



Pima County Building Safety and Sustainability **Beyond Code Programs**

- Context
- Approach
 - Adopt
 - Build
- Results





5/2008 Launch of Regional Residential Green Building Program



9/2008 Pima County LEED H Providership

2006 Tucson Adopts Mayors' Climate Protection Agreement & LEED Silver

5/2007 County Adopts LEED Silver

2002 1st LEED Building in AZ

2006 S. Az Branch USGBC Founded

1998 Scottsdale Program

1998 LEED Pilot

1993 USGBC Founded

First Earth Day 1977



Adopt or Build?

Rating Systems Evaluated

- **USGBC LEED for Homes:** launched at Greenbuild, Chicago November 2007
- **NAHB Green Home Building Guidelines;** due to launch Winter 2008
- **NAHB Green Home Building Guidelines as amended by the Joint County/City Green Building Subcommittee**
- **City of Scottsdale, AZ Green Building Home Program (since 1998)**

Simulated Building Sites

- **A - Star Valley-**
Intersection of W
Valencia Rd and
S Mountain
Eagle Drive

- **B -Menlo Park –**
W Congress at
Grande

- **C -Civano –**
South
Nightbloom Way
and E Seven
Generations Way

- **D -Marana –**
North El Uno
Gordo and W
Dos Rotundo
Drive

- **E -Midtown –**
South Avenida
de las Palmas
and East
Broadway Blvd.



Residence A- 2056 SF-Passive Solar, Masonry/Rammed Earth Construction :

Location	LEED Homes	NAHB	NAHB-PC	Scottsdale
A	68	366	379	120
B	75	375	379	122
C	71	375	378	120
D	68	366	379	120
E	74	366	374	122
Size Adj	4	N/A	N/A	8

A - Star Valley B -Menlo Park C –Civano D –Marana E -Midtown

Certification Levels:

LEED for Homes: Gold

NAHB National: Fails (Gold or Silver; fails Global Impact Category)

NAHB Pima County Revised: Fails (Gold or Silver; fails Global Impact)

Scottsdale Green Building: Advanced Level

Residence B- 2169 SF Zero-Net Energy Custom Solar; Insulated Masonry Construction

<i>Location</i>	<i>LEED Homes</i>	<i>NAHB</i>	<i>NAHB-PC</i>	<i>Scottsdale</i>
A	49	414	402	104
B	54	423	411	106
C	50	413	411	104
D	47	414	402	104
E	53	409	402	106
Size Adj	2	N/A	N/A	8

- A - Star Valley B -Menlo Park C –Civano D –Marana E -Midtown

Certification Levels:

LEED for Homes: Certified

NAHB National: Fails (Gold or Silver in most categories; Fails Global Impact)

NAHB Pima County Revised: Fails (Gold or Silver in most categories; Fails Global Impact)

Scottsdale Green Building: Advanced Level

Residence C- 1600 Large Scale Developer Model; Meets Code

<i>Location</i>	<i>LEED Homes</i>	<i>NAHB</i>	<i>NAHB-PC</i>	<i>Scottsdale</i>
A	15	166	170	10
B	22	175	179	12
C	18	175	169	10
D	15	166	170	10
E	21	166	165	12
Size Adj	4	N/A	N/A	10

- A - Star Valley B -Menlo Park C –Civano D –Marana E -Midtown

Certification Levels:

***LEED for Homes:* Fails to achieve certification**

***NAHB National:* Fails** (all categories except Energy Efficiency & Indoor Environmental Quality – achieves Silver)

***NAHB Pima County Revised:* Fails** (all categories except Energy Efficiency & Indoor Environmental Quality – achieves Silver)

***Scottsdale Green Building:* Fails to achieve mandatory measures or certification level**

Residence D- 988 SF Owner Designed/Built Rammed Earth Custom Home; Uses Permaculture Principles

Location	LEED Homes	NAHB	NAHB-PC	Scottsdale
A	70	372	394	142
B	77	381	403	144
C	73	381	393	142
D	70	372	394	142
E	74	372	384	144
Size Adj	7	N/A	N/A	20

A - Star Valley B -Menlo Park C –Civano D –Marana E -Midtown

Certification Levels:

LEED for Homes: Silver or Gold (Dependent on Location)

NAHB National: Fails; (Gold or Silver in most categories; Fails Indoor Environmental Quality)

NAHB Pima County Revised: Fails (Gold or Silver in most categories; Fails Indoor Environmental Quality)

Scottsdale Green Building: Advanced Level

Residence E- 4071 SF Large-Scale Developer “Energy Efficient” Model

<i>Location</i>	<i>LEED Homes</i>	<i>NAHB</i>	<i>NAHB-PC</i>	<i>Scottsdale</i>
A	39.5	146	144	61
B	46.5	155	149	63
C	42.5	155	148	61
D	39.5	146	158	61
E	45.5	151	144	63
Size Adj	-9	N/A	N/A	-2

- A - Star Valley B -Menlo Park C –Civano D –Marana E -Midtown

Certification Levels:

LEED for Homes: *Certified in two locations; fails to achieve certification in other locations*

NAHB National: *Fails (Bronze in some categories; Fails Indoor Environmental Quality, Homeowner Education and Global Impact)*

NAHB Pima County Revised: *Fails (Bronze in some categories; Fails Indoor Environmental Quality, Homeowner Education & Global Impact)*

Scottsdale Green Building: *Entry Level*



Green Building & Sustainability

Top of Form

Search

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Bottom of Form

Home

Building

Development Review

Planning & Zoning

Subdivision Coordination

DSD Intranet

Contact

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Green Building
Program Manager
Email

Yves Khawam, PhD
Chief Building Official
Email

Phone: 740-6490
Fax: 740-6888

Organizations

- US Green Building Council
- Arizona Chapter US Green Building Council
- ICC Green Building



LEED for Homes Program

General Criteria

- LEED for Homes Program Criteria (pdf)
- LEED for Homes Provider and Rater Fees (pdf)
- LEED for Homes Affordable Homes Fees (pdf)
- LEED for Homes Fees for Production Builders (pdf)

Rating System

- US Green Building Council LEED for Homes home page
- LEED for Homes Rating System (pdf)

Forms and Process

- LEED for Homes Questionnaire (doc)
- LEED for Homes Process (doc)
- LEED for Homes Project Checklist (xls)
- Production Builder Fee Calculator (xls)

Related Information

- Tucson Electric Power Guarantee Home Program
- Southwest Gas Arizona Energy Star Home Program



Regional Residential Green Building Program

General Criteria

- Green Building Program Criteria (pdf)
- Standard Operating Procedure for Permitting of Green Structures (pdf)

Rating System

- PC Regional Residential Green Building Standard (pdf)
- PC Regional Residential Green Remodeling Standard (pdf)

Forms and Calculators

- Residential Green Building Checklist (xls)
- Residential Green Remodeling Checklist (xls)
- Construction Waste Calculator (xls)
- Remodel Construction Waste Calculator

Related Publications

- Green Building White Paper (pdf)
- Pima County rating system evaluation study (pdf)
- Resolution In Support of New County Sustainability Initiatives (pdf)
- Daily Star article on County Program (pdf)



PIMA COUNTY REGIONAL RESIDENTIAL GREEN BUILDING RATING SYSTEM

This version for use within the:

PIMA COUNTY GREEN BUILDING PROGRAM

DIVISION OF BUILDING SAFETY & SUSTAINABILITY
PIMA COUNTY DEVELOPMENT SERVICES DEPARTMENT
201 NORTH STONE AVENUE
TUCSON, AZ 85701

MAY 16, 2008



Endorsed by:

Joint County/City Building Code Committee
Governing Council of the Southern Arizona USGBC
Tucson/Pima Metropolitan Energy Commission
Development Center for Appropriate Technology
Tucson Botanical Gardens
Water CASA
Southern Arizona Home Builders Association



**PIMA COUNTY REGIONAL RESIDENTIAL
GREEN BUILDING STANDARD V1.1
Energy Efficiency Checklist**

Section 3: Energy Efficiency

	Possible Poi	
<i>Credit 3.1</i>	Provide shading devices/overhangs for south-facing fenestration to provide full noon summer shading	2
<i>Credit 3.2.1</i>	Orient the building so the longest side faces within 30 degrees of true south & locate less than 20% of total glazing on the east and west faces of the building	4
<i>Credit 3.2.2</i>	Install appropriate glazing type for each orientation	2
<i>Credit 3.3</i>	Plant drought-tolerant trees, minimum 10' height, on the east or west side of the residence (1 to 3 pts)	3
<i>Credit 3.4</i>	Construct a passive evaporative cooling tower	2
<i>Credit 3.5</i>	Construct an exhaust (convection) tower, solar chimney, or below grade cooling tube system	3
<i>Credit 3.6</i>	Construct an enclosed vestibule or foyer at the main entrance of the residence	1
<i>Credit 3.7</i>	Install window treatments w/an openness factor of 0.8 or less	
	a. on 50% of east, west, and south facing windows	1
	b. on 100% of east, west, and south facing windows	1
<i>Credit 3.8:</i>	Install only Energy Star rated appliances (1 point/appliance type; max. 4 pts.)	
	a. Refrigerator	1
	b. Dishwashers	1
	c. Clotheswasher	1
	d. Freezer	1
<i>Credit 3.9:</i>	Install a whole house fan (or provide whole house capabilities in system) to ventilate residence w/outside air	1
<i>Credit 3.10:</i>	Install lighting & ceiling fans in accordance with the Energy Star Advanced Lighting Package (ALP)	2
<i>Credit 3.11:</i>	Install tubular skylights for illumination of interior spaces (max 2 pts.)	2
<i>Credit 3.12:</i>	Provide a minimum 15' retractable or fixed clothesline or an installed drying rack in laundry room	1
<i>Credit 3.13:</i>	Install a Heat Recovery Ventilation (HRV) or Energy Recovery Ventilation (ERV) system	2
<i>Credit 3.14:</i>	Install a passive solar ventilation preheating system	1
<i>Credit 3.15:</i>	Insulate all hot water lines to a minimum of R-4	1
<i>Credit 3.16:</i>	Plumb for future solar thermal (hot water) installation	1
<i>Credit 3.17:</i>	Install a solar thermal hot water system to provide	
	a. 60% of the estimated annual load (solar fraction)	2
	b. 90% of the estimated annual load (solar fraction)	3
<i>Credit 3.18:</i>	Provide electrical rough-in to flat or south-facing roof for future solar PV system	1
<i>Credit 3.19:</i>	Install a solar PV system to generate onsite electricity (1 pt. for each 10% of annual load)	10
Total Energy Efficiency Points		

**NOTE: The following section contains three point paths:
Performance (PERF), Energy Program (ENER), & Prescriptive (SCRIPT).**

You must choose only ONE energy path for scoring a residence.

Performance Path (PERF)

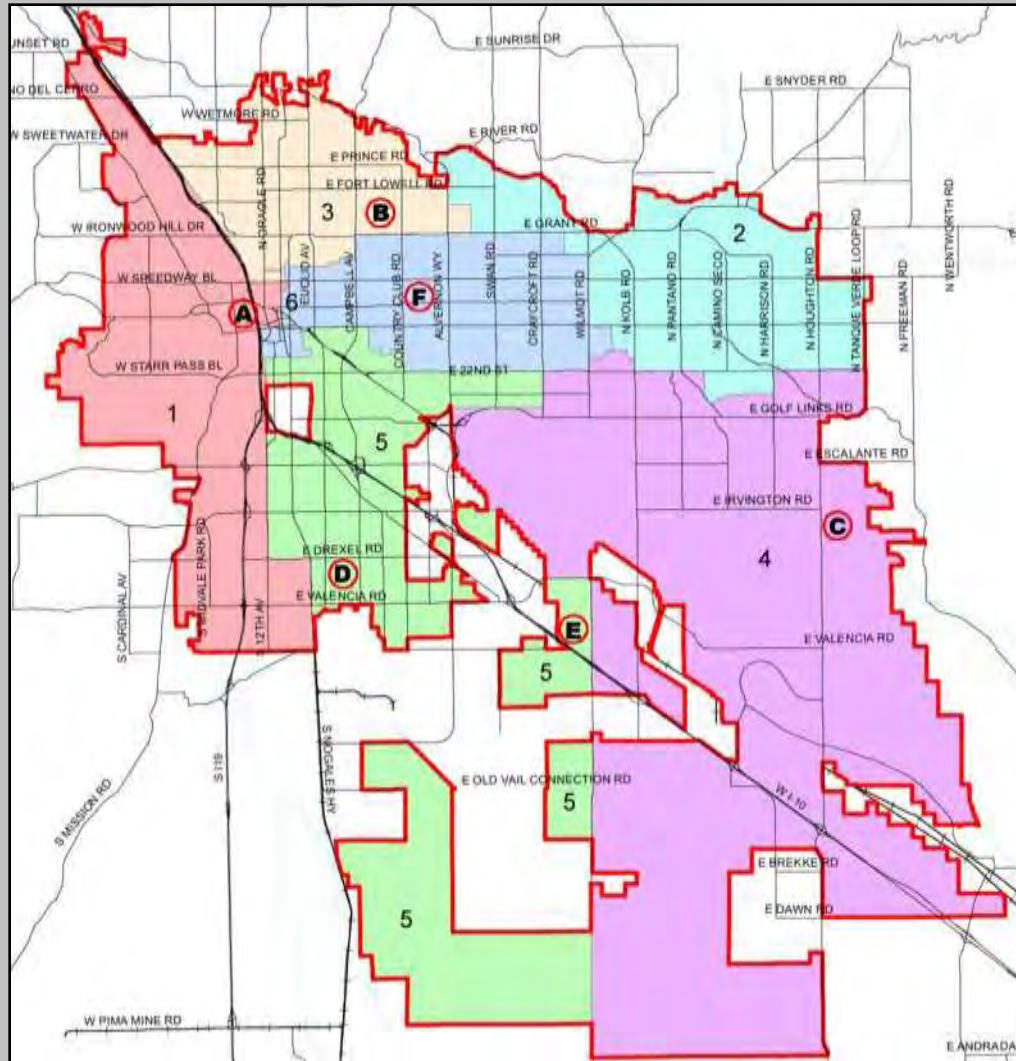
Mandatory: Provide documentation of third-party testing for residential energy performance by a certified HERS rater (Home Energy Rating System).

PERF Credit 1: Exceed the performance requirements of the currently adopted IECC by 15%

√

25

Regional?



Preliminary Analysis Results

Project	Mark	Pima Score	Pima Rank	LEED Score	LEED Rank	NAHB Score	NAHB Rank	Notes
Tucson Artisan Mercado	A	83	None	52.5	none			1,2
Ibarra-Rosano	B							
Pepper Viner-Civano	C	170	Emerald	79.5	Gold	540	Silver	
Chicanos Por la Causa	D	75.5	none	27.5	none			3
Habitat for Humanity	E							
Paulus-Indigo Modern	F	101	Silver	66	Silver	446	Silver	4

Notes

1	Pima: Does not meet MR minimum
2	LEED: Does not meet MR minimum
3	Pima: Does not meet WE minimum
4	NAHB: Does not meet Gold level minimum.

Rating System Award Levels

Rank	Pima Points	Pima Award	LEED Points*	LEED Award	NAHB Points	NAHB Award
0	0-74	none	0-44	none	0-237	none
1	100-129	Bronze	45-59	Certified	310-393	Bronze
2	130-159	Silver	60-74	Silver	394-942	Silver
3	160-200	Gold	75-89	Gold	943+	Gold
4	201+	Emerald	90+	Platinum		

*LEED Award Categories have a Home Size Adjustment

Results

Results



Regional Program

- SFRs: about a dozen
- Models: Pepper-Viner
- Multifamily: Riverside Crossing 348 units



LEED H

- Looking for first customer



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