Mistletoe Cottage, 20 High Street, Cheddington, LU7 0RQ - Supporting information

SUMMARY STATEMENT

We are looking to create two purpose built workshops, move one of the current outbuildings, adding a small wood store and bike store and remove one existing shed once the works are complete.

- The two new main workshop buildings will be constructed using Strocks (please see Appendix A for further information re. construction methods and materials). The buildings have been designed to ensure that there is no noise pollution from the use of these workshops. Workshop A will be a professional Wood Carving and Furniture Making workshop, Workshop B will be used to create professional Textiles Art, homewares, rugs, wall hangings and cushions as well as provide tuition from time to time.

- The workshops will be incidental to the enjoyment of the dwelling house. The workshops will not provide accommodation of any kind.

- The workshops eaves heights will be below 2.5 metres in height (2.3 metres).

In addition to all the basic elements, we are mindful that we are looking to build our workshops in a residential area. We are looking to live and work here for the long term and not only have a vested interest to ensure that this build does not cause annoyance for our neighbours, we are also looking to ensure that we minimise any noise pollution that our workshops may emit.

We are looking to do this through both high performance and environmentally friendly building materials. We have measured the dBA of all our machines as well and the underlying noise in our garden and whilst our basic structures fall within the permitted noise levels, we are looking to add to this using Cork or similarly insulative materials once the workshops are built to ensure the best possible thermal value as well as noise reduction.

We are unable to gain a full understanding of how these materials will work fully in practice as the technical data is not currently available, however the technical data is available for the Strocks. We are also mindful that different sounds operate at different frequencies and different materials reduce sound attenuation differently due to frequency, therefore we are calculating the basic sound reduction with a contingency to experiment with different materials to ensure the best thermal retention and noise reduction.

Appendix A.

Specification of Workshop A - 7 by 3.9 metres - placed 0.6 metres away from the boundary edge

WALLS - The walls will be constructed using Strock blocks (Strocks are building blocks created using natural building material, comprised of Clay, Rich Earth and Chopped Straw. More information here), we will test the sound attenuation after one course of bricks and if the subsequent use of insulation does not bring us to the relevant reduction in sound, we would look to double the thickness of the walls to ensure even greater sound reduction.

SINGLE WALL - Strocks are 1350kg/cubic meter, with a thermal conductivity of 0.2w/mk. With these high mass walls constructed at 0.21m thick, inclusive of the internal clay plaster (this has a similar mass to the Strocks), the sound attenuation can be calculated at 1350kg/m3 x 0.21 = 283.5kg/m2.

A result of 283.5kg/m2 gives a sound attenuation of approx. 46db (see Appendix B for workings).

DOUBLE WALL - Strocks are 1350kg/cubic meter, with a thermal conductivity of 0.2w/mk. With these high mass walls constructed at 0.32m thick, inclusive of the internal clay plaster (this has a similar mass to the Strocks), the sound attenuation can be calculated at 1350kg/m3 x 0.32m = 432kg/m2.

A result of 432kg/m2 gives a sound attenuation of approx. 50db (see Appendix B for workings).

FLOOR - The floor will be constructed using 150mm of foamed glass aggregate, compressed on top of a geo textile membrane. This will have an insulation value of 0.08w/mk.

100mm thick Strocks (please see explanation at the bottom re. Strocks) will be laid on top of the foamed glass aggregate.

ROOF - The exterior of the roof will then be clad with 12mm OSB boards on top and finished with tile.

We will be looking to experiment with cork boards and acoustic wood wool boards to further attenuate the sound. However these products do not have the relevant data to be able to ensure that this will be a good enough sound reduction. As mentioned above, we will be testing as we go to ensure that the frequencies of sound that we produce are reduced by the materials that we are using.

We have an alternative option of using Tecsound 100SY, reducto clips, furring bar, 50mm plasterboard x 2 layers, acoustic mineral wool 50mm which is proven to create a sound reduction of 54dB, however we would prefer to explore environmentally friendly and breathable options where possible, the above solution would be a last resort.

WINDOWS - There will only be one window in this workshop to further limit the sound passing through the structure.

There will be a double glazed window fitted in the traditional way, with all air gaps sealed. Then a secondary window fitted internally, also double glazed, with all air gaps sealed. This double window construction will massively reduce any possibility of sound leaking from the building.

DOORS - The doorway will be a similar double structure to the window construction, with an exterior and interior door being fitted, both sealed with acoustic door seals and with an air gap in-between. Both doors will be constructed from heavy board wood, with high densities, aiding with acoustic reduction.

Specification of Workshop B - 7.5 by 3.9 metres - placed 0.6 metres away from the boundary edge

We are in the final stages of purchasing these materials, there is a possibility that it may be more cost effective to only buy the larger blocks, however we have worked to the smaller blocks in calculations to ensure that we are working to the least amount of sound attenuation in our calculations.

SMALLER BLOCKS - Strocks are 1350kg/cubic meter, with a thermal conductivity of 0.2w/mk. With these high mass walls constructed at 0.16m thick, inclusive of the internal clay plaster (this has a similar mass to the Strocks), the sound attenuation can be calculated at 1350kg/m3 x 0.16 = 216kg/m2.

A result of 216kg/m2 gives a sound attenuation of approx. 44db (see Appendix B for workings).

LARGER BLOCKS - Strocks are 1350kg/cubic meter, with a thermal conductivity of 0.2w/mk. With these high mass walls constructed at 0.21m thick, inclusive of the internal clay plaster (this has a similar mass to the Strocks), the sound attenuation can be calculated at 1350kg/m3 x 0.21 = 283.5g/m2.

A result of 283.5kg/m2 gives a sound attenuation of approx. 46db (see Appendix B for workings).

FLOOR - As above

ROOF - As above

WINDOWS - There will only be two windows in this workshop. There will be a double glazed window fitted in the traditional way, with all air gaps sealed.

DOORS - The doorway will be similar to the window construction, with all air gaps sealed.

Appendix. B

Looking at the overall noise levels created by the machines that will be used, the reduction our basic construction (not taking in to account insulation, final finishes etc.), we have calculated the maximum noise that we could possibly produce, this is balanced against the underlying noise levels of the area.

I would like to once again highlight that we will be looking to reduce any noise as much as possible and will be looking to insulate to reduce noise even further than the below calculations. These calculations are to show what is possible with the method of construction that we are able to gain data for, we would much prefer to further research and test other materials to achieve an even greater sound reduction as a part of the build process.

The permitted noise level using A-weighted decibels (the unit environmental noise is usually measured in) is:

- 34 dBA (decibels adjusted) if the underlying level of noise is no more than 24 dBA
- 10 dBA above the underlying level of noise if this is more than 24 dBA

https://www.gov.uk/guidance/noise-nuisances-how-councils-deal-with-complaints

OUTDOOR READING AT THE PLOT IN 20 HIGH STREET, DURING THE DAY (SUNDAY 29 MAY 2022) range between 65dBA - 44dBA

OUTDOOR READING AT THE PLOT IN 20 HIGH STREET, DURING THE EVENING (10.30PM) (MONDAY 13 JUNE 2022) 33-45 dBA

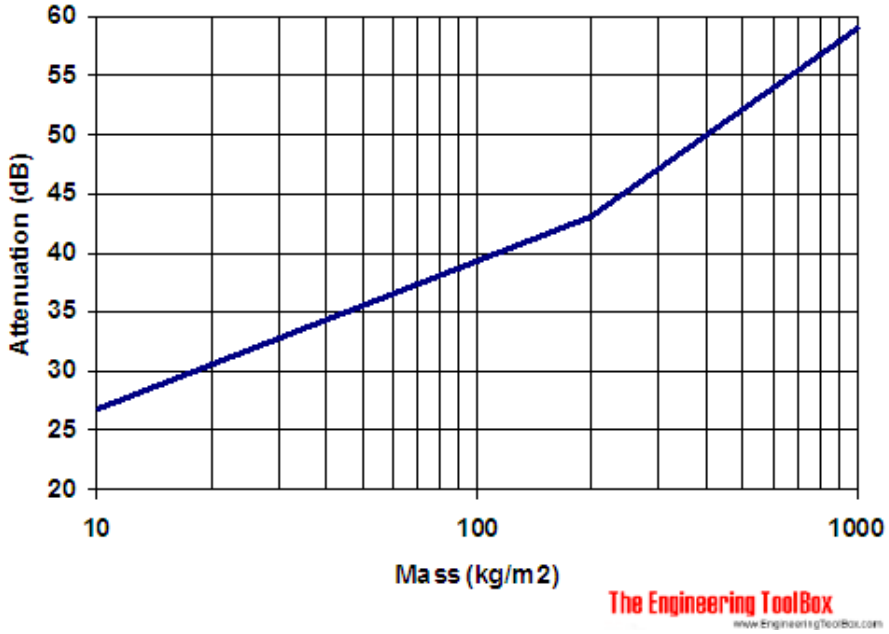
With this in mind we are working towards a maximum dBA of 54dBA during the day and 43dBA at night. We would hope to achieve an even greater sound reduction than shown here and would not use any machinery that would cause nuisance at inappropriate times of the day.

The calculations below for Workshop A are using a Double Wall of Strocks to show the level of sound that we are confident can be achieved with this material, however, if given the opportunity to test other materials once the first Wall has been built, we would like the opportunity to find materials that will further enhance the sound attenuation of the Strocks, the second Wall creates a further 4dBA of sound reduction which places us within the relevant limits, we would appreciate some room to further improve the noise reduction with a leniency of the materials used, with the below proposition used as proof that the relevant reduction can be achieved.

TEST USING A UNIT UT350 - A RATING

MACHINE	TASK	DBA	STROCKS SOUND ATTENUATION	RESIDUAL SOUND
WORKSHOP A RIP SAW	CUTTING OAK	103	50	53
WORKSHOP A RIP SAW	RUNNING	77	50	27
WORKSHOP A CHOP SAW	CROSS CUTTING WORK	77	50	27
WORKSHOP A BAND SAW	CUTTING OAK	86	50	36
WORKSHOP A BELT SANDER	IN USE	100	50	50
WORKSHOP A ROUTER	IN USE	100	50	50
WORKSHOP B TUFTING GUN (LIKE A HAND HELD SEWING MACHINE)	IN USE	85	43	42
WORKSHOP B OVERLOCKER	IN USE	77	43	34

Appendix C
How we calculated sound attenuation, using the graph as outlined here, taken from the below site.



https://www.engineeringtoolbox.com/sound-transmission-massive-walls-d_1409.html