Session 3, Insulation and Air Sealing Part I
May 5, 2015

Ben Tucker & Jake McAlpine
Minnesota Department of Commerce
Division of Energy Resources
How will the SWS affect:

• SWS Field Guide:
  – Chapter 2. Audits and Inspections
  – Chapter 12. Diagnostic Testing: Building Shell
  – Chapter 3. Weatherization Materials
  – Chapter 4. Attics
Chapter 2. Audits and Inspections

• Language difference
  – In Minnesota ECM has meant:
    • Electronically Commutated Motor
  – When the SWS Field Guide says ECM, it means
    • Energy Conservation Measure
Chapter 2. Audits and Inspections

• Not directly part of the SWS
• Still closely related to SWS
• Standards for Audit and Inspections in:
  – WA Manual (July 1, 2015)
  – Technical Policy Manual (July 1, 2015)
Chapter 2. Audits and Inspections

• Quality Work Plan (SWS & QCI)
• **SWS**: ensures quality work by WAP

• Home Energy Professional (HEP) Certifications
  – Quality Control Inspector (QCI), Auditor (EA), Crew Leader (CL), Retrofit Installer (RI)
  
• **HEP**: ensures WAP roles are filled by qualified personnel that results in a
  – quality Wx process
  – quality work
Chapter 2. Audits and Inspections

Diagram:
- Auditor
- QCI
- Crew Leader
- Retrofit Installer

Arrows indicate the flow of interaction or process between the roles.
Chapter 2. Audits and Inspections

Diagram showing the roles of Auditor, QCI, Crew Leader, and Retrofit Installer.
Chapter 2. Audits and Inspections

- HEPs help ensure work standards are met
Chapter 2. Audits and Inspections

• Auditors
  – Assess what work needs to be done
    • Documentation
    • “The story of the house” - Rodney
  – Communicate work standards
    • Work orders
    • Notes
Chapter 2. Audits and Inspections

The Energy Audit: Categories of Services

- Visual Inspection
- Diagnostic Testing
- Numerical Analysis
Chapter 2. Audits and Inspections

- Quality Control Inspectors (QCI) assess if
  - the right work was called for
  - if the standard was communicated properly
- Were work standard met by contractors/crews
- The Big Differences with QCI Inspection
  - inspecting the process and the work
  - not just the work
  - Auditing the audit
Chapter 2. Audits and Inspections

• Communication & Client Ed.
  – Introduce
  – Explain Program
  – Listen carefully
  – Ask questions
  – Provide a summary
  – Avoid promises
  – Prepare for additional visits
Chapter 2. Audits and Inspections

• Ethics
• How do poor decisions affect
  – The customer
  – The crews, contractors, and inspectors
  – The agency
  – The program
• We are Responsible for our part
  – Outcomes,
    • was the right work done
    • was the work done right
  – Ethics—especially health and safety
  – Positive Communication
Chapter 12. Diagnostic Testing

- HVAC Testing Found in Chapter 8: HVAC
- Building Shell Testing
  - No additional required building shell tests
  - Some will be done differently. I.e.
    - Zones WRT Outside
      - Less variability from baseline changes
- Required tests will be communicated in policy rollout
Chapter 3 Weatherization Materials

• 10 CFR 440 Appendix A
• MN State Plan and policy further defines, i.e.
  – No FG Batts in foundations
  – No Flex Duct for fans and dryers (except when install demands it).
Chapter 3 Weatherization Materials

• How is Air Sealing a durability issue?

• Air Sealing Goals
  – Durability
  – Energy Savings
  – Comfort
Chapter 3 Weatherization Materials

• Indoor Air Quality (IAQ)
• Combustion Safety
  – CAZ
• Fire Safety
  – Air Bypasses can be paths for fire to spread
  – Fire rating of materials is crucial
    • Ignition verses Thermal Barrier
      – Regular Use = Tighter standard
      – Storage verses maintenance in attics and crawlspaces

These are coming straight from the SWS
Chapter 3 Weatherization Materials

• Air Sealing Materials
  – Effectiveness
  – Durability
    • Consider Wind Load
    • Max Span 24”
  – Fire Rating
    • Foam Board: Thermax or equivalent is acceptable
    • Its convenient, but is it the best?
Chapter 3 Weatherization Materials

• Air Sealing Materials
  – Stuffing Materials
    • Backer Rod
    • FG Batts
    • Blown Cellulose/Fiberglass
Chapter 3 Weatherization Materials

• Caulking and Adhesive Materials
• What are they and which are best?
  – Water based
  – Silicone
  – Polyurethane
  – Acoustical
  – Duct mastic
  – Stove Cement
  – Non Combustible caulk
  – Fire-rated Mortor
  – Construction Adhesives
Chapter 3 Weatherization Materials
Chapter 3 Weatherization Materials

• Insulation materials
  – Pressure Boundary alignment, Why?
    • Cold and Wet
    • Windy
Chapter 3 Weatherization Materials

• One Part Vs. Two Part Foam
  – Advantages of one to another
  – Differences
  – Similarities

• Safety
  – Clients
  – Workers
Chapter 4. Attics and Roofs

• Air Sealing Chimneys
  – Fire safety
  – Technique
  – When is it needed
Chapter 4. Attics and Roofs

• Recess Lights
  – Air sealing
  – Fire protection
  – How to handle each Type
    • No Rating
    • IC Rated
    • ICAT Rated
Chapter 4. Attics and Roofs

- Kneewall Bypasses
  - Rigid backer necessary
    - dense pack only not acceptable
  - FG covered in spray foam constitutes a rigid backer
Chapter 4. Attics and Roofs

• Suspended Ceilings
  – Identifying the pressure and thermal boundary
  – The installed product at a ceiling boundary has to be the fire barrier
Chapter 4. Attics and Roofs

• Attic Hatch Requirements
  – Continuous R-Value
  – Gasketed and Air Sealed
  – Insulation Dam has be able to support a person entering the attic (115)
  – Work in progress