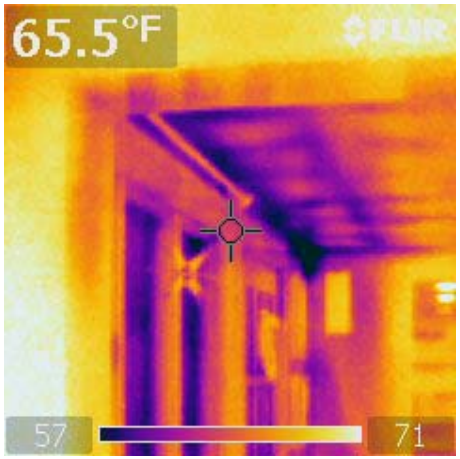
Stretch code as quality assurance—for consumers *and* builders

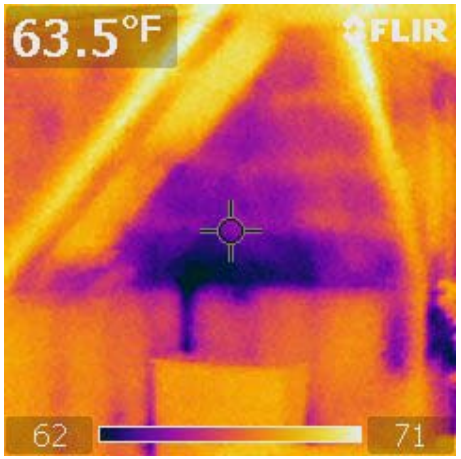
Paul Eldrenkamp
paul@byggmeister.com

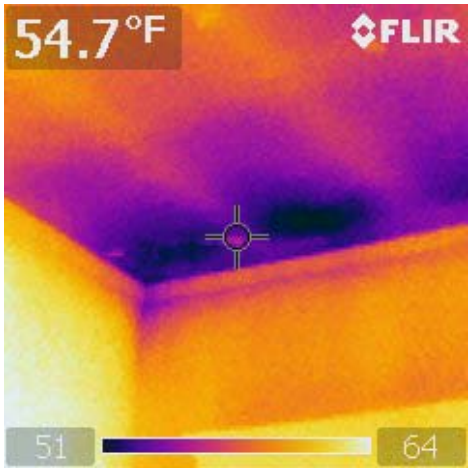
New construction: Townsend, MA

Builder: Transformations, Inc. / Carter Scott
Cost of construction: Less than $150/ft
HERS index: *-4* (net energy producer)

Infrared images showing flaws in insulation—new construction







Darker areas are colder; lighter areas are warmer

Blower door testing

Case study: Brookline

Baseline HERS		128
Well-installed cellulose in above-grade walls	-16	112
Air leakage reduction from 8150 CFM50 to 2100 CFM50	-22	90

Case study: Cambridge

- Pre-project HERS index: 171
- Post project: 87
- Improvement measures:
  - High efficiency boiler
  - Basement wall insulation
  - Attic insulation
  - Air sealing (9500cfm to 4500cfm)

Case study: Newton

- Pre-project HERS index: 140
- Post-project index: 75
- New windows
- Spray foam in walls and roof
- Blower-door testing during renovation

Lessons learned…

- Quality-control testing can yield improvements at little additional cost over time
- HERS analysis helps consumers leverage efficiency investments in their homes more intelligently
- Many contractors have been meeting or exceeding Stretch Code standards for some time now—and are still very much in business

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Jonathan Kantar

jonathan@sagebuilders.com

- Builders, Designers, Homeowners, and Communities need to build better
- Stretch Code seals the deal: tries to ensure the performance specified in previous codes
- Better buildings – more durable, and energy efficient – are easily doable

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Recently renovated house with major ice dam and icicle issues

Proper insulation and air sealing – complying with current codes -- likely would have eliminated most of these problems

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Insulation too short!

Like the current code, the stretch code requires air sealing and a “complete” thermal envelope…no room for gaps

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Insulation poorly fitted, gaps – allows lots of air leakage

Again, the stretch code is requiring the same amount of insulation and air sealing as in the current code, but with better installation practices.

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5-1/2” of dense pack cellulose, 3.5#/cf allowed us to achieve a HERS 70 on this renovated carriage house. We used some spray foam to “coat” a steel beam and reduce its thermal conduction. A blower door gives us better quality control and ensures compliance.

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Air barrier electrical box installed in 2x4 exterior wall sprayed with Icynene brand open cell urethane foam

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1” polyisocyanurate rigid insulation board with taped seams applied over exterior sheathing provides continuous insulation and air infiltration barrier, reducing thermal bridging across the framing.