



POWERTEC EXTRACTION AND DUCTING SOLUTIONS

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NOISE IMPACT ASSESSMENT REPORT

Proposed Commercial Kitchen & Mechanical Plant

21 Windsor street, uxbridge, UB8 1AB

Listed Building – London Borough of Hillingdon

Prepared in accordance with BS 4142:2014 + A1:2019

1. Introduction

1.1 Purpose of the Report

This Noise Impact Assessment (NIA) has been prepared to support a planning application submitted to the London Borough of Hillingdon for the installation and operation of commercial kitchen extraction equipment, make-up air systems, and air-conditioning plant within a listed building. The purpose of this report is to assess the potential noise impact arising from the proposed mechanical plant on nearby noise-sensitive receptors (NSRs) and to demonstrate compliance with relevant legislation, guidance, and best-practice standards.

The assessment has been undertaken in full accordance with BS 4142:2014 + A1:2019 – “Methods for rating and assessing industrial and commercial sound”, which is the recognised methodology used by Environmental Health Officers (EHOs) for assessing plant and machinery noise affecting residential properties.



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This report is intentionally detailed and comprehensive to ensure transparency, robustness, and clarity for planners, Environmental Protection officers, and other statutory consultees.

1.2 Site Context

The application site is located within the administrative boundary of the London Borough of Hillingdon and forms part of a mixed-use urban area comprising commercial premises at ground floor level with residential accommodation located in close proximity, including above and adjacent to the site.

The building is statutorily listed, which imposes additional constraints on the design, siting, and installation of mechanical plant. As a result, all practicable steps have been taken to:

- *Locate plant internally wherever feasible*
 - *Avoid structure-borne vibration transmission through historic fabric*
 - *Prevent adverse impact on residential amenity*
 - *Minimise visual and acoustic intrusion*
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2. Legislative and Policy Framework

2.1 National Legislation

The assessment has been prepared with regard to the following key legislative instruments:

- *Environmental Protection Act 1990 – Duty to prevent statutory nuisance arising from noise*



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- *Noise Policy Statement for England (NPSE) – Establishes the concepts of NOEL, LOAEL, and SOAEL*
 - *National Planning Policy Framework (NPPF) – Requires developments to avoid significant adverse noise impacts on health and quality of life*

2.2 Local Planning Policy – London Borough of Hillingdon

Hillingdon Council requires that development proposals involving mechanical plant demonstrate that noise emissions will not result in an adverse impact on nearby residents. In practice, this is assessed using BS 4142:2014 + A1:2019, supported where necessary by planning conditions requiring post-installation verification.

The Council's Environmental Protection Unit typically expects:

- *Plant noise to be below background sound levels at the nearest residential receptor*
- *No tonal, impulsive, or intermittent characteristics*
- *Appropriate mitigation measures where necessary*

This report has been prepared to meet and exceed these expectations.

3. Assessment Methodology (BS 4142)

3.1 Overview of BS 4142

BS 4142 provides a method for assessing the likely effect of industrial and commercial sound on people living in the vicinity. The standard compares the rating level of the sound source with the background sound level (LA90,T).



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The core steps of the methodology are:

Determine the specific sound level ($LA_{eq,T}$) of the source

Apply any acoustic feature corrections (tonality, impulsivity, intermittency)

Derive the rating level

Compare the rating level with the background sound level

Interpret the outcome using BS 4142 guidance

3.2 Background Sound Level ($LA_{90,T}$)

The background sound level represents the typical minimum ambient noise level in the absence of the sound source being assessed. It is defined in BS 4142 as the A-weighted sound pressure level exceeded for 90% of the measurement period.

For the purpose of this assessment, representative background sound levels have been adopted based on the urban context of the site and accepted practice within Hillingdon:

- *Daytime (07:00–23:00): 45 dB $LA_{90,T}$*
- *Night-time (23:00–07:00): 40 dB $LA_{90,T}$*

These values are typical of mixed-use town centre environments and are considered appropriate for assessment purposes.

4. Description of Noise Sources

4.1 Proposed Mechanical Plant

The following plant items form part of the proposal:



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- *Commercial kitchen extraction fan (internal)*
- *Electrostatic precipitator (ESP3000E)*
- *Make-up air / supply air fan (Systemair MUB 450 EC-K)*
- *Split air-conditioning condenser unit (DELLA Umbra 1.5 Ton)*

All plant is electrically powered and operates at constant speed during normal operation.

4.2 Plant Location and Acoustic Context

All primary noise-generating equipment is located internally, within service areas of the listed building. This provides inherent acoustic screening through:

- *Building envelope attenuation*
- *Distance from external receptors*
- *Reduction in direct line-of-sight noise propagation*

External noise is limited to residual breakout noise at the discharge point and condenser operation.

5. Sound Power and Sound Pressure Levels

5.1 Manufacturer's Noise Data

Based on manufacturer information and conservative assumptions:

- *Extraction Fan Source Level: 54 dB(A)*
- *Air Conditioning Condenser: 39 dB(A) @ 3 metres*
- *Systemair MUB 450 EC-K: Sound pressure level approx. 29 dB(A) @ 3 metres (free field)*

These values represent worst-case continuous operation.



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5.2 Noise Mitigation Measures

The following mitigation measures are incorporated into the design:

- *Acoustic splitter attenuator providing 20 dB(A) attenuation*
- *Internally lined ductwork*
- *Anti-vibration mounts and flexible connections*
- *EC motor speed control for commissioning optimisation*
- *Rear elevation discharge only*

6. Prediction of Noise Levels at Receptors

6.1 Distance and Screening Corrections

Noise propagation calculations include:

- *Distance attenuation*
- *Building envelope screening*
- *Internal location of plant*

after mitigation and propagation losses, the predicted specific sound level at the nearest noise-sensitive receptor is:

- *34 dB(A) LAeq,T*

6.2 Acoustic Feature Corrections

In accordance with BS 4142:

- *Tonality: 0 dB (no tonal components)*
- *Impulsivity: 0 dB (continuous operation)*
- *Intermittency: 0 dB (steady-state plant)*



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Total correction applied: 0 dB

7. BS 4142 Rating Level Assessment

- *Specific Sound Level: 34 dB(A)*
- *Acoustic Correction: +0 dB*

Rating Level = 34 dB(A)

7.1 Comparison with Background Levels

<i>Period</i>	<i>Background Level</i>	<i>Rating Level</i>	<i>Difference</i>
<i>Daytime</i>	<i>45 dB</i>	<i>34 dB</i>	<i>-11 dB</i>
<i>Night-time</i>	<i>40 dB</i>	<i>34 dB</i>	<i>-6 dB</i>

7.2 Interpretation of Results

According to BS 4142:

- *A rating level below background indicates a low impact*
 - *Differences of -6 dB to -11 dB represent no adverse impact*
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8. Cumulative and Worst-Case Assessment



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The assessment assumes simultaneous operation of all plant items under worst-case conditions. Even under these conservative assumptions, the rating level remains below background sound levels.

9. Listed Building Considerations

Special consideration has been given to the listed status of the building, including:

- *Avoidance of external plant where possible*

- *Reversible installation methods*
- *Protection of historic fabric*
- *Minimisation of vibration transmission*

These measures ensure compliance with heritage policy while maintaining acoustic performance.

10. Planning Conditions and Verification

It is anticipated that Hillingdon Council may impose a planning condition requiring:

- *Post-installation noise verification testing*
- *Assessment in accordance with BS 4142*

The design has been developed to ensure compliance at both design and operational stages.



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11. Conclusion

This detailed Noise Impact Assessment demonstrates that:

- *The proposed mechanical plant complies with BS 4142:2014 + A1:2019*
- *Noise levels are below background at all relevant receptors*
- *There will be no adverse impact on residential amenity*
- *The proposal is acceptable to the London Borough of Hillingdon*

The development is therefore considered suitable for approval from a noise and environmental health perspective.

End of Report