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Degradation of sound isolation due to electrical boxes in walls Nightingale, T. R. T.

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**Degradation of sound isolation due to electrical boxes
in walls**

Nightingale, T.R.T.

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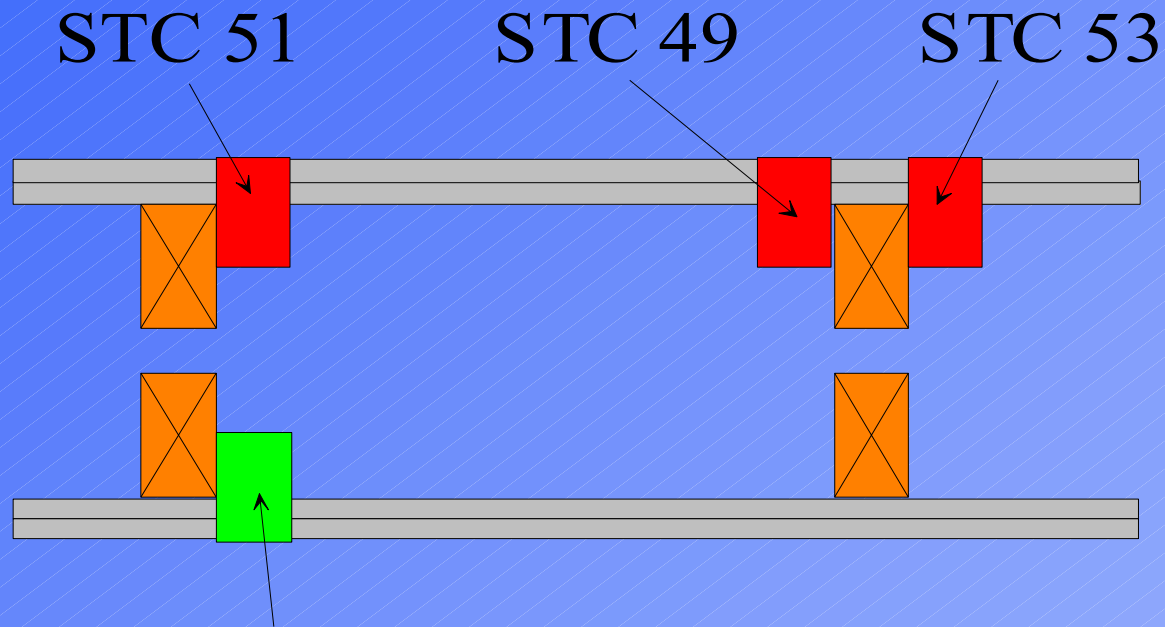
Degradation of Sound Isolation due to Electrical Boxes in Walls

Trevor Nightingale
IRC, Acoustics Laboratory

Variables

- ◆ Box location
- ◆ Cavity absorption
- ◆ Box type
- ◆ Wall type

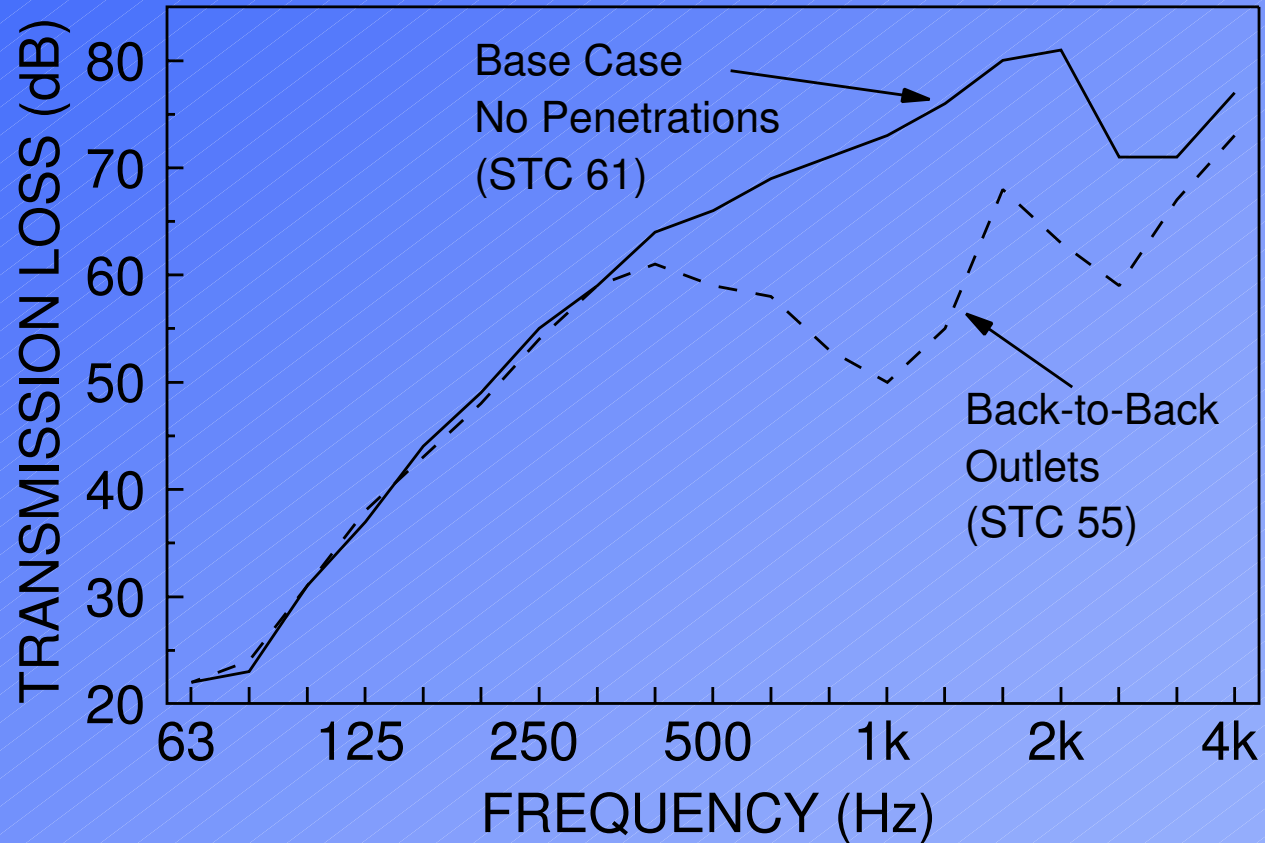
Effect of Box Location



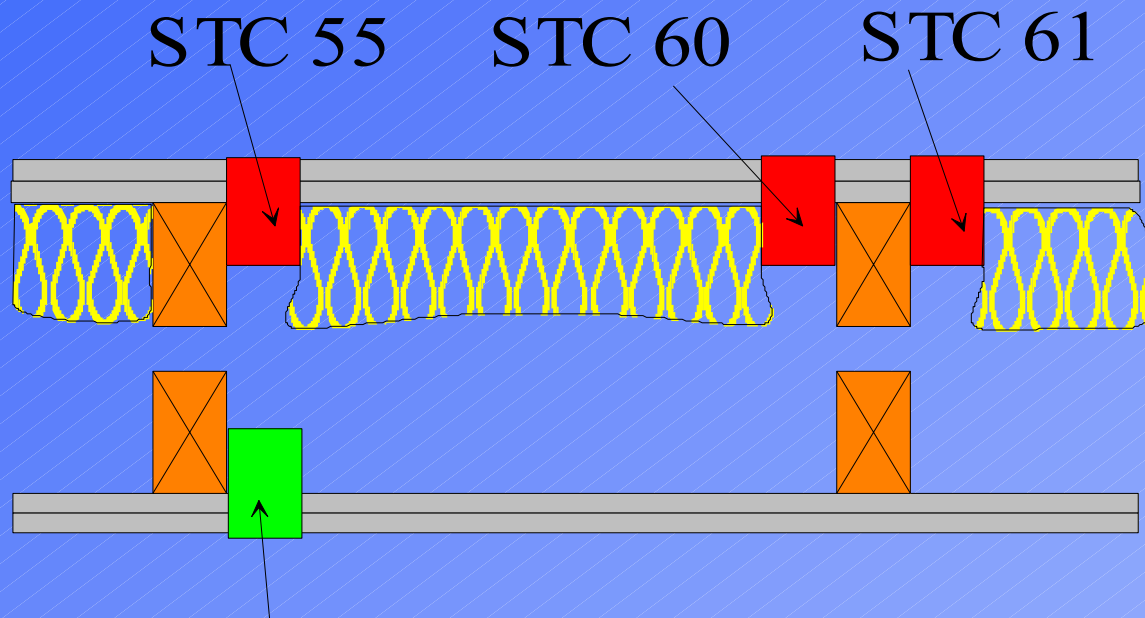
fixed electrical box

STC 55 without penetrations

Change in Sound Isolation



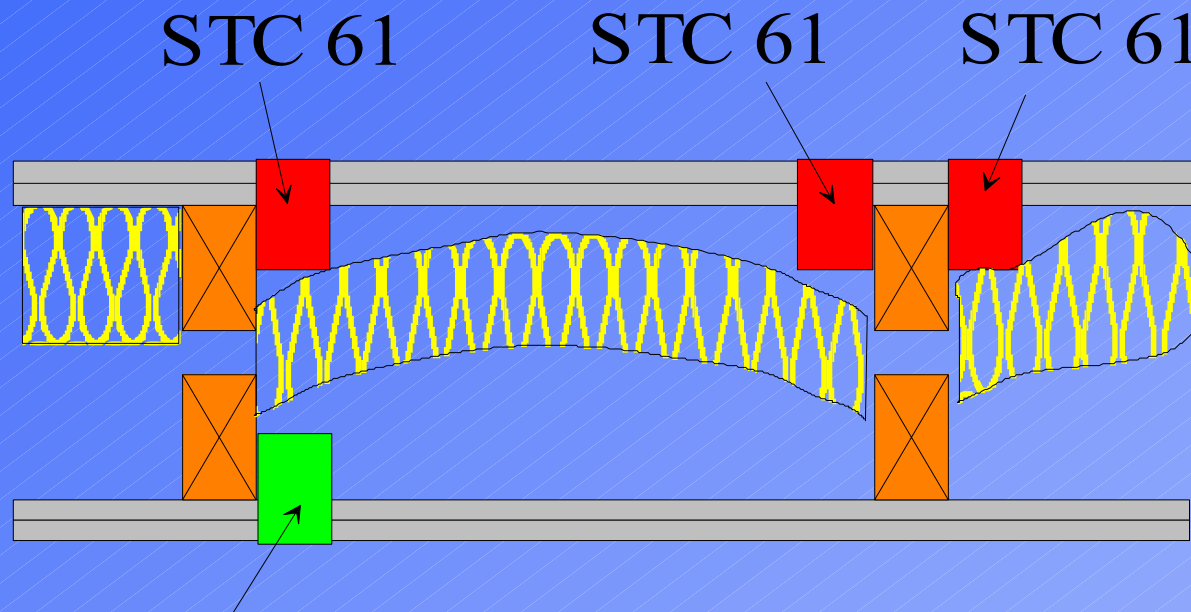
Effect of Box Location



fixed electrical box

STC 61 without penetrations

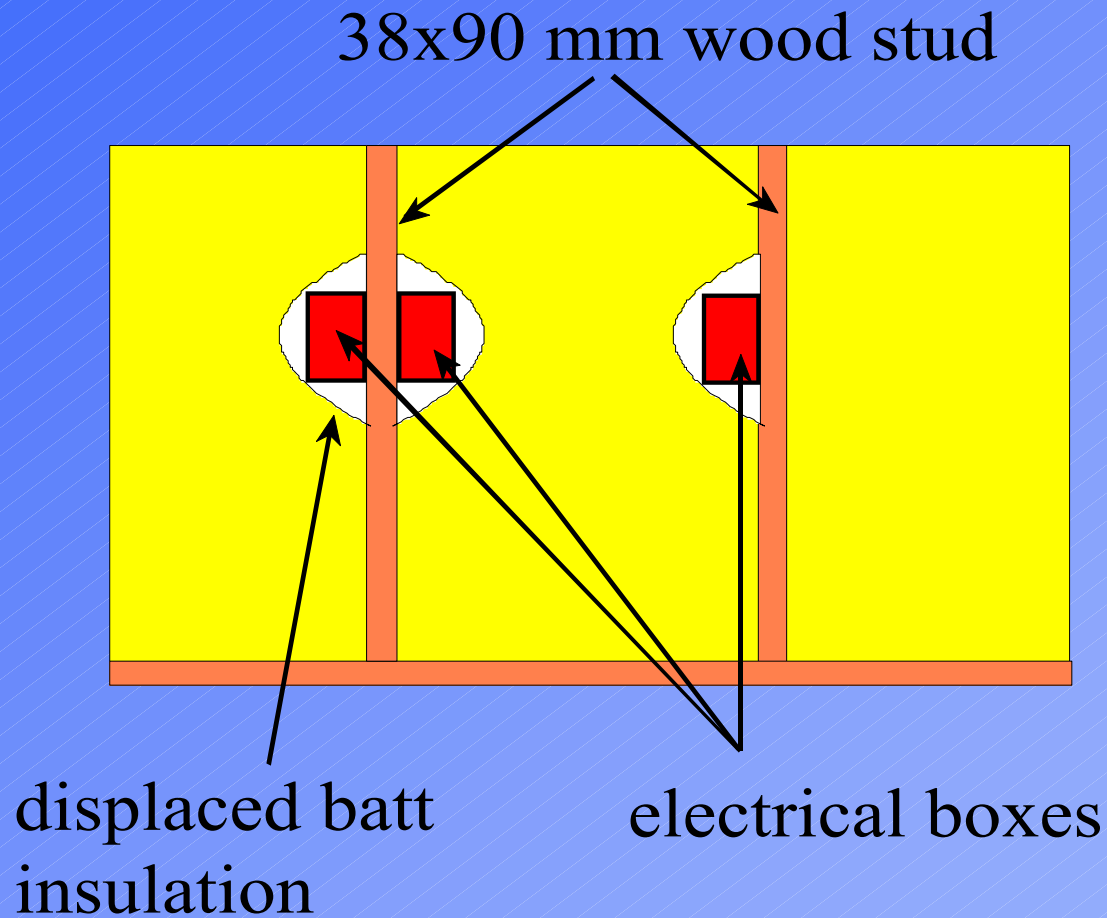
Effect of Box Location



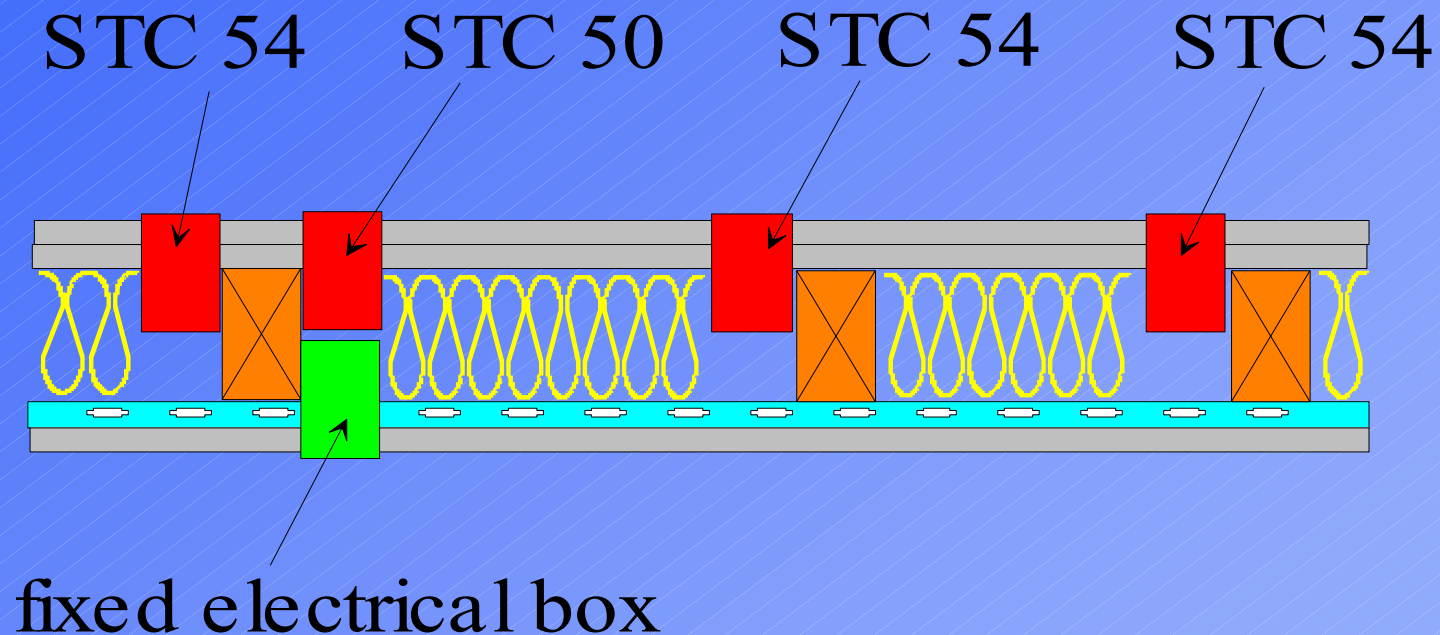
fixed electrical box

STC 62 without penetrations

Placement of Cavity Absorption



Effect on Resilient Channels



STC 55 without penetrations

Electrical Box Location

- ◆ Place boxes more than 40 cm apart
- ◆ Use cavity absorption
- ◆ Place absorption so it covers the backs of the boxes

Box Type

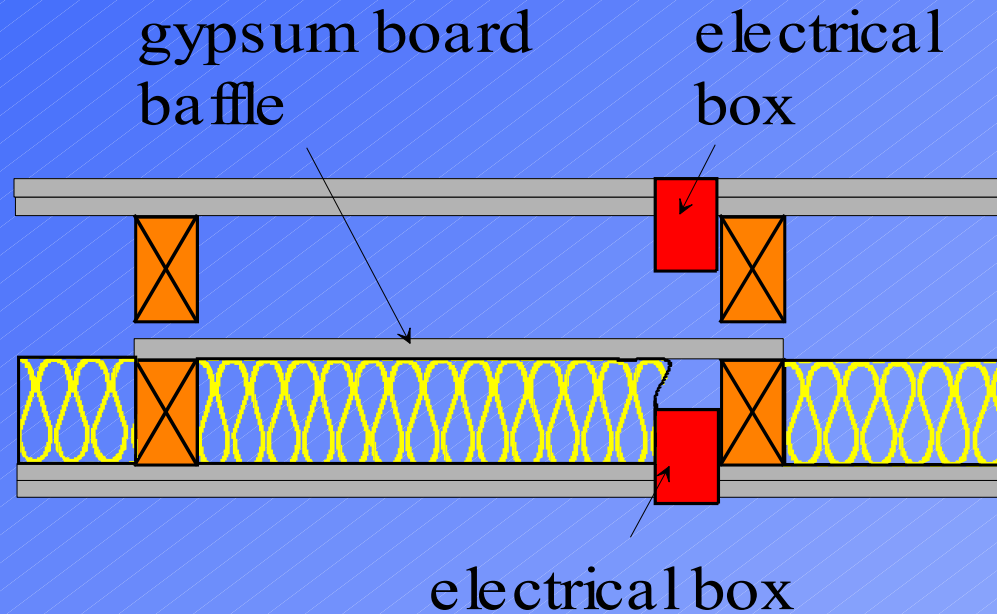
Metal Vs. Plastic

		Box Location	
		Base Case	Back-to-back 55 cm off-set
Metal		55	51
Plastic		55	55

Retro-fit Techniques

	Treatments	Double Stud back-to-back	Single Stud back-to-back
Worst	None	STC 51	STC 50
.	Gap caulked	+1	
.	Draft stopper	+1	+4
.	Gap caulked + box insert	+3	+3
.	Mass loaded material		+5
Best	No Penetrations	+4	+5

Fire Issues



Cavity Absorption	Base Case	No Treatment	Baffle
None	55	51	52
90 mm displaced	61	55	62

Conclusions

- ◆ Place boxes more than 40cm apart
- ◆ Use cavity absorption
- ◆ Make of use air-tight boxes
- ◆ Vapour barrier boxes are better
- ◆ Baffles require absorption