



EVOLVING DEFINITION OF TECHNOLOGY AND OF NATURE

The requirements for this project align with ambitions we pursue in our own research and practice: all components of building and landscape fall within an evolving definition of technology and nature. Both spheres are constantly fluctuating, overlapping, evolving and so are our perceptions of them. It is always our ambition to achieve architecture that is an intrinsic synthesis of all issues including environmental performance.

Environmental performance and its relationship to nature should be intrinsic to a building's form, its spaces, experience, the stories they tell, and architecture overall. We bring the same rigor and nearly spiritual passion for distilling architectural details and tectonics to the integration and design of building technological systems. We think of concrete floors, wooden window frames that don't contain chloroprene, and landscape design the same way we think of an hydronic heat exchanger: all reside in the spheres of nature and technology simultaneously.

Pictured above is the actual project site we have been commissioned to partially demolish, lift, retrofit, or completely redesign. Flood waters were up to the eaves. The following proposal for the Michael Kalil Memorial Fellowship is based on questions provoked during the scoping for this recent commission.

Designing and implementing a prototype that converges solutions for energy performance and flood resilience: A design-research case study for a single family home in the costal New York Metropolitan Area that was destroyed by Hurricane Sandy.

Dear Michael Kalil Memorial Fellowship Grant Jury,

Thank you for the opportunity to apply for this grant to work both in honor of Michael Kalil's legacy and to address issues germane to the constructed environment as provoked by Hurricane Sandy. The following proposal is for funding to support design-research at the paradoxical intersection of nature and technology. This project is the result of a recently secured commission for a 2,000 sf single-family home decimated by Hurricane Sandy and located below the 50 year FEMA flood plane in the metropolitan area. The clients are the 80 year old parents of an architectural historian who was referred to us through our teaching network.

Of the many issues to follow, one in particular may be the most uniquely aligned to Michael Kalil's legacy: This project affords the rare opportunity to *ask questions* through a unique form of practice. We are fortunate to have found a client willing to let us ask these questions with their project — and we are respectful that they come under duress physically, emotionally, and economically as a result of Hurricane Sandy.

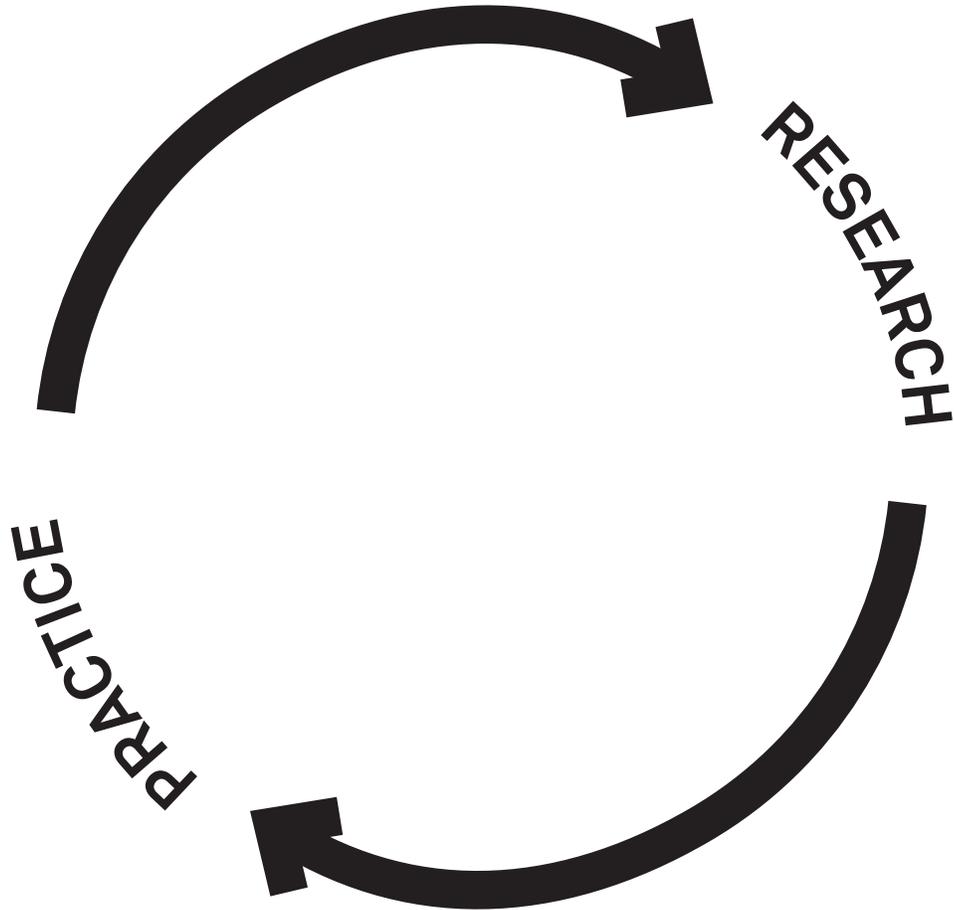
The project presents a confluence of issues richly concurrent with our of research and direction of practice. Furthermore, it is constrained by the real-estate economic context. It is a small but complex program dealing with contemporary issues of domestic space, dynamic patterns of habitation, and aging. It is governed by conflicting local and federal (FEMA) zoning.

In our preliminary research, after touring the destroyed structure for the first time (two weeks ago), we were able to articulate a question to define the project (and the clients agreed to let us look for an answer):

Is it possible to implement convergent solutions for energy performance and flood resilience in building components and construction methods?

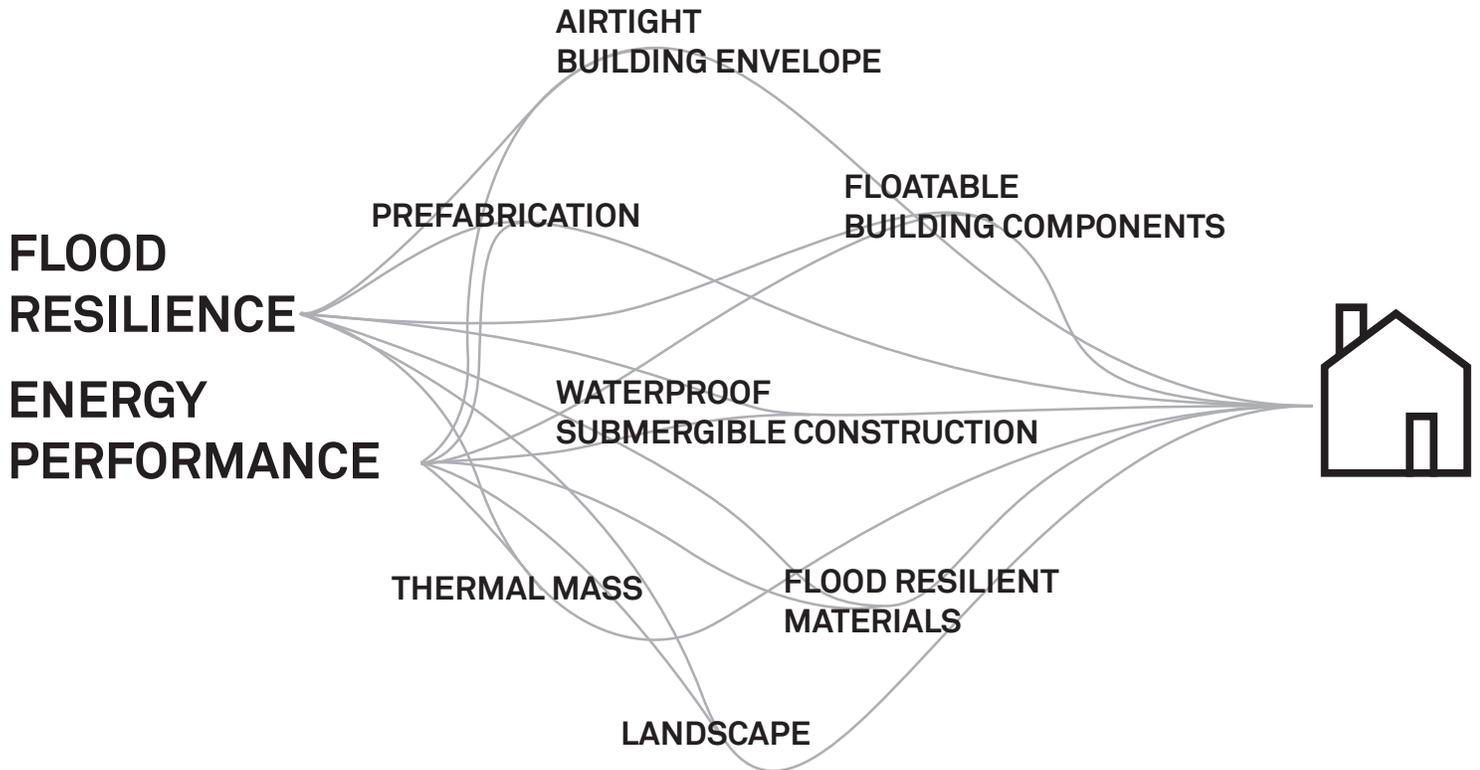
If so, this would drive the cost of the project down, achieve an architecture that satisfies all of the project's requirements, and serve as a precedent for others faced with the same problem of rebuilding intelligently after Sandy. Design solutions to this question and construction of this project provoke alternative relationships between the spheres of building technology and nature.

The window of time to intervene is now. Insurance claims are in the process of being finalized, research and design can take place for the remainder of the winter, and construction can begin mid summer.



RESEARCH / PRACTICE FEEDBACK LOOP

We always feel bad about making this diagram because we can't figure out which comes first, Practice or Research. We pursue both aggressively, in multiple spheres, in and out of academic and professional settings. We believe that research is a form of design and design is a form of research. This project presents unique opportunities to exercise a rare model of creative practice that interests us the most.



CONVERGENCE

“Process is the beginning but the beginning always steps backwards so that rather than simply beginning, the beginning is a search for the beginning.” -Donald Judd

The ambition for the project is to realize a new construction home within the client’s budget that achieves their ambition for living. It is also to test the thesis that two primary building technology issues can converge on one solution. Building technologies that achieve environmental performance such as air-tight construction envelopes and thermal masses could serendipitously achieve flood resilience by the simple virtue that they can easily be engineered to be water-tight. Landscape design principles can achieve both energy efficiency and flood resilience. Flood resilience must be defined both as the ability for a structure and its landscape to sustainably bear the conditions of up to a 14’ tidal surge while simultaneously not requiring extensive economic resources to re-inhabit after such flooding.

PREFABRICATION

AIRTIGHT BUILDING ENVELOPE

FLOATABLE BUILDING COMPONENTS

FLOOD RESILIENCE ENERGY PERFORMANCE

DOF

IBLE CONSTRUCTION

FLOOD RESILIENT MATERIALS

ESCAPE

The Lewiston
 No. 2107 "Always Cut and Fitted"
 Prefabricated Modern Home.
 Pages 118-119

SPECIAL FEATURES
 COMPLETE description of the particular and specifications for this home will be found on pages 99 to 115. Special features include: full size living room and dining room; kitchen with built-in sink and stove; central heating for the whole house; central air conditioning; built-in bookshelves; and many other features.

FIRST FLOOR
 THE ENTIRE house is built of pre-fabricated panels of heavy-duty steel and aluminum. The roof is made of light weight, fire proof, asbestos free panels. The floor is made of light weight, fire proof, asbestos free panels. The walls are made of light weight, fire proof, asbestos free panels. The house is built on a concrete foundation. The house is built on a lot 36 feet wide.

SECOND FLOOR
 A COMPLETELY finished second floor is available for an additional cost. The second floor is built of pre-fabricated panels of heavy-duty steel and aluminum. The roof is made of light weight, fire proof, asbestos free panels. The floor is made of light weight, fire proof, asbestos free panels. The walls are made of light weight, fire proof, asbestos free panels. The house is built on a concrete foundation. The house is built on a lot 36 feet wide.

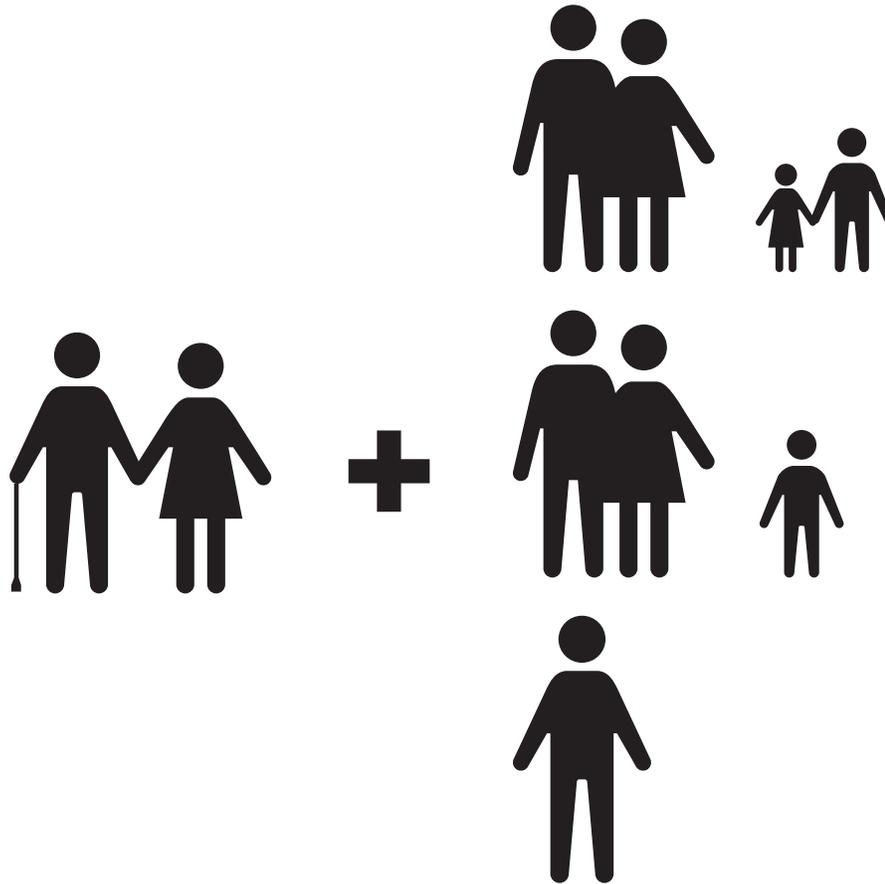
SEARS, ROEBUCK AND CO.

PREFABRICATION

The original home was a 1950's Sears Roebuck "Bachelor's Cottage". These homes were the articulation of a particular architectural phenomenon. Their design was a confluence of social, political, economical, and technological forces, as well as an attitude about nature. The design and construction of the client's new home will engage contemporary prefabrication technologies so that it will be affordable, marketable, and ultimately a sustainable prototype for the hundreds of thousands of other homeowners faced with the same problematic context as our client's.

OWNERS

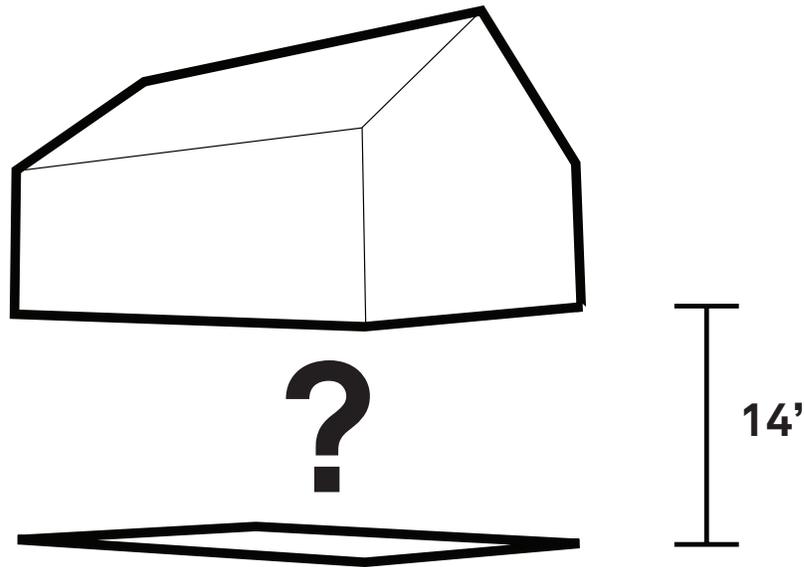
THEIR CHILDREN AND THEIR GRANDCHILDREN



DOMESTIC FAMILY UNIT

The destroyed home has immense nostalgic value for the client and their family. It was the first home purchased by the elderly couple who is currently displaced from it. Their children, all in their mid 30's, grew up there and cherish the memories of returning there with their own children for holidays and family get-togethers over the years. The parents had planned to live out their days together in this modest home within this particular community.

Although what we design will likely look very different from the original home, we will create phenomenological traces of its familiar spaces and their quirky attributes. Sequences, views, living patterns, floorboards that you can talk through, etc. will be translated into the new design. The design will mediate between existing domestic living patterns and new ways of living that alternatively engage nature and technology.



A PROTOTYPE FOR A SOCIALLY, ECONOMICAL, AND ENVIRONMENTALLY SUSTAINABLE ALTERNATIVE. (OPTION 1)

Can we create an alternative to lifting this home 14'? FEMA's 50 year flood plane requires the existing home to be lifted or new construction to begin above 13'. The local zoning required one additional foot. The project site, like hundreds of thousands more is located at 0' from mean high-tide. There are a battery of zoning, code, economic, and aesthetic issues that challenge lifting these homes as a reasonable solution— not to mention the elderly owners can't easily access a first floor that is 14' above the ground level— yet it is both the law and the safest thing to do given current construction practices.

We intend to research a safe and affordable solution for building at grade. To do this, we will need to create water tight and submergible walls and floors. The latter can be accomplished with concrete or prefab concrete and the former with a modified structurally insulated panel. SIPs (Structurally Insulated Panels) could become SISPs (Structurally Insulated and Submergible Panels)! Windows could be designed with quick-releases that incorporate necessary thermal breaks and insulation properties. When a flood is imminent, windows could be removed and safely stowed to provide necessary permeability for the forces of tidal waters.

The home could even be buoyant and anchored to the site. In the event of floods it would simply float as the water rises. Utilities could telescope, or more ideally the home could be completely off the grid. These are a few examples of many solutions we have already begun to identify in our research.



A PROTOTYPE FOR A SOCIALLY, ECONOMICAL, AND ENVIRONMENTALLY SUSTAINABLE ALTERNATIVE (OPTION 2)

If we discover that lifting is the best solution then we will have to invent a language to engage this direction. In beach communities and waterfront properties we are accustomed to seeing homes on piers and “stilts” as part of our visual landscape. In New Orleans and other areas, there are examples of inland homes on small “legs” which stand them above flood planes. In the North East, there are many dense single family and multifamily homes that are substantially inland and still require being lifted 14’. How could this be done so the building does not look like an “idea on stilts”? How could it be done to achieve an architectural language of its own?

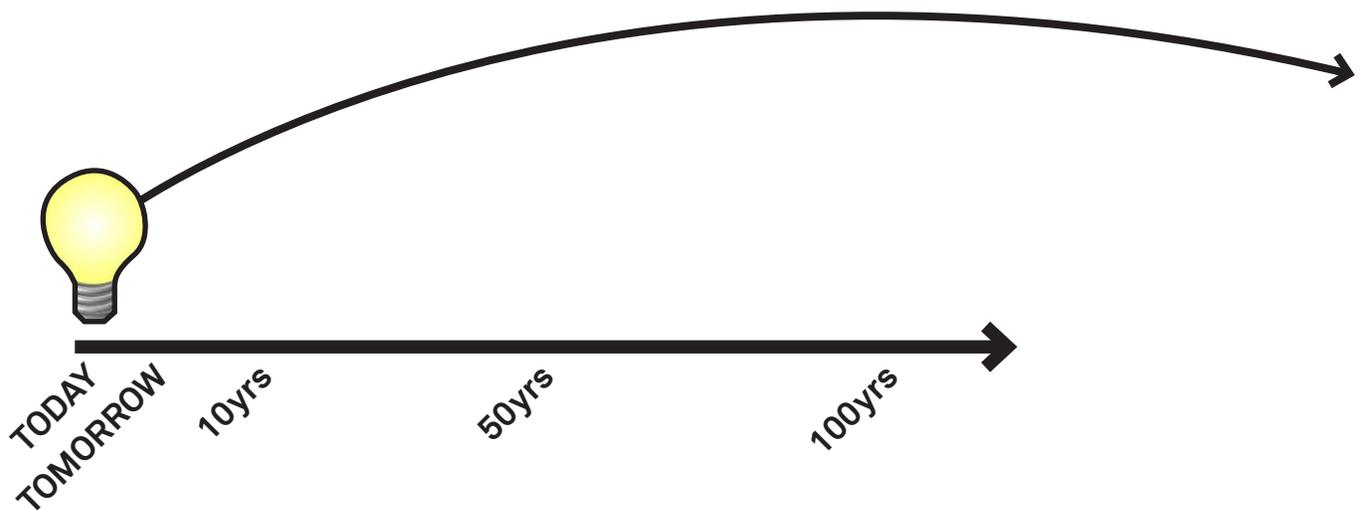
NOTE: Above is a collage we made for a (sadly) unbuilt proposal to lift a small cottage above a prefabricated pavilion. The client in this case needed an affordable addition for their expanding family and wanted to live “in nature” more so than their existing cottage provided. This idea provoked incredible energy efficiencies, affordability, and compact organization of domestic program.



AN UNLIKELY OPPORTUNITY TO CREATE A PRECEDENT

The intention of this project is to innovate within its constraints. Its economics are daunting. The owners are elderly and have limited disposable income. They are fortunate to have been carrying all of the appropriate insurances against the various forms of property damage that occurred as a result of Hurricane Sandy. Nevertheless, the insurance money they are receiving does not come close to covering even the most modest rebuilding effort. If we can deliver a building within budget that achieves the full range of requirements for the home we will have created an immediately replaceable precedent.

NOTE: Pictured above is the interior of the project home. After standard construction has been submerged, all materials such as insulation, sheetrock, etc. that can spore mold must be removed. This project, like many similar, contends with a variety of issues that inflate costs such as: extensive demolition, utility repairs, construction health hazards, extensive site repairs, and the cost of building a structure above 14'. FEMA codes requiring the home to be lifted are applicable if the cost of rebuilding is more than 50% of the assessed added value to the *structure* of the home since 1986. In other words, there would have to have been \$500,000 worth of structural modifications to this home on record in the local building department for the owner to spend \$250,000 on rehabilitating what is left of the home. Almost no-one will be able to legally leave their home at grade in this area.



CREATING SOMETHING NOW THAT HAS BENEFITS FOR PERPETUITY

Some people think about solving problems with technologies that are 100 years or further ahead, 50 years ahead, 10 years ahead, or about what is possible right now. We like thinking at all of those scales. That said, this project presents a unique opportunity to achieve something within the next 12 months that if successful or not, will be consequential to the public, design, construction, and real-estate industries immediately and into perpetuity. It will require rapid innovation with existing construction technologies and readily available materials.

We are looking for funding opportunities outside of the project's budget to allow us to take on immediate and extensive additional research and design with building systems and construction technologies.

BUDGET

SOURCE:	AMOUNT:	WORK ITEM:	NOTES:
- Michael Kalil Fellowship - self-financing - additional grants - in-kind contributions from contractor we have partnered with to develop these technologies - (worst-case scenario additional funding can be allocated from owner's construction budget)	\$10,000	#1 Architectural research and design.	The grant monies will be used to offset the costs of parallel research during all design phases of the project.
	\$15,000	#2 Construction mock-ups, testing, prototypes, analysis, and engineering.	We take on bread&butter projects to help offset the costs of non-standard research and design for projects like this. This project will proceed through construction regardless of total funds confirmed for items #1 and #2.
Dwelling Insurance	\$132,000	#3 Construction Scope	Confirmed
Lost Contents Insurance	\$38,000	#4 Construction Scope	Confirmed
Wind Insurance	\$9,000	#5 Construction Scope	Confirmed
Owner	\$50,000	#6 Construction, architectural design, consultant, and regulatory scope	Confirmed. This must be kept to a minimum as it will be coming from the elderly couple's disposable income.
Total estimated range:	\$254,000		

SCHEDULE

PROJECT COMMISSION: 1/14/13

SCOPING: Completed 12/8/12 to 1/14/13

DEMOLITION: To begin as soon as possible this winter and optimized with the design strategies.

PRE-DESIGN/ CONCEPT DESIGN/ R&D: 1/14/13 through June

DESIGN DEVELOPMENT THROUGH CONSTRUCTION DOCUMENTATION: June - July

PERMITTING, REGULATORY, AND PRE-CONSTRUCTION: Mid Summer

CONSTRUCTION: Anticipated to be completed by the end of 2013.

A detailed scope, schedule, and program can be provided upon request.