Top 10 QA Findings Countdown

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Presenter Info

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Agenda

- What is QA?
- How do we do it?
- Top 10 findings
- Questions

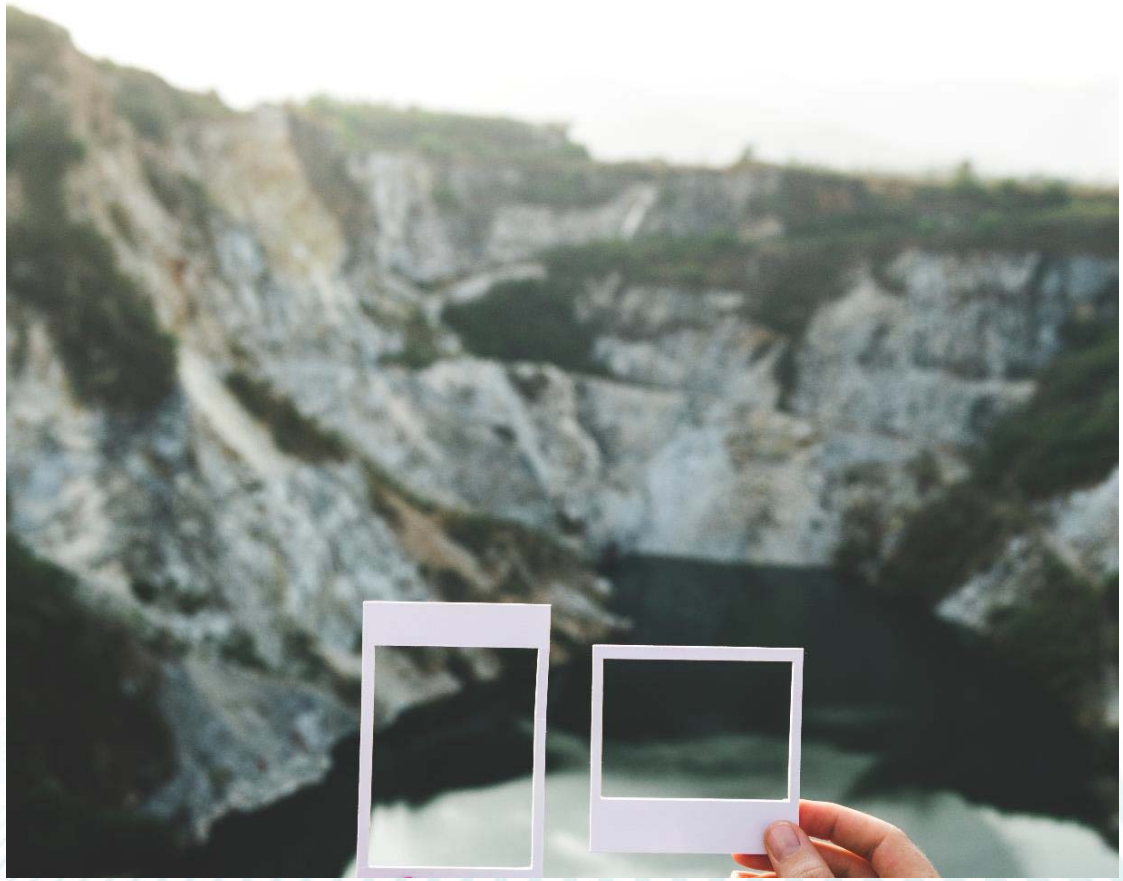
What is QA?

Not Q & A, but Quality Assurance

How do we do QA?

File QA

- Need documents
- Build the case for consistency & replication
- Compare documents
- Different ways to analyze accuracy
  - +/- 2 points = pass
  - Few significant discrepancies
- Otherwise Corrective Actions



How do we do QA?

Field QA

- Get the full picture
- Same sheet of music in how to apply eval
- Maybe opportunities for process refinement
- +/- 2 points = pass

Top 10 QA Findings

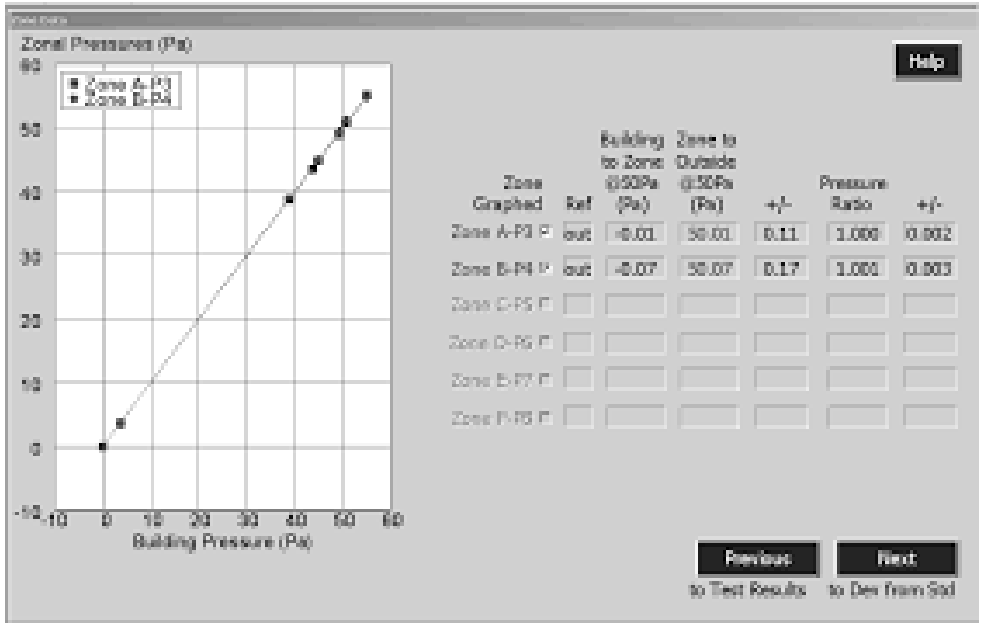
#10 – Infiltration Adjustments

Top 10 QA Findings

- **#10 – Infiltration not documented properly**
  - Previous: RESNET Chapter 8
  - Level of accuracy
    - Baseline range
      - Standard vs Reduced
    - Reduced
      - 5-10 Pa baseline range: 10% penalty, repeated single point or multi-point
      - >10 Pa baseline range: Multipoint
  - Adjustment factors
    - Temperature
    - Altitude

Top 10 QA Findings

- **#10 – Infiltration not documented properly**
  - Current: RESNET 380
    - Single-Point + 10%
    - Multi-point
  - Adjustment factors
    - Temperature
    - Altitude



Top 10 QA Findings

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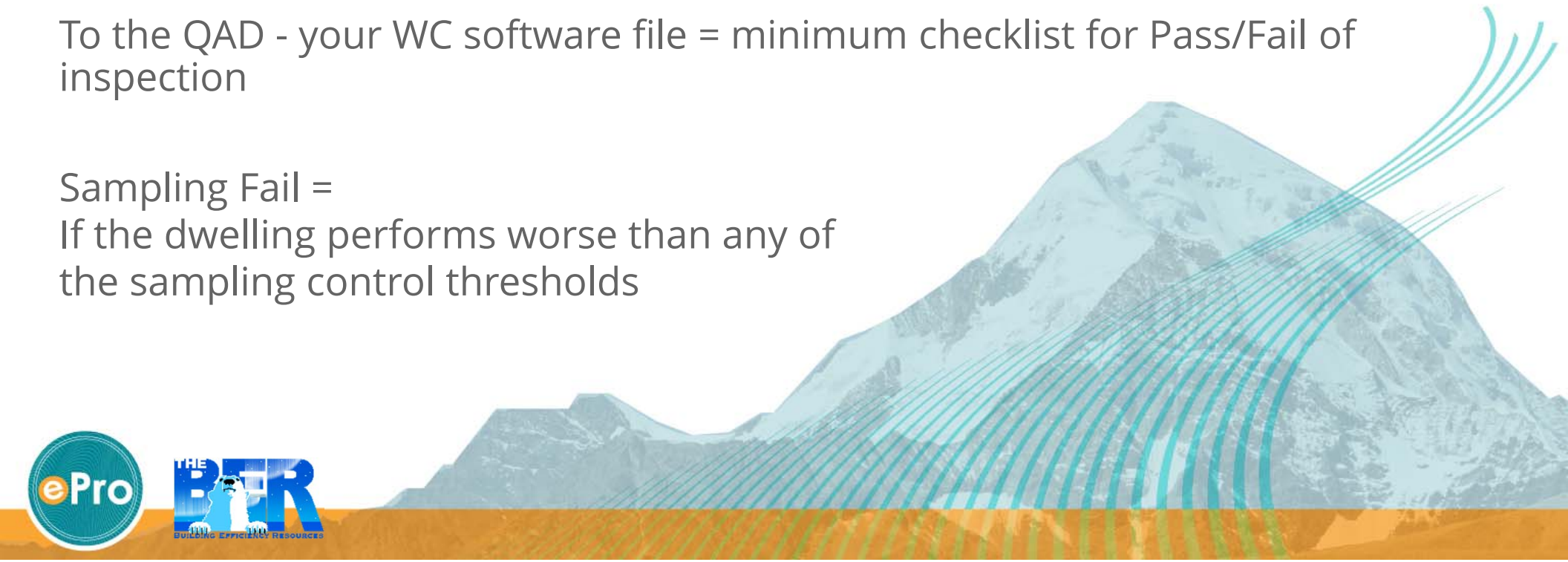
#9 – Sampling Not Followed

Sampling 101

Sampling controls based on thresholds of min performance =
WC (Worst Case) assumption on performance = mandatory minimums

To the QAD - your WC software file = minimum checklist for Pass/Fail of inspection

Sampling Fail =
If the dwelling performs worse than any of the sampling control thresholds



Top 10 QA Findings

- **#9 – Sampling not followed**
  - Defining consistent Sampling Controls / Worst-case Specs
    - Must set clear thresholds prior to beginning sampling
    - Must complete full sampling qualifying process for each Sampling Control , and then Sample at 1 in 7




Top 10 QA Findings

- **#9 – Sampling not followed**
  - Sampling qualifying set
    - 7 in a row must pass w/o failure BEFORE sampling begins

Top 10 QA Findings

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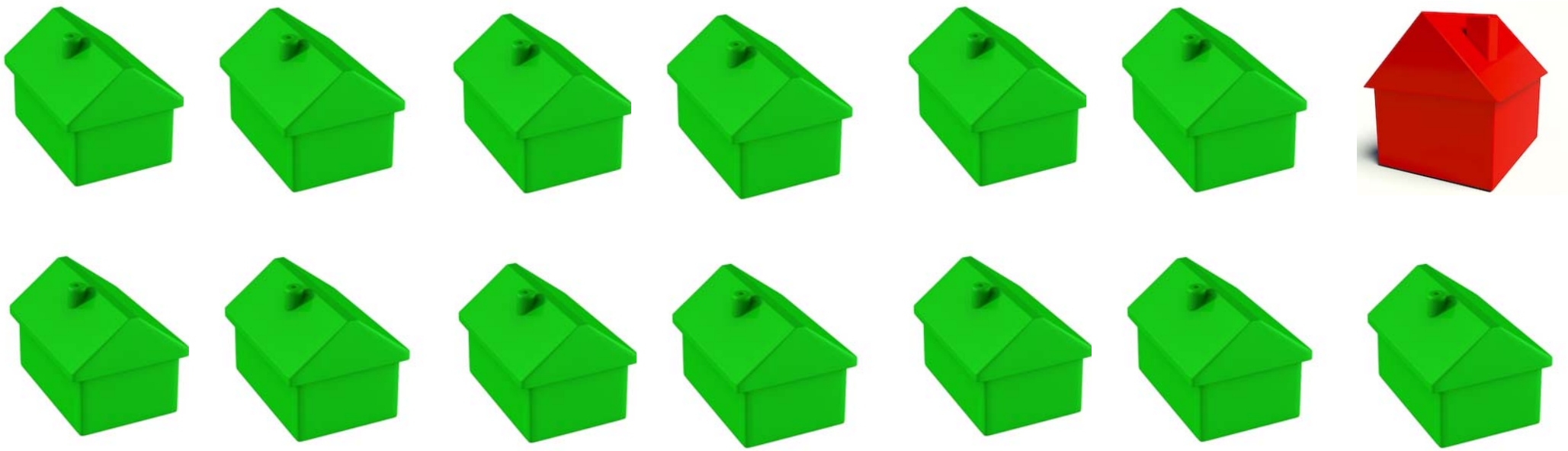
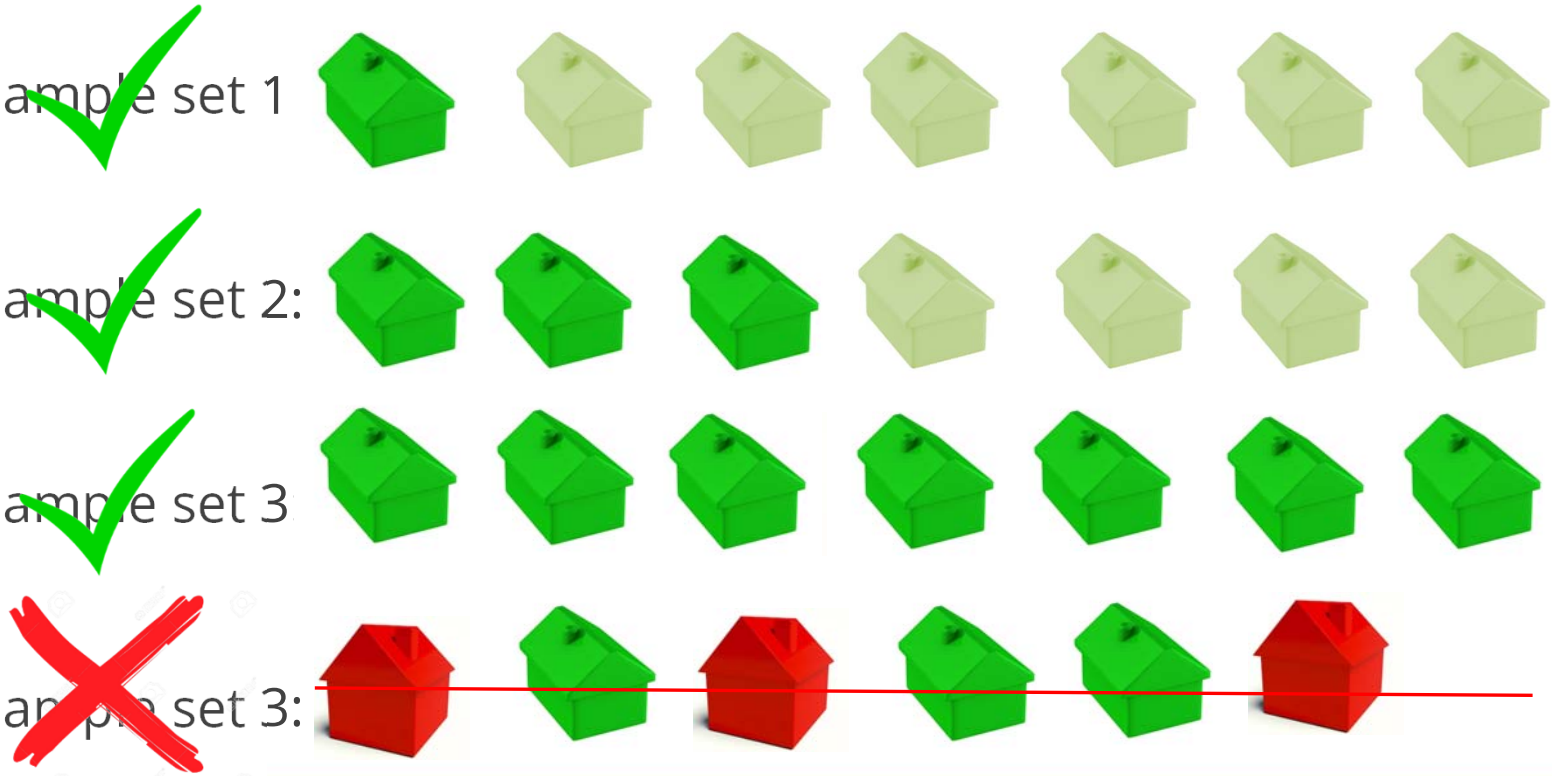


Top 10 QA Findings

- **#9 – Sampling not followed**
  - No additional testing after failures

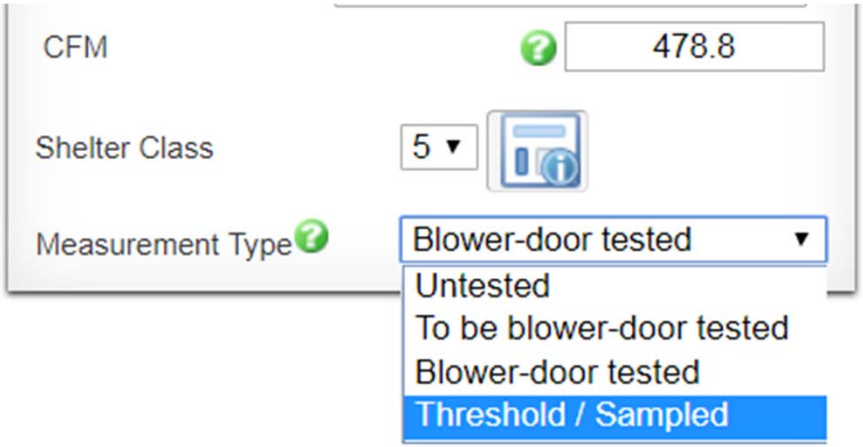


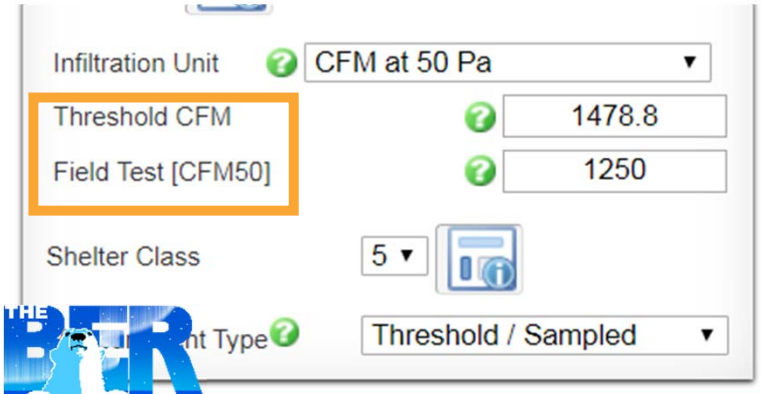
Do NOT put actual values in software files

- All values used in software calculations stay the same
- The tested dwelling in a sample set does not get credit for doing better
- General info is the only thing that changes (e.g. address, rater, dates, sample set ID etc.)

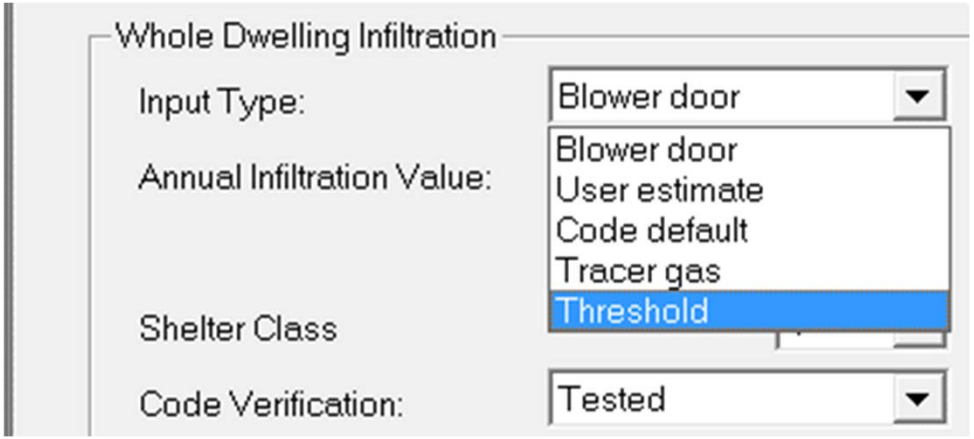
Sampling – Do NOT put actuals in software files…Unless

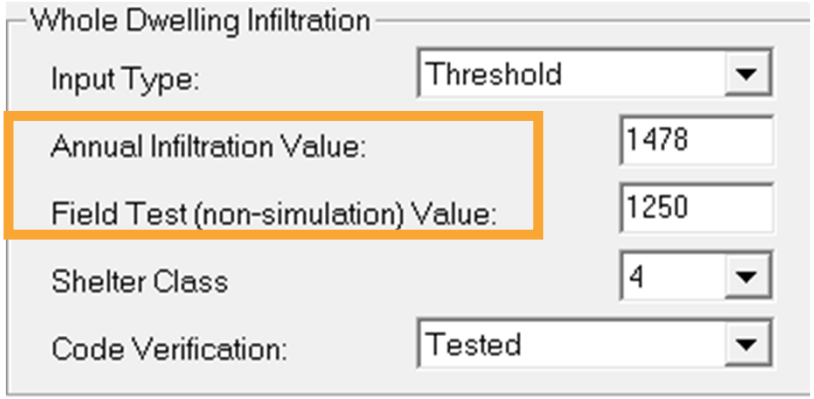
Ekotrope





REM/Rate





#8 – Documentation

Top 10 QA Findings

- **#8 – Documentation not maintained**

903.4.1.3.5 Confirm that paper and/or electronic files, are being maintained and archived by Raters for each rating and/or unique floor plan, including the Rating Software Energy Simulation File and all supporting documentation required to validate the inputs into the rating software file (e.g., architectural drawings, threshold specifications, field data).These files shall be maintained a minimum of three (3) years;

  - This data must be available for minimum of 3 years

QA Rating Data Files

QAD required to collect full list of Rating Data Files for every QA

Quality Assurance Data File (QA Data File)

The collection of data that comprises the complete quality assurance information for a specific Home Energy Rating including take-off forms; field data collection forms; energy simulation files; building plans; RESNET® Standard Disclosure Forms; rating certificates; rating reports; QA records, including findings and the resolution of any issues; photo documentation, as well as any documentation required by Third-Party Energy Efficiency Programs (EEP's) such as checklists, copies of labels or third-party certificates, and the names of each certified individual (i.e. Raters and/or Rating Field Inspectors) who worked on the rating (field inspections, modeling, etc.).

#7 – Foundation Options

Foundation Options

From Below Grade to Walkout

From Basement to Crawlspace

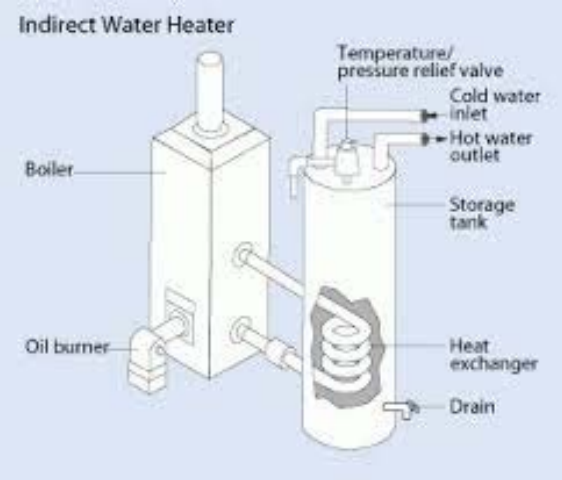
#6 - Incorrect Mechanicals Efficiencies

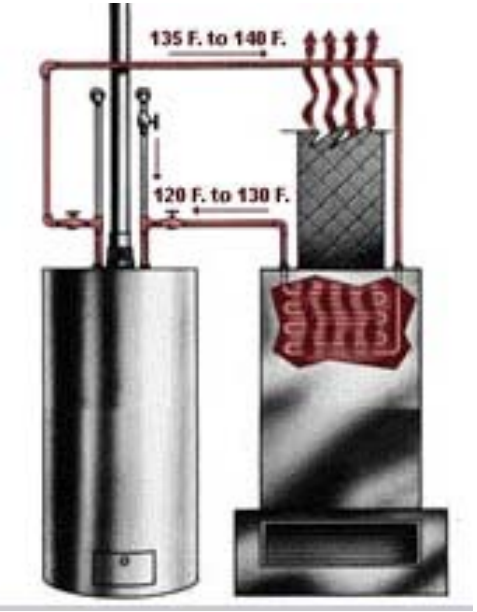
Top 10 QA Findings

- **#6 – Incorrect mechanical system efficiencies**
  - AHRI certs
    - Combo of AC/furnaces
    - Eae entered correctly

Top 10 QA Findings

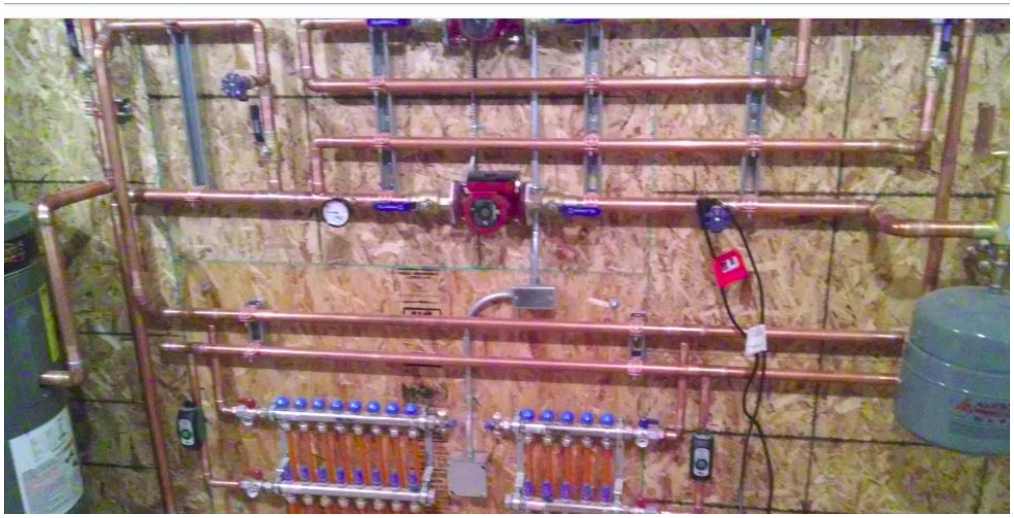
- **#6 – Incorrect mechanical system efficiencies**
  - Special system types
    - “Hydroair”
    - Mini-splits
    - Indirect fired water heater





Top 10 QA Findings

- **#6 – Incorrect mechanical system efficiencies**
  - Unmodeled auxiliary systems



#5 – Duct Properties

Top 10 QA Findings

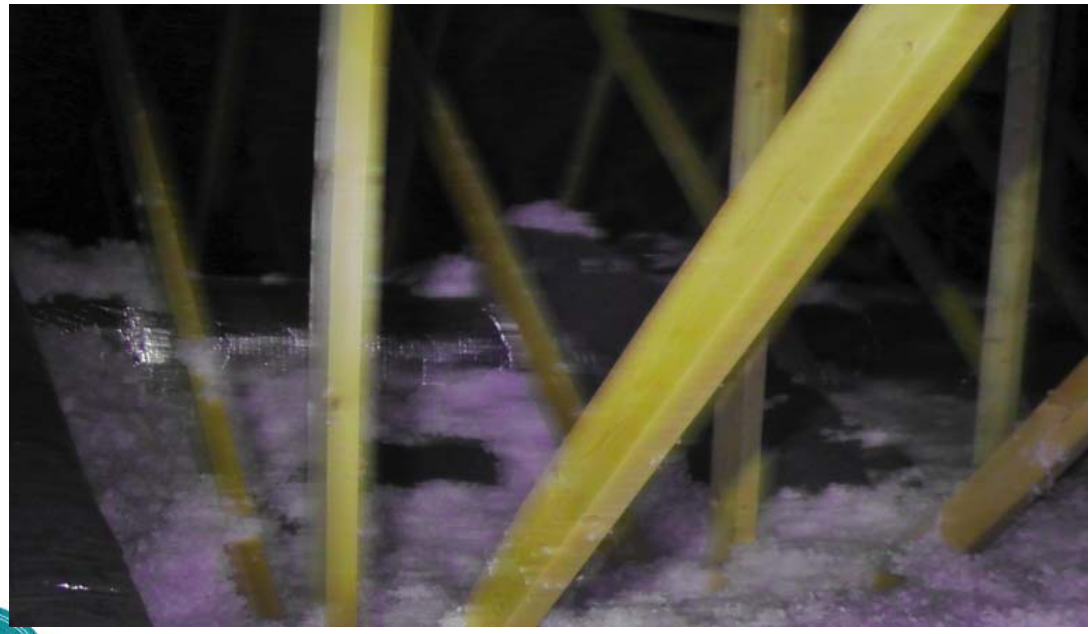
- **#5 – Duct properties incorrect**
  - Ducts in attic are only “under insulation” if 100% buried in insulation

- ***Attic,*** ***Under Insulation*** (***Note the revised input requirements!)*** - ducts located in the attic (vented or Sealed attics),
  - **and** within 5.5" of touching the ceiling sheetrock below,
  - **and** completely buried in blown insulation such that the top of the duct is at least 3.5" below the surface of the attic insulation,
  - **and** the sum of blown insulation R-value touching the duct, above and below the duct, is at least R-19 excluding the duct R-value.
  - When entering duct R-value, use only the insulation fastened to the duct (e.g. duct wrap), not the additional blown insulation. This change has been made to align with the logic in the 2018 IECC, section R403.3.6; the additional criteria of that section (e.g. R-value of blown insulation) are evaluated separately.

  - Multifamily
    - Assumed to be 100% in conditioned space but sometimes put into attics on top floor

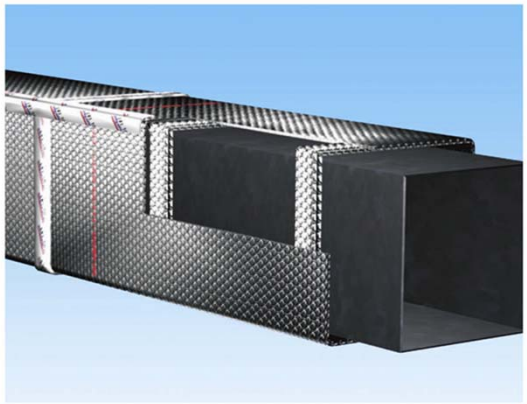
Top 10 QA Findings

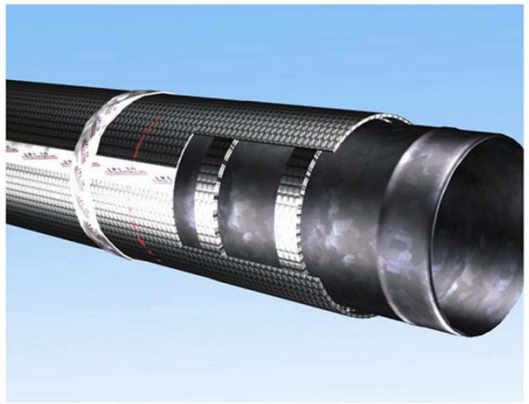
- **#5 – Duct properties incorrect**

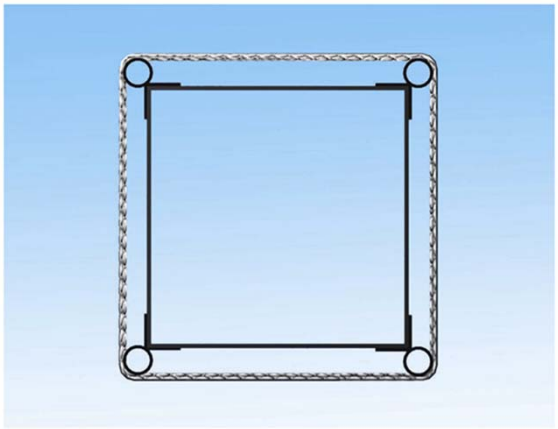


Top 10 QA Findings

- **#5 – Duct properties incorrect**
  - Foil-faced bubble wrap only has full R-value w/ air space







Duct Exemptions

It's more complicated then ever…

- New requirements must be followed by July, 1 2019
- Let's briefly discuss what changes…

Duct Exemptions

What has NOT changed:

Ducts outside conditioned space must still be tested

Ducts may be exempt if:

- Inside conditioned space (infiltration volume)
- Fully ducted (no building cavities used as ducts)

Total leakage may be used as LTO (leakage to outside)

- Only if air handler installed at time of test

Duct Exemptions

It's more complicated then ever...

- What will change:
  - Ducts may be verified at pre-drywall to be inside conditioned space (infiltration volume)
  - Untested ducts inside conditioned space take penalty of 0.88 DSE

More details found in
ANSI/RESNET/ICC 380 - 2019

Duct Exemptions

It's more complicated then ever

- What will change:
  - When Total leakage is input as LTO (e.g. rough testing)
    Single Family Only –
    - Verified at rough to be 100% inside infiltration volume and fully ducted
    - 4% duct leakage (6% with 3+returns)
    - 3.0 ACH50
    - Then 50% of total is input for LTO

Duct Exemptions

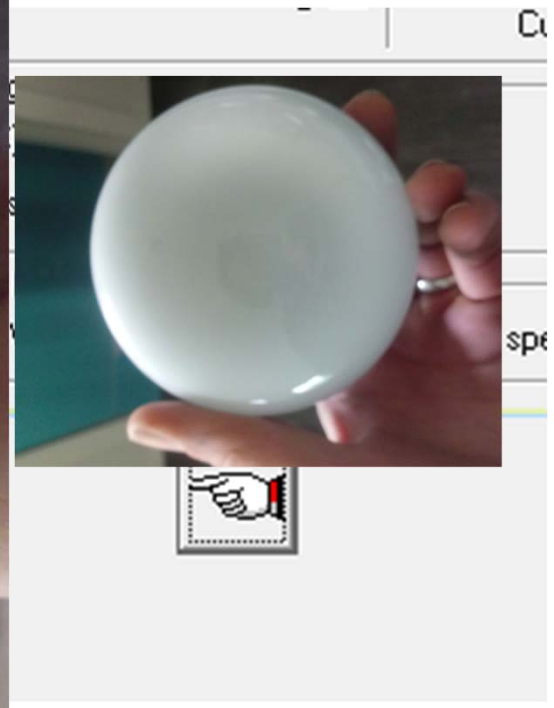
It's more complicated then ever

- What will change:
  - When Total leakage is input as LTO (e.g. rough testing)
    Multtfamily Only–
    - Input rough leakage into LTO
    - Software will pro-rate leakage based on percent location

#4 – Lights and Appliances

Top 10 QA Findings

- **#4 – Lighting and**



- Did you check the

Top 10 QA Findings

Product Type	Current Criteria
El	IMEF ≥ 2.76 IWF ≤ 3.2
El	IMEF ≥ 2.06 IWF ≤ 4.3
El	IMEF ≥ 2.07 IWF ≤ 4.2
ENERGY STAR Commercial Clothes Washers, Front-loading (IMEF= 1.82)	MEF_{J2} ≥ 2.20 IWF ≤ 4.0

Washer Presets: ENERGY STAR

Washer IMEF: 3.060 Elec Rate: 0.1065

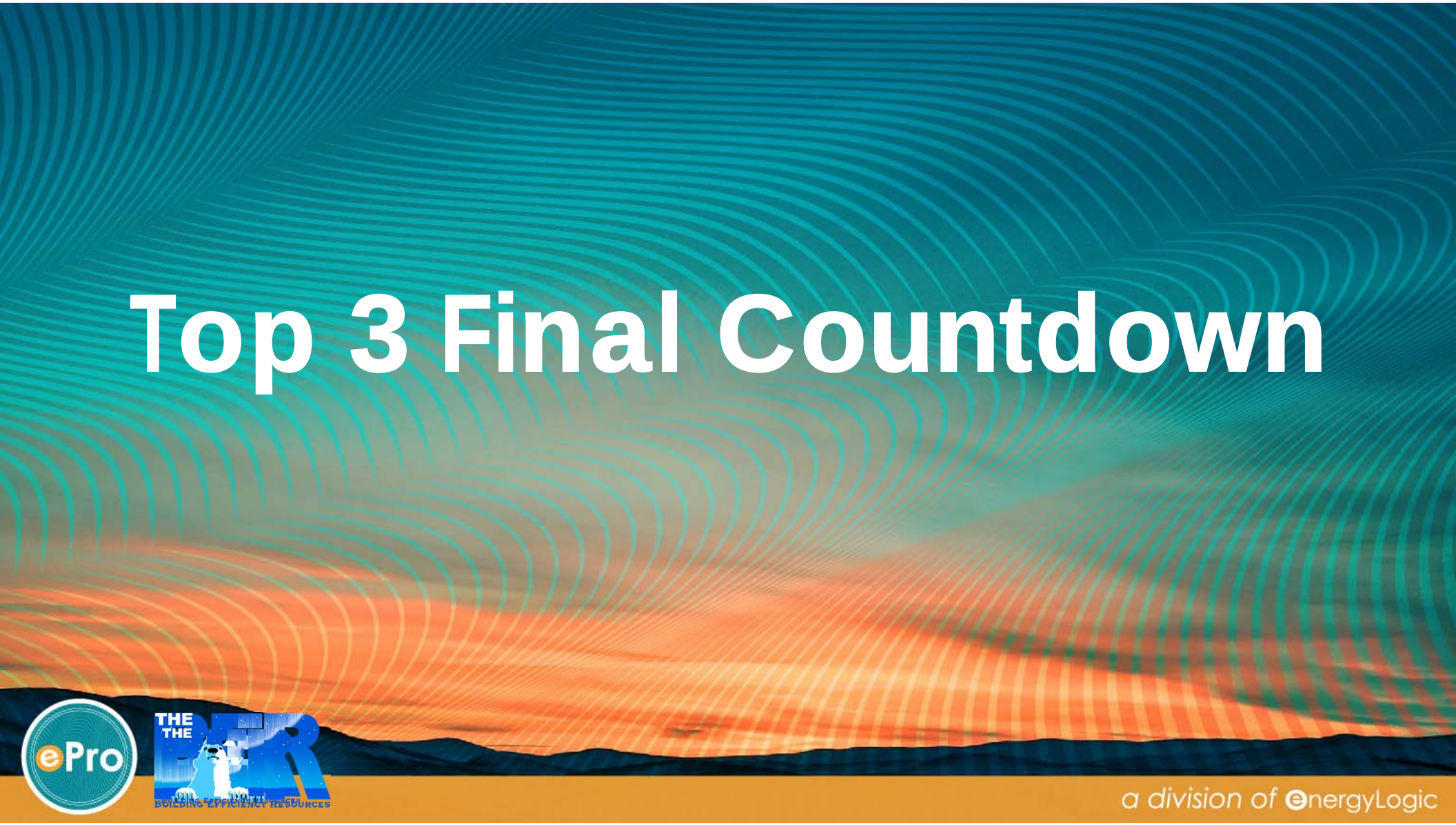
Washer LER: 96 kWh/yr Gas Rate: 1.22

Capacity Cu.Ft.: 3.810 Annual Gas Cost: 11.00

Top 10 QA Findings

- **#4- Lighting and appliances**
- **Other minor appliance issues**
  - Ceiling fan present; not modeled
  - Range fuels; convection present not modeled
  - DW place settings

Top 3 Final Countdown



#3 – Copy Mistakes

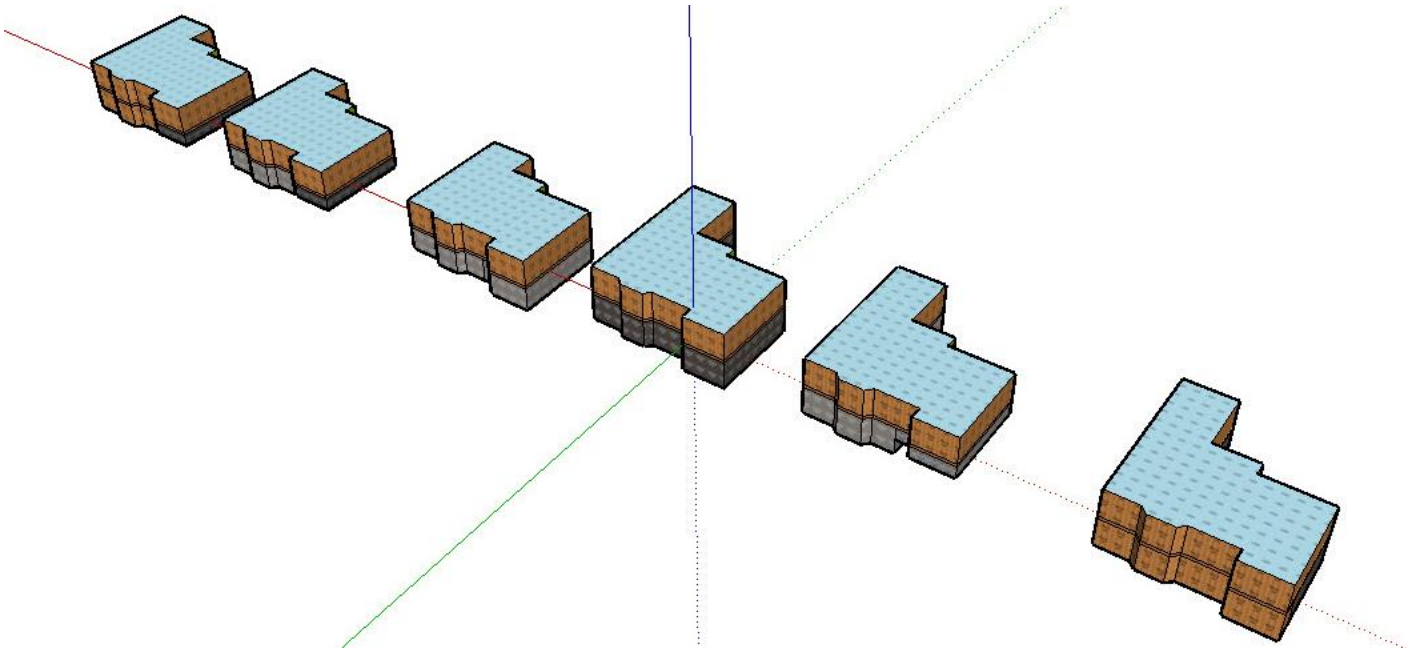
Copy Mistakes

You don't touch it, you still own it

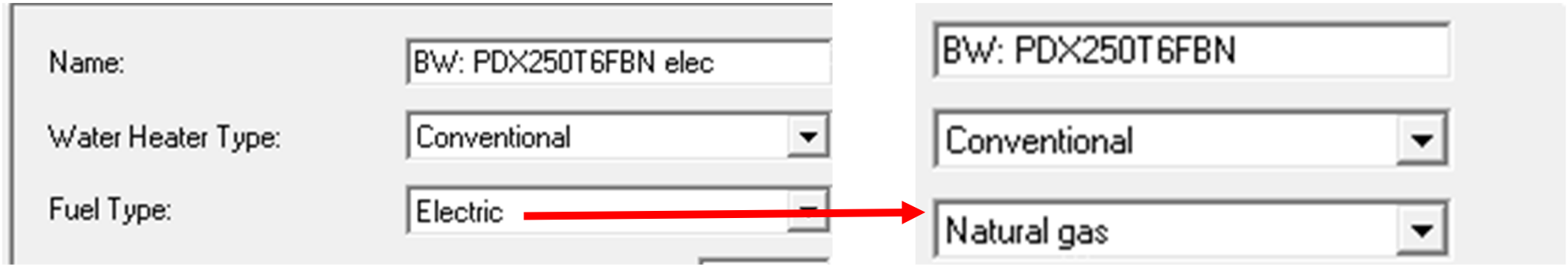
- Copying previous work can save a lot of time
- However, when you get in a hurry you miss things
- Let's look at common copy mistakes

Copy Mistakes

Wrong Templates – choose wisely and verify



Copy Mistake

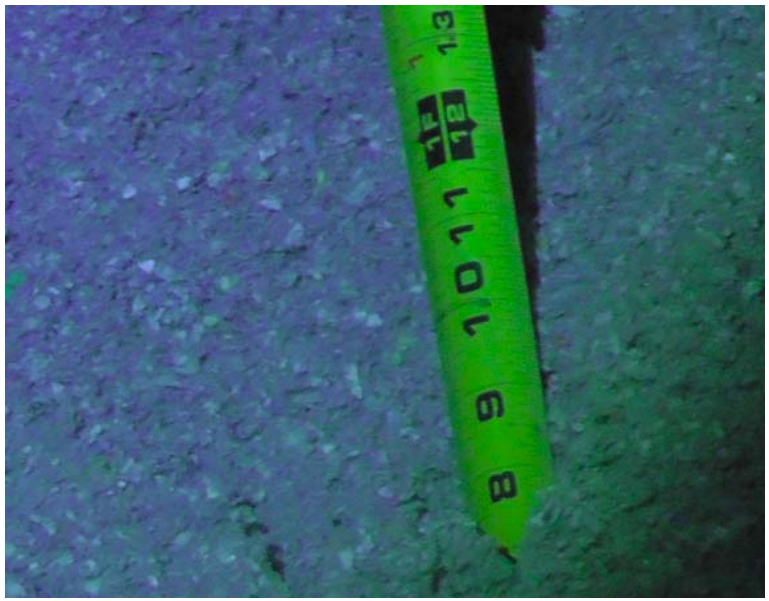


When you copy a water heater and only change fuel type – changes HERS by at least 6 points!

#2 – Insulation Measurement and Grading

Top 10 QA Findings

- **#2 – Insulation measurement / grading**
  - Attic insulation not measured… do you climb that ladder?



Top 10 QA Findings

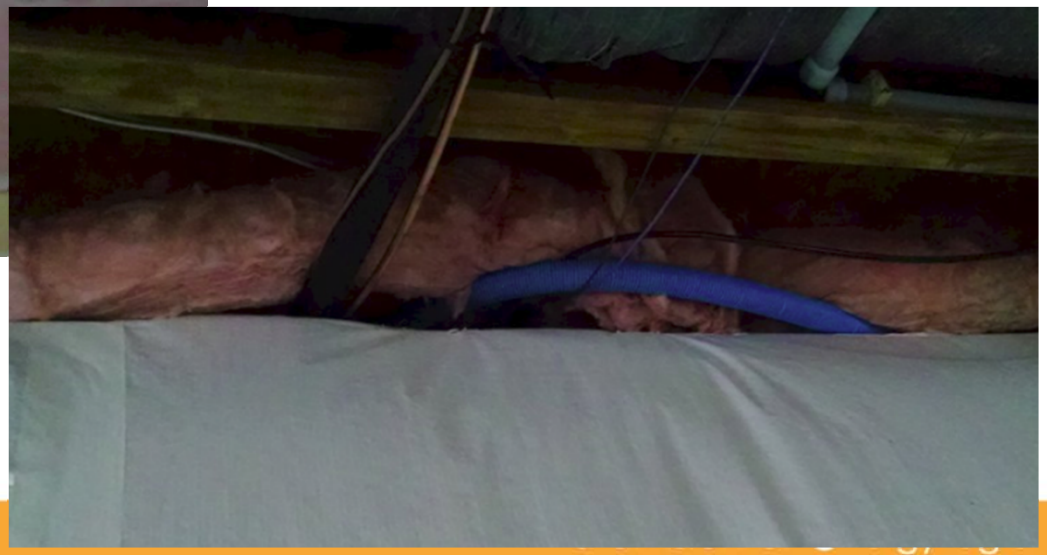
- **#2 – Insulation measurement / grading**
  - Attic insulation not measured… do you climb that ladder?

Top 10 QA Findings

- **#2 – Insulation measurement / grading**
  - Batts & Framed floors = Grade III or worse 80% of the time

Top 10 QA Findings

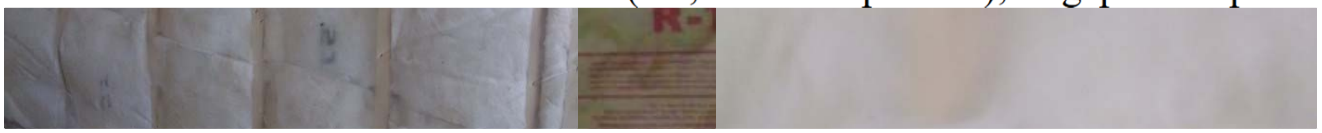
- **#2 – Insulation measurement / grading**
  - Batts in rim/bands rarely GI;



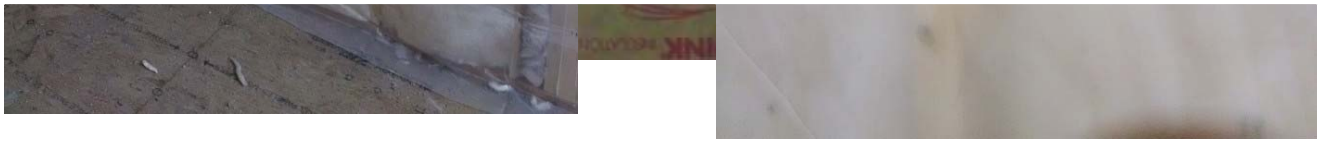
Top 10 QA Findi

- **#2 – In ment A**
  - Batt

2. “Grade II” shall be used to describe an installation with moderate to frequent installation defects: gaps around wiring, electrical outlets, plumbing and other intrusions; rounded edges or “shoulders”; or incomplete fill amounting to less than 10% of the area with 70% or more of the intended thickness (i.e., 30% compressed); or gaps and spaces



Compression or incomplete fill amounting to 2% or less, if the empty spaces are less than 30% of the intended fill thickness, are acceptable for “Grade I”.



Top 10 QA Findings

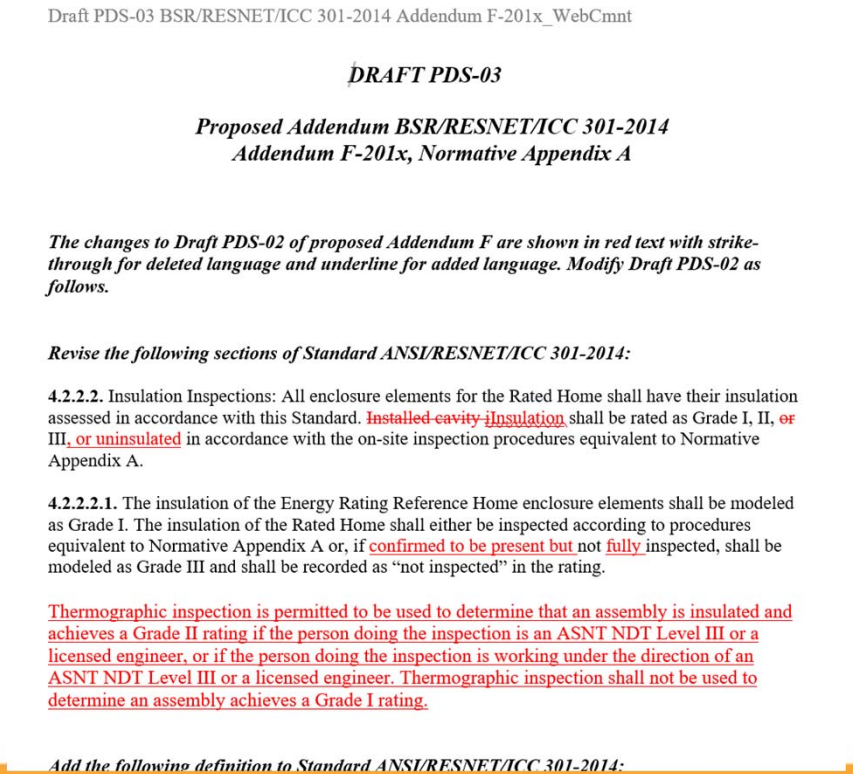
- **#2 – Insulation measurement / grading**
  - Batts in vaulted ceilings must be in full contact w/ drywall to be GI

Top 10 QA Findings

- **#2 – Insulation measurement / grading**
  - Basement blankets; the leaky diaper

Top 10 QA Findings

- **#2 – Insulation measurement / grading**
  - UPDATE: New insulation grading procedures – RESNET 301-2019



Draft PDS-03 BSR/RESNET/ICC 301-2014 Addendum F-201x_WebCmnt

DRAFT PDS-03

Proposed Addendum BSR/RESNET/ICC 301-2014
Addendum F-201x, Normative Appendix A

The changes to Draft PDS-02 of proposed Addendum F are shown in red text with strike-through for deleted language and underline for added language. Modify Draft PDS-02 as follows.

Revise the following sections of Standard ANSI/RESNET/ICC 301-2014:

4.2.2.2. Insulation Inspections: All enclosure elements for the Rated Home shall have their insulation assessed in accordance with this Standard. ~~Installed cavity i~~Insulation shall be rated as Grade I, II, ~~or~~ III, or uninsulated in accordance with the on-site inspection procedures equivalent to Normative Appendix A.

4.2.2.2.1. The insulation of the Energy Rating Reference Home enclosure elements shall be modeled as Grade I. The insulation of the Rated Home shall either be inspected according to procedures equivalent to Normative Appendix A or, if confirmed to be present but not fully inspected, shall be modeled as Grade III and shall be recorded as "not inspected" in the rating.

Thermographic inspection is permitted to be used to determine that an assembly is insulated and achieves a Grade II rating if the person doing the inspection is an ASNT NDT Level III or a licensed engineer, or if the person doing the inspection is working under the direction of an ASNT NDT Level III or a licensed engineer. Thermographic inspection shall not be used to determine an assembly achieves a Grade I rating.

Add the following definition to Standard ANSI/RESNET/ICC 301-2014:

Insulation Measurement and Grading

Measurements

Other examples include:

- Double framed walls not fully insulated/without air barriers
- Spray foam attics skimped
- Ducts in wall and ceiling not furred out fully for insulation requirements

#1...

Mechanical Ventilation

Top 10 QA Findings

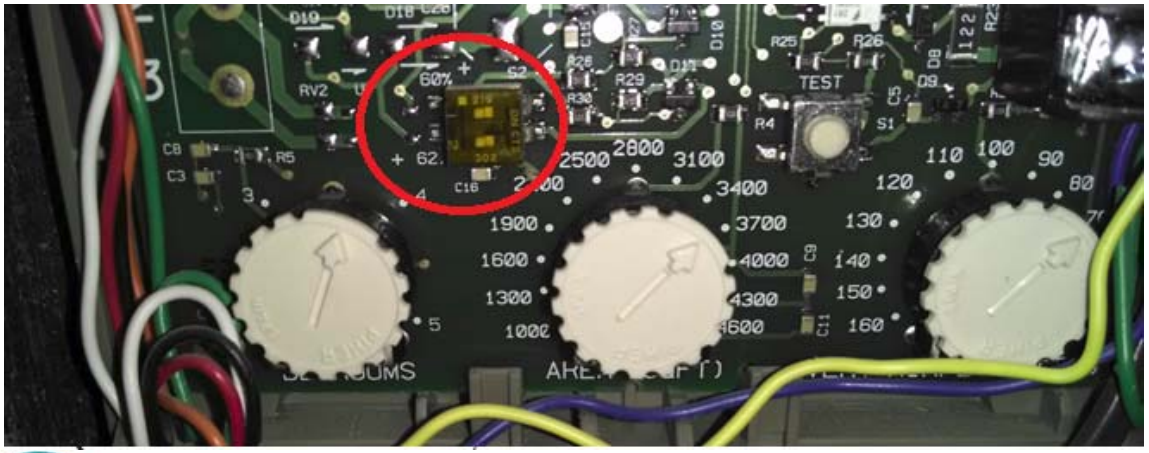
- **#1 – Mechanical ventilation documentation**
  - Modeled, but no controls/continuous system (ie, no ventilation)

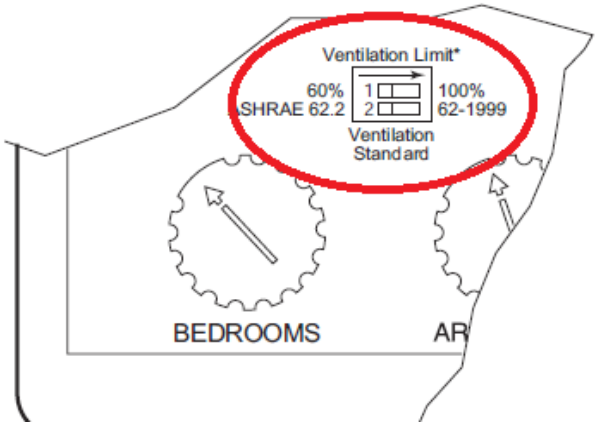
Top 10 QA Findings

- **#1 – Mechanical ventilation documentation**
  - Airflow volume not measured; guesstimated (incorrectly)

Top 10 QA Findings

- **#1 – Mechanical ventilation documentation**
  - Runtime not observed; incorrectly modeled





Top 10 QA Findings

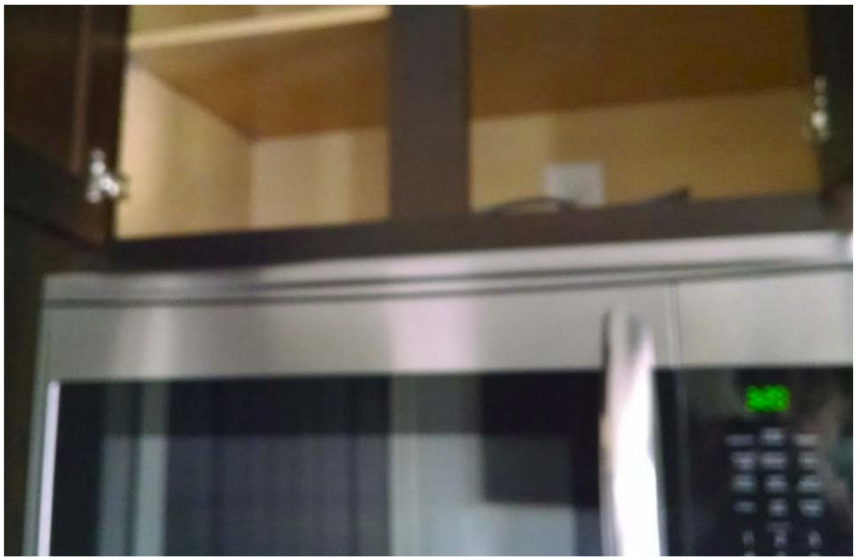
- **#1 – Mechanical ventilation documentation**
  - Wattage incorrect (especially for “AirCyclers”)

Top 10 QA Findings

- **BONUS: ENERGY STAR QA findings**
  - Penetrations not sealed

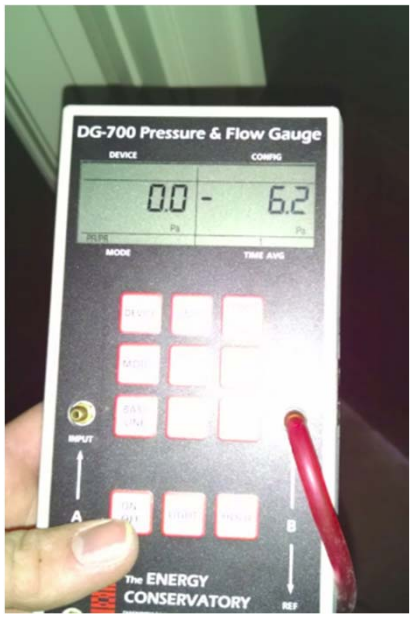
Top 10 QA Findings

- **BONUS: ENERGY STAR QA findings**
  - Kitchen exhaust missing/deficient
  - Bath exhaust underperforms



Top 10 QA Findings

- **BONUS: ENERGY STAR QA findings**
  - HVAC Checklists not collected; systems oversized
  - Other HVAC details missed



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