VIPAC ENGINEERS & SCIENTISTS LTD

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Ref: 60W-10-0036 - TNT - 840323-0-draft

28 April 2010

Attention: Mike Shock
Formcraft Pty Ltd
634 Casella Pl
Kewdale
WA 6105

Dear Mike Shock

FormPro 220 Wall & FormDeck Suspended Slab Floor

ViPAC Engineers and Scientists Ltd (ViPAC) were commissioned to carry out the following:

- Estimation of airborne sound insulation performance of FormPro 220 wall system.
- Estimation of airborne sound insulation performance of FormDeck suspended floor system.
- Recommendations (if necessary) to meet Rw + Ctr 50 minimum for both systems.

1. SYSTEM DESCRIPTION

1.1 FormPro 220 Wall

The 'FormPro 220' construction details are understood to be as follows:
One layer of 10mm SoundCheck plasterboard fixed with standard CSR stud adhesive to one layer of 60mm fire retardant polystyrene (26kg/m^3) either side of 100mm reinforced concrete cast in-situ.

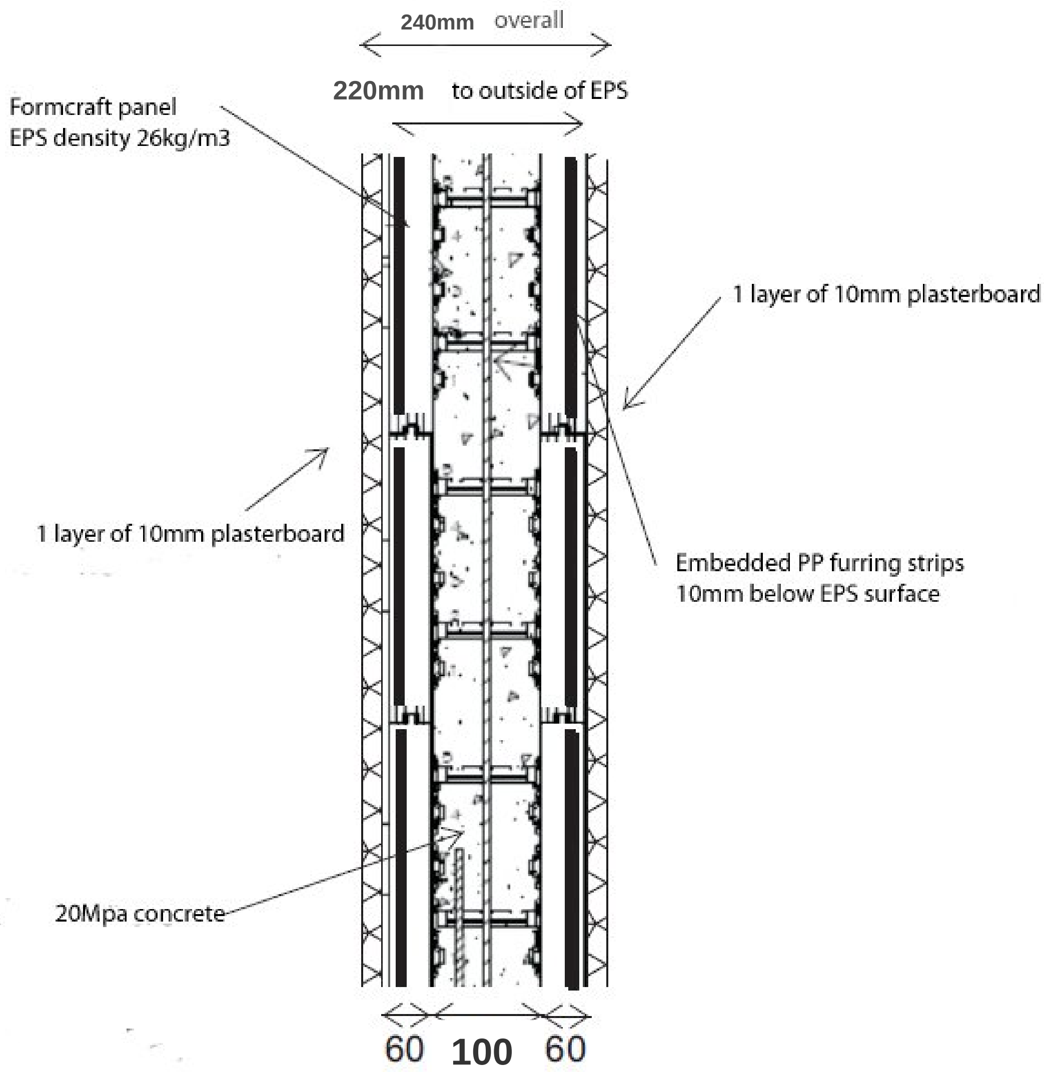
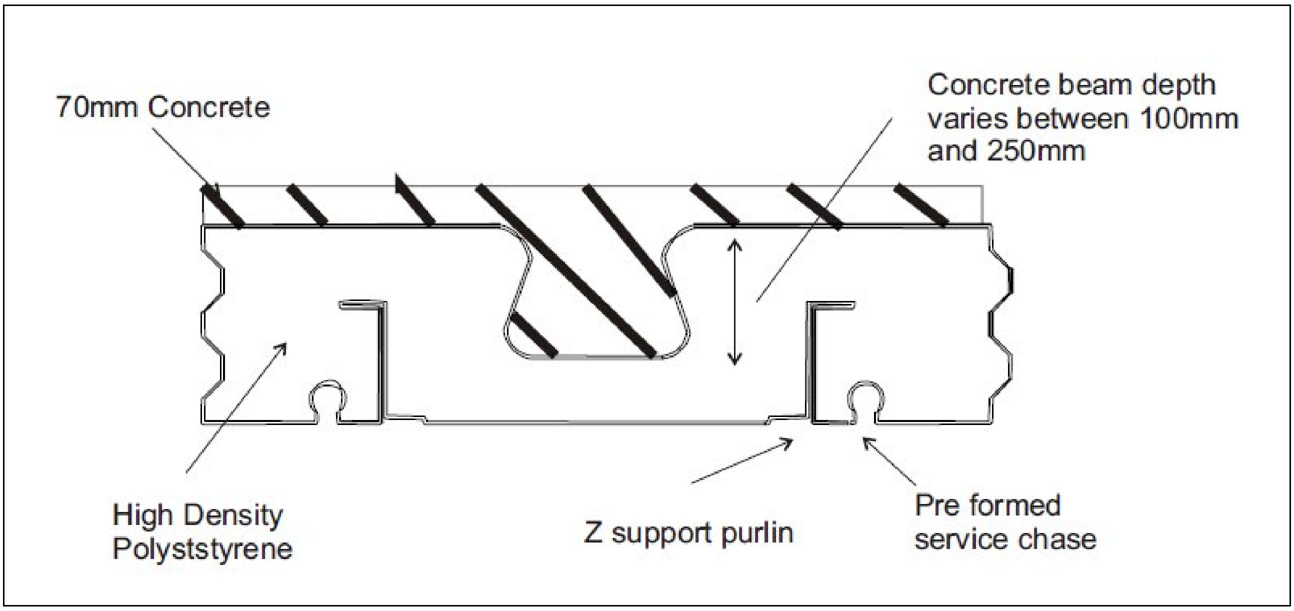


Figure 1: Section view of 'FormPro 220' wall

1.2 FormDeck Floor

The 'FormDeck' floor construction details are understood to be as follows:

- 70mm concrete cast in situ on top of;
- 150mm of EPS (26kg/m³) supported by Z-purlin.
- 1 layer of 13mm SoundCheck plasterboard fixed to sidewalls using independent ceiling joists/battens (independent from purlins – i.e. no mechanical link or rigid connection to floor above), minimum 50mm air gap between plasterboard and purlins underside, or mounted on resilient channels.



2. SOUND INSULATION PERFORMANCE RATINGS

2.1 FormPro 220 Wall

Based on the construction details in 1.1, ViPAC has estimated the airborne sound insulation performance of the 'FormPro 220' intertenancy wall as described in 1.1 to be as follows:

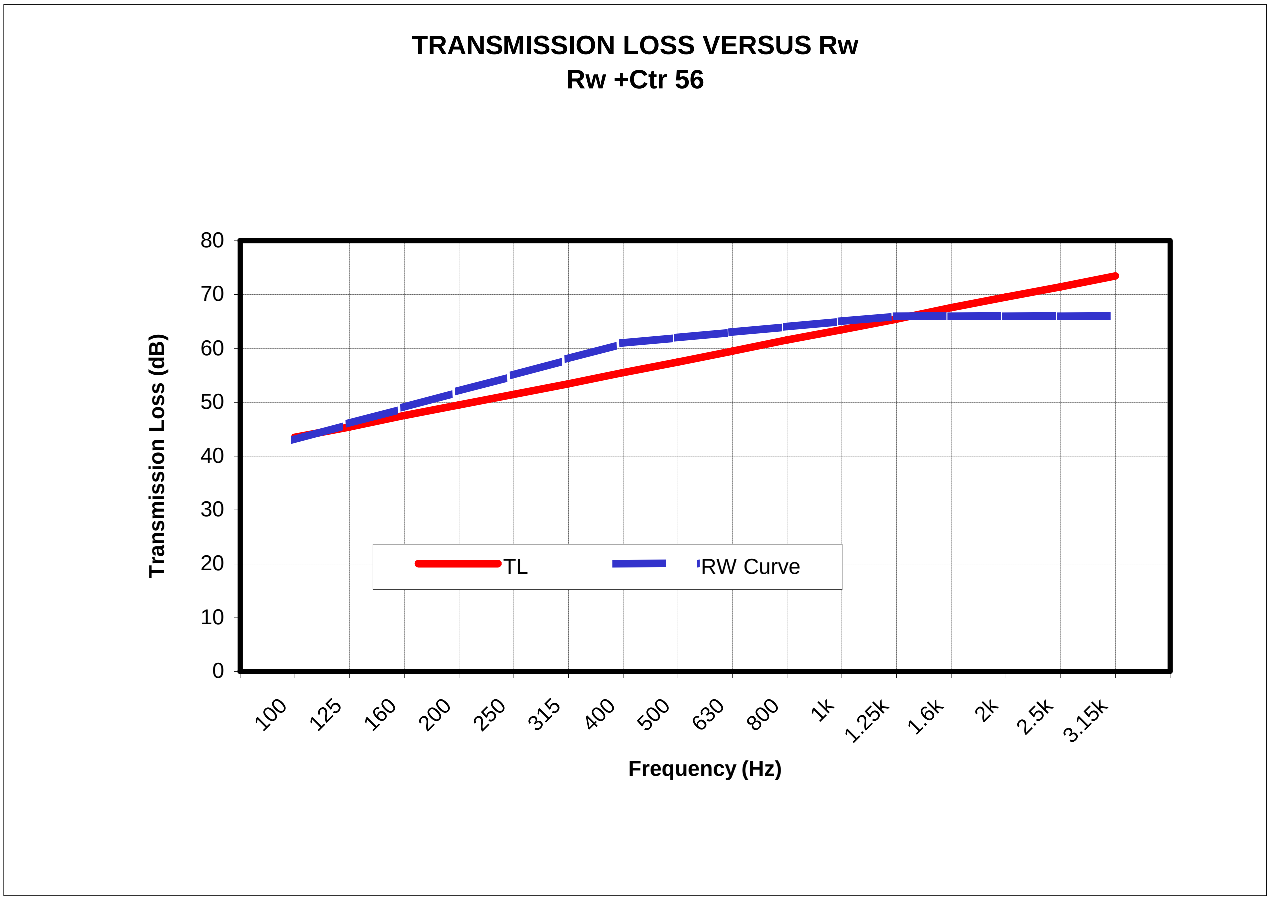


Figure 2.1: Graph of predicted airborne transmission loss of 'FormPro 220' intertenancy wall against frequency

The predicted sound insulation performance of this floor is therefore expected to be as follows.

Partition	R_w (dB)	C_{tr} (dB)	(R_w +C_{tr}) (dB)
FormPro 220 wall	62	-6	56

Table 2.1: Predicted airborne sound insulation performance of the 'FormPro 220' wall

Assuming good workmanship, this construction is capable of meeting the minimum airborne sound insulation performance prescribed in section F5.5(a)(i) of BCA 2010 for separating walls between adjacent sole occupancy units (class 2 building).

2.2 FormDeck Floor

Based on the construction details in section 1.2, ViPAC has estimated the airborne sound insulation performance of the 'FormDeck 220' separating floor to be as follows:

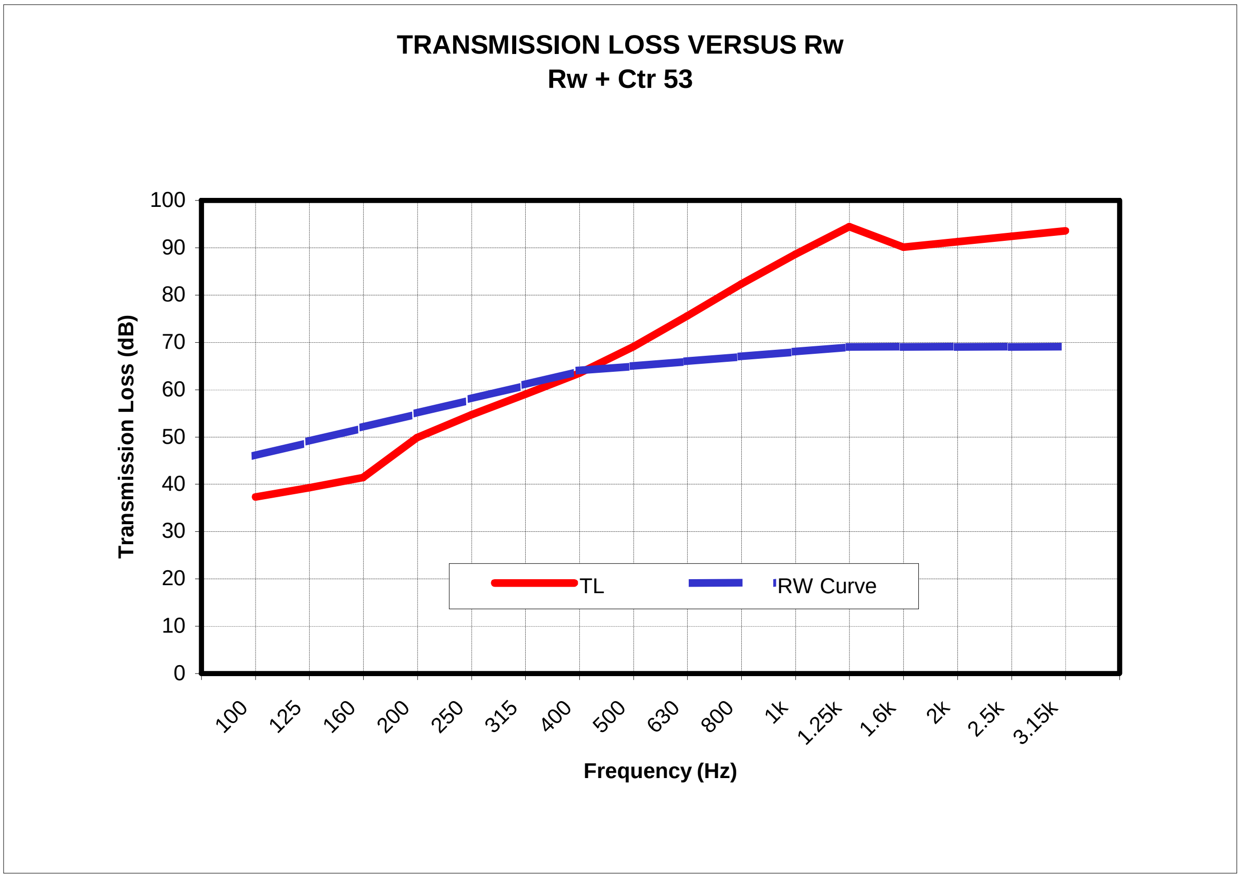


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Figure 2: Graph of predicted airborne transmission loss of 'FormDeck 220' separating floor against frequency (283mm nominal thickness)

The predicted sound insulation performance of this floor is therefore expected to be as follows.

Partition	R_w (dB)	C_{tr} (dB)	(R_w +C_{tr}) (dB)
FormDeck floor (283mm)	65	-12	53

Table 2.2: Predicted airborne sound insulation performance of the 'FormDeck' floor (283mm thickness)l

Assuming good workmanship, this construction is capable of meeting the minimum airborne sound insulation performance prescribed in section F5.4(a)(i) & (ii) of BCA 2010 for separating floors in class 2 buildings.

Yours sincerely

VIPAC ENGINEERS & SCIENTISTS LTD

Benjamin Hillion

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Project Engineer
Vipac Engineers & Scientists

Appendix – Acoustic Glossary

Airborne sound

Sound that arrives at the point of interest, such as one side of a partition, by propagation through air.

Background noise

Noise from all sources unrelated to a particular sound that is the object of interest. Background noise may include airborne, structure borne, and instrument noise.

Impact Noise

Noise resulting from direct impact on a building element (e.g. footsteps or furniture movement on a floor).

Impact sound Level Reduction ΔLw

The measured improvement of impact sound insulation resulting from the installation of a floor covering or floating floor on a test floor in a laboratory (ISO 717-2:1997)

Weighted Normalised Impact Sound Level $L_{n,w}$

The lower the $L_{n,w}$ rating the better the performance of the building element at insulating impact noise. The table below gives the subjective impression of different ratings:

$L_{n,w}$	Subjective rating
>66	Clearly audible
61-65	Clearly audible
56-60	Audible
51-55	Audible
46-50	Just audible
<45	Inaudible

Weighted Standardised Impact Sound Level L'nTw

Impact insulation value measured in-situ with a tapping machine in the source room and a sound level meter in the receive room. It is standardised with the reverberation time measured in the receive room, to account for the sound absorption. A spectrum adaptation C_I particular to foot fall is usually calculated and subtracted to the L'nTw value.

Sound Insulation

The capacity of a structure (e.g. a partition such as a wall or a floor) to prevent sound from reaching a receiving location. Sound energy is not necessarily absorbed; impedance mismatch, or reflection back toward the source, is often the principal mechanism.

Sound Transmission Loss (TL)

Of a partition, in a specified frequency band, ten times the common logarithm of the ratio of the airborne sound power incident on the partition to the sound power transmitted by the partition and radiated on the other side. The quantity so obtained is expressed in decibels. The reduction in sound level when sound passes through a partition or ceiling system.

Sound Reduction Index (measured in Laboratory Conditions), R

Of a partition, in a specified frequency band, the fraction of the airborne sound power incident on the partition that is transmitted by the partition and radiated on the other side. Unlike R', R is measured in a laboratory.

Sound Reduction Index (measured in situ), R'

Of a partition, in a specified frequency band, the fraction of the airborne sound power incident on the partition that is transmitted by the partition and radiated on the other side. Unlike R, R' is measured in situ.

Weighted Sound Reduction Index (measured in a lab), R_w

A single-number quantity, which characterises the airborne sound insulation of a material or building element over a range of frequencies (typically from 100Hz to 3.15kHz)- based on the laboratory measurement of R.

$R_w + C_{tr}$ Rw plus Spectrum Adaptation Term

$R_w + C_{tr}$ is equal to R_w with the addition of a low frequency sound correction, C_{tr}. The use of $R_w + C_{tr}$ has become more relevant due to the increase in low frequency sound sources such as surround sound systems, traffic and aircraft noise, drums and bass guitars. Two walls can have the same R_w rating, but have different resistance to low frequency sound, thus a different $R_w + C_{tr}$.

R_w	$R_w + C_{tr}$	Subjective rating
<30	<24	Normal speech easily audible
30-34	25-27	Loud speech easily audible
35-41	28-34	Loud speech audible but not legible
42-44	35-37	Loud speech faintly audible
45-47	38-39	Loud speech barely audible
48-52	40-43	Loud speech audible but not intrusive
53-62	44-54	Loud speech inaudible
63-69	55-59	Loud music slightly audible: bass notes 'thump'
>70	>60	Loud Music faintly audible

Weighted Sound Reduction Index (measured in situ), R'_w

A single-number quantity which characterises the airborne sound insulation of a material or building element over a range of frequencies (typically from 100Hz to 3.15kHz) - based on the field measurement of R'.