



Packing Heat: The icehouse's hip, soaring lofts conceal sophisticated environmental elements. The concrete floors, for instance, radiate warmth, but only to the height of a person, to save on utility costs.



FROM ICEHOUSE TO GREENHOUSE

HOW ONE YOUNG COUPLE TURNED AN ABANDONED BUILDING INTO SUSTAINABLE LOFTS

BY JOSHUA M. BERNSTEIN | PHOTOS CAROLINE ALLISON

In the 1860s, a three-story brick brewery and icehouse in Brooklyn's Crown Heights opened its doors. It thrived as the Nassau Brewery—doling out its frosty anesthetic to saloon keepers in what was then called Crow Hill—until Prohibition. A string of occupants followed: metal fabricators, a moving company, and, for the last 20 years, pigeons.

Then, four years ago, Benton Brown and his wife, Susan Boyle, were riding their bikes through Brooklyn when they spotted the empty icehouse. Crammed between auto body shops and warehouses, the building's arched, sunlit windows and two-foot-thick masonry stopped them in their tracks.

Brown, 32, is a welder and handyman. A few years earlier he and four friends cut their teeth on a factory-to-loft renovation near Brooklyn's desolate Navy Yards. They gutted the raw 10,000-square-foot space, and fitted it with boilers, bathrooms, and radiators and built Brown a welding studio. Boyle, 31, is a small, slender woman with a laid-back cadence and environmentalist leanings—for years she worked to promote bike-friendly transportation.

The couple envisioned mixing their passion for green building with their live-work lifestyle to create a home "as environmentally sustainable as possible," Boyle says. They purchased the



Home Brew: Brown and Boyle (above right) wanted their lofts to combine historic industrial charm with sustainable design. They recycled wood from the building to create trim and windowsills (above left), bartered steel beams from the site for vintage fixtures and sinks (right), and removed the building's window frames for re-use throughout (below). But the lofts do not lack for modern conveniences (facing page), with expansive kitchens, lots of light, and sculptural stairways. Not bad for a fixer-upper.



14,000-square-foot icehouse for close to \$240,000 in November 2001, two months after marrying.

Brown, an amateur builder with no formal architectural training, used AutoCAD, a drafting program, to design the space, and a structural engineer vetted his plans. Brown drew blueprints for six residential lofts (one for him and his wife, five to rent) and a studio. The units ranged in size from 1,100 to 2,500 square feet, and all incorporated the ecological sensitivity the couple felt so strongly about.

Brown and Boyle then boned up on green building techniques, taking classes and studying environmental resource books. Despite her lack of experience, Boyle became the project's sub-



contractor. She learned to forgo her subdued manner and became an order-barking, collar-grabbing, five-foot-four foreman. That, in retrospect, came easy. Solar power, soil roofs, and radiant heating, they soon discovered, came at a much greater cost. Renovation estimates ran as high as \$100 per square foot.

Luckily, New York state is in the midst of trying to promote sustainable design and development, so various government grants blunted Brown and Boyle's costs. They received a \$75,000 grant from KeySpan Energy's Green Cinderella endowment, a New York City program promoting environmentally sound building rehabilitation. The application took about a week to complete, the general requirements were straightforward, and, for the couple, the pro-

gram's standards—incorporate natural gas technology and green building methods into the construction—were second nature. The application was completed in July 2003, with good news arriving by September. The hardest part was waiting for the check—it was on hold until the building's certificate of occupancy was secured in September 2004. The New York State Energy Research and Development Authority added \$28,000 for a 7,000-watt solar energy system. Loans covered the \$1.3 million remainder—plus their living expenses—and by March 2002, cobbling the icehouse together was a full-time career.

The result is a homemade model of cutting-edge green architecture. The concrete floors contain up to 45 percent fly ash



(burning coal's reusable by-product), nearly four times the average. Radiant heating within the floors warms the building—but only to human height, not to the ceiling, thereby combating fuel costs (and inadvertently creating some teeth-chattering stairwells). High-efficiency water boilers also help to lower the icehouse's heating costs, and roof-integrated solar photovoltaics furnish 50 percent of its energy.

The 2,300-square-foot roof was flood-tested, sealed, and covered with alpine plants and a few garden favorites, all of which retain storm water, provide wintertime insulation, and diminish summer heat. (Occasionally the couple's DIY ethos almost did them in—instead of renting a hose-like soil blower, Brown

devised a backbreaking pulley system that dragged soil roofward in 55-gallon drums. "That," he says, "was not a fun day.")

Even before any of this high-minded construction began, the couple faced endless structural snafus. The icehouse's second floor sat awkwardly between window openings, blocking natural light. The remedy: ripping out hardwood floors and steel beams. The icehouse's sewage system needed to be modernized, so a new sewer line was dug, sparking a fight with city services, which insisted the old lines be excavated and capped. Brown says he'd envisioned doing much of the renovation alone. He designed and welded the steel front door and the staircase to the couple's loft himself. But as he began to fall

behind schedule, he eventually admitted that he needed assistance and hired a team of up to a dozen workers to help him finish the job.

"Our budget wasn't set up for that," Brown says. Further setbacks included \$600-a-month scaffolding that stayed up for 12 months instead of four. And construction delays forced a tarp into winter duty, covering the void where a new roof had yet to be built. During those months, the tarp often leaked, filling their bi-level rooftop apartment with five-foot snowdrifts. "The penthouse looked like a snowy prison," Boyle recalls. "I would walk in here and say, 'This is not a home.'"

That's when the fights began—the couple's new marriage was feeling the strain. Sensible developers would have tossed in the trowel and called *Extreme Makeover*. But Brown and Boyle share an irrepressibly optimistic outlook that helped to smooth things over. "No matter what, we always thought we were nearly finished," Boyle says.

Many of the headaches were, the pair confesses, self-inflicted. Progress was hamstrung by their preservationist standards: they insisted on retaining the building's character, taking pains to design around and recover existing elements. That meant leaving ragged brick walls exposed. Existing metal doors became sliding bedroom doors, and salvaged industrial windows were framed with sills and trim hewn from the icehouse's beams. Any wood left over was reused for kitchen cabinets. A local salvage collector bought steel beams that were no longer needed after demolition and, in return, sold the couple vintage cast-iron bathtubs and sinks.

"It probably wasn't the most cost-effective method," Brown says, "but recycling was key to the building." And the lofts wouldn't possess their industrial charm if Brown and Boyle hadn't been such sticklers from the get-go.

The couple's final, most gratifying project was to build their own workspaces. Brown created a welding studio in a choice loft on the icehouse's ground floor, where the "noxious smells and flying sparks" would be far from his living quarters. "This way, live-work doesn't feel so deadly," he says. For her photo habit, Boyle built a darkroom beside the welding studio, so her developing chemicals would be three floors removed from her bedroom.

Boyle and Brown finally moved into their loft in December 2003, after construction and paperwork hassles added a year to the building process. Tenants (a printmaker, then a painter) started to arrive in October 2004, two and a half years after construction began. When the last moving box was unloaded, after so many months of doing everything themselves, Brown and Boyle were wary about tenants. "I thought, 'This is our perfect building. People are going to mess it up,'" Boyle says. But now that the place seems to have developed a life of its own, "it's nice to have someone else turn the lights off and on for a change."

The residents, Brown says, love their new energy-efficient digs, and as landlords, the couple's financial security is practically guaranteed. But recently, their ecological single-mindedness once again bumped up against the practicalities of being developers. After all of their resolve to build the perfect green home, they discovered one last glaring oversight: "We forgot," Brown says, "to install DSL and cable TV." 📺



Secret Gardens: When the couple dug up the backyard of their new property (top), they discovered cobblestones, along with the railroad tracks that once conveyed deliveries to the old icehouse. The rooftop, planted with mountain flora and a few herbs (middle), insulates the building in winter and cools it off in summer, while a 7,000-watt solar power system atop the roof and high-efficiency water boilers in the basement (above) drastically reduce energy costs.

The Sunny Truth About Going Solar

by David Moisl

Sure, living in a sun-warmed, grass-roofed loft sounds ideal. But isn't sustainable design affordable only to the fabulously wealthy? Not necessarily. The average price for solar panel installation is around \$10 to \$12 per watt. Considering that an average family of four requires a maximum capacity of two kilowatts, that family's costs would come to about \$20,000 to \$30,000. That may sound budget-busting, but the investment can pay for itself in as few as three years, especially if you connect your solar system to the power grid via "net-metering," in which you sell the power you generate to the grid, then buy the electricity you use. (The power company subtracts your contribution from your bill.) The other option is a completely self-sufficient off-the-grid system, which requires buying battery packs (backup for rainy days) and a propane-powered generator for emergencies. Pricy, but imagine: you'll never pay a power bill again.

We're all about doing things yourself, but installing solar power may require professional help. The Solar Electric Industry Association (www.seia.org) is starting a program to certify technicians—look for one at their site. (Also check www.dsireusa.org for tax incentives your state offers.) And if installing panels still seems like too big a commitment, keep in mind that in many states you can now choose your power company as you would a long distance service. Ask your local utility, or check out www.green-e.org to learn about nonpolluting sun- and wind-derived sources for your home.