



# CITY OF AMARILLO

## DEPARTMENT OF BUILDING SAFETY

TO: Department of Building Safety Customers

SUBJECT: **INFORMATIONAL BULLETIN 14-01**  
**This bulletin outlines technical features primarily relating to indoor air quality and mechanical systems for one and two family dwellings.**

DATE: June 20, 2014

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The Department of Building Safety has developed this Informational Bulletin to describe and clarify some of the requirements for the energy efficiency in new homes. These provisions directly affect indoor air quality and the mechanical systems resulting in energy consumption.

Changes in state and federal regulations have enhanced the energy efficiency requirements for buildings in Texas. Amarillo standards are aligned and will provide long term savings to our citizens and business owners.

Texas leads the nation in energy consumption and is the fifth largest energy consumer in the world. Buildings account for almost 40 percent of the state's total energy use and 70 percent of electricity use, representing a significant opportunity for energy savings. New construction is the most cost-effective point in the life of a building to establish energy efficiency elements.<sup>1</sup>

Effective January 1, 2012, the Texas State Energy Conservation Office adopted the 2009 International Residential Code (Chapter 11) as the state-mandated energy code for all residential construction, one- and two-family residences of three stories or less above grade. The 26 counties of the Texas Panhandle region constitutes 10 percent of the land mass of Texas. The majority of the Panhandle is in a distinct climate zone which crosses the Central United States and impacts similar climates such as Oklahoma, New Mexico, and Arizona. The following bullets highlight the significant requirements of the energy code.

### **Energy Efficiency Requirements 2012 International Residential Code (IRC)**

#### **Effective October 1, 2014:**

- ✓ One & Two family dwelling units must include load calculations for mechanical systems (Manual J, Manual D, and Manual S, or equivalent)
- ✓ Mechanical Ventilation required.

#### **Effective August 1, 2014:**

- ✓ Mechanical Final Inspection includes requirement for "Duct Tightness Test" documentation.
- ✓ Building Final Inspection includes requirement for "Blower Door Test" documentation.

#### I. *Load Calculation Submittal (J, D, & S)*

##### Chapter 14 - Heating and Cooling Equipment and Appliances - SECTION M1401 GENERAL M1401.1 Installation.

Heating and cooling *equipment* and *appliances* shall be installed in accordance with the manufacturer's installation instructions and the requirements of this code.

M1401.3 Sizing.

Heating and cooling *equipment and appliances* shall be sized in accordance with ACCA Manual S based on building loads calculated in accordance with ACCA Manual J or other *approved* heating and cooling calculation methodologies.

- II. *Whole-house Mechanical Ventilation*: Energy Code requirements in this *Climate Zone (4B)* is 3 air changes per hour, as such whole-house mechanical ventilation is required.

**R303.4 Mechanical ventilation.**

Where the air infiltration rate of a dwelling unit is less than 5 air changes per hour when tested with a blower door at a pressure of 0.2 inch w.c (50 Pa) in accordance with Section N1102.4.1.2, the dwelling unit shall be provided with whole-house mechanical ventilation in accordance with Section M1507.3.

**M1507.3 Whole-house mechanical ventilation system.** Whole-house mechanical ventilation systems shall be designed in accordance with Sections M1507.3.1 through M1507.3.3.

**M1507.3.1 System design.**

The whole-house ventilation system shall consist of one or more supply or exhaust fans, or a combination of such, and associated ducts and controls. Local exhaust or supply fans are permitted to serve as such a system. Outdoor air ducts connected to the return side of an air handler shall be considered to provide supply ventilation.

**M1507.3.2 System controls.**

The whole-house mechanical ventilation system shall be provided with controls that enable manual override.

**M1507.3.3 Mechanical ventilation rate.**

The whole-house mechanical ventilation system shall provide outdoor air at a continuous rate of not less than that determined in accordance with Table M1507.3.3(1).

**Exception:** The whole-house mechanical ventilation system is permitted to operate intermittently where the system has controls that enable operation for not less than 25-percent of each 4-hour segment and the ventilation rate prescribed in Table M1507.3.3 (1) is multiplied by the factor determined in accordance with Table M1507.3.3 (2).

TABLE M1507.3.3(1) CONTINUOUS WHOLE-HOUSE MECHANICAL VENTILATION SYSTEM AIRFLOW RATE REQUIREMENTS					
DWELLING UNIT FLOOR AREA (square feet)	NUMBER OF BEDROOMS				
	0 - 1	2 - 3	4 - 5	6 - 7	> 7
	Airflow in CFM				
< 1,500	30	45	60	75	90
1,501 - 3,000	45	60	75	90	105
3,001 - 4,500	60	75	90	105	120
4,501 - 6,000	75	90	105	120	135
6,001 - 7,500	90	105	120	135	150
> 7,500	105	120	135	150	165

For SI: 1 square foot = 0.0929 m<sup>2</sup>, 1 cubic foot per minute = 0.0004719 m<sup>3</sup>/s.

TABLE M1507.3.3(2) INTERMITTENT WHOLE-HOUSE MECHANICAL VENTILATION RATE FACTORS <sup>a, b</sup>						
RUN-TIME PERCENTAGE IN EACH 4-HOUR SEGMENT	25%	33%	50%	66%	75%	100%
Factor <sup>a</sup>	4	3	2	1.5	1.3	1.0

a. For ventilation system run time values between those given, the factors are permitted to be determined by interpolation.

b. Extrapolation beyond the table is prohibited

- III. *Duct Tightness Test*: Mechanical final inspection required to have documentation that the Duct tightness test has been performed. Failure to provide this documentation will result in an unapproved final inspection. This test shall be performed by a person that meets the requirements of IRC Sec. N1103.2.2, as amended.

*“Duct testing to be done by a company/person who is certified...” (See N1103.2.2 below)*

Chapter 11 - Energy Efficiency

SECTION N1102 – BUILDING THERMAL ENVELOPE

**N1102.4.1.2 (R402.4.1.2) Testing.**

The building or dwelling unit shall be tested and verified as having an air leakage rate of not exceeding ~~5~~ **air changes per hour in Zones 1 and 2, and 3 air changes per hour in Zones 3 through 8**. Testing shall be conducted with a blower door at a pressure of 0.2 inches w.g. (50 Pascals). Where required by the *building official*, testing shall be conducted by an *approved* third party. A written report of the results of the test shall be signed by the party conducting the test and provided to the *building official*. Testing shall be performed at any time after creation of all penetrations of the *building thermal envelope*.

During testing:

1. Exterior windows and doors, fireplace and stove doors shall be closed, but not sealed, beyond the intended weatherstripping or other infiltration control measures;
2. Dampers including exhaust, intake, makeup air, backdraft and flue dampers shall be closed, but not sealed beyond intended infiltration control measures;
3. Interior doors, if installed at the time of the test, shall be open;
4. Exterior doors for continuous ventilation systems and heat recovery ventilators shall be closed and sealed;
5. Heating and cooling systems, if installed at the time of the test, shall be turned off; and
6. Supply and return registers, if installed at the time of the test, shall be fully open.

- IV. *Blower Door Test*: Building Final Inspection includes requirement for “blower door” documentation.

SECTION N1103 SYSTEMS

**N1103.2.2 (R403.2.2) Sealing (Mandatory).**

Duct tightness shall be verified by either of the following:

1. **Postconstruction test: Total leakage shall be less than or equal to 4 cfm (113.3 L/min) per 100 square feet** (9.29 m<sup>2</sup>) of conditioned floor area when tested at a pressure differential of 0.1 inches w.g. (25 Pa) across the entire system, including the manufacturer’s air handler enclosure. All register boots shall be taped or otherwise sealed during the test.
2. **Rough-in test: Total leakage shall be less than or equal to 4 cfm (113.3 L/min) per 100 ft<sup>2</sup>** (9.29 m<sup>2</sup>) of conditioned floor area when tested at a pressure differential of 0.1 inches w.g. (25 Pa) across the system, including the manufacturer’s air handler enclosure. All registers shall be taped or otherwise sealed during the test. If the air handler is not installed at the time of the test, total leakage shall be less than or equal to 3 cfm (85 L/min) per 100 square feet (9.29 m<sup>2</sup>) of conditioned floor area.

**Exception:** The total leakage test is not required for ducts and air handlers located entirely within the building thermal envelope.

Duct testing to be done by a company/person who is certified by a recognized accreditation organization and their equipment be recertified on an annual basis. Contractors who choose not to attain the required certification or use the proper testing tools will be required to engage the services of a certified tester.

Energy cost savings for Texas resulting from the state updating its commercial and residential building energy codes in accordance with federal law are significant, estimated to be on the order of nearly \$1 billion annually by 2030.<sup>2</sup>

1. Texas State Energy Conservation Office. 2. US Department of Energy.