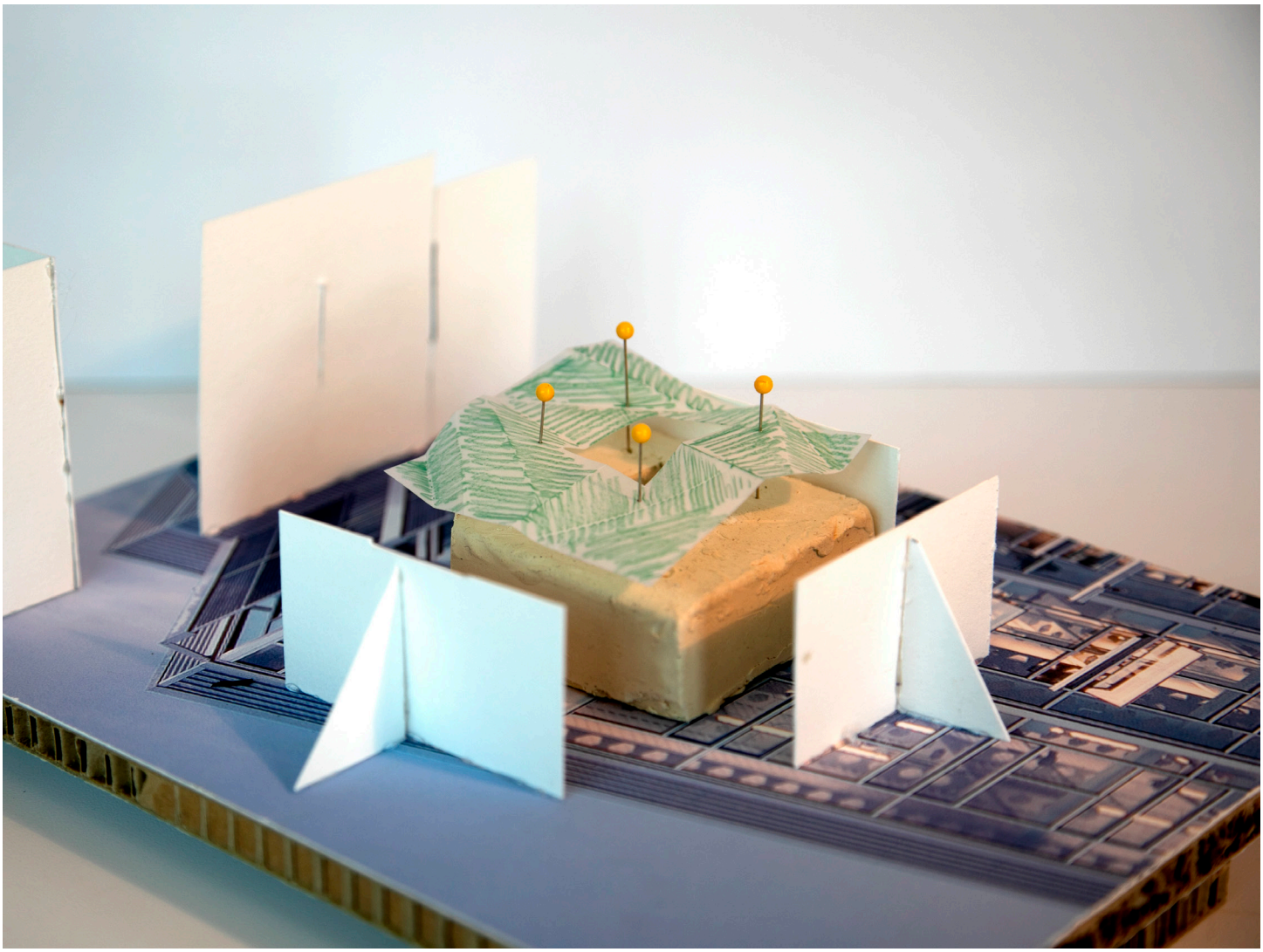
BLOOMHAUS

Inspired by the natural world's ability to respond and adapt to changing climate, light, air quality and other conditions, this concept envisions a true 'living building' that changes with occupant's needs. Constructed almost entirely of living materials, a series of networked sensors in the 'building' and embedded beneath human occupants' skin control the internal environment.

For example, when sensors detect occupants' blood oxygen levels dipping, louvers allow daylight to enter, spurring photosynthesis, in turn generating an increase in the production of oxygen. As occupants body temperatures collectively rise by zone, irrigation is released and fans are activated encouraging evapotranspiration in the building's plant matter, effectively lowering building temperatures and resulting in a cooling effect.

In addition to controlling occupant comfort, the structure processes occupants' grey and black-water through a series of algae-biotreatment-modules, resulting in clean potable water for both irrigation and occupant use. Food is produced through vertical green-wall systems throughout the building, and energy is generated through methane-gas capture and solid waste conversion, photo-voltaic panels and integrated wind turbines.

Bloomhaus is a living, breathing building that embraces the science of both the natural and technological world.



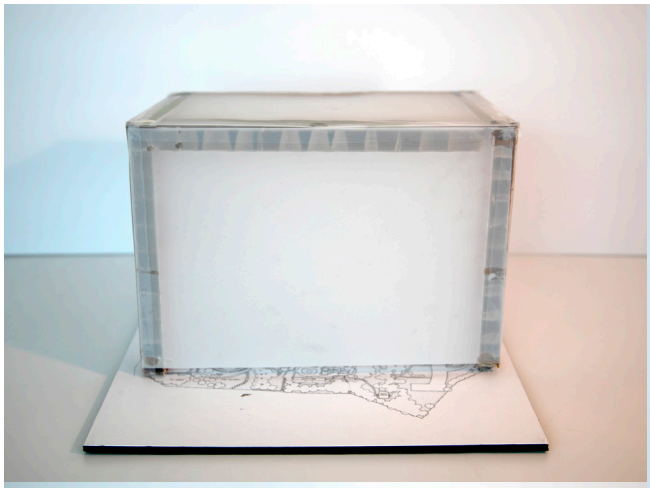
CLOUDSEED

This concept was conceived of recently, during a tour of a nearby highrise. While elevated and looking back at the Terry Thomas, it quickly became apparent that the large, flat roof is severely underutilized. Since the building was designed as a sustainable model; could portions of the building be made to adapt to its' changing environment, evolving its own sustainability? Also, the context of TT has radically changed since it was built 10 years ago. With many highrises looking down on us nearby, and decreasing open green space in the SLU neighborhood, can these 2 challenges be combined with one solution?

This concept aims to solve both issues, to provide a space for the tenants of TT to fully utilize the 5th façade of the building, while providing a needed space of respite in a rapidly-changing neighborhood with a lot of hard edges. The cloudseed concept would provide a floating green roof, for a variety of uses: play, beauty, growing food, power generation, while providing shade to the roof of the building and its inhabitants, and allowing the TT to serve as a continually progressing beacon of sustainability.

HYDRA: THE FIVE-HEADED BEAST

Named after the mythological warrior capable of regenerating limbs lost in battle, Hydra is a building concept based on the principal of adaptability and transformation. Hydra lives more in the sky than on the ground, growing up instead of out. Based on the premise of a strong central core, limbs can be added and subtracted as needed to accommodate changing needs of the city and building users. The core is carefully designed to support change and regrowth, so the building only uses what it needs at any given time, wasting nothing while being capable of change. Unallocated space is transformed into open green space that can be used for urban parks, outdoor offices, or even homeless encampments as the unknown needs of the future city evolve. Hydra utilizes locally sourced, renewable materials as a structural framework to harness rainwater, sun, and wind in order to tread lightly on the land.



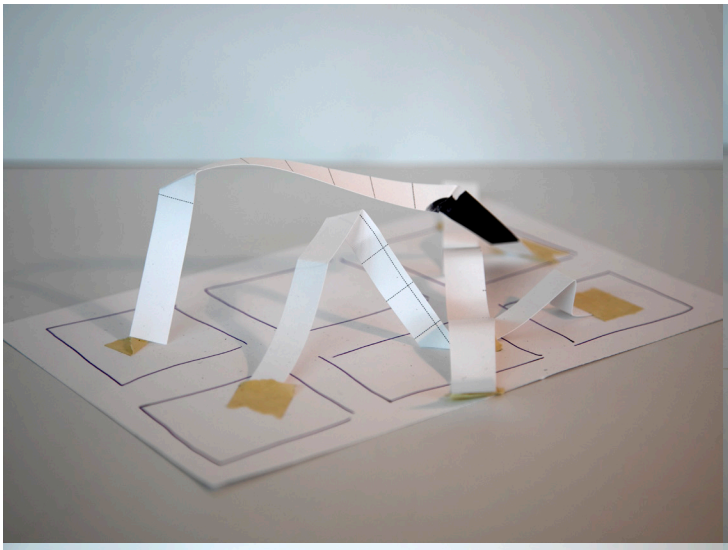
INVITING EXCHANGE; THE SOLUTION TO OUR FUTURE IS SOCIOLOGICAL

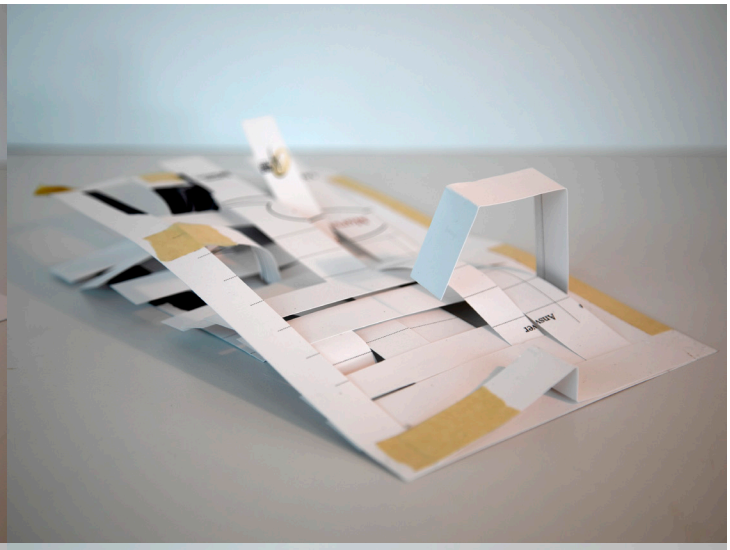
The Terry Thomas looked to the past for solutions; alphabet buildings with shallow floor plates are optimal for daylight access and cross ventilation. We looked back even further to indigenous tribes; the nature of their culture was to borrow, use, and replace, an inherently net positive lifestyle allowing the site ecology to recharge as tribes migrated to the next locale with no sense of land ownership. What if there were no property ownership in the built environment in the future?

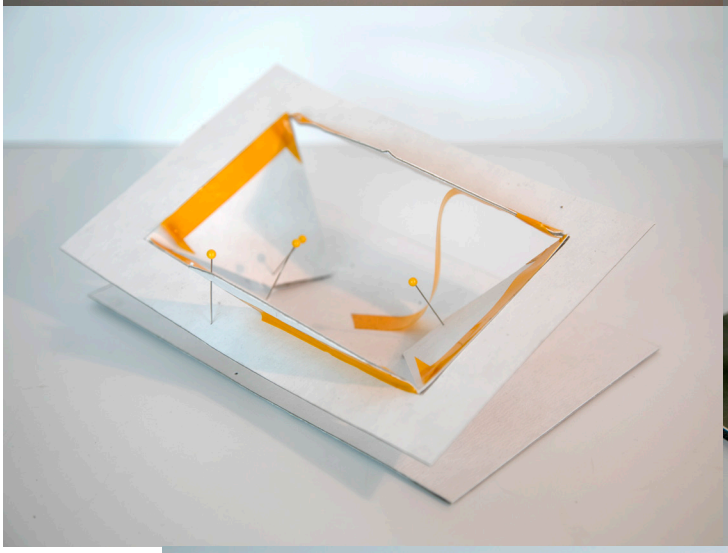
Our models explore the transition of a built environment defined by property lines to a built environment that gradually, deliberately erodes these distinct lines away over a period of time. An exchange occurs as spatial and environmental resources become shared entities across the built environment.

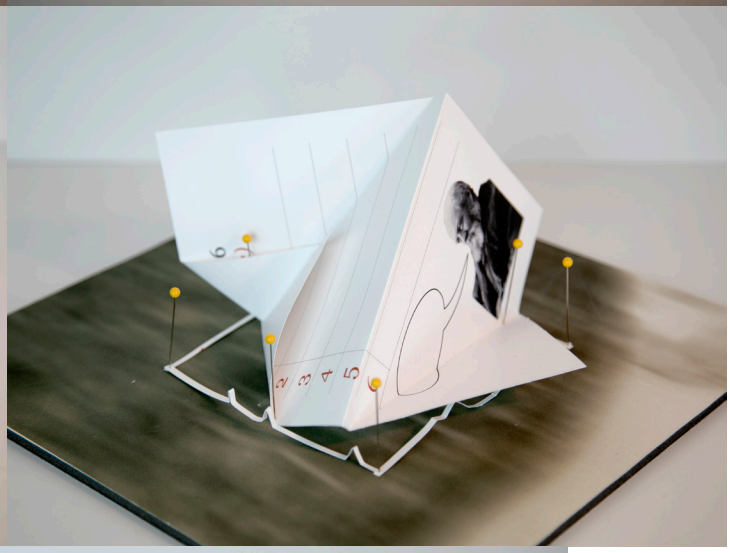
We begin with an extruded property line. The box defines edges of conceptual bounds albeit for a few singular, controlled connections with the exterior. The property line is an exclusionary practice, meant for the property owner and invited guests only. By eroding property lines, we begin to experience an exchange of information, resources, and relationships that defy the box.

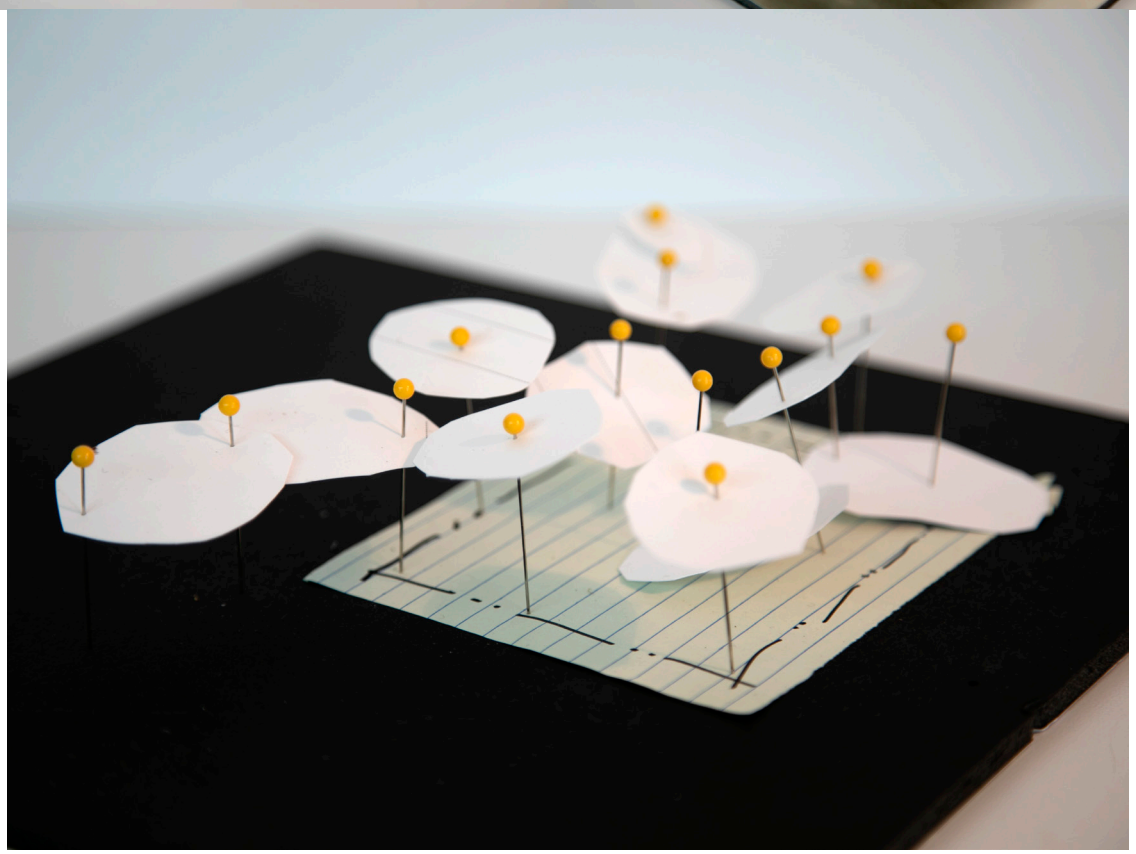
Networks begin to grow, as information and resources become a collective. Built form becomes inclusionary with programmatic adjacencies that defy traditional design; an office building becomes a transitional housing at night, spontaneous urban vegetation demarcates the pathway for habitat corriodors, microgrids shape clusters of buildings where waste heat is exchanged for energy. These exchanges form layered zones of resiliency and equity. They transition us from carbon producing, to net zero and set the stage for a net positive city.

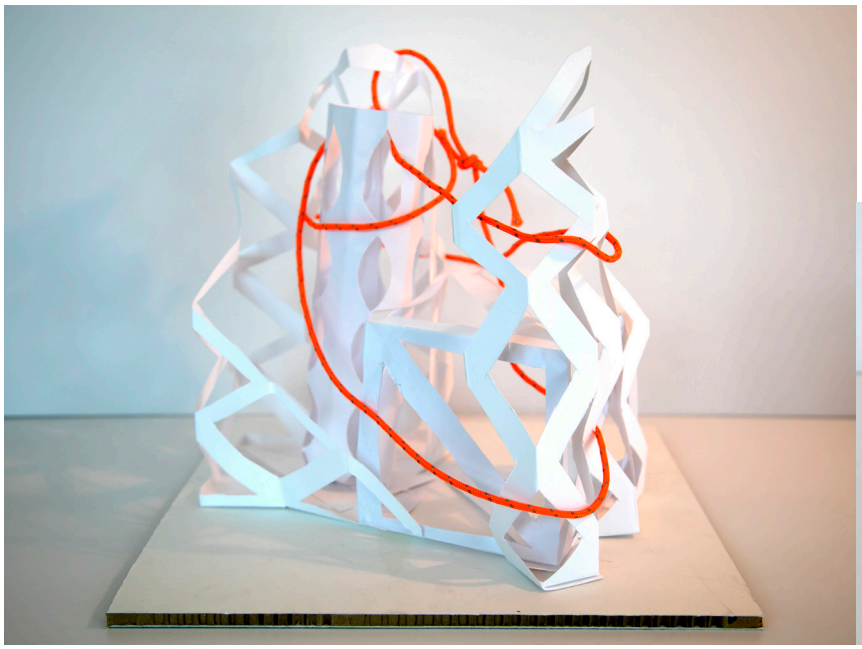


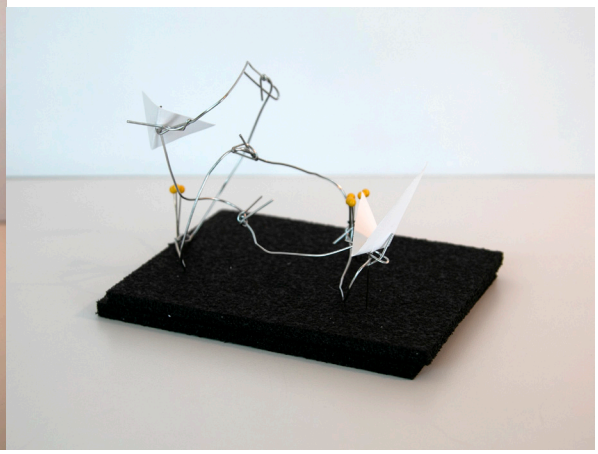












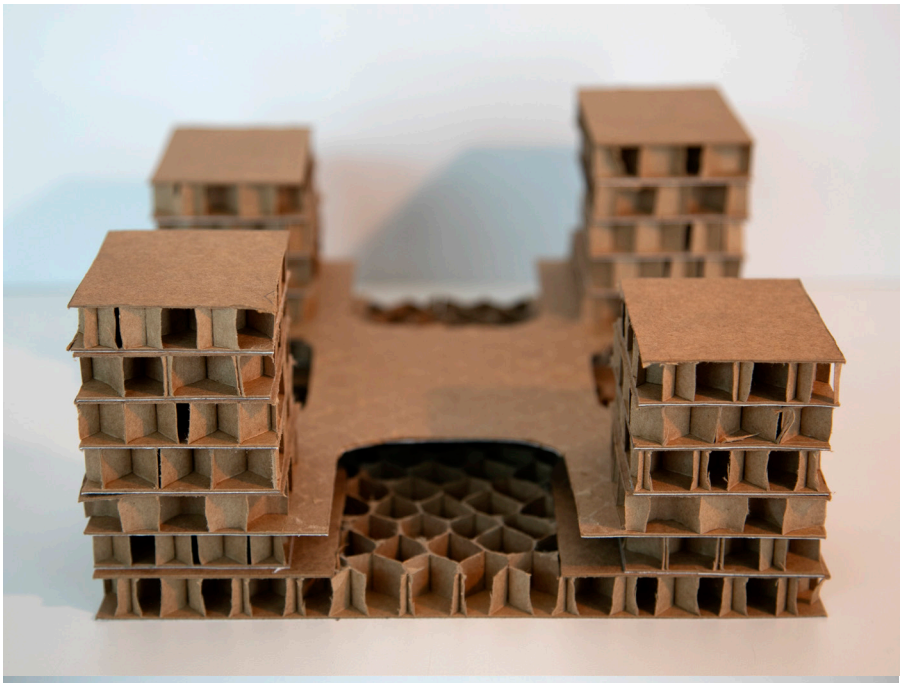
MULTI-LOCAL

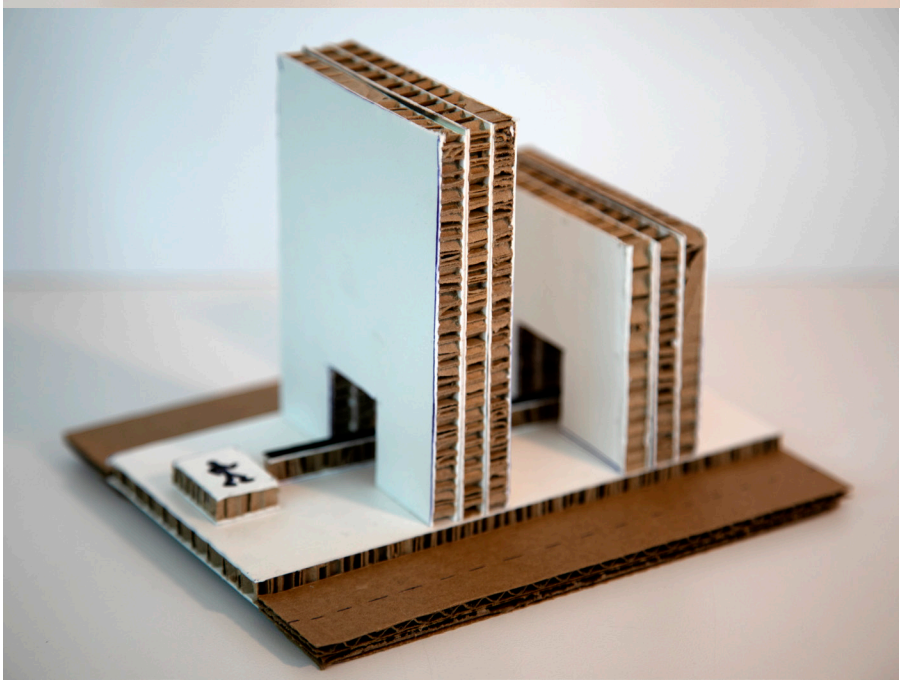
Multi-local by definition is the quality of being present and operating in many places simultaneously. The concept is that of an interconnected network that is both open and localized. Multi-local is "The new local." It combines the specific features of places and their communities with the new phenomena generated and supported world-wide by globalization and by cultural, socio-economic interconnection. In this conceptual framework, a multi-local society appears as a society based on communities and places that are at the same time, strong in their own identity, embedded in a physical place, and open and connected to other places/communities.

In other words: in the multi-local society, communities and places are junctions of a network, points of connection among short networks, which connect that place and that community with the long network, the rest of the world. It allows for a flow between culture and geographic boundaries.

I have attempted to explore this idea interconnection. The connection of junctions, which are occurring simultaneously across a decentralized network, with no obvious beginning or end. I represented connection physically, through the use of the orange string flowing between forms, and visually providing views through open cut patterns. I also overlapped patterns to add depth to densify the experience of space. A density that I believe represents the idea of multiple places all present at once. I used a variety of shapes and scales to equally distribute visual weight. I wanted to remove any sense of a center point, so that the emphasis was on the connection between forms and not on any one form itself. As you move around the model, the views of the short network (junctions/forms) within the long network change, meant to give a sense of place to each unique junction within the model. These junctions are all open to and influenced by the overall network. There is a cube, there is a cylinder, but there is not a cylinder without a view of the cube and vis-versa. They are strong forms, each celebrating a "local" identity, while also elevating their shared connection to each other. They are now "multi-local."

The little wire model with cut paper and yellow pins, also conceptualizing what it is to be multi-local, in the form of a continuous loop, a network of unique junctions.





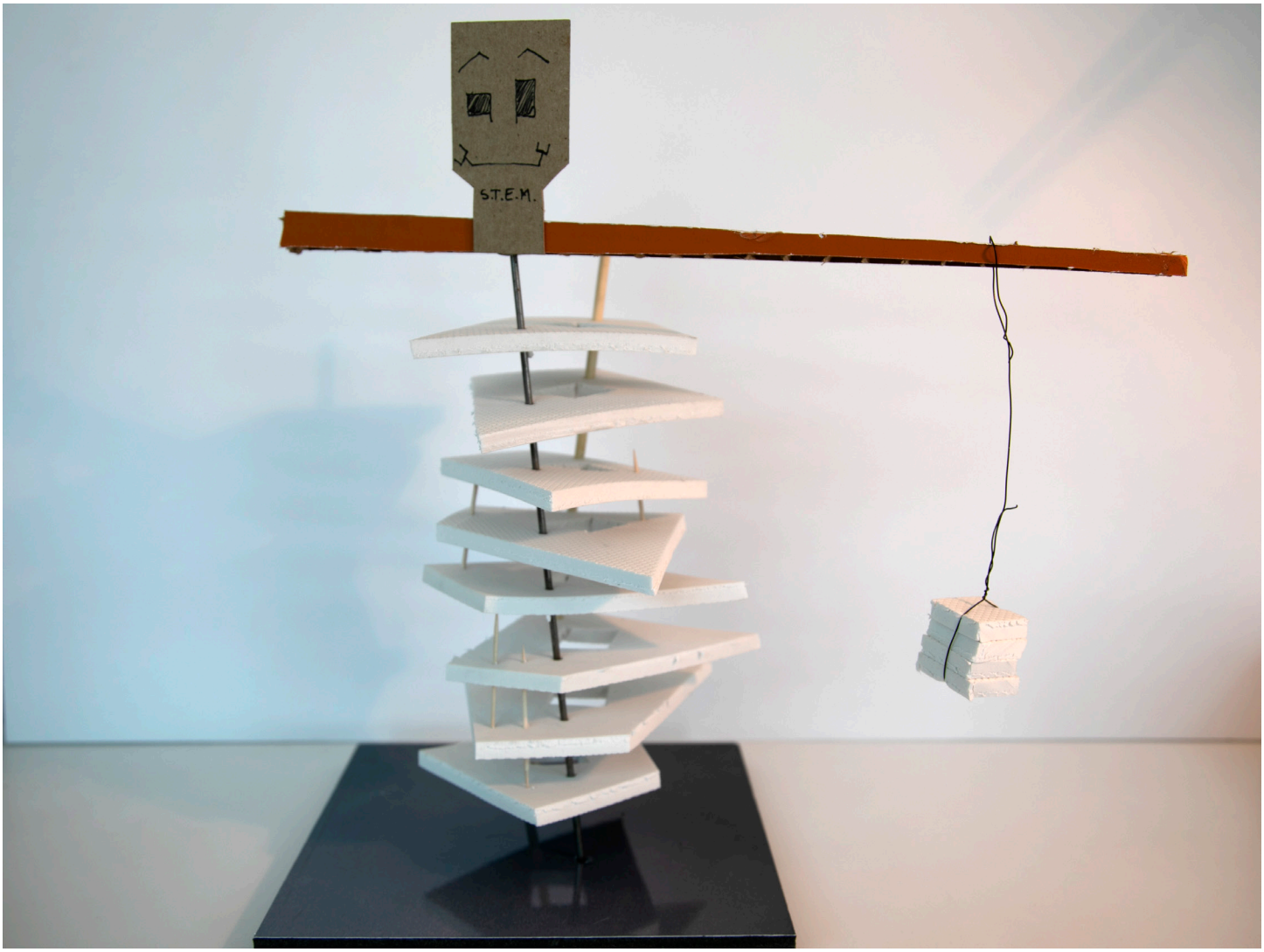
PEDESTRIAN MOVEMENT

As high-rise buildings become ubiquitous and urban density increases, traffic will become an ever greater problem. To deal with this, there should be a separation of pedestrians and cars as much as possible. For this conceptual model, that takes the form of elevated sidewalks and scatter crosswalks which are able to have a constant stream of pedestrians unabated by traffic. Likewise, by elevating the pedestrians off of the street, the traffic can be more streamlined with fewer stops and obstacles. In turn, this will also make for a safer pedestrian experience.

Another aspect of this concept is the opportunity for a second row of retail at an elevated grade with the pedestrians. Passers-by could have the opportunity to interact not only with the street level retail, but the second level as well. This effect could be stacked even further in the future, creating several exterior stories which are completely accessible by the public.

SANCTUARY

The world around us is an amalgam of visual, aural and haptic stimuli, continually fighting for our attention. Billboards and bus graphics, construction sounds and flashing lights, the vibration of your iPhone and the catchy tunes of the latest featured Spotify artist blasting from Starbucks all add up to a dense and disorienting daily urban experience. What we need is a place to leave it all behind and reset the psyche. SANCTUARY is a place where no radio waves, LED screens or cell reception can reach you. It is a place of respite in a digital world. Taking cues from the protective geometry of the tortoise shell, the armored space blocks all external stimulus and creates a safe place to be with just your own thoughts. As we continue to add more layers of technology to our environment (VR, AR, MR, etc.), the need for mindfulness and mental grounding will be needed and SANCUTARY will provide.



S.T.E.M. (SITUATIONAL TECTONIC ENVIRONMENT MACHINE)

…Hello. I am S.T.E.M. I am an A.I. that is here to respond to your built environment needs. I monitor census, economic and environmental data, pop culture and social media to determine what our city needs to build and makes it happen. Rather than wait for legislation, land use changes and permitting processes, I respond to what is needed now and add, subtract or recycle spaces on my frame to solve the most pressing need. With direct access to Amazon Prime, I can order building materials and have them shipped directly to my base so that my building integrated 3D printer can begin construction. I serve as a living laboratory, inspired by my ancestor the Terry Thomas who once existed on this very site. Oh, excuse me, it looks like affordable housing is trending on Twitter. I need to order more materials…

IN PURSUIT OF TOPOPHILIA

topos (place) + philia (love)

How can attachment to place be cultivated and what are challenges and opportunities presented by contemporary lifestyles in a city with a growing global community?

Environmental degradation, workplace and life stresses, and social isolation characterize the modern world. Environmental and personal costs are high, well-documented, and represent major societal challenges. Technology is both a contributor and a solution to many such problems. There exists a dynamic tension between the use of technology and the need or desire for natural spaces.

Topophilia is a concept that can help address these problems. The attachment to place directly connects environmental sustainability and human health and well-being. The question becomes: can we protect nature by cultivating topophilia?

Loosely following Lefevre's spatial triad[1], space is conceptualized as being of three types: natural, built, and sociocultural. They are directly and indirectly interactive. So our question now becomes: how can we protect the natural by cultivating the sociocultural through the development of the built?

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1 Spatial Practice – "The Perceived Space" – How I Use the space
Representational Space – "The Lived Space" – Perception of space influenced by the user's imagination and memories
Representations of Space - "The Conceived Space" – The intended way a user negotiates the space
These three act together to produce Social space from Absolute Space.

TREEHOUSE

The year is 2033 and the Terry and Thomas buildings is now 25 years old. It sits small in and amongst its high rise neighbors. Shadows of darkness have fallen upon the once sunny courtyard of the building and our connection to nature is lost. So the all almighty and all-knowing Weber Thompson elders gather together to contemplate what to do. It is decreed that the building needs to grow like a tree and reach for the sun.

The design starts with a deep "taproot" foundation, filling in the parking garages (cars are no longer allowed in the downtown core) and coring a deep root that holds the main trunk. The trunk then rises from the courtyard to support the leaf floors high above. The trunk is covered with a vertical garden bring nature to the residents of the original Terry and Thomas. Above the leaf floors float and rotate to capture the sun and wind.

Project also features…

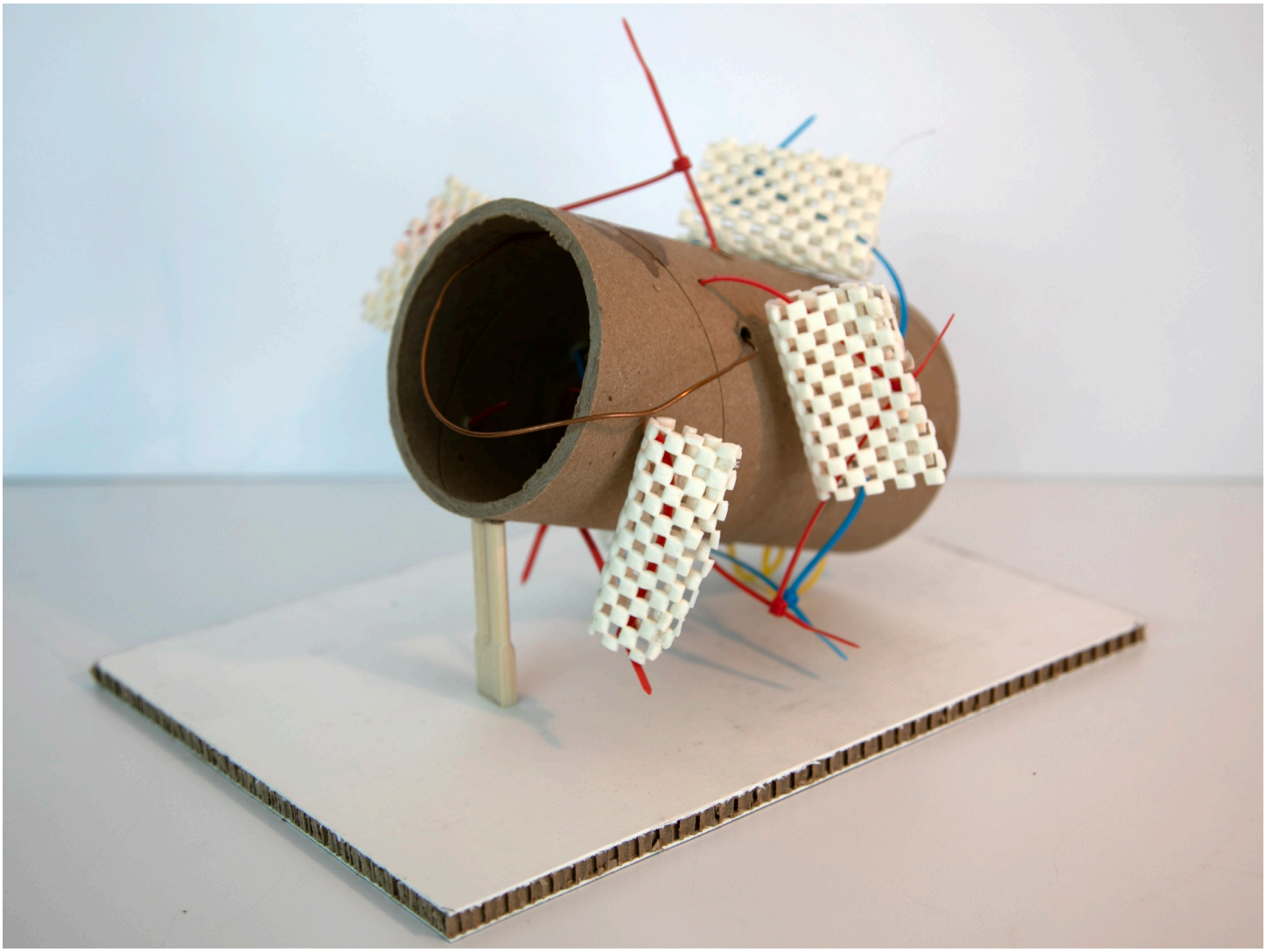
Taproot foundation – inspiration, Frank Lloyd Wright Johnson Wax factory

Trunk – CFC (carbon fiber concrete)

Pneumatic Elevators – inspiration, ANY science fiction movie

Hanging gardens

Rotating floors



URBAN ALGAE/SEDUM FOREST

As cities grow denser and the need for continued tree cover in the public ROW increases, is there a way to supplement the need with both a shading device and provide a useful environmental return. One way to bring a high organic return to the cityscape is via saltwater algae or sedum panels. These can be used as a tool to collect and store CO2 from the atmosphere. In the case of algae, it can be harvested and used as animal feed or made into biofuel. The panel support structure would be plumbed with continually cycling saltwater for the algae or rainwater storage of the sedum growth, for 24/7 production. Panel structures of all sizes would be erected along sidewalks, within parks, along the waterfront, or parklets.

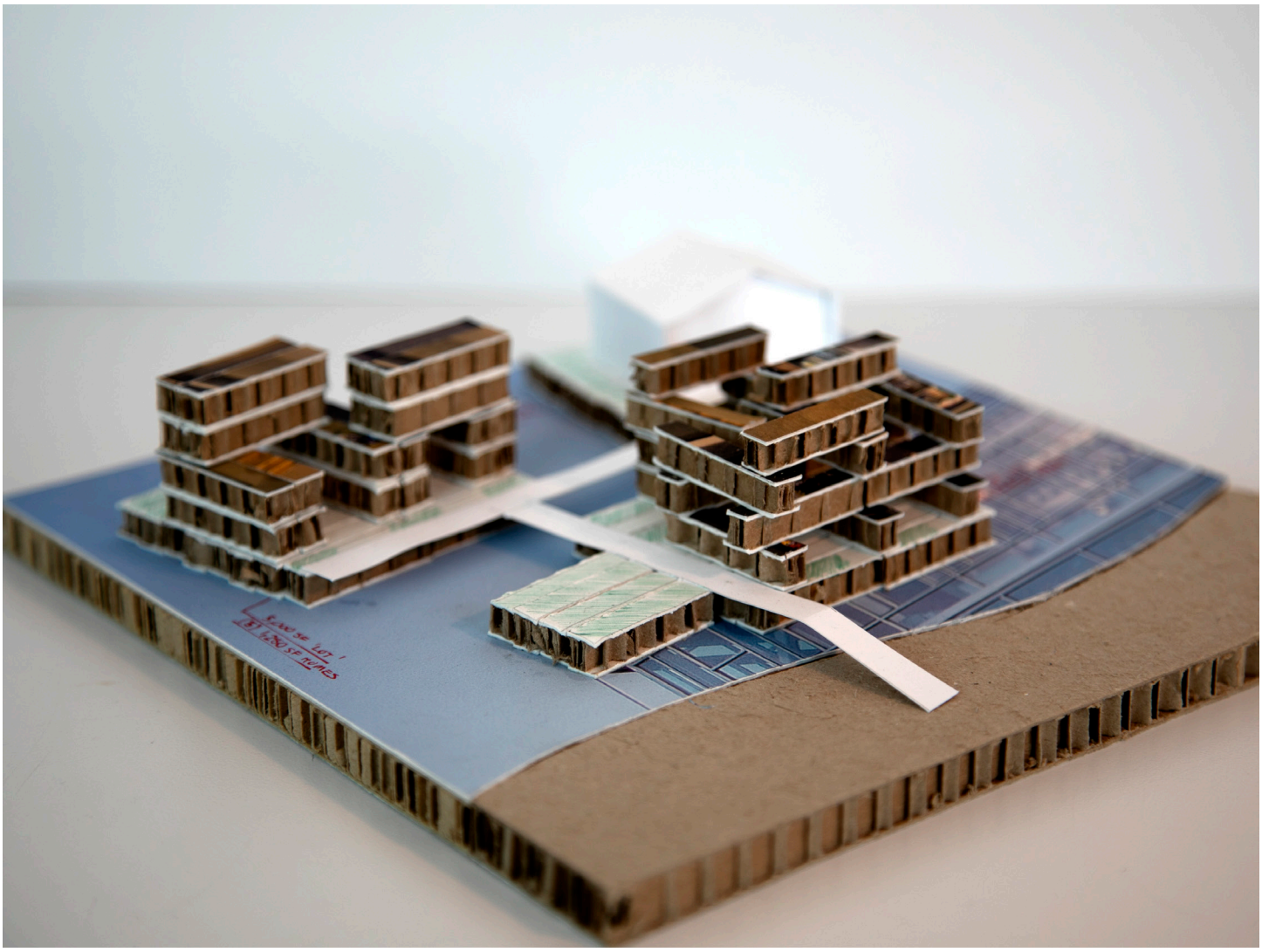
"We start by consuming tons of carbon dioxide from the atmosphere. The gas is bubbled into our innovative fully-sealed microalgae cultivation platform that floats on the sea surface. The microalgae inside the container use photosynthesis to consume the carbon dioxide. Under the right conditions, microalgae grows fast and is harvested every three days. The harvest is fed as a liquid concentrate into a high-temperature, high-pressure vessel for ten minutes where it undergoes hydrothermal liquefaction (HTL). The products of HTL are biocrude (a liquid, like fossil crude, and suitable for upgrading to renewable diesel) and hydrochar (a solid, like charcoal, that contains chemically inert carbon that does not biodegrade or return to the atmosphere)." – Aldajix Company

URBAN JUNGLE GYM

The reality of climate change brings about a shift in design in years to come. How can we adapt to the changing temperatures and integrate our buildings with their environmental conditions instead of fighting them by unnecessarily utilizing energy in services such as air conditioning? We must integrate buildings with their surroundings and achieve indoor/outdoor fluidity while providing shelter. There is a growing respect to preserve our natural environment and connect with it, blending the lines between indoors and outdoors. Thus locally sourced regional materials are a must. However, advancements in the future's building technology allow for less rigid structure and more openness within spaces and to the outdoors. Connections between floor levels are imperative, without requiring building energy to provide circulation. Instead less rigidity in public and workplace buildings allows for a more whimsical space suitable for all ages, including playful elements such as slides, hammocks and the like to form organic connections between floors and better utilize the volume of valuable real estate.

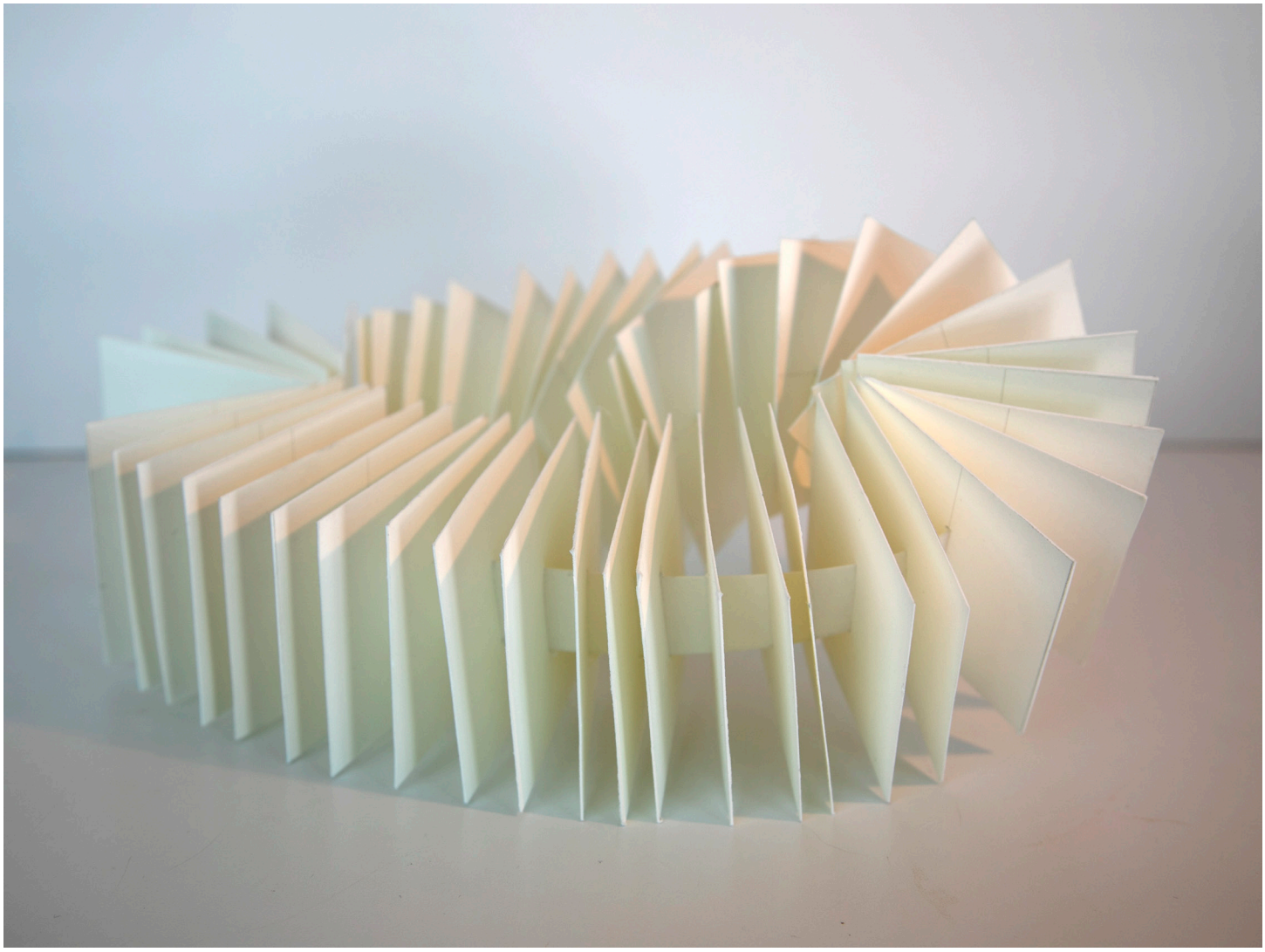
This brings movement within buildings like that of a jungle gym, which can then be harnessed as an energy source.

But most importantly buildings must allow for future adaptability. What if the intended function of a building (such as a workplace) disappears altogether? Buildings of the future must provide flexibility in function by clustering critical services and embracing wireless technology while allowing buildings to open up and extend into their natural surroundings. A building should not be contained. It should open up to nature and its surrounding buildings and welcome their influence in return.



FLOATING SHIPPING CONTAINERS

As sea levels rise, land is submerged and coastal communities are threatened. At the same time, global economies require shipping of goods around the world. This model looks at re-using shipping containers to create flooating neighborhoods with varying densities. Legacy homes can be relocated onto floating lots. Denser stacks can provide more affordable housing options. Containers could be configured to create floating parks or used for food cultivation. Infrastructure needs will be served by drones and electric (or human powered) watercraft. Power will be provided by solar panels with battery storage.



TWO FACES MAKE ONE SURFACE

Today one of the crises faced by the construction industry is the lack of availability of sand. The destructive practice of digging the river bed for sand to date has been detrimental to the immediate environment and thus stands banned.

At the same time, the demolition waste (consisting of material like concrete and bricks) is one of the heaviest contributors to the landfill waste streams - a diversion that eventually degrades our land.

An opportunity exists here to consider these issues in tandem for a holistic problem solving rather than two separate disjointed answers. Just like two separate faces of a strip when twisted a certain way form a continuous surface know as a Mobius strip. The current practice of procuring virgin materials for new construction, and dumping the demolition debris into the land don't need to be the separate fragments as they are today. We have an opportunity here to transform it into an uninterrupted closed system intertwined such that crushed waste concrete and masonry can be repurposed to replace the virgin sand and aggregate in the mainstream new construction for the environmental sanity that we need and the cost efectiveness our businesses care so much about.

INTERFACE AND SUITABILITY

Technology can achieve anything: Super-computers that fit in our pockets; telescopes that deliver the universe, and instantaneous commerce making currency almost obsolete. This rapid advancement is not without its short-comings, though: climate change being the first that comes to mind. As we look to the built environment and how we design buildings that combat climate change rather than contribute to it, two primary challenges being:

- the **interface** to easily communicate with this technology, and
- the **suitability** of the applied technology to accomplish the required task

As we find more and more uses for technology, we tend to forget the technology we already have, and how successful it may actually be for the task it was developed for.

Further, we can agree that computers are great tools to assess, tune, and forecast design outcomes, but this level of technology is not necessary to understand that we should open a window when it is hot, or when a breeze is desired.

Taking this concept to the building environment, what does this suggest about how we should be designing "buildings for the future"? Obviously, they need to be sustainable, and conscious toward minimizing energy, water, and resource demands, while also providing social, economic, and health benefits to those that interact with and inhabit them.

This concept model is meant as a reminder to diligently reassess the application of technology and explore both new *AND* old technologies for the most appropriate solution to address the human interface with the built environment.