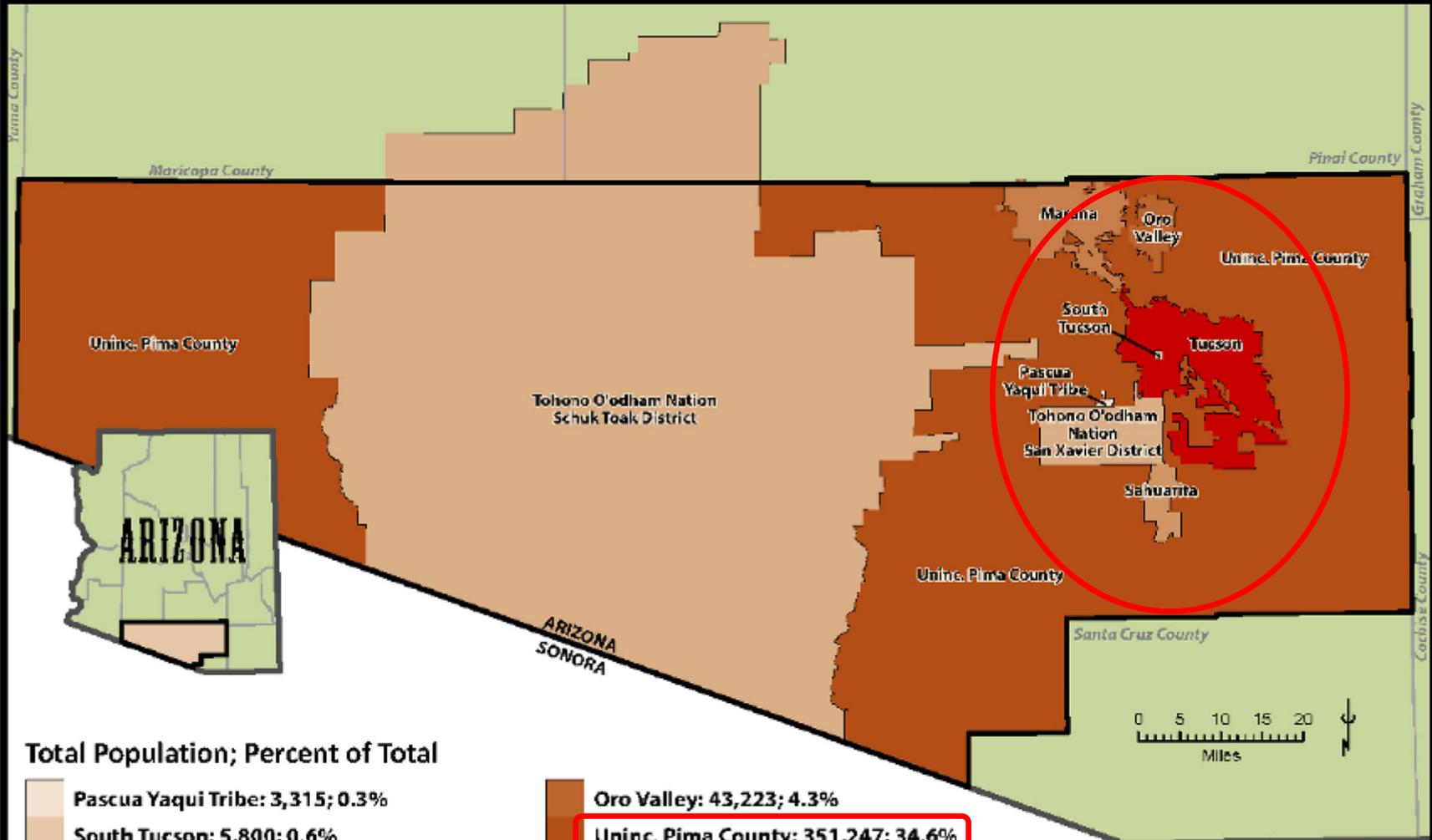


Context: The County

Pima Association of Governments Member Jurisdictions Population and Percent of Total

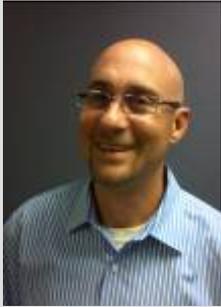


Total Population; Percent of Total

	Pascua Yaqui Tribe: 3,315; 0.3%
	South Tucson: 5,800; 0.6%
	Tohono O'odham Nation Total: 9,545; 0.9%
	Sahuarita: 23,190; 2.3%
	Marana: 33,744; 3.3%
	Oro Valley: 43,223; 4.3%
	Uninc. Pima County: 351,247; 34.6%
	Tucson: 543,959; 53.6%
	Pima County Total: 1,014,023

The information used on this map has been compiled from a variety of sources and is provided for general information only. Pima Association of Governments does not warrant or represent the accuracy, completeness, or timeliness of the data shown hereon.

Context: the People



Carmine DeBonis,
Director



Yves Khawam,
Chief Building
Official

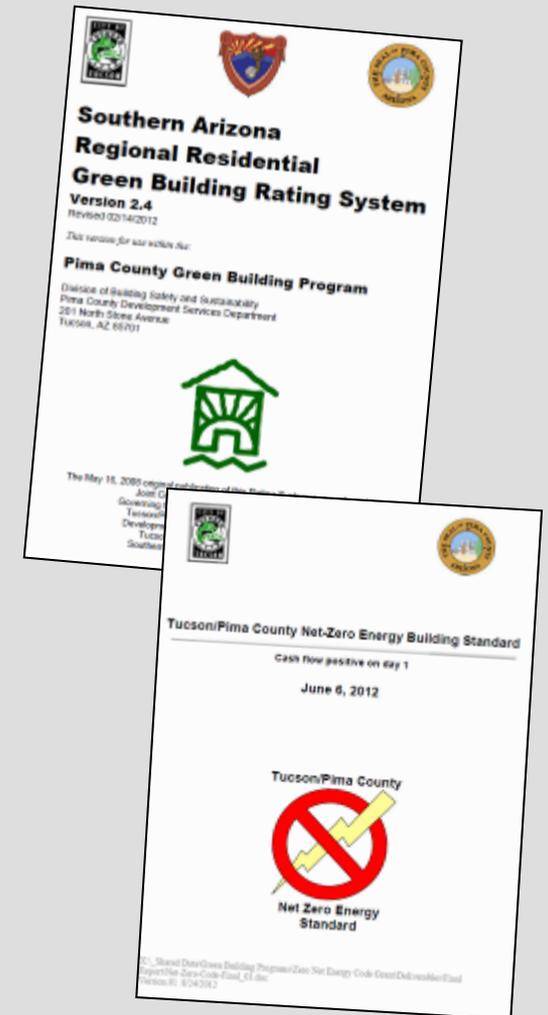


Manager Pima County
Development Services
Green Building Program



Context: the Codes

- 2001: Adopted 2000 IECC
- 2007: Adopted 2006 IECC
- 2007: County Sustainability Resolution
 - Develop a Green Building Program
- 2008: Adopted a voluntary green building program and became a LEED for Homes provider
- 2012: Adopted a voluntary net-zero energy building standard
- 2013: Adopted 2012 IECC



Context: The Partners

- Utilities

- Tucson Electric Power
- Southwest Gas



- Industry

- SAHBA
 - Pepper Viner Construction
- Alliance for Construction Trades
 - Hamstra Heating and Cooling



Manual J

- The context: 2009 Tucson Electric Power sponsors training, including free software
- 2010 submittal only
- 2011 compliance for sizing
 - Staff Training
 - Industry training
- All jurisdictions agree to require manual J with adoption of 2012 IECC



This 2-ton machine is replacing a 3.5-ton unit. The result? Greater home owner comfort and lower utility bills.

Submit only the following:

- Project Summary Entire House, and
- Component Constructions Entire House

See last page for report printing set up

Project Information

For:

Notes:

Design Information

Weather: Tucson, AZ, US

Winter Design Conditions

Outside db	32 +/- 2 degrees	32 °F
Inside db		70 °F
Design TD		75 °F

Summer Design Conditions

Outside db	104 +/- 2 degrees	104 °F
Inside db		75 °F
Design TD		14 °F
Daily range		M
Relative humidity		55 %
Moisture difference		33 gr/lb

Heating Summary

Structure	
Ducts	
Central vent (0 cfm)	
Humidification	
Piping	
Equipment load	

New construction:
Average, Semi-tight, or
Tight (after adoption of
2012 IECC - Semi-
Tight or Tight)
Equip replacement:
Average, semi-loose, or
loose

Sensible Cooling Equipment Load Sizing

Structure	20871 Btuh
Ducts	2568 Btuh
Central vent (0 cfm)	0 Btuh
Blower	0 Btuh
Use manufacturer's data	n
Rate/sizing multiplier	0.94
Equipment sensible load	22033 Btuh

Infiltration

Method	Simplified
Construction quality	Average
Fireplaces	0

Latent Cooling Equipment Load Sizing

Structure	1626 Btuh
Ducts	7265 Btuh
Central vent (0 cfm)	0 Btuh
Equipment latent load	8891 Btuh
Equipment total load	30924 Btuh
Req. total capacity at 0.70 SHR	2.6 ton

	Heating	Cooling
Area (ft ²)	2958	2262
Volume (ft ³)	16269	14181
Air changes/hour	0.32	0.16
Equiv. AVF (cfm)	87	38

Sensible Cooling Load must be within 1/2 ton (6,000 btuh) of selected equipment

Heating Equipment

Make	
Trade	
Model	
AHRI ref no.	
Efficiency	80 AFUE
Heating input	0 Btuh
Heating output	0 Btuh
Temperature rise	0 °F
Actual air flow	1331 cfm
Air flow factor	0.020 cfm/Btuh
Static pressure	0 in H2O
Space thermostat	

New construction: Area matches plans
Equip replacement: area matches
Assessors record

Cooling Equipment Summary

Make	
Trade	
Cond	
Coil	
AHRI ref no.	
Efficiency	
Sensible cooling	0 Btuh
Latent cooling	0 Btuh
Total cooling	0 Btuh
Actual air flow	1331 cfm
Air flow factor	0.057 cfm/Btuh
Static pressure	0 in H2O
Load sensible heat ratio	0.72

New Construction: Equipment must match that shown on plans
Equip replacement: Equipment must match scope of work on on-line permit app

Calculations approved by ACCA to meet all requirements of Manual J 8th Ed.

Self Permitting of HVAC replacements

- Issues
 - 1) Nobody permits replacements
 - 2) No such thing as “Like for Like”
- Water Heater Replacement Program
 - Estimate 29,000 replacements per year and virtually no permitting
 - Work with Alliance for Construction Trades to create training, testing and self permitting program
 - 338 water heaters in the program last year
- Industry Partners Complain
 - “Cheap Charlies” get the job without permitting



This 2-ton machine is replacing a 3.5-ton unit. The result? Greater home owner comfort and lower utility bills.

Self Permitting of HVAC replacements

- HVAC Replacement Program Design:
 - ACCA develops Quality Installer program
 - NATE has existing technician certification
 - Manual J software companies continually offer training
- Advantages:
 - Lower cost - \$50 vs \$116
 - No need to call for inspection
 - Saves HVAC company time
 - Or saves homeowner hassle
 - Increases overall compliance
- 996 self permits issued last year
 - Approximately 100 county permits issued

Self Permitting of HVAC replacements

- Auditing for compliance
- 2014 – one contractor barred from self-permitting until after five applications submitted without corrections
 - One audit field inspection at the request of the home owner
- 2015 – No problems

Best Practices Summary

- Working with utility partners
 - EP Sponsored Insulation Inspection Training
 - TEP Manual J training for industry
- Phasing in compliance
 - Training of plan review staff: webinars, in-house, ICC
 - Training for industry
 - Detailed submittal checklist for Manual J
 - Initial “awareness” submittal, then review to requirements
- Alternate Compliance Paths
 - HVAC Self Permitting
 - Energy Star in lieu of IECC
- Efficient Service
 - 5 day review turn around
 - Auto routing field inspections
 - Skype inspections

