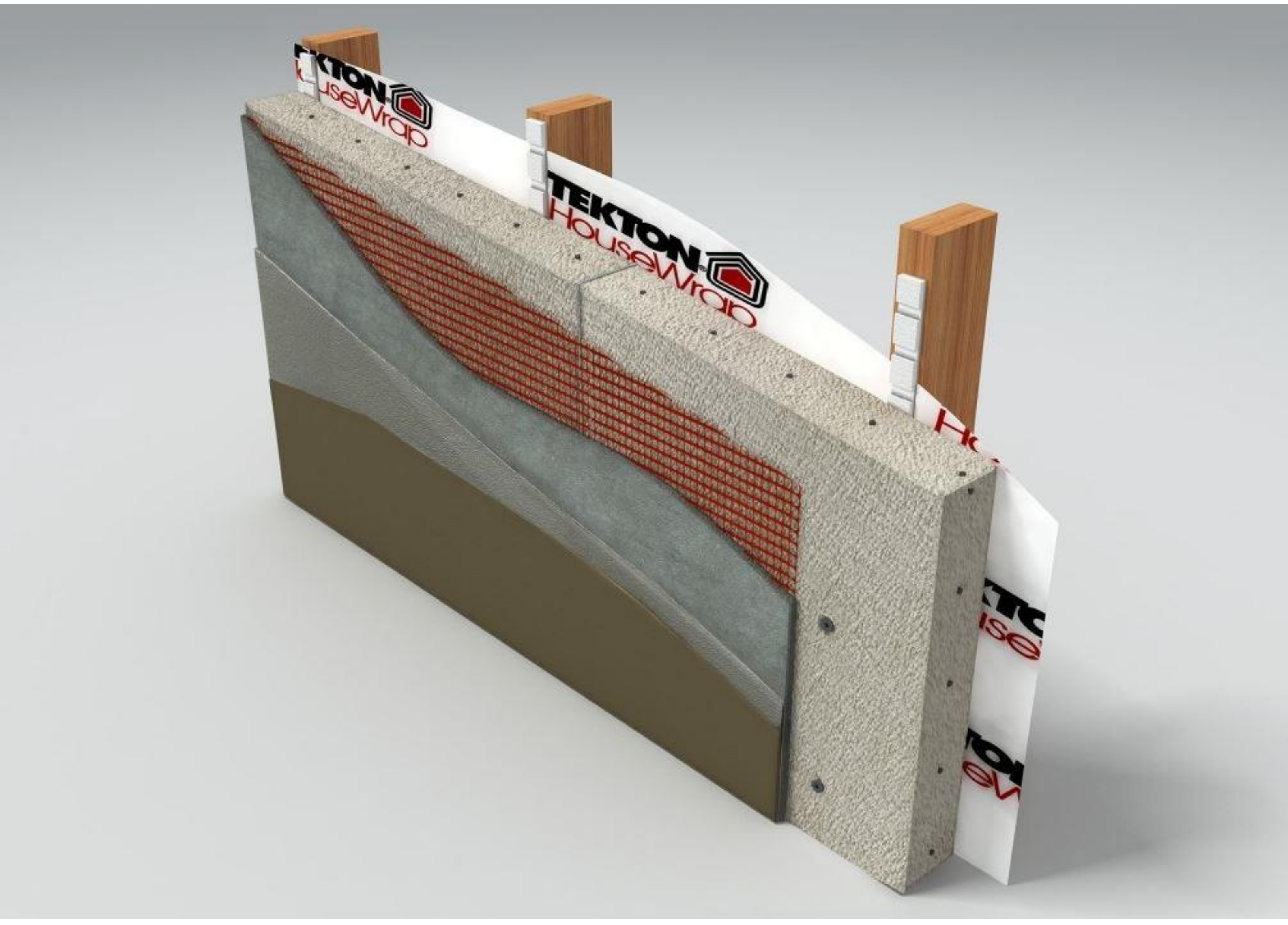


MARSHALL DAY Acoustics

# EZPANEL AAC OPINION
# ESTIMATION OF SOUND INSULATION PERFORMANCE

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Project: **EZPANEL AAC OPINION**

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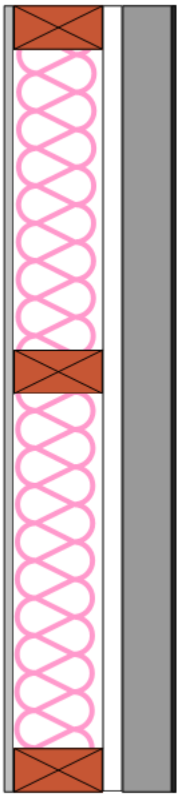
## 1.0 INTRODUCTION

Marshall Day Acoustics has been engaged by Specialized Construction Products Ltd to provide an opinion of the sound insulation performance of their EZPanel system. The opinion has been carried out using the INSUL Sound Insulation Prediction program to build a theoretical model of the system.

## 2.0 CONSTRUCTION

The EZPanel system of interest is described and illustrated below:

- One layer of 10mm plasterboard screw fixed at 600mm centres to;
- 90mm timber studs at 600mm centres with R2 insulation in the cavity on;
- 20mm VH grade EPS battens with;
- 50mm Nasahi AAC panel (690 kg/m3) screw fixed to timber frame and EPS battens at 600mm centres and surface finished with;
- 4mm cementitious render



All joints between wall linings and the perimeter are sealed with a fire and acoustic rated sealant.

## 3.0 THEORETICAL MODEL

The sound transmission loss of the system is determined by the following factors:

- The framing construction and spacing;
- The surface mass of the linings on each side;
- The stiffness and hence critical frequency of the linings;
- The airgap between linings;
- The type of acoustic absorption within the cavity.

The model incorporates the known physical properties and performances of known materials as currently manufactured. The frame construction was created as a hybrid using several different models.

Details of these theoretical model are available from Marshall Day Acoustics on request.

## 4.0 OPINION

Based on the above construction, the estimated laboratory performance of the EZPanel system would be:

**Table 2: Estimated Sound Insulation Performance Ratings**

| System | STC | $R_W$ | $R_W$+C | $R_W$+$C_{tr}$ |
|---|---|---|---|---|
| EZPanel system | 53 | 53 | 49 | 42 |

We consider that this would be acceptable in the majority of applications for residential and light commercial buildings. However, for a residential application where the façade is exposed to a high incident noise level then we consider that a higher performance will be required.

To improve performance, we recommend that the internal 10mm plasterboard layer is either replaced with 13mm plasterboard or another layer of 10mm plasterboard is installed on top of the existing layer. We consider that this will improve the sound insulation performance by 3 – 5 points resulting in a STC/$R_w$ rating of 56 – 58. Note that there are a variety of options that could improve performance and can be investigated if required.

## 5.0 LIMITATIONS

The above opinions are an estimate of the laboratory performance and not the in-situ performance where considerations such as flanking sound transmission and installation accuracy could lower and control the field performance. The estimate is expected to have a margin of error of ± 2 STC points.

If performance certainty is required, we recommend that acoustic tests are undertaken at a suitably qualified testing laboratory.

## APPENDIX A GLOSSARY OF TERMINOLOGY

| | |
|---|---|
| **Sound Insulation** | When sound hits a surface, some of the sound energy travels through the material. 'Sound insulation' refers to ability of a material to stop sound travelling through it. |
| **Transmission Loss (TL)** | The attenuation of sound pressure brought about by a building construction. Transmission loss is specified at each octave or one third octave frequency band. |
| **Flanking Transmission** | Transmission of sound energy through paths adjacent to the building element being considered. For example, sound may be transmitted around a wall by travelling up into the ceiling space and then down into the adjacent room. |
| **Structure-Borne Transmission** | The transmission of sound from one space to another through the structure of a building. |
| **STC** | Sound Transmission Class<br>A single number system for quantifying the transmission loss through a building element. STC is based upon typical speech and domestic noises, and thus is most applicable to these areas. STC of a building element is measured in approved testing laboratories under ideal conditions. |
| **FSTC** | The 'field' or in situ measurement of Sound Transmission Class. Building tolerances and flanking noise have an effect on the performance of a partition when it is actually installed, which result in FSTC values lower than the laboratory derived STC values, typically 5 dB less. |
| **$R_w$** | Weighted Sound Reduction Index<br>A single number rating of the sound insulation performance of a specific building element. Rw is measured in a laboratory. Rw is commonly used by manufacturers to describe the sound insulation performance of building elements such as plasterboard and concrete. |
| **$R'_w$** | Apparent Weighted Sound Reduction Index<br>Similar to the Rw value except that measurements are conducted in the field. Building tolerances and flanking noise have an effect on the performance of a partition when it is actually installed, which result in R'w values lower than the laboratory derived Rw values. |
| **C** | A sound insulation adjustment, commonly used with Rw and $D_{nT,w}$.<br>C adjusts for sources of mid-high frequency noise sources generated by typical living activities such as talking, music, radio, TV, children playing, etc. This term is used to provide information about the acoustic performance at different frequencies, as part of a single number rating system. |
| **$C_{tr}$** | A sound insulation adjustment, commonly used with Rw and $D_{nT,w}$.<br>$C_{tr}$ adjusts for low frequency noise, like noise from trucks and subwoofers. $C_{tr}$ values typically range from about -4 to about -12. This term is used to provide information about the acoustic performance at different frequencies, as part of a single number rating system. |