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ATF Report 940

Sound Transmission Loss Improvement by Installing Vibration Isolation Clips and Furring Channels to one side of a Timber Frame Wall with one Layer of 16mm Boral Plasterboard on each side of the wall

Stud and Track Manufacturing Co

Report summary

A "primary" timber framed wall, constructed as described, achieved a Sound Transmission Class rating of STC36 and an OITC rating of 28. The ISO 717-1 rating was determined as Rw (C; Ctr) =36(-2;-6) and the 100Hz to 5kHz "linear" and "A-Weighted" transmission loss average values were 35dB and 30 dBA respectively.

Th e wall was modified as described below and achieved a Sound Transmission Class rating of STC55 and an OITC rating of 40 . The ISO 717-1 rating was determined as Rw (C; Ctr) =54(-3;-10) and the 100Hz to 5kHz "linear" and "A-Weighted" transmission loss average values were 54dB and 49 dBA respectively.

It should be noted that the control wall contained resonances with significant transmitted acoustical energy levels within the 125Hz, 200Hz, 400Hz and 500Hz one-third octave bands which disappeared when the resilient sound isolation clips and furring channels were added. It also should be noted that the plasterboard coincidence frequency just above 2000Hz did not disappear. The apparent damping of these resonances produced the significant difference in measurement results (above). Past experience with these clips on walls with no transmitted acoustical resonances have recorded improvements of approximately STC10.

Testing requirement

The Acoustical Test Facility was commissioned by Stud and Track Manufacturing Co to determine the acoustical transmission loss improvement by adding hat track furring channels and their RSIC-1 Resilient Sound Isolation Clips to a 100mm cavity test wall sample.

The (primary) test wall was constructed with one sheet of 16mm thick Boral "Firestop" plasterboard, screw fixed to each side of 50mm wide x 100mm deep softwood studs spaced 450mm (nominally) apart across the 3447mm high x 2890mm wide test sample aperture between two reverberation rooms at the Acoustical Test Facility premises. A single nogging was inserted between each pair of studs. 75mm thick, 10kg/m^3 fibreglass was installed between each pair of studs.
The primary wall was acoustically tested and the results computer processed and recorded on a spreadsheet appended to this report. The plasterboard was then removed from one side of the wall, furring channels installed horizontally at 600mm (nominal) spacing with sound isolation clips on every second stud across the wall. The 16mm plasterboard and 75mm thick, 10kg/m^3 fibreglass were replaced and the wall retested. Computer processed results for this test were also appended to this report.

Test sample performance assessment

Several criteria are presented in this report to evaluate the acoustical transmission loss of the test sample. This is to satisfy building industry requirements overseas and in Australia.

a. The Internationally used rating of Sound Transmission Class as required by Australian Standard AS1191-1985.

b. The "Rw" rating with spectral corrections "C" and "Ctr" as discussed in International Standards Organisation document ISO717-1:1996 (*Acoustics – Rating of sound insulation in buildings and of building elements*). The Rw rating is relevant where the spectra has low frequency energy content and is similar in application to the American OITC criteria but differs in the frequency range

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