

No Grid in Sight



Most deserts are dry and dusty expanses of blue skies, bleached soil, and ruler-flat horizons. The Colorado Plateau is not one of them. This is a land of stunning contradictions, where thousand-foot rock monoliths jut like raised fists from flat riverbeds, and traffic-light-green foliage glows on stoplight-red soil. The sky here appears not blue but bright white, a flashbulb burst through squinted eyes.

At the heart of the Colorado Plateau is the Navajo Nation—a 27,000-square-mile sovereign state lying in the Four Corners region, in Utah, New Mexico, and Arizona. It's here, along a dirt road, miles from anything and anybody that Rosie Joe's house shimmers like a modernist mirage on an alien landscape.

Project: Rosie Joe Residence
Architect: DesignBuildBLUFF
Location: Bluff, Utah



Dwellings

Entirely off the grid, the house is powered by four photovoltaic panels that supply electricity to lights, small appliances, and water pumps. Rosie Joe weaves a traditional Navajo rug (opposite, top). DesignBuildBLUFF's 2007 team put the finishing touches on their latest project (opposite, bottom).



“That’s it on the left, see it?” asks Hank Louis, the 56-year-old lead architect, as we navigate a bumpy sand path and park in the shadow of the house’s sprawling V-shaped butterfly roof. “We were trying to do something special, to make some real architecture here,” explains Louis, stepping from our air-conditioned car into 105-degree summer heat. As he approaches the front door, the façade of exposed wood, red rammed earth, and glass is reflected in his circular Lennon-style glasses, which, like his Panama hat, never leave his head. “It’s traditional for doors to face east on Navajo homes,” he says matter-of-factly. “You know, when we build here it is not just about erecting a structure.” He pauses, then knocks on the door. “It’s also about reflecting and celebrating the Navajo culture.”

Rosie Joe’s house was the first project built in the Navajo Nation by DesignBuildBLUFF, a nonprofit organization affiliated with the University of Utah’s College of Architecture + Planning, that Louis directs with a group of first-year graduate students. Each year eight to ten students design a house for a Navajo family then spend a semester on the reservation constructing the house by hand. The houses must operate off the grid. The goal is for budgets not to exceed \$30,000.

Louis based DesignBuildBLUFF on the Rural Studio, which he had read about in a trade magazine a decade earlier. “I just thought those were the coolest things I’d ever seen,” he states. Led by Samuel “Sambo” Mockbee until his untimely death in 2001, Rural Studio enlists students from Auburn University to construct environmentally conscious, cost-effective, and innovative housing for low-income families throughout Alabama and surrounding states. In 1998 Louis invited Mockbee to give a lecture at an annual architecture symposium in Salt Lake City. “He really incited the students,” explains Louis, “and he really incited me. He told us to do something, to make something real happen—and to do it now!”

Four years later, Louis and students had completed two outdoor recreation spaces and a 2,000-square-foot straw-bale house for a Tibetan refugee family of nine living in suburban Salt Lake City. “After the [Tibetan family’s] house, I knew we could do this, push this beyond our comfort level and make something bigger happen,” says Louis. He planned to build the next house off the grid in the high desert of Navajo Nation. Eight students enrolled. By fall 2003, they had received 30 applications from families on the reservation in need of a home, but it was Rosie Joe, a single mother of two who worked three jobs and lived with her mother in a 150-square-foot shed without running water or electricity, who caught their attention. Louis worked with Navajo elders to secure a 66-year lease on a half-acre in the middle of a deserted bluff off Highway 191. In January 2004 the newly formed DesignBuildBLUFF team packed their bags and moved 350 miles southeast to the high desert. “We kind of just went on a leap of faith.”

Bluff is a dusty outpost located a few miles outside the Navajo Nation in the southeastern corner of Utah. ▶





Kitchen and living room walls were constructed of clear and white acrylic panels stuffed with straw to allow for natural ventilation and light to filter softly into the house. The walls leaked after the first winter and the straw sank down in the frames. Students returned to the site, sealed and filled the

walls with Styrofoam (leaving the straw-fill in the kitchen as is). Nicholas sits in the shade of the roof (opposite page); students cut and hand-welded thousands of reclaimed rebar pieces into a complex grid that would support four bi-level corrugated-steel roof panels.



It contains exactly one coffee shop and one taco stand, which provides most of the sustenance for its 320 flip-flop-wearing, mostly new-age and cowboy residents. At the dusty center of Bluff is a five-bedroom sandstone Victorian house once owned by a turn-of-the-century rancher. This is DesignBuildBLUFF headquarters, where students spend six months living and working together to build their house.

When I pull into the weedy parking lot across from the house, the four remaining 2006/2007 DesignBuildBLUFF students are there to greet me. They have just finished a nine-hour day of work and are playing horseshoes, strumming Beatles songs on guitars, and drinking Utah-regulated 3.2-percent beer on hand-me-down couches on a sprawling porch. This small group has volunteered to stay through the summer to put the finishing touches on the 2007 project—a crescent-shaped two-bedroom house for an elderly Navajo couple living three miles out of town.

“Ah, those new students, they have it easy!” says Clio Miller, a graduate of DesignBuildBLUFF who worked on Rosie Joe’s house. “When we showed up, there were no beds or couches. It was January, and it was freezing. We didn’t know what we were doing, didn’t know the building process, and we didn’t have any mechanical tools.”

What Miller and other Rosie Joe students did have was a three-dimensional paper prototype of the house they were about to construct, a 1,200-square-foot rectangular structure outfitted with a double roof that would heat and cool itself naturally via a complex passive solar program. “This was our opportunity to get out of the classroom and put something into reality,” states Scott Woodruff, another Rosie Joe graduate. “And we were very excited about it.”

Along the 22-mile drive from Bluff to Rosie Joe’s house in Navajo Nation, windswept shacks, collapsed sheds, and wheel-less Winnebagos stand on the desert landscape like tiny ships lost on a sandy sea. “Most Navajos choose to live alone out here, away from groups of people, away from utilities,” explains Louis. Of the more than 175,000 Navajos that populate this area, 44 percent are unemployed, and over 56 percent live below the poverty level, the highest poverty rate in the U.S.

“Some of the elders didn’t want us out here at all. They’ve said, ‘The most helpful thing you can do is to leave us alone, to quit giving people handouts,’” explains Louis. “But I don’t believe that. What we want to do is work together, to get everyone involved in this process. That’s what I learned from Mockbee, and that’s what we’re doing out here—trying to pass this on.”

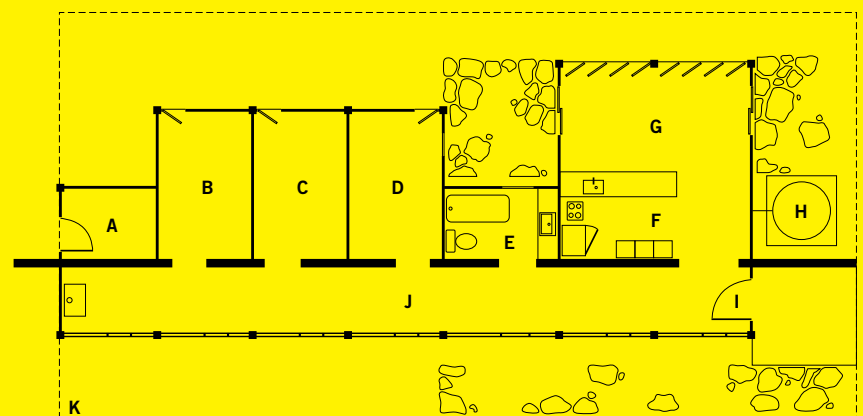
The first step in building Rosie Joe’s house was constructing a rammed earth wall. Students gathered sand and clay from around the house, handpacking it into a 75-foot-by-18-inch mold. Because it is made from the surrounding earth, the wall disappears into the landscape, the natural red-and-tan striations mirroring the rolling desert plains.

The concrete foundation came next. “We found that living off the grid was one thing; constructing a house ▶



**Rosie Joe Residence
Floor Plan**

- | | | |
|-------------------------|----------------------|-------------------------|
| A Storage | E Bathroom | I Entry |
| B Master Bedroom | F Kitchen | J Hall |
| C Bedroom | G Living Room | K Butterfly Roof |
| D Bedroom | H Cistern | |





Ram On

Take some dirt, sand, and clay, stomp on it for a while, and what do you get? One of the most resilient construction materials in history. It's called "rammed earth," and for thousands of years it's been used by billions—yes, billions—of people to build everything from latrines to parts of the Great Wall of China.

Rammed earth is not just energy-efficient and cool looking, it's also easy to make. A dirt mixture is dumped into a 12- to 24-inch mold, and a stabilizer of concrete—or, historically, lime and animal blood (not PETA-approved)—is added. The soil is tamped to about half its original height and then cured. What remains is a rock-like wall boasting a compression of up to 625

pounds per square inch—pliable enough to support a nail yet sturdy enough to last centuries. The considerable density gives the structure an exceptional thermal mass, allowing it to soak up heat during the day and evenly distribute it throughout the night.

Unlike traditional wood-framed houses, rammed earth structures are fireproof and termite-proof, and produce very little post-construction waste. An estimated 2 billion people in the world still use earth to construct their houses today.

off the grid was another," explains Miller. One night when the group was working until 9 p.m. to complete an integral last part of the foundation, they ran out of water. "We ended up emptying the water from our CamelBaks and pouring it into the concrete," she says. "It actually worked. We finished the job. But we got pretty thirsty."

The house is framed with exposed rough-sawn pine bought at a 50-percent discount from a mill in nearby Dolores, Colorado. Mismatched wooden pallets make up the ceiling, each gathered from the back of supermarkets and delivery depots around neighboring Cortez. The group pieced together the odd-sized pallets, Tetris-like, and lined them with canvas stuffed with insulation to allow air to circulate easily within and outside the house.

The final—and most challenging—component of the house was installing the semi-detached 2,500-square-foot butterfly roof. This open structure allows for wind—which is frequent in the area—to pass through the roof without lifting the panels. The roof also collects water for the house. As rain falls, the wide panels funnel water into a 1,500-gallon above-ground cistern located on the east wall. "Just a couple inches of rain fill the cistern—they've never needed [to supplement their water from a municipal system]," explains Louis.

I return to Rosie Joe's the next day. It is her day off from waiting tables and folding laundry in Bluff, but she's busy weaving a traditional Navajo rug. "This one is for Hank Louis," she says, flashing a smile. Her left hand feeds yarn to the hand-built loom as the right presses a wooden comb-shaped beater against the weft. Behind her, flat blue-white sky abuts red earth. Through the white-framed windows, the flat squares of contrasting land and air resemble a Rothko painting.

"You know, when the house was being built, I saw the big [rammed earth] wall and thought, It is so weird!" Rosie Joe laughs. Phelicia, her 14-year-old daughter, sits at her feet leafing through old magazines while 9-year-old Nicholas enthusiastically asks if anyone would like to join him in the 101-degree heat for a round of desert basketball. "Some people pass and they think it is a drive-through, or a gas station," she says. "But then they see that we live here, and they like it. And we like it very much too. It is our home."

Stepping outside to leave, I look back at the house. Atom-bomb storm clouds spit lightning across the crooked horizon. The sky, all gray and white and exploding in every direction, resembles the ocean at its most furious. In the tumult of the elements, the rectangular frame and rhombus roof appear almost fake, a magazine cut-out accidentally dropped on a Gateway screensaver. But there is a virtuosity, a realness, about the house. Void of superfluity, it is clean and modern and green not by choice but by necessity—an efficient machine made for simple living. In a world obsessed with varnish, stucco, and matching Pantone colors, this trueness of design and purpose is not only refreshing—it's revelatory. ■



In wintertime, the rammed earth hallway wall serves as the central heating device, soaking up sunlight through south-facing windows and distributing warmth throughout the house. A wood-burning stove at the end of the front hallway provides additional heat for cold winter nights.