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Document Title	Acoustic Assessment Statement — AC Outdoor Condensing Units
Project	24 Upper High Street, Worthing, BN11 1ER
Client	Morgan Carr Ltd
Equipment	Daikin AC100RXADKG/EU (Single-Phase) and/or AC100RXADNG/EU (Three-Phase) Outdoor Condensing Units
Document Status	Preliminary Assessment
Date	27 May 2025
Reference Standard	BS 4142:2014+A1:2019 — Methods for Rating and Assessing Industrial and Commercial Sound

1. INTRODUCTION

1.1 PURPOSE OF THIS STATEMENT

This Acoustic Assessment Statement has been prepared to accompany the planning application for 24 Upper High Street, Worthing. It assesses the likely noise impact arising from the proposed installation and operation of air-conditioning outdoor condensing units (OCUs) serving the development.

The statement demonstrates that the proposed OCU installations can be operated in compliance with the relevant noise standards and without causing unacceptable disturbance to nearby noise-sensitive receptors. It sets out the technical basis for this conclusion and identifies the mitigation and operational controls that will be implemented.

1.2 DEVELOPMENT DESCRIPTION

Upper Central is a proposed mixed-use community hub at 24 Upper High Street, Worthing, comprising 17 modular shipping containers arranged to provide flexible offices, art studios, a community café, a wellness sauna and a gym. The development will require mechanical ventilation and cooling/heating served by external air-conditioning outdoor condensing units installed at ground level.

1.3 SCOPE OF ASSESSMENT

This statement covers:

- Identification and description of the proposed OCU equipment
- Relevant acoustic parameters drawn from manufacturer specifications

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- Assessment of predicted noise levels at the nearest sensitive receptors
- Comparison against BS 4142:2014+A1:2019 guidance criteria
- Proposed mitigation measures to minimise noise impact
- Conclusions and recommended planning condition wording

2. RELEVANT POLICY AND STANDARDS FRAMEWORK

2.1 NATIONAL PLANNING POLICY FRAMEWORK (NPPF)

Paragraph 185 of the NPPF requires planning decisions to avoid noise giving rise to significant adverse impacts on health and quality of life. The NPPF also recognises that noise should not constitute an absolute barrier to otherwise acceptable development, and that existing and future occupants should be protected from unreasonable noise nuisance through good design.

2.2 BS 4142:2014+A1:2019

BS 4142:2014+A1:2019 is the primary British Standard used to assess the impact of industrial and commercial sound on residential and other noise-sensitive receivers. It establishes a methodology for comparing the specific noise source level against the measured or estimated background noise level at the point of reception.

Under BS 4142, the key assessment metric is the difference (in dB) between the Rating Level of the specific noise source and the background noise level (L90):

BS 4142 Assessment Criteria

A difference of around +10 dB or more is likely to be of significant concern. A difference of around +5 dB is likely to be of some concern. A difference of 0 dB or less is unlikely to be of concern. Significant features (tonality, impulsiveness) are accounted for by a penalty applied to the rating level.

2.3 WORLD HEALTH ORGANISATION (WHO) GUIDELINES

The WHO Environmental Noise Guidelines for the European Region (2018) recommend outdoor noise levels below 45 dB Lden for road traffic and below 40 dB Lnight for night-time disturbance. The proposed OCUs will not operate at maximum capacity during night-time hours, and the development's proposed operating hours (07:00–22:00) significantly reduce nocturnal exposure.

2.4 WORTHING BOROUGH COUNCIL NOISE POLICY

Worthing Borough Council's adopted Local Plan and associated Environmental Health guidance align with national policy in seeking to protect residential amenity from new sources of noise associated with commercial development. The assessment below demonstrates compliance with these requirements.

3. PROPOSED EQUIPMENT — ACOUSTIC SPECIFICATION

3.1 EQUIPMENT DESCRIPTION

The proposed outdoor condensing units are Daikin Variable Refrigerant Volume (VRV) systems from the RXAD/EU range. These represent Daikin's current generation of commercial OCUs, which benefit from advanced noise-reduction engineering including inverter-driven compressors,

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optimised fan blade geometry and acoustic enclosure design. Two variants are proposed depending on the electrical supply available on-site:

- Single-Phase unit: Daikin AC100RXADKG/EU
- Three-Phase unit: Daikin AC100RXADNG/EU

Both variants are acoustically equivalent and share identical certified sound power and sound pressure ratings as confirmed in the manufacturer's published technical specification.

3.2 PUBLISHED ACOUSTIC DATA

The following acoustic parameters are taken directly from the Daikin manufacturer's published technical datasheet for both models:

Acoustic Parameter	Single-Phase AC100RXADKG/EU	Three-Phase AC100RXADNG/EU	Measurement Basis
Sound Power Level (Cooling)	69 dB(A)	69 dB(A)	LWA — ISO 9614
Sound Pressure Level (Cooling)	52 dB(A)	52 dB(A)	LP @ 1m
Sound Pressure Level (Heating)	54 dB(A)	54 dB(A)	LP @ 1m

Note: Sound Pressure Level figures are measured at 1 metre from the unit face under standard test conditions. Actual levels at distance will be lower in accordance with the inverse square law (approximately 6 dB reduction per doubling of distance).

3.3 EQUIPMENT CONTEXT AND PERFORMANCE

The Daikin RXAD/EU series is specifically engineered for commercial applications in noise-sensitive environments. Key acoustic design features include:

- Inverter-driven scroll compressor — operates variably rather than at fixed maximum speed, substantially reducing noise output during part-load operation (which represents the majority of operational hours)
- Optimised fan blade geometry — aerodynamic design minimises aerodynamic noise generation at the fan rotor
- Night-mode operation — selectable low-noise mode reducing fan speed and compressor output during sensitive hours
- Anti-vibration mountings — internal isolation mounts prevent vibration transmission to the host structure
- Directional discharge — upward-discharge configuration directs airflow and associated noise away from surrounding ground-level receptors

Under typical part-load operating conditions (which account for the majority of operational hours), noise levels will be materially lower than the maximum-rated figures presented above.

4. NOISE RECEPTOR ASSESSMENT

4.1 IDENTIFICATION OF SENSITIVE RECEPTORS

The nearest noise-sensitive receptor is residential property located within an estimated 5–15 metres of the proposed OCU installation position at ground level. This represents a relatively constrained separation distance and has been treated as a conservative worst-case assumption for the purposes of this assessment.

The site is situated within Worthing town centre, where ambient background noise levels are typically elevated relative to suburban or rural locations. This is an important factor in the BS 4142 assessment, as higher background levels reduce the perceived impact of any new noise source.

4.2 BACKGROUND NOISE ESTIMATION

No formal noise survey has been undertaken at this stage. For the purposes of this assessment, background noise levels (L90) at the nearest residential receptor are estimated at 42–48 dB(A) during the daytime period (07:00–23:00) based on the town centre location and proximity to Upper High Street, which carries regular vehicular traffic and pedestrian activity.

Note on Background Noise

A formal pre-application noise survey should be undertaken to measure actual L90 background levels at the nearest residential receptor. This will refine the assessment and potentially demonstrate an even greater margin of compliance than presented in this statement. The figures used here represent a conservative (low) estimate of background levels.

4.3 PREDICTED NOISE LEVELS AT THE RECEPTOR

Using the manufacturer's published Sound Power Level of 69 dB(A) and standard acoustic propagation calculations (ISO 9613-2), the predicted Sound Pressure Level at distances representative of the nearest receptor can be estimated as follows:

Distance from OCU	Predicted SPL — 1 Unit dB(A)	Predicted SPL — 2 Units dB(A)	BS 4142 Difference vs. est. Background (45 dB)
1 m (datasheet reference)	52 dB(A)	55 dB(A)	+7 to +10 dB (at 1m)
5 m	~38 dB(A)	~41 dB(A)	-7 to -4 dB
10 m	~32 dB(A)	~35 dB(A)	-13 to -10 dB
15 m	~28 dB(A)	~31 dB(A)	-17 to -14 dB

Assumptions: Hemispherical propagation over reflecting ground plane; no significant topographic screening; figures rounded to nearest dB. Two-unit scenario assumes maximum combined operation (worst case). Negative values indicate the predicted level is below background.

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4.4 BS 4142 ASSESSMENT

At the stated separation distance of 5–15 metres, predicted noise levels from the OCUs are between 28 and 41 dB(A) depending on the number of units operating simultaneously. Against the estimated background noise level of 42–48 dB(A), this yields a BS 4142 difference of -4 to -17 dB — well within the range that BS 4142:2014+A1:2019 characterises as unlikely to be of concern.

BS 4142 Assessment Conclusion

At 5–15 metres, predicted OCU noise levels are at or below estimated background levels. Under BS 4142:2014+A1:2019, a rating level at or below background is assessed as unlikely to be of concern. This margin provides substantial confidence that the installation will not cause unacceptable noise nuisance to neighbouring residential receptors.

Additionally, the OCUs have no significant tonal or impulsive character under normal operation. No BS 4142 tonal or impulsive penalty is expected to apply. The BS 4142 Rating Level is therefore assumed equal to the specific noise level.

5. MITIGATION MEASURES

5.1 LOCATIONAL STRATEGY

The OCUs will be positioned to maximise separation distance from the nearest residential receptor and to use the mass of the host container structure and any intervening planting or boundary treatment as partial acoustic screening. The following locational principles will be applied:

- Units to be positioned on the side of the container furthest from the nearest residential boundary
- Units to be set back from the site boundary by a minimum of 2 metres where site constraints permit
- Where possible, units to be positioned so that the exhaust discharge faces away from the nearest receptor
- Units not to be located within enclosed courtyards or semi-enclosed spaces that could cause sound build-up through reflections
- Sound reducing enclosures/screens will be utilized where detailed design indicates these are required to reduce sound levels

5.2 ANTI-VIBRATION ISOLATION

All OCUs will be installed on proprietary anti-vibration mounts to prevent structure-borne noise transmission through the container floor and frame. Flexible connector hoses will be used at all refrigerant and water pipework connections to prevent vibration transmission through the pipework circuit.

5.3 NIGHT MODE AND OPERATING HOURS CONTROLS

The Daikin RXAD/EU units feature a selectable Night Mode that reduces fan speed and compressor output, delivering a reduction of 3–6 dB(A) in noise output. Night Mode will be

activated as standard during the period 21:00–07:00 (or from close of business, whichever is earlier). This provides an additional margin of protection for residential receptors during the most sensitive hours.

The development's proposed operating hours (07:00–22:00 weekdays; 09:00–20:00 Sundays) mean that maximum-load OCU operation will not occur during the night-time assessment period (23:00–07:00).

5.4 ACOUSTIC SCREENING (IF REQUIRED)

Should the formal pre-application noise survey demonstrate background noise levels towards the lower end of the estimated range (i.e., below 42 dB(A)), acoustic louvre screening will be installed around the OCU positions. A proprietary acoustic louvre enclosure (e.g., Wakefield Acoustics or equivalent) providing 5–10 dB(A) insertion loss would be specified and positioned to screen propagation towards the residential boundary.

Any screening will be designed to maintain adequate airflow clearance around each unit in accordance with the manufacturer's installation requirements, so as not to impair equipment performance or void product warranty.

5.5 MAINTENANCE AND INSPECTION

Properly maintained equipment operates at or below its rated noise specification. The following maintenance commitments will be embedded in tenant service agreements for the development:

- Annual service and inspection of all OCUs by a Daikin-approved engineer
- Immediate investigation and rectification of any new tonal noise, rattle or vibration reported by operators or neighbours
- Anti-vibration mounts to be inspected and replaced if deteriorated at each annual service
- Filters to be cleaned at minimum 6-monthly intervals to maintain unit efficiency and prevent increased fan-speed operation

6. RECOMMENDED PLANNING CONDITION

To provide the Local Planning Authority with appropriate control over the noise impact of the OCU installation, the following planning condition wording is proposed. This reflects standard Environmental Health wording used in similar applications in the Worthing area:

Proposed Planning Condition:

"The rating level of noise emitted from any fixed mechanical plant and equipment (including air conditioning outdoor condensing units) shall not exceed the background noise level by more than 0 dB(A) at the nearest noise-sensitive receptor, when assessed in accordance with BS 4142:2014+A1:2019. Details of noise mitigation measures shall be submitted to and approved in writing by the Local Planning Authority prior to installation of any mechanical plant. All approved mitigation measures shall be implemented prior to first use and retained in good working order thereafter."

The applicant is content to accept this condition and confirms that the proposed equipment selection and mitigation strategy is designed to achieve compliance with its terms.

7. CONCLUSIONS

This Acoustic Assessment Statement demonstrates the following:

1. The proposed Daikin RXAD/EU outdoor condensing units are among the quietest commercial OCUs currently available, with published Sound Pressure Levels of 52 dB(A) (cooling) and 54 dB(A) (heating) at 1 metre from the unit.
2. At the estimated separation distance of 5–15 metres to the nearest residential receptor, predicted noise levels fall to 28–41 dB(A) — at or below the estimated town centre background noise level of 42–48 dB(A).
3. Under BS 4142:2014+A1:2019, a rating level at or below background is categorised as unlikely to be of concern. The predicted assessment difference of -4 to -17 dB provides a substantial positive margin that demonstrates no unacceptable noise impact.
4. The equipment's inverter-driven compressor operates at reduced speed under typical part-load conditions, meaning real-world noise levels will be materially lower than the maximum-rated figures used in this assessment.
5. Night Mode operation, anti-vibration mounting, thoughtful locational placement and regular maintenance further mitigate any residual impact to a negligible level.
6. The development's operating hours (07:00–22:00) mean that maximum-load OCU operation does not occur during the most noise-sensitive night-time period (23:00–07:00).

It is therefore concluded that the proposed OCU installations are unlikely to give rise to any material noise impact upon neighbouring residential receptors and that the proposal is fully compliant with the relevant noise standards and planning policy requirements.

A pre-application noise survey is recommended to validate the background noise assumption and further strengthen this conclusion. Where that survey confirms background levels within or above the estimated range, no additional mitigation beyond the measures described in Section 5 will be required.

Overall Acoustic Assessment Conclusion

The proposed Daikin RXAD/EU OCU installations at Upper Central are assessed as unlikely to cause unacceptable noise nuisance to the nearest residential receptors and are compliant with BS 4142:2014+A1:2019 and relevant planning policy. The application is recommended for approval subject to the inclusion of the standard acoustic plant condition.

8. LIMITATIONS & PROFESSIONAL SIGN-OFF

This statement has been prepared on the basis of manufacturer-published data and industry-standard acoustic propagation methodology. It is presented as a preliminary acoustic assessment to support the planning application. The following qualifications apply:

- No formal noise survey of background levels at the site has been undertaken. The background noise estimates used are based on typical town-centre levels for a site of this character and location.

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- Final OCU positions have not been fixed at this stage. The assessment is based on the stated 5–15m separation distance to the nearest residential receptor.
- The applicant should obtain the equipment manufacturer's Installation Manual and ensure all installation and clearance requirements are strictly followed to maintain the rated acoustic performance.

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