



The Performance Gap

Dave Baker

Robust Details Limited

robustdetails

What exactly *is* the
'performance gap'?





Design v As-Built performance:

- Of interest to successive Ministers responsible for Building Regulations
 - Subject to recommendations by the **Zero Carbon Hub** – ‘90% of new homes to meet ‘as built’ performance standards from 2020’
 - **Part L 2013 recommendation:** “an overarching quality assurance process...” to include:
 - Sample testing
 - Feedback loops to drive improvements
- ...or else accept ‘confidence factor’ penalty

New scheme to tackle energy efficiency 'performance gap'

Building 6 March 2013

DON FOSTER MP



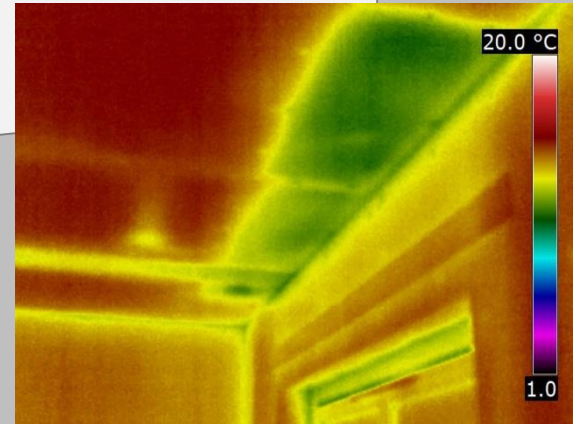
“The government has announced it will fund a construction industry wide scheme aimed at closing the gap between the energy standards new homes are designed to and the way they perform when built.”

“The programme will be overseen by the Zero Carbon Hub and will run from 2013 to 2020.”

“The first set of recommendations for how to improve the performance of homes will be made next year.”

New scheme to tackle energy efficiency 'performance gap'

Building 6 March 2013



*“...closing the gap between the energy standards **new homes** are designed to and the way they **perform** when built.”*

...isn't that what
Building Regulations
are for?





Building Regulations History:

- First evolved from public health scandals and precedent disasters, dating back to The Great Fire
- Established procedures for Checking designs and carrying out on-site inspections... ..to secure minimum standards in buildings.
- ‘Deemed to satisfy’ and limit state engineering approaches are recognised, at the choice of the builder/designer...



Part A: Structure

What's needed here?

Is there a 'Performance Gap?'

Is there a 'Confidence Factor?'

Who makes the choice?

What are compliance rates?

Does ANYONE mind the gap?

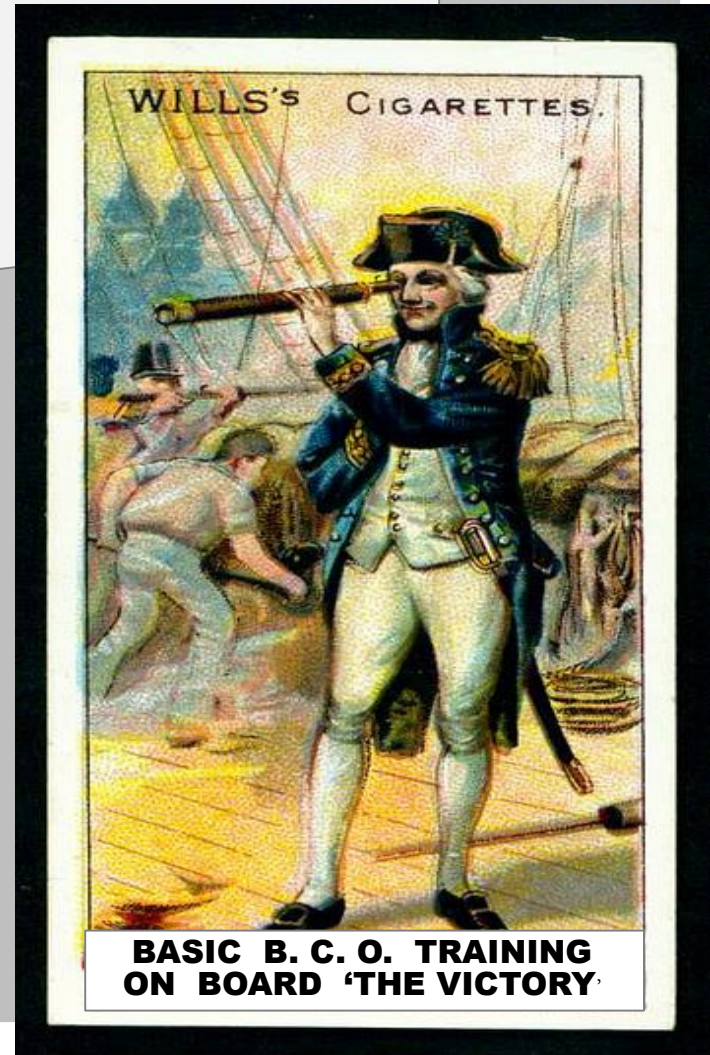


Part L enforcement 'shambolic' claims industry body

Building 13 March 2008

"Contractors are not hearing or seeing anything about enforcement of Part L.

“Building Control Officers have responsibility for this, but many are turning a blind eye.”

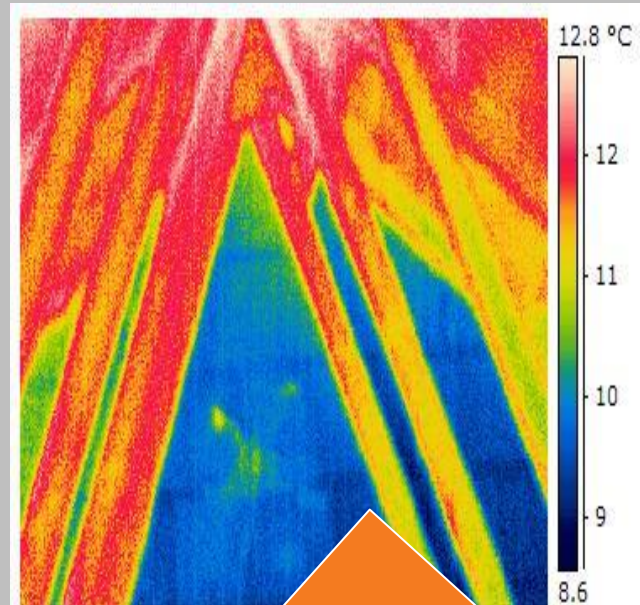
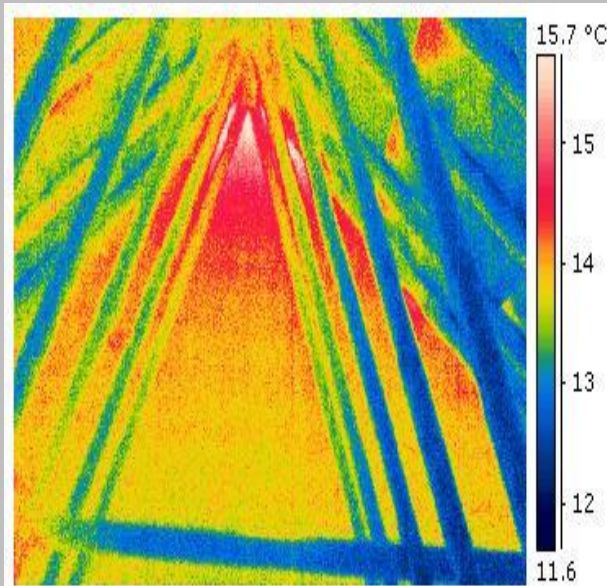




...What about Part E and Part L?

What about
Part E and
Part L?...





(slides courtesy of Leeds Metropolitan University, Wingfield et al, 2008)

The Blame Game



<i>does it comply with...</i>	PART E	PART L
DESIGN	✓	✓
BUILD	✓	✓

A Typical Post-Part L 2010 Separating Wall



<i>does it comply with...</i>	PART E	'NEW' PART L
DESIGN	✓	✓
BUILD	✓	✓

Separating wall cavity insulation (optional)

The cavity may be insulated with mineral wool with a maximum density of 40 kg/m³.

(EXAMPLE: New text inserted into existing RDs)



Sampling from the **whole population** of RD-registered homes

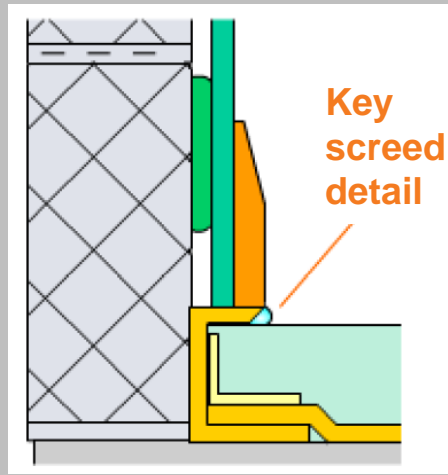
Investigating underperformance and **reporting failures** (to the builder, and building control)

The **feedback/ improvement** cycle: 'robusting-up' or **withdrawing** any patterns that fail to comply



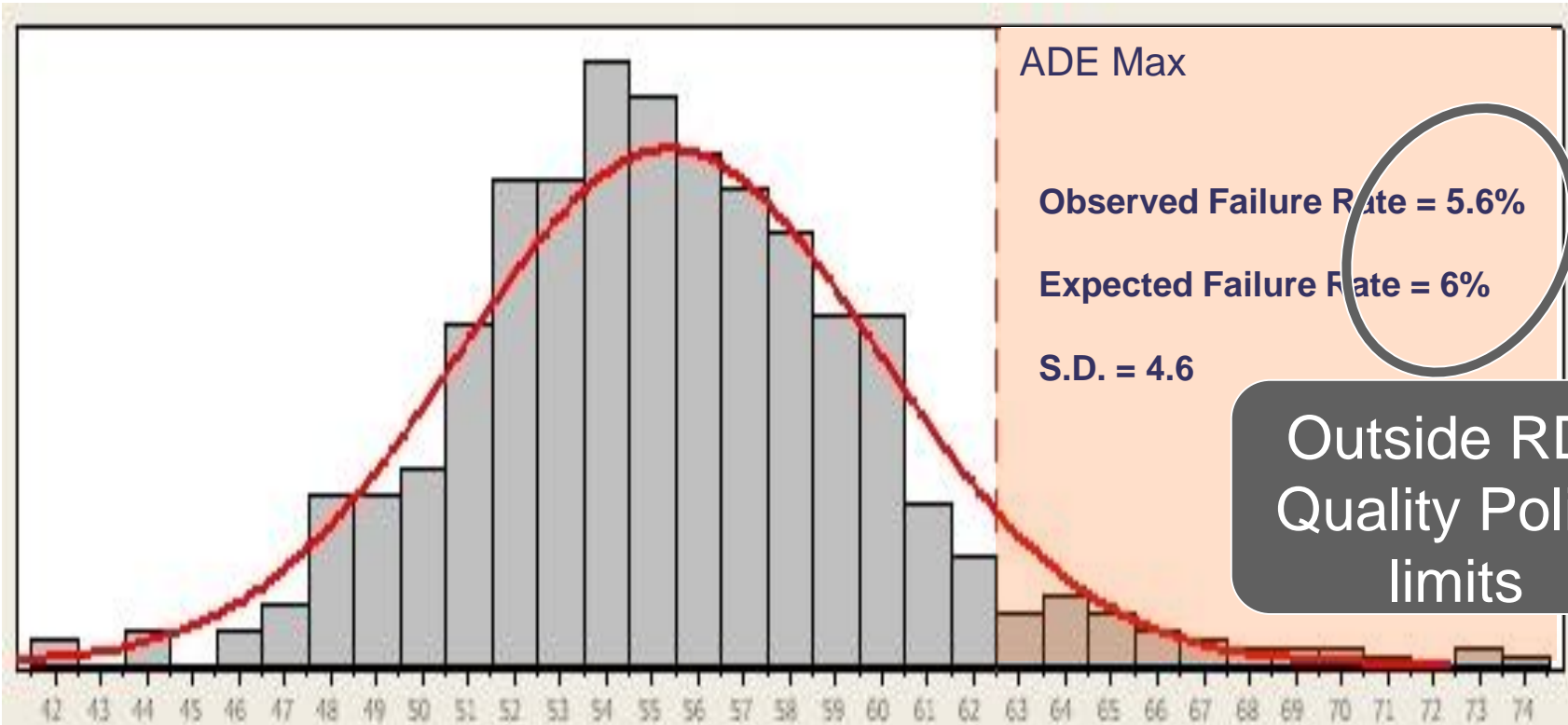
Inspectors' **main purpose** is to measure performance and establish compliance...

...but collected **data is essential** for anyone who 'minds the gap'...



...driving **innovation** and **efficiencies** in production and/or design

A 'typical' floor result - impact sound (pre-Sept 2008):



On-Site Training:

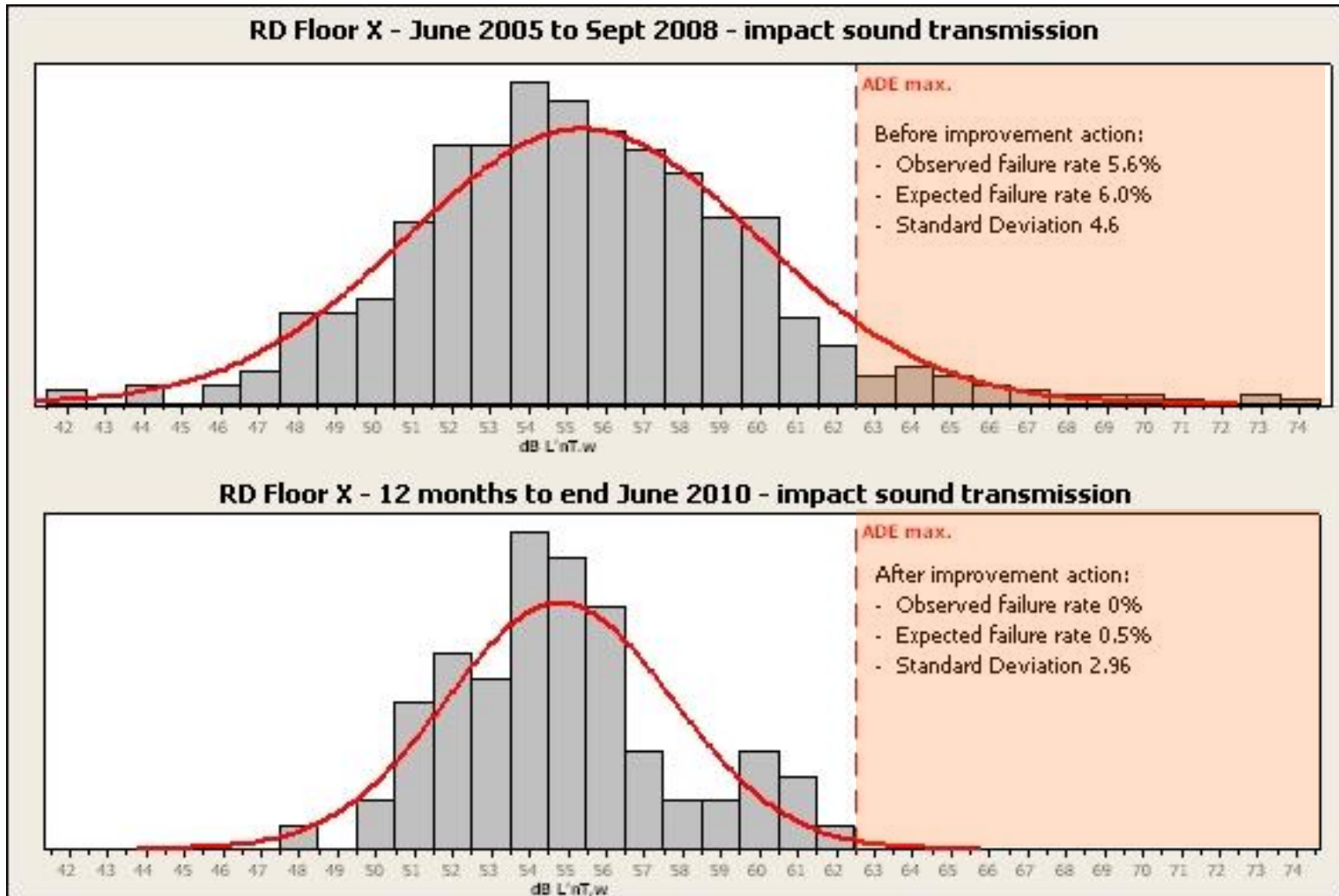
...lapped and taped joints of main resilient layer; and screed correctly isolated at perimeter...



...good isolation of screed by resilient flanking strip...



The kind of difference 'minding the gap' can make...?



Feedback and Improvement - an example



Practice Note 1 - Separating Wall - Cavity Masonry

Introduction
The Part E Robust Details scheme was established to provide an alternative means of compliance with Requirement E1 of the Building Regulations (England and Wales) for new build attached houses and flats, to avoid the requirement for pre-completion air-tightness testing (PCT). A fundamental part of the scheme is performance monitoring of the Part E Robust Details in use, in the respect Robust Details Ltd (RDL) has engaged a number of acoustic consultants to the RDL Inspectorate to undertake both visual inspections of Part E Robust Detail construction in progress and sound tests on completed Part E Robust Details.

The Part E Robust Details Practice Notes are intended to be a mechanism for feeding back the Inspectorate's observations to the industry as a whole. It incorporates a means that all relevant requirements of the Robust Details Part E Handbook are strictly followed. This first Practice Note looks at a common issue that the Inspectorate have identified with the Part E Robust Detail cavity masonry walls - cavities being bridged by mortar.

Choice of wall tie
The level of sound insulation between dwellings using isolation that is provided by the cavity between the wall leaves. Structural connections required for strength and stability will tend to reduce the isolation properties of the wall leaves. For cavity masonry walls, sound insulation is provided structurally via the wall tie and foundations. For this reason cavity masonry wall sound insulation should only be constructed using appropriate wall ties, such as butterfly ties or T-shaped wall ties approved in Document E (2002) Section 2.1.3 and Appendix A of the Robust Details Part E Handbook.

Avoid mortar build up (Figures 1 and 2)
In the course of constructing the wall leaves, mortar droppings and debris may fall down to the base of the cavity. Mortar that is able to collect and build up at the ground floor structure, the wall leaves at and above the ground floor structure, will result in excessive bridging between wall leaves. Insulation of bridging sources (used and unused) of cavity stops at floor level. Mortar that is able to collect and build up at the ground floor structure, the wall leaves at and above the ground floor structure, will result in excessive bridging between wall leaves. Insulation of bridging sources (used and unused) of cavity stops at floor level. Mortar that is able to collect and build up at the ground floor structure, the wall leaves at and above the ground floor structure, will result in excessive bridging between wall leaves. Insulation of bridging sources (used and unused) of cavity stops at floor level.

Figure 1: OKAY
No abnormal bridging of cavity. Sound insulation performance controlled by what sound insulation is via the foundation.

Figure 2: WRONG
Excessive BRIDGING of masonry wall leaves by mortar build up on a batten or membrane. Sound insulation performance now SIGNIFICANTLY REDUCED as sound easily transmits through MORTAR bridges.

RDL Site Pocket Guide
Loadbearing Masonry
robustdetails

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Defra report NANR 314: An investigation into the effect of historic noise policy interventions



Building Regs., Part E:

- *“The net effect of the policy over the period 2003 – 2010, assessed in terms of preventing 'failures', was estimated to have been about 198,000 attached houses and 111,000 purpose-built flats”.*





NEVER MIND THE GAP...

When the functional requirements can best be met by:

A simple pattern book, load/span tables, deemed-to-satisfy solutions, normal approval and inspection routines, etc.

....the 'RSJ over opening' approach



When the functional requirements can best be met by:

Limit state design, known and accurate calculation and design procedures, specialist approval and inspection routines, etc.

The kind of difference 'minding the gap' can make...?

