BUILD TEST SOLUTIONS

Race to the Bottom: The High Cost of Cheap Building Assessments

Michael Huth and Luke Smith

BTS Webinar Series #10

Build Test Solutions

- **Manufacturer** of measurement equipment
- **Eliminating guesswork** in building performance, accelerating the transition to **better quality, healthier buildings**
- Pioneering, **practical** measurement technologies
- Providing accurate, **actionable** insights

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Today We'll Cover

- Background to Assessments
- Mixed motives?
- Case study examples
- Communicating the value

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What is an Assessment?

- Assessment of building performance - geometry, energy efficiency, installed services. Often extending to condition, defects and presence of damp and mould.
- Generally a single visit lasting 30mins to 2-3hrs
- Typically non-invasive, based on visual inspections and gathering photographic evidence
- Pre works/compliance - baseline data (usually EPC based)
- During works - quality of workmanship, QC checks
- Post works/as-built - independent sign-off

Examples

- Point of transaction e.g.
  - EPC
  - Retrofit Assessment
  - RICS Survey
- Funding condition e.g.
  - PAS 2035
  - BS 40104 / BS40101
- Heat Pump Survey/heat loss calculation e.g.
  - MCS BS 12831

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Key Stakeholders

WHO IS INVOLVED?	KEY MOTIVES & OUTCOMES
○ Building owners ○ Private Landlords ○ Housing Associations ○ Contractors ○ Investors ○ Occupants	○ Compliance - *Building Regs, EPCs, PAS 2035* ○ Informing Investment Decisions - *valuation, acquisition, disposal, maintenance* ○ Informing Design - *optimising and improving* ○ Dispute Resolution - *evidence gathering* ○ Quality Control - *checking and snagging* ○ Occupant Wellbeing and safety - *HHSRS, compliance, user satisfaction*

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The Integrity Crisis: Mixed Motives

The ‘Skew’ Problem - Assessments are often distorted by conflicting drivers:

- Compliance vs. Performance: Focusing on "passing" a test rather than creating a healthy home.
- Cost Squeeze: Fast, low budget surveys use default lookup values rather than physical measurements.
- Scratching the surface: Balancing subjective human judgement and a tendency to ‘archetype’ with measurements and real data.

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The Integrity Crisis: Mixed Motives

The Consequences - When data is skewed by client priorities or site pressures:

- Investment Failure: Capital mis-spent on the wrong or inadequate measures.
- Dispute Risk: Unreliable data makes resolving performance gaps legally impossible.
- Failed Design: Retrofits that trap moisture (and/or lack ventilation) or lead to fuel poverty.

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New Build vs. Retrofit: SHARED RISK

The New Build ‘Compliance Trap’

- Based on a tick-box culture to comply with SAP/EPC models (ignores as-built problems)
- Hidden defects go unchecked leading to higher bills

The Retrofit ‘Assumption Gap’

- Cases of 100% uncertainty when using age-based u-value look-up tables
- ‘Hoped for’ airtightness and ‘back-of-the-hand’ ventilation testing create a recipe for disaster

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The Alternative ...

Measurement is key for the ‘Right First Time’ approach

- Identifies root causes (fabric vs. ventilation) and design solutions
- Instills a culture of quality assurance
- Moves from ‘worst case’ to highest possible certainty
- A 30% Capex saving for heat pump installs and £000’s saved on unnecessary insulation measures* … hello!?

*based on BTS case studies

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The Investment Case …

- As a rule (for able-to-pay retrofit), more effort invested in assessments generates higher quality outcomes for the householder and a greater likelihood of action in terms of project progress and works carried out*.

How else would you de-risk the retrofit/new-build delivery?

*Community of Practice for Community Retrofit

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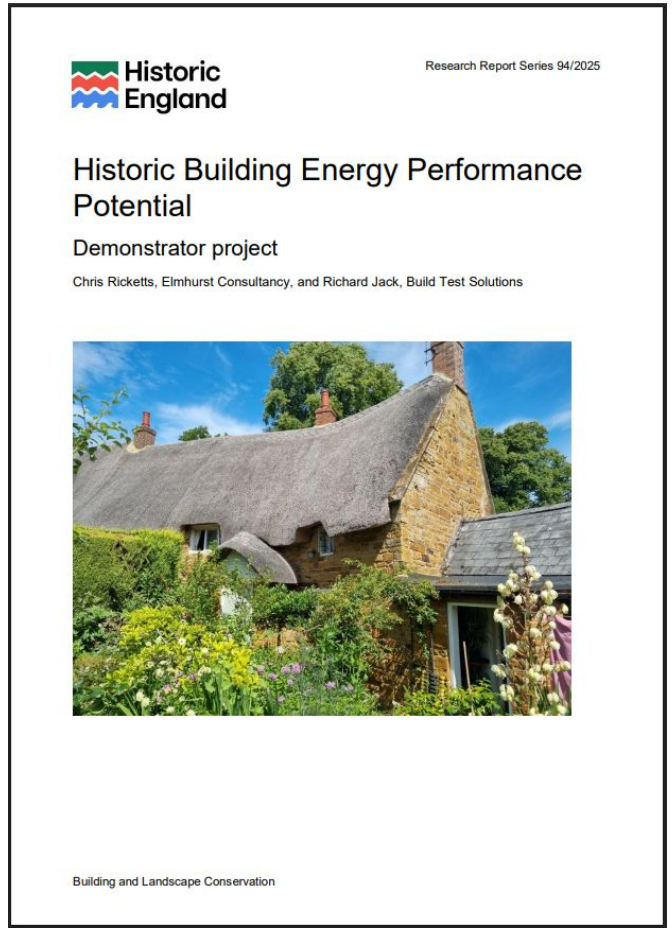
Assessing Conservation Buildings

- Historic England Study
- 6x typical residential heritage buildings
- rdSAP 10 baseline assessment
  - + Pulse airtightness test
  - + Heat3D U-value measurement
  - + Ventilation flow rates and mould risk assessment
  - + Measured HTC



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Assessing Conservation Buildings

- **Property 1** - very leaky but better than assumed wall U-values (thick sandstone). Fabric heat loss 32% higher than calculated - worse than a 60D might suggest. Strong case for prioritising fabric.
- **Property 2** - mediocre airtightness but much better U-values (0.75 W/m2K versus the 1.78 W/m2K default. Uplift of 5 EPC points.

	Property 1		Property 2	
Modelling Scenario	Current EPC Rating	Potential EPC Rating	Current EPC Rating	Potential EPC Rating
Baseline RdSAP	60 D	70 C	58 D	68 D
Baseline + Air Pressure Test	57 D	67 D	58 D	68 D
Baseline + Heat3D U value (max)	61D	70 C	62 D	68 D
Baseline + Heat3D U value (Min)	61D	70 C	64 D	66 D
Baseline + Heat3D U value (Avg)	61D	70 C	63 D	68 D
Baseline + APT & Heat3D U Value (avg)	59 D	67 D	63 D	68 D
Measured HTC	44 E	-	N/A	-

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Assessing Conservation Buildings

- **Property 3** - AP50 14, U-values 24% and 84% better than rdSAP defaults. Total measured heat loss 50% lower than calculated, swinging 9 EPC points from a 61D to a 70C. Peak heat demand of 4.9 kWp
- **Property 5** - AP50 of 9, 1.19 W/m2k. Positive gain of 6 EPC points. High mould risk so focus on ventilation before anything else.

	Property 3		Property 4		Property 5	
Modelling Scenario	Current EPC Rating	Potential EPC Rating	Current EPC Rating	Potential EPC Rating	Current EPC Rating	Potential EPC Rating
Baseline RdSAP	61 D	73 C	69 C	78 C	44 E	85 C
Baseline + Air Pressure Test	61 D	73 C	71 C	80 C	45 E	86 B
Baseline + Heat3D U value (max)	69 C	81 B	71 C	78 C	47 E	85 B
Baseline + Heat3D U value (Min)	69 C	81 B	73 C	78 C	51 E	85 B
Baseline + Heat3D U value (Avg)	69 C	81 B	72 C	78 C	49 E	85 B
Baseline + APT & Heat3D U Value (avg)	68 D	79 C	74 C	80 B	50 E	86 B
Measured HTC	70 C	-	82 B	-	N/A	-

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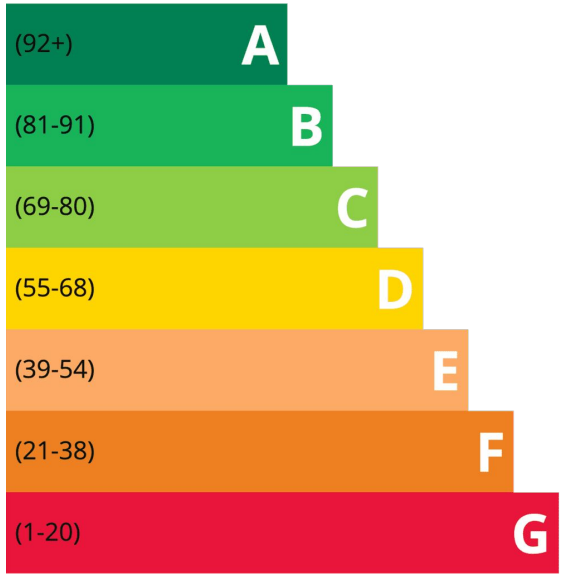
Assessing Conservation Buildings

- £400 added to the survey cost delivers:
  - +5-9 EPC points in 5 of the 6 cases = £80 per EPC point
  - A very clear steer on what to focus on - ventilation, draughts, insulation, heat pump or PV/storage.
  - £000's in avoided spend
- Why only spend £80 and get so little in return?



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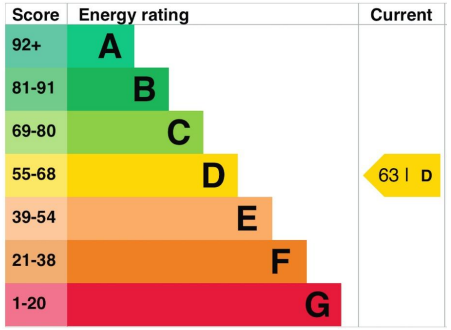
Social Housing End Terrace

Our survey says….

- Poor airtightness
- Extract fans in kitchen & bathroom
- Thermal performance poor
- EPC Rating 63D
- Large heat pump – 13kWp

Conclusions: insulate walls, make more airtight, maybe heat pump later



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Social Housing End Terrace

Metric	Measurement	Compared to survey assumption
Overall Heat Loss	2.7W/m^2K	26% less (better)
Airtightness	4.8m^3/m^2h@50Pa	73% less
Extract fan flowrate	6l/s	84% lower
Wall U-value	1.0 W/m^2K	24% lower (better)
Required heat pump size	9 kWp	26% lower
Mould risk	72/100 (High)	n/a
Internal environment	Cold (92nd percentile), damp (94th percentile), few heating hours (20th percentile	
Occupant satisfaction	Very high (92%)	

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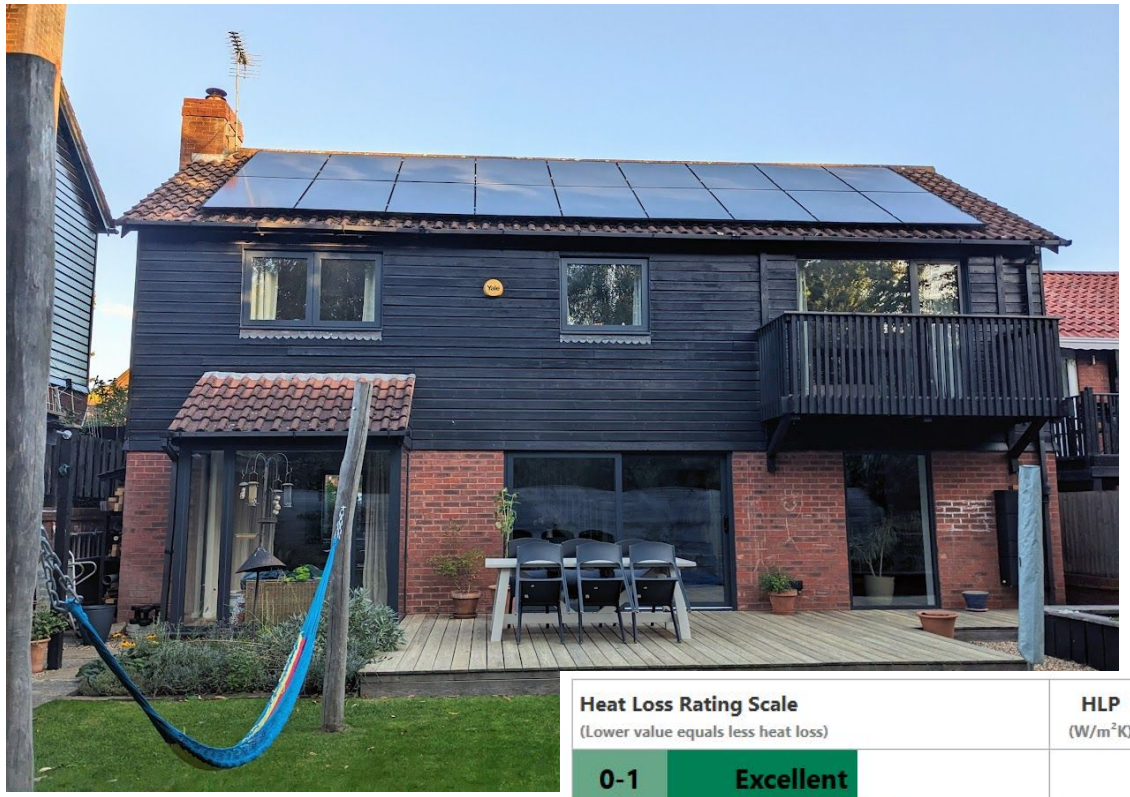
New conclusions:

- New EPC – 70C
- Prioritise ventilation
- Wall insulation less attractive
- Heat pump practical

Remote Pre-Assessment

- Flip the script with a remote SmartHTC assessment…?
- 1980’s 4 bed detached
- Insulate or heat pump?
- Measured HTC = 202 W/K (PH typically 50, new builds 100-150)
- Peak heat load = 4.7 kWp



Heat Loss Rating Scale (Lower value equals less heat loss)		HLP (W/m^2K)
0-1	Excellent	
1-2	Good	1.5
2-3	Average	
3+	Poor	

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Call to Action

- **Think about the objectives of the assessment and client requirements**
  - Is there an appetite to demonstrate compliance objectively with hard facts?
  - If it's just about EPCs, question it with the customer
- **There's not a one size fits all type of assessment**
  - There are efficiencies in bundling multiple services
- **Tailor services and tender responses**, presenting the add-on options available
- **Demonstrate to clients the cost of low cost** and the benefits of spending a bit more upfront
  - Cost per SAP point uplift
  - Right first time action
  - Avoided spend amounting to £000's
- **Have a plan for how to de-risk the retrofit/new-build delivery!**

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Next Webinar

Subject and Speaker TBC!

9th July 2026 @ 1pm

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Future Diary Dates

- **Training:**

  Level 1 Airtightness
  Pulse upskill from BlowerDoor
  U-value training
  SmartHTC and Pulse user training

  A range of courses run monthly to suit all levels and requirements

- **Events:**

  PEPA Conference, Nottingham - 29th June

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Thank you!

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