

Dodworth Road / Broadway / Pogmoor Road Planning Condition 26

Task 3: Noise Insulation Specification

Barnsley Metropolitan Borough Council

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1. Introduction

- 1.1 AECOM has been commissioned by Barnsley Metropolitan Borough Council (BMBC) to develop a noise insulation scheme as required by the following condition associated with the planning approval for the A628 Dodworth Road improvements, subsequently referred throughout this document as the 'Dodworth Road / Broadway / Pogmoor Road Junction Improvements':
- 26: Prior to the development commencing within the confines of the existing highway, a scheme taking account of the Noise Insulation Regulations 1975 (as amended) designed to mitigate adverse noise levels experienced by nearby residents shall be submitted to and approved in writing with the Local Planning Authority and the approved scheme shall be complied with in conjunction with the implementation of the development.
- Reason: In the interests of the amenities of local residents and in accordance with Core Strategy Policy CSP 40 and Local Plan policies SD1, GD1 and Poll 1.
- 1.2 This condition relates to those properties identified from the modelling of Mitigation Option C, as set out in 'Pogmoor Crossroads: Noise and Vibration assessment. Technical Note - Comparison of alternative noise mitigation options (9 November 2018)'. These properties were identified as likely to experience significant adverse effects due to the scheme, as a result of meeting the SOAEL +1dB(A) criteria in the opening year of the scheme.
- 1.3 The scope of work involved in developing the noise insulation scheme involves three discrete tasks:
- Task 1: Provide the council with the address of each property identified as meeting the SOAEL +1dB(A) criteria from the modelling of mitigation Option C in 'Pogmoor Crossroads: Noise and Vibration assessment. Technical Note - Comparison of alternative noise mitigation options (9 November 2018)'.
- Task 2: Draft a noise insulation scheme on behalf of the council, setting out the procedures to be applied in terms of contacting affected residents, identifying eligible rooms, scoping the required noise insulation measures and arranging installation. Provide an indicative cost of implementing the scheme to assist BMBC in budget planning.
- Task 3: Provide a draft noise insulation specification to assist BMBC in the procurement of a specialist contractor to implement the scheme.
- 1.4 This report sets out the findings of Task 3.

2. Draft Noise Insulation Specification

- 2.1 A draft noise insulation specification is provided in Appendix A. This specification is to be applied for noise insulation measures to be installed at properties eligible under the 'Noise Insulation Scheme – Dodworth Road / Broadway / Pogmoor Road Junction Improvements', as identified in survey reports prepared by the specialist contractor and agreed by BMBC.
- 2.2 This draft specification sets out the acoustic performance of the glazing, doors and ventilation which are to be provided to eligible rooms as part of the noise insulation package. Their acoustic performance has been set to meet at least that provided by the measures set out in Schedule 1 of the Noise Insulation Regulations 1975 (Ref 1). Where the room may be affected by solar gain, blinds shall also be included as part of the works.
- 2.3 The specifications for the glazing, doors and ventilation relate to their acoustic performance only. Therefore, as set out in the draft specification, the contractor is required to obtain appropriate advice from appropriately qualified specialists in relation to all other design aspects relating to the measures, e.g. fire safety, electrical safety, safety of combustion appliances, structural integrity.

3. Summary

- 3.1 AECOM have been commissioned by BMBC to develop a noise insulation scheme as required by the Planning Condition 26 associated with the planning approval for the Dodworth Road / Broadway / Pogmoor Road Junction improvements.
- 3.2 This condition relates to those properties identified as likely to experience significant adverse effects due to the scheme, as a result of meeting the SOAEL +1dB(A) criteria from the modelling of mitigation Option C, as set out in 'Pogmoor Crossroads: Noise and Vibration assessment. Technical Note - Comparison of alternative noise mitigation options (9 November 2018)'. 54 properties were identified as meeting the criteria, the details of which are set out in the report prepared and submitted for Task 1.
- 3.3 A number of discretionary noise insulation schemes have been studied to inform the draft insulation scheme for Dodworth Road / Broadway / Pogmoor Road Junction to be applied to these properties, which is set out in the report prepared and submitted for Task 2.
- 3.4 A draft noise insulation specification to assist BMBC in the procurement of a specialist contractor to implement the scheme is set out in Appendix A.

4. References

- Ref 1 Noise Insulation Regulations 1975 (<https://www.legislation.gov.uk/uksi/1975/1763/contents/made>)

Appendix A Draft Noise Insulation Specification

Introduction

Noise insulation works are to be carried out to eligible living rooms (including combined kitchen/diners) and bedrooms, the acoustic performance of which are to meet at least that provided by the measures set out in Schedule 1 of the Noise Insulation Regulations (1975). This includes secondary glazing, new or upgraded external doors, a powered ventilator unit and passive permanent ventilation, wherever applicable. Where the room is affected by solar gain, blinds shall also be included as part of the works.

The specifications contained herein relate to acoustic performance. Appropriate advice should be obtained from appropriately qualified specialists in relation to all other design aspects, e.g. fire safety, electrical safety, safety of combustion appliances, structural integrity.

Where the Noise Insulation Regulations provide additional requirements beyond acoustic specifications, these have been reproduced within this document where relevant; however, these should not be taken to negate the requirement for appropriate specialist advice to be obtained.

All products shall be installed in full accordance with the manufacturer's instructions and a high standard of on-site workmanship and detailing shall be maintained throughout.

Refer to Schedule 1 of the Noise Insulation Regulations 1975 for further details.

Windows

The existing windows within eligible rooms shall be supplemented by the installation of a new inner window (secondary glazing). Prior to installation of the secondary glazing, any gaps within the outer window shall be effectively sealed. The new inner window shall be well fitted into the existing structural opening, with any gaps between the window framing and the surrounding structure fully sealed, and shall be glazed with glass having a thickness of not less than 3 mm.

Both the outer and inner windows shall be adequately openable for direct ventilation when required, and the inner window shall be adequately openable for cleaning purposes. The opening lights of the inner window shall create an effective seal with the surrounding framing when closed.

If the window is a bay window, the inner window shall either follow the shape of the outer window, or shall be taken straight across the bay, with any projecting surround or window board required to close the window cavity having a weight of not less than 10 kgm⁻².

At least two reveals of the window opening between the outer and inner window shall be lined with sound absorbent material.

The shortest distance, or, in the case of a bay window where the inner window is taken straight across the bay, the mean horizontal distance, between the glass of the outer window and the glass or the inner window shall not be less than that specified in Table 1 below.

Table 1: Minimum distances between outer and inner windows

Thickness of glass of inner window	Minimum distance between glass of outer and inner windows
Less than 4 mm and not less than 3 mm thick	200 mm
Less than 6 mm and not less than 4 mm thick	150 mm
6 mm thick or more	100 mm

Blinds

For qualifying windows which face a direction within the 270° arc between north-east and north-west, a venetian blind shall be placed between the outer and inner windows. The blinds shall comply with the following:

- the slat surface shall be white or near white;
- the ratio of width to spacing of slats shall be between 1.15:1 and 1.25:1;
- the blind shall have horizontal slats capable of being raised or lowered, and the angle of tilt of the slats shall be adjustable, with the controls readily accessible within the room with the windows fully closed;
- the opening for control cords shall be sealed or kept to the minimum necessary for smooth operation;
- the blind box shall be fitted to the top of the window reveal or framehead between the panes of the outer and inner windows;
- the length of the slats shall be between 10 mm and 30 mm less than the width of the recess at its narrowest point, and the blind shall be capable of extending to the lowest level of the glazing of the outer window.

Doors

Where practical, a second door shall be provided behind each qualifying door, with the shortest distance between the doors to be not less than 150 mm, at least one of the doors to be weather stripped and the ceiling and walls between the doors to be lined with sound absorbent material. Where it is not practical to provide a second door, either:

- provide a new single door with improved sound insulation properties and, where appropriate, weather strip the new door, or
- fit a second panel of glass behind any existing glazed panel in an existing door and weather strip the door.

Powered Ventilator Unit

The ventilator system shall consist of a sound-attenuating ventilator unit and air supply duct protected by a cowl or grille, installed within the external wall of the eligible room, capable of supplying fresh air to the room directly from outside. The air supply duct and cowl (or grille) may be either a separate construction from the ventilator unit or integral with it.

Existing air bricks within the external wall of the room should be blocked up, however, flues and direct inlet ducts to combustion appliances shall not be blocked.

The ventilator unit (with air filter in position) shall be capable of giving variable ventilation rates ranging from:

- an upper rate of not less than 37 litres per second against a back pressure of 10 Nm⁻² and not less than 31 litres per second against a back pressure of 30 Nm⁻², to
- a lower rate of between 10 and 17 litres per second against zero back pressure.

If there is no continuous control of the ventilation rate, the following intermediate settings shall be provided:

- a ventilation rate of more than 31 and less than 33 litres per second against a back pressure of 10 Nm⁻², and
- a ventilation rate of more than 21 and less than 26 litres per second against a back pressure of 10 Nm⁻².
 - The effective area of the air path through the ventilator system with the fan switched off and the air filter in position shall not be less than 3250 mm². The effective area shall be ascertained by measuring the static pressure difference across the ventilator system for various flow rates and calculated using the formula:

$$1270 \times \left(\frac{Q}{\sqrt{\Delta p}} \right)$$

- (where Q is the measured air flow rate through the ventilator system in litres per second and Δp the measured static pressure difference across the ventilator system in Nm^{-2}). The effective area shall be calculated for air flow in both directions and the lower calculated value taken as the effective area.

The overall A-weighted sound level in the room due to the operation of the ventilation unit at a ventilation rate of 31 litres per second against a back pressure of 10 Nm^{-2} , measured at any point at least 1 m from the unit or any room surface and normalised by the subtraction of:

$$10 \times \log_{10} \left(\frac{10}{A} \right)$$

(where A is the measured sound absorption in the room in m^2 at each 1/3 octave frequency interval from 100 to 3150 Hz) shall not exceed 35 dB, and at the maximum ventilation rate of the unit against a back pressure of 30 Nm^{-2} shall not exceed 40 dB.

The element-normalised level difference ($D_{n,e}$) of the ventilator unit, measured in accordance with BS EN ISO 10140-2:2010 shall not be less than the figures shown in Table 2, except for the sum of adverse deviations at all 1/3 octave frequencies not exceeding 32 dB and an adverse deviation at any one 1/3 octave frequency not exceeding 8 dB.

Table 2: Element-normalised level difference at 1/3 octave frequencies

1/3 octave frequency band centre (Hz)	Element-normalised level difference, $D_{n,e}$ (dB)
100	30
125	33
160	36
200	39
250	42
315	45
400	48
500	49
630	50
800	51
1000	52
1250	53
1600	53
2000	53
2500	53
3150	53

Permanent Vents

Permanent vents shall consist of a sound-attenuating, purpose-made opening within the external wall of the eligible room which is designed to allow the passage of air between the room and external air at all times.

The effective area of the vent shall be determined as detailed above for the powered ventilator unit.

Each permanent vent shall either:

a) Vent Type A:

- have an effective area of not less than 3250 mm^2 and not more than 6500 mm^2 , and
- be constructed to achieve the minimum $D_{n,e}$ values in Table 2, except for the sum of adverse deviations at all 1/3 octave frequencies not exceeding 32 dB and an adverse deviation at any one 1/3 octave frequency not exceeding 8 dB.

Or

b) Vent Type B:

- have an effective area of not less than 3250 mm², and
- be constructed to achieve the minimum $D_{n,e}$ values in Table 2, except for the sum of adverse deviations at all 1/3 octave frequencies not exceeding 32 dB and an adverse deviation at any one 1/3 octave frequency not exceeding 8 dB. Prior to comparison with the values in Table 2, the measured $D_{n,e}$ values shall be corrected by the addition of:

$$10 \times \log_{10} \left(\frac{S}{3250} \right)$$

(where S is the measured effective area of the permanent vent type B in mm²).

The type and minimum required total effective area of the permanent vent(s) in each room is dependent on the presence of combustion appliances and shall be determined in accordance with paragraph 2(d) of Schedule 1 of the Noise Insulation Regulations 1975. It shall be ensured that there is sufficient combustion air to allow for the safe operation of combustion appliances.

