



Date: 31st July 2023
Project: Land to the Rear of 24 Stone Street – Gravesend
Subject: Floor Sound Insulation
Document Ref.: 4785_AC_1.0
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Introduction

Planning Consent has been granted (Application Number: 20191187) by the Local Planning Authority, Gravesham Borough Council, for the erection of a six-storey building on land to the rear of 24 Stone Street in Gravesend, Kent. The development consists of parking, ancillary and commercial space on the lower and upper ground floors with residential apartments on the four storeys above. Planning Consent for the development is subject to a number of restrictions. Planning Condition 6 relates to the sound insulation performance, which is the subject of this Acoustic Memo:

6. Sound insulation
Prior to the commencement of development the applicant shall provide to the Local Planning Authority (LPA) a suitable sound insulation assessment providing details of the substantially enhanced sound insulation performance of/sound reduction achieved by the floors/ceiling between the first floor flats and ground floor B1a use. Once this scheme has been approved the necessary work shall take place and suitable confirmation of this shall be provided to the LPA prior to first occupation.

Reason In order to provide acceptable living conditions for the future occupants, in accordance with adopted Local Plan Core Strategy Policy CS19.

To assist with the discharge of Planning Condition 6, sound insulation transmission calculations have been undertaken to demonstrate the acoustic suitability of the proposed floor build-up. The details of these calculations along with the proposed acoustic criteria are presented in this Acoustic Memo

Acoustic Criteria

Further to the requirements of Condition 6, the acoustic criteria set out in Approved Document E (ADE) of the Building Regulations¹ also apply to the development. With

¹ The Building Regulations 2010 (2015 Amendments) – Resistance to the passage of sound – Approved Document E



respect to sound insulation between the ground floor commercial units and the dwellings above, ADE Requirement E1 applies.

For E1 ground floor to first floor compliance, the floor build-up will have to provide a minimum airborne sound insulation performance of $45 \text{ dB } D_{nT,w} + C_{tr}$. However, for situations where Requirement E1 applies but the adjacent conditions are not of 'normal domestic use', e.g. a plant room, commercial space, or other noisy room/space, more onerous sound insulation requirements may be applicable, with ADE stating:

"A higher standard of sound insulation may be required between spaces used for normal domestic purposes and communal or non-domestic purposes. In these situations the appropriate level of sound insulation will depend on the noise generated in the communal or non-domestic space."

Considering the above and to comply with Condition 6, a minimum 10 dB uplift over ADE requirements is proposed, resulting in an onerous sound insulation requirement of $55 \text{ dB } D_{nT,w} + C_{tr}$.

Floor Sound Insulation

Floor Build-Up

The proposed construction of the floor between the ground floor commercial space and the flats above, is understood to consist of:

- ▶ 28 mm Collecta Screedboard
- ▶ 450 mm concrete slab (2300 kg/m^3 or higher density)
- ▶ MF ceiling system providing 85 mm cavity
- ▶ 15 mm SoundBloc plasterboard ceiling

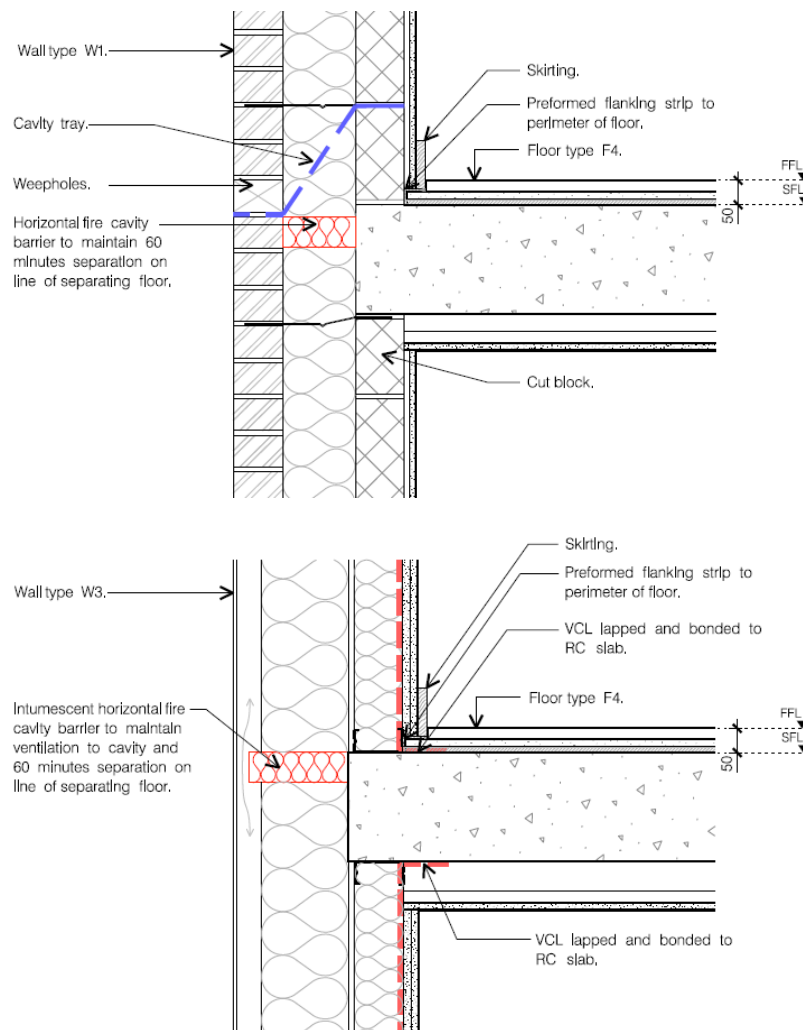
Analysis of the above build-up, using Insul (version 9.0.24) sound insulation prediction software, shows that the floor is capable of providing airborne sound insulation in the region of $64 \text{ dB } R_w + C_{tr}$. This would provide a 9 dB margin over the proposed in-situ $55 \text{ dB } D_{nT,w} + C_{tr}$ sound insulation performance.



Flanking Noise

In addition to the floor build-up, detailing at the junctions is also important for ensuring the sound insulation of the floor is not diminished through flanking noise transmission.

The figures below shows the typical floor/external wall junction detailing that is being proposed.



The proposed junction detailing is considered adequate for suppressing flanking noise transmission.

Notwithstanding the above, it is important that any noise-producing equipment or associated components within the commercial areas are installed as such to prevent significant amounts of noise/vibration from entering the structure and being transmitted to residential areas. This can be achieved by avoiding equipment being directly mounted



onto structural elements and/or suitable vibration isolation included as and where required.

Services penetrations between commercial and residential areas should, where possible, be avoided. Where services penetrations are required, these should be suitably boxed in. ADE considers an adequate acoustic enclosure to consist of:

- ▶ Enclosure constructed of material of at least 15 kg/m² mass per unit area, e.g. two layers of 12.5 mm plasterboard. The enclosure must be built from the structural floor to the soffit and any gaps sealed with an acoustic or flexible sealant. The enclosure shall also not be in direct contact with the pipe/duct.
- ▶ Either the pipe or duct within the enclosure must be wrapped with 25 mm unfaced mineral wool. Alternatively, the inside of the enclosure can be lined with 25 mm unfaced mineral wool.

Summary

As a means of complying with the requirements of Planning Condition 6, an airborne sound insulation performance providing a 10 dB uplift over Building Regulations sound insulation requirements is proposed between the ground floor commercial areas and residential areas above.

Analysis of the proposed floor construction and associated junction detailing shows that the proposed 10 dB uplift in sound insulation should be comfortably achievable. It is therefore considered that the proposed construction is compliant with the sound insulation requirements of Condition 6.