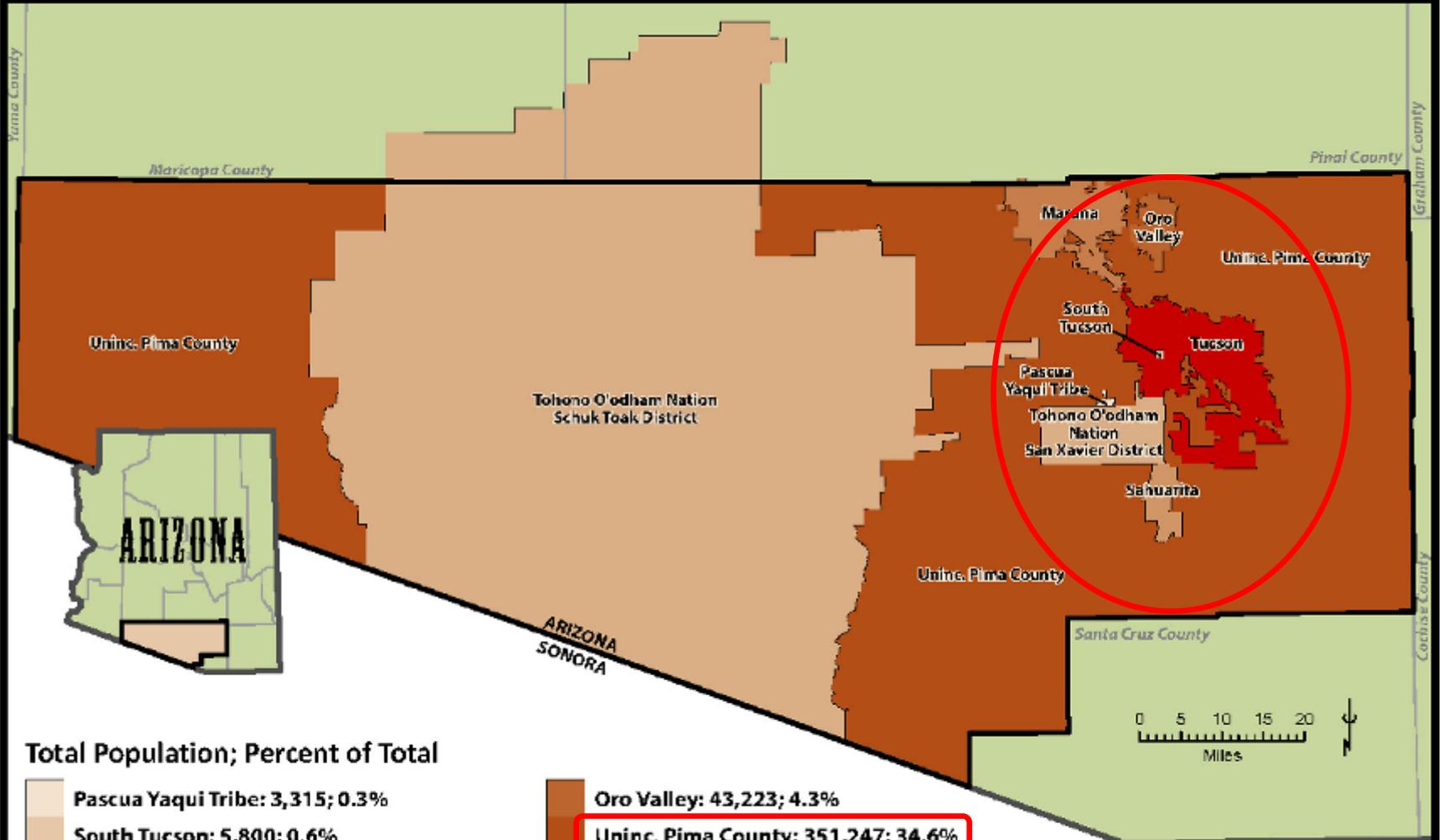


Context: The County

Pima Association of Governments Member Jurisdictions Population and Percent of Total



Total Population; Percent of Total

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

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 represent or warrant, express or implied, as to the accuracy, completeness, timeliness, or utility of such information.

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



Two Tier Energy Efficiency Program

- Tier One: Ramping up compliance inspection
 - Insulation
 - The context: 2009 Different prices for different projects
 - Inspection staff training
 - Anticipated industry resistance
 - Audit inspection and follow up training
 - 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	New construction: Average, Semi-tight, or Tight (after adoption of 2012 IECC - Semi- Tight or Tight) Equip replacement: Average, semi-loose, or loose
Ducts	
Central vent (0 cfm)	
Humidification	
Piping	
Equipment load	

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

Cooling Equipment Summary

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

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

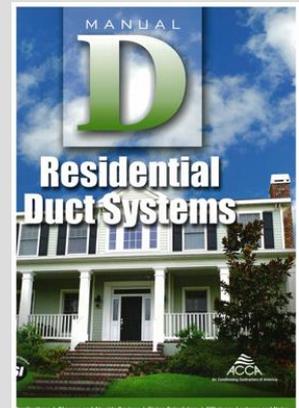
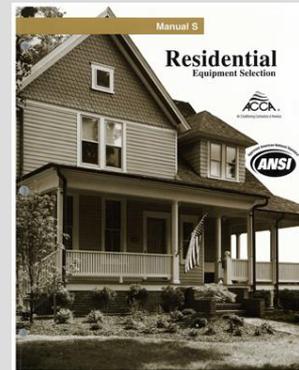
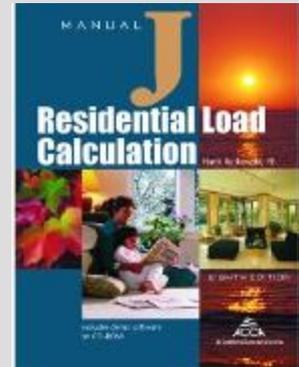
Two Tier Energy Efficiency Program

- Tier Two: Beyond Code Programs
 - Tucson Electric Power/Southwest Gas
 - Energy Star for Homes during the boom
 - 60% of the market
 - 2008 Regional Residential Green Building Program
 - Adopted by two other jurisdictions
 - Active in the SAHBA Green Build Council
 - 52 certifications by 2013
 - 2008 LEED for Homes provider
 - Over 600 certifications by 2014
 - 2012 Net-Zero Energy Building Standard
 - Extensive on-line tools
 - 1 Certification by 2014
 - Significance: Beyond code programs reduced the “fear-factor” of 2012.



Streamlining compliance

- Manual J
 - 2011/12 Allow proof of enrollment in TEP HVAC Replacement program in lieu of submitting Manual J/S/D
- Energy Star V3 label in lieu of
 - Manual J/S/D submittal
 - Insulation Inspection
 - Blower Door
 - Duct Blaster
 - Accept RESNET sampling protocol
- Self Permitting of HVAC replacements
 - Sponsored by local industry group
 - Contractor requirements:
 - ACCA Accredited Contractor
 - NATE Certified Technician
 - Manual J training by software provider



What Worked...and What Didn't

- Worked:
 - Plan reviewer and inspector training
 - Beyond code programs...sort of
 - Energy Star in Lieu
 - HVAC Replacement Self-Permitting
- Didn't work
 - Regional Green Building Program
 - Retired from the program in 2013, only 52 homes certified
 - Contractor Training
 - Did not discernably reduce training by plans-returned-for-correction

Questions at the end

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Pima County Green Building Program Manager

www.pima.gov/developmentservices



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Pima County » Government » Development Services

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- Addressing
- Building permits
- Subdivision platting
- Commercial development
- Infrastructure and engineering
- Landscape and environmental design
- Construction and occupancy
- Zoning and grading
- Septic systems
- Wells

Land Planning and Regulation

- Current Planning and Land Use
- Long Range Planning
- Boards, Commissions and Committees

Code Enforcement

- Building, grading & zoning violations

Green Building Programs

- LEED for Homes
- Net-Zero Energy Buildings

Pima Prospers

- Comprehensive Plan Update

Development Services
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Carla Blackwell
Deputy Director