

# Completing the Circle: The Builder-Rater-Utility Relationship

2005 RESNET Conference  
Marriott Plaza  
San Antonio, Texas  
March 1, 2005

# Program Presentation

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- Moderator
  - Thomas Hamilton, CHEERS
- Presenters:
  - Cece Barros, Pacific Gas and Electric Company
  - David Blanke, Sempra Energy Utilities, Southern California Gas Company
  - Elisa Clifford, Southern California Edison

# Session Objectives

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- Explore
  - Relationships between the builder and rater.
- Discuss
  - What a rater needs to know to work effectively with a builder and utility program.
- Review
  - Lessons learned and challenges the California statewide utility program has experienced.
- Develop
  - Ways to make the relationships even better.

# Overview

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- Home Energy Rating System (HERS) Raters continue to play integral role in Energy Efficiency Programs
  - Utility Programs
    - California Energy Star® New Homes Program
  - Environmental Protection Agency (EPA)
    - Energy Star® Homes
  - Department of Energy
    - Build America
    - Zero Energy Homes
  - United States Green Building Council
    - Residential LEED: Leadership in Energy and Environmental Design Program
    - Presentation at Break Out Session 7
- Attention to Energy Efficient Construction increasing.

# Changes in Building Requirements

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- Energy efficiency continues to increase in importance and focus at the national and state level.
- State and National energy codes continue to increase efficiency requirements.
- Minimum efficiencies of equipment continue to be increased.
- Increased focus and changes requires that building's performance needs to continue to be improved.

# Impact on Building Industry

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- Increases in requirements to meet National or State energy codes or programs require the building industry to explore new elements in construction.
  - Builders may need to implement new construction elements.
  - Insulation or windows may not be the solution.
- Builder must turn to the mechanical systems for both efficiency and performance.
  - Duct Air Sealing
  - Infiltration testing
    - Require field testing
- Utilizing these measures opens up a new area for compliance.

# Impact on Rating Industry

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- Builders now confronted with the need for a new level of inspection.
- Third party testing and verification now incorporated in construction process.
- Increases the need for HERS Raters.
- Rating industry needs to be ready for the changes and the increased need.
- Avoid impacting the building industry.

# HERS Required Diagnostic Testing and Verification in California

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- California Building Energy Efficiency Standards
  - Energy Consultants
  - HERS Providers and Raters
- California Raters
  - Verify or test conservation features or measures that are installed.
- 2001 Energy Efficiency Standards
  - Diagnostic testing and field verification required for:
    - Duct air sealing
    - ACCA Manual D design and installation
    - Refrigerant charge and airflow measurement
    - Building envelope sealing
  - Field verification required for:
    - Thermostatic expansion valves (TXV)
    - Duct surface area reductions
    - Duct location improvements



# 2005 Energy Efficiency Standards

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- Adopted by California Energy Commission  
November 2003
- Adopted by Buildings Standards Commission  
Summer 2004
- Effective October 1, 2005
  - All building permits applied for on or after must have energy calculations performed using the 2005 Energy Efficiency Standards
- Significant changes to code and building performance.

# Insulation Quality

- Studies show current values over-estimate insulation's effectiveness
- Framing members, gaps, voids and compressions reduce insulation's actual R-Value
- Compliance credit for proper installation
  - No gaps
  - No voids
  - No compression
  - In contact with air barrier
- Requires HERS Verification
- Proper Installation
  - Cut to fit or delaminated to eliminate voids around wiring and plumbing
  - Uniformly filled cavity between construction members
- Giving Credit to Quality Installation
  - Break Out Session 5, 1:30-3:00  
Hildago Ballroom B&C



# Air Conditioning SEER an EER Rating

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- Credit if Air Conditioner has high EER rating
  - Requires HERS Verifications
- Credit for Maximum Cooling Capacity, HVAC Sizing
  - In conjunction with duct air sealing, airflow testing, TXV, refrigerant charge
  - Requires HERS Verifications



# Rater Mystery

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- HERS processes are often a complete mystery to builders.
- Builders often have concerns about inspections causing construction delays.
- Raters need a clear picture of the construction schedule.
- Often a disconnect between the builder's office and the field.
- Raters form a link between these.

# Raters as Consultants

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- Source of information and instruction to the building industry.
- Present themselves as problem solution experts.
- Consultants not only to the builder but also the trades.
- Promote the marketing of energy efficiency.
- Not just code enforcers.
- Insure that proper construction takes place.
- Create a professional and positive image of HERS industry.

# Builders and Third Party Verifications

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- Lack of knowledge about the rating industry.
- Often not aware what's involved in engaging a rater.
- Building Industry Associations and HERS Providers both need to ensure that builders have a clear picture of the role of the rater.
- Builders often do not understand why third party verifications or inspections are necessary.
- Often do not understand the value of the inspections.
- Need to understand any costs that are associated with the rater.

# Rater and Construction

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- Raters should be familiar with construction practices.
  - Single and multifamily.
- Understand how construction is scheduled.
- Familiar with architectural and mechanical plans.
- Understand tract maps.
- Familiar with buyer options and how it affects the plan type.

# Builders and Rater Relationship

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- Need to engage a rater as soon as possible in the construction process.
  - For Compliance
  - For Energy Efficiency Programs
- All parties need a clear picture of the role of the rater.
- Architects and energy analysts need to be clear when a rater is needed and communicate this to their builder.
- Need to communicate to their rater that they are participating in a utility program or national program.
- Programs often require additional documentation than usually needed for building department.



# Single Family Construction

- Phased Construction.
- Multiple tracts.
- Diverse product type.
- Longer time to completion.
- Potential for changes to occur during timeframe.
- Model variations.
- Change installed products.
  - Windows
  - Mechanical



# Multifamily Construction

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- Construction on larger scale.
- More fixed product type.
- Multiple analysis methods.
- More rapid timeframe to completion.
- Verification time can increase.
- Multiple Raters might be required.



# Utility Energy Efficiency Programs

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- Support energy code changes by requiring an increased performance of the building beyond that of the code.
- Drives builders to incorporate measures not previously used.
- Increases awareness in building industry of future changes.
- Allows builders to experiment with new elements.
- Drives trades and suppliers to offer better products and services.
- Offer training courses and other outreach to educate on energy efficiency.
- Supports building industry with incentives as appropriate.
- Supports and increases the rating industry by promoting programs that require their services.

# California Energy Star® New Homes Program



- Statewide Residential New Construction Program.
- Increases the efficiency of residential new construction.
- Promotes early compliance with the 2005 Energy Efficiency Standards.
- Supports EPA Energy Star Program.
- Whole Structure performance based approach.



**OUR PARTNERSHIP IS HAVING A PROFOUND EFFECT ON CALIFORNIA.**

By promoting the California ENERGY STAR New Homes Program, we're giving our state a brighter energy future. That's because we're working to deliver energy-efficient single family and multifamily homes—by providing cash incentives to builders like you who construct them. Last year, this program helped us win the "Partner Of The Year For New Homes" award from the EPA. And we're proud to continue our partnership to support it. Because it's one program that benefits all Californians, both today—and down the road.

**To find out more about this powerful program, visit the program representatives at Pacific Gas & Electric Company Booth #714 and Southern California Edison Booth #1321 at PCBC.**

888-342-7737  
[www.pge.com/newhomes](http://www.pge.com/newhomes)

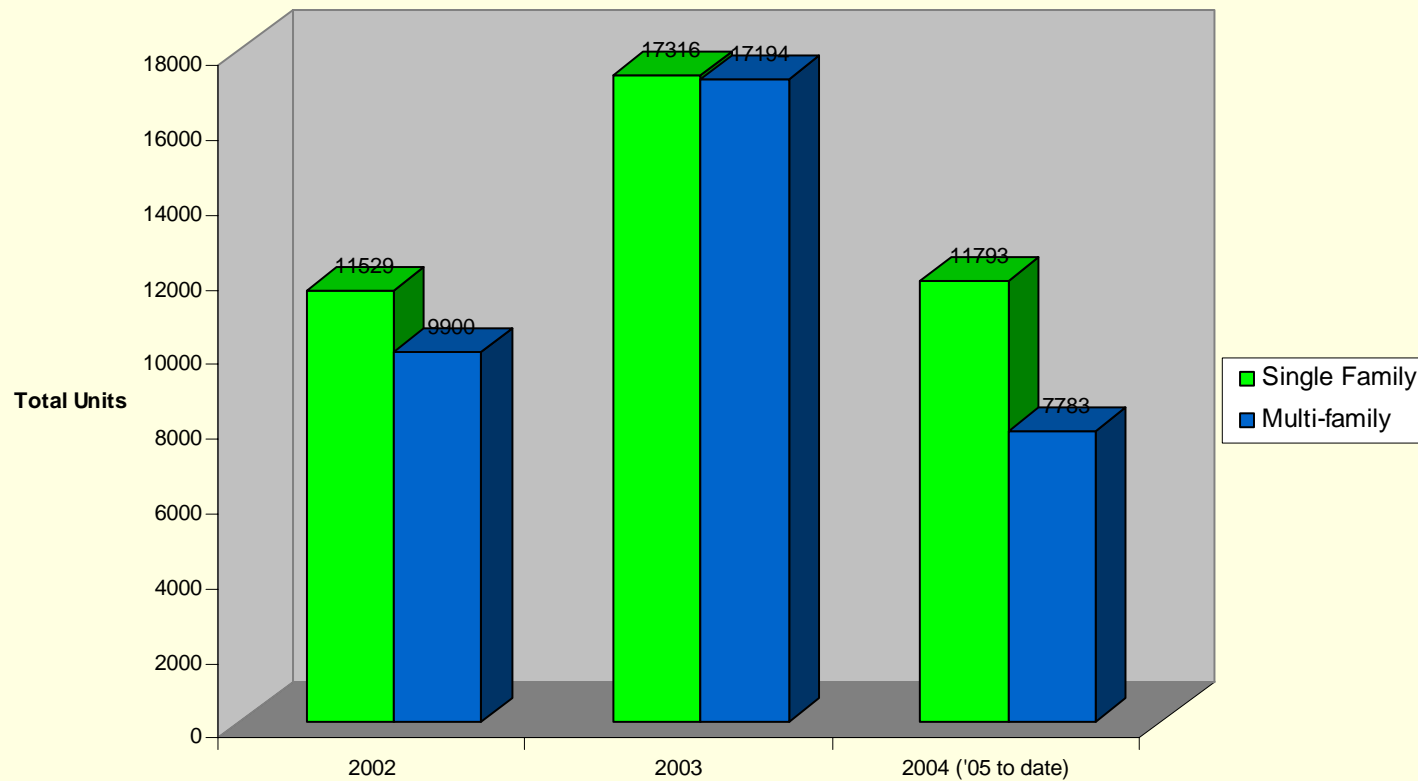
888-442-7828  
[www.sdge.com](http://www.sdge.com)

888-738-4777  
[www.sce.com](http://www.sce.com)

888-442-7828  
[www.socalgas.com](http://www.socalgas.com)

This program is funded by California utility customers and administered by Pacific Gas and Electric Company, San Diego Gas and Electric, Southern California Gas Company, and Southern California Edison, under the auspices of the California Public Utilities Commission.  
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# Program Accomplishments

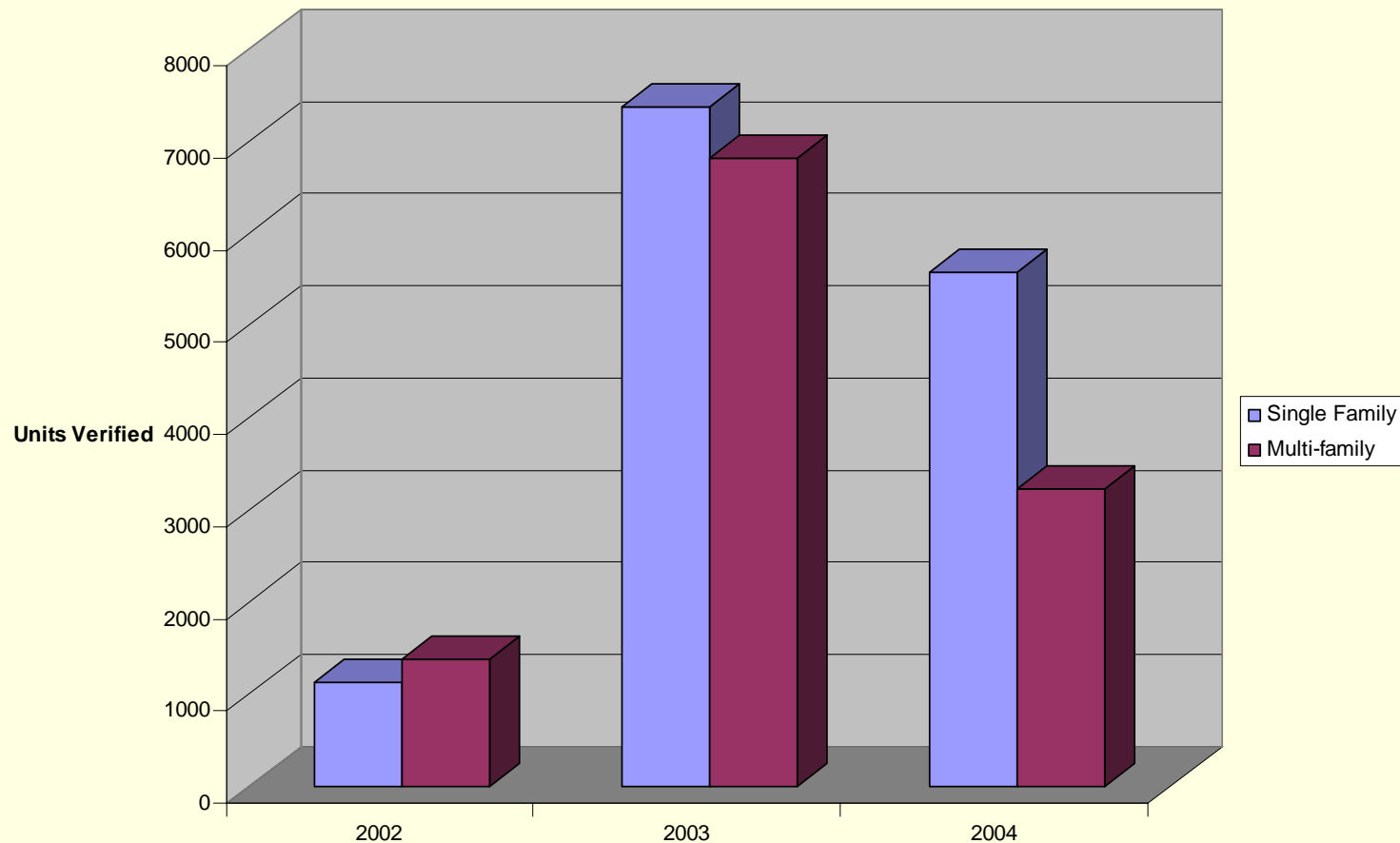


# Field Verification

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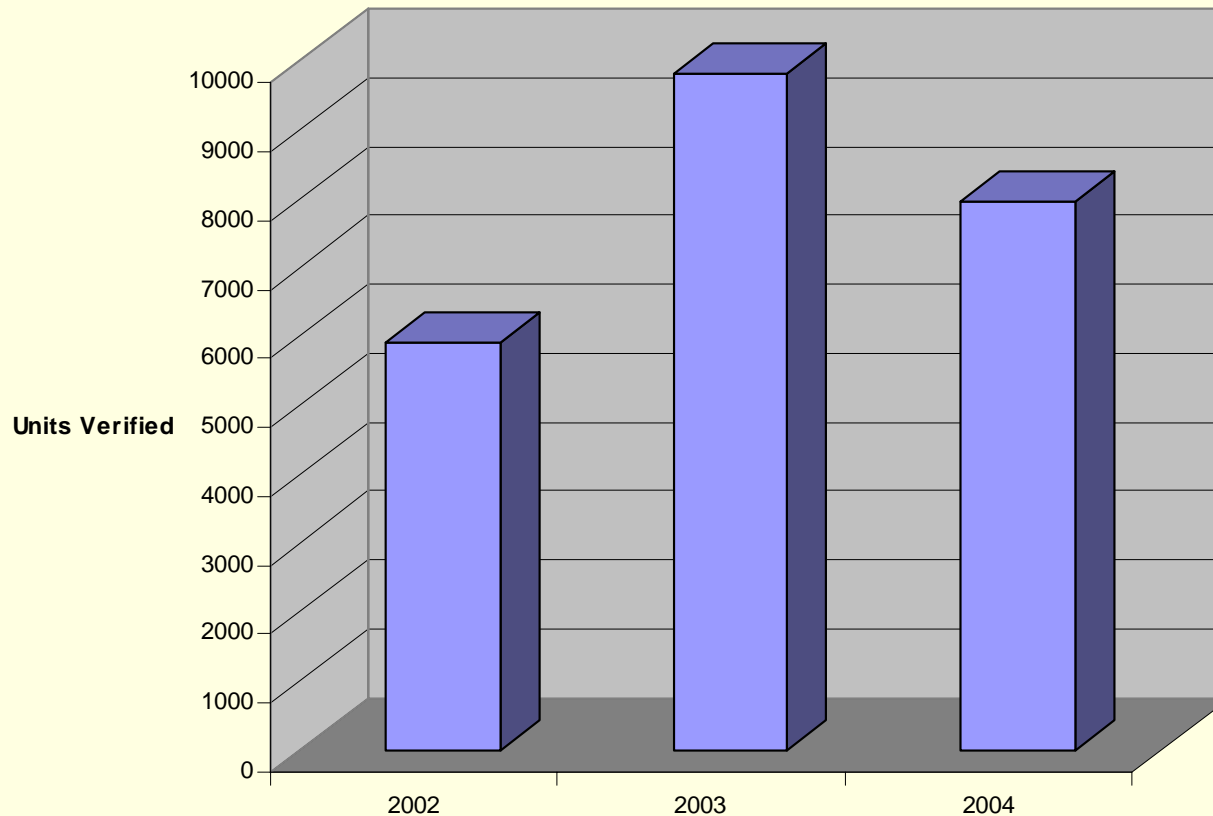
- California Program and Energy Star<sup>®</sup> requires third party inspections by HERS Rater.
- Rater utilizes reviewed/edit compliance documents created by plan review.
- Field verifies as-built meets or exceeds as-designed building.
- Report results of field testing and verification.

# Utility Verification Activity



# California Verification Activity

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# Utility Program Implementation

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- Raters should understand utility programs.
- Familiar with the application process.
- Timeframes and deadlines.
- Rater should understand any specific documentations that are required.
- Raters should also communication to the builder any specific steps or documents they need from the builder.
- Verifications need to be documented to insure incentive payments.

# California HERS Providers

- California Home Energy Efficiency Rating System (CHEERS)
- California Certified Energy Rating and Testing Service (CalCERTS)
  - Certify Raters
  - Provide Continuing Education
  - Assist Raters in marketing their services
  - Perform Quality Assurance Reviews
  - Report verification activity to the California Energy Commission and Energy Star.



[www.cheers.org](http://www.cheers.org)



[www.calcerts.com](http://www.calcerts.com)

# HERS Providers Databases

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- Internet based database for HERS Raters
- Allows project tracking and verification entry
  - Project → Plan → Lot/Building → Verification
- Utilized by California utilities to manage and track program participants and verification.
- Utilized by Rater to enter verification results.
- Creates link between the Rater and the Utility.

# CHEERS Registry, Project Listing

CHEERS :: Project :: OwnerList - Microsoft Internet Explorer provided by Semptra Energy

File Edit View Favorites Tools Help

Address http://www.cheersregistry.org/index.php?Realm=Project&Action=OwnerList&Morsel=50&Chunk=25&SortMe=&SortOrder=&Filter%5BKeyWords%5D=&Filter%5BStatus%5D=&Filt

California Home Energy Efficiency Rating Services Welcome, David Blanke San Diego Gas & Electric

**CHEERS** My Projects My Builders Support My Account Logout

**My Projects Actions**

Actions

- Create New Project
- Download All Projects XML

**Recent Projects**

Project	When
Arborage - 16348	02/22/2005

**Quick Links**

Go to:

Start Page Select a Project Plan List Select a Plan Structure List Select a Structure

**List Filter** Apply Filter

Key Words Status Type Sponsor Participation

**Project - OwnerList**

170 Results Page 3 Page size: 25 items

#	Name	Builder	Plans	Participation	Status	DateCreated
51	Select Sedona - 16354	Shea Homes S.C.	Select 6	Energy Star	Open	11/30/2004
52	Select Arborage - 16348	Richmond American Homes of Southern California	Select 10	Both Title 24 and Energy Star	Open	11/30/2004
53	Select Arborage - 16352	Richmond American Homes of Southern California	Select 10	Both Title 24 and Energy Star	Open	11/30/2004
54	Select Glen Park	KB Homes Coastal, Inc.	Select 4	Both Title 24 and Energy Star	Open	11/30/2004
55	Select Valente	KB Homes Coastal, Inc.	Select 3	Energy Star	Open	11/30/2004
56	Select Lucido at Santa Fe Hills - 5-3	KB Homes Coastal, Inc.	Select 3	Both Title 24 and Energy Star	Open	11/30/2004
57	Select Lucido at Santa Fe Hills - 6-4	KB Homes Coastal, Inc.	Select 3	Both Title 24 and Energy Star	Open	09/18/2003

Internet

# Plan Listing

C|H|E|E|R|S :: Plan :: ListAll - Microsoft Internet Explorer provided by Sempra Energy

File Edit View Favorites Tools Help

Address <http://www.cheersregistry.org/index.php?Realm=Plan&Action=ListAll&ProjectID=2233> Go

California Home Energy Efficiency Rating Services

Welcome, David Blanke San Diego Gas & Electric

[My Projects](#) [My Builders](#) [Support](#) [My Account](#) [Logout](#)

**My Plans Actions**

Actions

- Show -All- Plans
- Create New Plan

**Recent Projects**

Project	When
Arborage - 16348	02/23/2005

**Quick Links**

Go to:

- This Project
- Plans for this Project

Start Page [Arborage - 16348](#) [Plan List](#) [Select a Plan](#) [Structure List](#) [Select a Structure](#)

**List Filter** [Apply Filter](#)

Key Words  Status

**Plan - ListAll**

10 Results Page size: 25 items

#	Name	Structures	DateCreated	Status
1	<a href="#">Select</a> 1 AH I	<a href="#">Select</a> 3	00/00/0000	Active
2	<a href="#">Select</a> 1 AH C	<a href="#">Select</a> 7	00/00/0000	Active
3	<a href="#">Select</a> 1 EC I	<a href="#">Select</a> 4	00/00/0000	Active
4	<a href="#">Select</a> 1 EC C	<a href="#">Select</a> 8	00/00/0000	Active
5	<a href="#">Select</a> 2 AH	<a href="#">Select</a> 15	00/00/0000	Active
6	<a href="#">Select</a> 2 TC	<a href="#">Select</a> 6	00/00/0000	Active
7	<a href="#">Select</a> 3 EC I	<a href="#">Select</a> 8	00/00/0000	Active
8	<a href="#">Select</a> 3 TC I	<a href="#">Select</a> 3	00/00/0000	Active
9	<a href="#">Select</a> 3 EC C	<a href="#">Select</a> 4	00/00/0000	Active
10	<a href="#">Select</a> 3 TC C	<a href="#">Select</a> 7	00/00/0000	Active

Internet



# Structure Listing

C:\H\E\ERS :: Site :: List - Microsoft Internet Explorer provided by Sempra Energy

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites Media Print Mail RSS

Address http://www.cheersregistry.org/index.php?Realm=Site&Action=List&PlanID=6000 Go

**Structures Actions**

Actions

Create New Structure

**Recent Projects**

Project	When
Arborage - 16348	02/23/2005

**Quick Links**

Go to:

- This Project
- Plans for this Project
- 2 AH
- Structures for this Plan

Start Page Arborage - 16348 Plan List 2 AH **Structure List** Select 3 Structures

**List Filter** Apply Filter

Key Words Verification Status

**Structure List**

15 Results Page size: 25 items

#	StructureNumber	SampleGroup	Address	Verification	Status	DateCreated
1	Select 28	3	1 Cayton Court	Sampled	Approved	08/18/2004
2	Select 64	3	26 Globe Lane	Tested	Approved	08/18/2004
3	Select 32	3	4 Cayton Court	Sampled	Approved	08/18/2004
4	Select 39	3	7 Globe Lane	Sampled	Approved	08/18/2004
5	Select 25	4	24 Rylstone Place	Sampled	Approved	08/18/2004
6	Select 42	5	6 Ferrensby Way	Tested	Approved	08/18/2004
7	Select 18	5	6 Staveley Court	Sampled	Approved	08/18/2004
8	Select 2	7	5 Rylstone Place	Sampled	Approved	08/18/2004
9	Select 7	7	7 Kelfield Drive	Sampled	Approved	08/18/2004
10	Select 13	7	10 Kelfield Drive	Sampled	Approved	08/18/2004
11	Select 11	8	4 Kelfield Drive	Sampled	Approved	08/18/2004
12	Select 46	8	5 Natural Court	Sampled	Approved	08/18/2004
13	Select 52	9	11 Conyers Lane	Sampled	Approved	08/18/2004
14	Select 50	9	3 Conyers Lane	Sampled	Approved	08/18/2004
15	Select 60	9	22 Conyers Lane	Sampled	Approved	12/15/2004

Done Internet

# Verification

C|H|E|E|R|S :: Site :: Detail - Microsoft Internet Explorer provided by Sempra Energy

File Edit View Favorites Tools Help

Back Forward Stop Reload Home Search Favorites Media RSS Print Mail

Address http://www.cheersregistry.org/index.php?Realm=Site&Action=Detail&SiteID=80957 Go

This Project  
Plans for this Project  
2 AH  
Structures for this Plan  
64

### Statistics

Status: Approved

Verification: Tested

Number of Verifications: 4

### Verifications

Ducts: Complete

Feature	Verification	Latest Test	Status
Distribution System is Fully Ducted	Tested	08/17/2004	Complete
Proper Duct Sealing / Tape	Tested	08/17/2004	Complete

HVAC Equipment: Complete

Feature	Verification	Latest Test	Status
Cooling	Tested	08/17/2004	Complete
Heating	Tested	08/17/2004	Complete
Thermostatic Expansion Valve	Tested	08/17/2004	Complete

Structure Envelope: Complete

Feature	Verification	Latest Test	Status
CF-6R Verification	Tested	08/17/2004	Complete
Fenestration	Tested	08/17/2004	Complete
Surfaces	Tested	08/17/2004	Complete

Water Heating: Complete

Feature	Verification	Latest Test	Status
Water Heating	Tested	08/17/2004	Complete

Internet

# CalCERTS Project Listing

CalCERTS - Projects - Microsoft Internet Explorer provided by Semptra Energy

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Address http://www.calcerts.com/projects.cfm Go

David Blanke (San Diego Gas & Electric) Logged In

Search:

Projects: [View Inactive](#)

By Builder:

By Rater:

Name	Builder	City/State	Company	Type
Cornerstone at the Woods (172)	Cornerstone Communities (50)	Chula Vista/CA	California Living & Energy	SF
Crescent Court (210)	Barratt American Homes (104)	San Marcos/CA	Energy Inspectors	SF
Hillock (La Costa Oaks) (185)	K. Hovnanian Companies of California, Inc. (37)	Carlsbad/CA	California Living & Energy	SF
Mantilla (135)	Pardee	Chula Vista/CA	ConSol	SF
Paso Fino (14667) (198)	Barratt American, Incorporated (44)	San Diego/CA	Energy Inspectors	SF
Paso Fino (98-0445) (198)	Barratt American, Incorporated (44)	San Diego/CA	Energy Inspectors	SF
Rosemary Lane at 4S Ranch (215)	Laing 4S Area 34, LLC (131)	San Diego/CA	San Diego Gas & Electric	SF
San Donato at Covenant Hills (208)	Laing Luxury Homes (134)	Ladera Ranch/CA	Energy Inspectors	SF
Skye Isle (16389) (182)	K. Hovnanian Companies of California, Inc. (37)	Ladera/CA	California Living & Energy	SF
Skye Isle (16390) (182)	K. Hovnanian Companies of California, Inc. (37)	Ladera /CA	California Living & Energy	SF
Skye Isle (16414) (182)	K. Hovnanian Companies of California, Inc. (37)	Ladera/CA	California Living & Energy	SF
Valencia at Eastlake Vistas (173)	Cornerstone Communities (50)	Chula Vista/CA	California Living & Energy	SF

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Builders  
Raters  
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# Plan Listing

















CalCERTS - Plans - Microsoft Internet Explorer provided by Sempra Energy

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Back Forward Stop Reload Home Search Favorites Media Print Mail Address http://www.calcerts.com/plans.cfm?project\_id=149 Go

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 Plans for Hillock (La Costa Oaks) (185):

Name	Plan Type	File Date	Score	Rating	Has Model Test	
Plan 1	Energy Star Only (SFR)	7/29/2004	87	17.56%	Yes	 
Plan 1 w/option	Energy Star Only (SFR)	7/29/2004	87	18.55%	Yes	 
Plan 2	Energy Star Only (SFR)	7/29/2004	87	16.21%	Yes	 
Plan 2 w/option	Energy Star Only (SFR)	7/29/2004	87	16.27%	No	 
Plan 2X	Energy Star Only (SFR)	7/30/2004	87	15.48%	Yes	 
Plan 2X w/option	Energy Star Only (SFR)	7/29/2004	87	16.20%	Yes	 
Plan 3	Energy Star Only (SFR)	7/29/2004	87	17.83%	Yes	 
Plan 3 w/option	Energy Star Only (SFR)	7/29/2004	87	18.41%	No	 

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# Lot Listing

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Address [http://www.calcerts.com/lots.cfm?project\\_id=149&showpass=1](http://www.calcerts.com/lots.cfm?project_id=149&showpass=1) Go

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Search: 

Clear Apply Search

Lots for Hillock (La Costa Oaks) (185):

Lot	Name	Rater	Plan	Permit	Address	City	State	Zip	Utility
092	Highland, Dave		Plan 2X		7339 Paseo Capuchina	Carlsbad	CA	92008	San Diego Gas & Electric
094	Highland, Dave		Plan 2X		7347 Paseo Capuchina	Carlsbad	CA	92008	San Diego Gas & Electric
095	Highland, Dave		Plan 2		7351 Paseo Capuchina	Carlsbad	CA	92008	San Diego Gas & Electric
096	Highland, Dave		Plan 3		7355 Paseo Capuchina	Carlsbad	CA	92008	San Diego Gas & Electric
097	Highland, Dave		Plan 3		7359 Paseo Capuchina	Carlsbad	CA	92008	San Diego Gas & Electric
098	Highland, Dave		Plan 2		7367 Paseo Capuchina	Carlsbad	CA	92008	San Diego Gas & Electric
099	Chapman, Jeff		Plan 3		7353 Calle Conifera	Carlsbad	CA	92008	San Diego Gas & Electric
100	Chapman, Jeff		Plan 1		7357 Calle Conifera	Carlsbad	CA	92008	San Diego Gas & Electric
102	Chapman, Jeff		Plan 3		7365 Calle Conifera	Carlsbad	CA	92008	San Diego Gas & Electric
103	Short, David		Plan 1 w/option		7369 Calle Conifera	Carlsbad	CA	92008	San Diego Gas & Electric
104	Short, David		Plan 2		7373 Calle Conifera	Carlsbad	CA	92008	San Diego Gas & Electric
105	Short, David		Plan 3		7377 Calle Conifera	Carlsbad	CA	92008	San Diego Gas & Electric
106	Chapman, Jeff		Plan 1		7381 Calle Conifera	Carlsbad	CA	92008	San Diego Gas & Electric
107	Chapman, Jeff		Plan 2		7385 Calle Conifera	Carlsbad	CA	92008	San Diego Gas & Electric
108	Chapman, Jeff		Plan 1		7389 Calle Conifera	Carlsbad	CA	92008	San Diego Gas & Electric
109	Chapman, Jeff		Plan 2		3403 Corte Brezo	Carlsbad	CA	92008	San Diego Gas & Electric
110	Chapman, Jeff		Plan 3		3405 Corte Brezo	Carlsbad	CA	92008	San Diego Gas & Electric

# Verification

CalCERTS - Certificate - Microsoft Internet Explorer provided by Sempra Energy

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Address [http://www.calcerts.com/cf4r\\_print\\_certificate.cfm?lots=4612](http://www.calcerts.com/cf4r_print_certificate.cfm?lots=4612) Go

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**CalCERTS Certified Rating** January, 3 2005

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This Energy Star rating is for the home located at: 7339 Paseo Capuchina  
Carlsbad CA, 92008

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Certificate Number: CC1-1798345194  
Date Inspected: December, 23 2004  
CalCERTS Rater: Dave Highland  
CC2004052  
HERS Analyst: Sains/McCarty  
Builder/Developer: K. Hovnanian Companies  
of California, Inc. (37)  
Project: Hillock (La Costa Oaks)  
(185)  
Plan Name: Plan 2X  
Lot Number: 092



ENERGY STAR OVERALL RATING

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**Specifics about this home:**

*General Information*

Conditioned Floor Area: 1865 Square Feet  
Conditioned Volume: 20403 Cubic Feet  
Front Orientation: Cardinal  
Number of Stories: 2

*Heating and Cooling Systems*

Heating Equipment:  
Cooling Equipment:

*HVAC Air Distribution*

Duct Location: Attic  
Duct Leakage Target: 0.0

*Building Envelope*

Surface	Area	Proposed		Actual	
		R Value	U Factor	R Value	U Factor
Door	17	0	0.330	0	0.330
Door	24	0	0.330	0	0.330
FloorExt	93	13	0.064	13	0.064
Roof	1158	19	0.047	19	0.047
Roof	635	19	0.047	19	0.047
SlabEdge	182	0	0.76	0	0.76
SlabEdge	76	0	0.51	0	0.51
Wall	18	13	0.082	13	0.082
Wall	181	13	0.088	13	0.088
Wall	252	13	0.082	13	0.082

Done Internet

# Future Outlook for Programs in California

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- Strengthening of energy code offers challenges in program design.
- Changes in Energy Star requirements.
- Energy savings goals for California utilities increased.
- Three year program planning.
- Program concepts currently in development.
- Exploring both performance and prescriptive approaches.

# Lessons learned from the Field

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- Field changes to building design.
- Elements originally specified not always installed.
- Data reporting crucial to successful program implementation.
- Contact Important
- Everybody needs to be engaged in the construction process.

# Completing the Circle

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