

BY CLAYTON DEKORNE

Model for the Future: A David vs. Goliath Story

In the ongoing search for a solution to the skilled labor shortage in the construction industry, there is no silver bullet, no guaranteed training solution that is going to lead construction employers out of the most troublesome of predicaments plaguing the industry at all levels. However, there are some glimmers of hope. The story of Rancho Cielo's stunning win at the Orange County Sustainability Decathlon in Costa Mesa, Calif., is one of those glimmers—perhaps even a beacon of inspiration—for all of us in the building trades, not least because this story brings us all one step closer to a model for practical, healthy, net-zero, and water-efficient homes.

On October 17, 2023, the Orange County Sustainability Decathlon announced that the team representing Rancho Cielo Construction Academy won the top prize in a sustainable home design and construction competition. Rancho Cielo was not only the smallest school with the fewest resources participating in the challenge, but it was also the only school that doesn't grant degrees. Rancho Cielo

bills itself as a comprehensive job-training program for students who are “underserved,” which it identifies as “low income, drug use, gang involvement, criminal background, truancy, school credit deficient, school dropouts, probation referral, homeless, on foster care.” All the other teams were from colleges and universities, including the University of California San Diego in collaboration with Zhejiang Normal University of China, University of California Irvine in collaboration with Orange Coast College, Cal Poly Pomona, and several Cal State programs.

MODEL TRAINING PROGRAM

The origin story of Rancho Cielo as an institution is itself inspirational. It was founded in Salinas, Calif., by John Phillips, a former Monterey County prosecutor and superior court judge, who (as he wrote in an essay that was picked up by *Time* magazine in 2015 from Zócalo Public Square, a nonprofit media syndicate) was beginning to question California's 1990's tough-on-crime



Rancho Cielo students begin framing one of four modules that will comprise Nexus 01, the prize-winning model home that was designed to have a zero-carbon footprint and operate off the grid using solar roofing and storage batteries.

Photo courtesy Bill Hayward/Hayward Lumber

stance, which restricted judicial discretion: “At work, I found myself having to decide if an 18-year-old kid would be sentenced to 46 years to life—or 52 years to life,” Phillips wrote. “Most of the young people who stood before me were men of color who, because of multiple factors, had never had the opportunities that are supposed to be afforded to all our kids in this great nation.”

Knowing there had to be a better way, Phillips explored the possibility of founding a school where kids could learn a trade and be given the opportunities they needed. Key to making this work was Phillips’ insistence that no kids would ever be sentenced to Rancho Cielo. “Judges could recommend Rancho Cielo, but we wanted this ranch to be considered an opportunity for success rather than a punishment.”

To make this happen, Phillips set his sights on a 100-acre parcel in Salinas, Calif., where the county was dumping surplus furniture and equipment in buildings that had once been part of the Natividad Boys’ Ranch, a defunct juvenile incarceration center. Transforming that very site was a fitting representation of the transformation of jurisprudence he felt certain was needed.

His first ventures to make this happen involved a board of directors composed entirely of elected officials who required a \$26,000 feasibility study. The study concluded that a transformation of the Natividad site would be impossible. Undeterred, Phillips recruited a new board made up of local business owners, including construction industry leaders who were willing to reconstruct the site along with youth volunteers.



Each module of the Nexus 01 home was designed and built to be lifted with a forklift and trucked to the site, then stacked and arranged, looking nothing like the usual “double-wide” modular (**2-4**). The layout of the 847-square-foot home features two convertible rooms, an upstairs loft, a vaulted living-room ceiling, a kitchen (designed with guidance from students in Rancho Cielo’s culinary arts program), and screened-in front porch. Henry Blueskin, Milgard windows, and Thermacork exterior insulation all helped the enclosure reach Passive House standards for air-sealing.



On site at the Orange County fairgrounds in Costa Mesa, Calif., students begin to install a Tesla Powerwall alongside two heat-pump water heaters. With support from Monterey-based Scudder Solar, the Powerwall was integral to the off-grid, net-zero strategy that helped Nexus 01 place first in the “sustainability and resilience” category of the competition (5). All of the students participating on the Rancho Cielo team were coached to know and present on every aspect of the Nexus 01 home, an approach that helped the team compete in the “communication and marketing” category. To aid this, the team provided a view into the behind-the-wall systems of the demonstration home, including the ERV and whole-house filtration (6) that were central to the home’s “health and comfort” strategy.

“I had no money, but we moved forward anyways, commencing work on the property in 2003,” Phillips wrote. “When I arrived at 7 a.m. on that first Saturday morning, 75 pickup trucks already covered the hills; 22 dump trucks from various trucking companies lined the road. It was a beautiful sight to see. We never looked back.”

Since 2000, the Rancho Cielo Youth Campus has served more than 1,000 out-of-school, 16-to-24-year-old students in programs ranging from auto mechanics to culinary arts, with the Construction Academy standing front and center in this year’s Orange County Sustainability Decathlon.

THE OCSD

The Orange County Sustainability Decathlon (OCSD) was formed in response to the California Legislature adopting the goal of being 100% reliant on renewable energy by 2045. The goal of the OCSD—adapted from the U.S. Department of Energy’s Solar Decathlon—is to challenge university teams from across the country to design and build model homes that address climate change and California’s housing needs.

The decathlon is organized around 10 contests that are scored independently, each worth 100 points. The team winning the most points takes top honors. Six of the contests—sustainability

and resilience, architecture and interior design, engineering and construction, communications and marketing (which evaluates the teams’ skills), market potential (which evaluates the model homes), and innovation—are judged by juries of industry professionals. Two contests—energy efficiency and water efficiency—are based on the home meeting a maximum 40 HERS and 40 HERS_{H2O}, respectively, with the lowest scores in each category winning the contest. The remaining two contests are “performance verifications,” for which the teams must meet health and comfort and lighting and appliance criteria by demonstrating that relevant home systems “function as intended and are installed and configured per the construction documentation.”

NEXUS 01

The Ranch Cielo model home, dubbed “Nexus 01,” won first place in five contests—sustainability and resilience, architecture and design, energy efficiency, health and comfort, and lighting and appliances—and second place in communications and marketing, engineering and construction, and innovation.

A few excerpts from the judges’ comments that capture the essence of how this project met the competition’s goals follow:

Sustainability and resilience. “Overall, extremely impressive and well-integrated building with great execution, attention

Photos courtesy: 5. Scudder Solar; 6. Rancho Cielo



Shown here (7) is the completed assembly of Rancho Cielo's Nexus 01 model home, which won the overall Orange County Solar Decathlon, at the Orange County fairgrounds, in Costa Mesa, Calif. (8).

to detail, research, and documentation. Inclusion of passive-house strategies, including airtightness, ERV, continuous insulation, and natural daylighting, makes it the strongest contender."

Engineering and construction. "The thorough and thoughtful engineering and construction of this house make it applicable to any California climate. The engineering systems ensure a comfortable and healthy home." A few of the key systems that stood out for judges included the energy performance of the building envelope and systems, the energy recovery ventilator, energy recovery from the shower drain, the solar hot-water system, and the Span panel, which provides "sophisticated electrical control for improved battery performance."

Communications and marketing. "Each student understood every aspect of the project ... Did everything that was asked of them in a professional and timely way ... Mission is adopted and clearly communicated by everyone."

The communications and marketing contest stood out for Bill Hayward, owner of Monterey-based Hayward Lumber and founder of Hayward's Healthy Homes (H3), as a particular point of pride for the Rancho Cielo team, not least because other teams he witnessed had student representatives who could speak well about the one or two aspects they had worked on, but did not have a grasp of all the details. "Understanding the house as a complete system is an essential knowledge we coached each student on throughout the design and construction. It's an essential knowledge for every designer and builder," he urged.

In mentoring and guiding students through each phase of the project, Hayward was joined by a number of industry representa-

tives, including Pete Scudder of Scudder Solar and Scudder Roofing Co., and Thomas Rettenwender, principal of Carmel-based EcoLogic Architects, who all provided outsized support. However, in true "it takes a village" spirit, the Nexus 01 project received widespread community support from a host of local firms, including Don Chapin Co., Della-Mora Plumbing, Wheeler Flooring, Guardado's Landscape, Duke Kelso Construction, and Lopez House Movers, among others.

One of the standout guides on the project was instructor and former contractor Ed Bennett, said Mark Laliberte (known to the JLC community for his long-time contributions, most recently as a principal of Denver-based Construction Instruction), who also worked with students through the design and construction phases. "Ed is the guy that showed these students a way forward from the first day," Laliberte observed. "Ed became the leader when they got there. He might not have been well-liked at first because he's the guy that told them, 'If you wear your hoodies, you go home; if you write any gang sign on any tool, I'm going to find out who did it and you go home.' He held them accountable. These are tough kids, but in the end, Ed was the guy they looked up to the most."

Winning the OCSD appears to be just the first step in creating what Hayward contends is a "healthy home for all humanity." Rancho Cielo Construction Academy and EcoLogic Architects have formed a partnership, Nexus Housing (nexushousing.org), which has designed a range of models that meet similar performance goals to those of the prototype Nexus 01 and is currently taking preorders.

Clayton DeKorne is chief editor of JLC.

Photos courtesy: 7. Orange County Solar Decathlon; 8. Rancho Cielo