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# GREENER LIVING AMENITIES INCLUDED

PREWIRE STRATEGY BRIDGES TECHNOLOGIES  
IN MONUMENTAL CASA BELLA VERDE PROJECT



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PREWIRE STRATEGY BRIDGES TECHNOLOGIES  
IN MONUMENTAL CASA BELLA VERDE PROJECT

by Gregory A. DeTogne

If a home is only as good as the foundation it's built upon, Sacramento, California's Casa Bella Verde underscores the truth of this adage in literal, metaphorical, and technological ways.

Beautiful, luxurious, and yet still holding the promise of leaving greener footsteps for the entire building industry to follow, the residence, which will be complete by the beginning of 2012, combines a raft of eco-friendly features (solar panels, wind-generated energy, LED lighting, Energy Star appliances, and much more) with just about every conceivable amenity, including an infinity-edge pool that wraps around its entire rear elevation.

While a sustainable attitude may seem at odds with the cornucopia of upscale opulence found in every corner, the two find harmony nonetheless

thanks in no small part to a template of home automation technology that was asked to do things few have attempted until now.

"There are many other green homes out there," said David Teel of Richardson, TX-based Design Avenues LLC, "but this one is unique in that it proves you really can have it all without disregarding environmental concerns."

Along with partner Bill Taylor, Teel is a motivating force at Design Avenues, the systems design consulting firm given the task of taming Casa Bella Verde's technology. "Traditionally,

green building like this would be approached in distinctly separate ways as the house goes up," he offered as a point from which a better understanding of the project's scope can be gained. "On the one hand you have the core construction, which, in this case, utilizes ICF building techniques. ICF is an acronym denoting the process of using insulating concrete forms as your main building blocks. Next you have your green technologies. At Casa Bella Verde these include everything from solar and wind-generated energy to greywater harvesting systems. Last among these primary construction groups is the layer of automation controlling the lighting, housewide AV, security, heating, cooling, and other household functions."

Normally, Teel explained, paths among these

Opposite page: At Casa Bella Verde, green technologies include everything from solar and wind-generated energy to greywater harvesting systems. Last among these primary construction groups is the layer of automation controlling the lighting, AV, security, heating, cooling, and other household functions.

different disciplines seldom cross, especially between the worlds of automation/control and green technologies like solar. "The real design challenge here was for us to take control technologies into places they haven't gone before," he said. "It was uncharted territory from the very beginning."

### Taking Prewire Seriously

Having just exited the prewire phase of its construction this fall, Casa Bella Verde stands poised to live up to its Spanish name, which means "beautiful green home" in English. Owner and designer Briana Alhadeff is quick to point out that completing the prewire stage was as important to laying a solid foundation for the house as anything else.

"I knew from the beginning that technology would play a vital role in achieving the green goals I'd established for the home," she said. "Used creatively and properly, I viewed it as a bridge between all of the other elements on a number of levels. During the prewire stage, we were given the opportunity to build the real bedrock upon which the home will operate and continue to evolve into the future."

### A Designer's Dream Home

Casa Bella Verde is the realization of Alhadeff's dream-home, a vision she has cultivated and nurtured for years. As an interior designer, she became interested in sustainable living practices long before it was fashionable. While managing the details of her bustling career, she simultaneously immersed herself in the study of architecture and construction practices, along the way, becoming convinced that harnessing technology was the key to preserving natural resources and Earth as we know it.

"When I began really getting into this, many architects and contractors

were either uninterested or too busy to really initiate substantive change in the construction process," she recounted. "Conversely, I became an advocate for moving to the use of new materials and the latest technology has to offer. That's where I knew we could gain energy efficiency and make our living sustainable, all while keeping our amenities too."

Working with Alhadeff's blueprint, architect Nicholas Nikiforuk created a CAD rendering of her design, then passed it along to a structural engineer for further refinement. Now enclosing some 7,500 square feet connected via a sky bridge to a 1,500-square-foot guest house, Casa Bella Verde's R50-rated ICF walls complement its radiant floor heating and cooling capabilities, which are tied to a geoexchange system that draws upon the earth's own temperature to maintain a comfortable interior climate year-round.

Residing at the apex of a 40-acre parcel in the foothills of Northern California, the structure incorporates solar panels and wind turbines on its roof, and it is outfitted with its own water treatment plant as well as a greywater harvesting system housing a huge cistern with a storage capacity of 80,000 gallons. The on-site treatment plant is part of a management plan that uses every drop of water twice: once for drinking, bathing, washing clothes, and whatnot, and then—following treatment—for irrigating plants on the property. Water from the cistern is used for irrigation and even to keep up with the pool's evaporative losses as well.

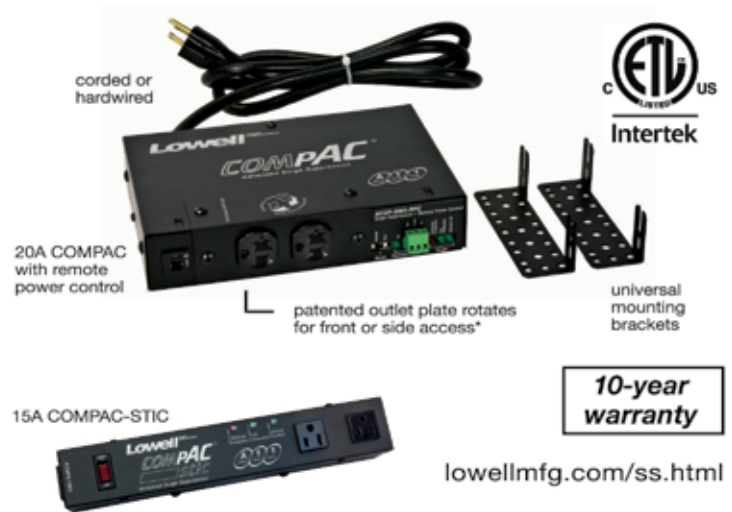
### Integrating It Together

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*Taking place over a span of only eight days, the low-voltage, prewire portion of the project was placed in the capable hands of Ryan Seith and John Hajdu, Design Avenue's go-to, A-list cable wranglers. Liberty AV Solutions provided the wiring and cable.*

touchpanels found in numerous locations. The pool, spa, and weather station will be linked to this palette of control as well.

Vantage plays a critical role in the home's control scheme in terms of lighting and energy management. Working in tandem with the company's proprietary InFusion technology, a software-based energy management system also culled from the Vantage catalog, offers a power meter that keeps tabs on energy usage. Vantage components additionally include occupancy and light level sensors that are used to help control room lighting, and intelligent hardware that governs the behavior of automated window treatments.

"Without question, AMX and Vantage are the main players on the control stage here," Teel said. "They are two rock-solid industry giants that work well together, and we know them well. I never worry about their components and software, and I know their limits. In this application, we are pushing those limits. We're going to be writing code that's never been written to control things that have traditionally been left outside their levels of control.



*To provide a sense of scale, here is the still-under-construction footbridge attaching Casa Bella Verde's main building to its guesthouse.*



This is why we had to build a solid foundation in the prewire stage and why that part of the construction process was so important. We had to build an infrastructure that was highly flexible and that allowed us to do anything along the way to

this entire project's completion. We know there are going to be changes before this is all done—lots of them most likely. In an arena where anything can happen and probably will, you have to lay down the prewire design from A-Z. If you do it from A-R,

figuring that you'll figure the rest out later, things are bound to go horribly wrong."

### Handling the Prewire Stage

Taking place over a span of only eight days, the low-voltage, prewire portion of the project was placed in the capable hands of Ryan Seith and John Hajdu, Design Avenue's go-to, A-list cable wranglers. Liberty AV Solutions provided the wiring and cable. Known as Liberty Wire & Cable prior to its expansion into becoming a comprehensive AV solutions provider, the company takes matters of copper, fiber, and everything in between quite seriously.

"Liberty was a logical choice for all of our cabling and wire," Teel said, "because its standards of quality are high. That means it pulls nicely and behaves itself as it's run through the house, and boosts the performance of the components it's connected to."

Fiber was selected from the Liberty catalog for the exceptionally long distance runs, which in this application were literally way down the road when it came to security gates and cameras, as well as inside the house to accommodate future, yet-to-be-decided networks.



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AMX and Vantage are the main players on the control stage.

Polk loudspeakers were spread across the home's interior and exterior; Liberty's premium, ExtraFlex 14\4, 105-strand cabling brings them all home to Middle Atlantic racks in a basement-dwelling main control room. Beyond the high strand count (loudspeaker cabling can commonly come in at a high count of 65 strands from some manufacturers), the oxygen-free copper (OFC) design of the Liberty wire greatly reduces the number of copper crystals encountered by audio signals traveling its pathways, thereby removing barriers that degrade sound.

On the network side, Liberty's Cat-6 cabling was unspooled throughout the environment. Capable of supporting 10 gigabit Ethernet on runs up to 295 feet (32 feet on patch cords), the cabling is tested and certified to 500 MHz. RG6 Quad was the choice for satellite and video signals running through the house. Cameras within the environment gained the connectivity benefits of Liberty's RG59 cabling;

Vantage lighting control wire was also a cataloged find from Liberty.

With prewire needs adequately addressed, Teel and the Design Avenues team will take its undivided attention to the next level—software. "Now that we've laid a reliable, limber, and infinitely adaptable highway for our low-voltage systems and signals to travel, I have no fear when it comes to interfacing all of these disparate systems," Teel said. "What we're doing here wasn't even considered as a possibility not all that long ago, but will be commonplace in the very near future."

For her part, Alhadeff concurred, "If you're open to trying new things and coming up with creative ideas, building and living greener is a lot easier than most people think. Technology is our partner, and Casa Bella Verde is proof that we can live a better and greener tomorrow beginning today."

Greg DeTogne is a freelance writer in Naperville, IL.

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