



# COMMUNITY DEVELOPMENT

## MEMORANDUM

**Date: 05/20/2019**

**To: Mayor and Council**

**From: Amy Palmer, Building Official**

**Subject: Requested information for 2018 Building Code Adoption**

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Mayor and Council,

This memo is being provided in response to Councilmember Odegaard's request for additional information on three items from the 2018 Building Code Adoption work session on May 14, 2019.

### **1. IEBC snow loads**

For compliance to IEBC 405.2.4 "Substantial structural damage to gravity load-carrying components", the Building Safety Program would require an Arizona Registered Design Professional (i.e., architect or structural engineer) to perform an assessment of the damage and provide a recommendation as to the extent of repair and/or replacement of the structural element(s). Where they have been determined to have sustained "substantial structural damage" as defined in the IEBC (see below), the repairs and/or replacements are, per this IEBC section, required to be in accordance with the "applicable provisions for dead and live loads in the International Building Code" and "snow loads shall be considered if the substantial structural damage was caused by or related to snow load effects".

Definition of "Substantial Structural Damage". A condition where any of the following apply:

1. The vertical elements of the lateral force-resisting have suffered damage such that the lateral load-carrying capacity of any story in any horizontal

direction has been reduced by more than 33 percent from its pre-damage condition.

2. The capacity of any vertical component carrying gravity load, or any group of such components, that has a tributary area more than 30 percent of the total area of the structure’s floor(s) and roof(s) has been reduced by 20 percent from its pre-damage condition, and the remaining capacity of such affected elements, with respect to all dead and live loads, is less than 75 percent of that required by the International Building Code for new buildings of similar structure, purpose and location.
3. The capacity of any structural component carrying snow load, or any group of such components, that supports more than 30 percent of the roof area of similar construction has been reduced more than 20 percent from its pre-damage condition, and the remaining capacity with respect to dead, live and snow loads is less than 75 percent of that required by the International Building Code for new buildings of similar structure, purpose and location.

## 2. Coconino County comparison

Below is the revised Cost/Savings Table slide that includes Coconino County requirements. We have also included a column indicating whether the provision is included in the 2018 model codes, or if it is an ‘above-code’ provision, meaning that the provision asks for more than the model code requires.

### Commercial Costs for Energy Provisions

City Requirement	Cost	County Required?	Included in Model Code?
EV-Ready Parking	\$2050 - \$11,000	NO	Above Model
Solar-ready	\$1000 +	NO	Above
	<b>\$3050 - \$12,000+</b>		

### Residential Costs for Energy Provisions

Solar-ready	\$150 - \$300	YES	Above
Blower door testing	\$300 – \$500	NO	Model code
Duct testing	\$200 - \$250	NO	Model code
Circulation pump	\$350 – \$500	YES*	Model code
EV Charging	\$300 – \$500	NO	Above
	<b>\$1300 - \$2050</b>		

\*County is currently requiring as 2012 IECC is adopted

**Residential  
“Seismic” Savings  
\$11,950 - \$2,050 =  
\$9,900  
net savings**

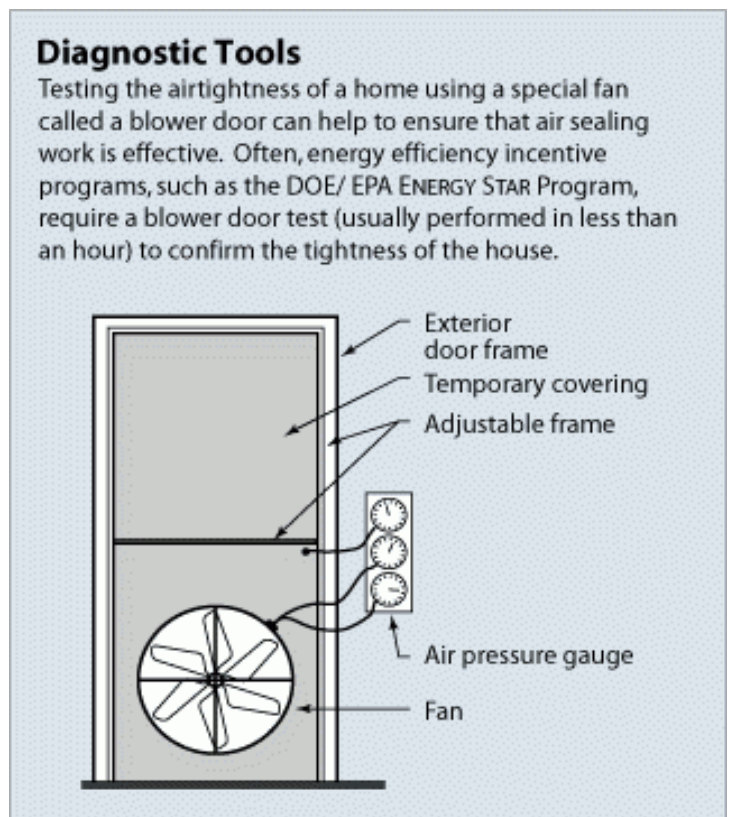
### 3. Blower Door Testing

Blower-door tests determine a home's airtightness. A blower door is a powerful fan that blows air into or out of a house, allowing a licensed professional to find air leaks in a home. These tests confirm the tightness of the house, and can detect issues that when remedied, can reduce energy use and save the homeowner money.

A blower door test can be performed in an hour or two, and costs between \$300 and \$500.

The history of the blower door testing in the International i-codes is as follows:

- The ICC first introduced the International Energy Conservation Code (IECC) in 1999. The first adoption of the IECC by the City of Flagstaff occurred in 2007, adopting the 2006 IECC.
- **2006 IECC:** There were no provisions/requirements for verifying/testing the overall structure for air leakage (402.4). **2009 IECC:** The blower door test was introduced and existed as one of two air leakage verification options. (402.4.2.1) The other option is a visual inspection (402.4.2.2).
- **2012 IECC:** The blower door test became mandatory (402.4.1.2).
- **2015 IECC:** While the section test does not specifically list "blower door", testing for overall building air leakage is required (402.4.1.2).
- **2018 IECC:** Air leakage testing remains required. The section language remains the same as 2015 edition except for the addition of addition referenced standards for test procedure compliance. Arizona cities including Phoenix and Tucson have adopted codes that require blower door testing, increasing the practice in the state.



The benefits of blower door testing include:

- The benefits of improved air tightness. A tight house, with reduced air leakage:

- will have a reduced chance of mold and rot due to lower potential for moisture movement
  - will have a better performing ventilation system
  - will be more comfortable for the occupants, because the potential for drafts is reduced
  - could require smaller heating and cooling equipment capacities.
  - will produce cost savings due to lower heating bills, because the home is losing less heat through unintended openings. Air leakage can increase heating and cooling costs by over 30% ([source](#)).
- **Consumer protection:** Without a blower door test, it is difficult to measure leakage or determine the air exchange rate in a home or building. This rate has a direct impact on efficiency, comfort and structure durability. The test can be used to identify and correct failures in the building envelope and air leakages. Simple testing can ensure the home is built to the standards it was designed for, and can identify simple fixes that will save the homeowner significantly over the life of the home.

Photos of a blower door test:



Please feel free to contact me with any additional questions.

Thank you,  
Amy Palmer