The FLOAT House

Make It Affordable: A new approach to mass-producing low-cost homes that respond to local culture and climate

Make It Float: A flood-safe house that securely floats with rising water levels

Make It Green: A high-performance house that sustains its own water and power needs

NEW ORLEANS - October 6, 2009

Morphosis Architects, under the direction of renowned architect and UCLA distinguished professor Thom Mayne, has completed the first floating house permitted in the United States for Brad Pitt’s Make It Right in New Orleans. The FLOAT House is a new model for flood-safe, affordable and sustainable housing that is designed to float securely with rising water levels.
FOR IMMEDIATE RELEASE
October 6, 2009

NEW ORLEANS – Morphosis Architects, under the direction of renowned architect and UCLA distinguished Professor Thom Mayne, has completed the first floating house permitted in the United States for Brad Pitt’s Make It Right Foundation in New Orleans. The FLOAT House is a new model for flood-safe, affordable and sustainable housing that is designed to float securely with rising water levels.

Mayne led a team from Morphosis Architects and graduate students from UCLA Architecture and Urban Design in this innovative housing project to help with the rebuilding of the Lower Ninth Ward post-Hurricane Katrina. The concept emerged from a study of the flooding record, social and cultural history of the city, and the ecology of the Mississippi Delta. Morphosis and UCLA’s collaboration on the research, development, design, and construction of the FLOAT House is exemplary of their shared goals to engage students in real-world design for social impact.

In the event of flooding, the base of the house – reconceived as a chassis -- acts as a raft, allowing the house to rise vertically on guide posts, securely floating up to twelve feet as water levels rise. While not designed for occupants to remain in the home during a hurricane, this innovative structure aims to minimize catastrophic damage and preserve the homeowner’s investment in their property. This approach also allows for the early return of occupants in the aftermath of a hurricane or flood.

“When Brad Pitt launched Make It Right, he promised the residents of the Lower 9th Ward that he would help them build back stronger, safer and better able to survive the next storm or flood. The FLOAT House is helping us deliver on that promise. For the first time, this house brings technology to Americans that was created to help save homes and speed recovery from flooding. It’s an approach and design that could and should be replicated all over the world now threatened with increased flooding caused by climate change,” says Tom Darden, Executive Director of the Make It Right Foundation.

Designed in response to Ninth Ward residents’ specific needs, the FLOAT House serves as a scalable prototype that can be mass-produced and adapted to the needs of communities world-wide facing similar challenges. On track for a LEED Platinum Rating, the state-of-the-art home uses high-performance systems, energy efficient appliances, and prefabrication methods to produce an affordable, sustainable house that generates its own power, minimizes resource consumption, and collects its own water.
Like the traditional New Orleans “shotgun” house, the FLOAT House sits on a raised four-foot base, preserving the community’s vital front porch culture and facilitating accessibility for elderly and disabled residents. This high-performance “chassis” is a prefabricated module, made from polystyrene foam coated in glass fiber reinforced concrete, which hosts all of the essential equipment to supply power, water and fresh air. The chassis is engineered to support a range of home configurations.

Of his involvement with the project, Thom Mayne says, “The immense possibilities of the Make It Right initiative became immediately apparent to us: how to re-occupy the Lower 9th Ward given its precarious ecological condition? The reality of rising water levels presents a serious threat for coastal cities around the world. These environmental implications require radical solutions. In response, we developed a highly performative, 1,000 square foot house that is technically innovative in terms of its safety factor – its ability to float – as well as its sustainability, mass production and method of assembly.”

While the Morphosis floating house is the first to be permitted in the United States, the technology was developed and is in use in the Netherlands where architects and developers are working to address an increased demand for housing in the face of rising sea levels associated with climate change.

The chassis was designed and built by Morphosis Architects and UCLA graduate students on the UCLA campus. In July 2009 the chassis was transported to New Orleans where prefabricated modules designed by the group were assembled on-site. Construction services were donated by general contractor Clark Construction Group, Inc.

UCLA Architecture and Urban Design chair, Hitoshi Abe, states “Our students were thrilled to have the opportunity that this unique project afforded to apply their research and design to a real world problem - building affordable, sustainable housing for communities afflicted by flooding. Our success demonstrates that the value of applied research can change the working methodologies of students and faculty who strive to develop and evaluate solutions with a positive impact on their context. The close collaboration between student, faculty and outside experts generates a unique studio environment characterized by outstanding creativity and energy.”

Mayne’s Morphosis was among thirteen local, national and international architects selected to participate in the first stage of the Make It Right project. The architecture firms were called upon to reimagine traditional New Orleans housing types, such as the “shotgun” house, to provide affordable, sustainable, and high design quality housing. The FLOAT House will support Make It Right’s mission to catalyze redevelopment of the Lower Ninth Ward by providing a displaced family with a flood-safe home, while preserving the community’s culture.

###

**ACKNOWLEDGEMENTS**

This project was made possible through the generous donations of: Morphosis Architects, Clark Construction Group, Inc., UCLA Architecture and Urban Design, and UCLA School of the Arts and Architecture. Additional support was provided by: Thornton Tomasetti, Inc., IBE Consulting Engineers, Inc., Strata International Group, Inc., SwissPearl, DEMODE by Valcucine, Pan Pacific Plumbing, and Epo Solar.
MAKE IT RIGHT

Make It Right was launched by actor Brad Pitt in December, 2007 to help residents of the Lower 9th Ward rebuild their lives and community in the wake of Hurricane Katrina. The initial goal of the Foundation is to build at least 150 affordable, green and storm-resistant homes for families who lived in the Lower 9th Ward when the hurricane hit. All of the Make It Right homes have been certified LEED platinum, the highest designation for energy efficiency and sustainability awarded by the US Green Building Council. This makes the Make It Right project the “largest, greenest neighborhood of single family homes” in America according to the USGBC. Make It Right will have 50 homes by December, 2009 and 150 homes by December, 2010.

MORPHOSIS ARCHITECTS

Morphosis is a collective practice committed to rigorous design and research that yields innovative buildings and urban environments. With projects worldwide, the firm’s work encompasses a wide range of project types and scales including residential, institutional, cultural and civic buildings as well as large urban planning projects. Morphosis has received 25 Progressive Architecture awards, over 90 American Institute of Architects (AIA) awards and numerous other honors. In collaboration with academic institutions worldwide, the studio has conducted extensive research on contemporary urban issues and has produced a series of publications including LA Now, Volumes One through Four. Morphosis has also been the subject of over 20 monographs, including a 2003 monograph from Phaidon, and 5 volumes published by Rizzoli International that span the complete works of the firm.

UCLA ARCHITECTURE AND URBAN DESIGN

UCLA Architecture and Urban Design in the School of the Arts and Architecture is a leading player on the international stage of contemporary architecture. Working with world-class faculty from established Pritzker Prize winners to the upstarts of tomorrow, our students integrate the most creative approaches to design, advanced developments in technology, and rigorous approaches to architectural thought available today. Using Los Angeles, one of the world’s greatest 21st century cities as model, laboratory and provocation, innovative programs give students the means and the vision to enter contemporary design culture as architects, urbanist thinkers and critics.

CLARK CONSTRUCTION

Since its founding in 1906, Clark Construction Group has developed a reputation as one of the nation’s most experienced and respected general contractors. With annual revenue in excess of $4 billion, Clark is consistently ranked among the country’s largest construction companies. Regional offices are strategically located to serve the diverse needs of public and private clients throughout the United States with the headquarters in Bethesda, MD. Community service is an integral part of Clark’s culture. Through monetary gifts, inkind donations, volunteer support, and probono work, Clark gives back to the communities in which it lives and works. Clark’s efforts with relief for Hurricane Katrina extend back to 2005, when Clark helped repair the medical clinic and library in Bayou La Batre, LA.
FACT SHEET
FLOAT House for the Make It Right Foundation

The FLOAT House:
An innovative prototype for affordable, green housing in flood-prone regions.

The FLOAT House is a new kind of house: a house that can sustain its own water and power needs; a house that can survive the floodwaters generated by a storm the size of Hurricane Katrina; and perhaps most importantly, a house that can be manufactured cheaply enough to function as low-income housing.

Location: 1638 Tennessee, New Orleans, Louisiana 70117

The site is in New Orleans’ Lower Ninth Ward, a few blocks east of the Industrial Canal that links the Mississippi River to Lake Pontchartrain and the Gulf of Mexico. Multiple breaches along the levees of the Industrial Canal and the Intracoastal Waterway resulted in devastating flooding and damage in the Lower Ninth Ward and New Orleans East from Hurricane Katrina in 2005.

Owner: Make It Right as launched by actor Brad Pitt to help residents of the Lower 9th Ward rebuild their lives and community in the wake of Hurricane Katrina. The initial goal of the Foundation is to build at least 150 affordable, green homes for families who lived in the Lower 9th Ward when the hurricane hit.

Project Delivery Statement: In 2007 Morphosis was one of thirteen architects invited by Make it Right to propose an affordable housing prototype for the Lower Ninth Ward. As an extension of this effort, capitalizing on Morphosis’s long standing relationship with academia, Morphosis partnered with UCLA Architecture and Urban Design to offer a studio class on the development and construction of the prototype home. In partnership with Clark Construction Group, Morphosis worked with UCLA Architecture and Urban Design graduate students to prefabricate the home on campus in Los Angeles, and ship it to New Orleans for assembly.

Size: 945 square feet
TIMELINE:

August 29, 2005: Hurricane Katrina devastates New Orleans

June 2007: Make It Right invites Morphosis to design a safe, healthy and affordable home to aid in the redevelopment of New Orleans’ Lower Ninth Ward

December 2007: Morphosis submits initial prototype design to Make It Right

January 2008: Thom Mayne/Morphosis invites UCLA Architecture and Urban Design to partner with Morphosis to further develop and construct prototype on the UCLA Campus.

March 2008 – June 2009: The Morphosis/UCLA partnership spanned a total of five academic quarters: spring, summer and fall 2008 design studios were dedicated to research, design and development of the prototype; construction seminars in the winter and spring 2009 focused on the building of the prototype on the UCLA campus.

December 2008: Prefabrication of core house element, the chassis, on UCLA Campus commences

March 20, 2009: Acquired property from the New Orleans Recovery Authority (NORA)

June 2009: Completion of prefabricated chassis on UCLA Campus

July 6, 2009: Chassis departed Los Angeles en route to New Orleans [Shell and roof building components also transported with chassis]

July 13, 2009: Chassis, shell and roof components arrived on site in New Orleans

July 13 – September 30, 2009: Installation and completion of prefabricated house in New Orleans

October 6, 2009: Public unveiling, ribbon cutting ceremony and celebration of completed house in New Orleans
How it works: The FLOAT House sits on a raised four-foot base, which has been reconceived as a high performance “chassis” – a prefabricated module, made from polystyrene foam coated in glass fiber reinforced concrete, which hosts all of the essential equipment to supply power, water and fresh air. The chassis is engineered to support a range of home configurations. In the event of flooding, the chassis acts as a raft, allowing the house to rise vertically on guide posts, securely floating up to twelve feet as water levels rise. While not designed for occupants to remain in the home during a hurricane, this innovative structure aims to minimize catastrophic damage and preserve the homeowner’s investment in their property. This approach also allows for the early return of occupants in the aftermath of a hurricane or flood.

Massing: This single family residential unit is organized according to the planning characteristics of the shotgun house, a ubiquitous residential type of New Orleans. The primary living spaces: living room, kitchen, bedrooms and bathrooms are aligned end-to-end within a 16’ x 58’ bar, and accessed from a parallel corridor, referred to as a gallery in this building typology.

Principal Interior Spaces:
- Master Bedroom
- Master Bathroom
- Bedroom
- Bathroom
- Kitchen
- Living room
- Gallery

Principal Exterior Spaces:
- Front Deck
- Optional Side Terrace

Principal Exterior Materials: Fiber cement panels; exposed galvanized steel structure; galvalum flat seam sheet metal; galvalum standing seam sheet metal roof

Principal Interior Materials: Exposed, sealed OSB (Oriented Strand Board) wall and roof panels; sealed wood and galvanized steel roof joists; sealed concrete topping
PROJECT CREDITS:

**DEVELOPER:** Make It Right
Thomas F. Darden III / Veronica Taylor / Annette Thigpen

**DESIGN TEAM:**
Architect: Morphosis
Design Director: Thom Mayne
Project Manager: Brandon Welling
Project Team: Andrea Manning / Patrick Dunn-Baker / Alex Deutschman
Project Assistants: Andrew Batay-Csorba / Natalia Traverso Caruana / Jesus Banuelos / Jessica D’Elena / Laura Decurgeon / Mark Johnson / Hugo Martinez / Josh Sprinkling /
Satoru Sugihara / Martin Summers / Aleksander Tamm-Seitz / Anne Marie Burke / Greg Neudorf / Jennifer Kasick / Sing Yeung Lau

In Collaboration With: UCLA Architecture and Urban Design
Chair: Hitoshi Abe
Professor / Advisor: Richard Weinstein
Student Design Team: Linda Fu / Saji Matuk / Ian Ream / Monica Ream / Erin Smith /
Legier Stahl / Ryan Whitacre

Structural Engineer: Thornton Thomasetti
Bruce Gibbons, Principal / Chris Kahanek, Project Engineer

Chassis Structural Engineer: Strata International Group
Nasser Saebi, President / Gerret Martin

MEP Engineer: IBE Consulting Engineers
Alan Locke, Principal / Bungane Mehlomakulu, Project Engineer

Make It Right Consulting Architect: John Williams Architects
John Williams / Sarah Howell / Connie Wu / Mark Clayton / Jennifer Lo

Make It Right Consulting MEP Engineer: Moses Engineers
W. Howard Moses / Eddie Litolf / John R. Owns

Make It Right Sustainability Consultant: William McDonough and Partners
Kathy Grove / Jordan Pollard

LEED for Homes Provider: Contects Consultants and Architects
John ‘Chip’ Henderson

**CONTRACTING TEAM:** Clark Construction Group, General Contractor
Marc Kersey, Vice President / Fred Case, Project Executive / Christian Ryan, Superintendent /
Corey Ward, Regional Safety Director / Art Vasconcelos, Project Engineer / Albert Williams,

Make It Right Construction Department
Jon Sader / Jodie Bua / William ‘Bill’ Lawton / Josh Primmer / Cesar Rodriguez / Pierre Moses
Paulette Pierce / John Stough Tim Duggan / Richie Katko / Ashley Hagan / Kristopher Kleinschmidt

TKO Maintenance & Construction
Tony Bua / Louie Jackson Jr. / Jose Terwogt / Russell Morrnan

In Collaboration With:
Strata International Group, Inc:  SABS Subcontractor
ACCO Engineered Systems:  Mechanical Subcontractor
Pan Pacific Plumbing:  Plumbing Subcontractor
Morrow Meadows Corp:  Electrical Subcontractor
Premier Building Systems Structurally Insulated Panels:  SIPS Manufacturer
Coast Iron and Steel:  Steel Fabricators
Washington Iron:  Steel Fabricators
BB & K:  Setters
EpoSolar:  Photovoltaic Panel Manufacture
SwissPearl:  Fiber Cement Cladding
RAM Industries:  Window Supplier
Fleetwood:  Window Manufacturer
Reba Sams, DOM LA:  Kitchen Consulting, Kitchen Appliances
DEMODE by Valcucine:  Kitchen Manufacturer
Weiss:  Flashing and Sheet Metal
Largo:  Shoring and Concrete
Bragg Crane and Rigging:  Hoisting
Transportation Management Group:  Hauling and Transport
Highland Products, Inc:  EPS Foam Supplier
Glass Wood Products:  TimberSIL Supplier
Perfect Barrier System, by WoodSmart Solutions:  BluWood Supplier
Premier Wall Constructors Inc.:  GFRC/Plaster Finishers
Rebar Engineering:  Rebar
PDQ Rentals:  Equipment Rentals

Additional Research and Consulting Generously Provided by:
R. Allen Eskew, FAIA:  Eskew+Dumez+Ripple Director
Steve Dumez, AIA:  Eskew+Dumez+Ripple Design Director
Scott Bernard:  Tulane University School of Architecture Interim Dean
Dr. Elizabeth English:  Louisiana State University Hurricane Center, The Buoyant
Foundation Faculty Advisor
Byron Mouton:  Tulane University School of Architecture Professor, Principal of BILD Design Studio
Emilie Taylor:  Tulane University URBANbuild Project Manager
Ronald Lewis:  House of Dance and Feathers Museum, President of The Big Nine, and Lower 9th Ward resident
ARCHITECT’S STATEMENT

The FLOAT House is a new kind of house: a house that can sustain its own water and power needs; a house that can survive the floodwaters generated by a storm the size of Hurricane Katrina; and perhaps most importantly, a house that can be manufactured cheaply enough to function as low-income housing.

Make It: Affordable

The FLOAT House optimizes the efficiency of mass-production, while respecting New Orleans’s unique culture and context. The Ninth Ward’s colorful vernacular houses, which local residents have traditionally modified and personalized over time, reflect the community’s vibrant culture. The FLOAT House grows out of the indigenous typology of the shotgun house, predominant throughout New Orleans and the Lower Ninth Ward. Like a typical shotgun house, the FLOAT House sits atop a raised base. This innovative base, or “chassis,” integrates all mechanical, electrical, plumbing and sustainable systems, and securely floats in case of flooding. Inspired by GM’s skateboard chassis, which is engineered to support several car body types, the FLOAT House’s chassis is designed to support a variety of customizable house configurations.

Developed to meet the needs of families in New Orleans’s Lower Ninth Ward, the FLOAT House is a prototype for prefabricated, affordable housing that can be adapted to the needs of flood zones worldwide. The FLOAT House is assembled on-site from pre-fabricated components:

- The modular chassis is pre-fabricated as a single unit of expanded polystyrene foam coated in glass fiber reinforced concrete, with all required wall anchors, electrical, mechanical and plumbing systems pre-installed. The chassis module is shipped whole from factory to site, via standard flat bed trailer.
- The piers that anchor the house to the ground and the concrete pads on which the chassis sits are constructed on-site, using local labor and conventional construction techniques.
- The panelized walls, windows, interior finishes and kit-of parts roof are prefabricated, to be assembled on-site along with the installation of fixtures and appliances.

This efficient approach integrates modern mass-production with traditional site construction to lower costs, guarantee quality, and reduce waste.
Make It: Float

Global climate change is triggering ever-harsher floods and natural disasters. Nearly 200 million people worldwide live in high risk coastal flooding zones, and in the US alone, over 36 million people currently face the threat of flooding. The FLOAT House prototype proposes a sustainable way of living that adapts to this uncertain reality.

To protect from flooding, the FLOAT House can rise vertically on guide posts, securely floating up to twelve feet as water levels rise. In the event of a flood, the house’s chassis acts as a raft, guided by steel masts, which are anchored to the ground by two concrete pile caps each with six 45-foot deep piles.

Like the vernacular New Orleans shotgun house, the FLOAT House sits on a 4-foot base; rather than permanently raising the house on ten foot or higher stilts, the house only rises in case of severe flooding. This configuration accommodates a traditional front porch, preserving the community’s vital porch culture and facilitating accessibility for elderly and disabled residents.

While not designed for occupants to remain in the home during a hurricane, the FLOAT House aims to minimize catastrophic damage and preserve the homeowner’s investment in their property. This approach also allows for the early return of occupants in the aftermath of a hurricane or flood.

Make It: Green

A high-performance house that generates and sustains its own water and power needs. On track for a LEED Platinum Rating, the FLOAT House is an innovative model for affordable, net-zero annual energy consumption housing. High-performance systems sustain the home’s power, air, and water needs, and minimize resource consumption:

- Solar Power Generation: The roof supports solar panels that generate all of the house’s power, resulting in net-zero annual energy consumption. The chassis incorporates electrical systems to store and convert solar power for daily use, and to give back to the electrical grid during the temperate fall and spring months.
- Rainwater Collection: The sloped concave roof collects rainwater, and funnels it to cisterns housed in the chassis, where it is filtered and stored for daily use.
- Efficient Systems—including low-flow plumbing fixtures, low-energy appliances, high performance windows, and highly insulated SIPs (Structural Insulated Panel) walls and roof—minimize water and power consumption, and lower the lifecycle cost for the home owner.
- High-grade energy efficient kitchen, appliances and fixtures maximize durability and reduce the need for replacement.
- Geothermal Heating and Cooling: A geothermal mechanical system heats and cools the air via a ground source heat pump, which naturally conditions the air, minimizing the energy required to cool the house in the harsh summer months and heat it in winter.

Footnotes:
2. “Over 12% of the United States population lives within a flood zone and even more people live close to the ocean, which means they are also potentially in danger of being flooded out by excessively high tides high, tsunamis or hurricanes storm surges.” Lance Winslow, http://ezinearticles.com/?Do-You-Live-in-a-Flood-Zone—12%-of-Americans-Do!/id=530215
Acknowledgements:

This project was made possible through the generous donations of: Morphosis Architects, Clark Construction Group, Inc., UCLA Architecture and Urban Design, and UCLA School of the Arts and Architecture. Additional support was provided by: Thornton Tomasetti, Inc., IBE Consulting Engineers, Inc., Strata International Group, Inc., SwissPearl, DEMODE by Valcucine, Pan Pacific Plumbing, and Epo Solar.
Educational Impact of the FLOAT House Project

Under the leadership of UCLA Professor Thom Mayne and his team at Morphosis, the FLOAT House project provided a remarkable educational opportunity for graduate students of UCLA Architecture and Urban Design (AUD) to connect research to professional practice in the field of architecture and urban design.

As a design-build project that involved University students in every step of the process, the FLOAT House is unique among the projects by 13 local, national and international architects selected to participate in the first phase of the Make It Right initiative. After the acceptance of the prototype design, Mayne invited UCLA Architecture and Urban Design to partner with Morphosis in further development of the design and construction of a prototype on the UCLA Campus. Mayne, the Morphosis team and seven UCLA AUD students researched, designed, developed and helped construct the FLOAT House prototype through a specialized design-build studio.

The design-build studio spanned five academic quarters: beginning with research, design and development; followed by meetings with city officials, architects, developers and other prominent experts; and culminating in construction seminars focused on the building of the prototype on the UCLA campus. From researching the context in New Orleans, through the design and building process, to finally shipping the 46,000-pound concrete chassis from Los Angeles to New Orleans, the students have been involved in a real-world process that has generated innovations and social impact. This groundbreaking approach to prefabricated, sustainable, affordable housing can be transferred to other contexts and cultures.

The FLOAT House collaboration not only offered an immersive, real-world educational experience, but also advances cutting-edge research between the university and industry, contributing to regional and national economic growth and social advancement.

About UCLA Department of Architecture and Urban Design

In defining the role of a public university in today’s world, the Department is committed to excellence in five key areas: teaching; research; the connection between research and professional practice; innovation in design and technology; and engagement with social issues. The FLOAT House project embodies all five of these core educational values, in a project that engages with our community and broader worldwide issues.

UCLA Architecture and Urban Design fosters an educational environment where individuals are excited to create knowledge together. The collaborative research culture in architecture and urban design flourishes on the exchange of ideas among students, professors, and experts in the field.

Pritzker Prize winning Distinguished Professor Thom Mayne has been a committed educator in architecture for over 40 years. His firm, Morphosis, is engaged in broader social, cultural, urban, political and ecological issues. Mayne’s significant contributions to architectural education include the highly regarded L.A. Now and Madrid Now initiatives. Under Mayne’s direction, UCLA Architecture and Urban Design students won the 2005 PA Award for “L.A. Now: Volume Three.” There has always been a symbiotic relationship between Mayne’s teaching and practice, evidenced in his commitment to this sustainable, affordable housing project for the Make It Right Foundation in New Orleans.

UCLA Students

The UCLA students involved include: Linda Fu (Cerritos, California), Saji Matuk (Merritt Island, Florida), Ian Ream (Lafayette, California), Monica Ream (Walnut Creek, California), Erin Smith (Traverse City, Michigan), Jeanne Stahl (New Orleans, Louisiana), and Ryan Whitacre (Bethel, Ohio).
The FLOAT House

A design-build project developed by:
Morphosis Architects in association with
UCLA Architecture and Urban Design, for
the Make It Right Foundation

This project was made possible through the generous donations of:
Morphosis Architects
Clark Construction Group, Inc.
UCLA Architecture and Urban Design
UCLA School of the Arts and Architecture

With additional support provided by:
Thornton Tomasetti, Inc.
IBE Consulting Engineers, Inc.
Strata International Group, Inc.
SwissPearl
DEMODE by Valcucine
Pan Pacific Plumbing
Epo Solar