



**The Noise Suppression Company Ltd**  
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Chesterton Humberts  
55 – 56 Hampstead High Street,  
Hampstead,  
London NW3 1QH

08<sup>th</sup> February 2011

Re: Flat 3, 27 Oakhill Avenue, Hampstead, London, NW3 7RD

Dear Maria,

Following my visit yesterday I am enclosing my observations and subsequent Specification for the proposed Acoustic Separation Works to the floor in the Living Room and Kitchen at the above address.

**Existing construction (Living Room):**

- Timber floor joists at approx 225 depth spaced at approx 380mm centres.
- Un-insulated floor joist cavity (where inspected)
- Combination of Timber floorboards and sheet Chipboard attached to floor joists via nailing.
- 1mm Plastic sheet stapled over floorboards.
- Acoustilay 3 (installed upside down and very poorly) fitted over plastic membrane abutted to perimeter strip.
- Tredaire rubber underlay fitted up to Carpet grippers.
- Saxony Carpeting stretch fitted onto perimeter carpet grippers.

**Existing construction (Kitchen):**

- Timber floor joists at approx 225 depth spaced at approx 380mm centres.
- Un-insulated floor joist cavity (where inspected)
- Timber floorboards attached to floor joists.
- Likely an 18mm Plywood secured to the Floorboards.
- Vinyl tiling glued to plywood, likely Amtico or Marley.
- 3mm Cushionfloor sheet vinyl partially glued at the perimeters with a mastic to all perimeters.

**Comments/observations (Living Room)**

The floor joists are very deep measured at 225mm depth and somewhat unusually are supported off the separating party wall. It is relatively uncommon

for the joists to span off the SPW although this has no bearing on the transfer of sound into the flat below.

The sub-floor is primarily made up of 18 – 22mm Chipboard and fastened using thin round nails. This is not the preferred method, screws are the recommended method of attachment. As a result the chipboard is very creaky and certainly feels loose overall and would undoubtedly be a cause of complaint.

I can think of no reason as to why the plastic membrane has been fitted other than to limit a phenomenon referred to as up draught soiling in that air passing behind the skirting boards that is carrying dust, is prevented from staining the carpet at the room perimeters. This is relatively ineffective unless fitted underneath the skirting boards and proven as the edges of the carpet are stained due to this factor.

The Acoustilay 3 is a product made by Sound Reduction Systems (SRS) used as an impact damping underlay and despite the fact that it has been laid upside down and very poorly fitted would still be effective. My only caveat would be the protective layer to prevent the break up of the soft foam layer would be ineffective. SRS manufacturer 3 products in this range, Acoustilay 3, 8 and 15. AC3 & 8 are for impact attenuation only, AC15 would also provide Airborne attenuation.

Acoustically this construction contains no provision for the limiting of Airborne sound transfer and only a very basic method for limiting structural impact transfer. The loose fitting chipboard and certainly the creaking are an issue as is the uninsulated floor joist cavity. The section of the floor to the right of the living room is displaying a low frequency resonance when subjected to impact and would also be an issue I would recommend to address.

### **Comments/observations (Kitchen)**

The overall build up of the floor measured from the floorboards is approx 25mm and although this does not usually have any significance in this case it means the Washing machine and Dishwasher are fitted so tightly that I would struggle to remove them for maintenance without damaging the Cushionfloor. When in operation the fact that they are so tight would mean the vibration, particularly from the washing machine would be heard throughout the entire property.

### **Acoustic performance of existing structure**

In every case I would relate the performance to the current recommendations as outlined in the Building Regulations Document E (2003 edition) and although this legislation would not apply in this case as the flats were constructed after this time, it is the best benchmark in which to work from. Following my analysis of the construction I would estimate the current transfer levels to be well below the conversion requirement for Airborne albeit less so for Impact due to the inclusion of the Acoustilay 3. I enclose the following table for your information.

### **Performance Criteria**

New Build	Impact	Floors only	62dB $L_{nT,w}$ or lower
New Build	Airborne	Separating Walls, Floors and Staircases	45dB $D_{nT,w} + C_{tr}$ or higher
<b>Conversion</b>	<b>Impact</b>	<b>Floors only</b>	<b>64dB <math>L_{nT,w}</math> or lower</b>
<b>Conversion</b>	<b>Airborne</b>	<b>Separating Walls, Floors and Staircases</b>	<b>43dB <math>D_{nT,w} + C_{tr}</math> or higher</b>

The acoustic terminology quoted in these reference values essentially describes the constructions ability to limit sound transfer and as a rule of thumb every 1dB is approximately a 10% difference. If I were to attribute a value to this construction, relating to these criteria, then they would be as follows:

Current Airborne: No higher than 35dB  $D_{nT,w} + C_{tr}$

Current Impact: No less than 70dB  $L_{nT,w}$

Under the guidance of the Approved Document E 2003 Edition as set out above an Airborne improvement of at least 8dB and an Impact improvement of at least 6dB would be required to at least achieve these Conversion values. In order for me to be confident that the improvement will be sufficient I would recommend a level improvement of at least 10dB Airborne and 13dB Impact.

Subjectively a sound level difference of 10dB is perceived as a two fold increase/decrease in loudness and therefore very clearly audible.

### **Flanking Sound**

Every acoustic manufacturer bar none will put in some type of disclaimer acknowledging attention to sound Flanking and the degrading effect this phenomenon has on system performance. In my experience I find this is the single most common reason for a poorly performing sound reducing system.

Also, airborne noise within the flat passing through gaps in the floorboards, behind skirting boards, through pipe services into the floor cavity, recess spotlights with no fire or acoustic hoods will all contribute to overall noise transfer to adjoining areas. This is something I look at in great detail when installing sound reducing treatments.

### **Recommendations for increase in acoustic privacy**

Given the specifics of the construction as outlined my recommendations would be relatively extensive due to the current levels of sound transfer. My recommendations would be as follows:

## **Acoustic Flooring Specification**

### **Areas for Works: Living Room & Kitchen**

#### **Preliminaries**

- Remove and set aside existing Carpeting, Cushionfloor, Underlay & Acoustilay 3.
- Remove and dispose Perimeter strips, carpet grippers and plastic membrane.
- Remove and dispose existing Floorboards, Chipboard and Plywood.
- Install Acoustic insulation within FJC to 45kg/m<sup>3</sup> friction fitted in slab format using RockSlab 100.
- Isolate FJC using 15kg/m<sup>2</sup> Cavity Isolation Board supported as necessary ensuring adequate spacing between insulation.
- Seal all perimeters of isolation board using acoustic mastic.
- Drape Acoustic membrane/curtain (Deadsheet 7) over floor joists to be lapped up behind skirting boards.
- Affix impact damping strips over floor joists using medium density resilient gaskets.
- Attach 22mm moisture resistant T&G Sub-floor to floor joists using isolated anchors in rubber grommets.
- Seal in all perimeters with closed cell co-polymer flanking gaskets and acoustic mastic.
- Fit supporting battens to all perimeters to accommodate installation of Carpet Grippers.
- Lose lay MassMat 20 Sound Barrier panel (20kg/m<sup>2</sup>) fitted broken bond up to battens.
- Re-install Acoustilay 3 and Carpeting to Living Room.
- Fully bond 9mm moisture resistant MDF to Kitchen floor only.
- Reinstall Cushionfloor as before. (This may need replacement if damaged in removal).

Given such a specification I would certainly guarantee the new performance would at least achieve the Conversion requirement.

#### **General Notes**

This system specification is very comprehensive in design and construction with the emphasis on construction. All aspects must be carried out to the letter, as any compromises will result in either partial or total failure. Particular attention to detail at the perimeters and the junctions with the internal partition walls are vital to ensure flanking sound paths do not degrade the performance of the acoustic floor system significantly.

## Quantities and Prices

<b>Description</b>	<b>Area</b>	<b>Price</b>	<b>Total</b>
<b>Acoustic Works</b>	37 M2	£ 96.00 M2	£ 3,552.00 Materials
	37 M2	£ 59.00 M2	£ 2,183.00 Labour
			<b>£ 5,735.00 Inc Vat</b>

**All Prices include Vat @ 20%**

### Insurance

- Public Liability (£2 million)
- Employers Liability Insurance (£10 million).

### Payment terms

My standard terms will form the basis of any contract, which will include the provision for:

1. Materials inc vat in full on day of delivery by bank transfer.
2. Labour paid in full on completion.

### Duration

5 – 6 Full working days, Mon – Fri 8am – 4pm

I hope everything meets with your approval, however in the meantime, if you have any questions whatsoever then please feel free to call and discuss.

Yours Sincerely,

Jason MacDonald  
Architectural and Building Acoustics Specialist