



BPI/RESNET Comprehensive Home Energy Audit

ACI New England
October 8, 2008

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Scope (edited)

- 1.1 “This Standard provides the requirements and sets forth the test methods for conducting a comprehensive home energy audit.
- 1.2 “This Standard includes requirements for analyzing the home, testing the home, rating the home, and developing a scope of work for the home.
- 1.3 “The standard is applicable for low rise residential buildings and is applicable to both new and existing homes.”



What’s the scope of the CHEA?

- Focus on what the **certified individual does** in the house and what the **product is**
 - Testing – measurement – analysis
 - Writing work scope
 - The work that gets done is outside the scope of the auditor
 - Work scope includes post-testing



Example:

- “When any work scope is presented to the building owner or occupant, combustion appliance testing shall be conducted both before and after work is completed.”
- Should read:- “When any work scope is presented to the building owner or occupant, combustion appliance testing after work is completed (as required) shall be included in the work scope.”



Summary of Public Comment Draft


- Audit standard is not installation standard
 - Auditor may be a consultant or contractor
- Home Energy Rating following RESNET guidelines for Comprehensive Audit
 - Not entirely consistent within document
- Simplify/clarify combustion testing requirements



Summary (continued)


- Analysis limited by consumption history
 - When available, adjustments/limitations
- Pre- and post-work testing as required
 - Confirmation tests for new construction
- Work scope development
- Disclosure (includes limitations of test conditions)





Scope of work ≠ contract for work

- Must be comprehensive
- May include HP contractor or 3rd party work
- May be adopted, in whole or in part, into a contract (but language stating as package)
- Sponsors/funding partners may require or incentivize any or all
 - Or prescriptive requirements / conditions


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Additional general requirements:


- Homeowner interview / Utility bill/review
- Lighting / appliance inspections
- Inspections of envelope components
- General inspections of mechanical equipment
- Inspections for moisture damage/evidence
- Customer review requirements


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Required tests


- Blower door (per RESNET Standards)
- Duct leakage (per RESNET Standards)
 - Exception when ducts are $\geq 75\%$ inside envelope
 - Pressure pan test all < 3 Pa, average < 1 Pa
- Combustion appliance tests
 - All new and existing
 - Minimal testing required if sealed/power vent specified in work scope

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
Combustion appliance tests


- Gas Leak, CO (per appliance type), Oven, Vent system inspection
- CAZ and Spillage test
 - Optional when work scope includes replacement with (or new home contains) sealed/direct vent
 - With sealed/direct, needed only if large exhaust appliances $> \text{CFM}50$ of home



CAZ and Spillage test


- Exception for **CONFIRMED** isolated zone
 - Meets combustion air requirements using only outdoor air
 - Isolation of CAZ from HVAC pressures (< 2 Pa with AH running)
 - Isolation from house confirmed with blower door (< 5 Pa when house is at 50Pa)
 - Visual confirmation including duct sealing
 - Spillage test under non-depressurization conditions


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Combustion Zone Depressurization Limits

Appliance type	Depress. limit, Pa
Direct-vent or power-vent	50
Pellet stoves with exhaust fans and sealed vents	15
Atmospherically vented oil and gas system (except water heater); oil power burner; fan-assisted (induced-draft) gas; solid fuel-burning other than pellet stoves with exhaust fans and sealed vents	5
Atmospherically vented water heater	2



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Appliance CO limits, maximum



Appliance Type	As measured	Air free
Furnace, boiler, water heater, vented space heater	100 ppm *	400 ppm
Oven	200 ppm	800 ppm

*or original equipment manufacturer's recommended level if specified



Indoor CO limits

NIOSH Personal Exposure Limit (time weighted average)	8 hr	35 ppm
NIOSH Personal Exposure Limit (ceiling)	15 min.	200 ppm



Work scope development:

- The work scope shall include a comprehensive home performance package, including (where applicable):
 - Measures that bring ductwork inside the thermal boundary
 - Upgrades to the building enclosure
 - Baseload reductions (such as efficient lighting and appliances)



Work scope development (cont):

- Water-saving measures
- Cooling load reductions such as shading devices
- Passive or active solar heating or water heating systems
- Measures that meet or exceed applicable state or local codes set forth by the authority with jurisdiction
- Compliance where possible with 2006 IECC for thermal and mechanical systems, or maximum possible upgrade

Work scope development (cont):

- Replacement of equipment with high-efficiency, direct-vent or power vented replacement(s), required when the total cost of repairs to existing equipment (including necessary combustion appliance testing) exceeds cost to replace or upgrade to a higher performance option

Work scope development

- Prioritized by analysis &/or programmatic
- Includes mitigation of pre-existing problems:
 - Moisture, combustion (CO, gas, spillage CAZ, venting)
 - CAZ mitigation exceptions: Spill switch or alarm installation for water heaters
- Requirements for crawl drainage, leaks, electrical components (but outside SOW)



Work scope development

- Mechanical equipment
 - Air flow, duct repair (option for envelope movement)
- Mechanical ventilation complying with 62.2 (4.1)
 - Exemptions per 4.1.3 (very leaky homes)
 - No exhaust only systems when CAZ limits exceeded or are predicted post-work
- Unvented combustion appliances
 - No shell, duct sealing (allow exterior ducts in CZ 1-3)
- CO alarm(s) installed

