



Building to Mitigate Climate Change and Address Social Justice

by Kathleen Marshall



Priscilla Garcia used to live in a gang-ridden neighborhood in Fresno, California, that, she says, was unsafe for her children. Now she lives 17 miles south of Fresno in Selma, California in an affordable housing complex called Valley View Homes. Valley View Homes is the largest Zero Net Energy (ZNE), single-family housing development in the United States. With the move, she adds, her kids can go outside, ride their bikes and play safely. And, she continues, “Before solar, my [utility] bills were over \$100 a month for our apartment, and this is a house where I have more square footage. I only pay \$10 a month...”

For housing-developers Corporation for Better Housing (CBH), the added values of safety and savings, as Priscilla describes, are part and parcel of their vision. Valley View Homes is a CBH development dedicated to housing for farm workers and their families. CBH is an award winning, 501(c) 3 non-profit organization whose mission is to, “abolish poor and unsafe living conditions and to create communities intent on uplifting and changing peoples’ lives”. It develops environmentally conscious, affordable housing while also providing social value in the form of programs and services for underprivileged segments of our communities, including low-income veterans, families, seniors, disabled people, and farm workers.

A LITTLE HISTORY

The act of designing and constructing buildings is as ancient as humanity itself. Stone-age evidence from the Wonderwerk Cave in South Africa dating back 2 million years suggests that our hu-

man ancestors intentionally occupied caves (*Science Daily* December 2008). Archeologist Klaus Schmidt verified the first evidence of deliberate, monumental architecture for ritual or worship dating to 11,000 BCE (*Smithsonian Magazine* November 2008). This site, Gobekli Tepe, located in Southern Turkey, consists of concentric circles of massive pillars, the largest 18 feet tall and weighing 16 tons. Neither the wheel nor beasts of burden were used in its construction.

Over the millennia designing and constructing buildings has evolved, from Gobekli Tepe to Dubai’s Burj Khalifa, today’s tallest building in the world, at 2,716 feet. Design and construction have grown beyond creating simple shelters. We have used ever more sophisticated tools, from simple pulleys to giant cranes; and have used ever more sophisticated materials, from fiber chinking to steel girders. Now humans, along with the buildings and communities we create, must face a new challenge—the most serious environmental and sociological crisis of our time. That challenge is climate change. From design through construction we must create buildings, communities and open space that will help assure a sustainable future for our descendants. And nowhere in the United States is that challenge embraced as strongly as in California.

ASSEMBLY BILL 32 AND THE CALIFORNIA GLOBAL WARMING SOLUTIONS ACT OF 2006

Just 10 years ago, California’s Legislature passed Assembly Bill 32 (AB32), now known as the California Global Warming



(top) A safe neighborhood where kids can ride bikes and play outside. (right) Oscar and Juana with their daughter.



Solutions Act of 2006. The Act requires the reduction of greenhouse gasses to 1990 levels by the year 2020. While the Act itself requires further reduction of greenhouse gasses below 1990 levels beyond 2020, the extent of those reductions was not defined until Governor Jerry Brown issued Executive Order B-30-15. Issued on April 29, 2015, Executive Order B-30-15 specifies continued reductions to 40% below 1990 levels by the year 2030. California's Air Resources Board is the lead agency for implementing the Act. According to their website, "The full implementation of AB 32 will help mitigate risks associated with climate change, while improving energy efficiency, expanding the use of renewable energy resources, cleaner transportation, and reducing waste." In accordance with the Act, California's Title 24 Building Code has been rewritten three times, in 2008, 2013, and 2016. In addition, DOE, EPA, and numerous private agencies like Build-it-Green (BiG) and the United States Green Building Council (USGBC) are busily establishing guidelines for healthy buildings and energy conservation that go beyond the requirements of California's Title 24 Building Code. These public and private efforts are setting precedents for the development of guidelines throughout the United States.

Net Zero Energy (NZE: see "Common Net Zero Acronyms") refers to the on-site production of energy from renewable resources meeting all of the annual energy needs of any given building or complex of buildings. This emphasis on renewable-resource power generation reduces CO₂ and other greenhouse gas emissions, thereby fulfilling the goals of the Act.

ADDITIONAL STANDARDS

However, healthy, environmentally sensitive, socially conscious housing should conform to other standards as well. These stan-

dards include meeting or exceeding the EPA's Energy Star Standards, pursuing the USGBC's Leadership in Energy and Environmental Design (LEED) Certification, getting a Home Energy Rating System (HERS) Certificate and, in California, obtaining a BiG Green Point Rating. Housing that conforms to these guidelines addresses the efficiency of heating-and-cooling systems in different climate zones, the implementation of recycling programs, the use of water-saving landscape design, the improvement of indoor air quality, the preservation of open space, and so on. Many of the guidelines also include added social value features such as the creation of shared community space, pedestrian and bicycle access and even bicycle storage facilities, all of which can improve quality of life.

Many people have worked hard to develop these guidelines—guidelines that are still evolving for architects, designers, and builders alike. But making the best possible use of these guidelines is a lot of work and can be complex. There are many elements of design and construction that must be brought together.

BRINGING IT ALL TOGETHER

According to Sean Armstrong, managing partner of Redwood Energy, the energy consultancy firm for the Valley View Homes



(left) HERS rater John Richau found less-than-best practice attic insulation. The insulation installers had to return to bring the level up to the 13-inch standard. (right) Upon inspection of shower-tub units HERS rater John Richau determined that 14 were installed improperly, without water-resistant backer board. All 14 had to be removed and re-installed properly.

development, “The people who bring all of those elements together are energy consultants and HERS raters. Energy consultants design NZE strategies, integrating Energy Star, LEED, BiG, and other standards, while HERS raters make sure the strategies are implemented.”



BUILDING BEGINS

When the design is complete, building begins; and this is when HERS raters like John Richau of Certified Multi-Family Consultants arrive on the scene. John was the HERS rater for Valley View Homes and visited the site for HERS inspections 54 times. Sean Armstrong describes John as a natural and sympathetic educator, a skill he considers invaluable for HERS raters. John refined those educational skills as a vocational instructor in solar installation. “Construction has become more technical and new skills are required,” he says. “I spend a lot of time educating the laborers”. On the Valley View Homes project, along with other projects he has inspected, John encountered many conventionally trained laborers; laborers who, as production workers, are accustomed to getting the job done as quickly as possible and moving on to the next. But, as John’s inspection photos from Valley View Homes illustrate, training in the area of best practice building could go a long way toward avoiding costly and unnecessary change orders. John has learned that construction techniques can either make or break a green-rated home.

If fiberglass batting insulation is bunched up and compressed it will not provide the insulation value needed to maintain stable interior temperatures of a house. A stable interior temperature, or one that fluctuates only slightly, is a critical component of energy conservation. Proper installation techniques directly affect the residents of energy-efficient housing. Valley View Homes is no exception. Valley View resident Gerardo Cervantes says that in his home, “the temperature stays at a comfortable

level.” Emmanuel Avila Lopez and his mother say they never change the preprogrammed thermostat settings. Sandra Martinez says that not only is she comfortable in her home but, “My PG&E bill used to be over \$200 [a month] and now I have not paid a dime.”

Luis Jimenez, an architect with Y & M Architects of Los Angeles, CA, worked on the plans for Valley View Homes. Luis agrees with John Richau that the learning curve for this type of green building can be steep, even for architects who typically have more education than laborers. “At first it was challenging, but plan-sharing made it easier.” Planning and building Valley View Homes required a lot of communication in the form of many meetings, in person and on the phone, between the developers, the builders, the landscape designers, structural engineers, and energy consultants.

Valley View Homes Construction Coordinator, Katherine Schmidtberger of BLH Construction, also believes that communication is critical when striving for excellence. Katherine was in constant communication with Construction Supervisor Jason Dougherty, who was also in constant communication with the many subcontractors including electricians, heating-and-cooling contactors, and insulation specialists. Jason and John Richau talked a lot. For each problem John found, he would not only communicate with the laborers, he would also talk with Jason. Jason remembers those HERS inspections almost fondly. “There are no problems,” he chuckles, “just solutions.” John’s inspections confirmed that, in fact, solutions to problems were implemented. Jason also agreed that more training is needed in green-building techniques for laborers as well as managers and supervisors like himself. “True that,” says Energy Consultant Sean Armstrong. Affirming that education is key to the success of any green building he says, “Anything that has to be done and then re-done, two sometimes three times, takes longer and costs more money. Nobody wants that. Those cost overruns can be avoided if everyone uses best-



Valley View Homes

housing projects qualified for a total of \$9-million in USDA low-interest loans in 2016. Those three projects constitute fully one-third of the projects chosen for these loans nationwide and half of those chosen in California. Of the nine eligible projects, six are in California; and five of those are Redwood Energy projects. Sean Armstrong is very proud of that accomplishment.

Sean's enthusiasm for his work is palpable when discussing Valley View Homes. "Valley View is different in so many ways," he says. "It has so much added value. It's the largest single-family ZNE development in the country. And even though it's called a Zero Net Energy project, it's really Net Positive. Most of the homes actually make more energy than they use. It's also LEED, Green Point Rated and Multi Family Zero Energy Ready Homes certified. That last means that every home is compliant with the Department of Energy's building standards that are really rigorous. The landscaping uses native plants and requires 86% less irrigation water than a similar standard development right next door to Valley View. Best of all, it provides dignified housing for farmworkers."

According to the Student Action with Farmworkers (SAF) most recent factsheet (www.saf-unite.org) there are two to three million farmworkers in the United States. Seventy-five percent of these workers were born in Mexico; most of those live a migratory lifestyle, moving frequently, following the crops. The states with the highest proportions of migrant farmworkers are California, Texas, Washington, Florida, Oregon and North Carolina. SAF identifies many health concerns associated with migrant housing writing, "Poor migrant housing conditions lead to increased prevalence of lead poisoning, respiratory illnesses, ear infections, and diarrhea." Temporary housing for farmworkers is notorious for its substandard living conditions. Many people, families and singles, live together in one room, a plywood shack or in makeshift cinderblock structures. Migrant worker housing is not subject to California's Title 24 building code. Farmworker wages are also not regulated by the Fair Labor Standards Act of 1938, so farm laborers frequently make less than minimum wage. Though Governor Brown recently signed legislation that will phase in overtime pay for farmworkers over four years beginning in 2019, farmworkers currently do not get overtime pay. A typical family income is \$16,000 per year, making farm work the second lowest paid job in the United States, just above domestic labor.

Valley View Homes provides an opportunity for farmworkers and their families to live beyond the stereotypes and societal boundaries imposed on them. The development consists of 48 stand-alone houses, two-, three-, and four-bedroom homes along wide boulevards. The landscaping features young native shrubs and trees. There are a few raised-bed garden plots provided, but, as is appropriate for drought-burdened California, there are no water-hungry lawns. There is a common playground area, an

Common Net Zero Acronyms

ZNE – The first term used to describe energy efficient buildings Zero Net Energy means that a building balances its energy needs with energy produced from renewable, zero-emission sources. There is a DOE paper on the topic dated 2006. It can be found at <http://www.nrel.gov/docs/fy06osti/39833.pdf>.

NZE – Net zero energy; same as above.

ZEB – Zero energy building is a term defined by the DOE which reads, "An energy-efficient building where, on a source energy basis, the actual annual delivered energy is less than or equal to the on-site renewable exported energy." The DOE identified four strata to which the definition is applied: building, campus, portfolio and community.

ZERH – A DOE Zero Energy Ready Home is a high performance home that is so energy efficient, that a renewable energy system can offset all or most of its annual energy consumption.

practice design and building techniques from the start, to finish of course, on any project."

ADDED VALUE

Valley View Homes is just one of many similar CBH developments. CBH's multifamily, affordable apartment complex for farmworkers completed in 2015, Calistoga Family Apartments, recently won the 2016 PCBC Golden Nugget Judges Special Award of Excellence. The award acknowledges CBH's dedication to, "Community Spirit or Service". That type of recognition could be part of the reason that three more CBH farmworker

exercise course and an on-site laundry facility. There is no graffiti and residents say the neighborhood is safe. There is a Community Room for gatherings. CBH helped the residents start a Neighborhood Watch program. It has also implemented monthly Tenant Council meetings, an after-school program, an employment development program in the on-site computer lab and an annual Toys for Tots drive. Valley View is a polling place for Fresno County voters. All of these programs provide the added value for the community that CBH feels should be incorporated into every affordable housing project. Emmanuel Avila Lopez' mother Ompora says, "These homes help our socioeconomic status. They are political." According to Oscar Bombela Mirales Valley View Homes provide a slice of the American dream formerly virtually unattainable by migrant farmworkers. He says, "When I was in Mexico...we used to watch American shows that portray homes like this one."

CBH's vision to "abolish poor and unsafe living conditions and to create communities intent on uplifting and changing peoples' lives" is fully realized in its development of Valley View Homes among its other award winning affordable housing projects.



The CBH vision demonstrates that yes, building and community design can be flexible, can adjust to environmental necessity, and can help create not just individual buildings but community—a community life of dignity, attainable by all, even by the most socioeconomically disadvantaged among us.. 

Kathleen Marshall has recently changed careers. Formerly a bachelor-educated RN, she now works part-time as a bookkeeper. Sixteen years ago she and her husband retrofitted their existing home with solar panels and air-source heat pumps. Last year they moved into their new near-NZE home in Arcata, California. She can be contacted at quepeachy@gmail.com. **Kevin Brenes-Melgar** contributed to this article as a Spanish translator. Kevin recently graduated from Humboldt State University and works for Redwood Energy as a HERS rater. **Sean Armstrong** also contributed technical information for this article.

>> learn more

California's AB 32 overview can be found at www.arb.ca.gov/cc/ab32

For a comparative list of guidelines visit BiG's documents and checklists page at www.builditgreen.org