

## 10 .The Moorside Room

### a) To consider and agree the installation of sound absorbing panels

#### INFORMATION

Our full range of acoustic panels can be viewed here:

<http://www.soundreduction.co.uk/Products/Sound-Absorption-Solutions/>. The online Flickr gallery that I mentioned during our meeting can be found here:

<http://www.flickr.com/photos/soundreduction/>

As discussed, the reverberation problem that exists won't be solved with the addition of plants or curtains/blinds, plants or carpeting on the window sills. A proprietary solution will undoubtedly be required.

Some links to our most popular absorbers are below:

*Sonata Aurio* - 50mm thick directly bonded foam absorber finished in high quality 'Trilogy' display fabric. *Sonata Aurio* can be bonded to walls and ceilings using our high-grab *Sonata* Adhesive.

<http://www.soundreduction.co.uk/Products/Sound-Absorption-Solutions/Sonata-Aurio/>.

*Sonata Vario* - 50mm thick suspended foam absorber finished in high quality 'Trilogy' display fabric. *Sonata Vario* is suspended from ceilings using our proprietary fixing kits or secured to walls via specially designed brackets. Suspending the *Vario* panels increases acoustic performance and, because no adhesive is used, the *Vario* panels can be easily removed, should you wish to relocate them or redecorate the walls. It is also possible to surface mount the *Vario* panels using 'Button-fix' fixings so that they are easily removable but don't have the air-gap behind them.

<http://www.soundreduction.co.uk/Products/Sound-Absorption-Solutions/Sonata-Vario/>

*Sonata Aurio* and *Vario* panels are rated as Class A acoustic absorbers. A number of different panels sizes are available to work around lights and other obstructions. All *Sonata* products are mineral fibre and fibre glass free.

I'll post a white sample of the *Aurio* panel over to you so you can have a look at it. If you wished to see the *Sonata Vario* panels installed I can put you in touch with Sutton (Under Whitestonecliffe) Village Hall as we did some work for them earlier this year.

#### INFORMATION FOR QUOTES 1 & 2

Using the room dimensions of 10.1m by 4.65m by 5.08m high, and using the information collected on the surface finishes present, my calculations suggest that mid-frequency reverberation time (average of 500Hz, 1000Hz, and 2000Hz) is approximately 2.63s and the overall reverberation time (average from 125Hz to 8000Hz) is approximately 1.93s. (see attached graphs of results). The calculations show that the reverberation time is particularly high within the mid-frequencies, giving us a large peak in the graph, and explains why speech and communication within The Moorside Room is difficult.

From this starting point, factoring in the known performance coefficients for our acoustic absorption products, my calculations suggest that you require 25m<sup>2</sup> of Class A absorption to reduce the reverberation significantly. This area of absorption better than halves the level of reverberation within the room and gives us a much improved spectral balance, shown by the much flatter graph. The most practical way to introduce the required area of absorption within the Moorside room would be to have 12no 1200x1200x50mm and 4no 1200x800x50mm panels on the ceiling and 3no 1200x1200x50mm panels at high level on the walls. Ideally I would like to include some absorption at lower level but placing acoustic absorbers here would restrict the use of the room as an art gallery and exhibition space.

### INFORMATION FOR QUOTES 3 & 4

**Following comments by Cllr Brampton on 21 July with regards to the optimal reverberation time of 1.5s to 2.5s for a general purpose auditorium for both speech and music (according to <http://hyperphysics.phy-astr.gsu.edu/hbase/acoustic/revtim.html> Richard Sherwood provided the following response:**

In my experience, a reverberation time of 1.5s to 2.5s would be too high for a room of this size. Auditoriums tend to be much larger rooms and often a higher reverberation time is desirable as this helps fill the space with music and is subjectively quite pleasing. I think the emphasis needs to be on the performance of the Moorside room with respect to the speech (mid) frequencies, so for a room of this size I would usually target around 1.0s or so.

As a minimum target I would suggest aiming for 1.3s as this represents a halving of the modelled mid-frequency reverberation time of the room at the moment. To achieve this you'll need around  $17\text{m}^2$  of our class A absorption, say 13no 1200x800x50mm Aurio or Vario panels on the ceiling and 3no 1200x1200x50mm Aurio or Vario panels on the walls.

### INFORMATION FOR QUOTES 5 & 6

**Does it make a difference how this is distributed between walls and ceiling? Would it be possible to have ceiling panels only?**

Although substantial improvement could be achieved using a 'ceiling-only' solution, due to the height of the room I would suggest it will be beneficial to have some panels on the walls. These will help to take some of the low(er) level reflections away.

As a ceiling only specification I would recommend 10no 1200x1200x50mm and 3no 1200x800mm panels to make up the necessary area of absorption. If you would like a quote for this please let me know.

### QUOTATIONS

**Option 1 – Suspended Sonata Vario panels suspended beneath the ceiling on proprietary fixings and on wall mounting brackets**

15no 1200x1200x50mm Sonata Vario Panels @ £139.00 each = £2,085.00

4no 1200x800x50mm Sonata Vario Panels @ £98.00 each = £392.00

16no Sonata Vario Ceiling Suspension Packs @ £4.80 each = £76.80

3no Pairs of Vario Wall Mounting Brackets @ £19.00 per pair = £57.00

Installation Charge = £525.00

VAT @ 20% = £627.16

TOTAL = £3,762.96

**Option 2 - Directly bonded Sonata Aurio Panels to the walls and ceiling (non-removable)**

15no 1200x1200x50mm Sonata Aurio Panels @ £89.00 each = £1,335.00

4no 1200x800x50mm Sonata Aurio Panels @ £68.00 each = £272.00

35no 310ml Tubes of Sonatac Adhesive @ £7.80 each = £273.00

Installation Charge = £525.00

VAT @ 20% = £481.00

TOTAL = £2,886.00

**Option 3 - Suspended Sonata Vario panels suspended beneath the ceiling on proprietary fixings and on wall mounting brackets**

13no 1200x800x50mm Sonata Vario Panels @ £98.00 each = £1,274.00

3no 1200x1200x50mm Sonata Vario Panels @ £139.00 each = £417.00

13no Sonata Vario Ceiling Suspension Packs @ £4.80 each = £62.40

3no Pairs of Vario Wall Mounting Brackets @ £19.00 per pair = £57.00  
Installation Charge = £460.00  
VAT @ 20% = £454.08  
TOTAL = £2,724.48

Option 4 - Directly bonded Sonata Aurio Panels to the walls and ceiling (non-removable)

13no 1200x800x50mm Sonata Aurio Panels @ £68.00 each = £884.00  
3no 1200x1200x50mm Sonata Aurio Panels @ £89.00 each = £267.00  
24no 310ml Tubes of Sonatac Adhesive @ £7.80 each = £187.20  
Installation Charge = £460.00  
VAT @ 20% = £359.64  
TOTAL = £2,157.00

Option 5 - Suspended Sonata Vario panels suspended beneath the ceiling on proprietary fixings only

3no 1200x800x50mm Sonata Vario Panels @ £98.00 each = £294.00  
10no 1200x1200x50mm Sonata Vario Panels @ £139.00 each = £1,390.00  
13no Sonata Vario Ceiling Suspension Packs @ £4.80 each = £62.40  
Installation Charge = £395.00  
VAT @ 20% = £428.28  
TOTAL = £2,569.68

Option 6 - Directly bonded Sonata Aurio Panels to the ceiling only (non-removable)

3no 1200x800x50mm Sonata Aurio Panels @ £68.00 each = £204.00  
10no 1200x1200x50mm Sonata Aurio Panels @ £89.00 each = £890.00  
24no 310ml Tubes of Sonatac Adhesive @ £7.80 each = £187.20  
Installation Charge = £395.00  
VAT @ 20% = £335.24  
TOTAL = £2,011.44

\*The installation prices shown include all labour, access towers, delivery of materials, loading materials to work area, protection to existing finishes, particularly floors, and removal of all waste (packaging) from site. The installation of the above, including travel, require 1 day of the installers time. Access would be required from 8:00am - 6:00pm. Our installer will require free of charge use of power for drilling and use of welfare facilities.

Should you wish to arrange your own installation please deduct this cost from the above total and allow for a delivery charge of £100.00. We carry stock of 'White' and 'Stone' coloured panels. Should stock not be available or if you require different colours then this can take a maximum of 3 weeks for us to manufacture. Information on colours can be viewed here:

<http://www.soundreduction.co.uk/Products/Sound-Absorption-Solutions/Sonata-Vario/Physical-Properties/>

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