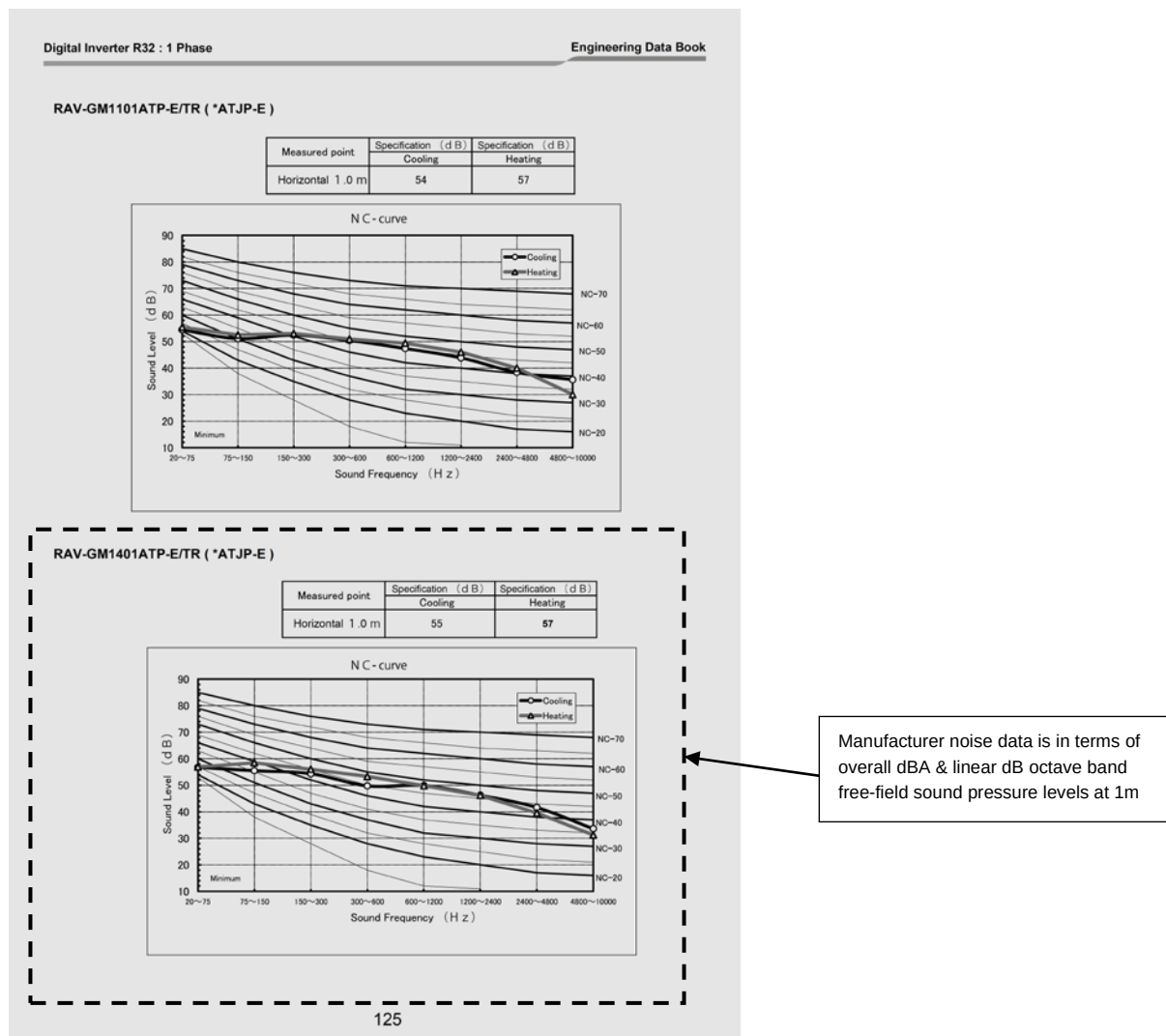
Site: 6b Market Street, Hoyland, Barnsley S74 9QR

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MANUFACTURER'S PLANT NOISE DATA

Air Conditioning Unit: Toshiba RAV-GM1401ATP-E



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MANUFACTURER'S PLANT NOISE DATA

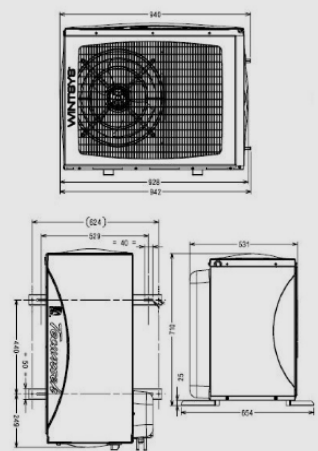
Cold Room Unit: Tecumseh Wintsys WINAJ4519Z-FZ


Condensing unit
Voltage Code : FZ
High Temp. Commercial (HP) 220 - 240V 1~ 50 Hz

R452A / R404A / R448A / R449A WINAJ4519Z-FZ

Conditions	Frequency	Nominal Cooling Capacity		Sound Power ISO3745 / ISO 3743-1
		Watts	BTU/h	
EN13215 / R452A	50 Hz	2729	9306	63 dBA
EN13215 / R404A	50 Hz	2860	9754	63 dBA
EN13215 / R448A	50 Hz	2501	8528	63 dBA
EN13215 / R449A	50 Hz	2502	8532	63 dBA

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



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

Net Weight (Kg) 65.0
Expansion device Expansion_Valve
Air Flow (m³/h) 1650
Compo Data Sheet 224ST-FZ
Elec Comp Type CSR

Current (Amp)
Load Rated Amp 10.2
Max Cont Current 15.5
Lock Rotor Amp 45

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 Braided

Liquid Line
Liquid Line Type Tube
For Tubing Out Diam 9.5 (3/8")
Liquid Connection Type Braided

Connection Type TT
Fan Guard maille < a 8mm

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

Selection program - V4_8_2020072 - 06/05/2020

APPENDIX E

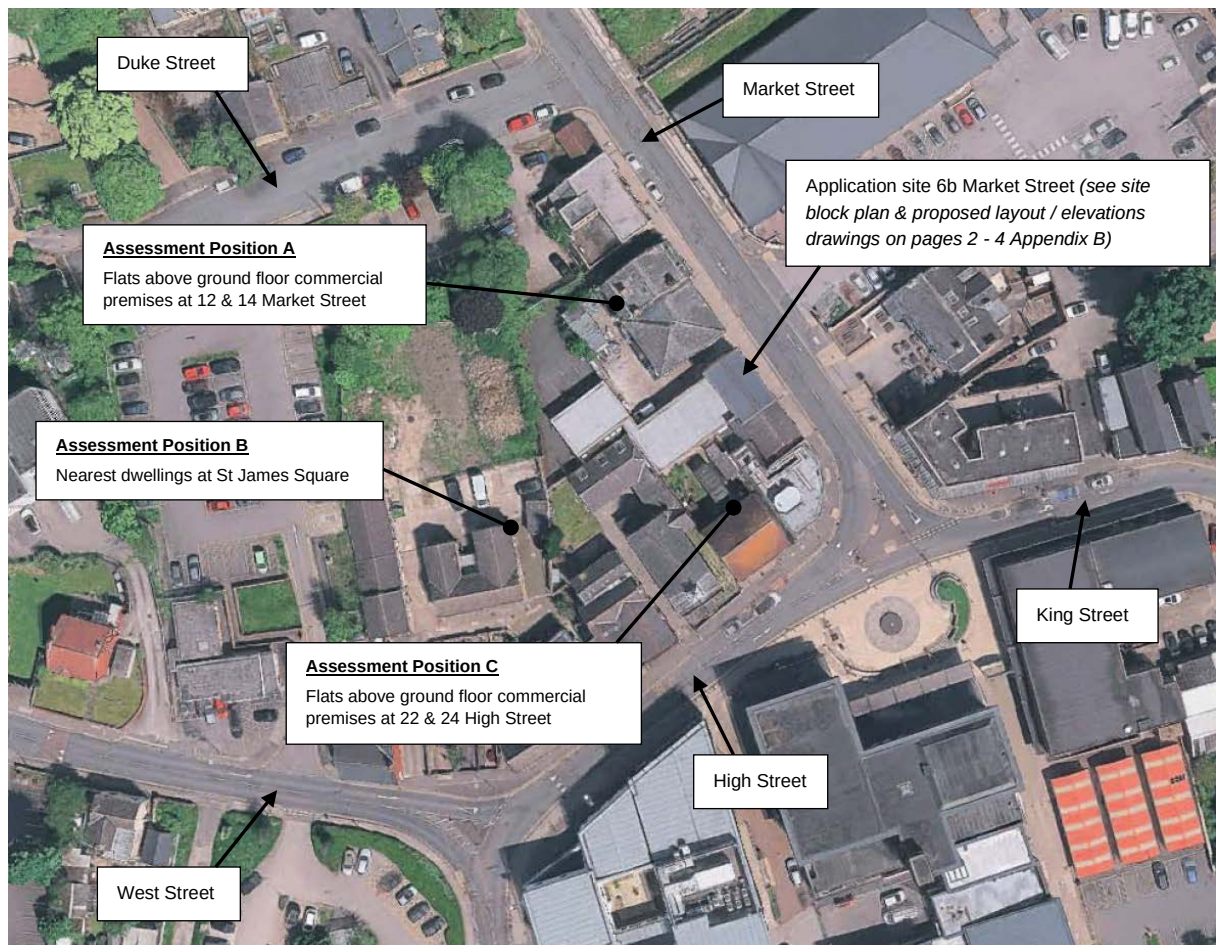
Noise Assessment Positions & Plant Noise Model Calculation

Site: 6b Market Street, Hoyland, Barnsley S74 9QR

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NOISE ASSESSMENT POSITIONS



Site: 6b Market Street, Hoyland, Barnsley S74 9QR

Report: 24063-002 Appendix E (page 2 of 4)

Date: August 2024

PLANT NOISE MODEL CALCULATION

ASSESSMENT POSITION A: Flats above ground floor commercial premises 12 & 14 Market Street

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

NOISE MITIGATION: Silencers to supply air system & oven extract system (see Section 7.1 Report 24063-002)

Plant & Description	Overall dBA	Lin dB at Octave Band Centre Frequency Hz							
		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; fan inlet induct	79	80	78	77	76	74	70	67	63
Duct Loss; duct length between fan & aperture (excluding silencer) - allow ~2m 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		-9	-5	-2	0	0	0	0	0
Noise Mitigation; atmosphere side silencer to system (Alnor SIL 450-600 circular silencer)		-2	-4	-8	-16	-18	-13	-12	-12
Sound power level Lw dB; external aperture Lw	63	69	69	67	59	54	54	52	48
Distance; free-field correction for ~20m from aperture to assessment position		-34	-34	-34	-34	-34	-34	-34	-34
Screening; partial line of sight screening correction applicable (intervening adjacent building), limit to -5dB		-5	-5	-5	-5	-5	-5	-5	-5
Directivity; nil off-axis aperture directivity applicable for "mushroom cow" type intake aperture		0	0	0	0	0	0	0	0
Non Free-Field / Reflections; nil correction applicable for intake aperture within large flat roof area away from walls		0	0	0	0	0	0	0	0
Individual contribution at assessment position	24	30	30	28	20	15	15	13	9
OVEN EXTRACT SYSTEM - DISCHARGE APERTURE: S&P TCBT/4-450/H Fan									
Sound power level Lw dB; fan outlet induct	77	72	74	74	74	73	70	66	60
Duct Loss; duct length between fan & aperture (excluding silencer) - allow ~5m 450mm Ø		0	0	0	0	-1	-1	-1	-1
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 450-600 circular silencer)		-2	-4	-8	-16	-18	-13	-12	-12
Sound power level Lw dB; external aperture Lw	61	60	64	64	57	52	53	50	44
Distance; free-field correction for ~22m from aperture to assessment position		-35	-35	-35	-35	-35	-35	-35	-35
Screening; partial line of sight screening correction applicable (intervening adjacent building), limit to -5dB		-5	-5	-5	-5	-5	-5	-5	-5
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 high level vertical discharge aperture		0	0	0	0	0	0	0	0
Individual contribution at assessment position	16	19	22	21	13	6	3	0	-6
AIR CONDITIONING UNIT: Toshiba RAV-GM1401ATP-E									
Sound power level Lw dB (unit installed for cooling mode operation)	63	65	64	63	58	58	55	50	42
Quantity; 0dB quantity correction applicable for 1 x unit		0	0	0	0	0	0	0	0
Noise Mitigation; non applied		0	0	0	0	0	0	0	0
Distance; free-field correction for ~22m from unit to assessment position		-35	-35	-35	-35	-35	-35	-35	-35
Screening; nil line of sight screening correction applied		0	0	0	0	0	0	0	0
Directivity; nil directivity correction applicable (unit radiates noise equally all directions)		0	0	0	0	0	0	0	0
Non Free-Field / Reflections; +3dB correction applied for unit positioned against wall		3	3	3	3	3	3	3	3
Individual contribution at assessment position	31	33	32	31	26	26	23	18	10
COLD ROOM UNIT: Tecumseh Wintsys WINA34519Z -FZ									
Sound power level Lw dB	63	65	63	61	59	58	55	51	43
Quantity; 0dB quantity correction applicable for 1 x unit		0	0	0	0	0	0	0	0
Noise Mitigation; non applied		0	0	0	0	0	0	0	0
Distance; free-field correction for ~23m from unit to assessment position		-35	-35	-35	-35	-35	-35	-35	-35
Screening; nil line of sight screening correction applied		0	0	0	0	0	0	0	0
Directivity; nil directivity correction applicable (unit radiates noise equally all directions)		0	0	0	0	0	0	0	0
Non Free-Field / Reflections; +3dB correction applied for unit positioned against wall		3	3	3	3	3	3	3	3
Individual contribution at assessment position	30	33	31	29	27	26	23	19	11
Cumulative Plant Noise (Specific Noise Level) At Assessment Position									
All Plant: Operating during opening hours (range 11am to 11pm)	34	37	36	34	30	29	26	22	15
Cold Room Unit: Operable over 24 hours (including through the night)	30	33	31	29	27	26	23	19	11

The overall cumulative sound pressure (noise) level at the assessment position due to all plant items operating is 34dBA. For only the cold room unit operating through the night, the noise level of plant at the assessment position is 30dBA.

Although the specified noise reduction treatment will tend to suppress 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 (although unlikely in practice – assessment indicates no tonal character).

Site: 6b Market Street, Hoyland, Barnsley S74 9QR

Report: 24063-002 Appendix E (page 3 of 4)

Date: August 2024

PLANT NOISE MODEL CALCULATION

ASSESSMENT POSITION B: Nearest dwellings at St James Square

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

NOISE MITIGATION: Silencers to supply air system & oven extract system (see Section 7.1 Report 24063-002)

Plant & Description	Overall dBA	Lin dB at Octave Band Centre Frequency Hz							
		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; fan inlet induct	79	80	78	77	76	74	70	67	63
Duct Loss; duct length between fan & aperture (excluding silencer) - allow ~2m 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		-9	-5	-2	0	0	0	0	0
Noise Mitigation; atmosphere side silencer to system (Alnor SIL 450-600 circular silencer)		-2	-4	-8	-16	-18	-13	-12	-12
Sound power level Lw dB; external aperture Lw	63	69	69	67	59	54	54	52	48
Distance; free-field correction for ~35m from aperture to assessment position		-39	-39	-39	-39	-39	-39	-39	-39
Screening; nil line of sight screening correction applied		0	0	0	0	0	0	0	0
Directivity; nil off-axis aperture directivity applicable for "mushroom cow" type intake aperture		0	0	0	0	0	0	0	0
Non Free-Field / Reflections; nil correction applicable for intake aperture within large flat roof area away from walls		0	0	0	0	0	0	0	0
Individual contribution at assessment position	24	30	30	28	20	15	15	13	9
OVEN EXTRACT SYSTEM - DISCHARGE APERTURE: S&P TCBT/4-450/H Fan									
Sound power level Lw dB; fan outlet induct	77	72	74	74	74	73	70	66	60
Duct Loss; duct length between fan & aperture (excluding silencer) - allow ~5m 450mm Ø		0	0	0	0	-1	-1	-1	-1
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 450-600 circular silencer)		-2	-4	-8	-16	-18	-13	-12	-12
Sound power level Lw dB; external aperture Lw	61	60	64	64	57	52	53	50	44
Distance; free-field correction for ~40m from aperture to assessment position		-40	-40	-40	-40	-40	-40	-40	-40
Screening; nil line of sight screening correction applied		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 high level vertical discharge aperture		0	0	0	0	0	0	0	0
Individual contribution at assessment position	16	19	22	21	13	6	3	0	-6
AIR CONDITIONING UNIT: Toshiba RAV-GM1401ATP-E									
Sound power level Lw dB (unit installed for cooling mode operation)	63	65	64	63	58	58	55	50	42
Quantity; 0dB quantity correction applicable for 1 x unit		0	0	0	0	0	0	0	0
Noise Mitigation; non applied		0	0	0	0	0	0	0	0
Distance; free-field correction for ~21m from unit to assessment position		-34	-34	-34	-34	-34	-34	-34	-34
Screening; complete line of sight screening correction applicable (intervening edge of building), limit to -10dB		-7	-9	-10	-10	-10	-10	-10	-10
Directivity; nil directivity correction applicable (unit radiates noise equally all directions)		0	0	0	0	0	0	0	0
Non Free-Field / Reflections; +3dB correction applied for unit positioned against wall		3	3	3	3	3	3	3	3
Individual contribution at assessment position	21	26	24	22	17	17	14	9	1
COLD ROOM UNIT: Tecumseh Wintsys WINA34519Z -FZ									
Sound power level Lw dB	63	65	63	61	59	58	55	51	43
Quantity; 0dB quantity correction applicable for 1 x unit		0	0	0	0	0	0	0	0
Noise Mitigation; non applied		0	0	0	0	0	0	0	0
Distance; free-field correction for ~21m from unit to assessment position		-34	-34	-34	-34	-34	-34	-34	-34
Screening; complete line of sight screening correction applicable (intervening edge of building), limit to -10dB		-7	-9	-10	-10	-10	-10	-10	-10
Directivity; nil directivity correction applicable (unit radiates noise equally all directions)		0	0	0	0	0	0	0	0
Non Free-Field / Reflections; +3dB correction applied for unit positioned against wall		3	3	3	3	3	3	3	3
Individual contribution at assessment position	22	27	23	20	18	17	14	10	2
Cumulative Plant Noise (Specific Noise Level) At Assessment Position									
All Plant: Operating during opening hours (range 11am to 11pm)	28	33	32	30	24	21	19	16	10
Cold Room Unit: Operable over 24 hours (including through the night)	22	27	23	20	18	17	14	10	2

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 22dBA.

Although the specified noise reduction treatment will tend to suppress 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 (although unlikely in practice – assessment indicates no tonal character).

Site: 6b Market Street, Hoyland, Barnsley S74 9QR

Report: 24063-002 Appendix E (page 4 of 4)

Date: August 2024

PLANT NOISE MODEL CALCULATION

ASSESSMENT POSITION C: Flats above ground floor commercial premises 22 & 24 High Street

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

NOISE MITIGATION: Silencers to supply air system & oven extract system (see Section 7.1 Report 24063-002)

Plant & Description	Overall dBA	Lin dB at Octave Band Centre Frequency Hz						
		63	125	250	500	1k	2k	8k
SUPPLY AIR SYSTEM - INTAKE APERTURE: S&P CBM/6-320/240-550W Fan								
Sound power level Lw dB; fan inlet induct	79	80	78	77	76	74	70	63
Duct Loss; duct length between fan & aperture (excluding silencer) - allow ~2m 500mm Ø		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
Duct Loss; aperture end reflection 500mm Ø duct to external fresh air intake aperture		-9	-5	-2	0	0	0	0
Noise Mitigation; atmosphere side silencer to system (Alnor SIL 450-600 circular silencer)		-2	-4	-8	-16	-18	-13	-12
Sound power level Lw dB; external aperture Lw	63	69	69	67	59	54	54	48
Distance; free-field correction for ~19m from aperture to assessment position		-34	-34	-34	-34	-34	-34	-34
Screening; nil line of sight screening correction applied		0	0	0	0	0	0	0
Directivity; nil off-axis aperture directivity applicable for "mushroom cow" type intake aperture		0	0	0	0	0	0	0
Non Free-Field / Reflections; nil correction applicable for intake aperture within large flat roof area away from walls		0	0	0	0	0	0	0
Individual contribution at assessment position	30	35	35	33	25	20	20	18
OVEN EXTRACT SYSTEM - DISCHARGE APERTURE: S&P TCBT/4-450/H Fan								
Sound power level Lw dB; fan outlet induct	77	72	74	74	74	73	70	66
Duct Loss; duct length between fan & aperture (excluding silencer) - allow ~5m 450mm Ø		0	0	0	0	-1	-1	-1
Duct Loss; duct bends between fan & aperture - allow 1 x 90° radius bend 450mm Ø		0	0	0	-1	-2	-3	-3
Duct Loss; aperture end reflection 450mm Ø duct to external vertical discharge aperture		-10	-6	-2	0	0	0	0
Noise Mitigation; atmosphere side silencer to system (Alnor SIL 450-600 circular silencer)		-2	-4	-8	-16	-18	-13	-12
Sound power level Lw dB; external aperture Lw	61	60	64	64	57	52	53	44
Distance; free-field correction for ~17m from aperture to assessment position		-33	-33	-33	-33	-33	-33	-33
Screening; nil line of sight screening correction applied		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
Non Free-Field / Reflections; nil correction applicable for high level vertical discharge aperture		0	0	0	0	0	0	0
Individual contribution at assessment position	23	26	29	28	20	13	10	7
AIR CONDITIONING UNIT: Toshiba RAV-GM1401ATP-E								
Sound power level Lw dB (unit installed for cooling mode operation)	63	65	64	63	58	58	55	42
Quantity; 0dB quantity correction applicable for 1 x unit		0	0	0	0	0	0	0
Noise Mitigation; non applied		0	0	0	0	0	0	0
Distance; free-field correction for ~30m from unit to assessment position		-38	-38	-38	-38	-38	-38	-38
Screening; complete line of sight screening correction applicable (intervening edge of building), limit to -10dB		-10	-10	-10	-10	-10	-10	-10
Directivity; nil directivity correction applicable (unit radiates noise equally all directions)		0	0	0	0	0	0	0
Non Free-Field / Reflections; +3dB correction applied for unit positioned against wall		3	3	3	3	3	3	3
Individual contribution at assessment position	18	20	19	18	13	13	10	5
COLD ROOM UNIT: Tecumseh Wintsys WINA34519Z -FZ								
Sound power level Lw dB	63	65	63	61	59	58	55	43
Quantity; 0dB quantity correction applicable for 1 x unit		0	0	0	0	0	0	0
Noise Mitigation; non applied		0	0	0	0	0	0	0
Distance; free-field correction for ~30m from unit to assessment position		-38	-38	-38	-38	-38	-38	-38
Screening; complete line of sight screening correction applicable (intervening edge of building), limit to -10dB		-10	-10	-10	-10	-10	-10	-10
Directivity; nil directivity correction applicable (unit radiates noise equally all directions)		0	0	0	0	0	0	0
Non Free-Field / Reflections; +3dB correction applied for unit positioned against wall		3	3	3	3	3	3	3
Individual contribution at assessment position	18	20	18	16	14	13	10	6
Cumulative Plant Noise (Specific Noise Level) At Assessment Position								
All Plant: Operating during opening hours (range 11am to 11pm)	31	36	37	35	27	22	22	19
Cold Room Unit: Operable over 24 hours (including through the night)	18	20	18	16	14	13	10	6

The overall cumulative sound pressure (noise) level at the assessment position due to all plant items operating is 31dBA. For only the cold room unit operating through the night, the noise level of plant at the assessment position is 18dBA.

Although the specified noise reduction treatment will tend to suppress 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 (although unlikely in practice – assessment indicates no tonal character).

APPENDIX F

Noise Reduction Treatment For Plant

Consultants in Noise & Vibration
Building Regulations Certification Sound Insulation Testing

Site: 6b Market Street, Hoyland, Barnsley S74 9QR

Report: 24063-002 Appendix F (page 1 of 1)

Date: August 2024

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-50 450-600

Circular silencers **SIL**

Download Wentyle
Download AlnorCAM
Buy via B2B

Dimensions

SIL-50 - 50 mm thickness insulation

Description	Ød, D L			attenuation (dB) for frequency (Hz)								(kg)
	nom	nom	(mm)	125	250	500	1000	2000	4000	8000		
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	Ød, D L			attenuation (dB) for frequency (Hz)								(kg)
	nom	nom	(mm)	125	250	500	1000	2000	4000	8000		
* 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	

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Silencers

Alnor Ventilation Systems product code SIL-50 450-600 circular type silencer (attenuator) specified for the supply air & oven extract systems