As students and members of the field of architecture, very often are we in search of how we can make things fit the way we think they should. We like things that are orderly and regular, things that fit a narrative we create, things that fit within the theme of a portfolio.

Sometimes we create rules when we begin the process of designing—rules that become arbitrary constructs within which we must try and fit our ‘solutions’. Often, we lose sight of what is critical to the project, the community, the environment, and so on.

My approach to designing changes with every prompt I receive and every project I begin—because unique problems require unique solutions. Although my design language and process are constantly changing and adapting, my design philosophy has never wavered: “solve more problems than you create.” Is it simple? Yes. Shouldn’t this be considered the bare minimum? Absolutely. But are all architects and designers always making sure they address this problem in some capacity? Unfortunately, no.

As a student and a lifelong learner, I like to believe that in the field of architecture we all follow an unwritten rule of leaving a place better than it was found—an ideal that was instilled in me at a very young age by my grandmother. But, as I continue to learn more about the real world, I’m worried my rose-coloured lenses are beginning to fade.

These projects are not complete, I don’t think they ever will be, to be honest. These projects stand to represent an ideology that a project and its body of work should not be placed in the archives, but rather operate as a point of reference to inform the strategies and methods of improvement used for future designs. More importantly, these projects are representations of my learning process—ways for me to become a better designer—a designer who will not fall short in giving back more than what is taken away. In other words, a designer who will do more than the bare minimum.

01_ 33 THOMAS / RE-WRAPPED
02_ ALL ROADS LEAD TO LABADI
03_ MONUMENTS TO NATURE
04_ MOD:LIVE
05_ WORM INFLATABLE
06_ DUNE
07_ +TILE
08_ (SUP)PAVILLION
09_ MISFITS
Inversion, Conversion, and Adaptation of the AT&T Long Lines Building

Since construction completed on AT&T’s windowless, 30-story tower at 33 Thomas Street in 1975, the building has embodied its original design intention: an impenetrable granite-clad fortress bolstered to support nuclear fallout and keep those privileged within safe from the city.

The first act was simple - to remove the facade, expose the building’s over-sized, regularized structure (necessary for the telephone infrastructure housed within), invert it as an active participant in the city, and re-program it by sandwiching affordable housing units to the north and south and inserting a robust social infrastructural program (including theatre, library, art studios, gymnasium, rooftop pool, etc.) in between. Taking advantage of the building’s deep floor plates allows space for new vertical circulation cores clinging to the east and west faces and a light, tensile and operable ETFE skin re-wrapping the building’s exposed frame.

While providing essential climatic performance and rendering the building as a ghost of its former self, the plastic wrapper facade inverts the building radically from solid, granite sculpture to green, translucent monolith.

LOCATION TRIBECA, NEW YORK
COURSE ADVANCED STUDIO V
CRITIC WONNE ICKX
TERM FALL 2022
COLLABORATOR BLAKE KEM

01_33 THOMAS / RE-WRAPPED
1.0 Peel Existing Facade

2.0 Sandwich Residential Units & Interior Program

3.0 Express Egress

4.0 Drape Facade Over Structure

Massing Models

Massing Diagram

Existing Images of 33 Thomas

Facade Isometric Render
New roof garden with public pool reclaims important elevated space for general accommodation.

ETFE skin lifts up at the base to emphasize its difference from existing structure and provide backdrop for public plazas surrounding the open ground floor.

Transparent, operable skin (manufactured from thin single-layer ETFE typically used for greenhouses) recalls monolithic massing of existing structure and provides essential thermal and weather performance.

Oversized circulation corridor between residential units and inner social infrastructure serves as essential buffer between public and private programs.

Publicly accessible exercise terrace and garden patio at existing setback serves as collective gathering space between upper and lower units.

Cross Section

Upper level multi-purpose space (with suspended running track) can be utilized for large community banquets, music recitals, sporting events, and much more.

"Units" adjacent to large spatial infrastructural spaces such as public restrooms, changing rooms, etc.

Church St.

Thomas St.

New vertical circulation cores on the east and west elevations are attached to the existing structure like armatures, allowing the new floor plates to remain as open and flexible as possible.

Publicly accessible exercise terrace and garden patio at existing setback serves as collective gathering space between upper and lower units.

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Church St.

Thomas St.
Facade Structure Isometric

- Existing Concrete Slab
- Hanging Planter
- Operable Single Layer ETFE
- 22-Tube Coaxial Cable
- Aluminum Rail
- Aluminum Channel
- Steel C-Beam
- Steel Bar Grate

Balcony Perspective

Render of Pedestrian Approach

WORK IN PROGRESS.
Typical Upper Level Floor Plan - Co-Working Space

Typical Lower Level Floor Plan - Library

Render of Library, from Corridor
Labadi, a historic community in Accra, has suffered greatly from urban dispossession. Despite losing 80% of its land to expropriation, the community has continued to thrive and adapt, particularly in the now vacant International Trade Fair (ITF) site. Constructed in the 1960s, the ITF has played a complex role in the community’s history, from its initial purpose of showcasing Ghanaian nationhood to its later use by small business owners who appropriated the voids between pavilions. In 2021, the government demolished the remaining structures without notice, leaving the site abandoned.

This project aims to negotiate civic space and existing infrastructure by repurposing the ITF site into a sustainable and vibrant community hub. The design features a removal of the highway that cut Labadi off from its agricultural land, creating a strong relationship between the community and the land that once belonged to them. A new system of Housing and an agricultural land occupy a large portion of the site, restoring localized livelihoods and providing opportunities for sustainable growth while still utilizing existing building practices and technology.

The formalized architecture includes a market, a football field, and schools to address the struggling national and local education system. These spaces will encourage community engagement, providing a gathering place for people of all ages. By prioritizing sustainable practices, we aim to create a new model for urban development that recognizes the value of community and the importance of preserving history.
Aerial Photograph of Ghana's International Trade Fair in 1970

Photo of ITF Grounds in 1970

Site Plan of Project Scope

WORK. IN PROGRESS.
Map of Accra's Spaces of Contention and Civic Interaction

02_ALL ROADS LEAD TO LABADI

The Map

This map can be understood as a representation of the city's urban fabric, highlighting the spaces of contention and civic interaction that have emerged in the context of urban development and social transformation. The map illustrates the complex interplay between formal and informal urban spaces, showing how different groups and communities use these spaces for various purposes, including resistance against eviction, protest, and social gathering.

Key:

- **Deed Station**: Landmark
- **Roads**: Transport routes
- **Buildings**: Residential and commercial structures
- **Open Spaces**: Parks, squares, and communal areas

The map is a tool for understanding the dynamics of urban life in Accra, revealing the layers of power and control that shape the city's social fabric. It highlights the importance of these spaces in the lives of city residents, offering insights into the processes of urbanization and social change.
ALL ROADS LEAD TO LABADI

Split Level Plan of School in Existing ITF Building

WORK IN PROGRESS
Interior View of Trade School in Existing ITF Pavillion A

Exterior Render of School in Existing ITF Round Pavillion

Section of New High School, Trade School, and Elementary in Existing ITF Building
02. ALL ROADS LEAD TO LABADI

Interior View of Elementary School Existing Round Pavilion
Plan of Market Canopy and Underlying Programs

Evening Render Under Market Canopy

WORK. IN PROGRESS.
Plan of Football Field and Shading Structure

Render of Football Field on Existing Urban Void

Section of Football Field
40 41
02. ALL ROADS LEAD TO LABADI
Illuminated Model Photograph
WORK IN PROGRESS.
Designed with the intent to complement nature by contrasting its delicacy with massiveness, fluidity with rigidity, and ever-changing qualities with permanence, these Monuments To Nature act as a blank canvas for nature to grow, change, and weather for the rest of time. These monuments have an aim to outlast the human experience and survive well into a post-human future.

The monuments are dedicated to the three main principles of our environment: air, land, and water. Because of our tendencies to selfishly mistreat and destroy elements of nature for our benefit, each of the three monuments consists of solid, two-foot-thick concrete walls. The narrative paradox created by designing monuments dedicated to nature—hoping they act as a blank canvas yet still using an unnatural material, shows how we as humans have still not found a way to design architecture that can resiliently and responsibly withstand nature’s forces while still using materials occurring naturally in our environment.

One’s experience on site concludes at the only formal ‘building’ inside of which is a cantilevered gallery of some of nature’s most beautiful objects—each of which are behind glass or rope. This furthers the idea that the only time one can truly appreciate nature and be fully immersed in its beauty is when one is outside, not when it is curated. The light timber and polycarbonate construction of the gallery is designed to decay over the course of 15-30 years. Only the monuments to nature are designed to survive.
Monument to Earth Section Perspective
Monument to Water Section Perspective
Monument to Air

Monument to Earth

Monument to Water
01 Monument to Air
02 Monument to Earth
03 Monument to Water
04 Temporary Gallery

Site Isometric

WORK. IN PROGRESS.
03. MONUMENTS TO NATURE

Render of Approach to Temporary Gallery

WORK IN PROGRESS.
03. MONUMENTS TO NATURE
Temporary Gallery Lobby

Temporary Gallery Exhibition Space
WORK IN PROGRESS.
Centered on the concept of implementing flexible living solutions to a stagnant and rigid housing system, MOD:LIVE aims to provide a space that can adapt to the changes and flows of the cycles of life at various scales—from day to day, month to month, and decade to decade.

In an effort to undercut the traditional manufacturing costs of housing and reduce the rate of vacancy, our flexible modular system can adapt to the everyday desires of our occupants while maintaining low levels of variance within prefabricated elements and reducing redundancy when combined with site-specific architectural moments.

On the interior of the units, walls can be pivoted and folded to accommodate diverse living situations, whether it be to create a new bedroom, expand a living room, or create more space for dining. This concept of flexibility is also translated to the exterior through a mechanical louver system that can be compressed, expanded, or rotated to accommodate the many occupants and their preference for incident sunlight, and privacy. These changes to the louvered systems represent each of the unique individuals residing in our project and the variety of ways they may choose to use their own living space. In addition to being able to adapt to the needs of the user on the inside, their desired changes to quality of daylight and privacy are ultimately expressed on the facade of the building’s exterior.

LOCATION SOUTH BRONX, NEW YORK
COURSE CORE STUDIO III
CRITIC MICHAEL CATON
TERM FALL 2021
COLLABORATOR BRENNAN HEYWARD
Southern Approach WORK. IN PROGRESS. Site Plan
Massing Model Photography

2 Bedroom Unit - Phase 1

2 Bedroom Unit - Phase 2

WORK. IN PROGRESS.
Typical Unit Floor Plans
Structural Chunk Diagram

Interior Courtyard

WORK. IN PROGRESS.
Facade Roadmap

Facade Kit of Parts

WORK. IN PROGRESS.
Basketball Court

Rooftop Terrace

Unit Module Kit of Parts

WORK. IN PROGRESS.
Designed and constructed by students in the “Outside-In Project” seminar during the Spring 2023 semester, this inflatable installation, titled GSAPP x WORM invites all kinds of interaction between user and pavilion. Visitors can walk through, play with, jump on, sit on, and lie down on the inflatable. The concept of a continuous line was employed to create simplicity in form for an ease of assembly and reduction in material cost and construction time frame. The pitched upper arms of WORM were designed to optimize incident sunlight to increase the efficiency of two mounted photovoltaic panels.

Anchored by weighted ballasts and filled with recycled foam, the lower section of WORM can accommodate any and all forms of interaction without impacting the structural performance or appearance of the inflatable. The economy of form allows for just a single blower to inflate the pavilion. Additionally, two industrial-grade colour-changing LED chords, and three charging cables, are powered by the PV’s mounted atop WORM’s Structure. Only one blower is used to keep this installation inflated.

Sited immediately in front of Avery Hall, this installation was designed in part for Columbia GSAPP’s “End of Year Show” and the school-wide graduation ceremony. This winning design proposal saw numerous design iterations and form optimizations throughout the course of the semester, but was ultimately built in just one day by the project team.

LOCATION_________ AVERY HALL, COLUMBIA UNIVERSITY COURSE_________ OUTSIDE-IN PROJECT CRITIC_________ GALIA SOLOMONOFF & LAURIE HAWKINSON TERM_________ SPRING 2023 PROJECT TEAM______ BRENNAN HEYWARD, VISHAL BENJAMIN, NICHOLAS RICHARDS, MARINA GUIMARAES, KELLY HE, DANIEL LI, & ZINA BERRADA

05_WORM INFLATABLE
Context Plan of Worm on Campus

Roof Plan and Circulation Plan from CDs

WORK. IN PROGRESS.
Daytime Render of Inflatable

Nighttime Render of Inflatable

WORK IN PROGRESS.
INFLATABLE WORK IN PROGRESS.

Detail Photos of Worm

Photo of Illuminated Worm
“Jessica opened her eyes to the desert stillness, to the mounting warmth of the day. Restless heat devils were beginning to set the air aquiver out on the open sand. The other rock face across from them was like a thing seen through cheap glass.

A spill of sand spread its brief curtain across the open end of the fissure. The sand hissed down, loosed by puffs of morning breeze, by the hawks that were beginning to lift away from the clifftop. When the sandfall was gone, she still heard it hissing. It grew louder, a sound that once heard, was never forgotten.”

Herbert, Frank. Dune, Chilton, 1965.

This triptych of renders acts as an exercise in architectural visualization and storytelling. Inspired by the cold, desolate, and unforgiving landscape depicted in the novel Dune, these images tell the story of a lone explorer searching for anything safe or salvageable in a post-human, dystopian future. The images document three parts of the explorer’s journey: discovery, approach, and the vast interior.
Through the process of 3D printing, silicone mould-making, and concrete casting, this project aimed to develop a series of tiles that aggregate to create an architectural screen. In addition to countless digital explorations, numerous iterations of concrete tiles were created to generate a distinct architectural detail. Drawings, animations, and photography were all digital tools that helped in the understanding, exploration, and development of tiles and their means of aggregation.

The arrangement of the tiles are loosely inspired by a basket-weave-like aggregation of three-dimensional forms. On their own, the tiles have two distinct faces—only upon being arranged together can it be understood that the tiles create identical patterns on the front and the back. An intricate balance of mass and void makes these tiles perfect for a full-scale architectural screen. They provide sufficient privacy for any interior space without sacrificing incident daylight.
Drawing of Tile Production Process
Bookend Arrangement of Tiles

Planar Arrangement of Architectural Screen

WORK IN PROGRESS.
This Single-Use-Plastic (SUP) Pavillion takes inspiration from three biological strategies of three distinct organisms. The modularity and form of the structure was designed based on the skeletal structure of the Radiolarian—a marine microorganism whose structure can regenerate following a fracture.

The (SUP)Pavillion operates in three stages. First, it leverages single-use plastic waste from locals—similar to the strategies used by the Burrowing Owl. In turn, the plastic that is placed within the voids of the structure helps in the diffusion of incident light—mimicking a strategy used by the Scarab Beetle, thus improving the thermal comfort for occupants and visitors. Lastly, once the voids in the structure are filled with discarded plastic, the waste is removed from the pavilion, processed, and formed into new modules to create a new (SUP)Pavillion.

Instead of plastic waste ending up in our oceans and landfills, this installation integrates a new closed-loop system within the single-use plastic industry.
**Phases of Plastic Production**

001_**Extraction**

The process of creating a plastic bottle begins with extracting oil from the earth, but is done through the use of a pumpjack on land, and an offshore drilling rig when being extracted from the seabed by a trawler.

The **Embodied Energy** of the Extraction of Oil for a Single Plastic Bottle is 0.56 kWh (34 kJ/kg).

002_**Storage & Transportation**

After being extracted from the earth, the oil is stored in drums, then transported to the refinery to be cleaned as preparation for processing into PET pellets.

This is the top of a network of transportation between sites throughout the production process.

003_**Refining & Processing**

Once the oil arrives at the refining facility, the oil is cleaned so it can be processed. The refined oil is then transported to a plastics factory and processed into PET pellets. The pellets are then melted and formed into uniform sizes of plastic sheets. These sheets are cut into bottles pre-forms, thus creating an empty plastic bottle.

The empty bottles are transported again to a bottling plant where they are filled with water. At this point, there have been 3 separate instances of transportation between various facilities.

004_**Transportation**

After being formed into the shape of a bottle and filled with water, the bottles are then transported to a commercial supplier and re-melted into recycled plastic.

005_**Retail & Storage**

Upon arrival, bottles are placed in vending machines, fridges, or displayed online. The bottles from the repurposed PET pellets are placed in storage until there is room in the containers for more production.

006_**Purchase and Consumption**

A customer purchases a bottle from the retailer, the fluids are consumed and the customer must now find a convenience to dispose or recycle the empty plastic bottle.

The **Embodied Energy** of a Single Plastic Bottle is 0.79 kWh.

The production process of a single plastic bottle results in the emission of 0.19 kg of carbon dioxide into the atmosphere, 36% of the weight of an empty plastic bottle (0.5%).
102

007. DISPOSAL/PLACEMENT

Instead of being disposed in the garbage or recycling, the pavilion EJECTS SINGLE-USE PLASTICS like bottles, straws, shopping bags, grocery bags, among others, FROM LANDFILLS and eventually ending up in our OCEANS.

The pavilion is seen as an attraction, thus incentivizing people to place their plastics in the void of the structure rather than throwing them away.

Since waste is ultimately diverted from landfills and recycling plants, the EMBEDDED ENERGY of the entire DISPOSAL process, 164,000 kWh is subtracted from the total embodied energy of the pavilion 0.5 kWh/bottle.

008. COLLECTION & SORTING

Once the voids in the structure are filled with PUBLICLY SOURCED PLASTICS, employees remove the items from the structure and sort them by material into garbage bins.

These bags are then transported to the production facility where they will be cleansed.

009. CLEANING

Upon arrival at the production facility, employees begin collecting bags of the debris that were disposed of from its initial use.

Once completely washed down, the plastics are left to dry to ensure no excess moisture is introduced to the shredding process.

The EMBEDDED ENERGY of CLEANING enough plastic for a SINGLE MODULE is 124 kWh. It would take 12,316 kWh to come enough plastic for its ENTIRE PAVILLION.

010. SHREDDING

After drying complete, the cleansed plastics are shredded into an industrial shredding machine that grinds the items into small, pellets-like pieces. Any foreign particles that pass through the machine are filtered out. The shredded plastic pieces drop into large bins and are moved to the pressing station.

It takes 120 kWh to SHRED ENOUGH PLASTIC FOR ONE PAVILLION (0.5 kWh/bottle).

011. MODULE PRESSING

The shredded plastic pieces are fed into a machine that heats up, melts, and extrudes the nearly-uniform material into individual module molds made from steel while still hot, the entry hole is sealed and the entire steel mold is submerged in cool water.

Once fully cooled, the steel molds are taken apart so the plastic module can be removed and any excess material can be cleaned off modules varying in size and shape so there are a set number of steel molds for each module type.

The EMBEDDED ENERGY of MELTING enough plastic for one pavilion is 795 kWh (4.44 kWh/m3 each).

On average, it takes 1 kg of SHREDDED PLASTIC, or 40 plastic bottles, to produce a SINGLE MODULE.

This means that approximately, 328,000 bottles would go into the production process at a new pavilion.

012. TRANSPORTATION & ASSEMBLY

Once all modules for the pavilion have been formed, they are collected, organized, and transported to a different public park in a different city. Upon arrival, the pavilion is assembled and begins to leverage single-use plastic from new pavilions to a new pavilion can be constructed again.

The embodied energy of transportation depends on the distance between each facility and its corresponding pavilion as well as the weight and carrying capacity of the transport vehicle. If it would take such a trip to TRANSPORT 4300 kg of plastic (40,000 bottles), each pavilion is constructed of 4200 modules and the TOTAL EMBEDDED ENERGY OF ONE PAVILLION IS 12,742 kWh, 150 kWh/module.

With the subtraction of the energy diverted from recycling plants, the pavilion is NET POSITIVE, SAVING 1 TOTAL at 15,000 kWh.
made from 328,000 plastic bottles (8,200 kg of plastic)

plastic cleaning accounts for 81.7% of production energy

plastic shredding accounts for 11.7% of production energy

module pressing accounts for 6.15% of production energy

transportation accounts for 0.38% of production energy

net positive savings of 151,058 kWh per pavilion

total embodied energy to produce is 12,942 kWh (~151,058 if diverted energy is included)

total of 164,000 kWh diverted prior to production process

constructed from 8,200 individual modules

Pavillion Features
As designers in today’s field of architecture, we’ve come to learn that role of an architectural designer is not as monodisciplinary and specialized as it may once have been. Instead, we as designers wear many hats—we explore techniques in graphic design, business, architectural visualization, model making, research, public speaking, history, personal branding, sales, and photography, among many other niches.

Misfits are not full projects. They are sketches, architectural models, case studies of real-world experiments, explorations in graphic design, architectural visualizations, etc. These images stand to represent my transdisciplinary approach to designing over the course of my time here at GSAPP. Together they represent the experimentation and exploration of a workflow that yields ideas and designs that will eventually become full projects.

This selection of multidisciplinary work is a reminder to myself that the process behind each project holds value. From the numerous errors to countless iterations, and from the many trials to small and intimate moments of inspiration.
Corner Typologies in West Harlem for Core I

Model Photograph for a Culinary Institute in West Harlem for Core I
Model of DS+R's Alice Tully Hall for ADR I

Render of 33 Thomas St. for Adv V

WORK. IN PROGRESS.
Classroom Render for Core II

Exploded Axonometric of Hannes Meyer’s Petersschule for Core II
Kings Crescent Section Model for Core III

09_MISFITS

Kings Crescent Taxonomy of Thresholds for Core III

WORK. IN PROGRESS.
WORK.

IN PROGRESS.

A PORTFOLIO BY SAMUEL BAGER.

M. ARCH, COLUMBIA GSAPP.