

WMF's Energy Audit Field Guide

Practical reference for energy auditors

Companion to WMF's Walkthrough Manual and WMF's Visual Reference Guide

Measurements • Diagnostics • Safety • Calculations • Documentation

This is a field reference, not a substitute for professional training, current program rules, instrument instructions, or safety protocols.

How to use this guide

The Walkthrough Manual explains where to enter information in WMF. This guide explains what to measure and verify. The Visual Reference Guide illustrates the app screens.

Audience

For auditors with basic training. Advanced diagnostic interpretation and certification procedures are outside this guide.

Important

A green WMF group indicates software entry completion, not a safety clearance, diagnostic pass, code compliance determination, or program approval.

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01 Building science and audit sequence

Start with the house, not the form.

Walkthrough Manual: pp. 7–19, 38–40, 63–64

Identify boundaries

The thermal boundary is the insulation layer; the air boundary controls air leakage; the pressure boundary depends on the test setup. These may not align at knee walls, attics or attached garages.

Heat and moisture

Conduction transfers heat through materials, convection transfers it with air, and radiation transfers heat between surfaces. Air leaks can carry moisture into assemblies.

Practical sequence

Confirm identity and utility; inspect heating and combustion safety; evaluate basement and interior; measure walls and openings; inspect attic; perform authorized diagnostics; review exterior and report.

Unknowns

Record barriers, inaccessible locations and missing data. Never invent measurements to complete a field.

02 Measurements and area calculations

Write the unit with every measurement.

Walkthrough Manual: pp. 14, 28–32, 36–40

Area

Rectangle = length × width. Triangle = base × height ÷ 2. Convert inches to feet before reporting square feet.

Openings

36 × 80 inch door = 20 SF. Two 36 × 60 inch windows = 30 SF total.

Wall area

Gross = length × applicable height. Net = gross – window openings – door openings. Assign openings to the correct wall.

Linear feet

Sills and rim-joist work are often LF. Do not substitute SF for LF.

03 Insulation and R-values

Existing, added and final R are different.

Walkthrough Manual: pp. 16, 30–32, 42, 46

R-value

R-value expresses resistance to heat flow. Identify insulation type, depth, density and condition before estimating.

Depth versus R

For a homogeneous material, approximate $R = \text{inches} \times \text{rated } R/\text{inch}$. The WMF example $6 \times 3.33 \approx R-20$ is illustrative, not a universal conversion.

Document

Record cavity, area, existing depth, estimated existing R, proposed added R and final target separately.

Bag estimates

Verify cellulose bag counts and installed thickness against the actual product coverage chart.

04 Air sealing and thermal boundaries

Describe location and treatment.

Walkthrough Manual: pp. 29–30, 41–43

Common leaks

Attic top plates, plumbing penetrations, wiring holes, chases, rim joists, access hatches and knee-wall transitions.

Before work

Check fire clearances, moisture, electrical and combustion hazards, access limits and required ventilation openings.

Scope

State the area, treatment, quantity, unit and access limitations. Do not seal required vents.

Verification

Review site photographs and confirm intended air boundary continuity.

05 Blower-door testing

Test according to the instrument and program procedure.

Walkthrough Manual: pp. 14, 17, 47

CFM50

Airflow in cubic feet per minute at a 50 Pa pressure difference. A reported reading requires a valid test setup.

Record

Fan/ring configuration, measured CFM, pressure achieved, test condition, date and unusual circumstances.

Units

Pa measures pressure; CFM measures airflow. Pressure signs matter.

Limits

Use current program criteria for interpretation; this guide provides no universal pass/fail threshold.

06 Zonal pressure diagnostics

Record the exact zone and test setup.

Walkthrough Manual: pp. 17, 47

Purpose

ZPD examines pressure relationships between a house, a zone such as an attic or garage, and outdoors.

Document

Zone, doors/hatches open or closed, house reference pressure, zone pressure in Pa and any configuration changes.

Interpret

Results depend on the exact setup and authorized method. Do not infer a pass/fail threshold from an unrelated test.

Example

“Attic ZPD –45 Pa, openings documented” is an example entry, not a judgment.

07 Duct blaster and pressure-pan testing

Related tests, different units.

Walkthrough Manual: pp. 29, 47–48

Duct blaster

Quantifies duct leakage under a specified pressurization or depressurization setup. Record target pressure, flow, masking and whether total leakage or leakage to outdoors was measured.

Pressure pan

Under an appropriate house pressure setup, record pressure in Pa at each tested duct register.

Never substitute

Pressure-pan Pa is not equivalent to duct-blaster leakage CFM.

Not applicable

Use N/A only if the duct-specific procedure does not apply to the actual building.

08 Combustion safety and CAZ

Safety procedures always take priority.

Walkthrough Manual: pp. 20–27

CAZ

Combustion Appliance Zone. Follow authorized baseline and worst-case pressure, spillage, venting and CO testing procedures.

Record

Appliance type, fuel, identifiers, input, venting, pressure, spillage, appliance CO, ambient CO, and outcome per approved protocol.

Escalation

Gas odor, suspected vent failure, hazardous CO or other urgent risks require the organization's stop-work and emergency procedure.

No invented limits

Numeric safety limits vary with the adopted protocol and equipment. Confirm the current requirements.

09 Heating, cooling and domestic hot water

Verify the equipment plate.

Walkthrough Manual: pp. 20–25

Heating

Type, fuel, year, make, model, serial, capacity, distribution, condition and thermostat.

Cooling

Type, location, BTU/h capacity, year and observed condition.

Hot water

Type, fuel, condition and venting where applicable. Record heat-pump water heater installation details against manufacturer instructions.

Photos

Keep clear unit, data plate, venting and DHW images in the applicable slots.

10 Attics and ventilation

Record existing and proposed separately.

Walkthrough Manual: pp. 16, 41–46

Areas

Measure attic floor, slopes, knee walls, gables, Mansard surfaces and accesses as applicable.

Ventilation

NFA is net free area, not gross opening area. Verify actual manufacturer vent ratings and units.

Baffles

Document proper vents, stairs, recessed-light covers and air sealing. Avoid blocking ventilation paths.

Insulation

Verify depth, area, cavity, added R, final target and product coverage.

11 Basements, crawlspaces and moisture

Check moisture before specifying insulation.

Walkthrough Manual: pp. 28–35

Foundation

Record height, height above grade, perimeter, material, conditioned status and moisture observations.

Water

Document bulkhead, standing water, sump, vapor barrier and drainage issues with location-specific photos.

Quantities

Foundation walls and crawl ceilings may be SF; sills LF; air sealing hours.

Safety

Escalate suspect asbestos, structural damage, electrical and combustion hazards.

12 Windows, doors and wall totals

Every opening belongs to a wall.

Walkthrough Manual: pp. 36–40

Windows

Dimensions, quantity, type, glazing, frame, shading, leakage, proposed measure and direction.

Doors

Dimensions, material, storm door, leakage, sweep, weatherstripping and direction.

Wall totals

Enter floor heights and directional lengths, then verify deductions.

Worked example

$(40 + 30 + 40 + 30) \times 16 = 2,240$ SF gross; subtract 30 SF windows and 20 SF doors = 2,190 SF net.

13 Health, safety and documentation

Distinguish observations from client reports.

Walkthrough Manual: pp. 18–19, 23, 33–35, 49–50

Concerns

Record reported comfort and health concerns separately from observed conditions.

Health and safety

Check detectors, exhaust and dryer venting, moisture, suspected hazardous materials and access barriers.

Photos

Check images at full size. A completed slot does not establish clarity.

Unknown versus N/A

N/A means genuinely not applicable, not untested or unknown.

14 Field formulas and conversions

Quick reference; check units first.

Walkthrough Manual: pp. 14, 16, 28, 36–40, 44, 47–48

Area

Rectangle $L \times W$; triangle $B \times H \div 2$; 144 square inches = 1 SF.

Wall

Net wall SF = gross wall SF – opening SF.

Insulation

Approximate R = thickness in inches $\times$ rated R/inch, where applicable.

Diagnostic units

Pa = pressure; CFM = airflow; CFM50 = airflow referenced to 50 Pa; NFA = net free ventilation area.

Other conversions

12 inches = 1 foot; 1 cubic foot = 1,728 cubic inches; BTU/h is a rate of energy transfer.

15 Final review and handoff

Review the deliverable, not just the progress bar.

Walkthrough Manual: pp. 54–64

Before leaving

Confirm identity, utility, measurements, units, photographs, safety issues, and access barriers.

Work order

Check measure descriptions, quantity units, notes and duplicates. Labor hours are not square feet.

Report

Inspect each page and choose the correct report format. Confirm whether required official-form mapping has been verified by your office.

Sharing

Verify recipient, attachment and filename. Opening a share chooser does not send the file.

Retention

Follow employer record-retention and device security procedures. Do not delete saved jobs as a troubleshooting shortcut.