



SMILE!
CHEESE!
茄子!

SELECTED WORKS
ARCHITECTURE

JIA ZHANG

Education

University of Waterloo, School of Architecture
 Bachelor of Architectural Studies, Honors
 Cambridge, Canada
 2015 - 2020

TU Delft
 Erasmus Exchange, Faculty of Architecture
 Delft, The Netherlands
 2018 - 2019

Hello, I am Jia, a recent architecture graduate based in Den Haag. With over two years of professional experience, I am confident I will be a great asset to your practice. My interest in design lies in its ability to shape the human experience in a world where increasingly interconnected forces are further unifying ourselves, our knowledge, our possessions, and our built environment.

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Phone +31 6 15429441

Email jszhang0510@gmail.com

Website <https://jiajasminezhang.com/>

Experience

Energy Analyst Intern
 Footprint - Smith + Andersen Group
 Toronto, Canada
 01. 2020 - 04. 2020

VCS/VR/AR Intern
 Ledcor Group
 Vancouver, Canada
 02. 2019 - 08. 2019

Product Analyst
 Forze Hydrogen Electric Racing
 Delft, The Netherlands
 09. 2018 - 08. 2019

Intern Architect
 Solomon Cordwell Buenz
 San Francisco, United States
 04. 2018 - 08. 2018

UX Design Intern
 TD Innovation Lab
 Toronto, Canada
 09. 2017 - 12. 2017

Architectural Preservation Intern
 Scott Henson Architects
 New York City, United States
 01. 2017 - 04. 2017

Distinctions

Eric Haldenby Rome Award
 University of Waterloo
 2019

President's International Experience Award
 University of Waterloo
 2017, 2018, 2019

Competition II at SpaceX Hyperloop
 Los Angeles, United States
 2018

Code/Design to Win Hackathon
 Communitech
 2018

Palladio Award - Adaptive Reuse
 Traditional Building Conference
 2017

Strengths

Rhinoceros 3D	Illustrator
Grasshopper	Photoshop
Revit	InDesign
AutoCAD	AfterEffects
3DS Max	IES (VE) (ICL)
3D Printing	Mould Making

Given the level of attention to sustainable practices and development today, this project attempts to understand what it means to design in a sustainable way. What are the considerations of the built environment to its environmental conditions? What varies from project to project, and to what degree is this architectural language maintained?

While working in the realm of sustainability, I believe it is important to address the com-modification of everything green to be sustainable- the implementation of evaluation standards such as LEED and C2C certifications to name a few, feed into the prevailing market economy and view systemic environmental problems through the narrow lens of a simple checklist. This ultimately moves the AEC industry further from a sustainable place in nature (Lee 2011) and does not consider sustainability to be a cornerstone to architecture as a praxis, but rather acts simply as an addendum.

To this end, it is important to recognize the reshaping of urban landscapes to be a mix of political, economic, and social processes. (Swyngedouw 2004) I would like to explicitly recognize the conditions that comprise urban environments today, have historically been controlled and manipulated to serve the interests of the elite at the expense of marginalized populations. But hey, there is nothing unnatural about New York City (Harvey 1993). The ground floor of this proposal will remain public and the cafe program is integrated with the artists kitchen and living space.

Summer 2020 Comprehensive Design Studio
Supervisor - Andrew Levitt

The Earth is as much calibrated for human beings as it was for the dinosaurs.

This project looks at land reclamation for evaluating and developing adaptive forms of capturing sediment. Sand is engineered into the most fundamental of all infrastructures, and a precursor to any development – land itself. Seemingly infinite, sand is the second most consumed natural resource on the planet, like the presence of water, only a marginal percentage of sand grain, water-withered flat sand grains is considered suitable for construction. The Toronto Islands are the result of such naturally occurring terraforming from the littoral flow from the Scarborough Bluffs.

However, most terraforming projects occurring at the mouth of the Don require human intervention. The total soil excavated for Line 1 and the Crosstown LRT adds up to over 2.5 million cubic meters, as Ontario's cities continue to grow in population and density, the addition of green, protected land is as relevant as ever. The delicate marriage of littoral flows and human landfilling finds a home for excess soils at the Leslie Street Spit.

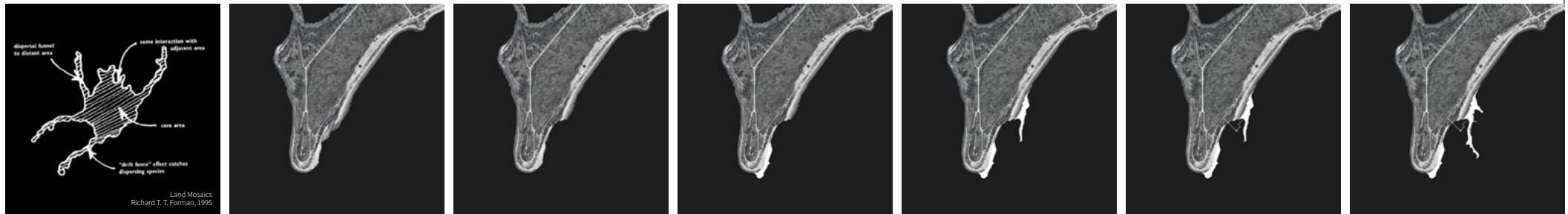
Upcycle

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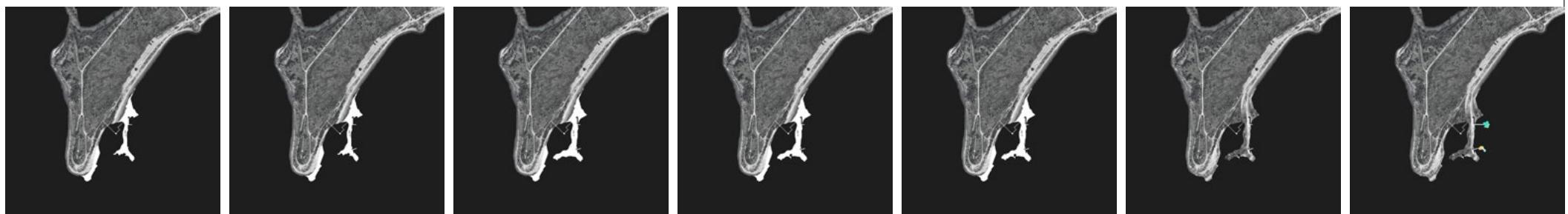


Site Axonometric

15 Years



30 Years





1. EXISTING LIGHTHOUSE WITH 2 ADDITIONAL WC AND COVERED BIKE STORAGE FOR 30 BIKES
2. COVERED BIKE STORAGE FOR 30 BIKES WITH 8 KW PV PANELS AT 20° TILT
3. CONSTRUCTED WETLANDS
4. WILDLIFE HIDE
5. PUBLIC ARTIST STUDIO
6. CAFE AND ARTIST RESIDENCE
7. UNINSULATED CHANGING ROOMS WITH OUTDOOR SHOWERS AND OVERHANG
8. BEACH
9. BIRD HIDE
10. SWIM DOCKS
11. AQUATIC CENTER
12. TOWER- SAUNA (+2) DIVING DOCK (+2) LOOKOUT (+3)
13. SAUNA
14. FIRE PIT
15. SWIM DOCK/ HYDROGEN BOAT DOCK



EXISTING TREES



NEWLY PLANTED TREES

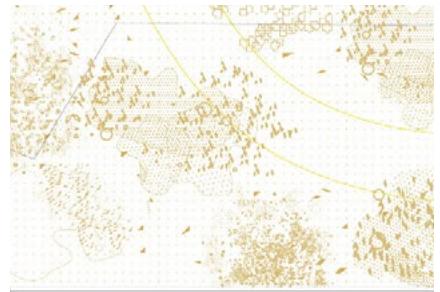
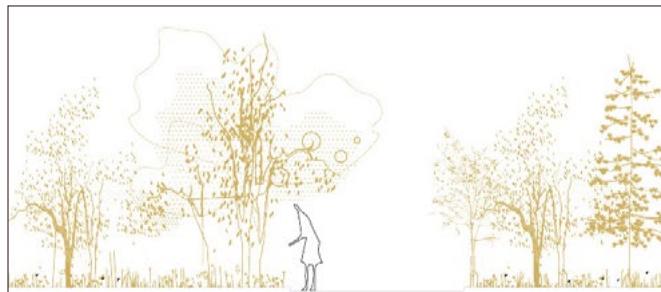
Proposed Site Plan

Trees

	Moisture	Soil	Wildlife
Pine, Eastern White (<i>Pinus strobus</i>)	A	CS	S
Spruce, White (<i>Picea glauca</i>)	MD	CLS	S
Cherry, Pin (<i>Prunus pensylvanica</i>)	MD	B	B
Ash, Black (<i>Fraxinus nigra</i>)	A	B	B

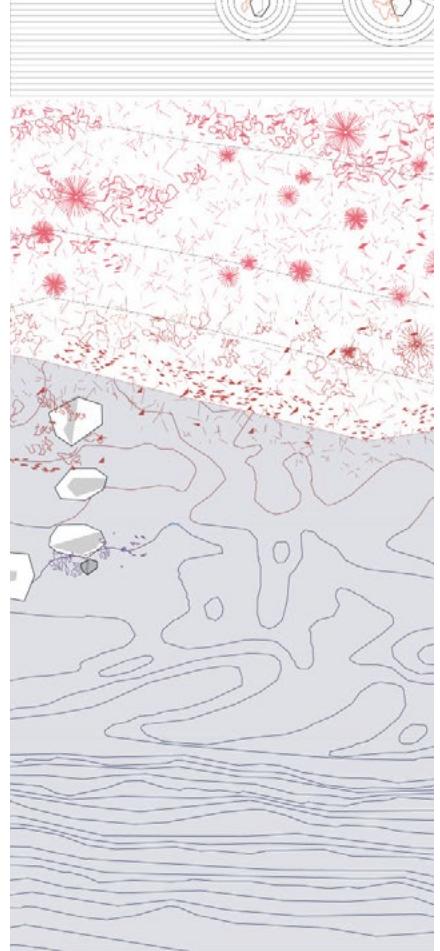
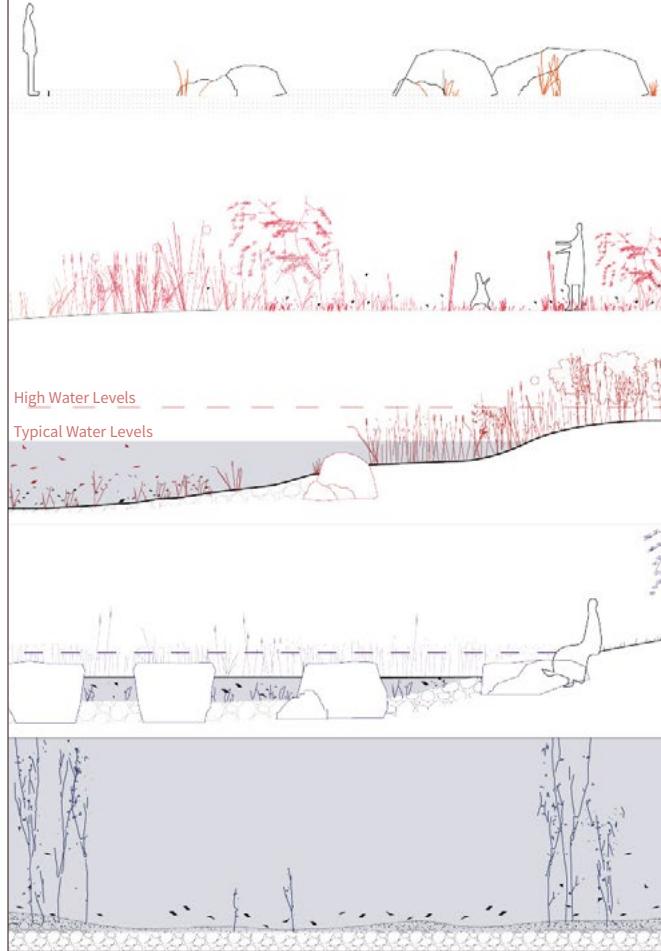
Aggregate Garden

Pine, Eastern White (*Pinus strobus*)



Wet Soil

Black Raspberry (<i>Rubus occidentalis</i>)	MD	-	S
Phlox (<i>Phlox spp.</i>)	M	L	B
Bunchberry (<i>Cornus canadensis</i>)	M	-	B
Columbine (<i>Aquilegia canadensis</i>)	M	B	H
Spotted jewelweed (<i>Impatiens biflora</i>)	WM	-	H
Trumpet creeper (<i>Campsis radicans</i>)	WM	CL	H
Button Bush (<i>Cephaelanthus occidentalis</i>)	WM	B	B
Winterberry holly (<i>Ilex verticillata</i>)	WM	-	S

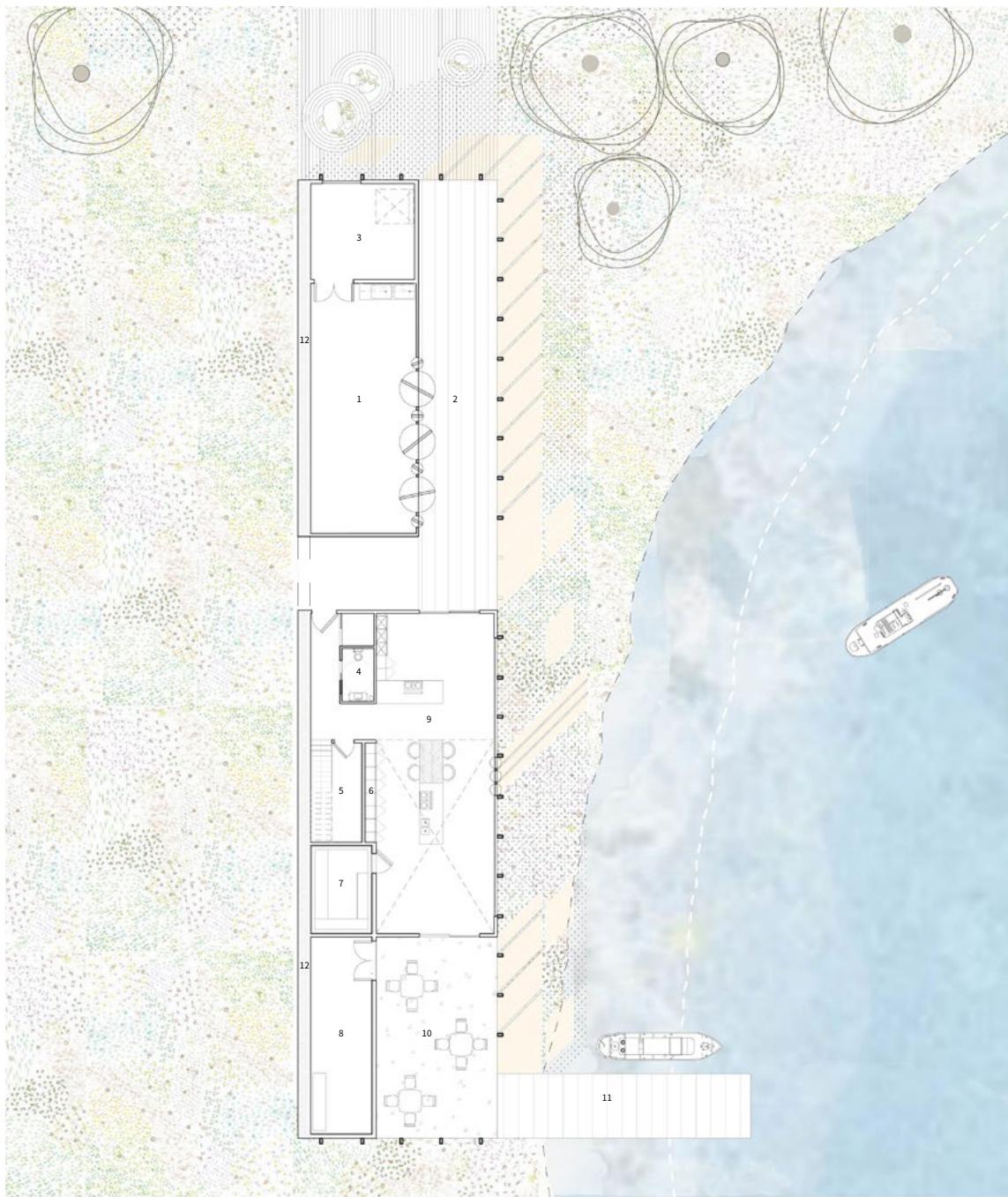


Shallow Water Species 10-15 cm

Arrowheads (<i>Sagittaria latifolia</i>)	W	Cite: Urban Blackout Group
Water plantain (<i>Alisma triviale</i>)	W	Moisture
Marsh Cinquefoil (<i>Potentilla palustris</i>)	W	A - All (wet, moist, dry) M - Moist D - Dry W - Wet
Rose, Swamp	W	Soil types

Deep Water Species 50- 100cm

Yellow Spatterdock (<i>Nuphar spp.</i>)	W	B - Broad range of Tolerance P - Peat C - Clay S - Sand L - Loam
White water lily (<i>Nymphaea odorata</i>)	W	Wildlife
Coontail (<i>Ceratophyllum demersum</i>)	W	B - Attracts butterflies S - Attracts seed eating birds H - Attracts hummingbirds
Canada Waterweed (<i>Anacharis canadensis</i>)	W	



Ground Level



First Level



Communal Cafe and Living

1. PUBLIC INTERIOR STUDIO
2. PUBLIC EXTERIOR COVERED STUDIO
3. UTILITY ROOM
4. PUBLIC WC
5. STORAGE ROOM
6. PANTRY
7. WALK-IN REFRIGERATOR
8. MECHANICAL ROOM, COMPOSTING, RECYCLING ROOM
9. SHARED KITCHENS, INTERIOR CAFE, LAUNDRY, COMMUNAL LIVING/ DINING
10. EXTERIOR COVERED CAFE
11. SWIM DOCK/ HYDROGEN BOAT DOCK
12. CONTINUOUS CAVITY WALL
13. ARCHIVE
14. ARTIST RESIDENCE
15. ARTIST WHEELCHAIR LIFT STAIRWAY



Private/ Public Section AA



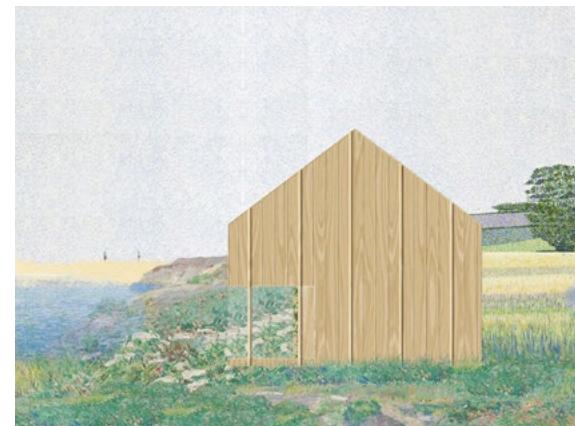
Private/ Public Section BB



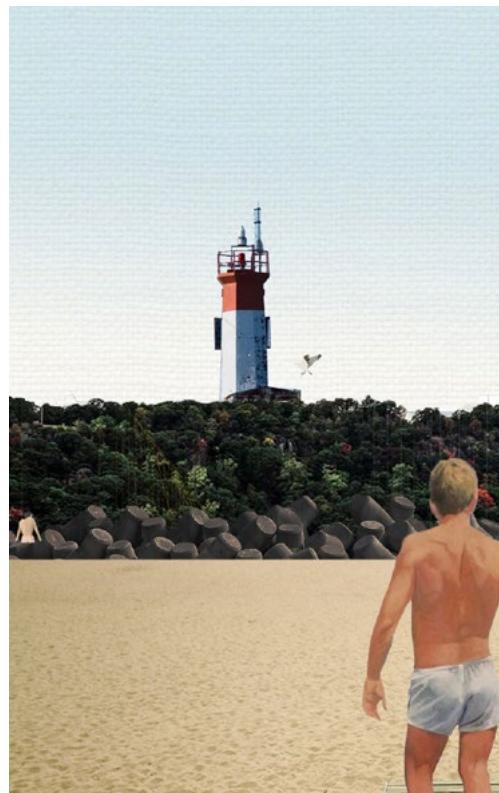
Exterior Cafe and Living



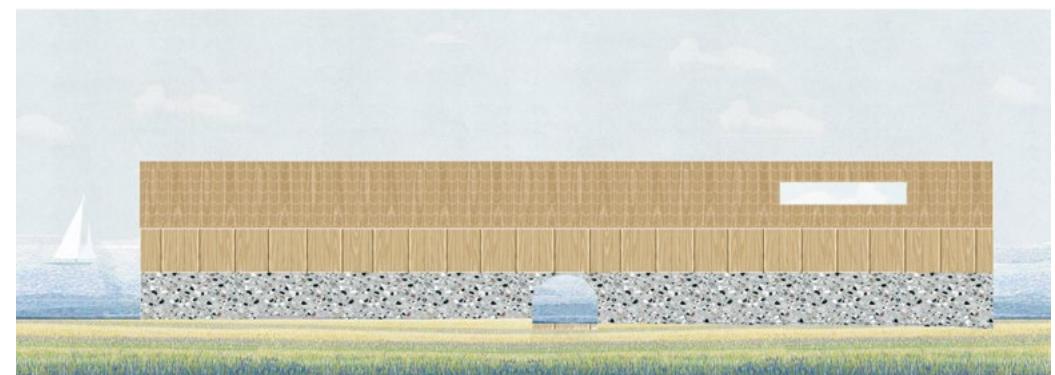
Communal Cafe and Living



North Elevation



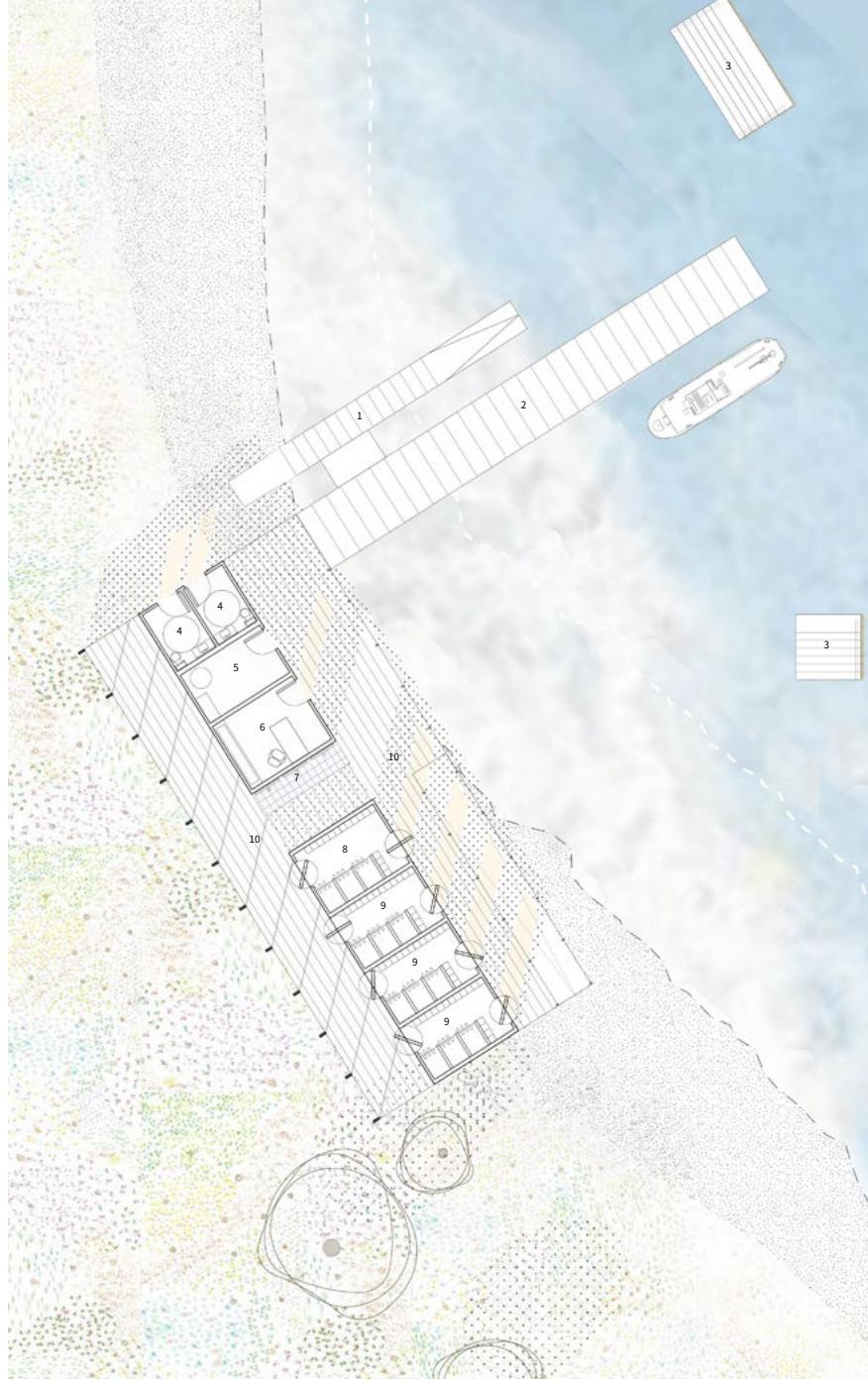
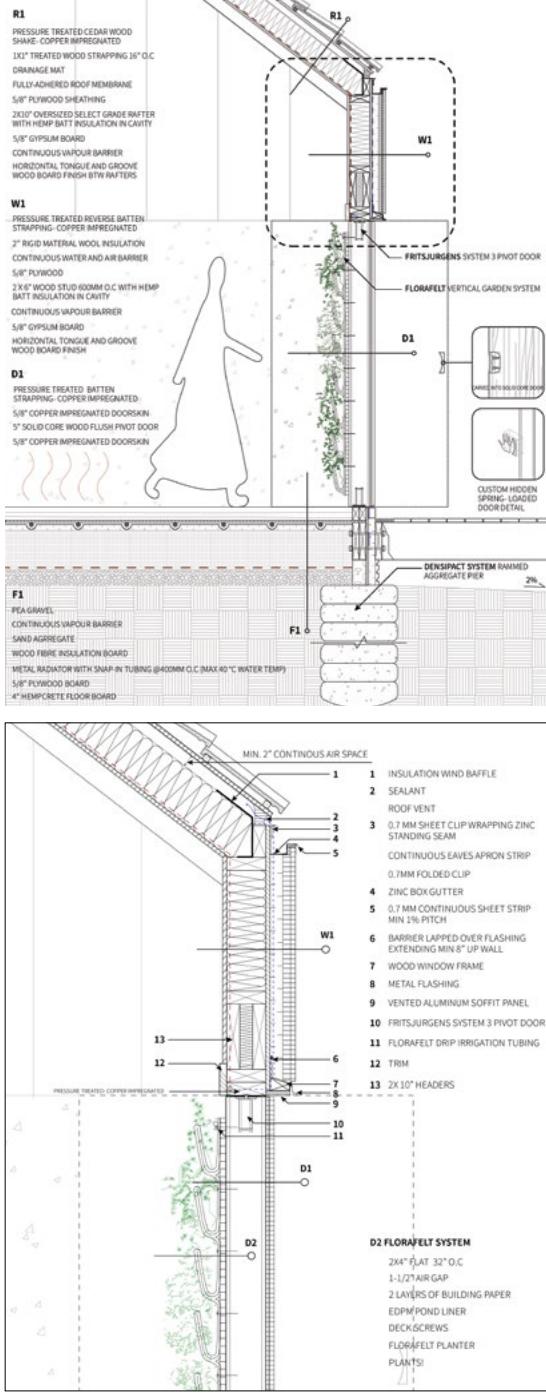
East Elevation



West Elevation



Site Section



GROUND LEVEL

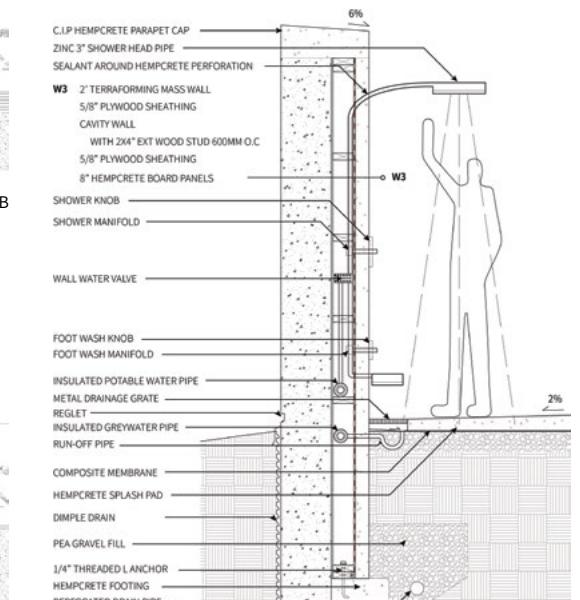
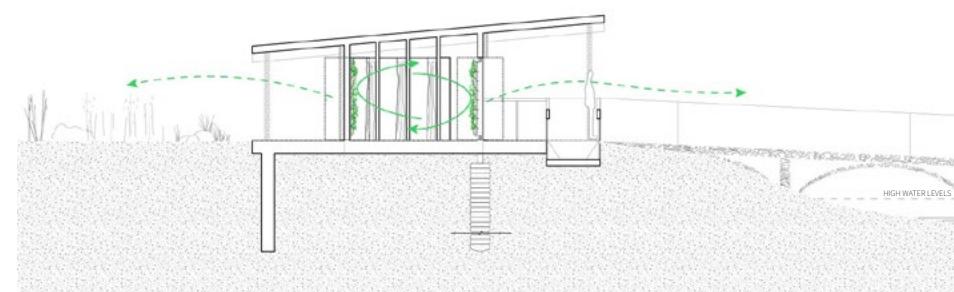
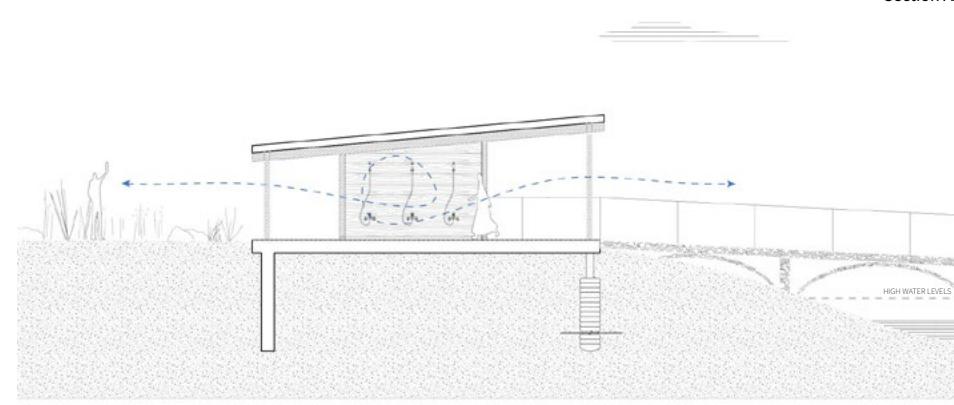
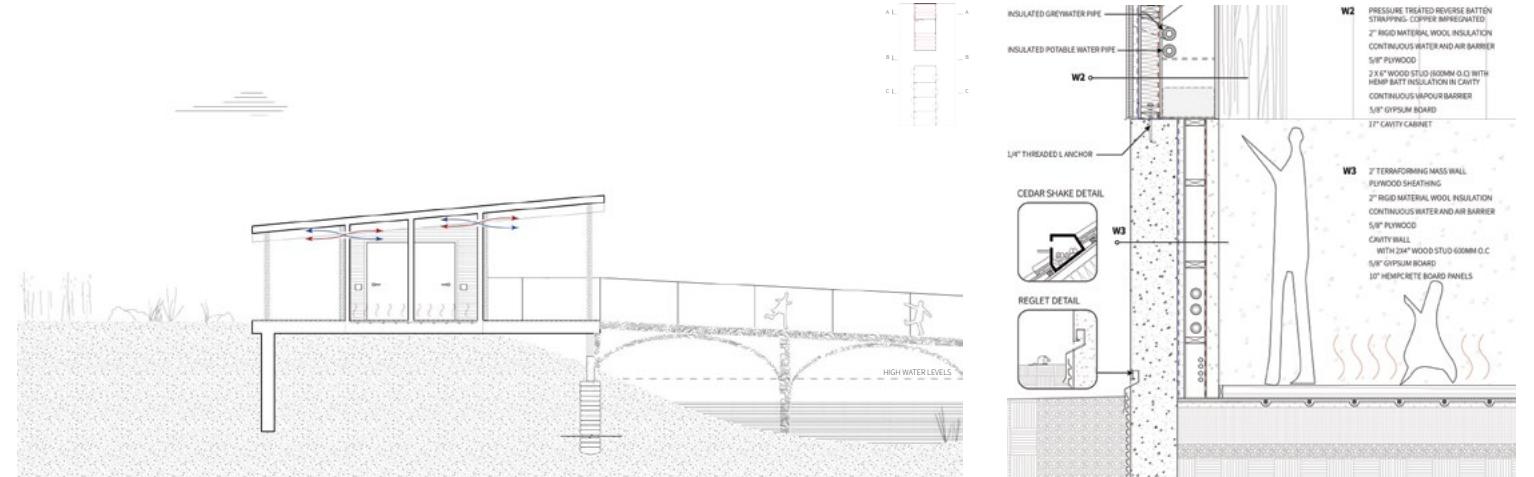
1. SWIM DECK
2. BOAT DECK
3. SWIM DOCKS
4. PUBLIC WC
5. MECHANICAL ROOM
6. OFFICE
7. EXTERIOR COVERED SHOWERS
8. STAFF CHANGE ROOM (UNINSULATED)
9. SAUNA/ AQUATICS CHANGE ROOMS (UNINSULATED)
10. COVERED THRESHOLD



South Elevation



North Elevation



Economy of Scope

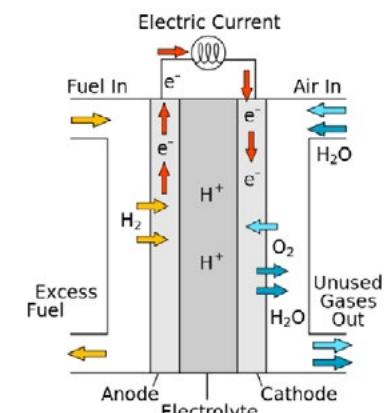
The transportation sector is the second largest end-use sector for energy consumption. In the transition towards low-carbon energy systems, the growth of electrification and the increasing adoption of heat pumps and electric vehicles indicate the overall consumption for electricity will only continue to rise. Variable renewable energy sources (V-RES) such as solar and wind in the electricity systems currently struggle to cope with the increased uncertainty and variability that affects the residual demand. By means to combat this variance, commercial and residential consumers have been taking the role of prosumers, generating electricity back into the grid using distributed generation technologies, most commonly by rooftop solar photovoltaics.

The adoption of electric vehicles is one other way to adapt but will present great challenges to the energy infrastructure if their market share increases. While niche developments in electric vehicles have been in the works since 1835, there is a contemporary resurgence in the interest of electric mobility.

This aggregated capacity to support the grid in the future appends the traditional solutions around the issue of flexibility through dispatchable generation, storage, demand response, and increased interconnection.

Fuel Cells

The principle of fuel cells was first demonstrated as early as 1839 by Sir William Grove. In essence, fuel cells turn reactants into products, heat and electricity. There are many types of fuel cells, each with their own specific fuel, oxidizer, electrolyte and operating conditions. The Proton Exchange Membrane Fuel Cell (PEMFC) is widely considered to be the most suitable fuel cell for mobile applications due to its vast range of operating conditions, efficiency and power density. PEMFCs facilitate the oxidation of hydrogen to form water. From chemical thermodynamics, when hydrogen and oxygen are mixed, and then ignited, the change in enthalpy between the reactants and the product will cause the Gibbs free energy to be released in the form of heat and expansion: combustion. Fuel cells make clever use of the enthalpy difference and create a voltage. They are able to release the energy not only as heat but also as electric energy.



A single hydrogen/air PEM fuel cell

Supply Curve

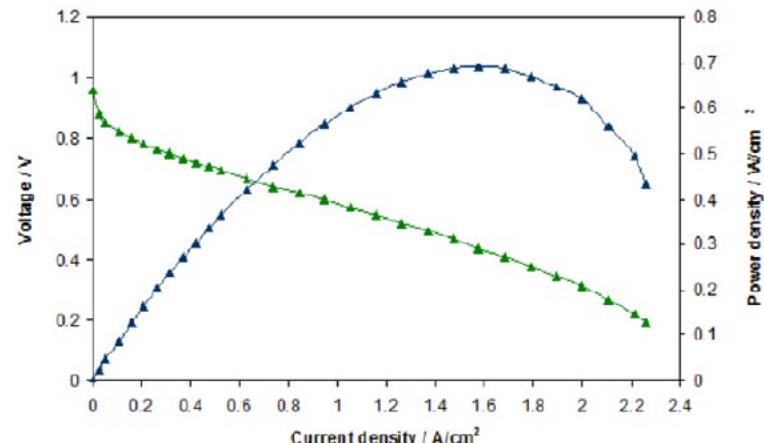
$$mc_{pp} = \frac{c_{fuel} + c_{carbon} \cdot v_{carbon,fuel}}{E_{fuel} \cdot \eta_{pp}}, [\text{€}/\text{MWh}]$$

Fuel type	Fuel cost, €/MWh	Carbon cost, €/MWh			Total fuel cost, €/MWh		
		80SWLC	80SWMC	80SWHC	80SWLC	80SWMC	80SWHC
Biomass & biogas	17.28	0.00	0.00	0.00	17.28	17.28	17.28
Hard coal	10.37	2.12	10.61	21.23	12.49	20.98	31.60
Hydro	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Lignite	10.37	2.00	10.00	20.00	12.37	20.37	30.37
Natural gas	25.27	1.09	5.43	10.87	26.36	30.70	36.14
Nuclear	4.46	0.00	0.00	0.00	4.46	4.46	4.46
Oil	36.16	1.95	9.75	19.50	38.11	45.91	55.66
Waste	0.00	0.85	4.27	8.53	0.85	4.27	8.53
Solar	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wind	0.00	0.00	0.00	0.00	0.00	0.00	0.00

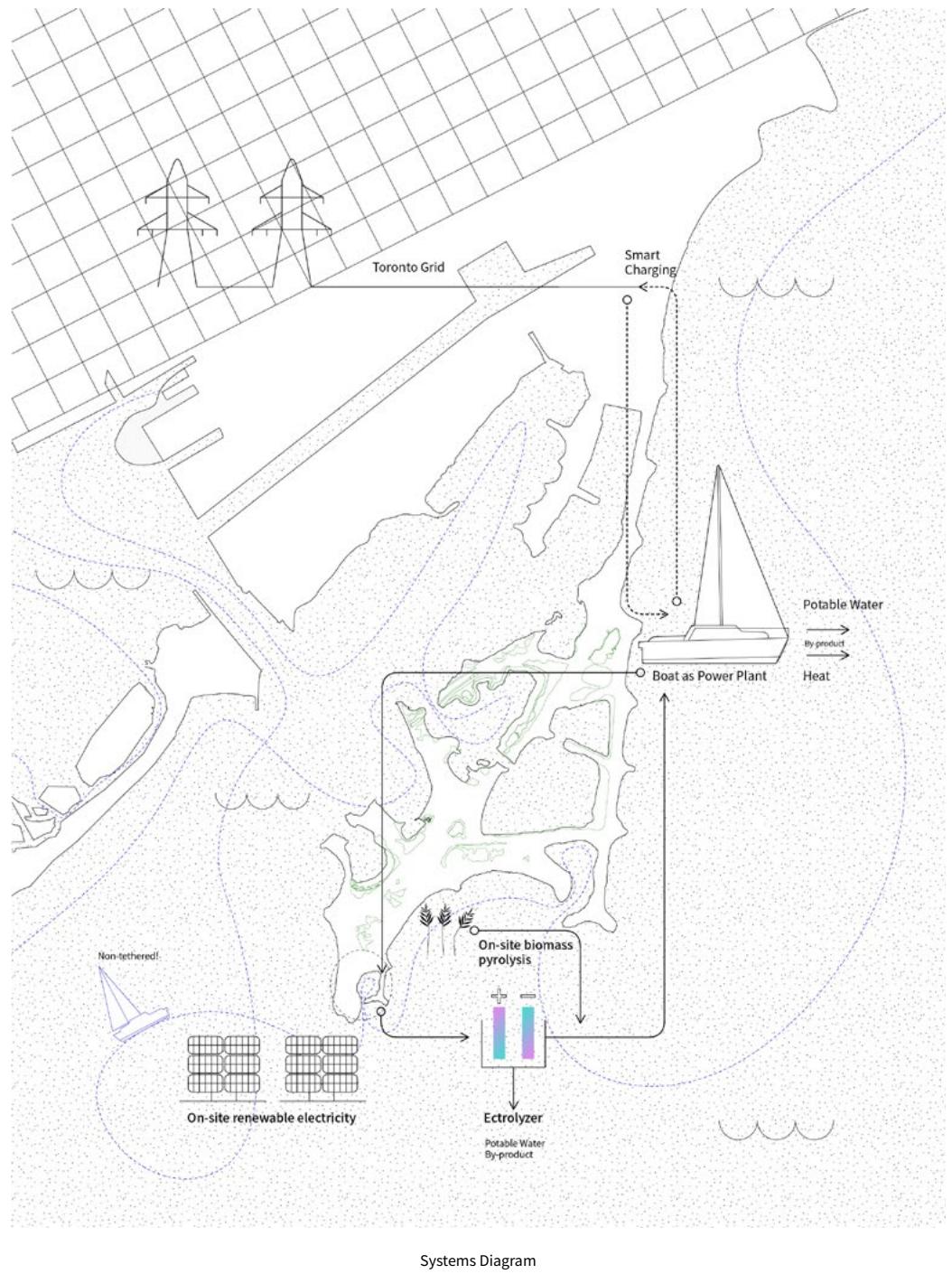
Per fuel type, fuel costs (EUR) per MWh and carbon costs per MWh were calculated using several sources for fuel costs (BP, 2017; Khan, Verzijlbergh, Sakinci, & De Vries, 2018; UK Department of Business Energy & Industrial Strategy, 2018) and carbon emission coefficients (U.S. EIA, 2016)

Ohm's law:

$$P = V * I$$



Typical PEMFC polarization curve: voltage (green) and power (blue) related to current



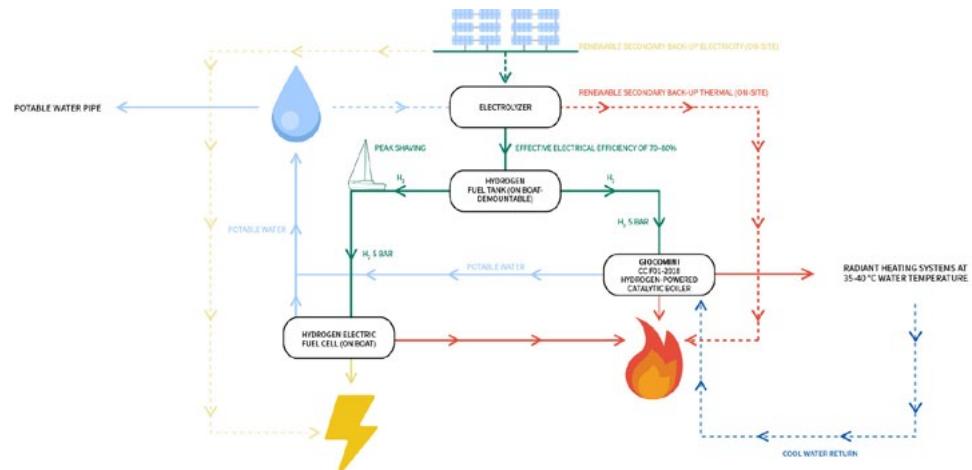
Boat as Power Plant

By combining the synergies between the power and transportation sector, the Boat as Power Plant concept allows for renewable energies to act both as storage and dispatchable power, provided from vehicle-to-grid (V2G). This concept integrates energy and transportation systems based on Fuel Cell Electric Vehicles. One fuel cell has enough capacity to power 100 houses. 500 fuel cells combined at a 'car-park' can replace a whole power station. Currently, the commercialized fuel cell runs on hydrogen.

One common misconception about hydrogen is that it is an energy source; hydrogen cannot be found as a pure element and must be produced from other resources. Hydrogen is a by-product of any metabolic reaction to produce either renewable or conventional energy. There are many hydrogen production techniques, from which electrolysis of water and the reforming of methane are the most common. Green hydrogen is the product of the electrolysis (using an electric current to break water, H₂O, into its component elements of hydrogen and oxygen) when the current is produced by a renewable source (ie. solar PV or wind turbines).

Hydrogen is therefore an energy carrier and not a source, making it a competitor to the battery (which requires rare earth metals, becomes very polluting, and has a limited lifetime without safe methods of disposal). Through smart charging, these Fuel Cell Electric Vehicles can delay electricity consumption following system needs or prices. Since vehicles can be charged when there is surplus renewable energy in the system, they can also be considered distributed energy resources. The energy in these vehicles also feeds back to the grid. Through vehicle-to-grid, aggregated vehicles can supply power to sustain activity on the Leslie Street Spit, and back to Toronto Hydro-Electric Systems Limited (Toronto's local distribution company).

Vehicles are considered to be parked 95% of the time. When not in use, the boat produces clean electricity. A Hydrogen Fuel Cell Vehicle has the capacity to power the new embayment, the Leslie Street Spit and all of Toronto's waterfront. The by-products of these Fuel Cell Electric Vehicles are potable water and heat, which will be collected and fed back into the embayment's heating and water system.



Topography τόπος (topos, “place”) and -γραφία (-graphia, “writing”)

Anastylosis (from the Ancient Greek: αναστήλωσις, -εως; ανα, ana = “again”, and στηλώ = “to erect [a stela or building]”) is an archaeological term for a reconstruction technique whereby a ruined building or monument is restored using the original architectural elements to the greatest degree possible.

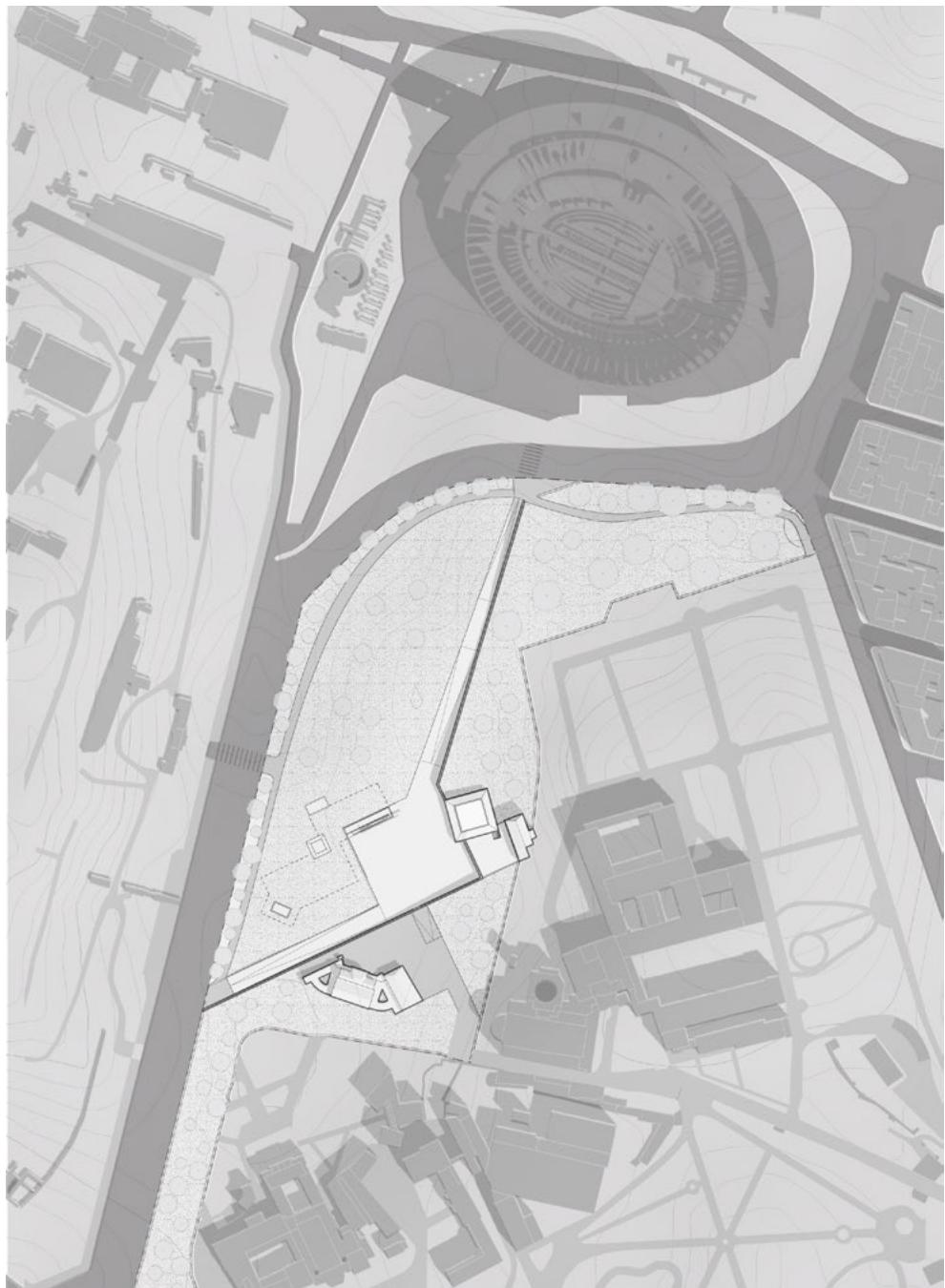
Located between the Colosseum, Palatino Hill, and Circo Massimo, **rarefaction** intents to understand free space and public space with the absence of architecture. With the aim to bring back to life, forgotten histories and buildings of Rome, an ongoing, open excavation of the Aqua Claudia survives at a -3 level.

The archaeological area is both a rare historical resource and a unique urban phenomenon: an enormous open space of the most universal cultural significance, located at the center of a contemporary capital. The outlines of ancient Rome are preserved in a landscape setting, an urban Arcadia of architectural fragments and natural elements which may evoke an ideal of a lost culture, or allude to the continuity of the remains concealed beneath the modern city. In certain remote corners, relatively untouched by the excavations, one is easily reminded that just over a century ago most of the area was actually rural. The ruins stood as landforms of exotic vegetation native to the soil of Rome. Urban expansion and excavation have distorted the traditional relationship between the remains, the countryside and the city. The role of archaeology in the modern city remains ambiguous and unresolved, but the problem must be addressed at a cultural level.

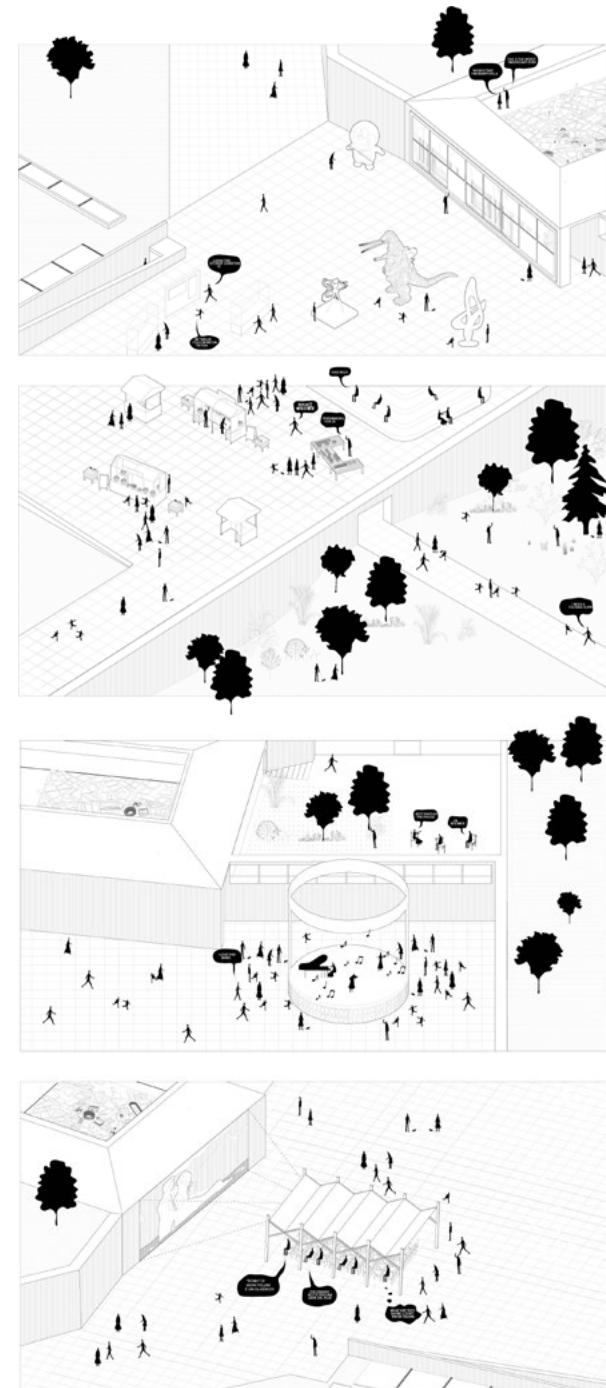


In Collaboration with B. Tien
Fall 2019 Rome Design Studio
Supervisors - Beatrice Bruscoli, Lorenzo Pignatti

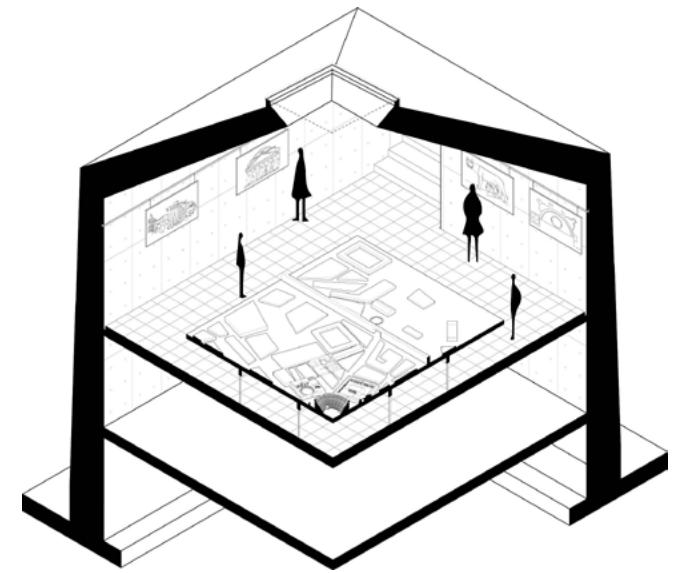
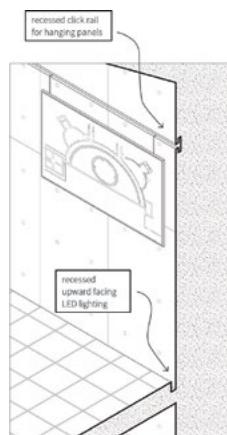
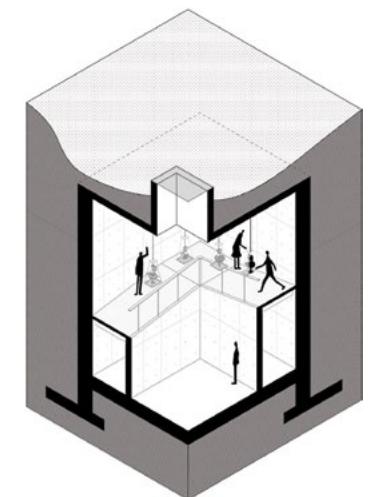
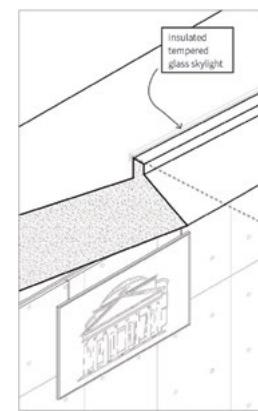
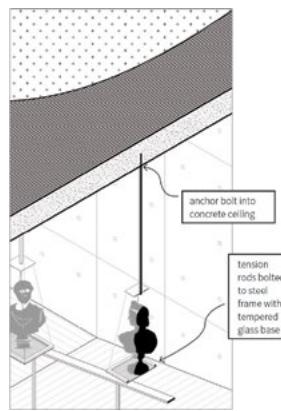
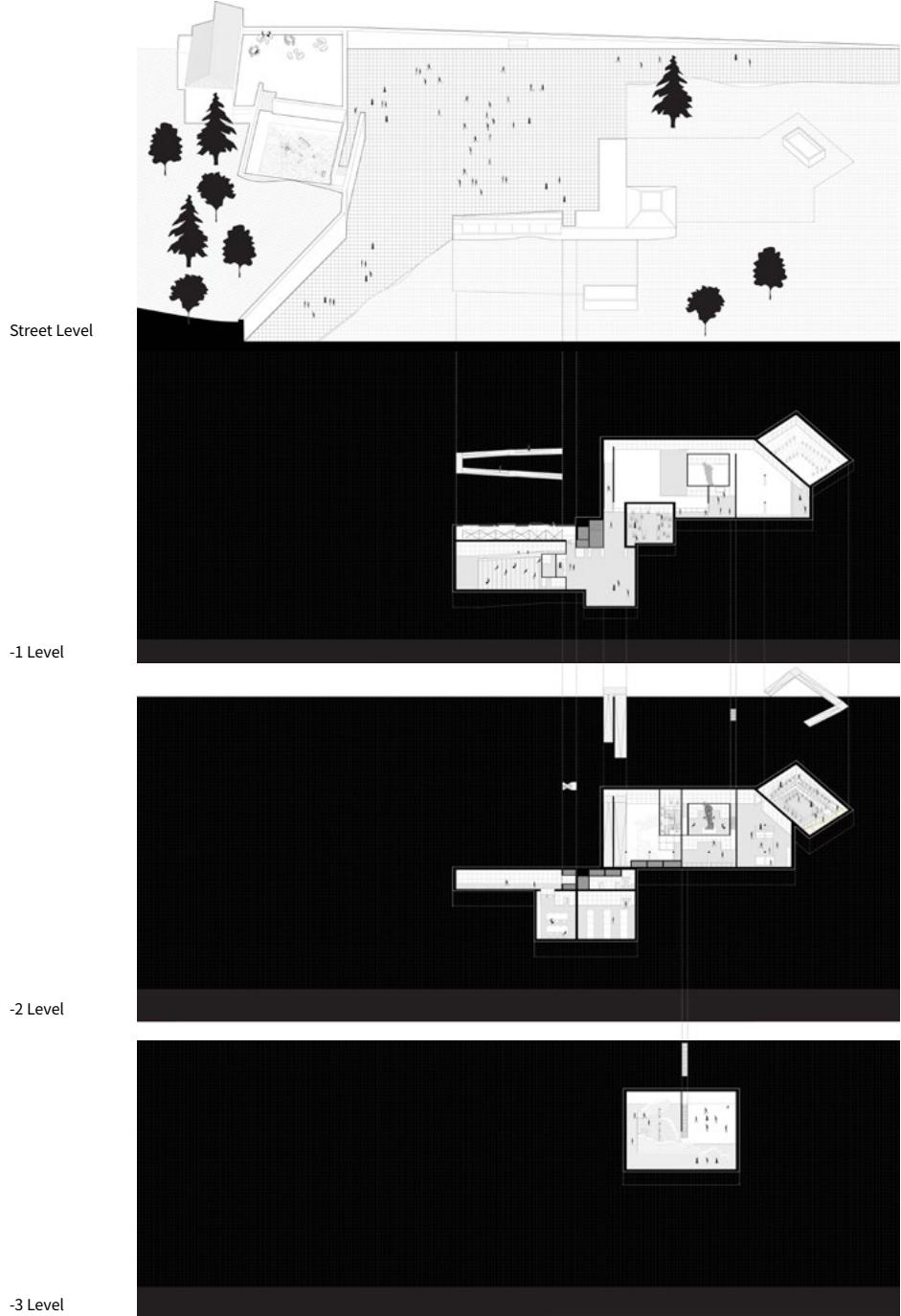
Perspective from Colosseum

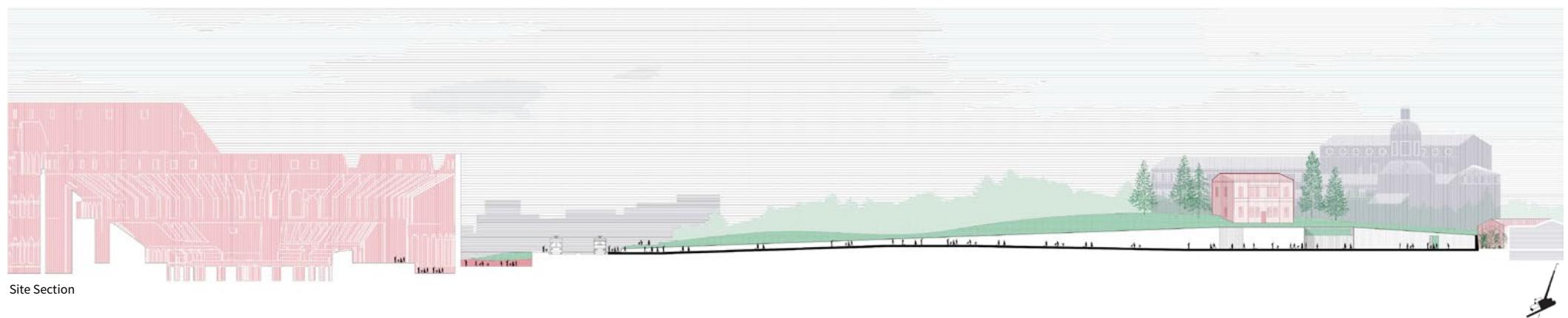
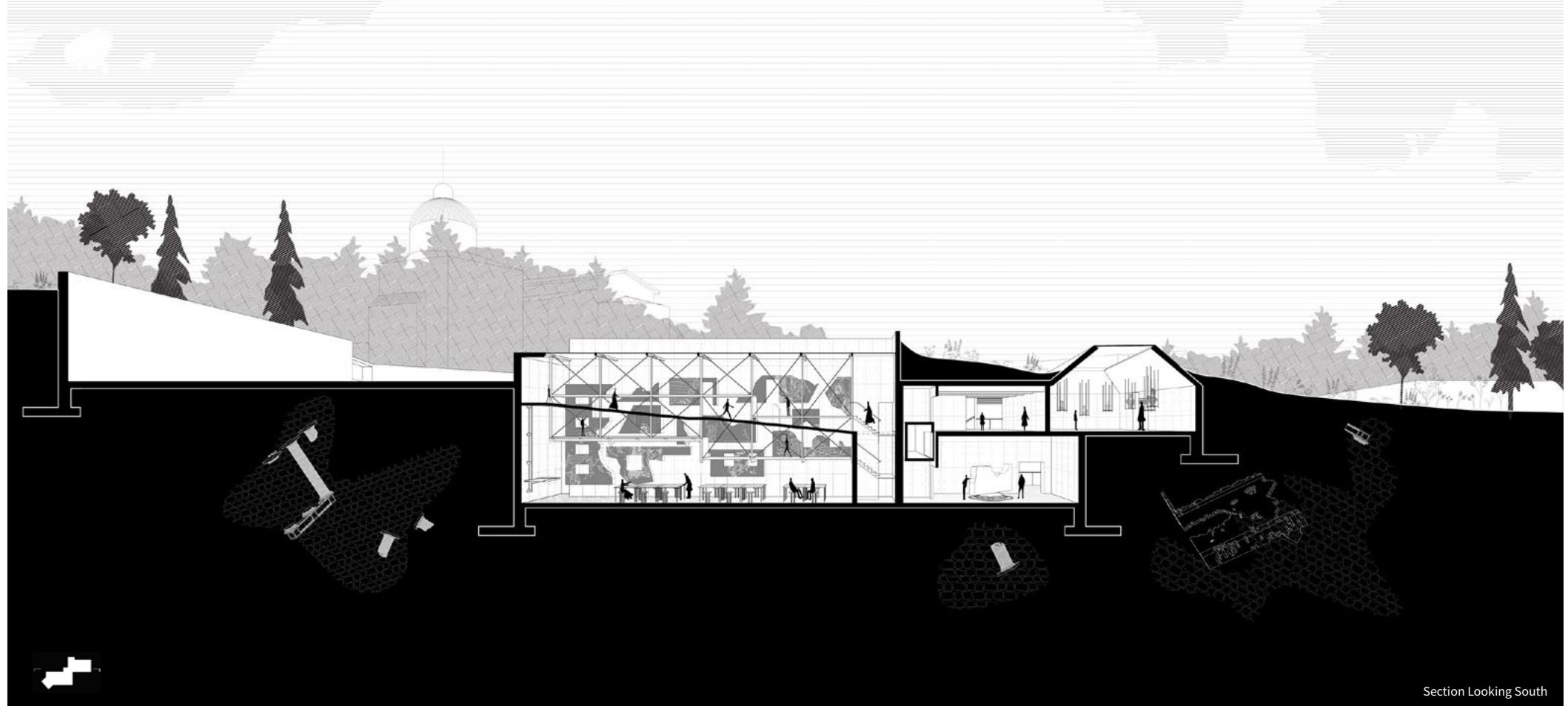


Proposed Intervention



Freespace Piazza







Section Looking North



Cafe



Exhibition Space



Model Room

District 11 Masterplan

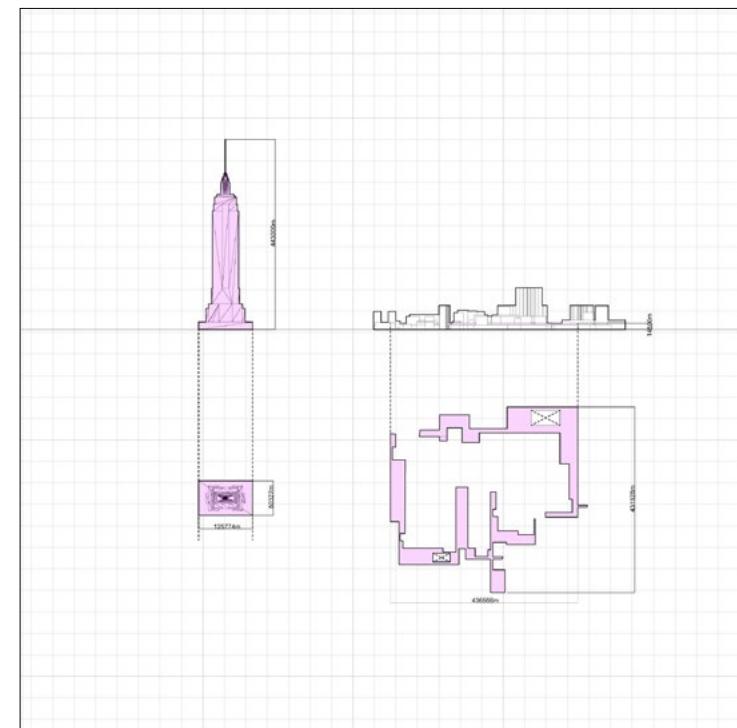
iii

Located in Toronto's mature suburbs, the intersection of Finch and Weston has long been isolated from the rest of the city fabric. Lacking in comfortable housing, social services, and public space, it lies in the center of the most marginalized neighborhoods, falling victim to high rates of poverty and crime.

The development of the Finch West Light Rail Transit system and the Bolton Commuter Rail, the neighborhood will begin to see significant changes in the foreseeable future. From a socio-political and biophysical aspect, the master plan seeks to outline and analyze existing energy flows across the site both emergently and exergetically and posits a new series of processes and exchanges that will reinvent the Finch and Weston block in a socially equitable and sustainable way.

In contrast to contemporary development that uses aggressive tactics of high-rise superstructures, the city block is densified through mid-rise development connected by a **mat** building.

The master plan is a large-scale urban design considering how architecture can modulate the existing eMergies of the site focusing on the social and the biophysical. A proposal for the development situated in North York, Toronto focusing on providing empathy for the existing site, allowing for the preservation of the culture of its residents as well as its buildings. Toronto's subway lines fragment the city and poorly connect it with the surrounding urban fabrics. They serve to segregate the city keeping poverty out of view. These systems serve to repress these districts from the consciousness of affluent urban residents, forming the vast region of Toronto's urban unconscious.

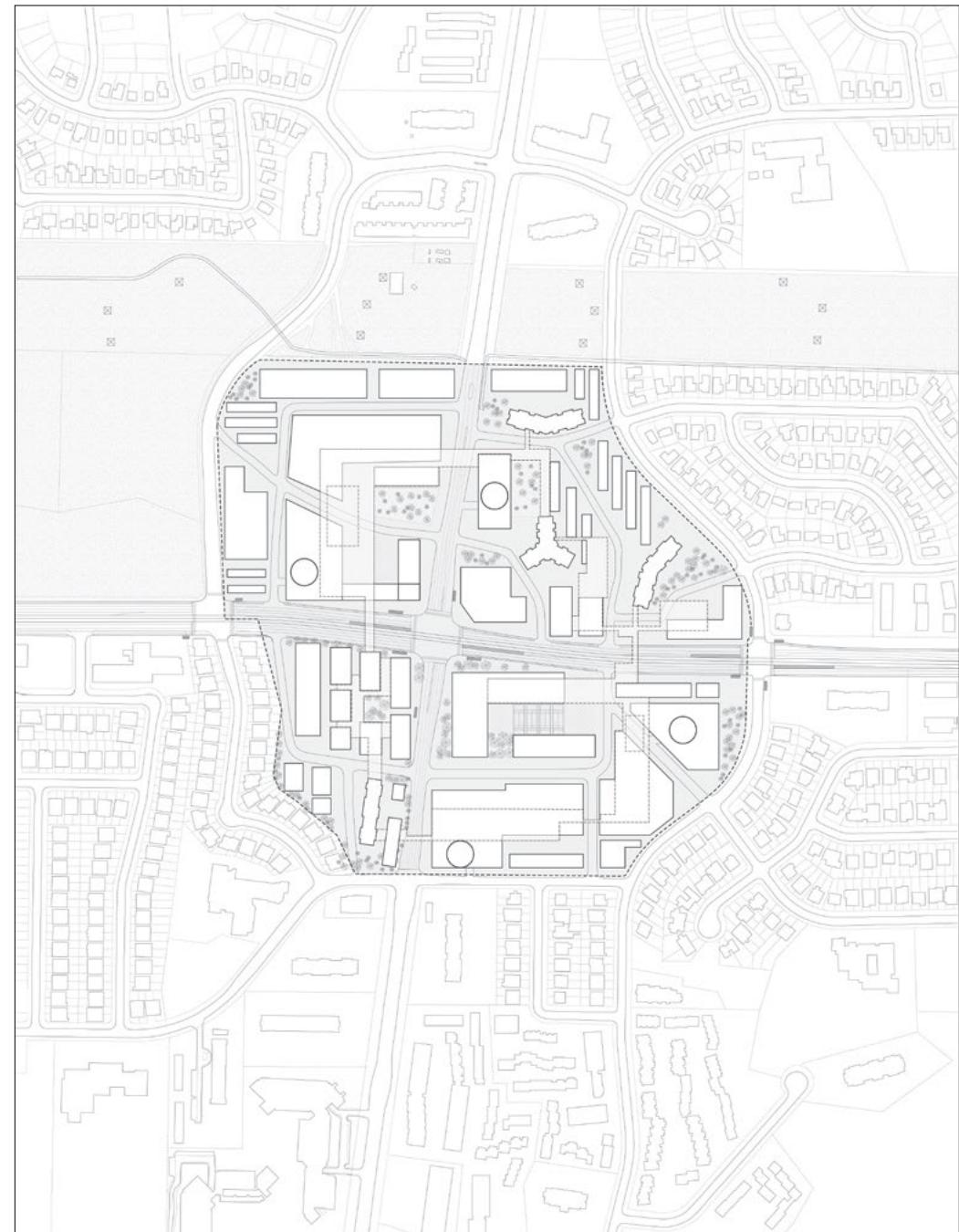


In Collaboration with M. Reinhart and B. Tien
Spring 2018 Design Studio
Supervisors - Adrian Blackwell, John McMinn

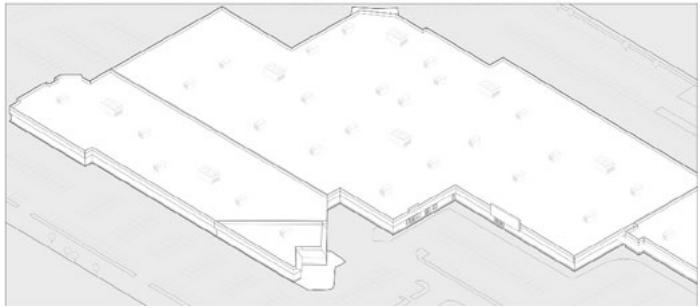
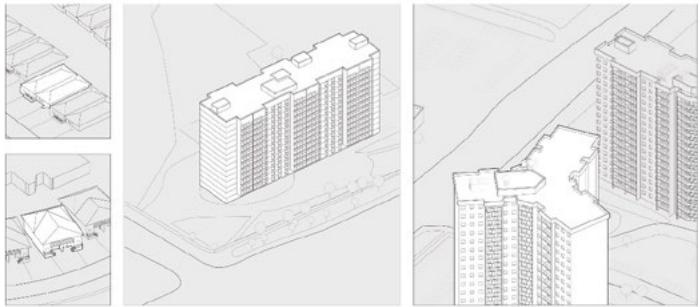
Density Analysis



Existing Site Plan



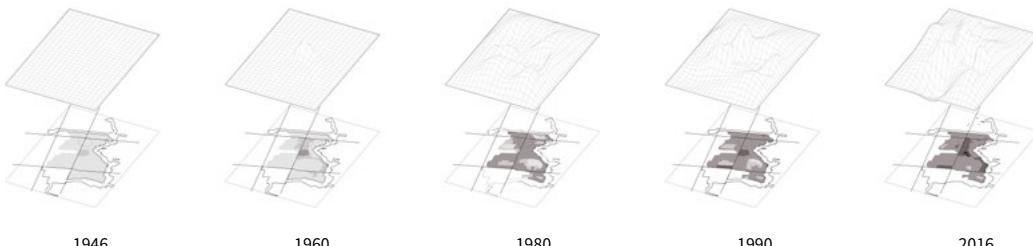
Proposed Site Plan



Existing Building Typologies



Existing Strip Parking



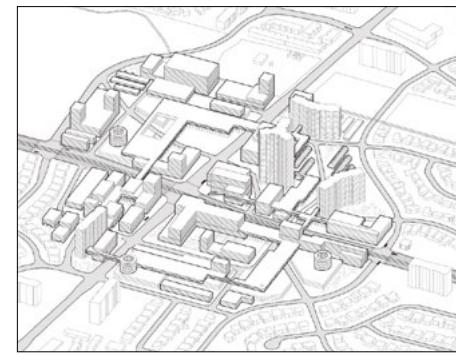
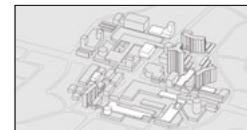
1946

1960

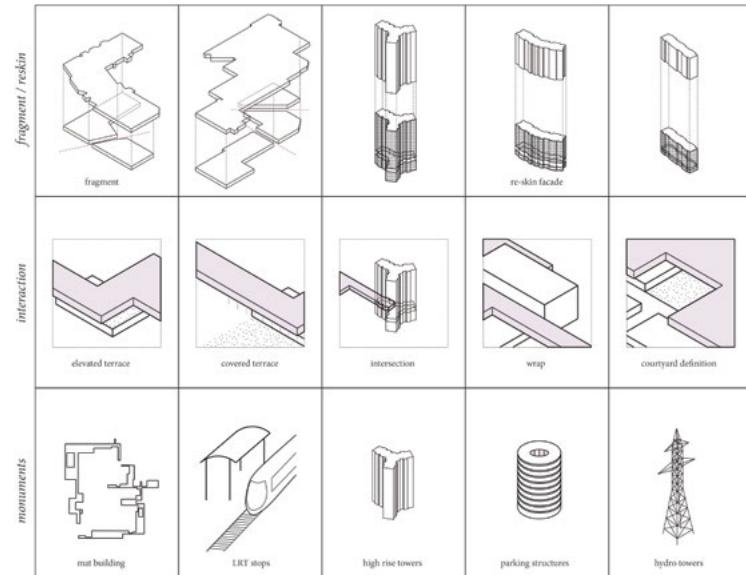
1980

1990

2016



Urban Growth



Just as the sleeper—in this respect like the madman—sets out on the macrocosmic journey through his own body, and the noises and feelings of his insides, such as blood pressure, intestinal churn, heartbeat, and muscle sensation (which in the waking and salubrious individual converge in a steady surge of health) generate, in the extravagantly heightened inner awareness of the sleeper, illusion or dream imagery which translates and accounts for them, so likewise for the dreaming collective, which, through the arcades, communes with its own insides. [...] Of course much that is external to the [individual] is internal to the [collective]: architecture, fashion—yes, even the weather—are, in the interior of the collective, what the sensoria of organs, the feeling of sickness or health, are inside the individual.

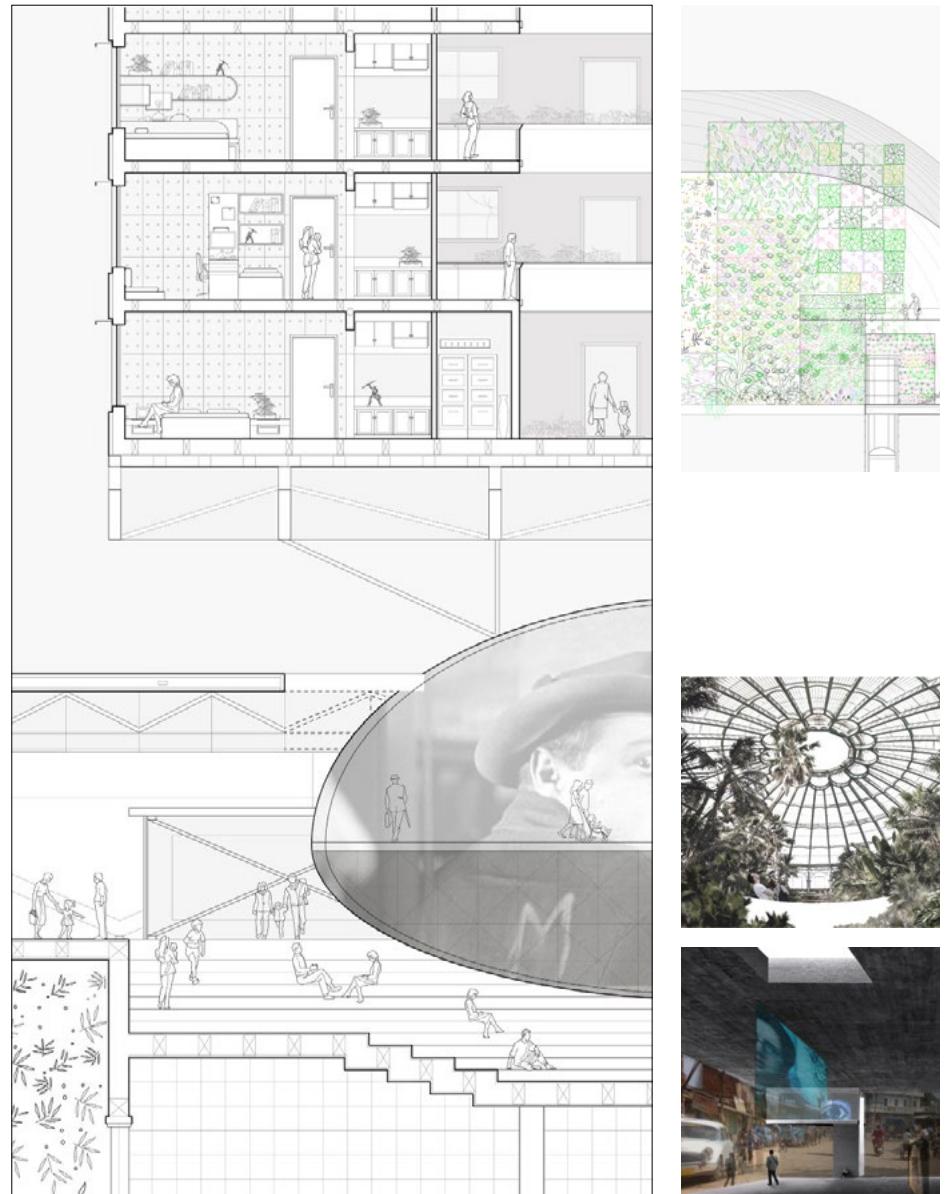
And as long as they preserve this unconscious, amorphous dream configuration, they are as much natural processes as digestion, breathing, and the like.

They stand in the cycle of the eternally selfsame, until the collective seizes upon them in politics and history emerges.

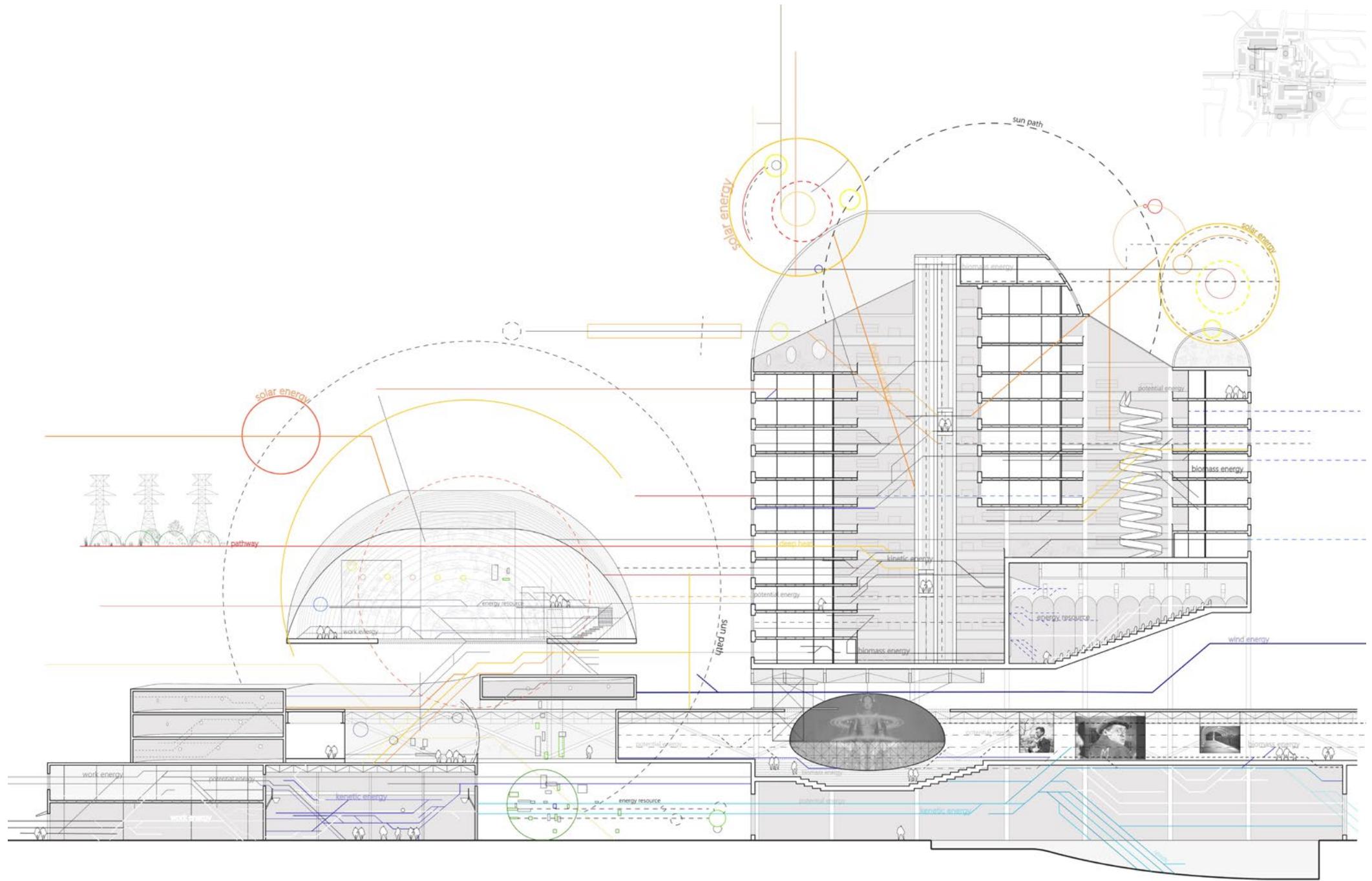
—Walter Benjamin, *The Arcades Project*

The abandonment of the shopping mall as a model marks a significant transition of modes of exchange. A community-based treatment model shapes the language used by the psychiatric profession to explain the adoption of the American mall as a therapeutic space.

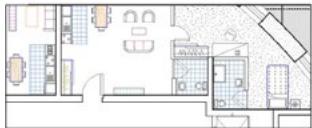
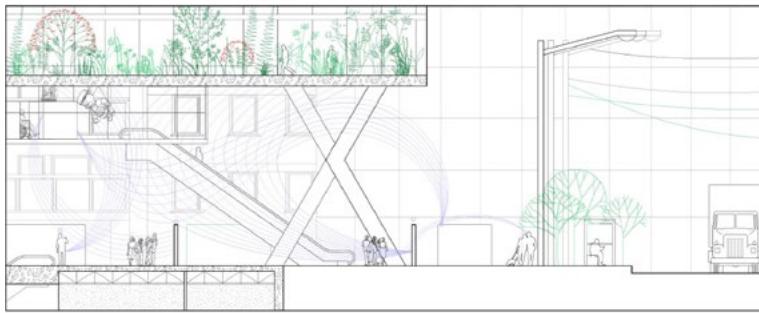
Modeled after the Eastern Shore Hospital Center in the State of Maryland, psychiatric treatment spaces promote reciprocity, redistribution, and market exchanges occurring on different levels of a mat building block outlined in the District 11 master plan proposal (pp 33). eMergy acts as a node in the system that makes no distinction between the mad and the non-mad, the asylum and the city, consumption and treatment.



Section Details

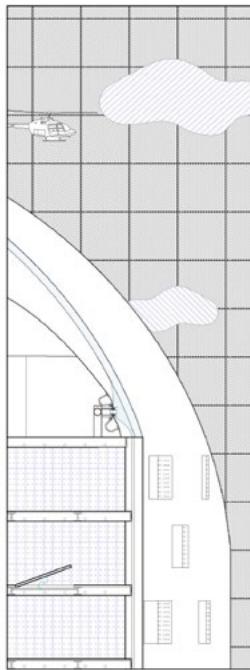


Energetic Section



"according to British psychotherapist Adam Phillips, 'madness is when you can't find anyone who can stand you, [and] if you can't find anyone who can stand you, you can't find anyone who believes you've got anything they want' ... revealing the way in which psychiatric centers dream of how we might one day want something from the mentally ill, thereby offering them a moment of normative recognition."

-Denizen, Obituary for a Psychiatric Centre and its Shopping Mall



Terrace level- Informal marketplace, clinic
Visual, verbal, material, monetary exchange
between: patient and pedestrian, pedestrian
and pedestrian, patient and patient

Commercialism that does not differentiate
between the patient and the pedestrian, the
clinic and the city, consumption and treatment

Nodes communicate with their neighbors,
subconscious architecture

Complete flexible use of channel with an
infinite size array

Distributed

Ground level- Screen installations, hanging
glazed pods

Visual, verbal, material, monetary exchange
between: patient and pedestrian, pedestrian
and pedestrian, patient and patient

Use of virtual reality pods as an exchange of
exposure therapy, leisure, and education

Without centralized location, ever changing

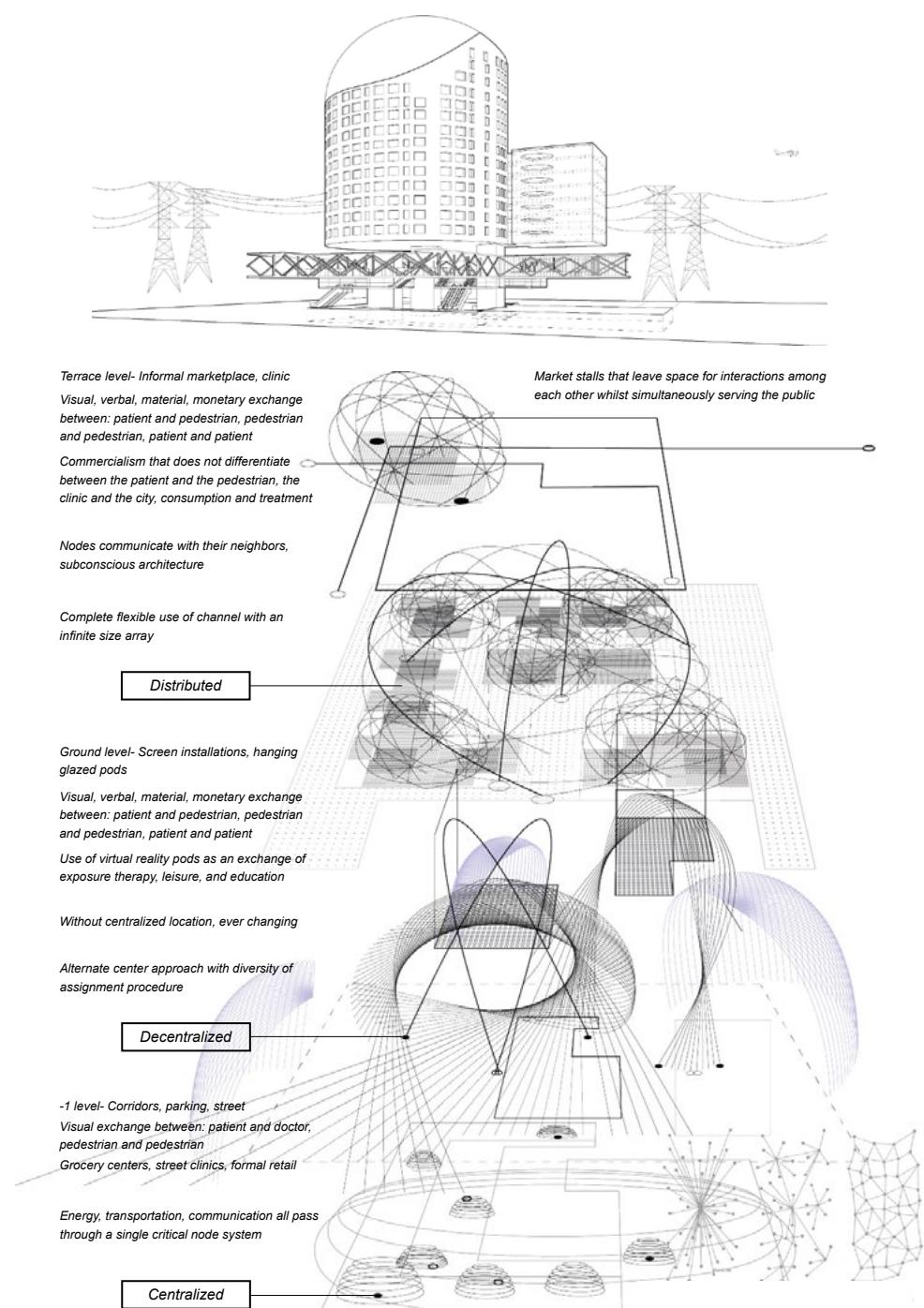
Alternate center approach with diversity of
assignment procedure

Decentralized

-1 level- Corridors, parking, street
Visual exchange between: patient and doctor,
pedestrian and pedestrian
Grocery centers, street clinics, formal retail

Energy, transportation, communication all pass
through a single critical node system

Centralized



I had the opportunity to work with Scott Henson Architects, a New York City-based historical preservation architecture firm. During my four month internship there, I assisted with SD, DD, and CD submission packages for cultural, institutional, and private buildings using AutoCAD, Revit, and Adobe Suite.

I was privileged to be involved in an adaptive re-use of Brooklyn row home to achieve EnerPHit certification, full façade restoration of the Knickerbocker Telephone Co. Building, and performed on-site inspections, surveys, and technical reviews. I also completed tasks for the firm's promotional material such as graphics work and a new branding package inclusive of business cards and letterheads.



Professional Work
Winter 2017

SCOTT HENSON ARCHITECTS

45

200 Lafayette Street, New York, New York- Knickerbocker Building
Recognized by the Palladio Awards for Adaptive Reuse in 2017

46

JIA ZHANG

SCOTT HENSON ARCHITECT

May 5th, 2017

26 Springer Drive
Richmond Hill, Ontario
Canada L4C 0E9

To Whom It May Concern:

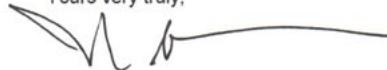
As Principal of Scott Henson Architect, I had the pleasure of working closely with Jia Zhang on a number of projects throughout her four-month work term in our office (January to April 2017). During that time, I found Ms. Zhang to be enthusiastic, motivated and a capable member of our team whose eagerness to learn made her especially well-suited for our office.

As a small firm, Scott Henson Architect values interns who are comfortable working collaboratively across several projects, often requiring them to wear several "hats" throughout the day. From creating construction drawings to preparing presentation graphics, Jia's energetic resolve and diligence proved invaluable when faced with the many difficult technical challenges of Historic Preservation.

During her time at SHA, Jia contributed to a variety of projects in all phases of the design process including the utilization of marketing software, performing inspections, surveys and technical reviews, the creation of design presentations and the preparation of construction documents.

Regardless of the task at hand, Jia was able to not only learn from, but positively contribute to every assignment she was given. Her upbeat attitude, dedication and willingness to learn made her a great addition to the team and while we are sad to see her go, I am confident that she has a very successful future wherever her career leads. I would highly recommend Jia to any firm, but she always has a place at SHA.

Yours very truly,



Scott Henson
Principal



200 Lafayette Street, New York, New York- Knickerbocker Building

THANK YOU, HAVE A GOOD DAY!

Phone +31 6 15429441
Email jszhang0510@gmail.com
Website <https://jiajasminezhang.com/>