Design Like You
Give a Damn
Edited by
Architecture for
Humanity

Building Change from the
Ground Up

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[2]
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*Design Like You Give a Damn [2]* is an indispensable handbook for anyone engaged in the search for a more sustainable future. Documenting over 100 exemplary projects from around the world, it is packed with practical and ingenious design solutions that address the need for basic shelter, housing, education, health care, clean water and renewable energy.

Personal interviews and provocative case studies demonstrate how innovative design is reimagining community and uplifting lives. From swing sets in refugee shelters to a coed skate park in war-torn Afghanistan; building material innovations such as smog-eating concrete to innovative public policy that is repainting Brazil’s urban slums, *Design Like You Give a Damn [2]* serves as a how-to guide for anyone seeking to build change from the ground up.
“Design Like You Give a Damn scream its message in its title. Good design is not a luxury, but a necessity.”
Newsweek

“No community is immune to the forces of climate change. If we have learned anything from Hurricane Katrina, it is that we must adapt. Good design accelerates the adoption of new ideas—and this book shows us how.”
Brad Pitt, Jolie–Pitt Foundation

“It is not just about putting bricks to mortar. It is about taking the vision of creating a better world for others and making it tangible”
Auma Obama, CARE International

“Architecture can save lives.”
San Francisco Chronicle

“If you care about the future we’re building, you ought to own a copy of Design Like You Give a Damn.”
Alex Steffen, co-founder, Worldchanging

“An encyclopedia of inspiration...”
Amazon
Bamboo Shelter

PROJECT LOCATION
Ramsar, Mazandaran, Iran

DATE 2008–9

END USER Latifi family

CLIENT Manouchehr Mirdamad

DESIGN TEAM Javad Abbasi,
Kaveh Akef, Milad Haghehjap,
Pouya Khazaeli Parsa

CONTRACTOR Javad Abbasi

FUNDER Manouchehr Mirdamad

COST $1200 USD (prototype)

AREA 40 sq m/430 sq ft

OCCUPANCY 4 people

Milad Haghehjap, from the design team, stands inside a completed bamboo shelter. Bundles of rice stems are tied to bamboo stalks on the exterior for climate control.

Photo: Pouya Khazaeli Parsa
In the fall of 2008, Iranian Architect Pouya Khazaei Parsa wanted his students at Azad University of Tehran to research shelter alternatives for post-disaster situations. The assignment was inspired by late architect Nader Khalili’s innovative earthen dome design at The California Institute of Earthen Art and Architecture, which Parsa learned of in the first Design Like You Give a Damn book. One of Parsa’s students, Javad Abbasi, took his inspiration from Iran’s iconic Sultania Dome, but during the course of building a project model, discovered the strips of foam he was spiraling to form it were too thick. Abbasi realized his error about one-third of the way through model construction and considered it a failure. However, Parsa urged his student on, seeing potential in the form developing from the flawed dome design. The result was simple and beautiful. They set out to create a bamboo prototype of the structure of the unique, dome-like form.

Bamboo is an abundant and affordable natural resource in the region. The frame was constructed by overlapping half circles formed by joining two strips of bamboo. Gas pipes acquired from the local market were arranged to make a foundation for the bamboo strips. The finished frame was covered with rice stems gathered from nearby fields after harvest. They were bundled together, then placed in layers to create a climatic regulating membrane that expands when wet and shrinks when dry, regulating airflow as seasons change. There are no windows and the thick layer of rice stems on the exterior blocks out daylight. Candles or lanterns are needed to brighten the interior.

After construction of the bamboo shelter prototype, which took five days total to refine, the owner of the land on which it was built allowed his gardener’s family to inhabit it for three months. Parsa hopes to continue improving on the spiral dome design. He’s considering incorporating windows and having it produced on a mass scale as a cost-effective, viable shelter.

Architecture for Humanity dedicates this page to our colleague Nader Khalili, who died before he could know how many he inspired.

“"It is a wonderful method of sheltering—far more interesting than a conventional dome—beautiful and very simple.”

Pouya Khazaei Parsa, architect

Shelter height varies from 3.8 meters in the living space to 2.3 meters in the sleeping area. The design meets minimum Sphere guidelines.

Image: Pouya Khazaei Parsa
Soe Ker Tie Hias (Butterfly Houses)

LOCATION Noh Bo, Tak province, Thailand
DATE 2008–9
END USER 60–70 Karen refugee orphans
CLIENT Ole Jørgen Edna
DESIGN FIRM TYIN Tegnestue
CONTRACTOR TYIN Tegnestue, local workers
FUNDER 60 Norwegian companies
TOTAL PROJECT COST $12,300 USD
AREA 10 sq m/107 sq ft (per unit)
OCCUPANCY 4 or 5 people

The siding of the building is covered by thin bamboo slats, which are woven into each other to create a smooth outer surface and to improve its aesthetic appeal. The slats also help to regulate the temperature inside the building by providing shade.
Years of conflict have forced many of the Karen tribal people living along the Burma–Thai border to seek refuge in Thailand. As a result of the mass displacement, there are many homeless Karen orphans in northern Thailand. In 2008, Norwegian architecture firm TYIN Tegnestue was moved to assist in providing Karen children and teens with shelter, hygiene facilities, formal education, and a sense of home. “Building a place helped them build an identity and connect them to that place,” says architect Andreas Gjertsen. From fall of 2008 to May of 2009, the architects completed four related projects in Thailand with this goal. Each project incorporates traditional Karen materials and building methods. The projects included Old Market Library in the Thai capital Bangkok; Safe Haven Library, and Safe Haven bath house, both in Ban Tha Song Yang, Thailand. Of these projects, perhaps the most innovative was Soe Ker Tie Hias (Butterfly Houses) in the small village of Noh Bo, Thailand, a design for sheltering orphans.

"Working with children is not only enjoyable, it is an extremely efficient and foolproof way to tap into potentials in the community that normally are hidden to practitioners like ourselves.”

Pasi Aalto, architectural photographer

Children play on swings made of rope and bamboo hanging from the extended roof of the transitional shelter, which was designed for that purpose.

Photo: Pasi Aalto/TYIN Tegnestue

It was after visiting an existing orphanage and interacting with locals that the design team decided not to build a new proposed orphanage in the conventional block dormitory style. Instead, they pursued the Butterfly Houses design featured here. These cozier dwellings house Karens ranging in age from 2 to 16 years old and feature designated play spaces and swings. “The children we met in Noh Bo have had the worst imaginable start of their lives,” Gjertsen says. “There is little doubt that the lack of parents, a home, and an identity makes life hard for them far beyond the actual abuses they have experienced.”

Using locally harvested bamboo, the Butterfly Houses consist of six structures, each accommodating six children. “Small, sheltered spaces are easier to ‘make your own’ and large spaces are good for meetings and social life,” Gjertsen says. “We imagined that the children would enjoy and benefit from a range of different spaces.” The irregularly arranged buildings create outdoor areas, like those found in Karen villages, where youth can play and relax. Interior spaces double as playrooms, lofted sleeping areas become jungle gyms, and floor space is open for games or impromptu lessons. Siblings are allowed to bunk together in the Butterfly Houses, offering them added peace.

“All of a sudden our clients had to cope with three times the amount of people to shelter and feed,” Gjertsen says. The second floor of the library became a sleeping area for close to 50 Karen refugees and the bathhouse had increased the sanitary capacity a lot. Gjertsen recalls the crisis bringing deeper meaning to the work for the design team.

Experts say play therapy helps children cope with trauma. Child protection advocates use it to help Karen orphans. “Play materials and space to play are extremely important in the relief phase, when refugees are in shelters,” explains Carol Raynor, a clinical therapist in youth services from Marshall, Missouri. “Children are still reliving the terrors internally, and they need opportunities to play out the trauma with toys and art materials.”
Ma’erkang Steel Frame Housing

LOCATION Yang Liu Village, Sichuan Province, China
DATE 2008-9
END USER 440 earthquake survivors in Yang Liu Village
CLIENT Chinese government
DESIGN FIRM Rural Architecture Studio
DESIGN TEAM Mei Fan, Tian Hua, Jiang Jiajie, Liang Jin, Ma Manlin, Huang Yabin, Heih Ying-Chun
ENGINEERING Heih Ying-Chun, Autodesk-China
CONTRACTOR Autodesk-China, Local villagers, Heih Ying-Chun
MANUFACTURER Rural Architecture Studio
CONSULTANTS Luo Jiade (Tsinghua University sociology department)
FUNDS Autodesk; Beijing Red Cross Foundation; Narada Foundation; Heih Ying-Chun
COST PER UNIT 50 000 Chinese yuan/ $14 000 USD
AREA 108 sq m/1162 sq ft
NUMBER OF UNITS 56 units

1.6 Roofs are built from corrugated steel and walls from cement. Insulation consists of readily available local materials such as bamboo, wood, stone, straw, and earth, minimizing construction and transportation costs.

Photo: Rural Architecture Studio
China and Taiwan are in a region with complex tectonic geography and seismic activity. In the fall of 1999, a 7.6-magnitude earthquake struck Taiwan, destroying the stacked brick and stone buildings common to the country’s rural areas. Thousands of people died and many were displaced. The widespread devastation created an immediate need for housing.

Among the first to respond was Taiwanese architect Hsieh Ying-Chun. He realized the need for quick, resilient housing that could be erected by people who did not have specific training—a departure from the traditional chuan-dou wood frame construction used for over 5000 years. Ying-Chun turned to preformed steel beams as a solution. “Lightweight steel helps to create the openness for my building system and can be applied to different sorts of houses,” Ying-Chun says.

When an equally catastrophic earthquake hit China’s Sichuan province in 2008, the software company Autodesk teamed with Tsinghua University and Ying-Chun to create the Ma’erkang Project. Using 3-D design and engineering rendering technologies and Ying-Chun’s steel frame design, the team created a disaster response plan focused on providing a blueprint for permanent, sustainable, replicable rebuilding on a large scale.

In order to ensure maximum stability and earthquake resistance, the Autodesk research and development team in Shanghai, China ran Ying-Chun’s design through rigorous structural simulations, according to Autodesk spokeswoman Rosh Saeed. In addition, analysis visualization modeling of sun, shade and wind conditions showed the thermal activity of the house year-round. “Using Autodesk Revit Architecture software, the team analyzed energy savings and ultimately designed a 50 percent energy-efficient building that performs well in summer and winter in different climatic conditions,” Saeed said. Detailed reports of materials and construction costs were calculated to reduce waste. The team also did data output on the carbon emissions of product production and construction to understand and reduce their carbon footprint for the project. Within 9 months, a team of designers had produced five standardized home designs that could be configured in multiple ways.

ABOVE
The Autodesk Research and Development team in Shanghai ran a load analysis on the steel frame design through structural simulations to help ensure maximum stability and earthquake resistance.

Photo: Autodesk

RIGHT
Ying-Chun continues to help with disaster reconstruction. Since the Ma’erkang Project, his firm Rural Architecture Studio has helped organize labor and financing so that the steel frame design can be built independently.

Photo: Autodesk

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Photo: Autodesk
This is an excerpt from Rebuilding After Disaster: The Biloxi Model Home Program, a book published by Architecture for Humanity detailing the program’s success. To purchase, visit www.architectureforhumanity.org.

The Biloxi Model Home Program was created to assist residents of Biloxi, Mississippi, in meeting the challenges of rebuilding their community after Hurricane Katrina.

East Biloxi, an ethnically diverse community with a large Vietnamese immigrant population, was one of the hardest hit areas of the Gulf Coast. More than 90 percent of the neighborhood’s housing stock was damaged or destroyed. Even before the devastation of Hurricane Katrina, the community suffered from poverty, drug activity and disinvestment. Nearly one in four East Biloxi residents earned incomes less than 150 percent of the federal poverty line, and most made less than $26,000 per year. In short, like in many other areas along the Gulf Coast, the effects of Hurricane Katrina in East Biloxi exacerbated preexisting social and economic problems.

Rumors spread among those displaced by the storm. The community feared that new building elevation requirements would dramatically increase the cost of rebuilding their homes, making it impossible for them to return home. In addition, regional and citywide planning initiatives raised the threat that some residents might lose their properties altogether by recommending that the city reclaim more vulnerable, low-lying areas through eminent domain.

There was no single source for reliable, accurate information. Few agencies were able to answer homeowners’ most basic and pressing questions: Is it safe to rebuild on my lot? How will the new building codes and flood elevations affect me? If I rebuild, what can I afford?

The goal of the Biloxi Model Home Program, which launched in 2006, was not only to help answer these questions for homeowners, but...
The center established a case management system using the Coordinated Assistance Network (www.can.org) platform. In addition to tracking residents’ needs, this shared database supported threaded financing from a wide variety of private, state, and local funding sources. As volunteer groups ramped up, Architecture for Humanity established a building 101 training program to help train volunteer leaders to oversee crews and prevent unsafe construction. Led by Program Manager Mike Grote, and jokingly referred to as Mike’s Construction Fun Time, the class covered the basics of housing construction, mechanical, electrical and plumbing systems.

The program was also a chance to set high standards for new construction in the area and establish a set of best practices that could be used going forward. Architecture for Humanity invited (a competition would have taken too long) or architects from the region to design sustainable, hurricane-resistant, affordable homes that met new construction standards and height elevations required by the city. Of these, families selected six firms to help them rebuild their homes at a House Fair held in the summer of 2006.

Families worked one-on-one with architects and design professionals. The program approached rebuilding through standardizing design processes, methods, and partnership strategies—as opposed to standardizing a single design. Much of the effort and time was devoted to creating program materials, from developing family selection guidelines, to standardizing one-stop shop for residents seeking assistance in the aftermath of the hurricane, from architectural and construction services to legal and financial aid. The program was groundbreaking because it brought together design and construction services, case management and an innovative financing structure together under one roof.

The Parker family inside their home
Photo: Leslie Schwartz

The program lasted more than three years and enlisted a wide array of organizations and agencies. It was led by the Hope Coordination Center (then the East Biloxi Coordination Center, Relief and Redevelopment Agency). Architecture for Humanity secured $4 million in funding from Oprah’s Angel Network and provided a seed grant to the Mississippi State University School of Architecture to relocate its studio from Jackson to Biloxi. Wankac Community Consulting and Enterprise Corporation of the Delta worked to structure a loan fund, which was administered by the Hope Coordination Center and Architecture for Humanity. Support also came from design and construction firms, local community–based organizations and the city of Biloxi itself, which expedited permitting and helped resolve zoning issues. Hands On Gulf Coast provided volunteer housing, and some 500 volunteer organizations participated in mold removal, repairs and reconstruction.

Early on, the center established a grid system of East Biloxi’s neighbor hoods, assigning a target area on the map to each of the many relief organizations that arrived to help. This was a critical early step. It allowed the relief groups to work quickly with a minimum of confusion and overlap. The grid system was also a huge help to the center’s caseworkers because they knew exactly where to refer families based on where they lived.

Next, assessments and a survey conducted by volunteer groups identified owners, including those displaced, and helped prioritize immediate needs. The house-by-house survey gathered key information, including whether a property was rented or owned occupied, whether the structure was more than 50 percent damaged (and therefore likely to be condemned), the homeowner’s interest in selling or rebuilding, as well as income and demographic information.

While the fund was able to recapture 20 to 90 percent of the cost of constructing new homes, it took several years. Funds from federal financial aid programs administered by the Mississippi Development Authority (MDA), which were a key source of financial assistance, took up to two years and in some cases longer to make their way to families.

Despite these hurdles, by August 2008, three years after the storm struck, this unique collaboration had repaired approximately 75 percent of East Biloxi’s 2,300 damaged homes and constructed more than 1,000 new homes (including the pilot Biloxi Model Homes featured here). The Hope Coordination Center and Gulf Coast Community Design Studio continue to serve East Biloxi. It changed its name again and is now the Hope Community Development Corporation.

Monetizing still, the model of pairing community members with professional designers—and the strategy of locating a community design studio within a housing recovery center—has since been replicated across the Gulf Coast and in other disaster areas.

“Through this collaboration we have helped so many people. We’ve been able to find the resources to bring families back home from one end of Biloxi to the other. It’s like a city reborn.”
Bill Stallworth, Hope Coordination Center
"I Have Rights" is written in five different languages across the vibrant brick red exterior of Centre pour le Bien-être des Femmes and la prévention des mutilations génitales féminines 'Gisèle Kambou' (CGF). The off-the-grid women’s health center near Ouagadougou, Burkina Faso, was designed by FAREStudio in partnership with Associazione Italiana Donne per lo Sviluppo (AIDOS), an Italian non-governmental organization committed to supporting women’s rights and advocating for women around the world.

The building is the first formal structure in Section 27, a squatter camp outside the capital. "The center has helped to beautify the area," says Alice Bagagnan, 35, a user of the clinic. "The color and how it is constructed means that you know immediately that the building is the center." It stands out for that reason, and because the designers chose attention-grabbing super-graphics to convey the statement. "We could have painted figures or ideograms, but the designers chose something written in all the different languages spoken there meant to show to local people the building’s aim to be universal and made for the whole community," says Erika Trabucco, site supervisor from FAREStudio.

The building is lifted above the ground to avoid dust and heat are issues in summer. The PV panels produce enough energy for the garden, and the roof is detached from the walls for passive cooling.

One of the most common legal issues women request assistance with is marriage protection. "This is not just something nice but something important from the legal point of view," Cirillo says. "Women usually only have a traditional wedding. This means that if the relationship ends they are left with nothing; no child support or alimony." Spurred by success of the center, the government has started to contribute funding for additional infrastructure to the area. A maternity center was completed in December 2010.

"I have rights" is both the local non-governmental organization’s slogan and a strong statement. The building shouts it out loud giving a voice to those who have traditionally not had access to or knowledge of their legal and human rights. The center provides medical, legal, educational and psychological services for more than 4500 clients annually. It functions as a community center where meetings, health classes and weddings are held for men and women.

The climate, funding and political constraints in Burkina Faso caused lead architect Riccardo Vannucci to design a self-sufficient structure. "Politicians and government might pledge to support the building but I could not trust them and thus designed the building to be off-the-grid and function without government support," he says. Energy is generated by the rooftop photovoltaic panels (PV), and with the exception of the medical rooms that need a generator to filter the air, it requires no additional electricity. The building is lifted above the ground to avoid dust, large barrels collect rainwater for the garden, and the roof is detached from the walls for passive cooling.

Alima Konate, the center’s director, says that the PV panels produce enough energy for the center, but dust and heat are issues in summer. It is taboo for women to seek help in this area and the center offers a necessary level of privacy, according to AIDS Project Manager Paola Cirillo. “For gynecological diseases we were ashamed to go and get help. Now we go to the center for awareness sessions,” Ibloudo, a client, says.

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lighting illuminates the surface of the bridge and overhead theatrical framing projectors direct focused beams of light when more illumination is needed, at the same time minimizing light pollution on the river below. The "lumibenches" are a "lensed, gasketed, marine-grade fluorescent fixture placed within the reflective white cavity of the hollow benches," providing dramatic lighting for the performance space.

The revitalized Urban Plaza also features a multimedia art installation called RiverPulse by local artist Ray Chi. Real-time data about the Milwaukee River's temperature, turbidity, electrical conductivity, dissolved oxygen and water flow directs light animations on a long vertical surface that mimics the play of light along the surface of the water.

The projects have been successful in creating a stronger connection between two sides of Milwaukee. "I really liked that [the designers] recycled the infrastructure of the bridge to reconnect Milwaukee over the river," Kupfer says. "The river was a total industrial wasteland for decades and projects like this are critical to the reformation of urban communities."
Tiuna is an experimental collective. “We came together in 2005, taking up the rebellious urban arts as arms in a struggle to radically transform the society in which we live,” its website states. The self-described “public art activists” provide youth ages 3 to 18 with an alternative to violence by encouraging personal development and expression through graffiti, street art, poetry, video and radio production, film, circus arts, dance, music, and theater at the Tiuna el Fuerte Cultural Park. Tiuna is an alternative public space that “facilitates the interchange, self-expression, formation, recreation, and inclusion of lower-income youth.” The collective received financial support from the mayor’s office for the first six years of operation, and are now running on donations, mostly from corporate sponsors.

Tiuna is located in a former parking lot in the El Valle neighborhood of Caracas, Venezuela, a densely populated neighborhood with few parks and one square foot of green space per person. The park borders a highway, the main thoroughfare to western Venezuela, and blocks of low-income apartment buildings. “Tiuna was not conceived as a terrain or lot, but rather an extension of the street,” recalls Alejandro Haiek, an architect with Lab.Pro.Fab.

Lab.Pro.Fab started holding community meetings in 2005 to discuss turning the Tiuna project into a living experiment for social activism and engagement. “We try to use at least 40 percent of our time to research experimental projects,” Haiek says. “Architects, sociologists, landscape architects and communication experts are involved.”

Any organization or person can use the space, but they have to pay for their use by teaching an academic course for the local youth. Latent Voices, an activist group, organized a graffiti art day in a juvenile prison with support from Tiuna. The Laboratory of Urban Arts uses the space to teach youth in three areas: hip-hop, popular and alternative communication, and performing arts and music. Their intensive all-day workshops have been held once a week since 2006, serving approximately 800 youth over the years. Four productions combining singing, dancing, music and street theater are a result of the program. Tiuna’s buildings are built from converted containers and other recycled materials. The modular containers have been transformed into classrooms, offices, laboratories, a skate park, and a permeable theater. Other materials such as cardboard cup holders were used to provide sound insulation in the radio station and recording studios. Community member Lorena Freitez, of the activist group Latent Voices, stresses the importance of reusing the castoff materials. “Our choice of architecture reflects our political beliefs,” she says. “We want to create an alternative use or value to those materials and people that have been excluded from the formal discourse of the city.”

Embraced by the community, the park “meets the aesthetic and symbolic references of the young people that we work with,” Freitez says.

The park is now about halfway through its transformation, and the architects are revising their original plans based on community input. Miqueas Figuera, a local musician who uses the recording studio and is a member of the collective, has planted many of the new trees, and advocated for a hostel and tennis courts. Two of the auditoriums and their supporting classroom and laboratory spaces, each called a nucleus, have been completed and a third is in the works. “Our initial goal was five,” Haiek says. “But now three to preserve more green space. At this moment we really want to transform this parking lot into a park.”
The new Hazelwood School for Children and Young People with Sensory Impairment is the only educational institution in Glasgow, Scotland, of its kind. Students may be blind and deaf, or they could be physically handicapped and struggle with a learning disability. “Our children are probably the most disabled children in Glasgow,” says Monica McGeever, the school’s head teacher. “When they were being schooled in [two] run–down buildings, that didn’t send a great message in terms of the value we put on children with disabilities.” In 2003, the Glasgow City Council decided to build a single school for young people with multiple sensory impairments. It was finally completed in 2007.

In the United Kingdom, school procurement is done through a public–private partnership. Construction companies bid to build schools and the local governments pay for them over time. Rather than select the cheapest option, as is often the case under this system, the Glasgow City Council decided to hold a design competition for a school that would accommodate children with special needs.

Architect Alan Dunlop was selected out of the six local architects invited to participate and launched a challenging 18–month community–focused design development period. He wanted to explain to students who were blind and deaf the design of the school and made models of cardboard for them to feel. The design charrettes with teachers, parents, therapists and doctors were a key way for Dunlop to learn about the struggles disabled youth face on a daily basis. “When the clinicians took me through the range of problems that each child can have it was overwhelming,” Dunlop says. “In many ways I had

“Now we are saying that your children are so valuable that we are giving them a fantastic building.”

Monica McGeever, head teacher
to put aside everything I had learned as an architect and in architecture school."

These discoveries informed every aspect of the school’s design. The team developed a strategy that focused on using highly tactile materials to promote sensory navigation so that different spaces are defined by gravel, grass, woodchips and floor markings. The ceiling heights in classrooms differ to create distinct acoustical environments. A slate wall strategically positioned to absorb warmth from the sun delineates classroom levels.

The transitions between spaces facilitate “trailing,” which is when a visually impaired person runs their hand along a wall or handrail. The locker wall in the main corridor is faced with cork that helps these students find their way around. In the old building there were thick red handrails on the walls that gave the school “an institutional feel,” Dunlop says. “Depending on the angle of the wall related to the entrance of the classrooms they know exactly where they are.”

The thoughtful design of the main trailing wall also facilitates sensitizing students to closer contact. “There is one young man who had great difficulty moving independently around his previous school,” McGeever recalls. “When he came to Hazelwood, within a matter of weeks he was moving around the school, almost with no support whatsoever.”

Non-toxic interior finishes were used because of the student body’s heightened sensitivity.

The building’s low profile minimizes its impact on the site and surrounding neighborhood. It weaves through trees that were on the site before it was built.

Students dine in the cafeteria. The design emphasizes daylight.

A site plan of the school shows its curved shapes.
Severe poverty has threatened the health of Cambodian children throughout the country’s tumultuous history. The stunning child mortality rate is mainly due to preventable ailments like bacterial pneumonia and diarrhea. Photographer Kenro Izu founded Friends Without A Border in 1996, inspired to improve children’s health after traveling there. Three years later, the organization opened Angkor Hospital for Children in Siem Reap, Cambodia. The Center for Friends Without a Border, featured here, was completed in 2008 and sits on the hospital’s grounds.

The center provides a separate space for visitors to learn about the hospital without compromising patient privacy. “The center is very open and you can see through the building to the hospital so you feel like you’re a part of the complex without being in it,” says Basil Stamos, a physician and partner for Sterling Stamos Capital Management, which funded the building. It also provides office space for Friends Without A Border and hosts art exhibits, health classes and training sessions.

New York–based Cook + Fox Architects designed the sustainable building. (Lead architect Rick Cook first adopted children from Cambodia in 2002.) “When they are older and know about their country’s situation they will want to know how we helped,” he says. The center is inspired by sacred building techniques of the Khmer people (Cambodia’s largest ethnic group). The new structural bays are laid out in a square grid, recalling the axial symmetry of nearby temples. The canted roof drains to a pool and rainwater cistern. “The Angkor Wat temples have very
A rainwater collection pond in the central atrium demonstrates resourceful water storage. Photo: Cameron Sinclair/Architecture for Humanity

Sustainably harvested bamboo louvers on the exterior cladding satisfy aesthetic and environmental needs. Photo: Cameron Sinclair/Architecture for Humanity

Compostable toilets are a virtually water-free way to dispose of waste and empty into a composting unit outside. Photo: Cameron Sinclair/Architecture for Humanity

Advanced hydrological engineering,” Cook says. “This simple gesture, making the rainwater collection a central feature of the building, connects the present to a cultural tradition.” Sterling Stamos hired Ryan Maliszewski to research sustainable strategies for the center. “The biggest challenge was trying to mediate the global modern efforts toward sustainability with the Khmer culture and construction practices,” Maliszewski says. He coordinated between Cook + Fox and the local contractors. This eased the communication problems between the designers and builders. Shading slats around the exterior were originally meant to be made of koki wood, which has historically been used to build boats, but the political and cultural ramifications of its harvesting during the Khmer Rouge era has made it difficult to procure. After exhausting all other options, Maliszewski was forced to order bamboo fiberboard from southern China. “It was sort of a win–lose because we were trying to source local but (this example) typified some of the barriers we hit,” he says. “If we wanted to make this work we had to look outside of the 250–mile radius.”

Although koki wood is culturally valuable, the finished product uses a more sustainable material.
It started with a tree. Joseph Mutongu, a local conservationist, wanted to introduce a tree growing program at the school his son attended. The Mahiga Hope School is located in a dusty rural village in the Aberdare Mountain Range in central Kenya. Most families are subsistence farmers and at the time were in the midst of a four-year drought. The school needed water to allow the tree to grow, but more importantly to provide some clean drinking water to its students. Joseph took it upon himself to find a way to make it happen.

There were three options: to rely on the municipal waterline, which worked two weeks of the year; to drill an expensive bore well; or to develop an off-grid rainwater catchment system. A chance encounter with Turk and Christy Pipkin of the Nobelity Project created the opportunity for the third option. In 2008, Joseph, Turk and the school installed a simple gutter system on one of the school’s wooden structures. Rainwater was collected in a small tank and purified with an ultraviolet system. For a few thousand dollars, the school suddenly had access to a small supply of water. The team then had a bolder idea, to provide water for every student all the way to the end of high school.

For a rural school, access to water is the key for focused learning. Children don’t have to walk miles to collect unsafe water, school lunches can use clean water for cooking and for drinking, and safe access to sanitation prevents disease and ensures teenage girls stay in school. The idea was born of tackling two uniquely different issues, the desire of the children to have access to sports and the need for safe drinking water. Turk and Christy worked with Dick Clark Architects to develop a concept for a rainwater court and entered into the Gamechangers design challenge run by Architecture for Humanity and Nike. As one of the winners of the competition, the school was awarded financing, construction management and a one-year design fellow who would live and work in Mahiga.

Greg Elsner arrived in Mahiga with a task to design and build a multi-purpose basketball court that would collect up to 30,000 liters of water, with a budget on par with a simple borehole well. Partnering with local architects Multiplex Systems, Elsner and the team utilized local hand-cut stone (Mahiga means “stone”), a steel structure that mirrors traditional Kenyan art, and a two-panel metal roof to build the 456 sq m (4850 sq ft) structure. Going beyond a court, the architects designed a community space that included classrooms and a library. The whole community attended the opening of the rainwater court. The project has had a lasting impact on the school and the community.
designed a small stage that could be used for community meetings, movie nights and weddings. Like many institutional projects, this was more than a structure; it became a community catalyst. In less than 18 months student test scores jumped from the lowest to the highest in a district of 600 schools, enrollment in the high school tripled; the school had electricity for the first time; it installed a computer lab and a library and a two–story high school was built. Mahiga went from a derelict rural school to a model education campus. When the court finally opened it had not rained in over three months. Over 1000 community members stood in the midday sun under a cluster of umbrellas to see the first basketball game played on the new court. As halftime approached, dark brooding clouds rolled across the skyline and by the time of the last shot the heavens opened up. Most building openings are dampened by a downpour, but in the case of the Mahiga rainwater court, it was the best way possible to celebrate. Joseph collected the first bowl of clean water to nourish a tree still growing in a corner of the schoolyard.

“We finished it right when the rains came. Keep in mind it had not rained in the previous three months.”

Greg Elsner, Architecture for Humanity design fellow
10x10 Housing Initiative

FEATURED PROJECT Sandbag Houses
LOCATION Mitchell’s Plains, Cape Town, South Africa
DATE 2007–9
IMPLEMENTING PARTNER Design Indaba

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bags filled with sand are stacked within the frame and covered with mesh wire and plaster to form smooth walls. These houses do not need foundations and the sandbags act as the anchoring element to further reduce construction costs. Sandbags have been used in South Africa but the designers pushed boundaries by using them to build a two-story home. Expanding vertically helps to maximize living space on small plots of land. “We had to be very creative about how we would use sandbag building technology because we were not aware if it had been used before,” Mpahlwa says. “We had to get the services of an engineer and he had to be innovative about how to support the top structure.” Concrete beams were placed on top of the first-floor walls to ensure structural stability, and a concrete beam acted as a foundational element for the second floor. Ten homes were built from the design and 10 families are now living in them. Each house has a second-story platform that the occupants can use as a patio or make into an additional room. The homes were all placed close to the road to create the largest backyards possible. “We used architecture as a way of empowering a community that has never had a house before,” Mpahlwa says.
Water bladders are an efficient, life-saving method of distributing and storing potable water in emergency situations. Produced by Structure-Flex and distributed by Oxfam, an international aid agency, the bladders first arrived in Haiti after the devastating earthquake that struck near the capital of Port-au-Prince in January 2010. Oxfam has been using the water bladders for over 20 years. Resembling huge yellow pillows, they are in high demand in Haitian communities. In the wake of the magnitude 7.0 earthquake, half a million people are dependent on such systems for water. Oxfam implemented the water bladders in Delmas 48, a refugee camp located in Port-au-Prince that is situated on what used to be a golf course. Shortly after the earthquake it became a makeshift home to an estimated 50,000 people per night. The demand for water was so high that Oxfam had to implement five water bladders as well as semi-permanent storage tanks.

The main drawback is that the tanks have to be shipped from the United Kingdom, which is a costly delay during an emergency. They are also dependent on water delivery from trucks, which can be interrupted by fuel shortages, traffic or washed-out roads. Haitian water truck drivers are doing the best they can to serve their communities and keep the bladders full.

Kenny Rae helped set up Oxfam’s water sanitation program in Port-au-Prince. “People always emphasized to us that water is the most important necessity. It was 95°F and people hadn’t had clean water for days, and then we suddenly arrived,” Rae recalls. “We not only provided clean drinking water, but set up separate men’s and women’s areas where they could bathe. They were so thankful.”

The Sphere Humanitarian Charter and Minimum Standards in Humanitarian Response of 15 liters of water per person, per day. Under the Sphere standard, a 10,000-liter bladder can provide water for 700 people a day. Oxfam strives to provide camps with the Sphere Humanitarian Charter and Minimum Standards in Humanitarian Response of 15 liters of water per person, per day. Under the Sphere standard, a 10,000-liter bladder can provide water for 700 people a day.

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“I want to say one word to you. Just one word... plastics.” So goes one of the most memorable lines from the iconic film *The Graduate*. That was 1967.

Today, the limitless potential of plastic has come at an environmental cost that has led many to question the material’s widespread use and benefits. Plastic waste is perhaps the most visible drawback, and has created a large and looming problem. The North Pacific Gyre, a swath of circular currents twice the size of Texas, has trapped a large amount of plastic, which ultraviolet rays degrade into microscopic particles. A 2001 study by oceanographer Charles Moore, published in the Marine Pollution Bulletin, reported an average of 334,271 pieces of plastic per square kilometer of ocean.

David de Rothschild, founder of the environmental organization MYOO, formerly Adventure Ecology, was inspired by a United Nations Environment Program report outlining the threat to our oceans, and Thor Heyerdahl’s pioneering Kon-Tiki expedition of 1947. He decided to draw attention to the problem by building the Plastiki, a 60-foot-long catamaran made of reclaimed soda bottles that instantly became a plastic waste pin-up when it set sail from San Francisco, California to Sydney, Australia, in March 2010.

On a mission to reevaluate plastic waste as a resource, the Plastiki spent four months at sea sending a “message in a bottle” to the watching world. “Waste is fundamentally a design issue and plastic is not the enemy,” de Rothschild says. “We need to redefine our understanding and use of the material.”

He journeyed 8,000 nautical miles to report on the health of the world’s oceans, in particular the colossal amount of plastic waste floating out of sight. The concept of this ambitious project was to construct the entire vessel out of recycled polyethylene terephthalate (PET) bottles. MYOO approached the design team behind the product development and incubation company, Level 2 Industries, to experiment with the material. After research and testing, they decided to fill the catamaran’s two pontoons with 12,500 2-liter plastic bottles filled with carbon dioxide to make them more rigid.

The cabin acts as a self-sustaining home for the six-person crew, providing shelter from the unforgiving heat and tropical storms of the Pacific Ocean. The design team employed principles of “biomimicry” design, looking to nature as a source of inspiration.

A specially developed technology incorporating recycled PET (rPET) was used to engineer the superstructure of the boat. Recycled plastic fibers replace the commonly used unrecyclable fiberglass or costly carbon fiber. The two masts, measuring 12 and 18 meters (40 and 60 ft) tall, are made from reclaimed aluminum irrigation pipes and the sails are handmade from recycled PET cloth. The bonding agent is recycled and also biodegradable—it is made from sugarcane and cashew nut husks. Following the success of Plastiki, MYOO has entered into a joint venture to market recycled PET under the name Seretex for a variety of uses, from sporting goods to disaster relief shelters.

**Plastiki rPET**

**LOCATION** Pacific Ocean

**PROJECT TYPE** Plastiki Expedition

**DATE** 2010

**SPONSORING ORGANIZATION** MYOO

**PROJECT COORDINATOR** Matthew Grey, MYOO

**NAVAL ARCHITECT** Andrew Dovell

**DESIGN TEAM** Nathaniel Corum, Jason Ifrahah, Michael Jones, Michael Pawlyn, Greg Pranko, Mike O’Kelly

**ADDITIONAL SUPPORT** Andy Fox, Architecture for Humanity; Ashley Biggin, University of Southern California School of Architecture

**LENGTH OF VESSEL** 18 m/60 ft

**OCCUPANCY** 6 people
Cary Fowler collects seeds. “Most people don’t think about this, but our agricultural crops are on the frontlines of climate change and will be the first to be affected,” says Fowler, president of the Global Crop Diversity Trust. “What we are conserving for the future are options.” The seeds collected contain precious genetic variation that might otherwise be lost. They are being preserved in the Svalbard Global Seed Vault, located in arctic Norway. Although there are over 1000 seed banks in the world, this seed vault, close to the North Pole and lodged in a permafrost mountain, is the ultimate lair for preservation.

Barlindhaug Consult AS won the bid because of its previous work in Svalbard and understanding of the unique and harsh building conditions. “It is a combination of mining construction and building construction because the portal building is actually a building, but everything from the portal building into the vaults is like a mine,” says lead architect Peter Søderman. “It is strange for an architect to design a building that is not supposed to have any inhabitants except seeds and is not supposed to be a place that you visit.” The sleek architecture portal building (the only visible part of the facility) protrudes from the snowy hostile environment and is adorned with a jewel lighting art installation that glows at night and reflects the sun in the day. “It is a very picturesque facade but it is also a practical thing,” Søderman says. “[The wedge shape] divides the stone masses and snow on the slope so that rocks and snow roll down on either side of the entrance.” The design team worked with geologists and engineers to understand the geology of the mountain, which directed their construction and design decisions. A 100-meter (328-ft) steel tube protrudes from the portal entrance through the different geological layers and connects to the main three cave-like chamber vaults, each with the capacity to store 1.5 million different seed samples.

The team faced many challenges constructing a building that could hold up to the low temperatures necessary to preserve seeds. Limited building materials and sub-zero conditions were common, and the design team had to work with them to create a unique and efficient solution.

The beautiful architecture of the portal building contrasts with the surrounding arctic landscape, creating a unique and striking landmark in the harsh environment. The Svalbard Global Seed Vault is a testament to human ingenuity and the importance of preserving genetic diversity for future generations.
Favela Painting Project

LOCATION Vila Cruzeiro, Rio de Janeiro, Brazil
DATE 2005–present
END USER 34 houses and nearby favela residents
IMPLEMENTING AGENCY Soldados Nunca Mais Program of the Ibiss Foundation
DESIGN FIRM Haas&Hahn
ARTISTS Jeroen Koolhaas, Dre Urhahn, and young men living in the Rio Favelas
FUNDER Grants, donations, sponsorships
COST $200 000 USD
AREA 150 sq m/1615 sq ft (Boy with Kite); 2000 sq m/21 528 sq ft (Rio Cruzeiro); 7000 sq m/75 347 sq ft (Praça Cantão)

Colorful painted rays decorate the exterior of 34 houses built on hillslopes at Praça Cantão in the center of Rio de Janeiro, Brazil. Artists Jeroen Koolhaas and Dre Urhahn (Haas&Hahn) enlisted locals to help create the artwork spanning 7500 square meters.

Photo: Haas&Hahn
About 873 million people live in slums worldwide. Yet investments focused on water sanitation and infrastructure do little to mark a visual change in the community. With minimum expenditure in comparison to mainstream interventions, street artists are reimagining informal settlements from Kenya to Brazil.

In 2006, after filming a documentary for MTV in Rio de Janeiro and São Paulo, Brazil, Dutch painters Jeroen Koolhaas and Dre Urhahn were inspired to start the Favela Painting Project through their new organization, Haas&Hahn. They created murals in two poor areas to help beautify the landscape. “All the hills are covered with slums and the slums are used as the scapegoats to all the problems of Brazil,” Urhahn says. “We wanted to make a visual intervention, so that just by looking at the favelas you get a completely different perspective and you are forced to change your thinking.” As of 2010, three large-scale painting projects had been completed.

The program hires and trains young men from the community to paint in the favelas, providing an alternative direction for the most likely demographic to join gangs. “Everybody asks me if I made that painting,” said Vitor Luis da Silva, 15, while playing basketball on a court next to the mural Boy with Kite, spanning 150 square meters (1614 sq ft). “Thanks to God, yes. I learned a lot by doing it. If I wasn’t involved in these projects, I think I would be in the drug gang, maybe even shooting,” he said.

After the first mural, people took note and thousands poured into the favelas for the 2008 Rio Cruzeiroo opening ceremony to see the Japanese-style painted concrete river of fish swimming 2000 square meters (21 527 sq ft) down the hillside. In addition to tourists visiting the favelas to view the art, the employment opportunities for the young men who worked on the project are expanding. Residents of the area have a new perception of their neighborhood, especially the 34 houses painted in colorful stripes for the O Morro project.

“We wanted to find a way for these people to have a sense of pride about their neighborhood and to show the outside world that they feel good about themselves. By putting a small film of paint on the whole surface of the favela we thought that we...”

LOCATION Kibera, Kenya; Morro da Providência, Rio de Janeiro, Brazil
DATES 2003–present
ARTIST JR
FEATURED PROJECTS 28 Millimeters: Women Are Heroes; The Wrinkles of the City; Face2Face
FUNDER Self-funded
would be able to bridge this gap," Koolhaas says. Haas&Hahn hope to expand the project, bringing color to the strong-spirited community as it strives to overcome crime and violence.

JR, a photographer from Paris, is similarly bringing art to slums. In 2006, JR went to Clichy Montfermeil, a low-income area of Paris, and took portraits of community members. He then pasted them in the bourgeois areas of Paris to draw attention to the conflicts among them.

Motivated by an ambitious mission "to post art all over the world," JR travels to embattled areas and uses renegade art to amplify the issues. His projects focus on women as heroes, among other themes. "I want to celebrate the strength and courage of women who live in places where they are targets in wartime and are discriminated against in times of peace," he says.

LEFT
Women Are Heroes project, Morro da Providência, Rio de Janeiro, Brazil, 2008.
Photo: jr-art.net

ABOVE
Photo: jr-art.net
Starting in the 1980s, political instability led to the rise of paramilitary groups and armed conflict throughout Colombia. As groups such as Revolutionary Armed Forces of Colombia rose to power, violence forced Colombia’s rural poor from their land. The flight from the countryside into the urban area led to the rise of informal settlements and street crime. Para-military groups and gangs controlled the hillside slums of Medellín. Throughout much of the 1980s and 1990s Medellín was considered the capital of the cocaine trade. (In 1999, Forbes magazine estimated that 80 percent of the global cocaine market was controlled by the Medellín Cartel.) In 1999, then President Andres Pastrana proposed “Plan Colombia.” With aid from the United States and other countries, Plan Colombia called for the investment of 3.1.3 billion USD over the course of the next decade in sweeping reforms aimed at ending the drug trade. While the bulk of these funds were directed toward demilitarization and counternarcotics, Plan Colombia also made way for significant investment—more than 1.3 billion in the United States alone for social infrastructure and programs. These programs worked to disarm paramilitary groups. The national government signed an accord with the paramilitary and narcó-trafficking groups, and began a long-term commitment to reintegrate ex-combatants into the social fabric of the nation. On the heels of these investments, Medellín’s transformation began.

In 2003, Sergio Fajardo, a mathematician and the son of an architect, was elected mayor of Medellín. “We spent all our time saying how our society should be, but the politicians are the ones who make all the decisions in society. So, with a group of friends, we said we are going to have to get into politics.” Fajardo ran on a platform of social renewal and articulated a plan for reducing violence and revitalizing the city. When he was elected in 2003, he began implementing the plan: “We had a formula to solve the problem. We have to start reducing violence, but whenever we reduce violence we immediately have to come back with social interventions. And we brought in architecture,” Fajardo explained in a television interview. “We would go to the poorest neighborhoods and build the most beautiful buildings. So suddenly in the places where there was no hope we were building the most incredible spaces—but all were related to opportunities.” During his administration, the city invested 47 percent of its budget in schools, libraries, cultural centers, public spaces, job training centers and transit. These investments were tied to slum upgrading programs and social programs to reintegrate ex-combatants.
Children’s park in Santo Domingo provides a safe place for youth to play.

The Line K Metrocable station was completed in 2006 and helps connect the barrios to downtown.

The Parque Biblioteca España, designed by Colombian architect Giancarlo Mazzanti, enhances educational opportunities for the Santo Domingo barrio youth.

Terraced pathways reinforce steep inclines around the Metrocable.

A health center was one of the many community projects built to improve the city.

The Cedzco are business centers that offer workshops and business advice.

Ex–combatants who participated in job training in tandem with development.

Ex–combatants who participated in job training in tandem with development.

A gondola runs above Medellín, the center of Colombia’s textile industry, funded the upgrades through a mix of national funding and new taxes. In 2010 the city had expanded the scope of an existing local economic development corporation, charged with upgrading public spaces, and renamed it Empresas de Desarrollo. As an autonomous agency, it had broad latitude to partner across sectors and across agencies allowing it to direct and thread funding from different city budgets. This was a key element to the success of the city’s urban upgrading initiatives. To date, the city has invested 445 billion Colombian pesos (1.2 billion USD) in tandem with another 1.5 billion USD in annual spending on education.
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