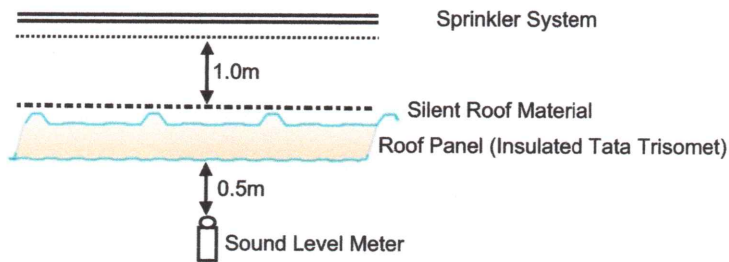


Acoustic Report - Some explanatory notes

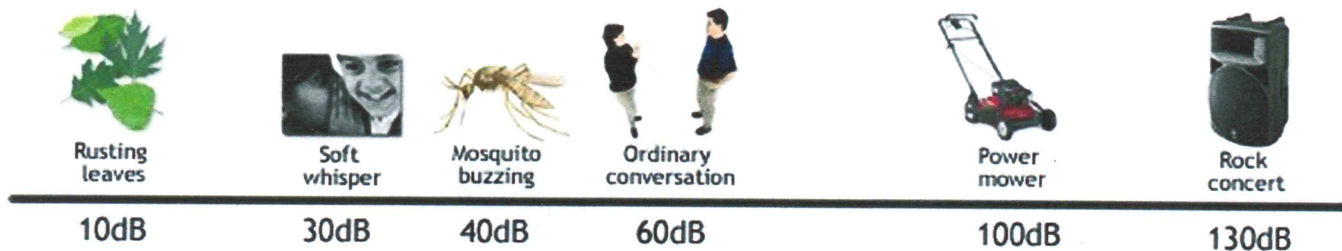
Our most recent acoustic report was produced to support the use of Silent Roof Material (SRM) at a specific location. The testing setup and procedures are explained in detail in the report and the results show the reduction in noise level provided by a covering of SRM above a given roof panel type. A schematic of the test setup is shown in the diagram below.



The resultant measurements taken during the test are shown graphically in the report, but what do these measurements in dB LAeq,T actually mean in layman's terms?

Definition: *Leq (or LAeq) is the Equivalent Continuous Sound Pressure Level. Leq/LAeq, is the constant noise level that would result in the same total sound energy being produced over a given period.*

In other words, the noise levels are time related and correspond well to that perceived by human hearing. A pictorial representation of noise levels in dB are described below to give an example of what these different noise levels mean in relation to us humans.



It should be made clear that the scale that is used is not linear it is logarithmic. In simplified terms this means that one sound that is 10dB louder than another is in fact TWICE as loud. Similarly a difference of 15dB is THREE times as loud.

When dealing with sound reduction, achieving over 10 dB in sound reduction will have a very material affect on the sound one hears. So that if a sound reduction of 10dB is achieved then the sound will appear HALF as loud as before.

It can be seen from the report data that in this particular test arrangement, Silent Roof Material installed over a typical profile metal roof (PMR) construction delivers a virtual three fold reduction in simulated rain noise. In other ad hoc tests that we have performed in the past, a 20dB reduction in noise level has been recorded in real world conditions inside a warehouse being converted to a sound stage with an un-insulated PMR roof above.

Silent Roof reduces annoying, disruptive rain noise to a whisper.

Silent Roof

Acoustic Test Results

Ref: TN01-22114-R0
Date: 17 January 2022
Note by: Chris McNeillie, MSc CEng MIOA, Director

1. INTRODUCTION

- 1.1 Cass Allen are Acoustic Consultants specialised in Environmental and Building Acoustics. We are members of the Association of Noise Consultants (No. 0145) and all our technical staff are members of the Institute of Acoustics (IOA).
- 1.2 This technical note sets out the results of acoustic testing carried out on a sample of Silent Roof. Silent Roof is a black, lightweight material designed to be laid over roofs to reduce rain noise in rooms below.
- 1.3 The objective of the testing was to establish the typical reduction in rain noise provided by the material when placed over a typical lightweight roof construction.

2. METHOD

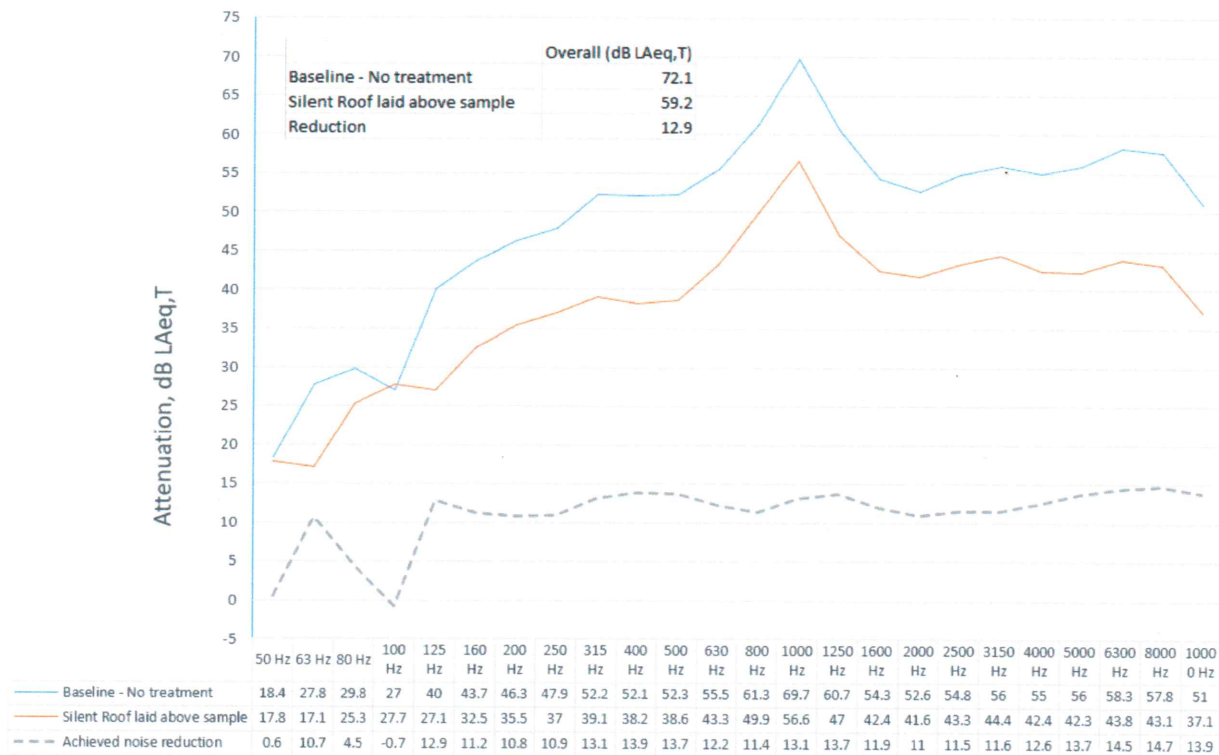
- 2.1 A $\sim 1\text{m}^2$ sample of lightweight insulated roofing panel (Tata Trisomet) was placed horizontally beneath a sprinkler system designed to simulate heavy rainfall. The sprinkler system was placed approximately 1m above the panel and configured to evenly distribute water droplets across the panel.
- 2.2 The sprinkler system was switched on and noise measurements were carried out beneath the panel using a Type 1 calibrated Sound Level Meter (SLM). The microphone of the SLM was positioned approximately 0.5m directly below the middle of the panel. The SLM took LAeq,T noise measurements in 1/3 octave bands from 50Hz to 10KHz. LAeq,T noise levels correspond well to human hearing and therefore are appropriate for the assessment.

2.3 The noise measurements were taken with and without a sample of Silent Roof material laid on top of the roof panel. The measurement results were then used to calculate the level of rain noise attenuation provided by the Silent Roof material as shown in the results below.

2.4 It should be noted that the actual rain noise level in a room will vary depending on the intensity of rainfall, the roof construction, and the internal characteristics of the room (dimensions, reverberation time etc.). However, we believe the results are sufficient to demonstrate the effectiveness of the material at reducing typical rain noise levels.

3. TEST RESULTS

- Tested sample – ~1m² Silent Roof
- Roof material - ~1m² Tata Trisomet roof panel (lightweight composite insulated panel formed of PIR core and thin coated steel outer inner and outer skin)
- Sound level meter – Bruel & Kjaer 2250 Type 1 SLM (SN 3029152)
- Calibrator - Bruel & Kjaer 4231 (SN 2115551)



4. DISCUSSION

- 4.1 The results of the test show that the Silent Roof material is very effective at reducing rain noise beneath lightweight metal roofs.
- 4.2 The overall attenuation in rain noise provided by the Silent Roof material was 12.9 dB. A 10 dB reduction in noise levels is typically considered to represent a subjective halving of a noise level. This is due to the logarithmic nature of decibels. Therefore, the achieved reduction of 12.9 dB means that the Silent Roof product will more than halve the perceivable rain noise level in a room beneath a lightweight metal roof.

5. CONCLUSION

- 5.1 In our view the results of the test are sufficient to demonstrate that the Silent Roof is a very effective treatment for reducing rain noise in rooms beneath lightweight metal roofs.

Quality Assurance

CHECKED BY

Tim Ives, PhD BEng CEng
FIOA, Technical Director
