



# ENERGY AUDITOR Field Guide

## Exterior

Candidate tested ambient CO outdoors  
Candidate displayed ability to accurately measure the perimeter of the home  
Candidate identified the exterior sheathing material(s)  
Candidate accurately assessed any possibility of lead based paint  
Candidate accurately assessed any existing moisture issues  
Candidate accurately determined roof condition, pitch, materials, and penetrations  
Candidate correctly identified roof exposure and orientation  
Candidate accurately identified condition of any parapet walls, flashing, and drainage  
Candidate completed an exterior inspection of the building

## Interior

Candidate tested ambient CO indoors **(GATED ITEM)**  
Candidate monitored ambient CO levels throughout the building and accurately noted the highest reading  
Properly interpreted measurements  
Candidate correctly determined if the CO levels exceed any applicable action levels **(GATED ITEM)**  
Candidate located existing smoke/CO detectors  
Candidate determined if smoke/CO detectors are hard wired or battery operated  
Candidate identified conditions that could promote the growth of mold  
Candidate identified presence of mold-like substance  
Candidate accurately identified other potential safety concerns  
Candidate completed an interior inspection of the building

## Doors

Candidate displayed ability to accurately measure a door and calculate the surface area  
Candidate accurately identified door type  
Candidate accurately assessed door performance  
Candidate accurately assessed condition of door sweep and weather stripping  
Candidate accurately assessed door hardware condition  
Candidate accurately assessed replacement concerns  
Candidate accurately evaluated repairs needed  
Candidate accurately evaluated the structural integrity of the door and frame

## Windows

Candidate accurately identified window type  
Candidate accurately identified frame material  
Candidate accurately identified glazing type  
Candidate accurately assessed the orientation of the windows and the exterior shading  
Candidate accurately assessed window performance, operation, and general condition  
Candidate accurately assessed replacement concerns  
Candidate accurately evaluated repairs needed  
Candidate accurately evaluated the structural integrity of the window and frame

## Walls

Candidate accurately identified the wall type  
Candidate accurately identified framing method  
Candidate accurately and safely measured cavity depth  
Candidate determined repairs needed and structural integrity of wall(s) to be insulated  
Candidate determined square footage of area to be insulated  
Candidate determined proper insulation levels and identified appropriate insulation to be added  
Candidate determined if pressure plane and thermal boundary are aligned  
Candidate determined if the location of vapor retarder is appropriate

## Attic

Candidate displayed ability to accurately measure existing attic ventilation

Candidate accurately discussed minimum attic ventilation requirements  
Candidate determined existing attic ventilation type  
Candidate measured attic floor area/roof cavities  
Candidate determined repairs needed and structural integrity of attic to be insulated  
Candidate determined proper insulation levels and identified appropriate insulation to be added  
Candidate determined if pressure plane and pressure boundary are aligned  
Candidate discussed the climate-appropriate location of a vapor retarder  
Candidate evaluated attic ventilation

#### **Appliances**

Candidate correctly located and collected manufacturer's data plate information from 2 different appliances  
Candidate determined the need to measure the flow rate on the shower head if not listed  
Candidate demonstrated ability to inspect appliance for watt hour meter accessibility  
Candidate demonstrated ability to use a watt hour meter  
Candidate accurately assessed clothes dryer vent configuration  
Candidate demonstrated ability to interpret data from a watt hour meter  
Candidate discussed the information used to determine potential lighting upgrades  
Candidate discussed methods used to determine the electrical consumption of appliances  
Candidate identified other sources which could contribute to the home's electrical consumption  
Candidate accurately determined water saving opportunities (low flow devices, etc.)

#### **Mechanical Ventilation**

Candidate accurately determined the volume of the affected space  
Candidate accurately determined the type of fan control  
Candidate accurately assessed the condition of the ventilation ductwork  
Candidate accurately compared existing exhaust flow ventilation with rated capacity  
Candidate accurately assessed the need for and placement of additional mechanical ventilation

#### **Foundation/Mechanical Equipment**

Candidate accurately assessed any electrical hazards (open junction boxes, overloaded circuits, etc.)  
Candidate identified sources and signs of moisture  
Candidate accurately identified the foundation type, material, thickness and exposure  
Candidate identified infiltration points and location of plumbing pipes and penetrations  
Candidate determined rim joist/box sill insulation needs  
Candidate determined appropriate insulation location and the need for a vapor barrier  
Candidate accurately determined water heater insulation opportunities  
Candidate accurately determined pipe insulation opportunities  
Candidate accurately determined economics of major appliance replacements (cost effective, feasible, etc.)  
Candidate evaluated the HVAC systems for health and safety concerns  
Candidate correctly identified heating / cooling system types  
Candidate correctly identified basic heating / cooling system operating components  
Candidate completed visual inspection of flue system for problems  
Candidate identified existing heating / cooling system components safety concerns  
Candidate evaluated the distribution system  
Candidate evaluated any available fuel switching opportunities  
Candidate identified duct insulation or hydronic pipe insulation opportunities  
Candidate evaluated basic system controls  
Candidate assessed the possibility for performance enhancements  
Candidate accurately assessed distribution problems  
Candidate identified other components related to the HVAC appliance(s)  
Candidate identified safety features related to the HVAC and domestic water heating appliance

#### **Prepare for the test(s)**

Candidate gathered all necessary equipment to perform the diagnostics  
Candidate disabled combustion appliances until needed  
Candidate verified solid fuel appliances are in the appropriate condition to allow for blower door testing to be performed  
Candidate prepared test equipment for use according to manufacturer's specifications

#### **Combustible Gas Leak Test**

Candidate properly conducted combustion gas leakage testing  
Candidate properly recommended soapy solution to verify positives

### CAZ Test

Candidate set up home for natural conditions  
Proper manometer setup  
Candidate correctly measured baseline pressure differential  
Set up home in worst case condition - **NOT SCOREABLE**  
All exhaust appliances running  
Correct door closures - measured quantitatively or qualitatively  
Air handler operation impact checked  
Candidate correctly measured worst-case CAZ depressurization  
Candidate calculated minimum draft pressure based on existing weather conditions  
Candidate checked for worst case spillage in heating system  
Candidate checked for worst case spillage in DHW  
Candidate correctly identified time limits for spillage based on BPI Standards  
Candidate correctly determined if the appliance passes the spillage test  
Candidate identified what steps should be taken if it does not pass (ask candidate)  
Candidate performed worst case draft test on heating system  
Candidate correctly performed worst case draft test on DHW  
Candidate made appropriate recommendations according to BPI standards (using right table)  
Candidate compared diagnostic results to appropriate table in the BPI standards  
Candidate identified the need for further evaluation when other combustion sources exist

### CO Tests

Candidate measured heating system flue gas CO during combustion safety testing  
Candidate conducted Steady State Efficiency test on heating plant  
Candidate accurately measured heat rise delta T  
Candidate measured DHW flue gas CO during combustion safety testing  
Candidate appropriately applied BPI action levels based on test results for CO in the flue  
Candidate monitored ambient CO levels in the CAZ during entire combustion safety tests (**GATED ITEM**)

### Oven Test

Candidate checked for items, excessive debris inside oven  
Candidate's sampling location appropriate for the oven test  
Candidate appropriately applied BPI action levels based on test results for CO in oven

### Duct Pressurization Test

Candidate set up duct pressurization device (total leakage only) **NOT SCOREABLE**  
Manometer set-up appropriate  
Pressure tap appropriate  
Accurate measurement  
Candidate made duct sealing recommendations  
Demonstrated ability to prioritize repairs  
Appropriate materials selected for repairs  
Appropriate method selected for repair

### Blower Door Test

Candidate set combustion appliances to pilot or disabled them (**GATED ITEM**)  
Candidate properly set-up the blower door frame/shroud/fan  
Candidate properly set-up the manometer  
Candidate properly set-up house for testing  
Candidate correctly measured baseline pressure differential  
Candidate accurately took CFM50 measurement  
Candidate conducted sample room by room inspection with blower door running  
Candidate discussed ventilation needs in relation to ASHRAE 62.2 2010  
Candidate measured zonal pressure differential to one appropriate zone  
Candidate properly interpreted the results