



# Acoustic Assessment for Proposed development at, 827 Stockport Road, Manchester, M19 3PN.

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## Prepared for:

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## **Contents**

|                                      |    |
|--------------------------------------|----|
| 1. Introduction .....                | 3  |
| Site Location and Context .....      | 3  |
| 2. Policy and Guidance .....         | 4  |
| 3. The Assessment .....              | 8  |
| The proposed development.....        | 8  |
| Nearby Receptors .....               | 8  |
| Impact Assessment .....              | 8  |
| 4 Conclusion.....                    | 9  |
| Figure 1 – Aerial Photograph .....   | 10 |
| Appendix A – Extraction Detail ..... | 11 |



## **1. Introduction**

- 1.1. Martin Environmental Solutions has been commissioned to undertake an acoustic assessment to support a planning application for the erection of an extraction flue to the rear of 827 Stockport Road, Manchester M19 3PN.

### **Site Location and Context**

- 1.2. The development site is situated to the east of the busy A6 Stockport Road and consists of an end-terrace property. The neighbouring properties consisting of retail units to the ground floors with flats to the upper levels. To the rear is a large carparking area and beyond the blank gable wall of a residential property 19.5m away.
- 1.3. An aerial Photograph is enclosed in Figure 1.
- 1.4. The report has been written following concerns raised over the potential impact of the development on the surrounding land uses.



## **2. Policy and Guidance**

- 2.1. The impact of noise can be a material consideration in the determination of planning applications. The planning system has the task of guiding development to the most appropriate locations. It is recognised that on occasions it will be difficult to reconcile some land uses, such as housing, hospitals, or schools, with other activities that generate high levels of noise. However, the planning system is tasked to ensure that, wherever practicable, noise-sensitive developments are separated from major sources of noise (such as road, rail and air transport and certain types of industrial development).
- 2.2. The Government's publication of the National Planning Policy Framework (NPPF), updated in February 2019, states that planning policies and decisions should prevent new and existing development from contributing to or being put at unacceptable risk from, of being adversely affected by unacceptable levels of noise pollution.
- 2.3. The Government have also issued the Noise Policy Statement for England (NPSE). The NPSE clarifies the Government's underlying principles and aims in relation to noise and sets a vision to promote good health and a good quality of life through the effective management of noise while having regard to the Government's sustainable development strategy. The NPSE aims to mitigate and minimise adverse impacts on health and quality of life through the effective management and control of noise.
- 2.4. The NPSE introduces the following terms, although no sound levels are given to represent these, many authorities have identified the sound level criteria in line with the World Health Organisation, BS8233:2014 and BS4142: 2014 levels. The terms introduced by the NPSE are:
- NOEL – No Observed Effect Level (<30dB(A) inside <50dB(A) outside, 10dB below background)
- LOAEL – Lowest Observed Adverse Effect Level (30-35dB(A) inside 50-55dB(A) outside, background to +5dB)
- SOAEL – Significant Observed Adverse Effect Level (>35dB(A) inside, >55dB(A) outside, >+10dB above background)
- 2.5. The sound levels within the brackets of the previous paragraph are those determined as appropriate levels to indicate the relevant effect levels represented by the NPSE.



- 2.6. Other commonly used examples of standards utilised by Local Planning authorities for the consideration of noise impacts include comparison of the likely noise levels to be experienced at a development, with levels that have been recommended by the World Health Organisation (WHO) as Guidelines for the prevention of Community Noise Annoyance and within BS8233: 2014.
- 2.7. The WHO recommended noise levels for outdoor amenity areas (gardens) that should not be exceeded are 55dB(A)  $L_{Aeq,16hr}$  in order to avoid 'Serious Community Annoyance' or 50dB(A)  $L_{Aeq,16hr}$  to avoid 'Moderate Community Annoyance' during the day. For indoor levels WHO set 35dB(A)  $L_{Aeq,16hr}$  during the day to prevent Moderate Annoyance and 30 dB(A)  $L_{Aeq,8hr}$  at night to prevent sleep disturbance.
- 2.8. The WHO guidance also recommends that maximum sound levels at night should not regularly exceed 45dB(A) within bedrooms to prevent sleep disturbance. Regularly is considered to be more than 10 times during any 8-hour night-time period.
- 2.9. BS 8233:2014 'Guidance on sound insulation and noise reduction for buildings' also specifies desirable noise levels to be achieved inside dwellings.
- 2.10. BS 8233:2014 'Sound insulation and noise reduction for buildings – Code of Practice' also specifies desirable noise levels to be achieved inside dwellings. BS 8233 presents two levels, the first between the hours of 07:00 – 23:00 and the second between 23:00 -07:00.
- 2.11. The daytime period suggests internal noise levels of 35dB  $L_{Aeq,16hr}$ , for resting in living rooms and bedrooms while for night-time a level of 30dB  $L_{Aeq,8hr}$  is recommended. Criteria for external areas mirrors that within the WHO guidance.
- 2.12. Another commonly used standard is British Standard 4142:2014 'Method for rating industrial and commercial sound' compares the sound predicted by the source in question against the background,  $L_{A90}$  sound levels.
- 2.13. The "residual"  $L_{Aeq}$  measurement is then subtracted from the "ambient"  $L_{Aeq}$  measurement (with the sound source) to calculate the sound level created by the "problem" sound alone -termed the "specific" sound level.



- 2.14. If the "problem" sound is tonal, such as whine or hum, or if it is impulsive such as bangs or clatters or if it is irregular enough to attract attention a correction is added to the "specific level" to produce the "rating level". The "background"  $L_{A90}$  measurement is then compared against the "rating level".
- 2.15. If the "rating level" exceeds the "background" by around 10dB(A) or more this "indicates a significant adverse impact". A difference of around 5dB(A) 'indicates an adverse impact. The lower the commercial noise level is, the lower the likely impact. In addition, the published 'ProPG Planning & Noise, Professional Practice Guidance on Planning & Noise, New Residential Development' provides a 4-staged approach to undertaking a risk assessment in relation to anticipated sound levels at new residential development and the provision of mitigation measures. The guidance is principally aimed at sites exposed predominantly to noise from transportation sources.
- 2.16. In addition, the 'ProPG Planning & Noise, Professional Practice Guidance on Planning & Noise, New Residential Development' provides a 4-staged approach to undertaking a risk assessment in relation to anticipated sound levels at new residential development and the provision of mitigation measures. The guidance is principally aimed at sites exposed predominantly to noise from transportation sources.
- 2.17. The first stage consists of an initial noise risk assessment, based on indicative day and night-time *noise* levels. Simply put, the higher the ambient noise in an area the greater the impact. The levels given are shown below although it should be noted that these are in excess of both the WHO and BS 8233: 2014.

| Noise Risk Category*                                                                            | Potential Effect if Unmitigated                                       | Pre-Planning Application Guidance                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>0 – Negligible</b><br>$L_{Aeq,16hr} < 50dB$<br>$L_{Aeq,8hr} < 40dB$                          | May be noticeable but no adverse effect on health and quality of life | In this category the development is likely to be acceptable from a noise perspective, nevertheless a good acoustic design process is encouraged to improve the existing environment and/or safeguard against possible future deterioration and to protect any designated tranquil areas. A noise assessment may be requested to demonstrate no adverse impact from noise. Application need not normally be delayed on noise grounds.                                         |
| <b>1 – Low</b><br>$L_{Aeq,16hr} 50-63dB$<br>$L_{Aeq,8hr} 40-55dB$                               | Adverse effect on health and quality of life                          | In this category the development may be refused unless a good acoustic design process is followed and is demonstrated via a Level 1 Acoustic Design Statement which confirms how the adverse impacts of noise on the new development will be mitigated and minimised and that a significant adverse impact will not arise in the finished development. Planning conditions and other measures to control noise may be required.                                              |
| <b>2 – Medium</b><br>$L_{Aeq,16hr} 63-69dB$<br>$L_{Aeq,8hr} 55-60dB$<br>$L_{AFmax} > 80dB^{**}$ | Significant adverse effect on health and quality of life              | In this category the development is likely to be refused unless good acoustic design process is followed and is demonstrated via a Level 2 Acoustic Design Statement which confirms how the adverse impacts of noise on the new development will be mitigated and minimised, and clearly demonstrates that a significant adverse noise impact will not arise in the finished development. Planning conditions and other measures to control noise will normally be required. |
| <b>3 – High</b><br>$L_{Aeq,16hr} > 69dB$<br>$L_{Aeq,8hr} > 60dB$<br>$L_{AFmax} > 80dB^{**}$     | Unacceptable adverse effect of health and quality of life             | In this category the development is very likely to be refused on noise grounds, even if a good acoustic design process is followed and is demonstrated via a Level 2 Acoustic Design Statement. Applicants are advised to seek expert advice on possible mitigation measures. Advice on the circumstances when the refusal of a new housing on noise grounds should normally be anticipated is included in the ProPG.                                                        |

2.18. Stage 2, consists of a full assessment of the prevailing ambient noise and requires 4 elements to be considered:

- I. Element 1 – Good Acoustic Design
- II. Element 2 – Internal Noise Level Guidelines
- III. Element 3 – External Amenity Area Noise Assessment
- IV. Element 4 – Assessment of Other Relevant Issues

2.19. A good acoustic design is implicit in meeting the requirements of the NPPF and can help to resolve many potential acoustic issues.

2.20. Details of the criteria considered suitable are provided above for both internal and external sound levels. Element 4 includes such issues as local and national policy, likely occupants, wider planning objectives.



### **3. The Assessment**

#### **The proposed development**

- 3.1 The proposed development will see the erection of an extraction flue to the rear of the property, exiting on the first-floor flat rear roof and running up the rear of the property, terminating 1.7m above the eaves of the annex.
- 3.2 Adjacent to the extraction system is the front door of the flats occupying the upper floors. This door enters into a lobby/hall area.
- 3.3 The extraction system has been designed with a Flaktwood 400mm fan unit, and will be fitted with anti-vibration brackets and two 2D attenuators, one either side of the fan.
- 3.4 This report will consider the impact of the extraction system on neighbouring developments.

#### **Nearby Receptors**

- 3.5 It has been confirmed that the nearest existing residential property is the flats to the first floor, the habitable rooms being 3.6m away behind the annex of the building. To the north the adjacent property is located 5.6m away with a direct line of sight.

#### **Impact Assessment**

- 3.6 The extraction system has been designed with a 400mm diameter Flaktwood JM Aerofoil long cased Axial fan model, 40JM/16/4/5/40, manufacturers data for this fan have been obtained, along with the proposed Type C 2D attenuators, see appendix A.
- 3.7 The manufacturers data has been used to assess the impact of the fans at the nearest receptors. This has identified a sound level of 38.3dB(A) at the nearest façade.
- 3.8 An open provides a 15dB attenuation<sup>1</sup>, although it is understood than Manchester prefers the use of 13dB attenuation, therefore the internal sound level will be 25.3dB(A) below the night-time recommended sound level within BS8233:2014 and recommended by the World Health Organisation.
- 3.9 Breakout noise from the fan will be 28.2dB(A) at the nearest window.
- 3.10

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<sup>1</sup> BS8233: 2014; Guidance on sound insulation and noise reduction for buildings



- 3.11 The chosen extraction system will not exhibit any tonal, impulsive or intermittent qualities as such no penalty correction would be applied in line with BS4142:2014, to form a rating level which given the nature of the area and the busy road, is likely to be significantly below the prevailing background sound level.

## **4 Conclusion**

- 4.1 A consideration of the development and the surrounding area has been undertaken. This has enabled a design for the proposed extraction unit to be produced, incorporating mitigation measures in the form of attenuators fitted to the extraction system.
- 4.2 The suggested design specification will ensure recommended guideline values inside the nearest property are not exceeded and as such the development will have a No Observe Effect on the future residents in line with the Noise Policy Statement for England.
- 4.3 The development will meet the objectives of the National Planning Policy Framework in ensuring that no significant adverse impact is experienced by the future residents. The development is therefore considered to be acceptable in terms of noise and odour.

**Figure 1 – Aerial Photograph**



## Technical Data Sheet

### JM Aerofoil

|                        |                                  |
|------------------------|----------------------------------|
| Project Name           | : jm single phase pdf            |
| Quotation Number       | :                                |
| Customer               | : nfs                            |
| FanCode                | 40JM/16/4/5/40                   |
| FanDiameter /Size      | 400mm                            |
| Blades                 | 5                                |
| FanSpeed               | 1420 rpm                         |
| Velocity               | 8.0 m/s                          |
| BladeAngle             | 40°                              |
| Form of Running        | B                                |
| FanCasing              | Long                             |
| RequestedDuty          | 1.01m³/s @ 110Pa (static)        |
| OutletDynamic Pressure | 38 Pa                            |
| DutyShaft Power        | 0.265kW                          |
| MaxShaft Power         | 0.271kW                          |
| Total Efficiency       | 56 %                             |
| MotorFrame             | BT9                              |
| Motor Rating           | 0.320kW                          |
| Full LoadCurrent       | 2.2A                             |
| StartingCurrent        | 5 A                              |
| MotorMounting          | Pad                              |
| ElectricalSupply       | 220-240 Volts 50 Hz 1 Phase      |
| StartType              | DOL                              |
| MotorWinding           | Standard                         |
| Enclosure              | StandardAll                      |
| AirDensity             | 1.2 kg/m³ / 20 °C / 0 m / 50% RH |
| Smoke Venting          | NonSmoke Venting                 |
| ProductNumber          | DX411452                         |

[illegible]



## TYPE C DYNAMIC ATTENUATION

| BORE DIA.<br>MM (D) | LENGTH | OCTAVE-BAND MID FREQUENCIES HZ |     |     |     |    |    |    |    |
|---------------------|--------|--------------------------------|-----|-----|-----|----|----|----|----|
|                     |        | 63                             | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| 315                 | 10     | 2                              | 5   | 5   | 9   | 18 | 20 | 18 | 15 |
|                     | 20     | 2                              | 6   | 6   | 12  | 20 | 25 | 20 | 17 |
| 355                 | 10     | 2                              | 5   | 6   | 9   | 18 | 22 | 19 | 16 |
|                     | 20     | 2                              | 6   | 7   | 13  | 25 | 27 | 21 | 17 |
| 400                 | 10     | 2                              | 6   | 6   | 10  | 19 | 24 | 20 | 17 |
|                     | 20     | 3                              | 7   | 8   | 14  | 29 | 29 | 23 | 18 |

| Outlet                | 63    | 125   | 250  | 500  | 1000 | 2000 | 4000 | 8000 | Lw   |                         |
|-----------------------|-------|-------|------|------|------|------|------|------|------|-------------------------|
| 40JM/16/4/5/40        | 76    | 75    | 71   | 70   | 66   | 64   | 60   | 55   | 80   | <a href="#">Lp@3.6m</a> |
| Type C 400mm 2D       | 3     | 7     | 8    | 14   | 29   | 9    | 23   | 18   |      |                         |
| a-weighting           | -26.2 | -16.1 | -8.6 | -3.2 | 0    | 1.2  | 1    | -1.1 |      |                         |
| resulting sound level | 46.8  | 51.9  | 54.4 | 52.8 | 37   | 56.2 | 38   | 35.9 | 60.4 | 38.3                    |