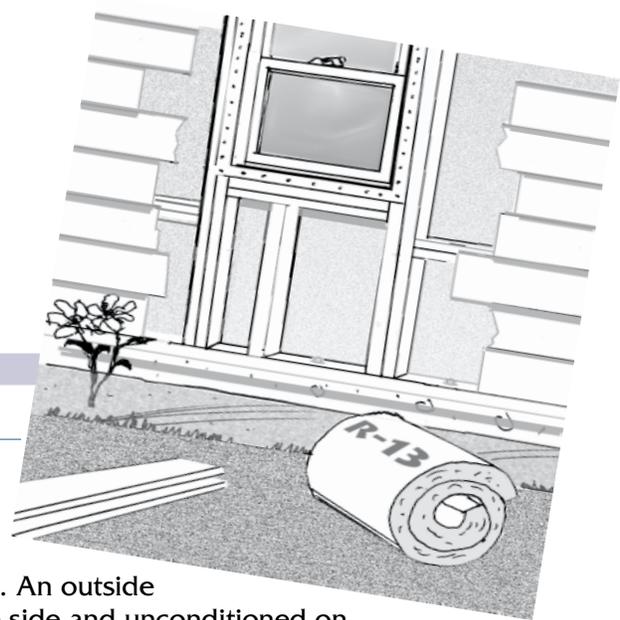


An all Electric Subdivision?
- page 2

SEEKING EXCELLENCE
A new series of articles - page 2

CalCERTS approved as
HERS Provider - page 5

QUESTIONS and ANSWERS



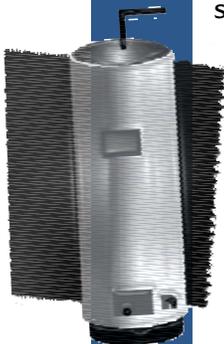
RESIDENTIAL

Q Do I need to insulate when opening the wall cavity of an outside wall?

A Yes, the insulation level must be a minimum of R-13. An outside wall is one where there is conditioned space on one side and unconditioned on the other. If the outside wall is opened, then insulation must be installed in all accessible areas. Cut the batt insulation when installing to fit the opening as tightly as possible. The insulation should touch all four sides of the framing bay without being compressed. Compressing insulation reduces its ability to provide its rated insulation value. Fit around pipes and wiring by slicing the insulation. See Section 150(c)

Q I am planning to build a new house. Can I achieve compliance with the Energy Efficiency Standards if I want to install an electric water heater in my new residence?

A Yes. Compliance with the energy budget can be achieved using electric water heating, but it is difficult. You will need to use the performance compliance approach, or meet all the prescriptive requirements, including those listed in table 3-14 of the Residential Compliance Manual. Check with your energy consultant or call the Commission's hotline for answers to specific scenarios.



Even when using high efficiency (Energy Factor of .93 or better) electric storage tank water heaters or electric instantaneous water heaters, plan on using the performance approach and installing high efficiency heating and air conditioning equipment and other energy efficiency measures to achieve compliance. Consider installing instantaneous electric water heaters at each point of use if the water piping design allows you to take the Point of Use credit.

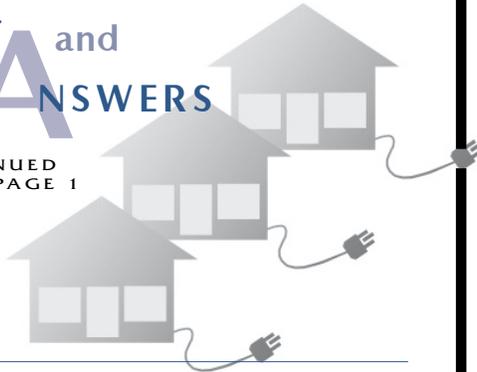
In locations where freezing is not considered a problem, you can use solar hot water systems. Note that this is the only single option for electric water heating where you can achieve equivalency to natural gas with no other tradeoffs required.

...continued on page 2

SEEKING

QUESTIONS and ANSWERS

CONTINUED
FROM PAGE 1



Q

I am developing a small subdivision and have been told that it would be less expensive to build “all-electric” homes. Will I be able to achieve compliance with the energy code if I install electric space heating and water heating?

A

Yes, compliance may be achieved but it might cost you more money because of necessary “trade-offs” employing the use of other higher energy efficient systems and devices.

To achieve compliance for an all electric house using the performance approach, first see the answer on electric water heating above. You may need to use either a heat pump or meet the requirements for wood heating as the primary heat source. Check local ordinances related to any prohibition of wood heating if you are considering the wood heating option.

Consider using electric radiant instead of convective heating systems. There is a credit for using electric radiant heating; so if electric space heating is the only option, consider electric radiant panels in the ceiling or walls.

If you are using electricity, choose windows with the lowest U-factor and Solar Heat Gain Coefficient available.

This is the first in a series of articles about building departments, builders, energy consultants, HERS raters and others who are making exemplary efforts to achieve energy efficiency in buildings.



In this issue we talk with Rich Coyle, Purchasing Manager with homebuilder D.R. Horton in Sacramento. Rich’s company actively embraces the use of third party testing and verification of duct sealing, building envelope sealing, duct design and quality installation of insulation. Already advocates of installation of ducts in conditioned space, they are experimenting with ducts buried in attic insulation. For the past two years they have participated in the “Environments for Living™” program, and are beginning to work with “Building America.” The company continues to search for other leading edge energy efficiency improvements they can incorporate into the homes they build.

The California Energy Commission does not endorse any products, supplier, manufacturer or builder. The text in this interview is meant to be informational and not all inclusive.

page
2

EXCELLENCE

BLUEPRINT: Why is the Sacramento Division of your company so interested in building homes that are more energy efficient?

COYLE – Once we learned that there was a better way to build and insulate a house, it didn't make sense to return to the way we had been doing it. D.R. Horton is a unique builder. We have to turn a profit obviously. We have to compete with the other large builders, but at Horton we're fortunate enough to have a division president, Tom Harding, who has embraced energy efficiency as a niche for us. He has encouraged his staff

to explore new ways of improving the energy efficiency, comfort and the value of the homes our company builds and sells.

BLUEPRINT: How much more does it cost you?

COYLE: It probably costs about \$1,500 to \$2,500 more per house. We plan to have seventy-one houses in Rocklin that will be "Building America" houses. Each house will be 31% to 37% more efficient than Title 24.

BLUEPRINT – What do your customers think about the energy efficiency built into your homes?

COYLE: Recently I asked a buyer in our Woodcreek subdivision how he liked his new home. "Oh," he said, "I love it." I asked him if the "Environments for Living™" program was a factor in his decision to buy. He said, "It wasn't the only reason, but it was a great bonus." We are beginning to get people to understand the difference, and this helps

differentiate us from other builders and provides a better deal for the homebuyers.

BLUEPRINT: Could you tell us about your energy guarantee?

COYLE: We give the homebuyer a three-year energy guarantee. In the "Environments for Living™" program it's called the "Gold Plus" level. We perform duct blasting and blower door testing in every "Gold Plus" house. These tests verify duct and building envelope leakage levels. When these tested features are used for compliance credit with the code, only one out of seven houses

must be tested. But we decided to just spend the money to test every house. This allows us to be confident that all our houses are highly energy efficient and will perform correctly with very low duct and envelope leakage.

BLUEPRINT: Do you tell the homeowners that all the houses are tested?

COYLE: Yes.

BLUEPRINT: We noticed there is a sign posted in front of each model home that lists exactly how much the energy costs should be for that model for a year. How does the guarantee work?

COYLE: The homeowner can log in their monthly bills on an internet website and at the end of 12 months, if their utility bill is higher than we promised, we will pay the difference.

BLUEPRINT: What other things do you do to save

"The homeowner can log in their monthly bills on an internet website and at the end of 12 months, if their utility bill is higher than we promised, we will pay the difference."

"Environments for Living™" is an energy efficiency program of Masco Contractor Services (MCS), which helps builders to achieve higher performing, more energy-efficient homes that are comfortable, durable, healthy and safe. The program utilizes the advanced principles of building science for stringent requirements that focus on specific areas of the home.

"Building AmericaSM" is a program of the U.S. Department of Energy. "Building America" works with members of the home-building industry to produce quality homes that use less energy .

SEEKING EXCELLENCE continued

energy beyond the Standards?

COYLE: We are trying hard to go beyond code. We take special care installing insulation. The insulation is not compressed, has no voids and is installed so that it is in contact with the air barrier. In some places like Woodcreek Executive, and the Sierra Valley Oaks that are part of the "Building America" program, we will be installing, as the standard, a special blown-in fiberglass that provides an R-value of R-23 in a 6-inch wall (not counting the framing or foam under the stucco).

BLUEPRINT: Can you explain that insulation a little more?

COYLE: It is a blown-in insulation system. After the framing inspection has been completed, the wall is covered with a gauze-like material. Then a specially formulated fiberglass 3 times denser than the fiberglass found in an R-19 batt is blown into the wall cavity. It's more costly than installing batts, but combined with the special stucco we use that has foam on the outside of the studs, it makes a tremendous difference. This is standard for our executive series homes.

The first blower door tests that were performed on these new houses confirmed that there was very low building envelope leakage. These houses were significantly tighter than previous houses where we did not use this insulation method. Even though it takes a certified technician to install the insulation and it takes longer to do, it is well worth it. Not only do we know that the house will perform better and be more comfortable for our buyers, but we will be less likely to have to pay the difference between what we promised and what the actual utility bill is.

BLUEPRINT: Quality installation of insulation is part of the 2005 standards as a compliance option, so you are already ahead of the curve. What caused the change?

COYLE: We have always attempted to provide the best possible, state-of-the-art, energy efficient home. We have provided quality installation of insulation throughout the history of D.R. Horton, but we were always looking to improve our methods and the final product. When we found out that there were

better ways, we decided to adopt those new methods.

BLUEPRINT: You are also installing ducts in conditioned space?

COYLE: Yes, in our "Building America" houses we have begun to locate the furnace in an interior closet instead of in the attic. In one-story homes we're furring the hall ceiling down a foot, and installing the ducts in the furred space. In two-story houses we're using 16-inch deep, open-web floor joists and placing all the duct work in the space between the two floors.

BLUEPRINT: Are you using mechanical ventilation?

COYLE: Yes. With the very tight building envelopes we are building, we're using air cyclers for fresh air ventilation. The cycler will bring fresh air into the house for 10 minutes every 30 minutes. That helps circulate the air in the house and it also helps with our energy guarantee, because we not only guarantee utility bills, but we also have a comfort guarantee. We guarantee that the center of any room in the house will be within 3 degrees of the thermostat setting.

BLUEPRINT: Any other special attention to ventilation?

COYLE: Yes. We also started putting in 90 cubic feet per minute (cfm) quiet exhaust fans in the master suite instead of the little noise makers that you usually see in production homes. We also have a humidistat switch so that when high humidity is sensed, the fan is activated. We talked to buyers and they said, "You know we love that, but can you do it in the secondary bath because the kids never turn the fan on?" So now I've found an all-in-one unit with a fan and light that has a built-in humidistat switch. On the new projects coming out we'll start using that in the secondary bath as well.

BLUEPRINT: Are these units using fluorescent lights?

COYLE: Yes. We're doing that and we're using tight ducts, jumper or transfer ducts in every bedroom. We have duct blaster and blower door testing in every house. We have gas fireplaces everywhere, and we right-size for the HVAC system.

BLUEPRINT: Tell us about right-sizing.

COYLE: We're using the Air



Conditioning Contractors of America (ACCA) Manual J and Manual D in every house that we build. The design calculations from our mechanical contractor are reviewed by “Environments for Living™” and/or “Building America,” to confirm the correct sizing for each model.

BLUEPRINT: So when you do right-sizing to figure out the air conditioner size, is the right-sizing done from a given floor plan or is it modeled for that floor plan on its given orientation?

COYLE: It’s sized for the worst orientation because we’re building production homes and the Energy Standards allow us the option of complying in all four cardinal orientations as opposed to calculating the exact orientation of each home.

BLUEPRINT: So in the case where you calculate for the worst orientation and you have a house with the best orientation, doesn’t it actually end up a little bit oversized?

COYLE: Yes, on some. I was telling you about the “Environments for Living™” program. There are the different levels of energy efficiency offered. We are currently using the “Gold Plus” level because we’re testing every house. When you get to the “Platinum” level the major difference is that the ducts must be in conditioned space. We will be using the “Platinum” level for the Sierra Valley Oaks subdivision in Rocklin.

BLUEPRINT: Do all D.R. Horton homes in California follow this or is it just your division?

COYLE: So far just our Sacramento Division. The way D.R. Horton is structured, each Division is somewhat autonomous. In our annual plan, we reported building 513 houses this year, and we anticipate building 625 homes next year. Last year 435 of the homes were “Environments for Living.” Next year all 625 homes will be “Environments for Living™” Gold and Platinum levels, including our first “Building America” homes after that.

BLUEPRINT: Do you think you are leading the way in the Sacramento area?

COYLE: Yes I do. I believe what’s happening now is that, slowly but surely, we are influencing the

Sacramento market. I recently talked with Sacramento Building Products, one of our insulation subcontractors. The manager said he got a call from another builder asking, “How can I do those guarantees that Horton’s doing down the street?” So people are talking.

There are also other builders who are doing this. Pulte has been a pioneer in “Building America” and “Environments for Living,” and they have been doing it for years in different parts of the country.

I went back to New Hampshire last month for a building science symposium, and there were people there from both Ryland and Pulte. In different regions within California they are doing a lot of different things. I think that people are starting to pay attention.

Ryland Homes in San Antonio is participating in the “Environments for Living” program and are doing a great job. Once a month, they provide a seminar on “Environments for Living™.” They make it fun; a guy puts on a lab coat and pretends he’s a mad scientist. I’ve also been told that Ryland does a very good job of marketing these programs.

We plan to enhance our marketing of energy efficiency. One garage at each subdivision will be devoted to how we achieve energy efficiency. We’ll create samples, including a cross section of how we construct a wall. PG&E has agreed to help out with some brochures, and perhaps some wall displays. Obviously we want to make a sale, but one of our goals is also to get buyers to remember, “Oh yeah, there’s one builder who is doing it differently.” If we can better educate buyers, they’ll remember us, even if they go through a dozen model complexes before they make their purchasing decision.

BLUEPRINT Do you think other builders will notice?

COYLE: As consumers become more educated and demand better performing homes, other people and builders will pay attention too.



SEEKING EXCELLENCE continued

Builders need to be aware that Title 24 is going to be more stringent and they are going to have to comply. We want to be ahead of the curve.

BLUEPRINT: What features are tested in the house to verify quality and efficiency?

COYLE: We are using HERS raters to verify at several different stages.

This goes beyond what is required by the code, which requires HERS raters to just do testing and field verification after the sheetrock is installed. We have HERS raters come in and perform duct blaster tests first at the rough-in stage. They make sure at that point that we have our air barriers in place around the tubs; these have to be insulated before the tub can be installed. They verify that all of those are in place, that the ducts are properly installed, and that they don't leak. After the house is insulated, they verify that it is done correctly. We have a walk-through with our home owners, usually before the drywall has been installed. The

superintendent explains all the mechanical systems, and how the house works. They talk about how we are building the house, and check that everything the customer ordered has been provided. It's a learning process. Not every crew is qualified for the insulation part. If every builder in Sacramento said, "Hey, we're going to do that," there would not be enough qualified installers. That is one of

the reasons I like being on the leading edge.

BLUEPRINT: Many builders think that testing their systems while they're trying to build houses is a big hassle. Are you finding it easy to work with the HERS raters?

COYLE: Very easy, and it is smart business. If we are going to provide a three-year guarantee for people, and we didn't test, just think of the problems we'd have with our customer service. It would be a real hassle to go to a house that is already occupied and try and find out what was wrong. We decided to spend the extra money and test every house to be sure everything is in order. It is not a hassle, simply part of our process, and built into the schedule.

BLUEPRINT: Can you tell us about designed duct systems?

COYLE: It has been a learning curve for us and our contractors. We went through a lot of iterations to get that right. It takes more planning, supervision and cooperation between all parties to improve the system. It was not as smooth as I hoped it would be, but it is getting better. As time progresses I believe it will be very easy.

BLUEPRINT: How do you feel

about what you are doing and would you encourage other builders to follow your lead, in building energy efficient, comfortable homes?

COYLE: We feel great! We are doing a better job of building our homes and helping our homeowners save more per month on energy bills. It's a good feeling. We'd definitely encourage other builders to follow.

"If we are going to provide a three-year guarantee for people, and we didn't test, just think of the problems we'd have with our customer service. It would be a real hassle to go to a house that is already occupied and try and find out what was wrong. We decided to spend the extra money and test every house to be sure everything is in order. It is not a hassle, simply part of our process, and built into the schedule."



Did you know?

CaLCERTS

N

ow there are two HERS Providers approved by the Energy Commission. On October 8, 2003, the Commission approved CaLCERTS as a Home Energy Rating System (HERS) Provider. CaLCERTS can authenticate compliance with the 2001 Building Energy Efficiency Standards when measures requiring third party field verification and diagnostic testing are used. Until now, the California Home Energy Efficiency Rating System (CHEERS) has been the only Energy Commission-approved HERS Provider for Standards compliance purposes. Among other duties, HERS Providers are responsible for training, certifying and overseeing HERS Raters.

HERS Raters serve a critically important function by insuring high quality installation of energy efficiency features in California homes. As special inspectors, they work hand-in-hand with local building departments. Building departments are legally required to receive a CF-4R form signed by an approved HERS Rater before final approval of any building that uses measures requiring field verification and diagnostic testing to show compliance.

Contact information for the two HERS Providers approved by Commission:

CaLCERTS
200 Crestridge Lane
Folsom, CA 95630-2109
916-987-9444
www.calcerts.com

CHEERS
9400 Topanga Canyon Boulevard, Suite 220
Chatsworth, CA 91311
800-4 (CHEERS) (1-800-424-3377)
www.cheers.org

Compliance Forms in Auto Cad Format

The compliance forms are now available in auto cad format for:

Nonresidential buildings at:

www.energy.ca.gov/title24/nonresidential_manual/index.html#complianceforms

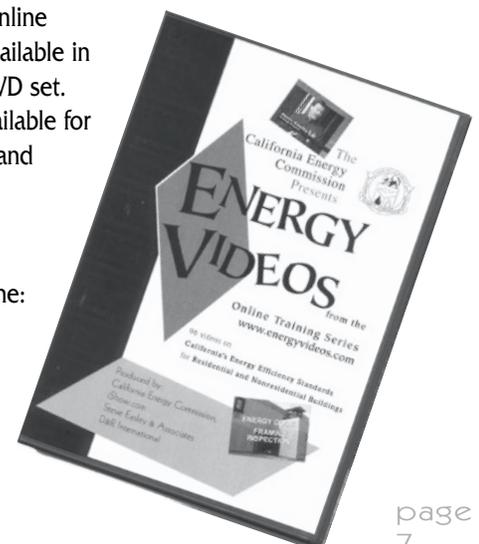
Residential buildings at:

www.energy.ca.gov/title24/residential_manual/index.html#complianceforms

Energy Videos

The Energy Commission's Training videos are now available at:
www.energyvideos.com or
www.ConsumerEnergyCenter.org/videos/

The 96 videos from the Online Training series are now available in limited supply in a two DVD set. These publications are available for \$12.95. Building officials and jurisdictions can order complementary copies. To order, call the Energy Commission Hotline: 1-800-772-3300 and ask for publication # 400-03-010S1.





CALIFORNIA
ENERGY COMMISSION

William J. Keese
Chairman

Commissioners

Robert Pernell
Arthur H. Rosenfeld
James D. Boyd
John L. Geesman

Robert L. Therkelsen
Executive Director

Residential Buildings and
Appliances Office
1516 Ninth Street, MS-25
Sacramento, CA 95814-5512
(916) 654-4064

Beverly Duffy
Editor

Special Thanks to:
John Eash, Elaine Hebert,
Rob Hudler, Valerie Hall,
Bill Pennington, Bryan Alcorn,
Maxine Botti, Rob Schlichting,
Tav Commins, Linda Franklin,
Debbie Friese, Chris Wardell and
Kurt Pisor for their help in creating
this edition of the *Blueprint*.

CHANGE OF ADDRESS

Send old and new addresses, with the five-digit
ID number (appears above name on mailing
label) to above address.

TECHNICAL
SERVICES
Web Site

[www.energy.ca.gov/
efficiency](http://www.energy.ca.gov/efficiency)

Hotline

(800) 772-3300
(916) 654-5106

Publication number P400-02-024

The inside story:

#73

RESIDENTIAL

OPENING AN OUTSIDE WALL CAVITY.....PAGE 1

ELECTRIC WATER HEATERS.....PAGE 1

ALL ELECTRIC HOMES AND COMPLIANCE.....PAGE 2

SEEKING EXCELLENCE

*The first in a series of articles about building departments,
builders, energy consultants, HERS raters and others who are
making exemplary efforts to achieve energy efficiency in
buildings.*

AN INTERVIEW WITH RICH COYLE

OF D.R.HORTON.....PAGE 2 - 6

DID YOU KNOW?

CaCERTS APPROVED AS HERS PROVIDER.....PAGE 7

COMPLIANCE FORMS IN AUTO CAD FORMAT.....PAGE 7

For any questions or additional information
relating to the Standards contact the
Energy Hotline at (800) 772-3300.

