

Creating a Level Planning Field - Making Blower Door & Duct Leakage Testing Consistent Among Raters

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Inspection Equipment

Proposed Amendment: TECH: 2004- 02 – Definition of Standards for Measuring House Tightness

Appendix A, Building Element Air Leakage – Amend as follows;

Building Element: Air leakage

Blower door test	Determine effective leakage area from a blower door test	<p>Use current protocol, such as ANSI/ASTM E-779-87. <u>Use the testing protocol described in ASHRAE Standard 119 Section 5.1, with the modifications described below:</u></p> <p><u>The following protocol shall be followed in preparing the building envelope for testing:</u></p> <ol style="list-style-type: none"> <u>1. Leave all supply registers and return grills open and uncovered.</u> <u>2. Leave all bathroom and kitchen fans open (i.e., in their normal operating condition). Only a permanently installed back draft damper in its normal condition may impede the flow of air.</u> <u>3. Leave any combustion air ducts or louvers to the exterior open. (If a homeowner or builder has sealed them off, open them for the test.)</u> <u>4. Leave any make-up air ducts with in-line dampers (e.g., for large kitchen exhaust fans or combustion air) as-is (unsealed). Only a permanently installed back draft damper or motorized damper, in its normal condition may impede the flow of air.</u> <u>5. Leave the dryer vent as-is, whether or not the dryer is in place during the test. Only a permanently installed back draft damper in its normal condition may impede the flow of air.</u> <u>6. Leave open any outside air duct supplying fresh air for intermittent ventilation systems (including a central-fan-integrated distribution system)</u> <u>7. Operable crawl-space vents, where present, are to be left in the open position.</u> <u>8. Open all interior doors within the conditioned space, including doors to conditioned basements. (Closet doors may be left closed unless the closet contains windows or access to the attic or crawl</u>
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Measuring House Tightness

		<p>space).</p> <ol style="list-style-type: none"> <u>9. Leave louvered openings of a whole-house fan as is. (If there is a seasonal cover in place during the test, leave it in place.)</u> <u>10. Close all doors to the exterior or unconditioned spaces; if any door to the exterior or unconditioned space lacks weather-stripping at testing time, it can be temporarily taped off.</u> <u>11. Close and latch all windows.</u> <u>12. Close chimney dampers.</u> <u>13. Either seal or fill with water plumbing drains with p-traps that may be empty.</u> <u>14. Seal off exterior duct openings to continuously operating fresh-air or exhaust-air ventilation systems (preferably at the exterior envelope).</u> <u>15. Close any adjustable window trickle ventilators and/or adjustable through-the-wall vents.</u> <u>16. If an evaporative cooler has been supplied with a device used to seal openings to the exterior during the winter, that device should be installed for the test.</u>
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1. Leave all supply registers and return grills open and uncovered.



2. Leave all bathroom and kitchen fans open (i.e. their normal operating condition).



3. Leave any combustion air ducts or louvers to the exterior open.





4. Leave any make-up air ducts with in-line dampers (ex. large kitchen exhaust fans) as-is (unsealed).

5. Leave the dryer vent as-is, whether or not the dryer is in place during testing.



6. Leave open any outside air duct supplying fresh air for intermittent ventilation systems.





7. Operable crawl-space vents, where present, are to be left in the open position.



8. Open all interior doors within conditioned space, including doors to conditioned basements.



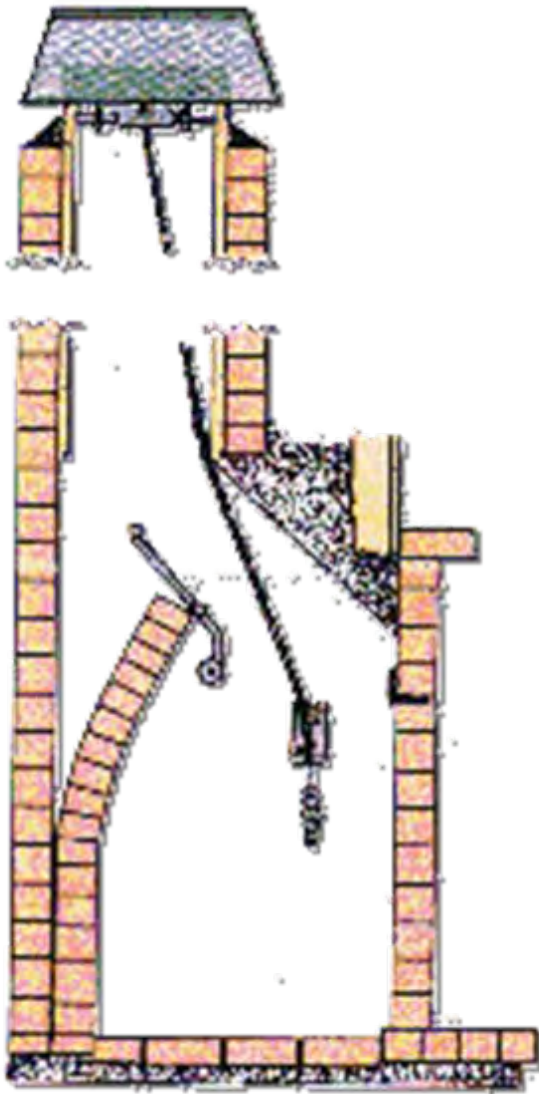
9. Leave louvered openings of a whole-house fan as-is. (If there is a seasonal cover in place during the test, leave it in place.)



10. Close all doors to the exterior or unconditioned spaces; if any door to the exterior lacks weather stripping at test time, temporarily tape-off.

11. Close and latch all windows.

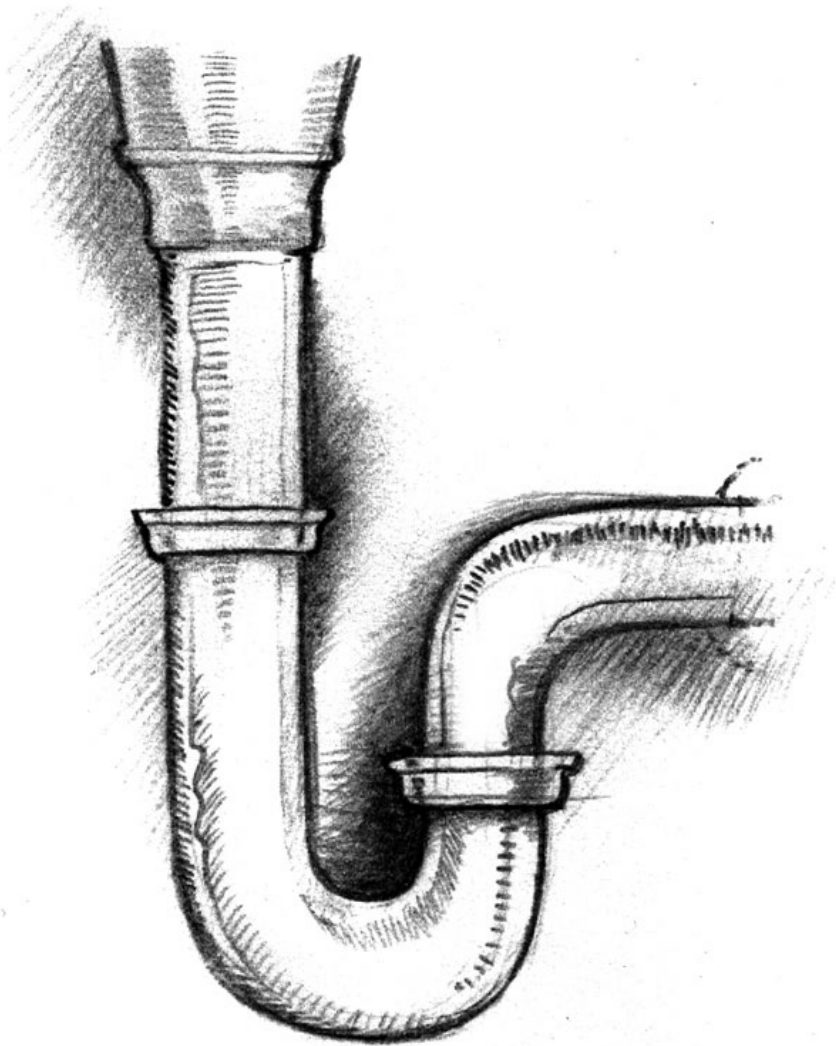




12. Close chimney dampers.



13. Either seal or fill with water plumbing drains with p-traps that may be empty.





14. Seal off exterior duct openings to continuously operating fresh-air or exhaust-air ventilation systems (preferable at the exterior envelope).



15. Close any adjustable window trickle ventilators and/or adjustable through-the-wall vents.

16. If an evaporative cooler has been supplied with a device used to seal openings to the exterior during winter, that device should be installed for the test.



If the preceding protocol is followed, the building envelope will be ready for testing.

Blower Door Test Procedures:

Once the building envelope has been prepared, testing may proceed.

Proposed Amendment TECH: 2004- 03 – Blower Door Test Procedures

Appendix A: Building Element: Air Leakage – Amend as follows:

Building Element: Air leakage		
Rated Feature	Task	On-Site Inspection Protocol
Blower door test	Determine effective leakage area from a blower door test	<p>Use the testing protocol described in ASHRAE Standard 119 Section 5.1. Blower door and associated pressure testing instruments, which include but are not limited to hoses, and Manometers, gauges and fans shall be field tested annually for calibration by the HERS provider or rater. The provider shall use a standard for field testing of calibration provided by the equipment manufacturer. Magnehelic Gauges cannot be field tested and shall be recalibrated by the Blower Door manufacturer annually. Field check the fan and flow measuring systems for defects and maintain them according to manufacturers recommendations</p> <p>The HERS provider shall maintain a written log of the annual calibration check to verify all equipment accuracy for a period of three (3) years. These records shall be made available within 24 hours to a RESNET Quality Assurance Committee member upon request. It is recommended all pressure equipment be field checked for calibration more frequently than is required in these standards, i.e., monthly, quarterly, etc.</p>

Blower Door Test Procedures On-Site Inspection Protocol



Blower door and associated pressure testing instruments, which include, but are not limited to hoses, manometers, gauges and fans shall be field tested annually for calibration by the HERS Provider or Rater.

Magnehelic
Gauges **cannot
be field tested**
and must be
recalibrated by
the Blower Door
manufacturer
annually.



Field check the fan and flow measuring systems for defects and maintain them according to manufacturer's recommendations.



Fan Maintenance

- Examine your motor cooling holes for excessive dust build-up. Use a vacuum with a brush attachment to remove dust.
- Inspect housing, blades and guards. Especially note clearance of blade tips relative to the fan housing. There should be about 1/2 inch of clearance.



Calibration

Blower Door fans generally maintain their calibration unless physical damage occurs. Conditions which could cause your fan calibration to change are primarily damaged flow sensors and movement of the motor and blades relative to the fan housing. These conditions are easily detected and should be tested for regularly.



The HERS Provider must maintain a written log of the annual calibration check to verify all equipment accuracy for a period of three years.

FIELD MANOMETER CALIBRATION CHECK LIST – MONTHLY
HOUSTON / DALLAS FT. WORTH
(Includes Blower Door and Duct Blaster Fan sensor checks)

> Technician - _____
> City - _____
> Vehicle Number - _____
> Manometer serial number - _____

Gauge Calibration Check

* High Range (2000 pa) @ "A" side reference

+ 500 5 pa (1%) - Y ___ N ___ (result if no ___)

+ 180 2 pa (2 counts) - Y ___ N ___ (result if no ___)

* Low Range (200.0 pa) @ "A" side reference

+ 180.0 1.8 pa (1%) - Y ___ N ___ (result if no ___)

+ 15.0 0.2 pa (2 counts) - Y ___ N ___ (result if no ___)

* High Range (2000 pa) @ "A" side input (standard stays on "A" reference)

- 500 5 pa (1%) - Y ___ N ___ (result if no ___)

- 180 2 pa (2 counts) - Y ___ N ___ (result if no ___)

* Low Range (200.0 pa) @ "A" side input (standard stays on "A" reference)

- 180.0 1.8 pa (1%) - Y ___ N ___ (result if no ___)

- 15.0 0.2 pa (2 counts) - Y ___ N ___ (result if no ___)



Surface Area: Procedures for Measuring Floor Dimensions

ANSI®
Z765-1996

American National Standard
for Single-Family Residential Buildings

**Square Footage –
Method for Calculating**



Secretariat
NAHB Research Center, Inc.

Approved April 8, 1996
American National Standards Institute, Inc.

Square Footage



Calculation of square footage is with **exterior dimensions**.

AMERICAN NATIONAL STANDARD

ANSI Z765-1996

American National Standard
for Single-Family Residential Buildings –

Square Footage – Method for Calculating

1 Scope and purpose

1.1 Scope

This standard describes the procedures to be followed in measuring and calculating the square footage of detached and attached single-family houses.

1.2 Purpose

It is the purpose of this standard to describe a method of measurement that will make it possible to obtain accurate and reproducible measurements of square footage in single-family houses.

2 Definitions

2.1 attached single-family house: A house that has its own roof and foundation, is separated from other houses by dividing walls that extend from roof to foundation, and does not share utility services with adjoining houses; may be known as a townhouse, rowhouse, or duplex for example.

2.2 detached single-family house: A house that has open space on all its sides.

2.3 finished area: An enclosed area in a house that is suitable for year-round use, embodying walls, floors, and ceilings that are similar to the rest of the house.

2.4 garage: A structure intended for the storage of automobiles and other vehicles.

2.5 grade: The ground level at the perimeter of the exterior finished surface of a house.

2.6 level: Areas of the house that are vertically within 2 feet of the same horizontal plane.

2.7 square footage: An area of a house that is measured and calculated in accordance with the standard. When employing Metric or Standard International (SI) measurement units, the term *floor area* is used in place of *square footage*.

2.8 unfinished area: Sections of a house that do not meet the criteria of *finished area*.

3 Calculation of square footage

To claim adherence to this standard, the following methods of measurement and calculation must be employed when quantifying square footage in single-family houses. When using English measurement units, the house is measured to the nearest inch or tenth of a foot; the final square footage is reported to the nearest whole square foot. When using Metric or Standard International (SI) measurement units, the house is measured to the nearest 0.01 meter; the final floor area is reported to the nearest 0.1 square meter.

Calculation of square footage made by using exterior dimensions but without an inspection of the interior spaces is allowed but must be stated as such when reporting the result of the calculation. Calculation of square footage for a proposed house made by using plans must be stated as such when reporting the result of the calculation.

For detached single-family houses, the finished square footage of each level is the sum of finished areas on that level measured at floor level to the exterior finished surface of the outside walls. For attached single-family houses, the finished square footage of each level is the sum of the finished areas on that level measured at floor level to the exterior finished surface of the outside wall or from the centerlines between houses, where appropriate. Where finished and

Surface Area: Procedures for Measuring Floor Dimensions

Measure floor dimensions in accordance with **ANSI-Z765-1996** with the exception of Section 3 Paragraph 6 (floor areas with ceiling heights of less than 5' will be included in the finished square footage).

**For conditioned basements and crawl spaces, find dimensions of basement walls and floor. Divide walls into above and below grade sections.*

Questions?