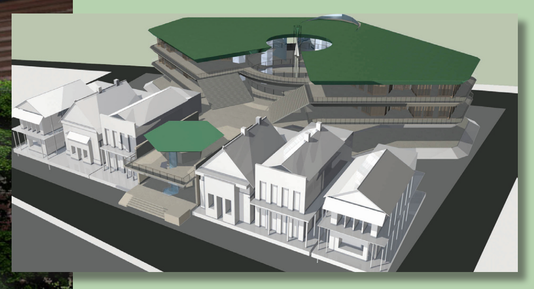


"This community extends levee to levee." - Ninth Ward Resident

"An object seen in isolation from the whole is not the real thing." - Masanobu Fukuoka

9th WARD RISING

A regenerative solution for New Orleans begins with understanding that humans and our dwellings are deeply intertwined within the complex web of natural systems around us. In recent times, we have neglected this relationship and wrought much damage upon ourselves and the environment that sustains us all. For this reason mere sustainability is not enough; if we are to survive upon this fragile land then we must regenerate what we have broken and help reverse the processes contributing to the "inconvenient truths" of global warming, pollution, depletion of non-renewable resources and structural socioeconomic decline. We must also find a way to survive the inevitable consequences of our actions — a fate already upon us.

We can continue to war over depleted fossil fuel resources or we can integrate ourselves into the naturally regenerative cycles that Nature provides for free.

We can design in ways that remain vulnerable to both climactic change and natural disasters, or we can design our buildings to expect these cycles and transcend them.

Our proposal maintains the fact that a sustainable building in New Or-leans is only as sustainable as the neighborhoods and city surrounding it. A community center brightly floating above a sunken city is a bleak pic-ture and reflects a fundamental flaw in our current way of thinking.

"When we try to pick out anything by itself,
we find it hitched to everything else in the Universe." — John Muir

In accordance with this concept, we recognize that affordable housing best serves its inhabitants if it does not concentrate poverty nor isolate the poor from community-support systems. We therefore present a practical solution to raise and protect coastal Louisiana with a region-wide array of wind-powered pumping infrastructure integrated within diffusely located, affordable and re-generative housing.

Our design goals are ambitious. We encourage you to read the fine print and discover how they can be brought to life.

Design Goals:

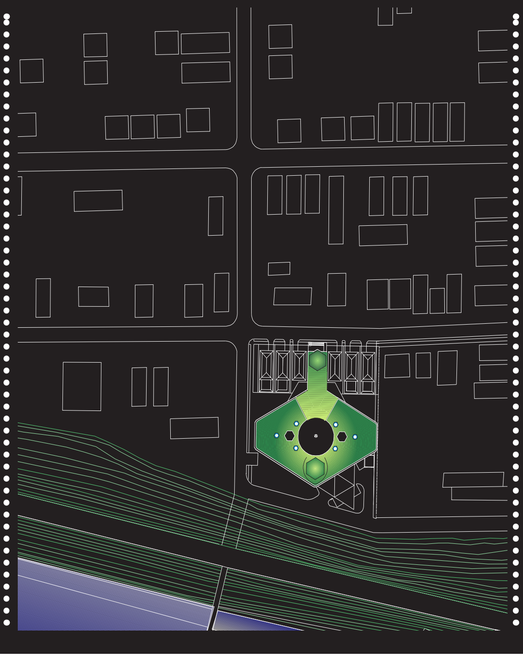
— *Raising a City:* Propose a viable, long-term, protective infrastructure addressing the threats of rising sea levels and subsidence for the city of New Orleans and surrounding wetlands.

— *Regenerative Green Design:* Use proven technologies to empower the self-healing capabilities of nature by fully integrating human processes into a climate-neutral, beyond-net-zero structure. - Passive Survivability: Provide for passive survivability of this structure in the face of what was visited upon the Holy Cross neighborhood last summer.

— *Affordability:* Produce a model for affordable, beyond-sustainable housing as a key element of a plan to ensure economic viability for the entire city, and explain how to finance "Raising a City".

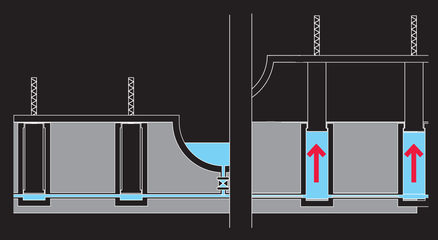
— *Safe, Vibrant Community:* Create a safe, healthy, inspiring, interactive, educational and service-laden facility specifically addressing the desires of Holy Cross residents.

— *Lagniappe:* Do all of the above in a way that aesthetically and naturally evolve from the unique historic fabric of New Orleans.



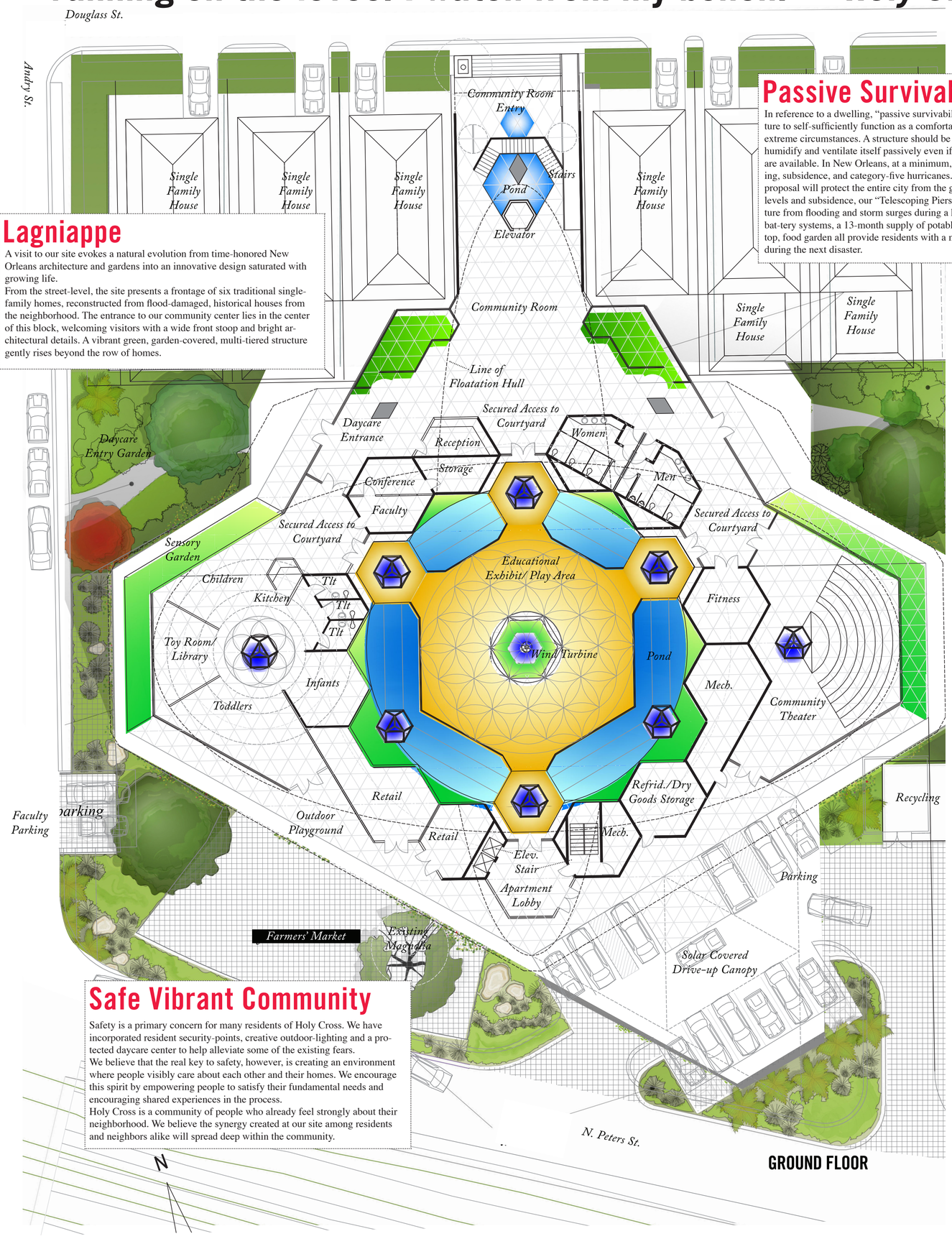
THERE ARE ONLY TWO TYPES OF FOUNDATIONS IN THIS CITY.

THOSE THAT HAVE SUNK, AND THOSE THAT WILL.



The complex also floats upon eight, telescoping piers that can raise 40 feet — high enough to be safe from a storm surge and the waves which overtop that surge. But these piers are normally retracted so that the commu-nity facilities are accessible at ground level.
When one of the wells that contains a pier sinks, as foundations in New Orleans will, our building is designed to compensate for this change and avoids the structural damage traditionally associated with this phenomenum. This is significant long-term energy efficiency measure since a major reason for build-ing air leakage in New Orleans is subsidence.

This is my levee. It's the best spot in the world. I wake up and look forward to running on the levee. I watch from my bench. —*Holy Cross Resident*



GROUND FLOOR

Lagniappe

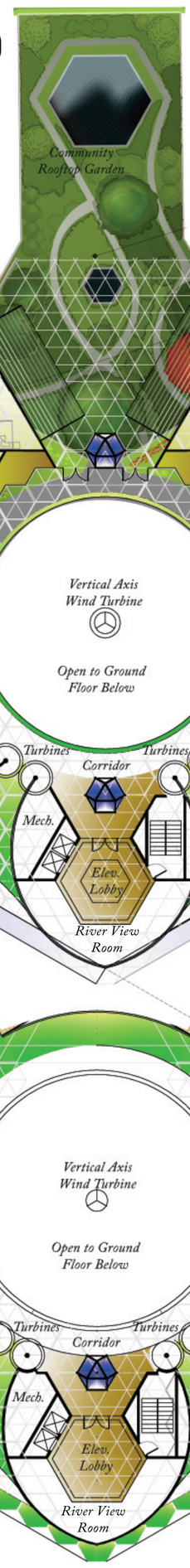
A visit to our site evokes a natural evolution from time-honored New Orleans architecture and gardens into an innovative design saturated with growing life.
From the street-level, the site presents a frontage of six traditional single-family homes, reconstructed from flood-damaged, historical houses from the neighborhood. The entrance to our community center lies in the center of this block, welcoming visitors with a wide front stoop and bright ar-chitectural details. A vibrant green, garden-covered, multi-tiered structure gently rises beyond the row of homes.

Passive Survivability

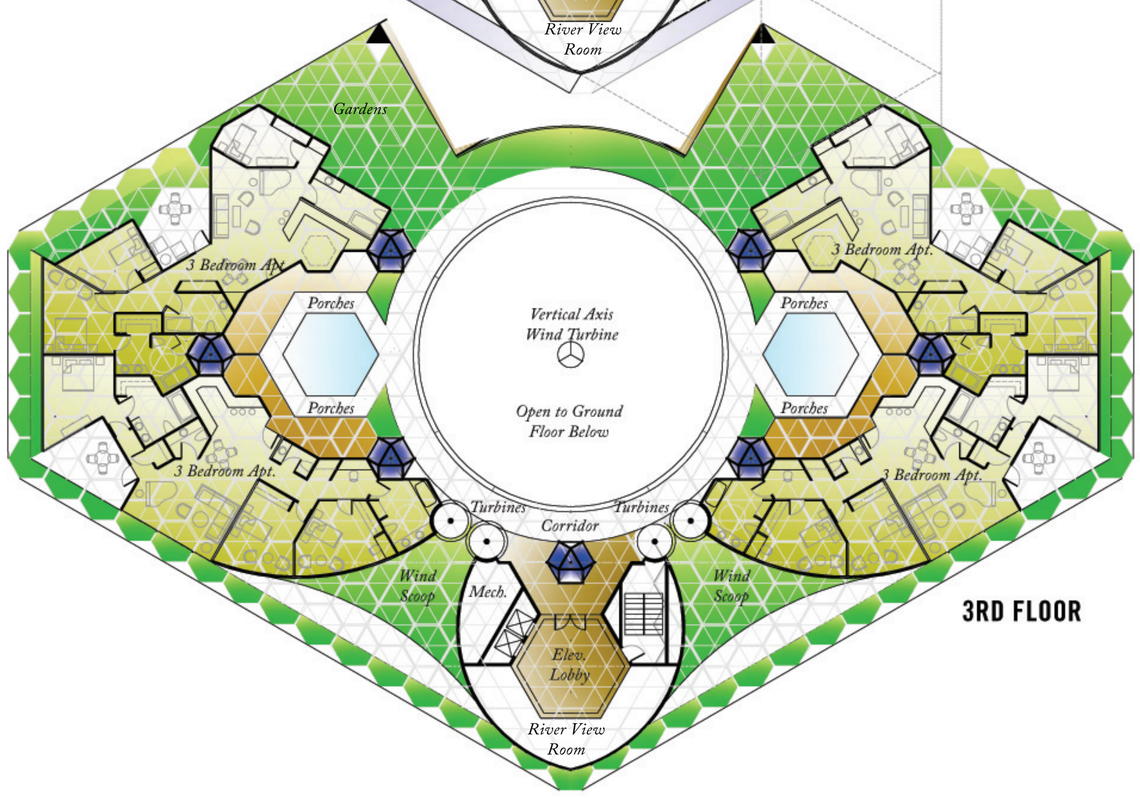
In reference to a dwelling, "passive survivability" is the ability of a struc-ture to self-sufficiently function as a comfortable shelter, even in the face of extreme circumstances. A structure should be able to light, heat, cool, de-humidify and ventilate itself passively even if no off-site energy resources are available. In New Orleans, at a minimum, it must survive global warm-ing, subsidence, and category-five hurricanes. While our "Raising a City" proposal will protect the entire city from the gradual processes of rising sea levels and subsidence, our "Telescoping Piers" system protects each struc-ture from flooding and storm surges during a hurricane. Renewable energy, bat-tery systems, a 13-month supply of potable water and a flood-safe, roof-top, food garden all provide residents with a means to sustain themselves during the next disaster.

Safe Vibrant Community

Safety is a primary concern for many residents of Holy Cross. We have incorporated resident security-points, creative outdoor-lighting and a pro-tected daycare center to help alleviate some of the existing fears.
We believe that the real key to safety, however, is creating an environment where people visibly care about each other and their homes. We encourage this spirit by empowering people to satisfy their fundamental needs and encouraging shared experiences in the process.
Holy Cross is a community of people who already feel strongly about their neighborhood. We believe the synergy created at our site among residents and neighbors alike will spread deep within the community.



2ND FLOOR



3RD FLOOR

Space-Frame Design

The space-frame system consists of two planes, parallel grids (upper and lower layer), formed by repeating a fixed size, equilateral triangle. External loads are spread omnidirectionally — making it well suited to concentrate weight and extend cantilevers. Structurally, the integrity of the space frame is vastly superior in weight-to-strength ratios than conventional post-and-beam structures which have proven inept in catastrophic events.

Living Roof

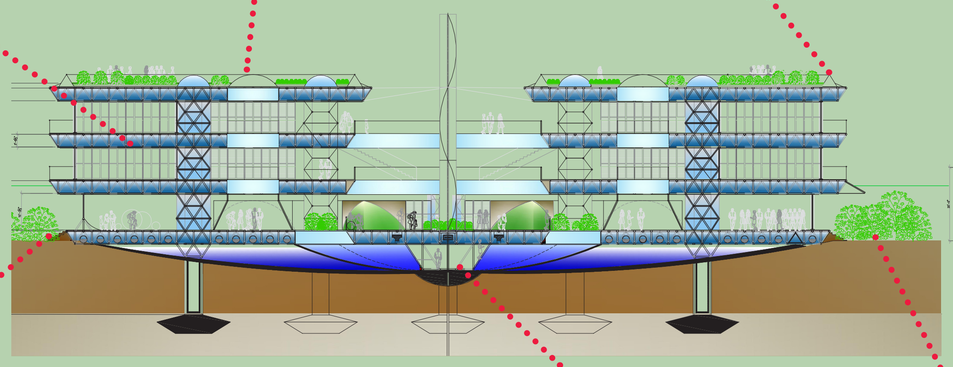
Rooftop vegetation helps retain storm water, absorbs car-bon dioxide emissions and provides a space for residents to grow food. The living roof provides evaporative cooling through the roof.

4.7 tons of food potentially produced a year.

Rainwater Catchment

Excess rainwater is collected around the perimeter of our living roof and passed through a filtration system providing make-up water for watering the gardens and flushing the toilets.

13 months supply of fresh water is stored in the complex's integrated water system.



Ventilating to the LEED Standard

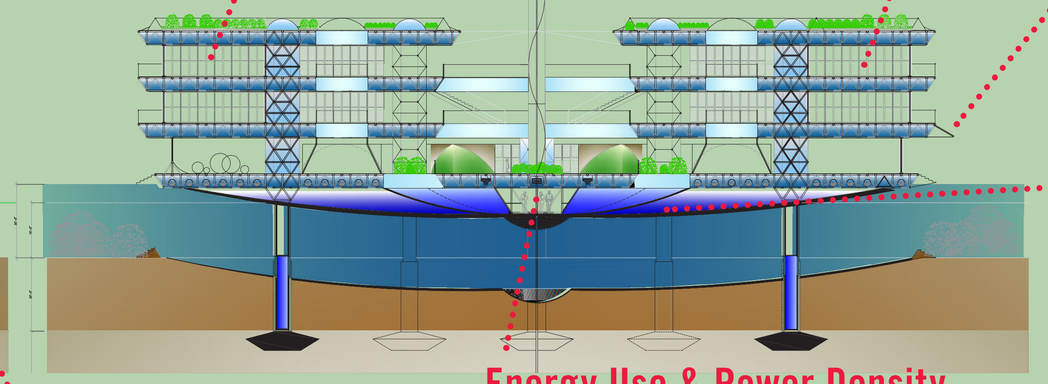
Our building dehumidifies itself. By creating a differential air pressure across porous concrete, capillary condensation transfers water vapor from the fresh air supply to the return airstream. Therefore, we offer an energy-efficient solution to ventilating in a hot-humid climate otherwise unknown to the industry.

40% more energy than is used for cooling is normally required to achieve adequate dehumidification and ventilation for even the best green design's energy budget.

$0 is what it costs to de-humidify and ventilate our building.

Designed Leakage

works with the positive pressure created by the ventilation system to protect the indoor-air-quality of the home and improve the durability of the en-velope of the building. This significantly improves the perfor-mance of the windows and exterior doorways.



Renewable Energy

By orienting and shaping the design of our building around the collection of wind energy, we are able to achieve far greater wind-energy density.

300% energy collection compared to energy consumption in our building.

50% lower energy density in our building by using passively-collected HVAC energy from renewable resources.

Thermal Reservoir

An underground thermal reservoir consists of a large water tank plus several feet of the surrounding earth, isolated from adjacent soils by means of a deep, environ-mental barrier made of recycled construc-tion waste. The water in the tank circulates through the walls of the house via a system of pipes, using a small pump powered by one of our wind turbines. The reservoir "stores" the seasonal temperature cycles of the earth so that it may be gradually redis-tributed throughout the building months later.

Constructed Wetlands Treatment

is a natural wastewater treatment system that uses minimal energy, costs less than many sep-tic systems and requires no structure to build other than the tanks and the liner. It is odorless, com-pletely below the ground and adds habitat; plants grow out of the gravel — above the system.

63% approximate leakage in the (potable) New Orleans water supply system. (~85 million/gal-day)

Raising the Grade

As part of a long term, 2000 square-mile plan to raise the sinking earth under the city of New Orleans, this pumping equipment has the capability to inject water, sand and silt 75 feet under the site.

3 inches per year. The pumps are able to raise the land relative to sea level.

50 years, at current rate of wetland depletion, until the mouth of the Mississippi is at New Orleans.

Recycling and Compost

The profits from the neighborhood recycling can be used for any-thing from site maintenance to supplementing the community room's budget. The non-profit bioremediation group, RePlant New Orleans, will be invited to use the center as a venue to educate neighbors about ways to naturally remediate toxic soils.

Energy Use & Power Density

20 watt-hours per square foot per year is the power density for an average home in New Orleans.

1.6 watt-hours per square foot per year is the power den-sity for our building.

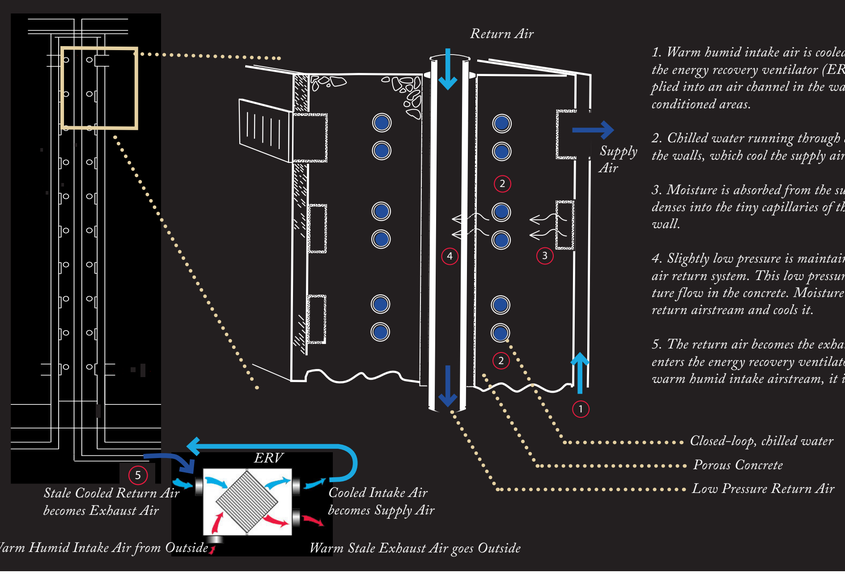
Energy used for heating: 0
Energy used for ventilation: 0
Energy used for cooling: 0
Energy used for dehumidification: 0
Energy used for water heating: 0

Residential Lights & Appliances Loads: ~ 4.0 kWh / day

Refrigerators: SunFrost with built-in compressors for both AC & DC operation ~ 0.5 kWh / day
Cooking ~ 0.5 kWh / day
Magnetic Induction Cooktops: ~ 85% the energy used by the appli-ance gets into the food
Lighting: Cree EZ-Bright™ LED's have twice the efficiency and three times the luminaire efficacy avail-able in fluorescent lighting ~ 0.5 kWh / day
Ceiling Fans: the 52-inch Gossa-mer Wind provides twice the air flow for the same energy ~ 0.5 kWh / day
Electronic Equipment: ~ less than 0.5 kWh / day

HUMIDITY? NO SWEAT.

OUR WALLS PULL WATER FROM THE AIR AND RECYCLE IT.



1. Warm humid intake air is cooled as it passes through the energy recovery ventilator (ERV); it is then sup-plied into an air channel in the wall adjacent to the conditioned areas.

2. Chilled water running through a system of pipes cools the walls, which coot the supply air in the air channels.

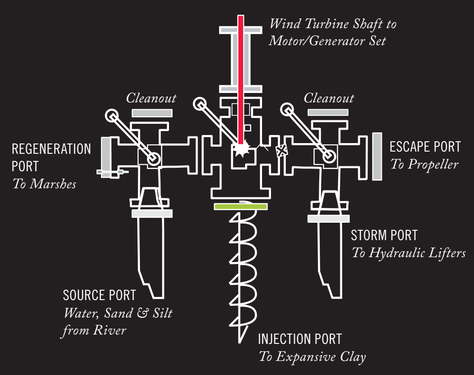
3. Moisture is absorbed from the supply air and con-denses into the tiny capillaries of the porous concrete wall.

4. Slightly low pressure is maintained in the building air return system. This low pressure attracts the mois-ture flow in the concrete. Moisture evaporates into the return airstream and cools it.

5. The return air becomes the exhaust airstream as it enters the energy recovery ventilator. After it cools the warm humid intake airstream, it is exhausted outside.

WHAT WOULD MOTHER NATURE DO?

USE THE RIVER TO REBUILD THE LAND AND SURROUNDING MARSHES.



Injection Valve – 50 gals/min.
The valve directs high-torque wind-turbine rotational energy toward raising the city and the coastal wetlands, feeding the marshes, lifting the building or providing propulsion by rotating the propeller.

REGENERATIVE GREEN DESIGN

KEEP THE ELEMENTS OUT? WHAT A WASTE! WE'RE USING THEM TO MAKE THREE TIMES THE ENERGY.

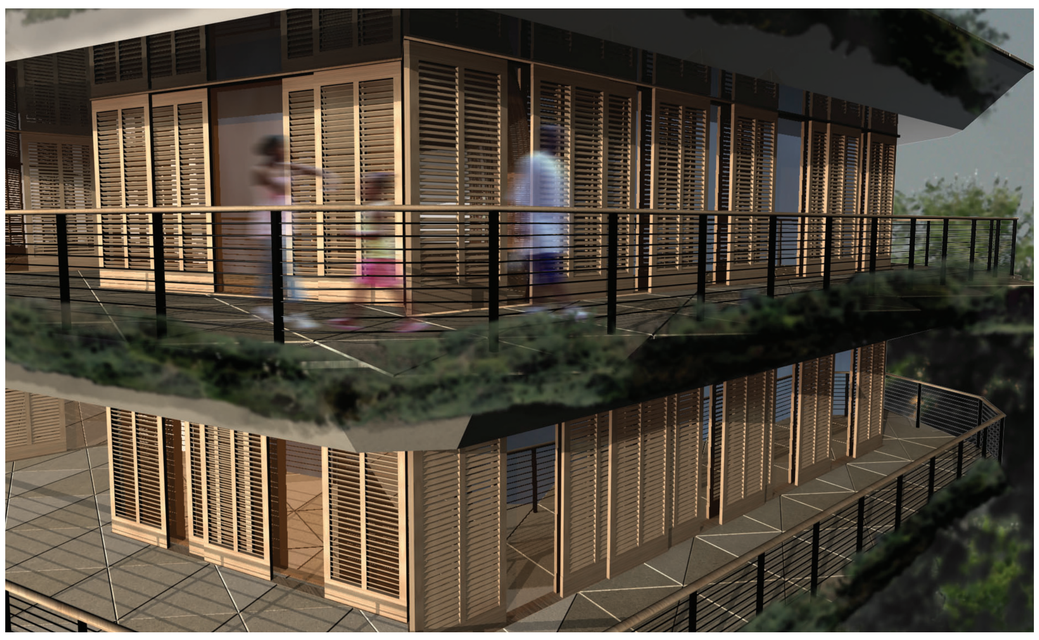
Our design emulates the interrelated and self-sufficient web of a natural ecosystem. The Holy Cross complex harvests sand, silt, wind, rain, solar, river and lake waters, tidal flows and even the occasional hurricane. By doing so, we rebuild our wetlands and marshes and generate three times the energy we consume, two and a half times the potable water and enough food to sustain ourselves and support a small farmers' market.

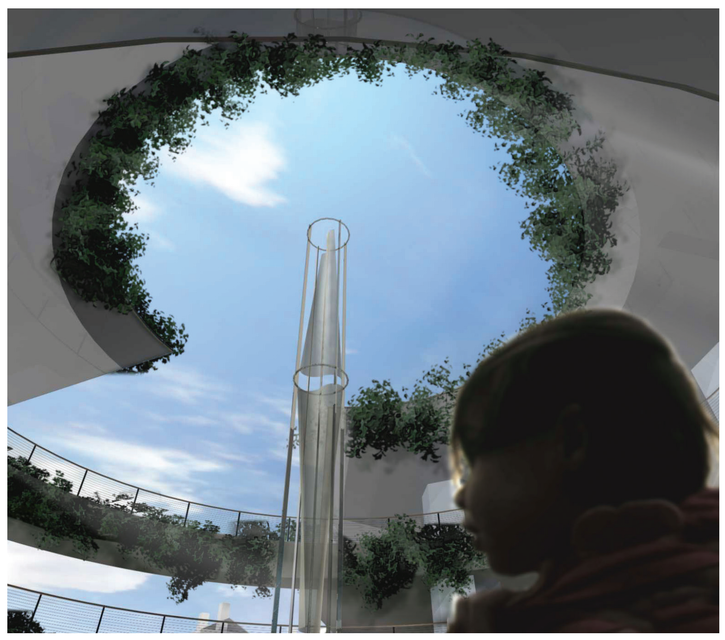
Our design responds uniquely to the demanding challenges of achieving a net-zero home in a hot-humid climate. It combines an isolated thermal reservoir system, a living roof, walls that "breathe" and an innovative passive dehumidification and ventilation system that conditions the interior living spaces, generates hot water and shelters occupants. With traditional energy loads eliminated by design (normally 75% of the average New Orleans' home energy use), we easily exceed the remaining energy and shelter requirements of the development.

Our design collects otherwise untapped energy. This regenerative capacity highlights the underutilized potential of the urban environment as a source of energy collection. By incorporating these renewable energy resources into our urban landscape, we eliminate the need for vast arrays of commercial power. The source of our power lies in our own backyards.

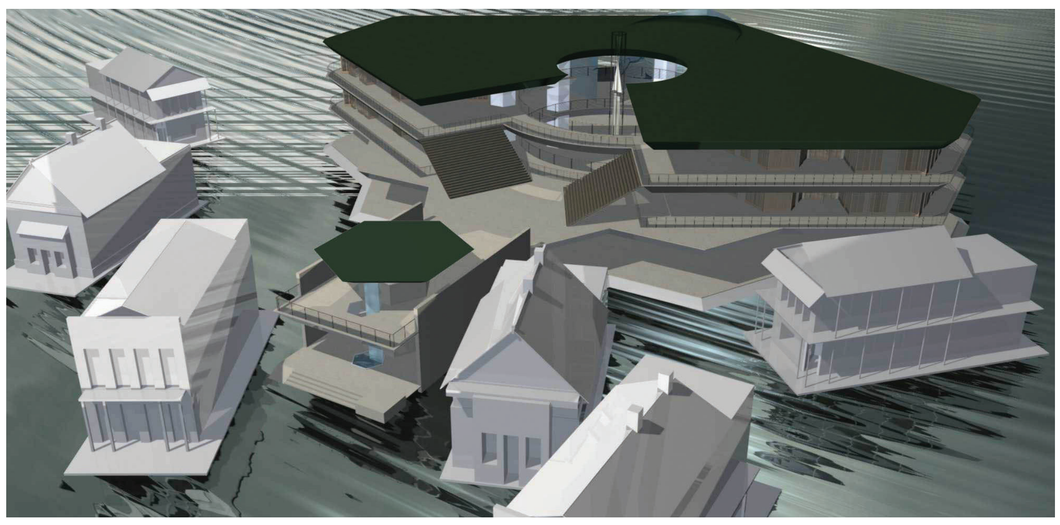
Our design empowers a sense of deep caring within the community and creates and maintains the lines of support to ensure it retains its vitality. While we believe that regenerative capacity is the key to empowering sustainable de-velopments, we remain cognizant of the fact that functionally achieving an affordable sustainable development is not an end unto itself.

Our design calls for the regenerative redevelopment of 6000 truly historic homes. This plan includes the deconstruction of storm damaged properties by a local labor force, the salvaging and reconditioning of the veneers and functional hardware, followed by the reapplication of these materials in a self-sustaining structural configuration, custom-made from the original floor-plan of the damaged property. Our design provides good-paying jobs, an intimate connection between the community and the people who rebuild it, but most importantly--our design helps us work with the environment to preserve our cultural heritage and historic homes. Our design reintegrates the Holy Cross community into the ancient and natural cycles that transcend time.





"I can envision a little village … fresh fruit market. I wouldn't want a daiquiri shop. I wouldn't want a nail shop." —Holy Cross Resident



AFFORDABILITY FINANCING THE HOLY CROSS CENTER

*Estimated total cost = 12 million dollars.**
Using a ten-year, 9% annual federal tax credit slot-ted for high-quality, low-income housing projects, we can sell the project's tax credits to an investor (who nets $800,000) for $10 M up front. This, plus a $2 M loan from the bank gives us the $12 million to build the project. At a 5% interest on our loan, this leaves us with just $100,000/yr. in interest-only pay-ments – which is roughly what the complex generates in an-nual income:

Surplus energy	*= $5,000*
Recycling, Food, Farmer's Market	*= $45,000*
Rent (average $500/month per apt)	*= $72,000*
Total	*$122,000*

** Note that this cost does not include the cost of the six single-family homes, each of which could be built with our sustainable technologies for $100/sq. ft. or $125/ sq. ft. to achieve net-zero performance (with no energy input from the complex).*

WHAT DOES IT COST TO SAVE SOUTHERN LOUISIANA?

Economies of scale allow us to purchase each wetlands pump for $0.6 M and residential pumping stations for $7 M.

1000 residential pumping stations	*= $7.0 billion*
3000 wetlands pumps	*= 1.8 billion*
Horizontal plumbing system	*= 5.0 billion*
100 million cypress trees planted	*= 0.5 billion*
Total	*$14.3 billion*

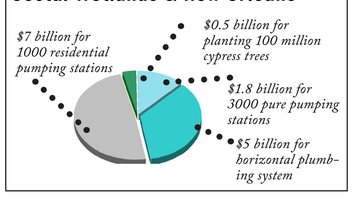
Using ten-year, 4% annual federal low-income housing-project tax credits, our investors will pay 35% up front to help finance each of the $7 M residential units; after using our annual $100,000 per residential pumping station we must still find another $128 M of annual cash flow to finance these 1000 stations. Carbon-trade credits pay $75 per ton of sequestered carbon. Thus, our 100 million cypress trees need sequester only 1.7 million tons of carbon a year to pay this amount — a reasonable expectation.
The remaining $7.3 billion price tag looks economically at-tractive for the city when compared with the projected cost of a category-five levee system at $20 billion or a practically certain, $100 bil-lion loss of real-estate by another Katrina-like storm in the next few decades.
Additional economic value derives from by-product eco-nomic activities of the project and the generation of related sustainable building industries and jobs. We believe this economic growth will be sufficient to pay back the invest-ment in five years.

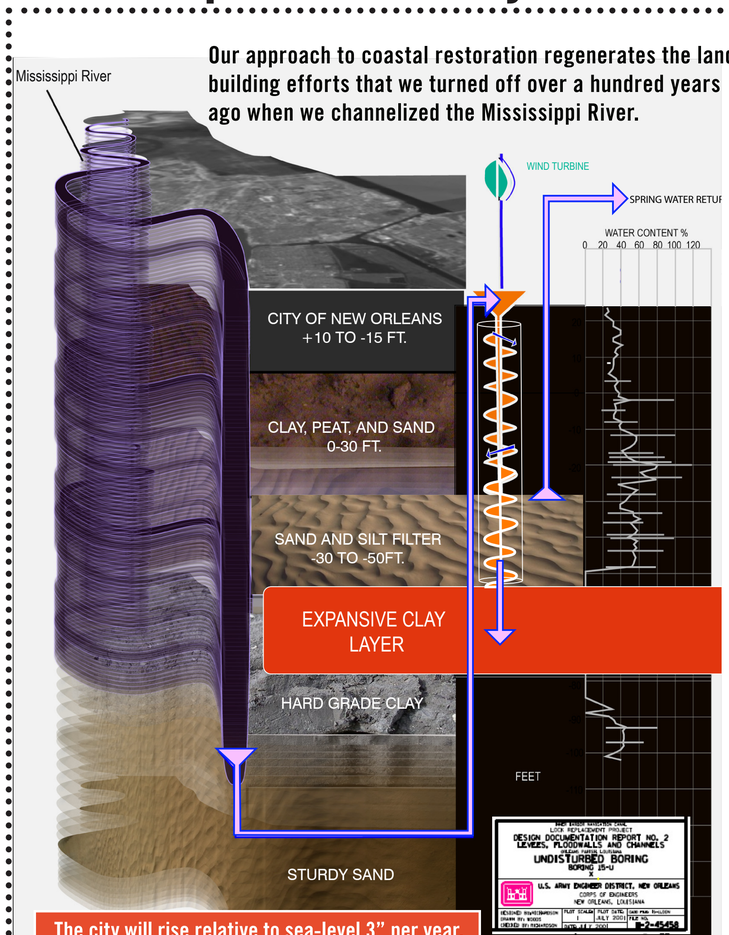
THE FINANCING: One among 1000 Residential Pumping Stations

35% paid by investors for 40% tax credit on low income housing

financed at 5%, $100,000 from income, $128,000 from carbon credits

THE PROTECTION PLAN: Costal Wetlands & New Orleans





The city will rise relative to sea-level 3" per year.
Powered by a wind turbine – water, sand, and silt are siphoned from the river and injected into a deep, clay layer. The silt lifts the clay layer, and the water expands it. Although subsidence and sea level rise add up to 1" per year, the city will rise roughly 2" a year from infill, and 2" from hydration.

RAISING THE CITY

OUR SOLUTION RAISES THE CITY WITH WATER AND SILT.

Conservative scientific projections of land subsidence and rising sea-level put our Holy Cross site at the mouth of the Mississippi River within 50 years (currently 125 miles away). A proven technology (implemented in Baton Rouge) com-patible with the soil substructure under New Orleans, can literally raise the land under the city. Moreover, this can be done fast enough to more than compensate for both subsidence and conservative estimates of sea-level rise.

The city will rise 3" per year relative to sea level.

Powered by a wind turbine — water, sand and silt are siphoned from the river and injected into a deep, clay layer. The silt infills the clay and the water expands it. To overcome subsidence and sea-level rise, which add up to 1" per year, the city will rise roughly 2" a year from infill and 2" from hydration. Byproducts of the injection process are filtered and cooled, spring wells that allow surrounding homes to use highly energy-efficient, ground-source heating & cooling. Thereafter, toilets and gardens can use the same water.

As a residential pumping station, our apartment complex is part of an array of 4000 pumps placed 1000 yards apart to cover the 2000 square miles of the map below.

There we will plant 100 million cypress trees —

sequestering millions of tons of CO_2 per year.

With these measures, we will protect a major part of the habitat of one-third of the migratory bird species that live part of their lives in North America,

protect the habitat of almost 1 million humans

and preserve the precious community of Holy Cross!