

Area / Community Retrofit Nottingham Case Study

Dr Tina Holt



Outline of talk

1. Community approach
2. Energy saving options
3. Seeing heat loss - thermography
4. Implications for community retrofit?





1. Community approach



To clarify...

- Nottingham City Council has achieved some significant area wide retrofit projects, insulating and adding PV to estates of mainly social housing
- West Bridgford lies outside the City Council area, so this talk covers the approach taken by a small community group.



Community Awareness Raising

- 20,000 homes (40% solid wall)
- West Bridgford - not a tight-knit community!
- No group retrofits to date
- Providing inspiration / information to individuals
- Open Homes and other events



Eco House

Open Day - May 2010

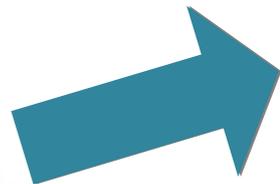


Eco House Open Day – May 2010

- Organised by Transition West Bridgford
- 7 houses open to the public
- 70 visitors took part
- A wide range of eco features on display
- High level of interest led to further events...



Visitors to one event become Open Homers a few years later



Community Events...

- ...Led to a LEAF project in 2012





Eco House Visits





Exhibition



Borough Council Involvement

- LEAF led to...
- Green Deal Pilot - TWB teamed up with Borough Council and a Green Deal Installer to offer 100 free Green Deal Assessments
- Some of these GDAs led to individual installations using ECO and GDHIF finance





2. Energy saving opportunities



Community awareness

- Behavioural change
- Common sense measures
- Renewable technologies
- Whole house retrofit

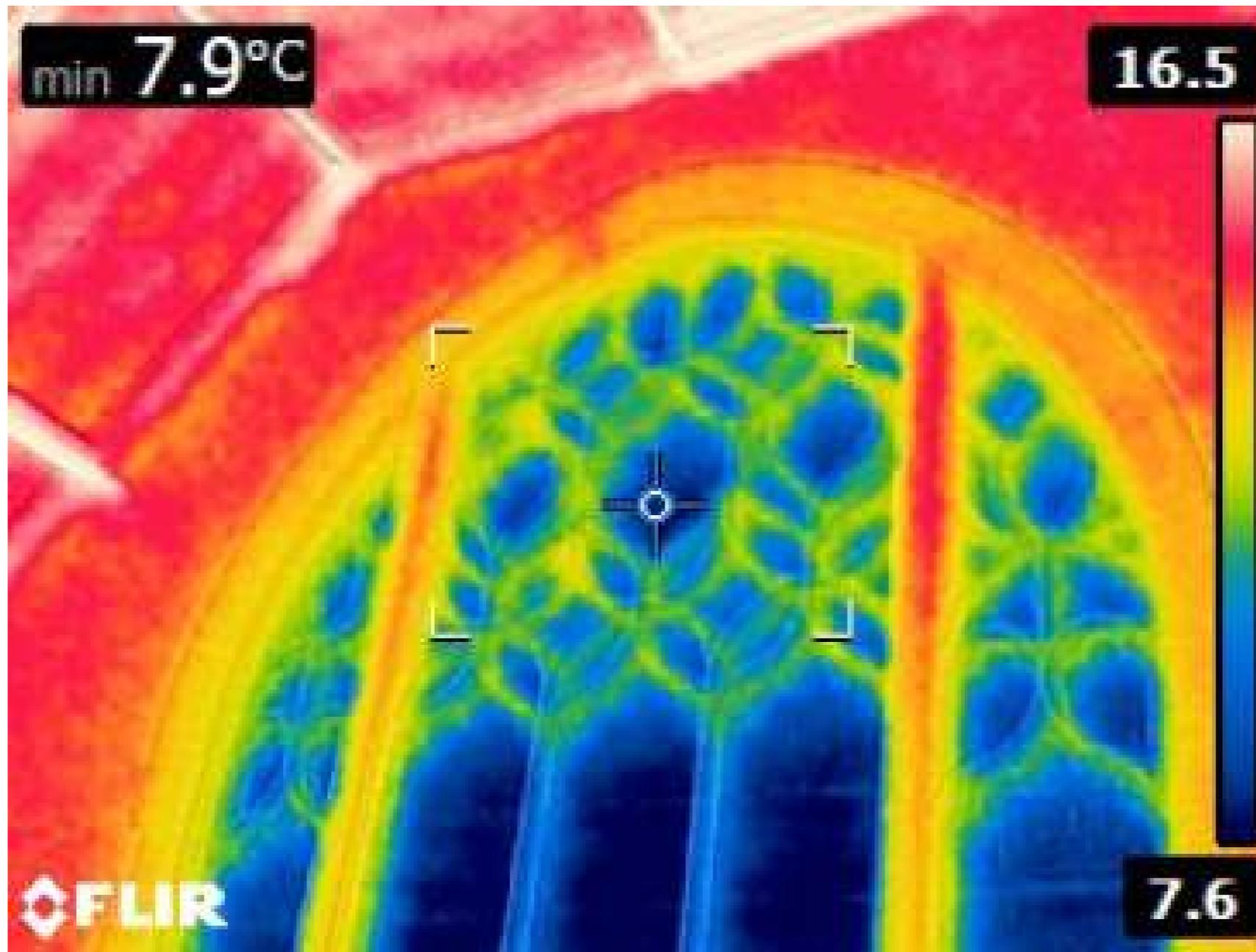


Before & After - Fabric First

- Draught-proofing
- Insulation - loft, cavity, EWI and IWI
- Whole house refurbishment
- Extensions and loft conversions

• Thermal imaging





3. Seeing heat loss - thermography

Thermal Imaging

- Seeing is believing!
- It often tells us what we know already - but has more impact
- It sometimes reveals surprises (usually unpleasant ones)
- Moderate and deep retrofit examples



Thermal Imaging...

- Useful for community awareness raising
- Useful for demonstrating heat loss
- Useful for feedback on retrofit projects
- Raises some questions about do's and don'ts of retrofit - what is "good enough"?



Improving the fabric.....

- Walls
- Loft insulation
- Pitched roofs
- Dormers
- Floors



with community retrofit in mind..



External walls

- Uninsulated house
- EWI and IWI to building regulations
- Warm room with IWI
- Deep retrofit - super insulated extension

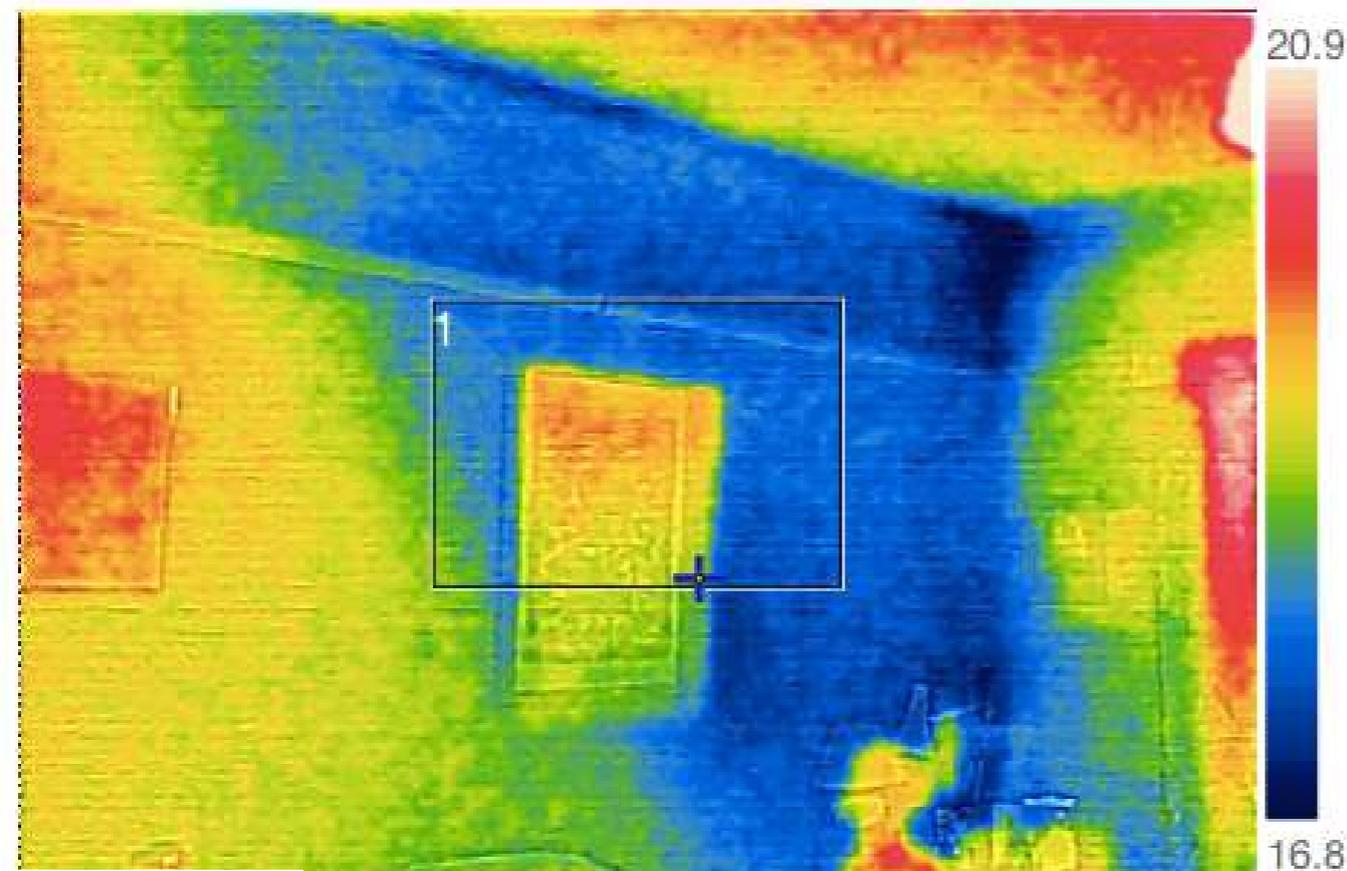


Traditional home

- Solid external wall next to pitched roof

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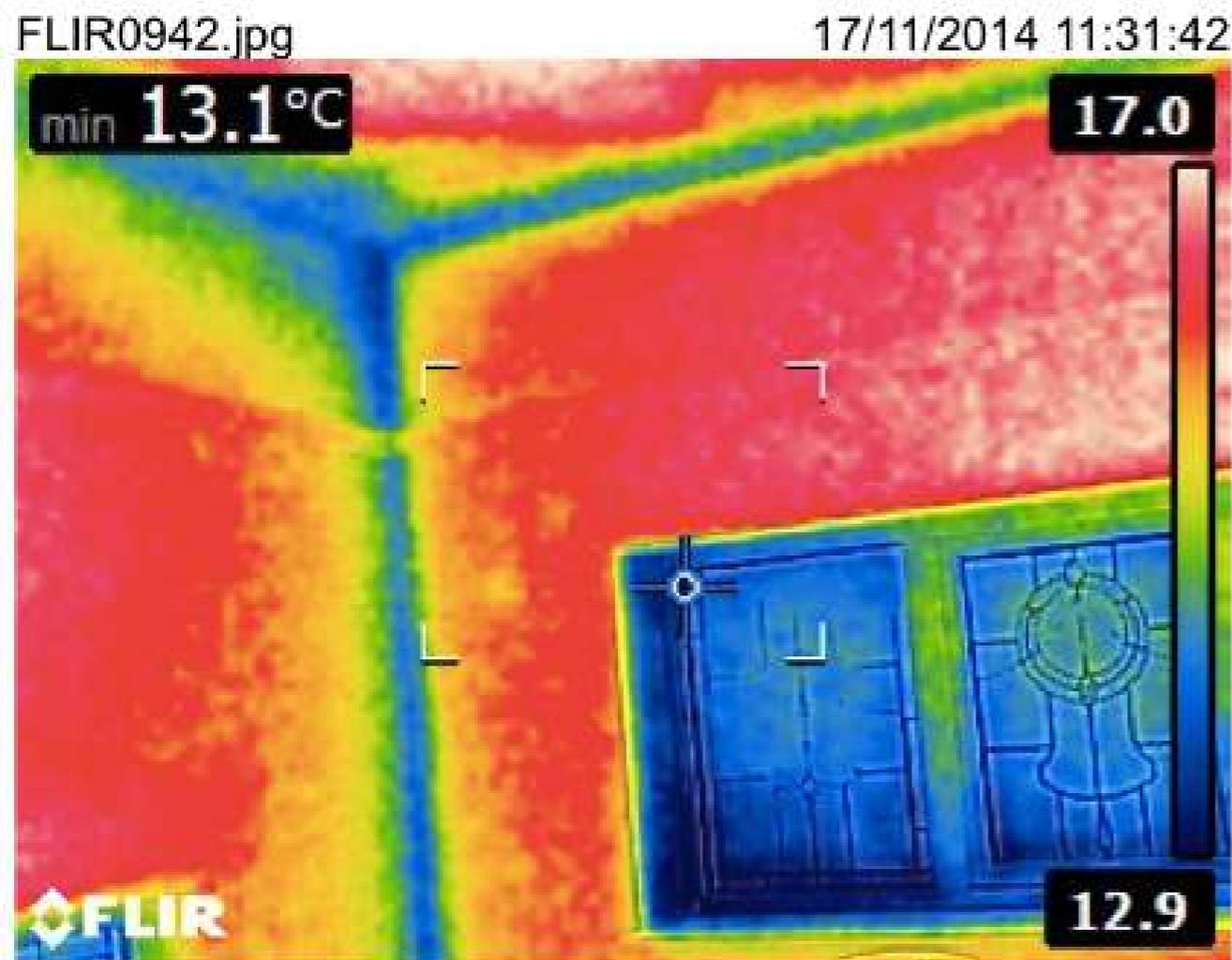
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Moderate retrofit

- EWI (left wall), IWI (right wall) - no overlap



Warm room example

- IWI wraps round to internal wall to minimise cold bridge at corner.

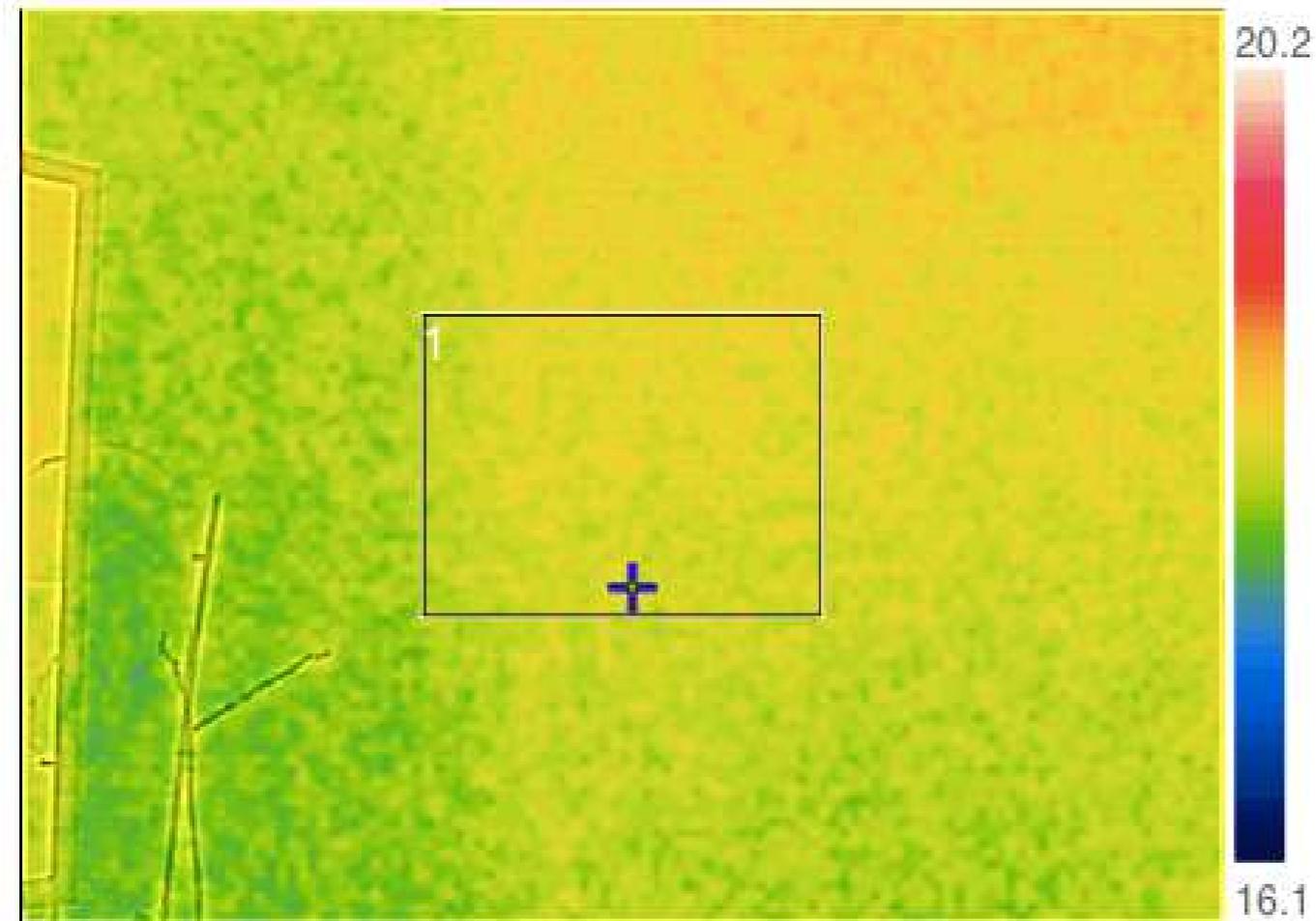


Deep retrofit

- EWI (U value 0.13) on external wall (left) - little contrast with internal wall (right)

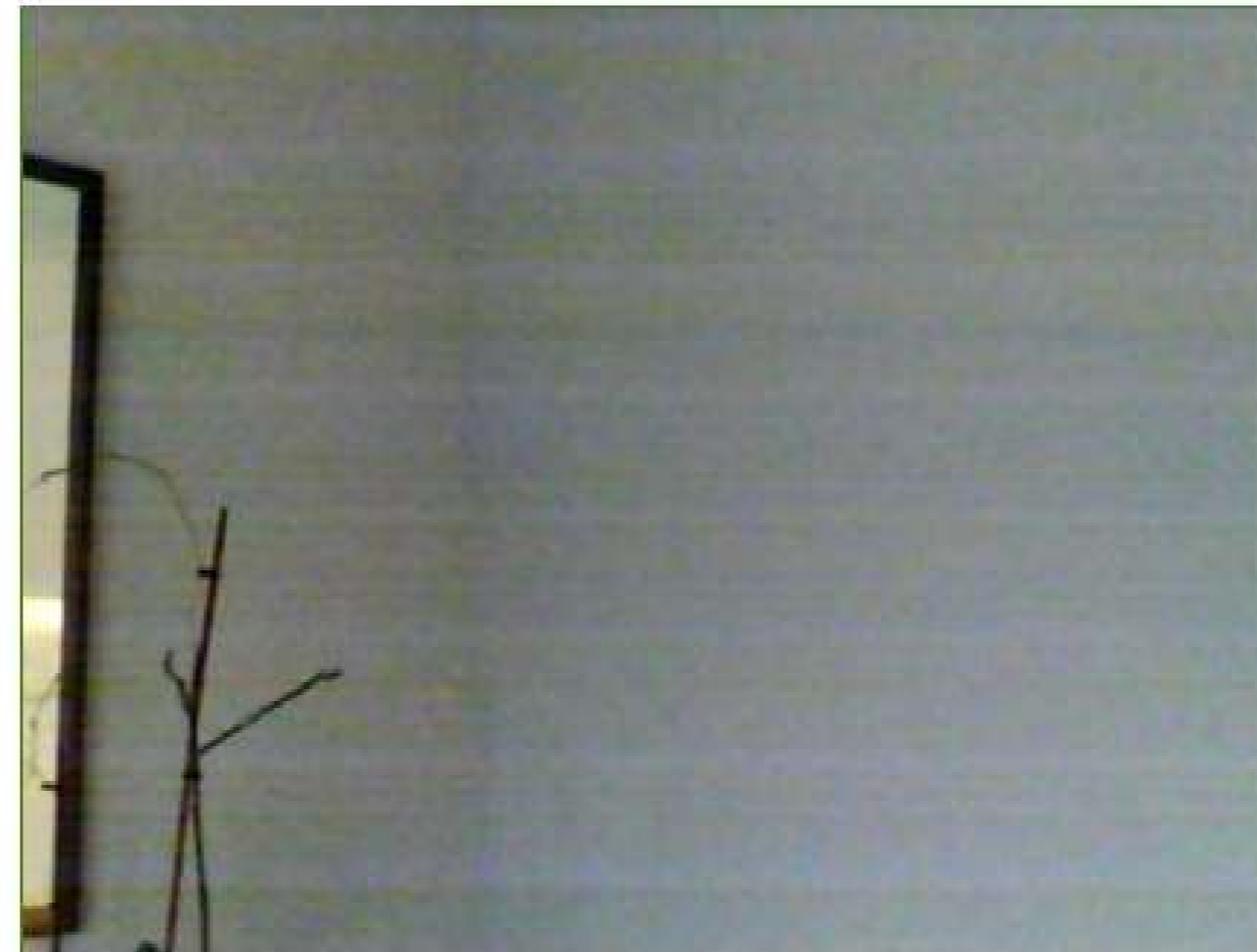
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Group retrofit implications

- With area wide EWI or IWI – can best practice for common details be considered for all the homes?



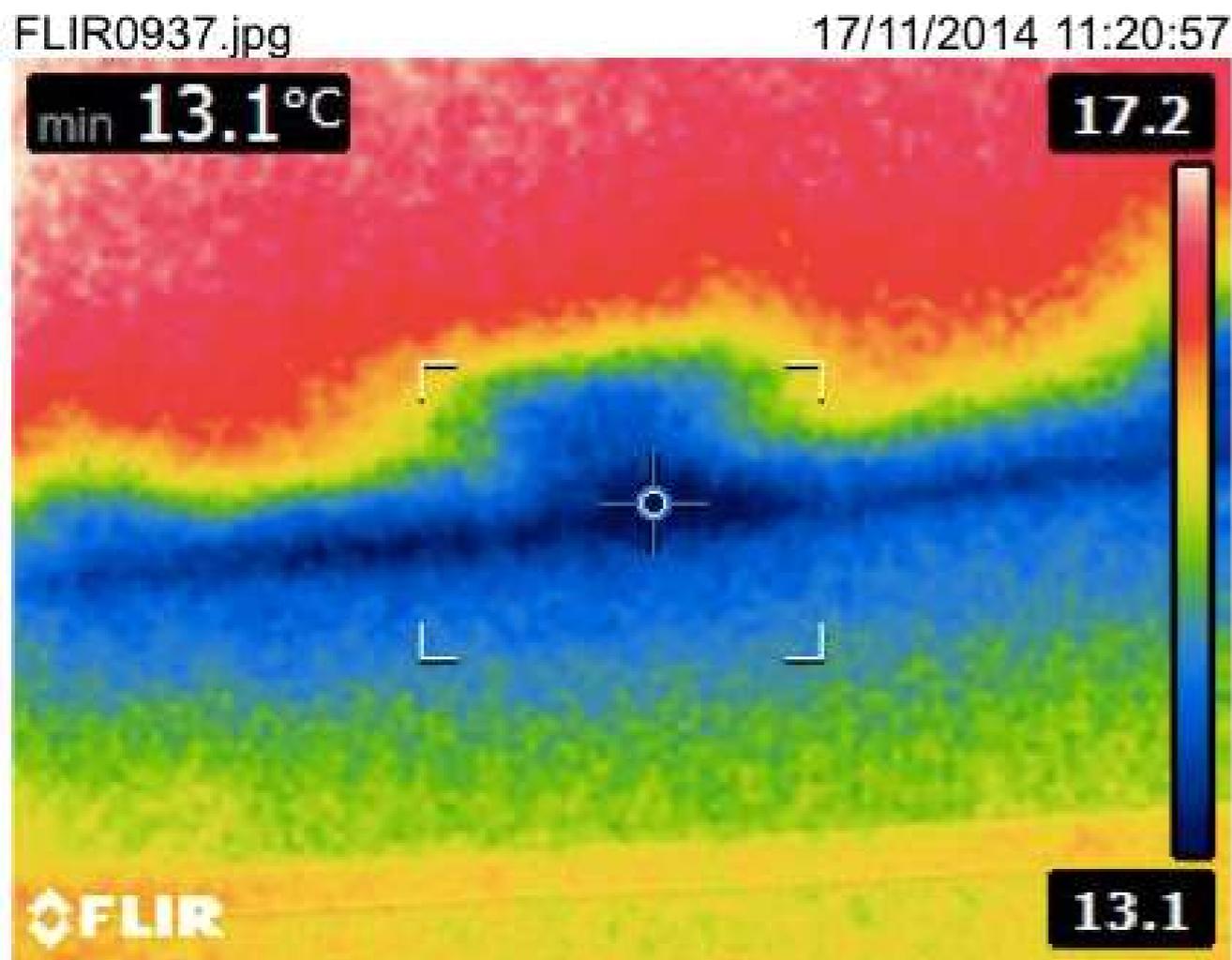
Wall-roof junction

- Moderate retrofit to building regulations
- Modern extension to building regulations
- Deep retrofit - super insulated extension



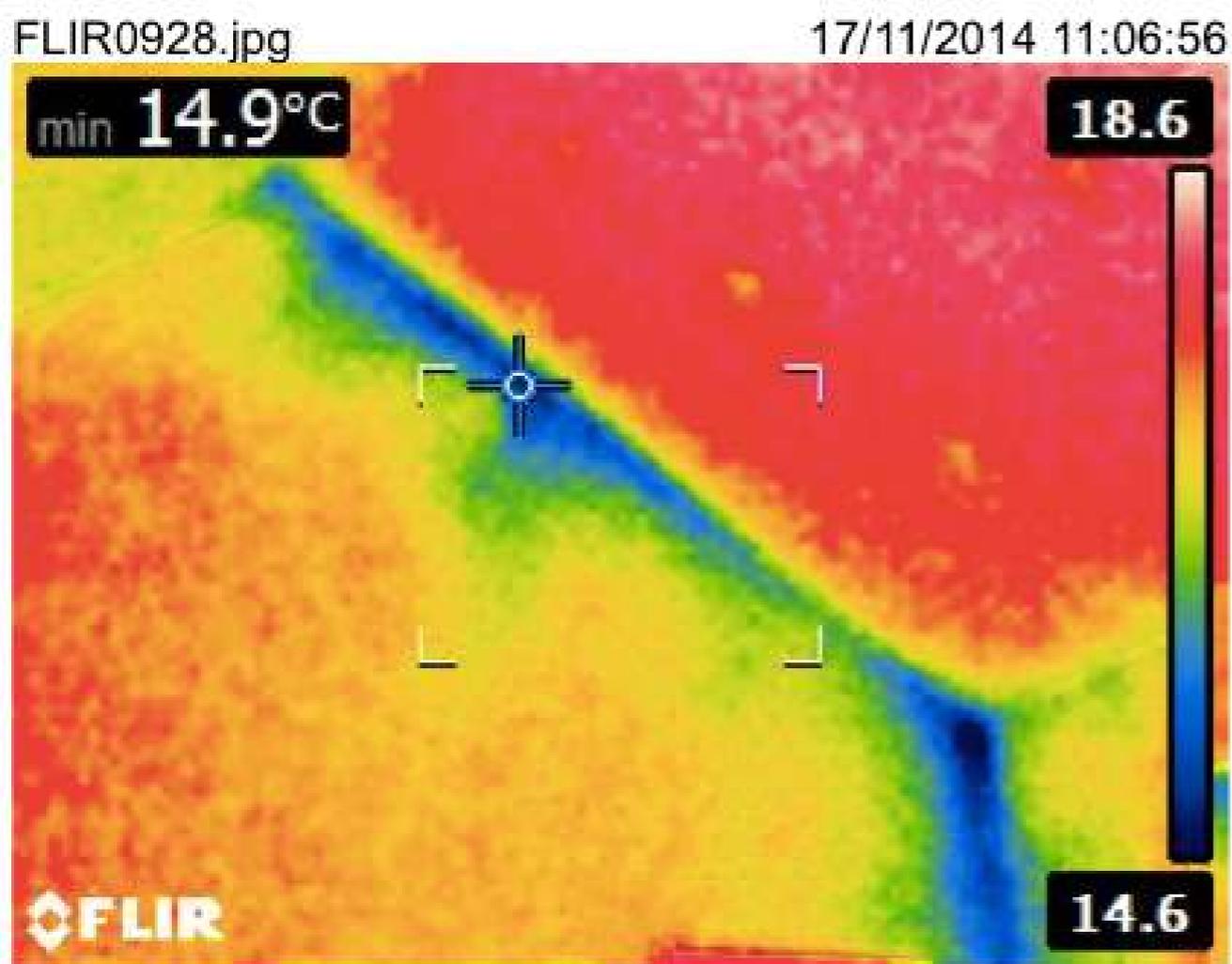
Moderate retrofit

- Cold bridge between EWI and loft insulation



Modern extension

- New extension 2014 - cold bridge between cavity wall to insulated pitched roof

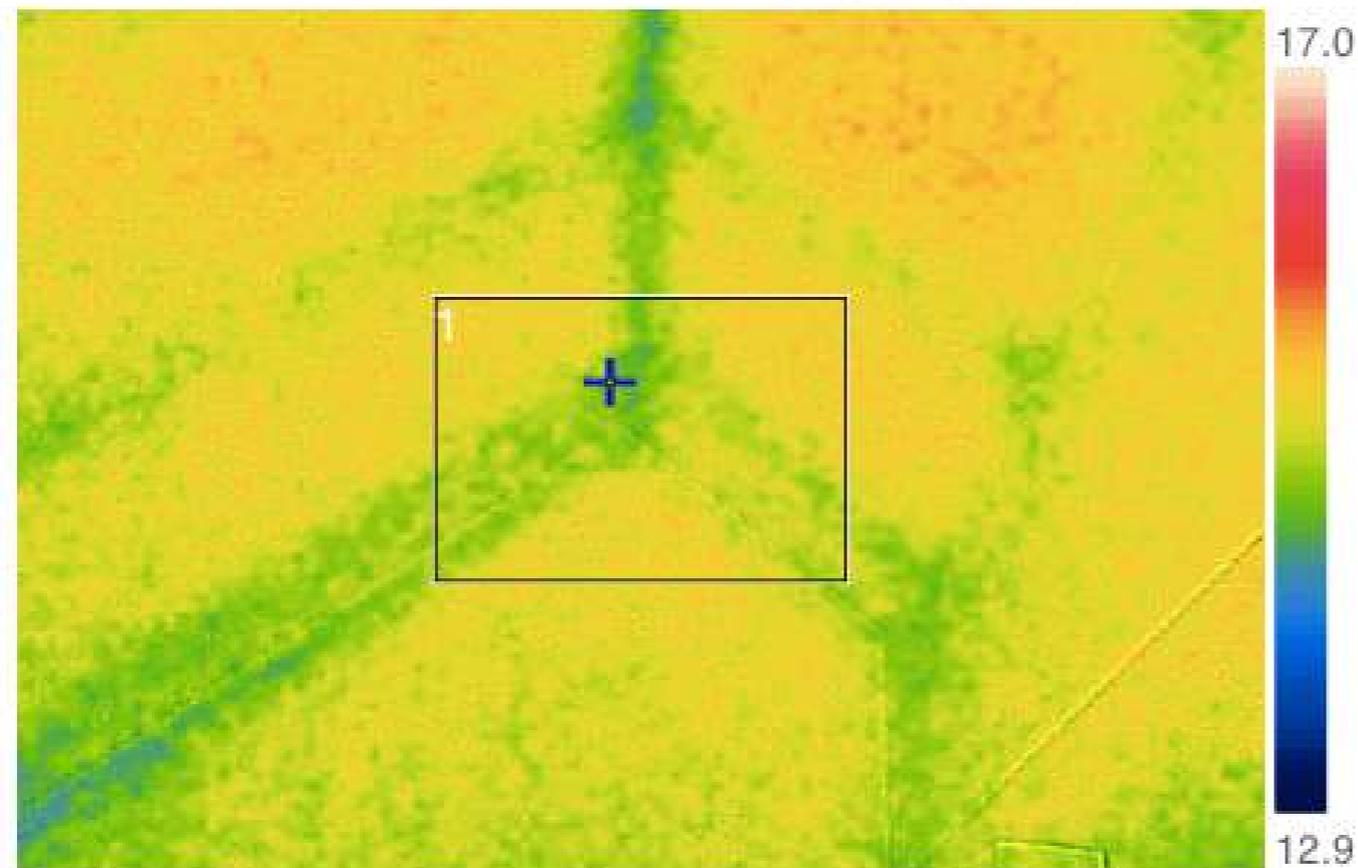


Deep retrofit

- Loft conversion pitched roof (U value 0.13) - meets gable end

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Group retrofit implications

- “cold bridge where EWI doesn’t meet loft insulation”
- Is there a solution that would be feasible in a group retrofit situation?
- The deep retrofit example involved a re-tile and re-felt, plus insulation above rafters – not suitable for the average area wide retrofit project.



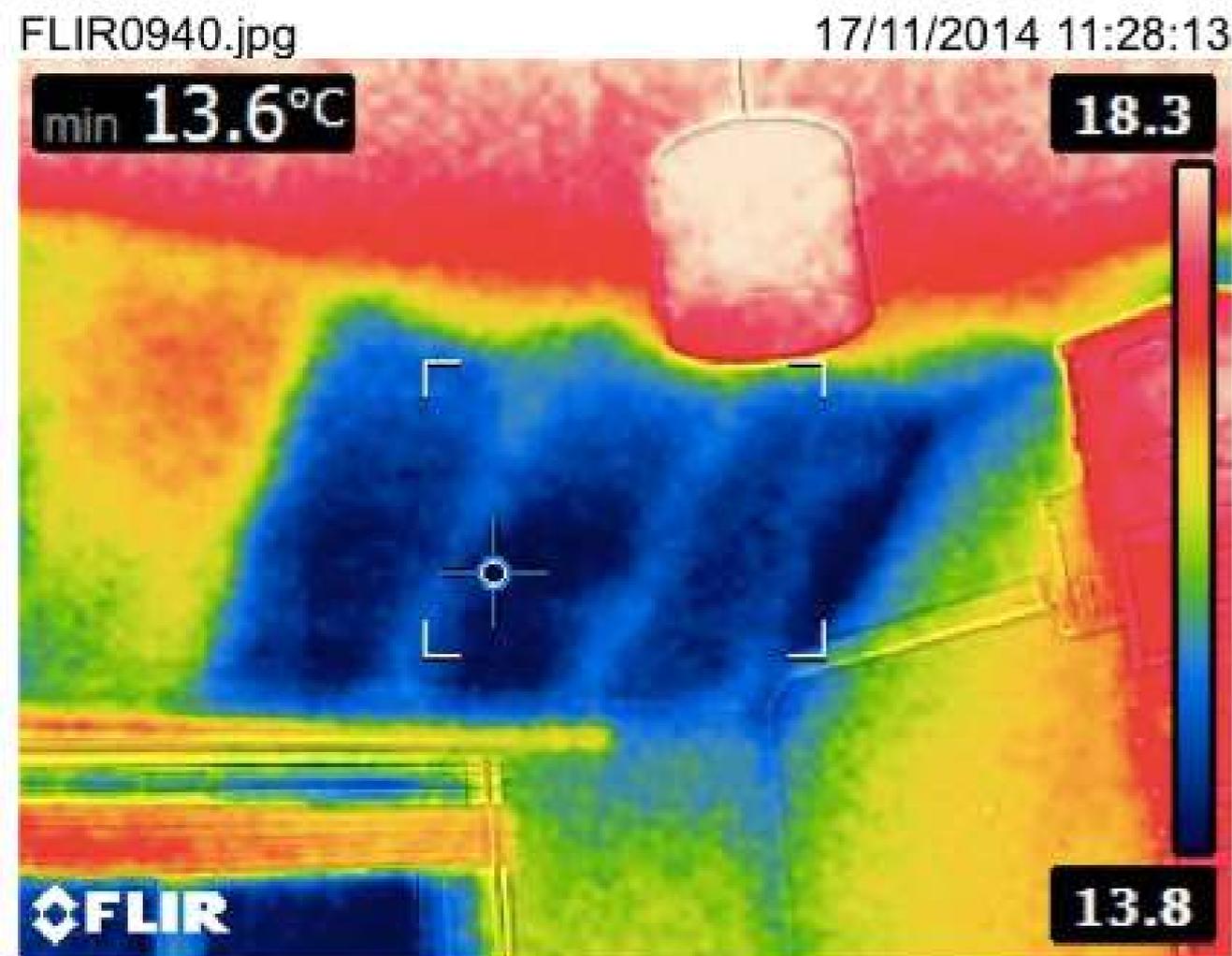
External wall meets section of pitched roof

- Moderate retrofit to building regulations
- Deep retrofit - super insulated extension



Moderate retrofit

- Loft and walls insulated but pitched roof not insulated at all

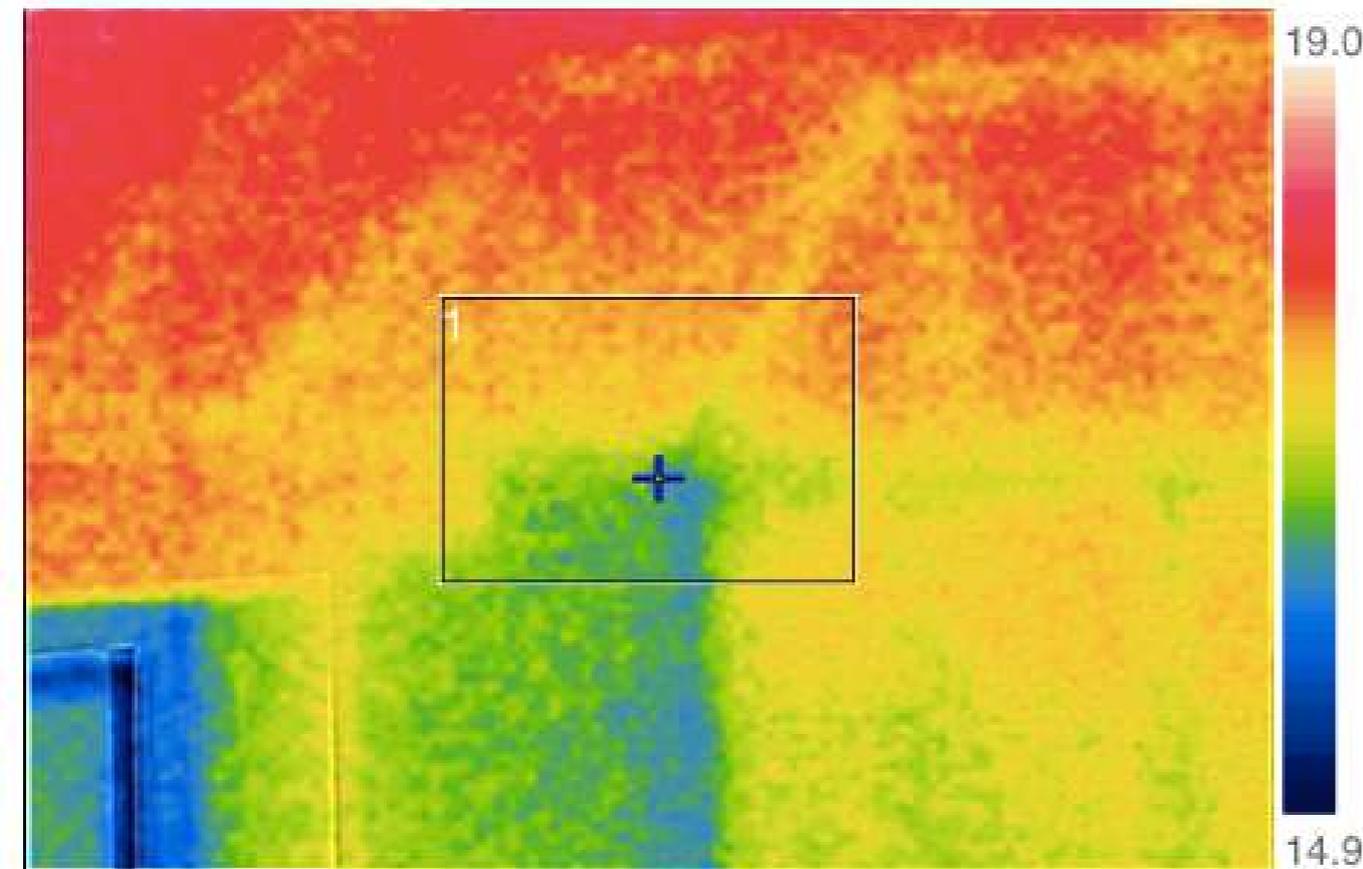


Deep retrofit

- Dormer walls (NE corner) meet pitched roof

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Group retrofit implications

- Could area wide retrofit projects deal with these tricky areas of pitched roof?
- Potentially, but could involve disruption (internally) or be costly if attempted externally.

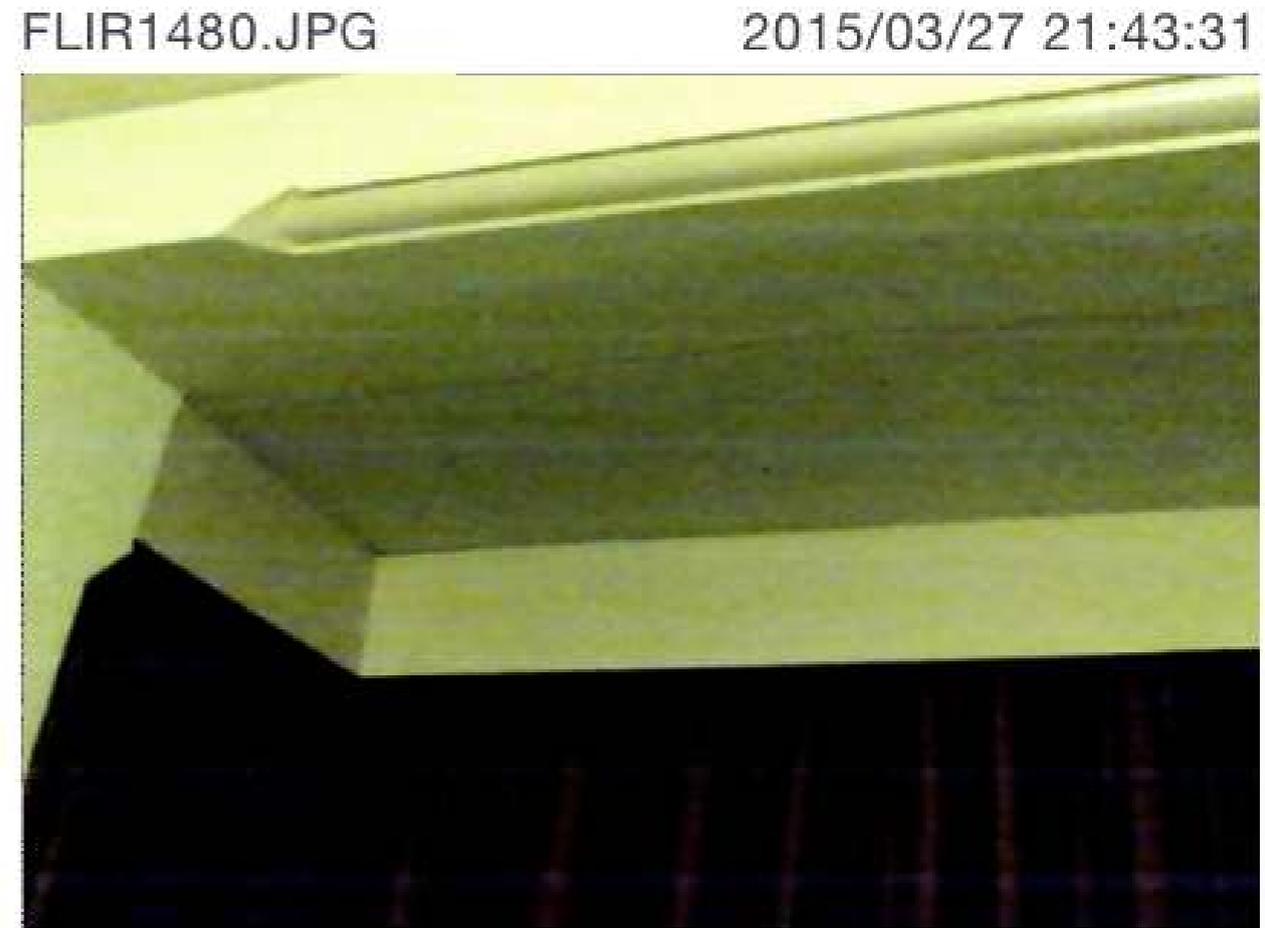
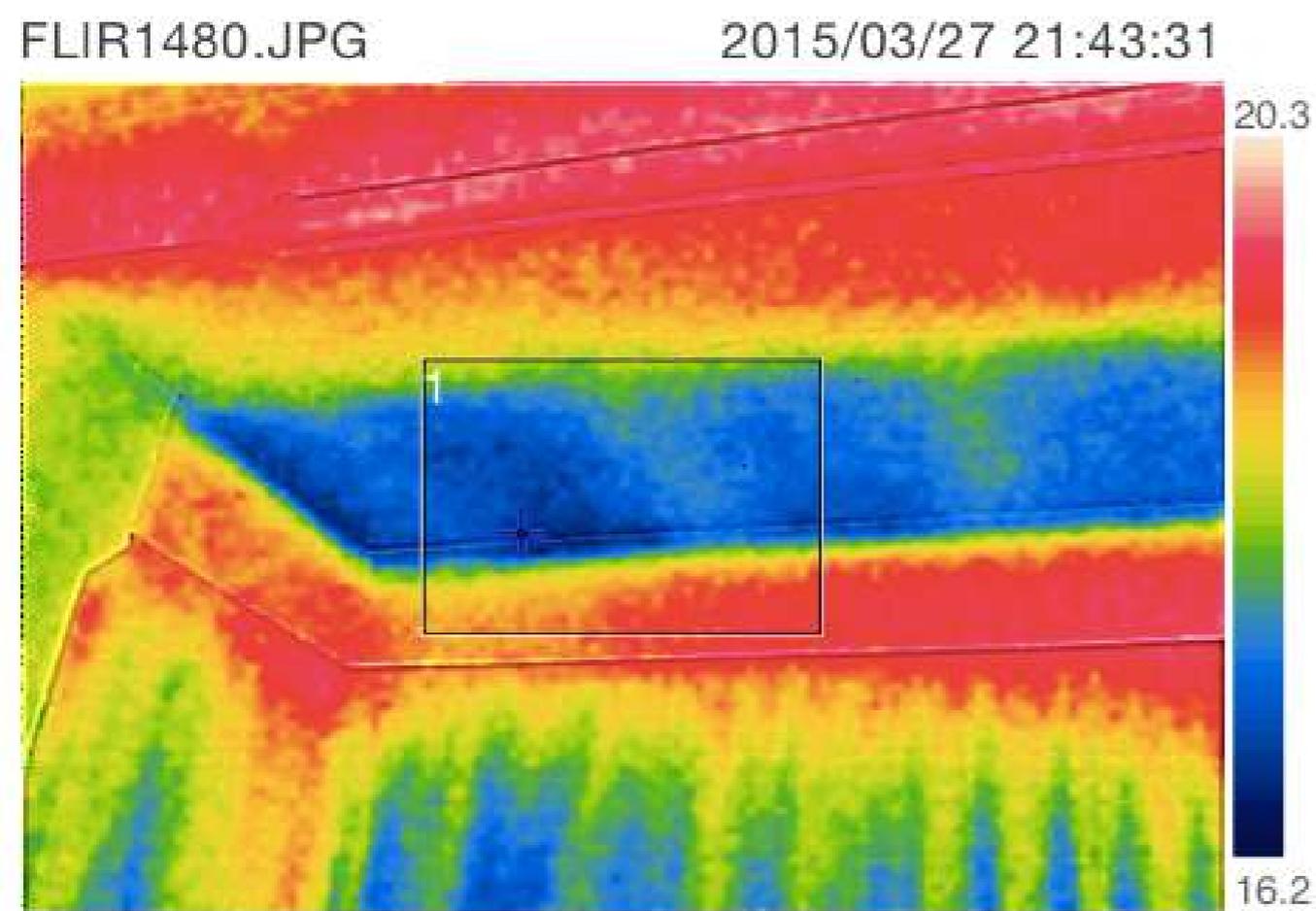


Bays

- Uninsulated bay top
- Bay of internally insulated rooms (but not between floors)

Traditional home

- Bay top not insulated (flat roof above)



Moderate retrofit

- IWI around bay is reducing heat loss but note cold spot (lack of IWI between floors)



Group retrofit implications

- Bay tops could be included in an area wide EWI project (insulating from the outside)
- Tile hung bays - likewise



Dormer windows

- Uninsulated house
- Deep retrofit - super insulated extension

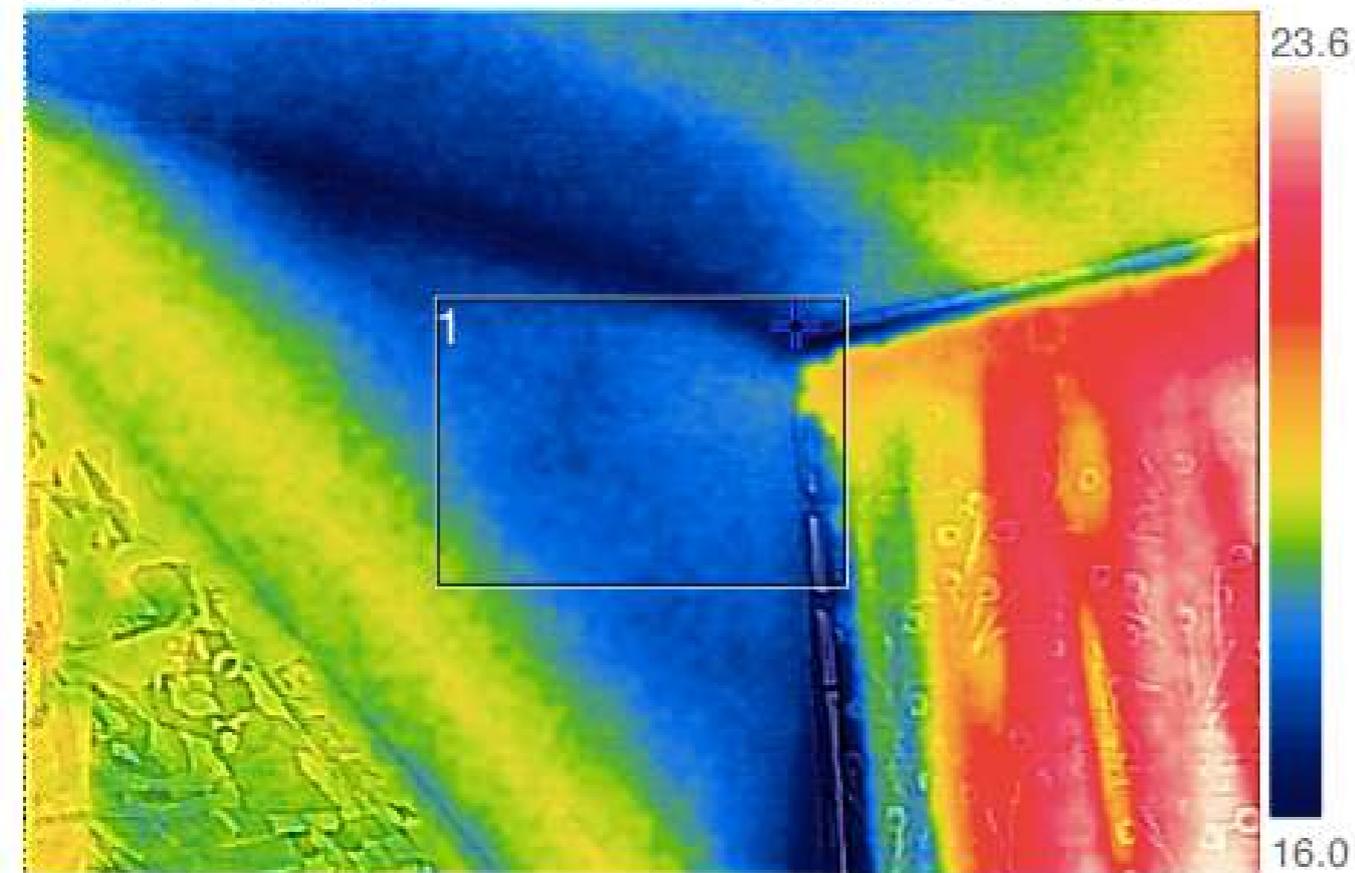


Traditional home

- Dormer window - traditional house

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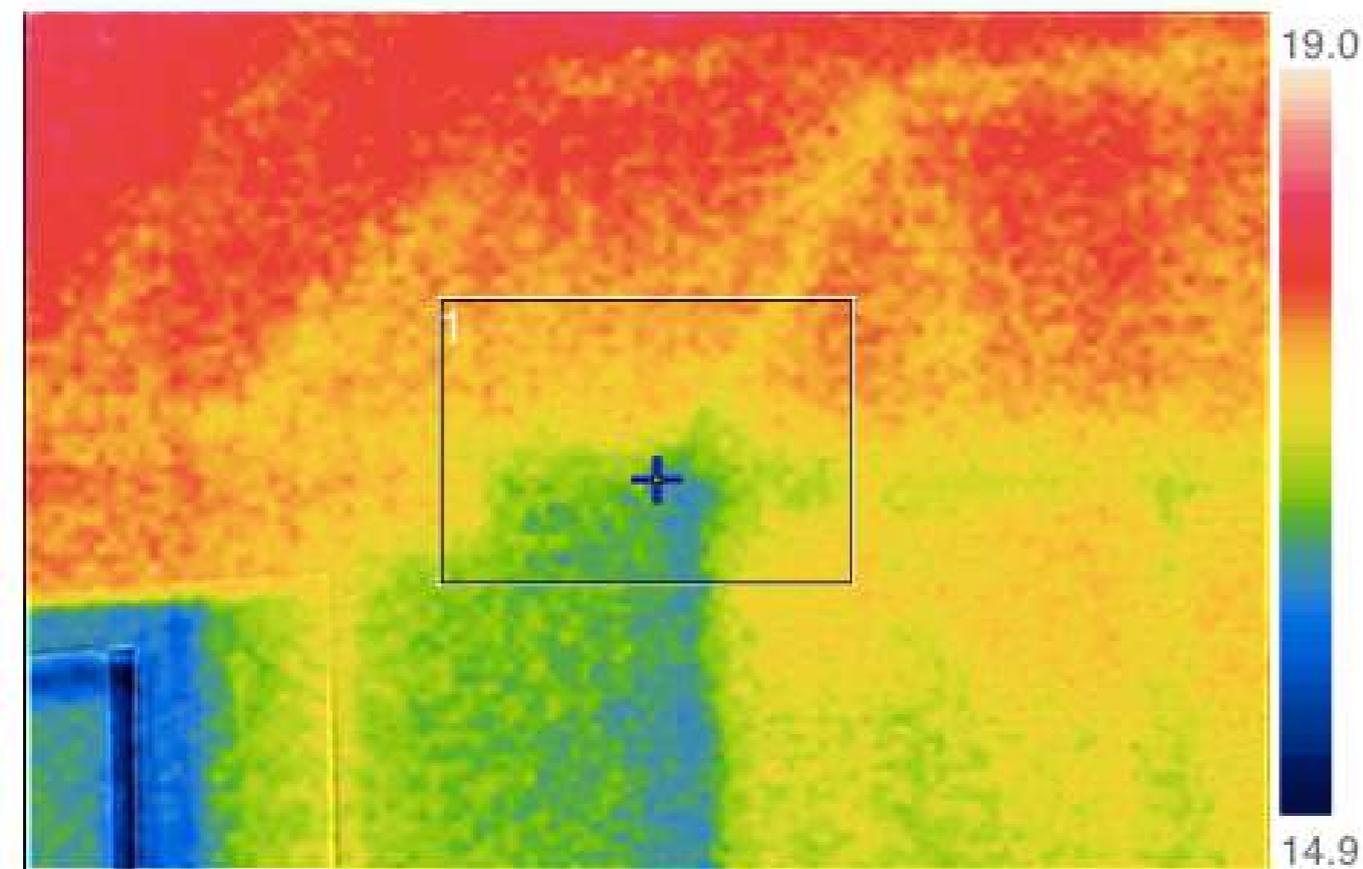


Deep retrofit

- Dormer walls (NE corner) meet pitched roof

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Group retrofit implications

- Could dormer cheeks / tops be included in an area wide EWI project?
- Probably these vary more from house to house, so there may be reduced economies of scale
- Householders rarely seem to “synchronise” – i.e. by having the money and inclination to do the same work at the same time!



Floors

- Uninsulated house
- Modern extension to building regulations
- Deep retrofit - super insulated extension

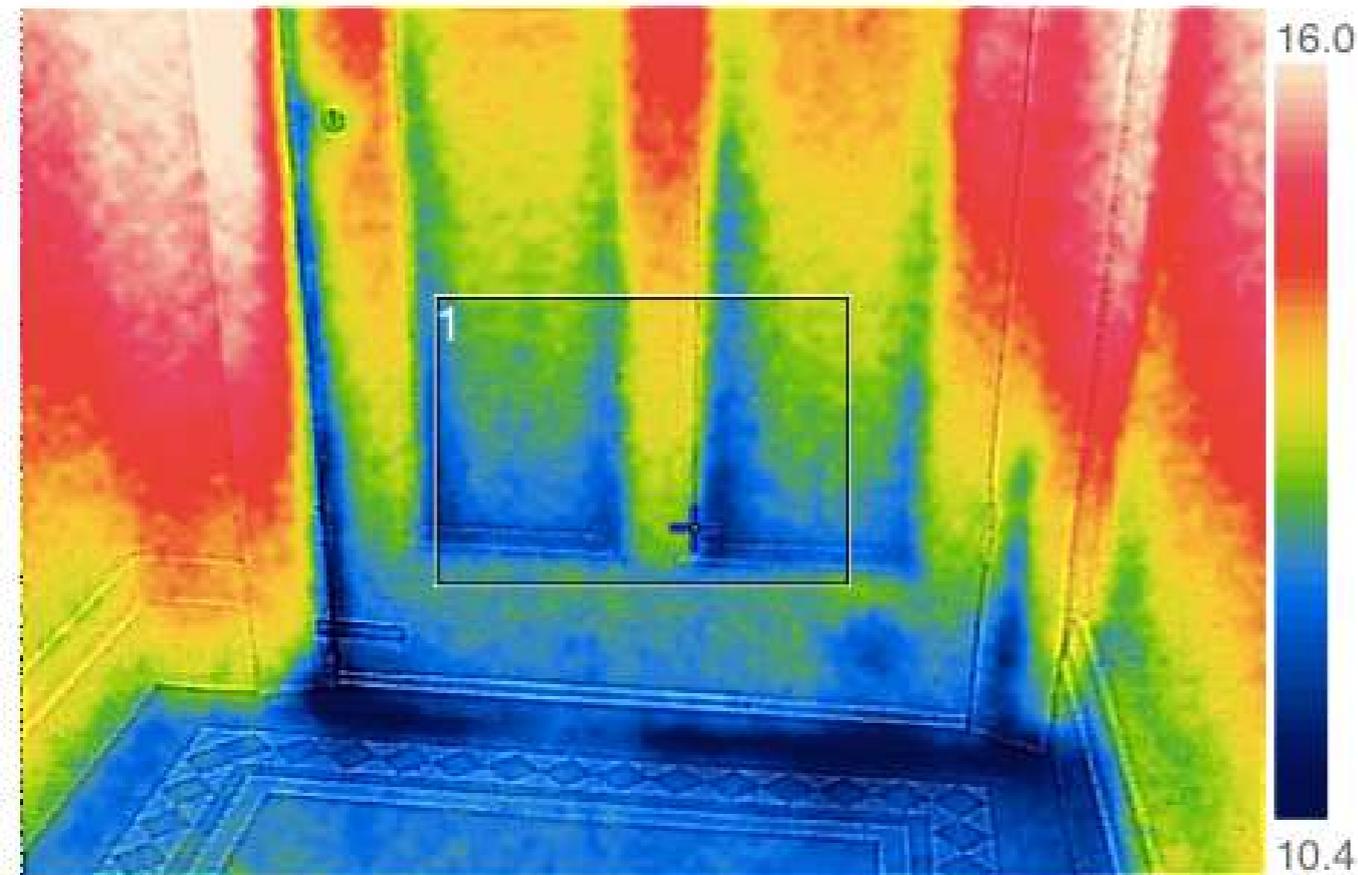


Traditional home

- Cold floor, draughts at front door

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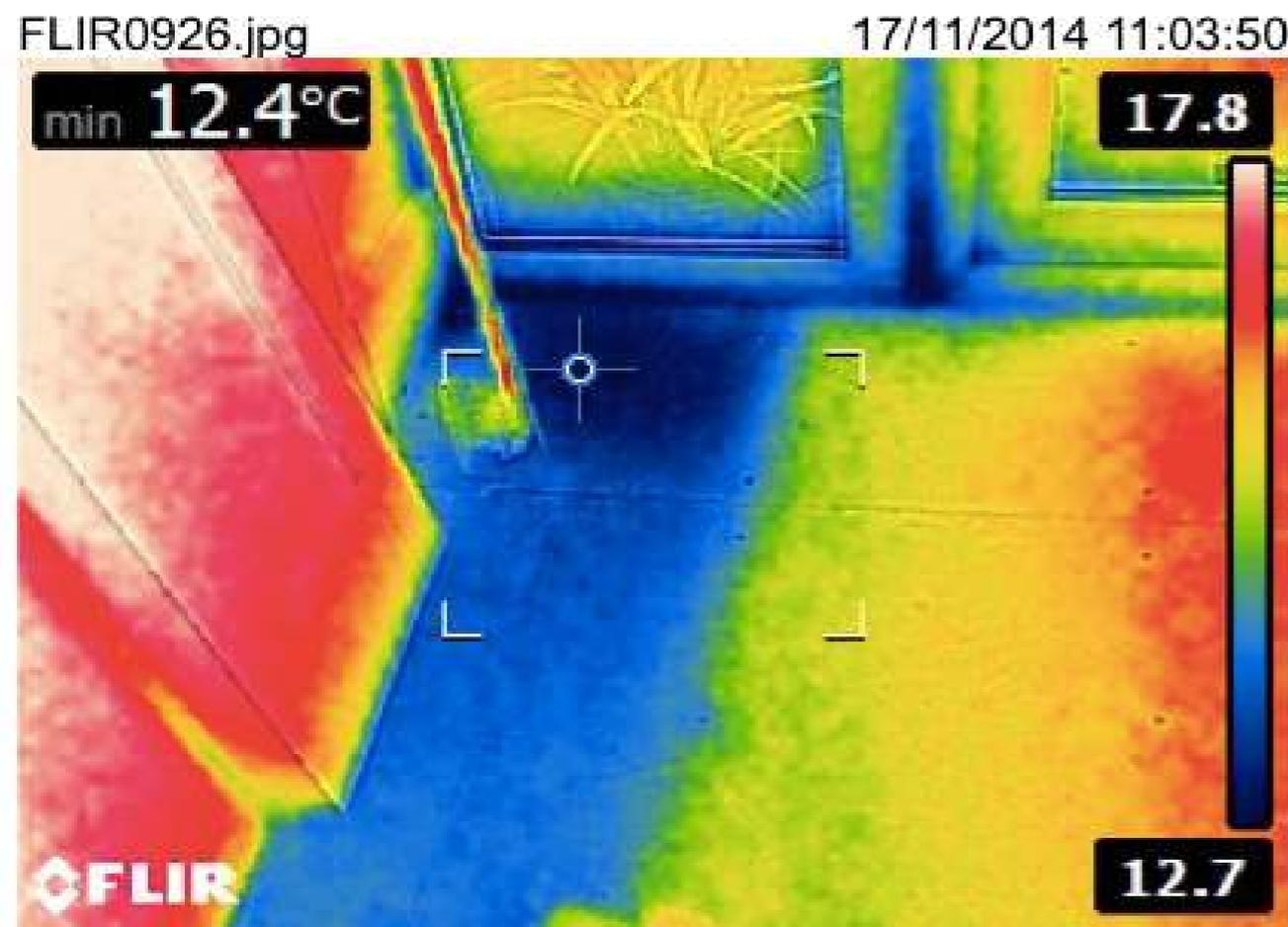
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Modern extension

- New extension 2014 - no attempt made to insulate floor where air vent runs below it.

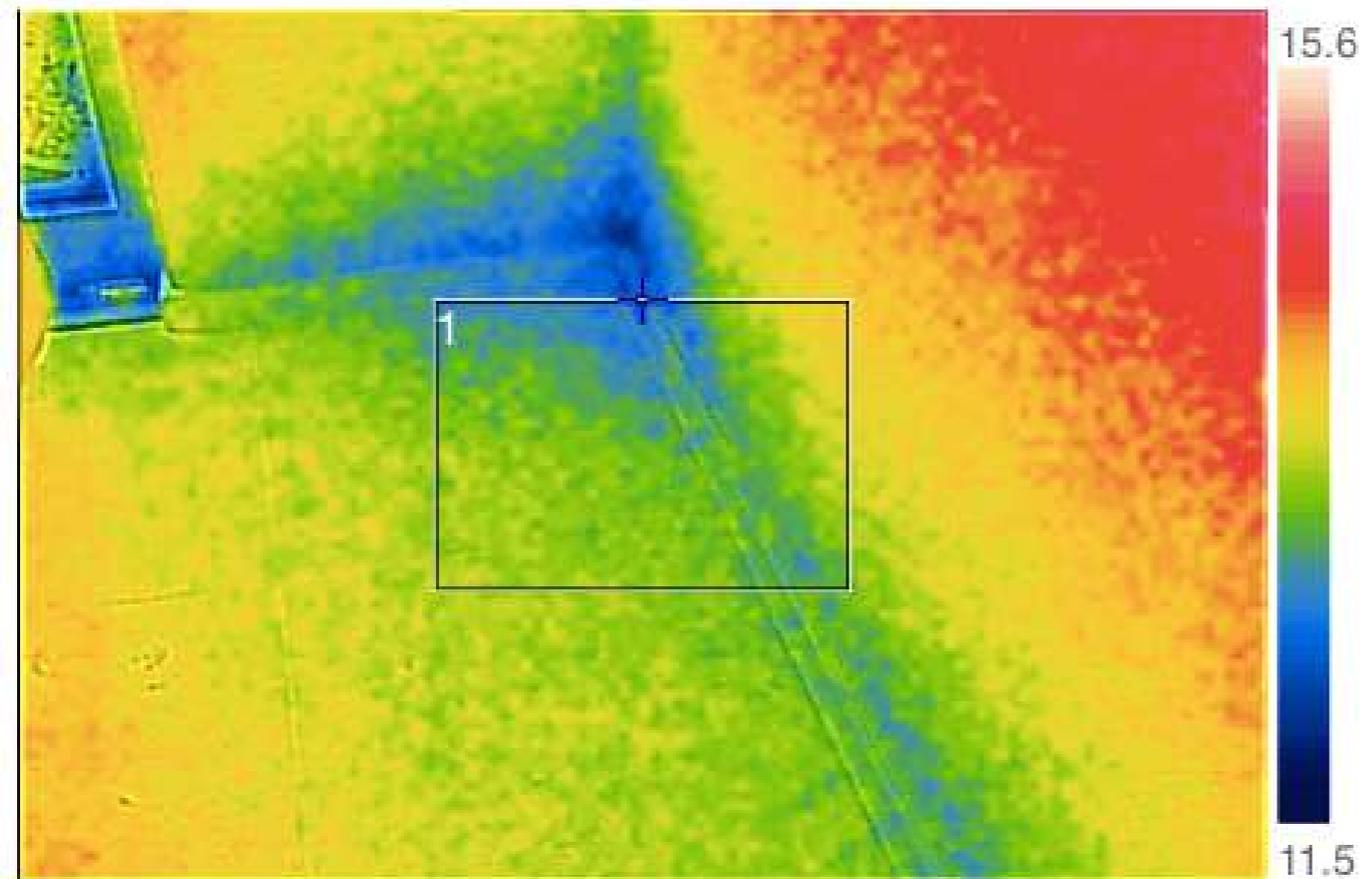


Deep retrofit

- Extension floor (U value 0.1) at NW external corner

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Group retrofit implications

- Could floor insulation be done as an area wide project?
- Extensions are a very individual activity – so awareness raising around good practice currently seems like the only realistic approach.
- Removing joists and replacing with super-insulated solid floor – a bit drastic, except for one-off projects



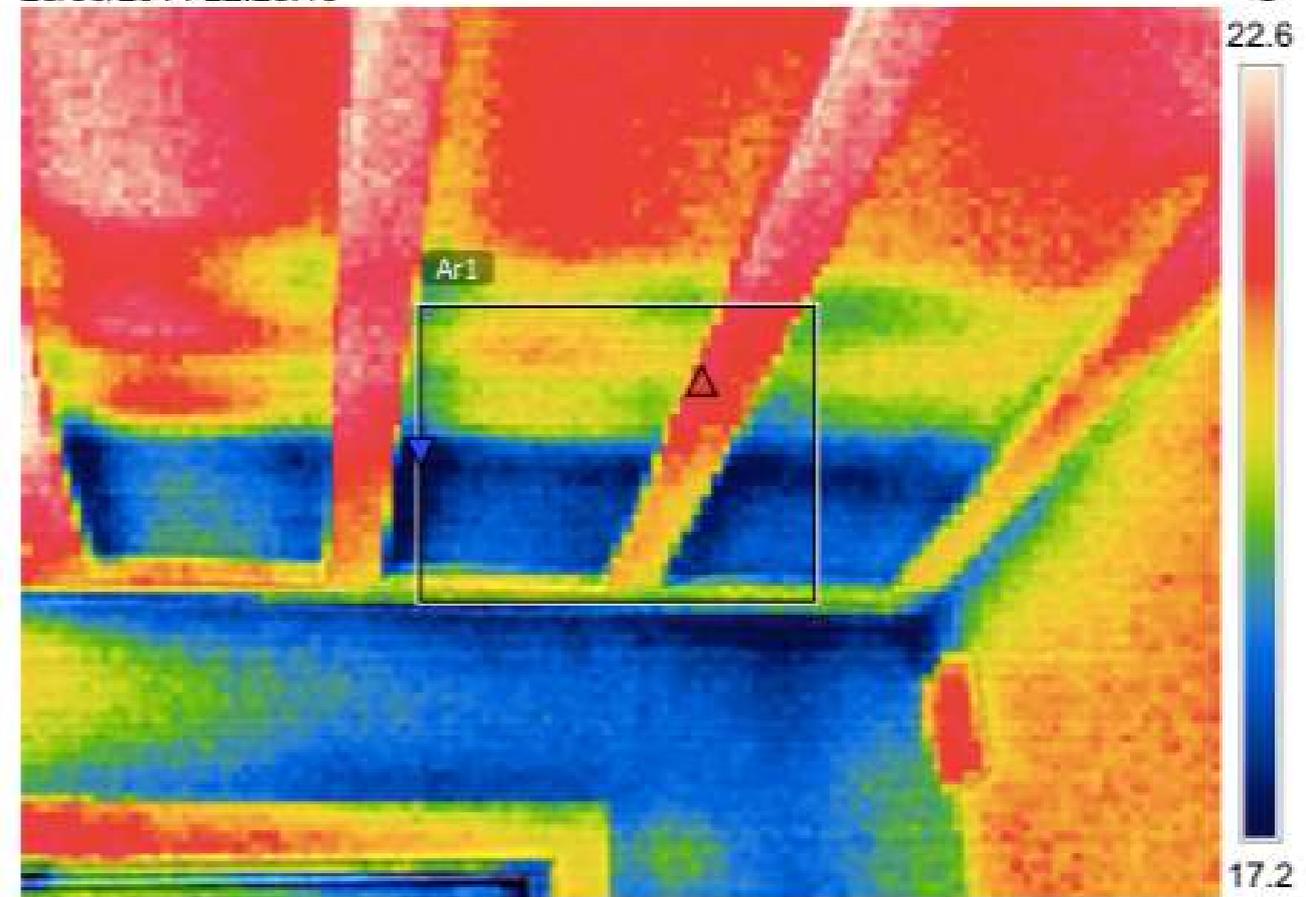
Other common issues



Typical surprises

- Uninsulated area above small extension flat roof
- Wall looks uninsulated too

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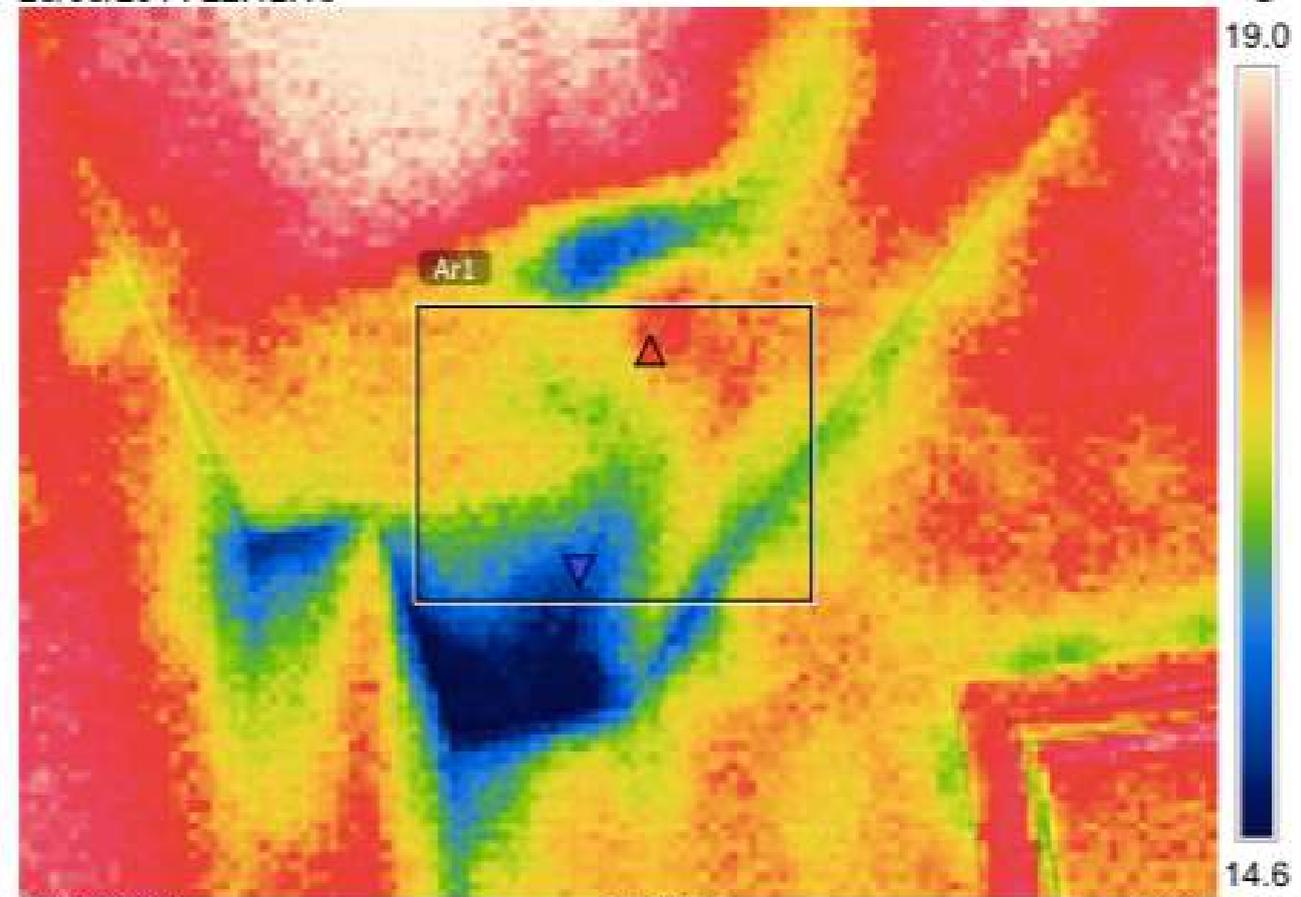
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Typical surprises

- Tricky junction at roof, due to an extension
- Air gap and missing insulation likely

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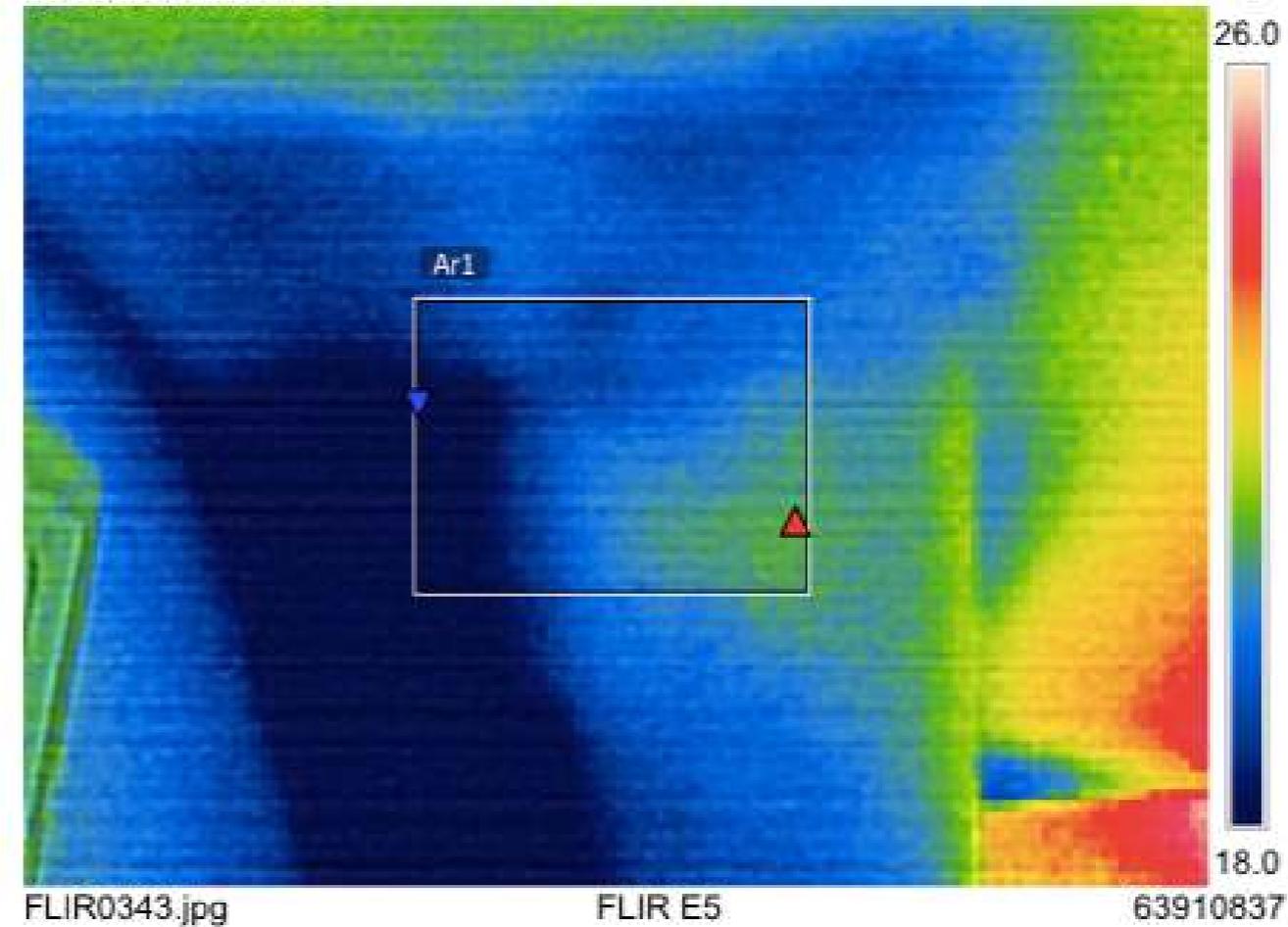
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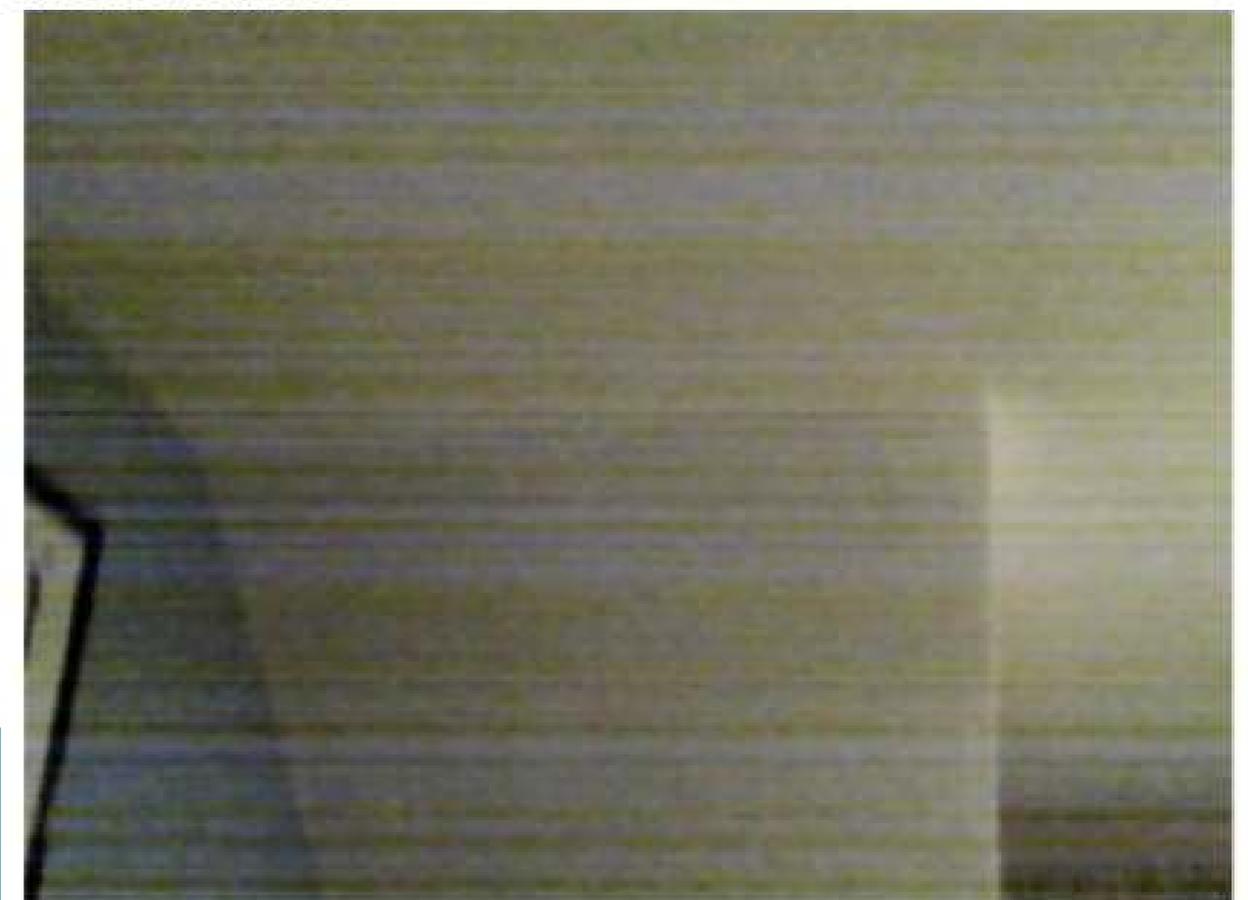
Typical surprises

- Missing insulation in pitched roof

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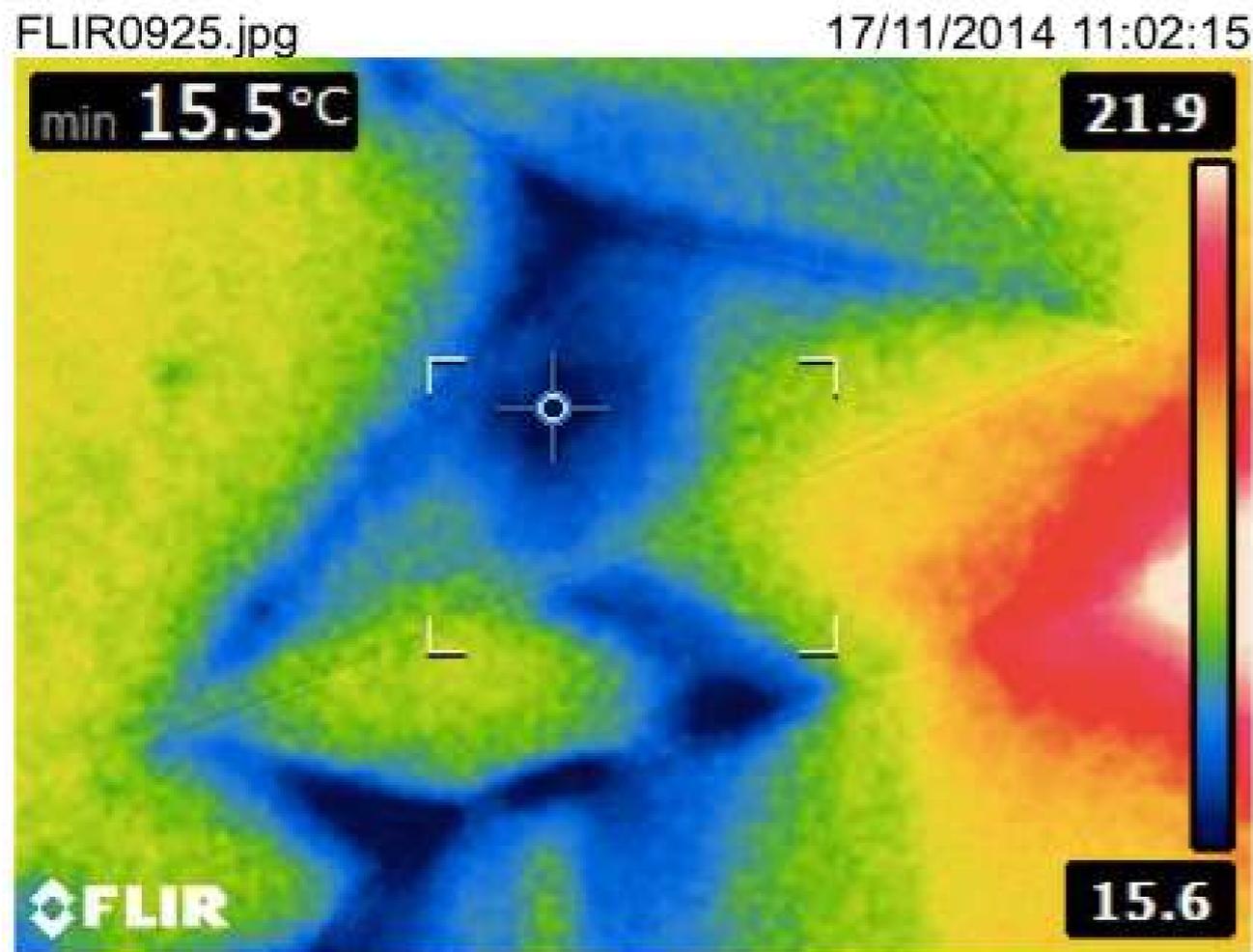
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New build surprises

- New extension roof 2014 - internal wall backing on to existing kitchen



Group retrofit implications

- Awareness raising around good practice currently seems like the only realistic approach.



Common issues

- Can be minimised...
- But which can be tackled as part of area wide retrofit projects?

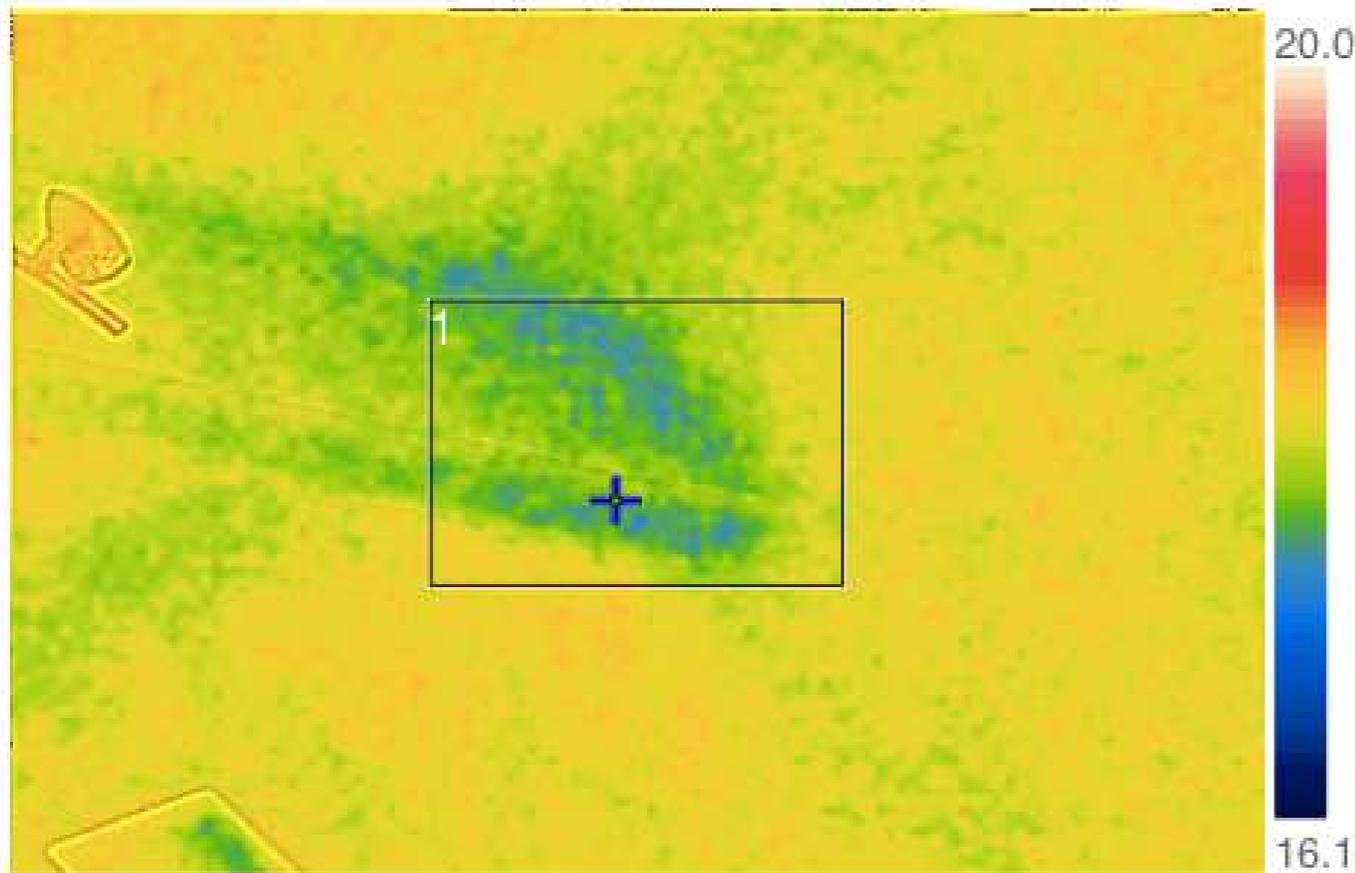


Deep retrofit

- Loft conversion (U value 0.13) where steel meets pitched roof

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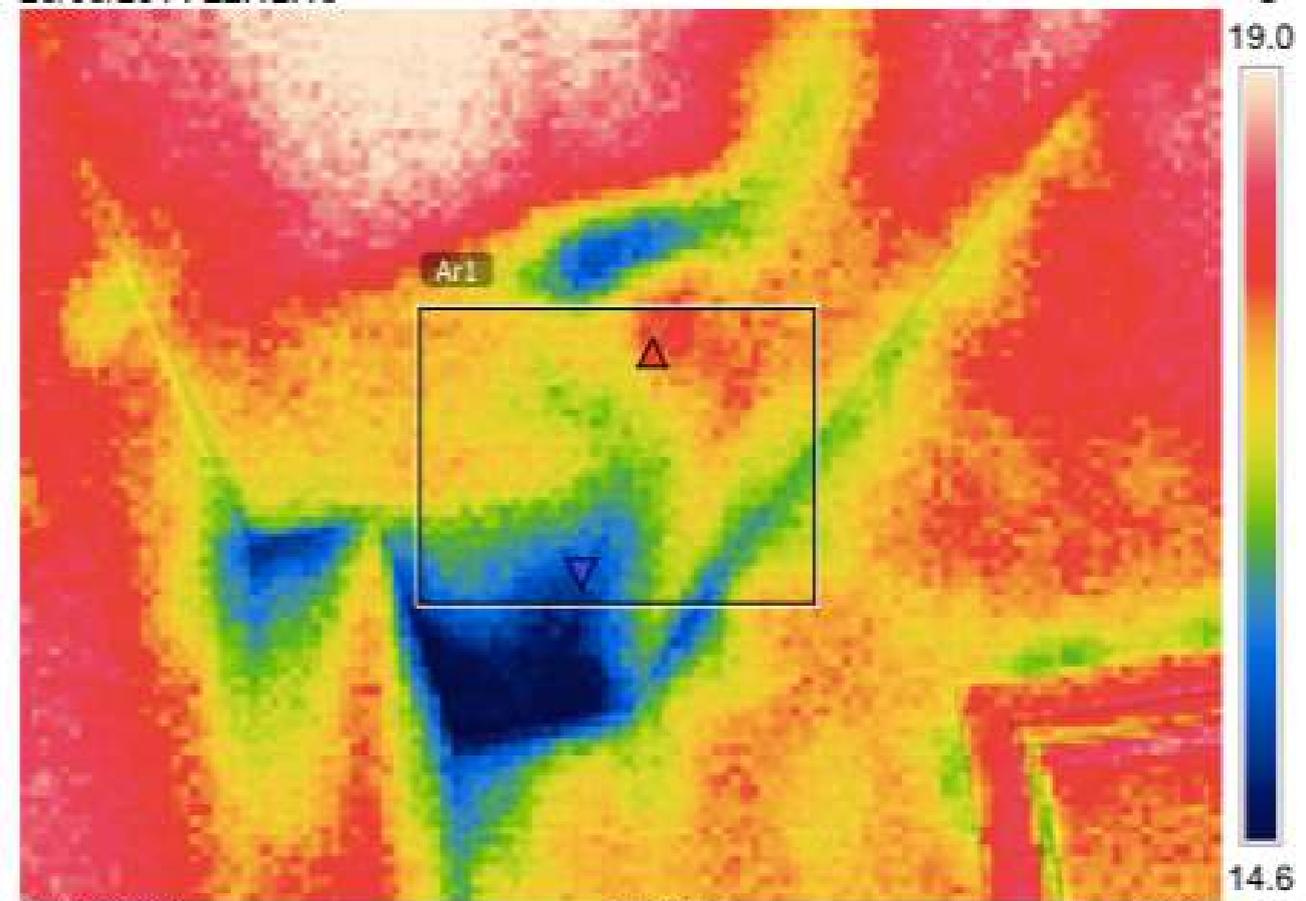
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not this...

- Tricky junction at roof, due to an extension
- Air gap and missing insulation likely

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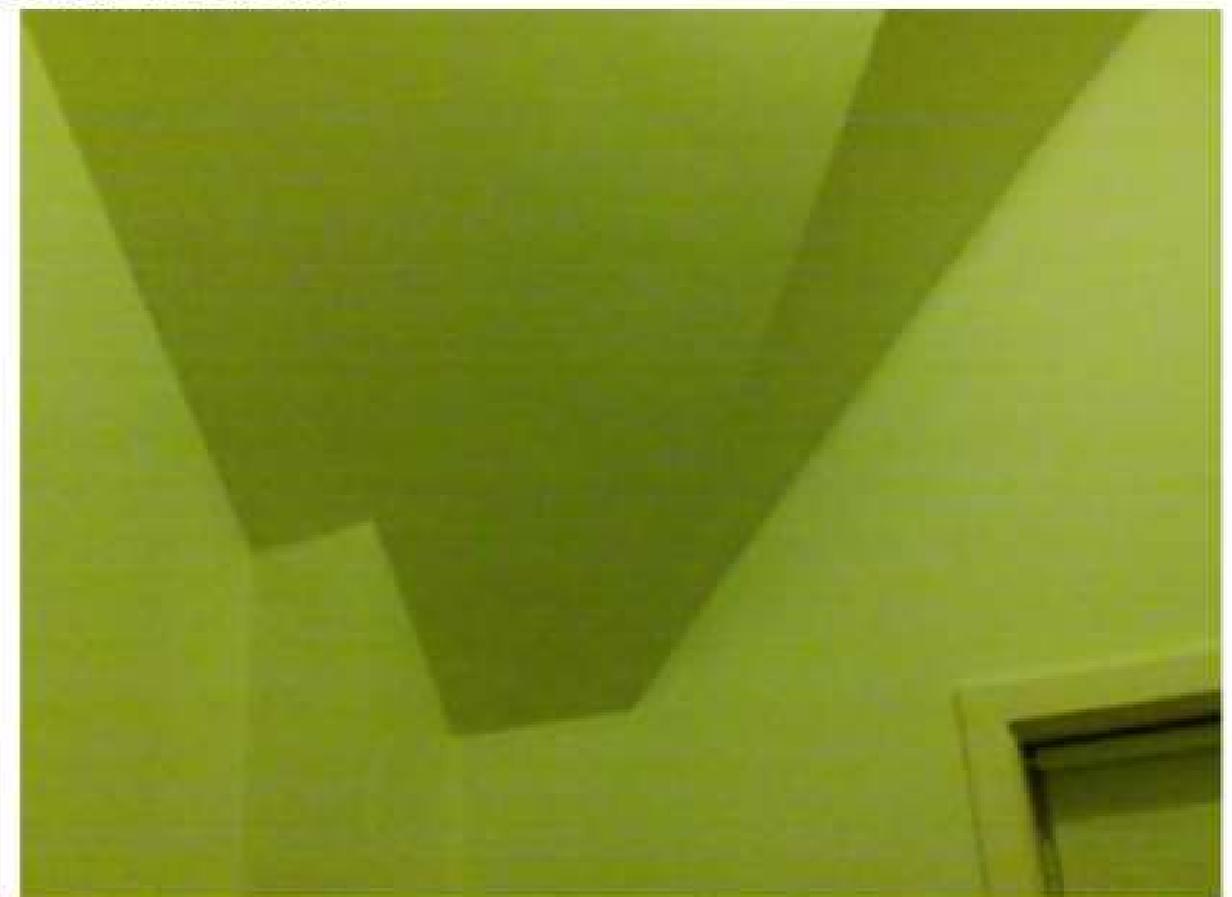


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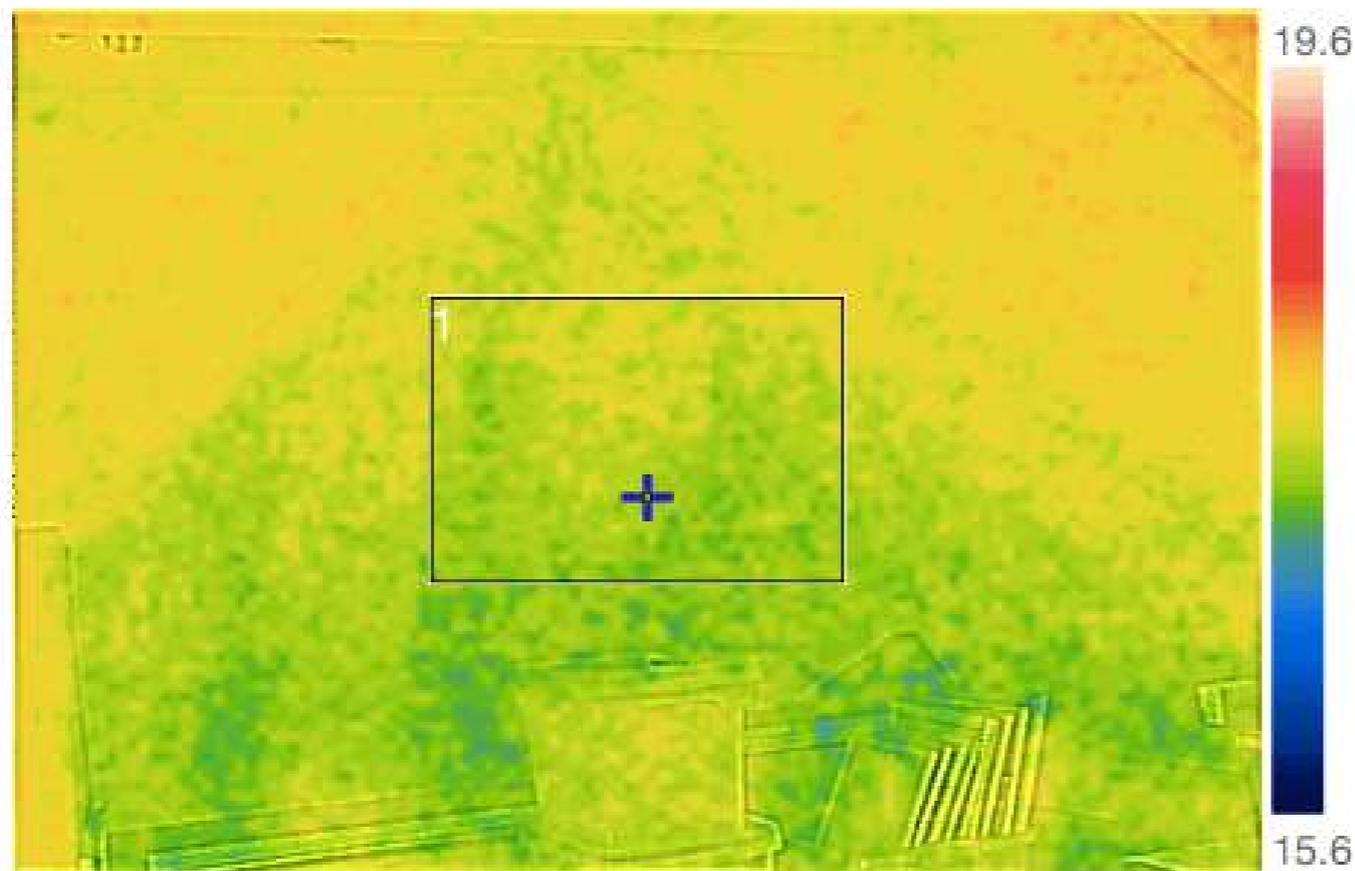
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Deep retrofit

- Pitched roof (U value 0.13) showing good continuity of insulation

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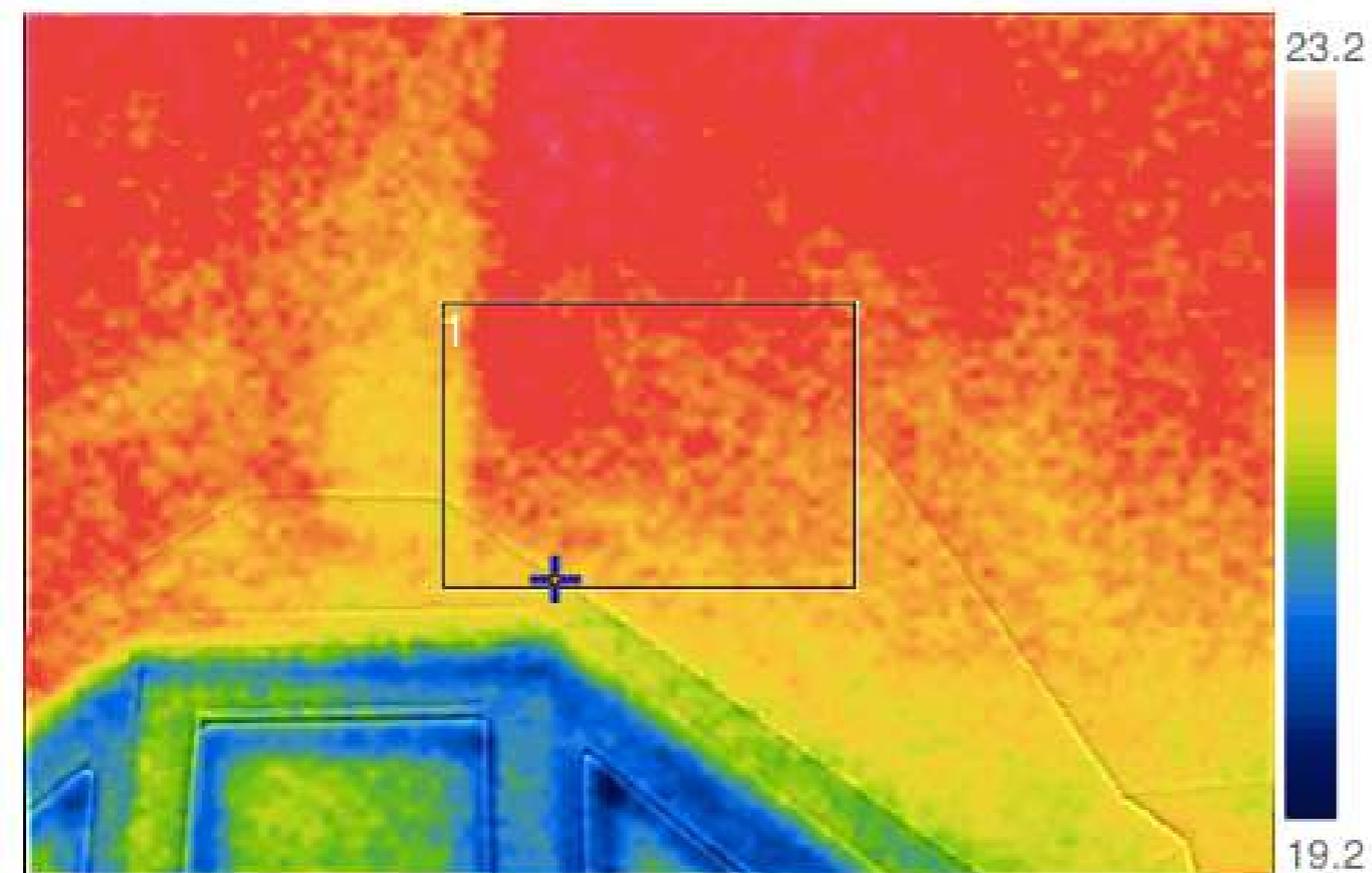


Deep retrofit

- Loft conversion pitched roof (U value 0.13) and triple glazed window

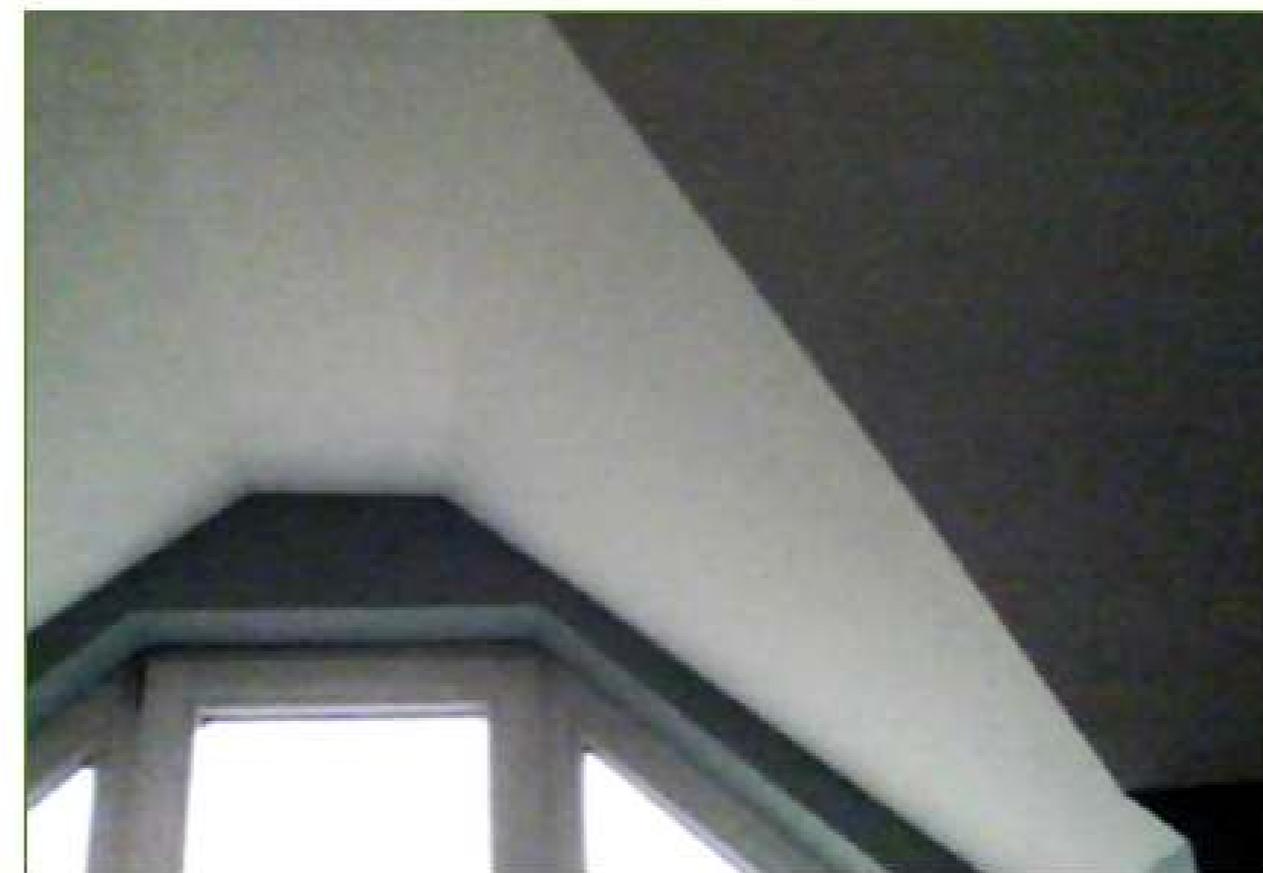
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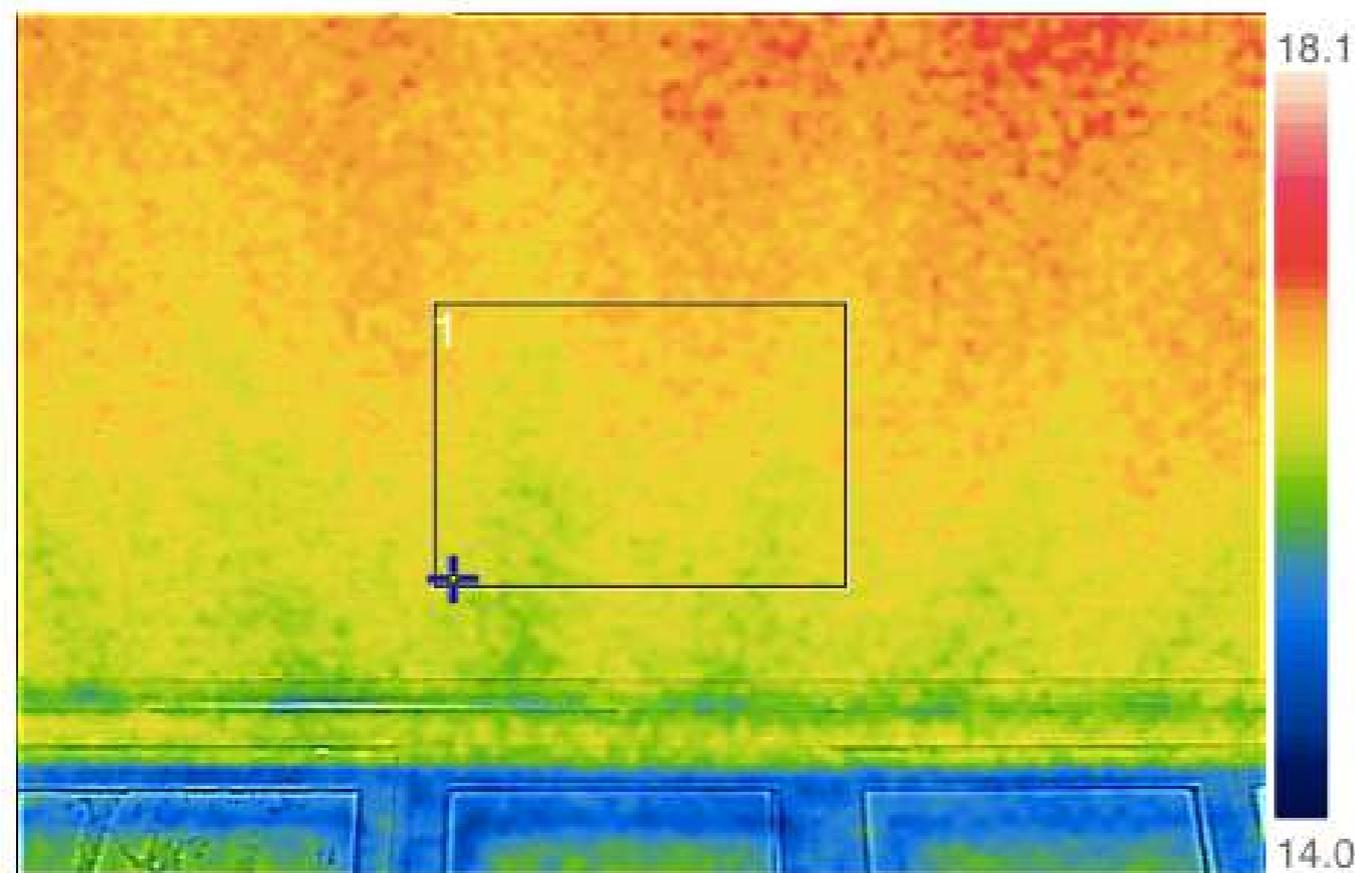


Deep retrofit

- Extension mono pitch roof (U value 0.13) meets top of triple glazed patio doors

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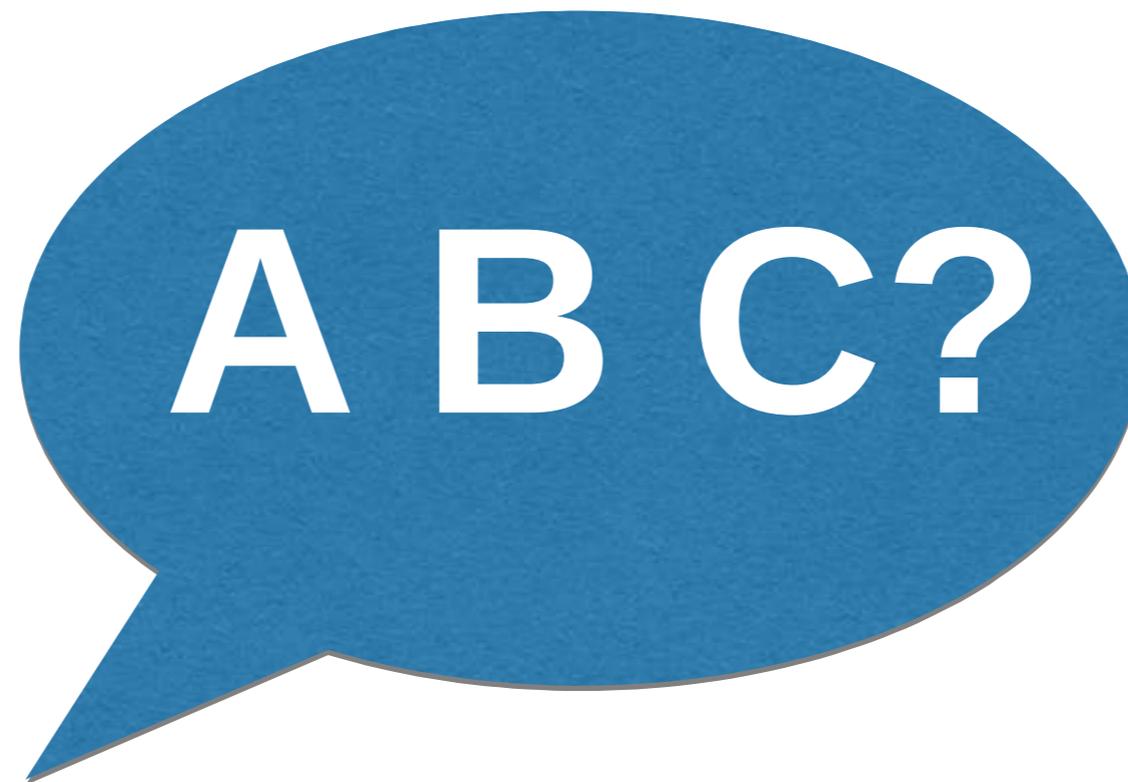


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4. Implications for Community Retrofit



Awareness

- Many householders don't have much knowledge about best practice at all.
- But awareness raising activities and community retrofits can help to overcome this



Build quality

- Some builders / insulation installers are more interested in speed than end result
- A householder can insist on a good result
- Easier to achieve more widely with an experienced champion for the whole retrofit group



Cost

- Community approach should bring economies of scale at all stages:
- Expertise in design / specification
- Negotiating cost of materials and labour
- On-site quality control



Q is for Quality

How good is good enough?

- Cold bridges, IWI - when is it ok / not?
- **CarbonLite Retrofit for...**
- Making good efficiency choices
- Lowering risk to the fabric of the building



Learning from experience

- **Sharing feedback with other community wide retrofit projects**
- **e.g. thermal imaging after the retrofit and recording issues if they arise**



Thank you for listening

- Your questions and suggestions?

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