

Toward a More Natural Method of Construction

Kevin Rowell wants you to replace your chemical paints, fiberglass insulation, and pressure-treated lumber with non-toxic materials.

By Alec MacDonald



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On a bright autumn Saturday in 2008, **Kevin Rowell** delivered a captivating glimpse beyond the frontiers of green building. For this feat, staged in West Oakland's deFremery Park as part of the **Living Word Festival**, he brought along a truckload of bamboo slats, some rope, and a few dozen students of varying ages. They staked out a grassy corner and got busy; within a couple hours,

they had produced a series of massive frames, each a wild tangle of dramatic curves and stark beauty.

To assemble one such piece, Rowell rounded up several youth into a circle. He had them clasp hands, close their eyes, and shuffle around blindly for a while. Then they all stopped in their tracks and marked the ground where they stood, establishing an outline along which they laid bamboo slats as a rudimentary foundation. Stepping inside the foundation, the students held their hands up where they thought a ceiling should go and Rowell took their picture. Based on this photographic blueprint, more slats were bent into soaring arches, completing a kind of shell. A large tarp or canvas could have been draped on top to make a cozy hut, but the fledgling architects left their creation bare, its bamboo bones free to soak up the sunlight.

While any Realtor can tell you that exposing inhabitants to the elements will kill home value, this particular exercise had little to do with such pragmatic concerns. In fact, not everything the group put together even resembled a dwelling. One configuration conjured up a giant wooden Slinky, sprawled out horizontally. Clearly, the lesson of the day favored imagination over formula.

"Our idea is to help people understand space," Rowell explained afterward. "How space is made and how we can create it. ... It's a multi-tiered effect. People actually get the experience of building a structure, something you can walk inside of and experience. You get to think about the design process, understand shapes, understand a little bit about architecture. And at the same time it's just playful, it's very playful and very user-friendly."

Notwithstanding the vaguely New Age vibe, Rowell has a serious message, and training kids to manipulate bamboo is merely the tip of the iceberg. Most of his efforts revolve around home and business remodeling, because by trade he's a contractor — but one who defies the conventional image of his profession. Through simultaneously radical and traditional practices, he's promoting a specific brand of environmentalism that seeks to elevate

construction to an ecological art form.

In an age when developers routinely rely upon hazardous or hard-to-replenish materials for residential and commercial fabrication, Rowell advocated for safer and more sustainable alternatives. Instead of using pressure-treated, clear-cut lumber for that fence, how about trying locally grown bamboo? Instead of applying paint containing volatile organic compounds, how about a mix of clay and minerals? Instead of filling that wall with fiberglass insulation, how about spent rice hulls? Instead of making that house out of concrete cinderblocks, how about bricks made of actual dirt?

This is the way Kevin Rowell thinks, someone trying to take green building one step further. This is the way a natural builder thinks.

Natural building, a nebulous term, generally refers to a set of diverse construction methods that draw upon raw, renewable, and recycled materials, ideally gathered from the site vicinity. Priorities of the discipline include maximizing a structure's energy efficiency and minimizing its toxicity. And while these sound like decidedly modern preoccupations, natural builders are quick to point out that aspects of their craft date back hundreds if not thousands of years. Adobe, commonly associated in this country with the Pueblo villages of New Mexico, presents a familiar example, but most others remain obscure, such as cob (used to erect the world's first skyscrapers in Yemen), slip-straw (featured in some of the earliest Tudor mansions), or lime plaster (applied to the chambers of Egypt's pyramids).

That's not to say natural building derives solely from longstanding traditions. Practitioners also incorporate ongoing scientific research and pioneering design concepts to keep their work fresh and relevant. The field continues to evolve and expand, and over the past twenty years has steadily gained momentum.

In the authoritative *Alternative Construction: Contemporary Natural Building Methods*, editor **Lynne Elizabeth** describes natural building as a movement that "encompasses a broad set of ethics, underpinned by a worldview that treats the earth as not only sacred, but alive." It's a worldview Rowell embraced early on when, at age seventeen, he ditched his native Michigan and came west to immerse himself in agriculture and Buddhism at the **Green Gulch Farm Zen Center** of Marin County. After several years growing food and practicing meditation, he left to work for a contractor, but took with him the values he cultivated in the fields and in the temple.

In the decade since his transition to construction, Rowell has racked up untold hours of labor and accumulated vast technical skill. His career path has wound through places like rural Laos, where he coordinated the construction of a school made from earth. Sculptures by **Bamboo DNA**, one of his edgier professional partnerships, have popped up at events like the **Coachella Music Festival**. *The New York Times* paid a visit to his El Cerrito home to observe him pouring a mud floor. And just this spring, he's been down in Haiti, attempting to shape that country's redevelopment strategies in the wake of its devastating January 12 earthquake.

Now 31 years old, Rowell has established himself as a prominent flag-bearer for the natural building movement — evident in small part by the name of the company he owns, **The Natural Builders**. Still based in El Cerrito, he specializes in coordination, tapping into a network of forty or so specialists and subcontractors to form customized teams for tackling different projects around the Bay Area. The region has become a hub for natural building practitioners, who seem to have found a comfortable niche here, perhaps due to the pre-existing undercurrent of activist culture. Rowell, however, believes the movement can find far broader support, and hopes to popularize natural building to the level of mainstream acceptance and adoption. To what extent he can accomplish this goal, though, remains a tricky question.

Rowell's firm has displayed flashes of the movement's large-scale potential, as evident from a recent tour of some of the company's East Bay portfolio.

Rowell started with a basic residential remodel in El Sobrante, where he partnered with architect **Darrel DeBoer** to expand the back of a house and raise its roof line, adding salvaged windows, secondhand lumber, and a lime finish. After rapping with DeBoer over a fresh cup of coffee, he hopped into his truck and drove deeper into the hills. He parked in a secluded spot away from the main road, close to the wood frame skeleton of another house, one he is helping to raise from scratch. If he gets permission from Contra Costa County, he's planning to insulate the walls with spent rice hulls trucked in from the Central Valley.

Leading the way past some bamboo clusters he's been cultivating, he turned a corner and revealed a trailer-size shed — a rustic laboratory of sorts where he and his collaborators experiment with different materials. Inside, the smooth earthen floor allowed a nearly imperceptible give underfoot; tiny flecks of straw were visible embedded in the pale gray surface, which had yet to receive its finishing coat of linseed oil or beeswax.

Next it was down to Berkeley's **BioFuel Oasis**, a gas station that sells recycled vegetable oil for use in diesel-engine vehicles. The station's owners were holding a meeting in their storefront, which The Natural Builders renovated as a barter job in exchange for occasional tank fill-ups. Rowell chatted briefly with one of the owners, **Melissa Hardy**, about the possibilities for sprucing up the area around the solar-powered pumps. Then he cruised up to the **David Brower Center**, an office complex adjacent to the UC Berkeley campus that leases space to nonprofit organizations. Recycled materials account for more than half the construction of this new building, whose lobby showcases another project of The Natural Builders. Flanking the entrance, a reception desk sits within a rectangular alcove; close examination of its high, cappuccino-colored walls reveals they are encrusted with soil.

Despite representing just a fraction of his company's efforts, Rowell's tour offered an intriguing preview of the ways natural building might take root in the Bay Area. Once he'd wrapped things up, he sat down for a late lunch and speculated about the trajectory of his discipline.

"We already have it viable, successful, and proven at the level of the people who want to go live in the woods in a hobbit house, so thank you Frodo Baggins," he quipped. "The trick that I'm really excited about — and a lot of my colleagues are as well — is how do we make this real for Joe Shmoe Contractor or Cindy the Housepainter?"

As Rowell indicated, the movement has often riffed on **J.R.R. Tolkien's** vision to breathtaking effect. Whimsically fantastic yet totally inhabitable houses made out of cob — a mixture of clay, sand, straw, water, and earth similar to adobe — have sprung up along the West Coast, principally in Oregon. However, these dwellings typically lie off the beaten path, occupied by folks without any strong desire for social contact, much less neighbors. While these avant-garde exploits demonstrate an impressive can-do spirit, they wouldn't necessarily fit in the metropolitan Bay Area. You might have enjoyed *Lord of the Rings*, but you'd probably rather live in a bungalow. "We have to make this stuff make sense for the homeowners first, so that they're asking for it," Rowell said.

At first gloss, persuading the general public to hop on the natural building bandwagon seems fairly straightforward — just shed a little light on how nasty the status quo can be. Rowell contends that consumers have no way of knowing what chemical evil lurks in the mass-produced wares lining the aisles of corporate chains like **Home Depot**, because no one's forcing the manufacturers to disclose such information. Slap a coat of their paint on your living room, and you might be inhaling harmful fumes for years. Pick up a stack of their plywood, and you might have picked up a little urea as well. And that fiberglass insulation of theirs you bought? It might contain formaldehyde.

"It doesn't mean that all the natural building materials don't have a certain level of care that needs to be taken with them," Rowell admitted. "It's not about being naïve and pretending that the natural materials are all of a

sudden benign, but it's about knowing their purpose, their application, and their end use, and knowing how to work with them safely during that process."

If a homeowner hires Rowell for a remodeling job, she'll have a pretty good idea where he's getting his materials from; in fact, he might source them off her property. If the soil from her backyard tests out okay, then he can mix it up into a plaster. Or, maybe he'll cut down a tree that's threatening to fall on her house, and have it milled into boards by his friend **Paul Discoe at Live Edge Lumber** in West Oakland. And even if what he uses doesn't come directly from the construction site, its origins won't be shrouded in secrecy.

Despite this upside, natural building materials face serious obstacles to gaining widespread acceptance. Synthetic equivalents might harbor unsavory qualities, but they are cheap and easy to churn out, so they completely dominate the market. As a result, they dictate how the entire construction cycle runs, too. **Marisha Farnsworth**, who co-founded The Natural Builders with Rowell back in 2005, noted that "everybody already knows how to build with two-by-fours or two-by-sixes, and everybody knows how to pour concrete. ... The architects know how to design with those materials, the builders know how to use them, the hardware store sells them."

The same can't be said for natural building materials. Not only do few people have experience handling them, but they can also tie up the permitting process. "The real challenge with building departments is that safety and security is such a big, important issue," Farnsworth said. "Building officials just want to make sure that people are safe, so when you go in there talking about alternative materials, they're like, 'Whoa, how do I know that this is safe?'"

Of course, natural builders deem these materials much less dangerous than the going standard, and not just in terms of toxicity. They also emphasize climate change, a menace that municipalities have begun to address in earnest. Yet in the essay "**Our Myopic Building Codes**," former **US Green Building Council** board member **David Eisenberg complained that permitting requirements place** "tremendous scrutiny" on earth, straw bales, or local timber, while issuing a free pass to "industrialized materials and systems that travel thousands of miles to a building site and have huge ecological footprints."

Advocating a reversal of this situation, he continued, "Our building code is a gate, and code officials are the gatekeepers for the crucial and enormous changes that must happen in the next decade if we are to avoid the catastrophic consequences of global warming, peak oil prices, and the impact of 6.5 billion of us on this planet."

Eisenberg directs a Tucson-based nonprofit that supports sustainable development strategies and maintains an office at **Vital Systems**, a natural building firm in Ukiah. Despite the caustic title, his essay does not set out to vilify officials, but instead calls for updating policy through dialogue with the government.

Keeping this conversation flowing appears to be the preference of most natural builders. Practitioners can, of course, choose to fly under the radar and simply not bother with permits — and with the discipline's counterculture attitude, this surely does happen — but that puts a crimp in marketing possibilities. Besides, taking the formal approach can turn out to be beneficial. Darrel DeBoer, Rowell's architect partner in El Sobrante, reported that county officials in Contra Costa were "very open and helpful" in reviewing a straw and clay insulation for which the team recently sought approval. A couple of minimal restrictions were handed down, but those were based on the literature that DeBoer submitted with the application; the county regulated them according to their own natural building standards.

Farnsworth concurs on the importance of certified research and testing in prompting authorities to set more inclusive codes and to issue permits with greater flexibility. The urge to procure legitimacy through official channels motivated her and Rowell to start The Natural Builders in the first place, as a

means to obtaining a contractor's license. Farnsworth has since moved on — in both a business and a personal sense; the couple recently ended their marriage — and is pursuing a master's degree in architecture at **UC Berkeley**. Eventually, she'll be armed with yet another license that will aid her in convincing people to "start thinking about these materials as just another toolset that any designer has at their fingertips, and not as this specialized, fetishized, new set of materials.

"People build with these materials all over the world," Farnsworth noted. "I don't think that in many countries these are called natural materials, they're just the materials that people build with." According to the book ***Earth Architecture***, for example, "between a third and a half of the world's population — approximately three billion people on six continents — lives in buildings constructed of earth."

Earth Architecture surveys a few dozen pertinent projects across the globe, really only scraping the surface of this abundant medium while still digging deep into its history. The author, UC Berkeley architecture professor **Ronald Rael**, does not consider himself a part of the natural building movement, but his perspective certainly fits the mold. He grew up around the adobe landscapes of New Mexico and Southern Colorado, and he erected a house out of mud bricks in Texas. "There's something about seeing a building made of earth, touching a building made of earth, that completely resonates," he raved. "It has this amazing quality to it."

From his background, one might guess Rael would be optimistic about natural building materials catching on around these parts. Quite the contrary, actually, at least with respect to the substance he knows best: dirt. "Not only is it non-industrial, it's non-capitalistic," he said. "They don't use it in capitalist societies because you can't make money with it, even though it has all this potential."

The potential lies in widespread availability (dirt is everywhere), high thermal mass (dirt absorbs heat during the day and releases it at night), and low embodied energy (you can make a dirt house without consuming much petroleum or emitting a lot of carbon dioxide). The hitch, though, stems from dirt's lack of uniformity. Rael contrasted it with steel. The steel you get in Japan will be the same as you get in America. Japanese dirt, on the other hand, will give you a different kind of mud brick than American dirt. In fact, you don't even need to cross an ocean — just cross the street. That's how sharply dirt varies from place to place. "Since you can't homogenize that and measure it, you can't sell it, because you don't know what you're selling," said Rael.

In light of this line of reasoning, dirt's prospects for truly taking off seem dim. "I really believe it doesn't receive mainstream support because you *cannot* make money from it," Rael said. "Maybe some lucky guy is going to do that some day," he added, but then proceeded to rattle off a list of past instances when earthen construction crumbled under capitalism. Around the French Revolution, a man named **François Cointeraux** tasted success with it before the masons, carpenters, and merchants "smashed his models and kicked him out of town because they thought he threatened their livelihood." In a bid to conserve resources during both World Wars, the US government printed educational pamphlets encouraging people to try it, but dropped the campaign when prosperity returned. **Frank Lloyd Wright** flirted with it, but this remains a lost piece of trivia within his monumental legacy. After the Vietnam War, New Mexico made it prohibitively expensive, overhauling construction regulations to require the inclusion of concrete and steel reinforcements in new adobe structures; the move effectively eradicated the practice in the Native American communities from where it had originated.

Given this bleak overview, what hope can an earth architect hold out for? Rael suggested "a complete changing of building codes, maybe an abolishment of building codes in some places."

But while natural building faces the challenge of building codes, so-called green building does not. "That's why we've seen green building take off much

faster than natural building," said **Taja Di Leonardi** of **Ecohome Improvement**, a residential remodeling retail store she opened in Berkeley around the same time Rowell and Farnsworth launched The Natural Builders.

Di Leonardi sells an array of what she terms "ecological and healthy home" products — flooring, countertops, cabinets, stains, sealers, paints, and plasters selected according to various environmentalist criteria. None of her merchandise will cause a snag in the permitting process. What's more, in the age of Al Gore, she can bank on prospective customers responding positively to the green marketing angle. This strategy has proven so lucrative that less scrupulous opportunists have infiltrated the scene with products of marginal environmental benefit.

Natural building has the opposite problem. "I think a lot of people are very interested in it, and they want to read the books, and they want to sound versed in it," Di Leonardi opined, but "a far less percentage of those people have consumer readiness to put their dollars into that technology — actually make the purchase."

The shelves of Ecohome Improvement may provide them an opportunity to take that plunge. In fact, Di Leonardi carries a brand of earthen plasters called **American Clay** with genuine commercial promise. Rowell heartily endorses the brand, and relies on it when clients show hesitancy at having their own backyard smeared all over their bedroom walls. Given the dissimilarity of most dirt, American Clay has some degree of standardization, and it also bears the carbon footprint of being shipped up from New Mexico. But in advancing the movement, Rowell understands he has to pick his battles. As he acknowledged, "Compromise is an important part of accomplishing things."

When you set out to reform an entire system, you can't always quibble over details. Or you can, but you probably won't get very far. In this case especially, such a daunting challenge demands that natural builders choose the right entry points for intervening into the unsustainable protocols of conventional construction.

For Farnsworth, this uphill slog against the norm can get a little overwhelming. Tests need to be conducted, rules need to be rewritten, professionals need to be trained, and the public needs to be informed — and "those particular issues are why we often build sculptures and sheds and benches and that kind of stuff," she said, elaborating that "there are definitely architects and engineers who are building whole houses, which is awesome, but I think taking the baby steps and educating people and spreading the word little by little is also another route that may be a little bit less frustrating."

That's why bamboo frames have sprung up in deFremery Park the past two years, and why, if you head over to the Living Word Festival this fall, you'll see a group of youth out on the grass, learning what it feels like to ply one of the most versatile and renewable building materials on the planet. What you're witnessing isn't just a bunch of kids having a good time, but also the steady forward progress of an ambitious environmentalist movement.

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