

# WALLS & CEILINGS

November 2012 | Volume 75, Issue 11 | The Voice of the Industry Since 1938™ | [www.wconline.com](http://www.wconline.com)

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## INSULATING CONCRETE HOME!

EXPLORING ICFS IN RADICAL HOME DESIGNS

- ▶▶ IDEA VERDE CASA
- ▶▶ FUTURISTIC WORK CENTER
- ▶▶ ENERGY CONSUMPTION REDUCTION





# BUILT FOR A THOUSAND

The American dream is alive and well. At least that should be the point of view of Briana Alhadeff, project manager, designer, builder and most importantly owner of Casa Bella Verde. This home, constructed in El Dorado Hills, Calif., is 9,000-plus square feet of modern, innovative construction in the hills of Steinbeck land. A whopping 27,663 square feet of IntegraSpec ICF wall systems and 18,000 square feet of Insul-Deck Roof and Floor Systems were used on this project.

Alhadeff's passion is sustainable and green design, so it was no surprise when it came to designing her dream home that these principles would be put to practice. Her day job is assisting

The Casa Bella Verde home in Northern California boasts a longevity to rival the Greeks. One woman designed the home and visitors from as far as Egypt visit the site for architectural inspiration. **By John Wyatt**

**Photos by Unique Aeriography.**

builders and construction professionals in sustainable and green design.

"Because builders do not have the time to do the years of research that I have accrued in the area of sustainable design, they will come to me to assist them in this area so that they may provide their clients with green options," Alhadeff says.

"Since I have started my business, I have seen tremendous

growth in the area of green building," she says. "When the cost of energy was low, people did not seem to have an interest in green and sustainable design, but as soon as energy costs began to skyrocket, that is when people took notice and started looking for more energy efficient options like solar power and ICF walls and floors for the construction of their homes."





# D YEARS

## A ROOM WITH A VIEW

The site for Casa Bella Verde sits on top of a 40-acre parcel located on the highest peak in the area, and has a 360-degree view. Surrounded by water and picturesque views of the Sierra Nevada mountain range, Lake Tahoe, Folsom Lake and the foothills of the Napa Valley can all be seen. The main house is approximately 7,500 square feet, including a 1,500-square-foot guest house connected by a sky bridge. An *infiniti* edge pool also wraps around half of the home, so no matter where you are standing, water is always visible.

What has really captured the attention of the building community

is the fact that the home is constructed entirely green. Alhadeff is proud to say that no wood at all was used in building the structure. An obvious choice in lieu of lumber was the use of insulating concrete forms. When completed, Casa Bella Verde will be one of the only LEED Platinum certified homes in the U.S., and one of the greenest and most sustainable homes in the world, says Alhadeff. The forms they used have insulating properties which perform at an R-value of 50.

Other green attributes the home features are a geothermal system tied into a radiant floor heating system. Ninety-five solar panels on the roof, which will supply the home with

most of the energy it will require. Also attached to the roof is a vertical axis wind turbine. The house will also include an on-site water treatment facility, which is set up like a small municipal system.

“Every drop of water that enters the house will be used twice, once for bathing, washing dishes, etc., then treated, and used again for irrigating the plants throughout the property. The house also has an 80,000 gallon cistern for rain water harvesting, which will be used for irrigating the rooftop garden and replacing the evaporative loss from the swimming pool,” says Alhadeff. “In addition to creating a self-sustaining house, we are also incorporating complete home automation and control into the design, which will include touch screen technology to control lighting, security, A/V and all of the home’s heating and cooling, just to name a few. Incorporating home automation and controls into the design of the home was a must for this house. When your home is controlled, it not only gives you a better quality of life, it makes your house more energy efficient.”

“For example,” she continues, “we have all of our window openings wired for the shades to be raised and lowered automatically. To achieve this, we installed light sensors on the east and west facing exterior walls of the house. We will be able to program our system to raise and lower the shades automatically when a certain amount of light is received by these sensors. The house, in turn, will be cooler in the summer, reducing the energy consumption of the house and therefore lowering my energy bill.”

Alhadeff’s ultimate goal is to achieve net zero, which would eliminate an energy bill altogether. “This, combined with the other systems in the house, will make Casa Bella Verde completely self-sustaining,” she says. “A smart house that is completely self-sustaining, energy efficient and beautiful.”

## ICF INSPIRED

Although not a licensed architect, Alhadeff did design the home. With assistance from IntegraSpec’s Nicholas Nikiforuk, Alhadeff’s drafting was fleshed out into CAD to obtain





the permits for building. (Nikiforuk has an architecture, engineering and ICF building background, in addition to Alhadeff's interior design and project management background).

The duo used the Casa Bella Verde project as a training site for licensed contractors to work and receive training in the area of ICF construction. Although this added time to the construction schedule, Alhadeff says she enjoyed introducing builders to new technology.

"Because I built with ICFs, it made all of the beautiful cantilevers possible without the need for expensive steel I-beams and cranes," says Alhadeff.

Insulating concrete forms were used for several factors, she says. On top of the list is the fact that ICFs are known to provide strong energy efficient properties. "Think of it," she says. "You have 2½ inches of EPS on the outside and inside of your steel reinforced solid concrete wall. You just can't get a stronger, more energy efficient structure than that." The material has strong fire resistive properties, will never burn and is resilient to tornadoes hurricanes, earthquakes, floods or termites.

"It is a house that will last for more than 1,000 years," Alhadeff says. "I call Casa Bella Verde the millennium house ... that is why I buried a time capsule. When this house is eventually demolished (because it certainly will not go down from natural causes), I want people to know a little bit about what life was like at this time and a why I built this house."



Briana Alhadeff and Nicholas Nikiforuk.

During the design phase, Alhadeff researched all ICF options and found that IntegraSpec best suited her ambitions. She saw the systems at an International Builders' Show and was impressed with staff's knowledge and ideas central to design capabilities with the material.

"I knew the product was great but it was not until our first wall pour that I knew that I made the right decision," she says. "We poured our 230-foot long, 18-foot high cistern wall in one lift. We had absolutely no trouble at all and not one blow out. There's no way we could have done this with any other system."

In addition to all of these features, the ICF product allowed Alhadeff to solve all of the complex architectural features that were designed into the house without the need for expensive steel beams and cranes. (Hoist, crane and access equipment rentals can be very costly.)

A project of this size will no doubt present job site challenges. So of course, Alhadeff and company report on several of these.

"For the construction of the pool, we needed to create a waterproof shell. To achieve this, we made the walls and floor of the pool monolithic by pouring them at the same time," she says. "The strength and design of the IntegraSpec system allowed us to accomplish this. This would have created issues had we built conventionally. In addition, the ICF technology allowed us to easily form the Caribbean shelf, the spa, the pedestal steps and the steps leading into the pool.

This would have been a challenge with conventional forming."

The building team eliminated several columns and post supports by using the ICF flooring system. In addition, the team achieved 40- to 70-foot cantilevers easily with the flooring system that would have been extremely difficult to accomplish with conventional hinge systems. These cantilevers were achieved using a special waffle grid technique that creates beams that run in both directions like a waffle. The concrete is then poured to create a monolithic floor that is incredibly strong.

#### SHOW AND TELL

According to Alhadeff, her business is booming as a sustainable building consultant. With her knowledge and experience in green building—and the media focus on Casa Bella Verde—the company is getting calls and visitors from around the world. Architects, engineers and builders have come to tour the project and learn more about the technologies used.

"They see how an ICF home is constructed and feel the insulating properties immediately upon entering the home," says Alhadeff. "We show them all the green features of the house and explain how all the systems are integrated to create the ultimate green and sustainable home."

ICF homes are worth the initial investment to have a house that can last forever, Alhadeff concludes. "With an ICF home, they will always have peace of mind knowing that they will never lose their home to a natural disaster." **W&C**

For more information, visit [www.casabellaverde.com](http://www.casabellaverde.com).