

# Portfolio

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ziegelmueller.me  
Winter 2022

## INFLATABLES

spring 2022  
design studio  
Nanako Umemoto

Design, prototype, and fabrication of vinyl inflatable seating furniture based on found-object primitive. Employ precise analog manipulation of 2D-to-3D surfaces to unify representational and material logics.

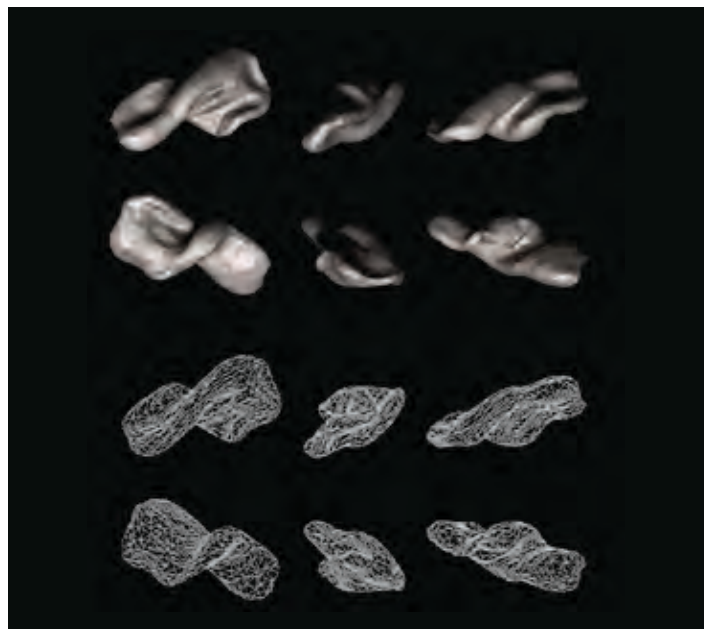
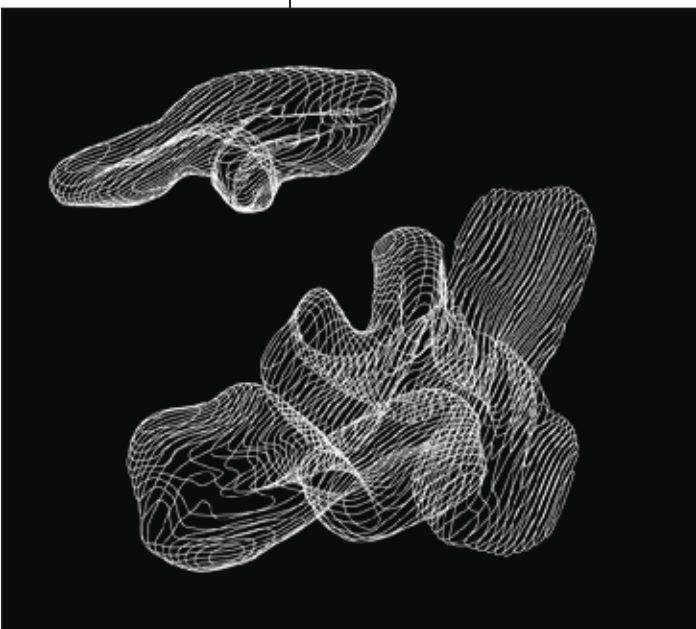


The studio brief focused on volumetric relationships in the human body and material composition. A three-dimensional amalgam was sculpted from our readymade objects: dryer vent tubing.

Our initial explorations derived their forms from sculptural impressions of the human body. Overlapped photos of different body positions created stick-figures and flows which were then interpreted and modified with the tubing.



This clay object was the result of rapid iterations using cues from the tubing experiments translated into three dimensions. The object combined two masses twisted to create an impression of a human figure in repose. This primitive was then used to create the full-size tubing model shown above. 3D scans of the clay model gave us the opportunity to investigate its form in more detail. These collages were used to demonstrate the object's relationship to the human figure using a series of multiple-exposure photographs (not included here).







The tubing model was later subject to a skinning process in which we extracted a surface-map or net from its form by covering it in butcher paper and impressing or tracing important lines before cutting it apart and flattening it. This produced a paper "inflatable." This revealed construction challenges in the base shape where concave and detailed surfaces were lost.







Over the course of three weeks of around-the-clock work this paper net was projected & traced, transferred to vinyl, pieces cut, creases created, seams welded, and a valve and gravel weights were added to what was now a room-filling vinyl inflatable. It popped the minute we sat on it!





# OFF/SET

Fall 2021  
architecture studio  
prof. Aaron Schump

sitework

OFF/SET is an artists' gallery and residence sited between the numerous civic and cultural landmarks which define St. Louis' Grand Center Arts District. To the south and east museums and galleries dot the streets. To the north and west, civic buildings loom. OFF/SET connects these two realms by activating a lot flattened by urban renewal efforts with a sidewalk-focused and open design.

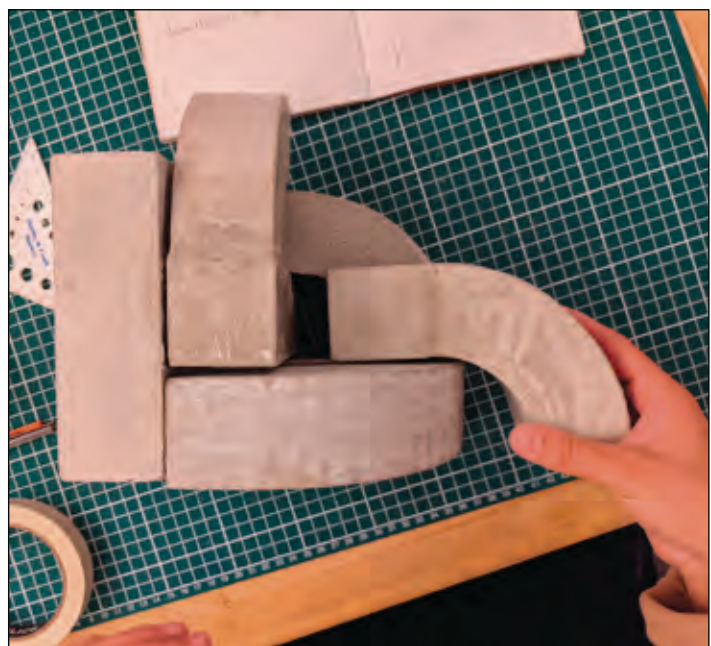
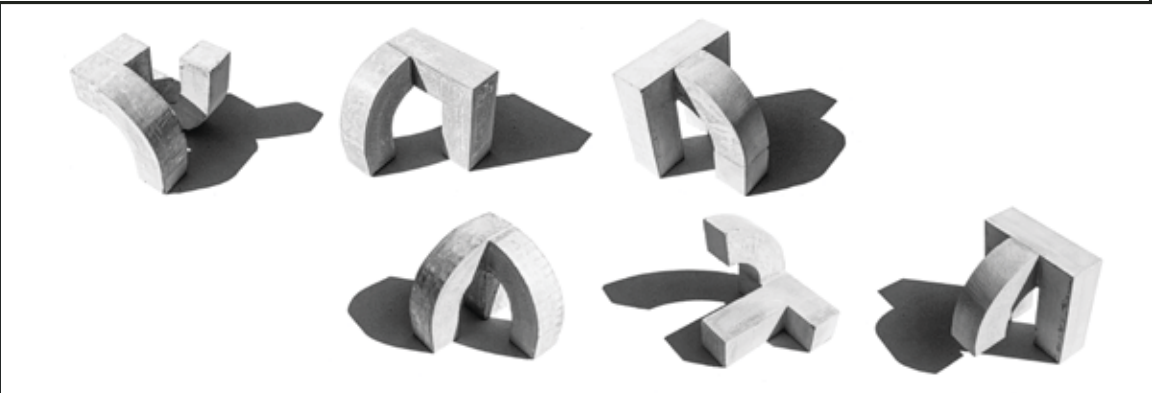
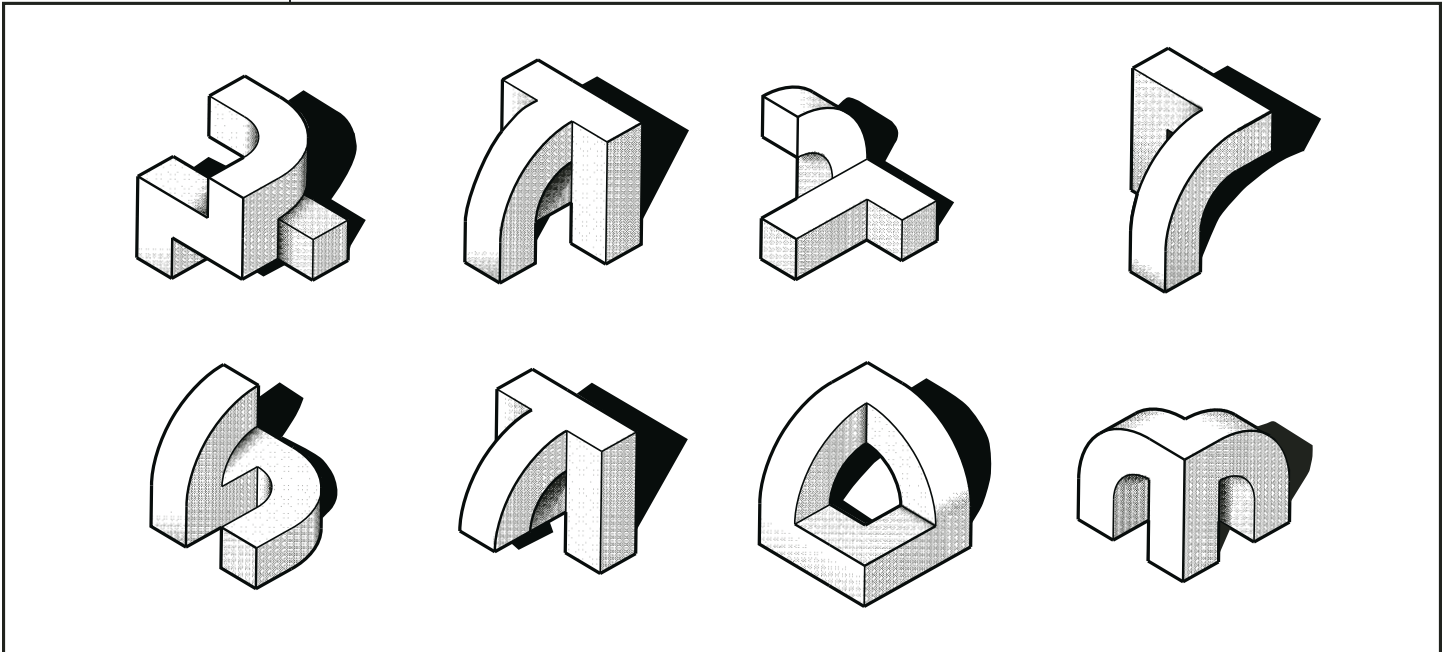


An extended site visit afforded the opportunity to photograph and measure the lot itself and nearby buildings. The entire studio collaborated to create two 4'x8' models in 1/32" of the entire neighborhood.



modular massing

A massing concept for the gallery was originated from a set of eight modules cast in concrete. Each module was created by combining a unit cube and a curve to create semi-porous assemblages which could then be stacked and interlocked.





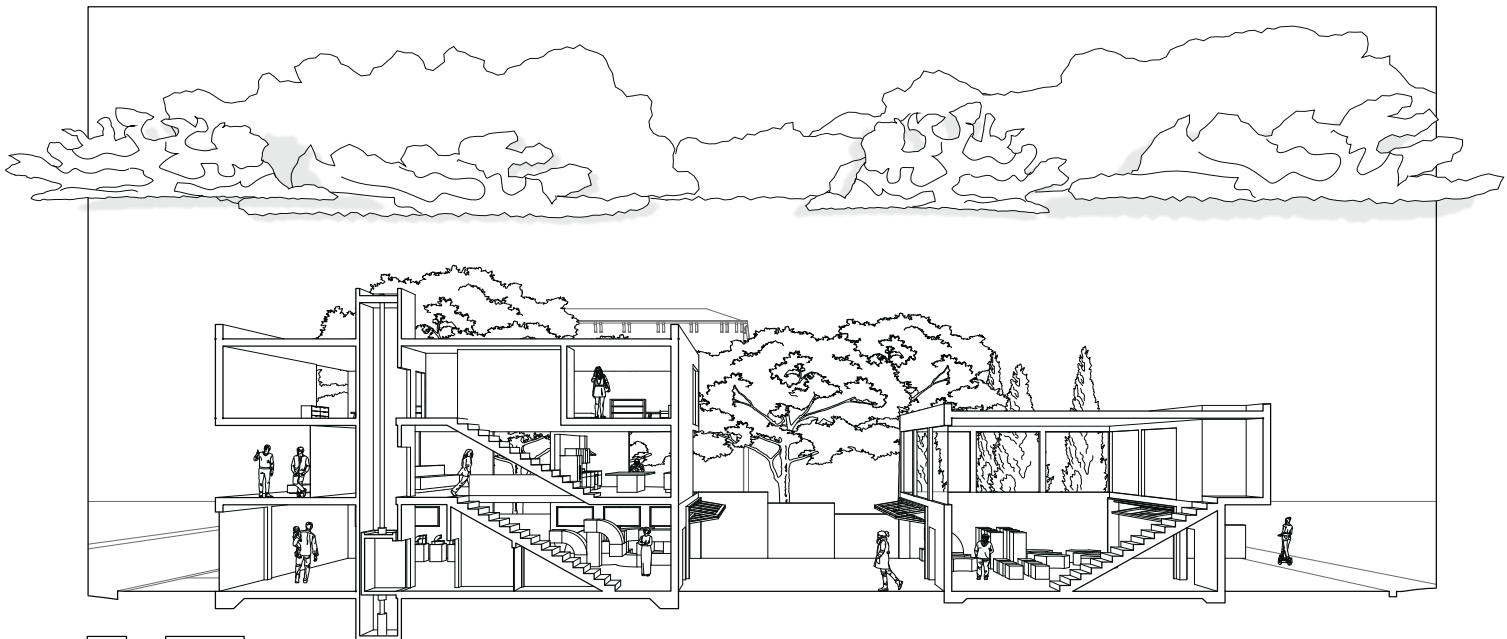


0' 6' 12' 24'

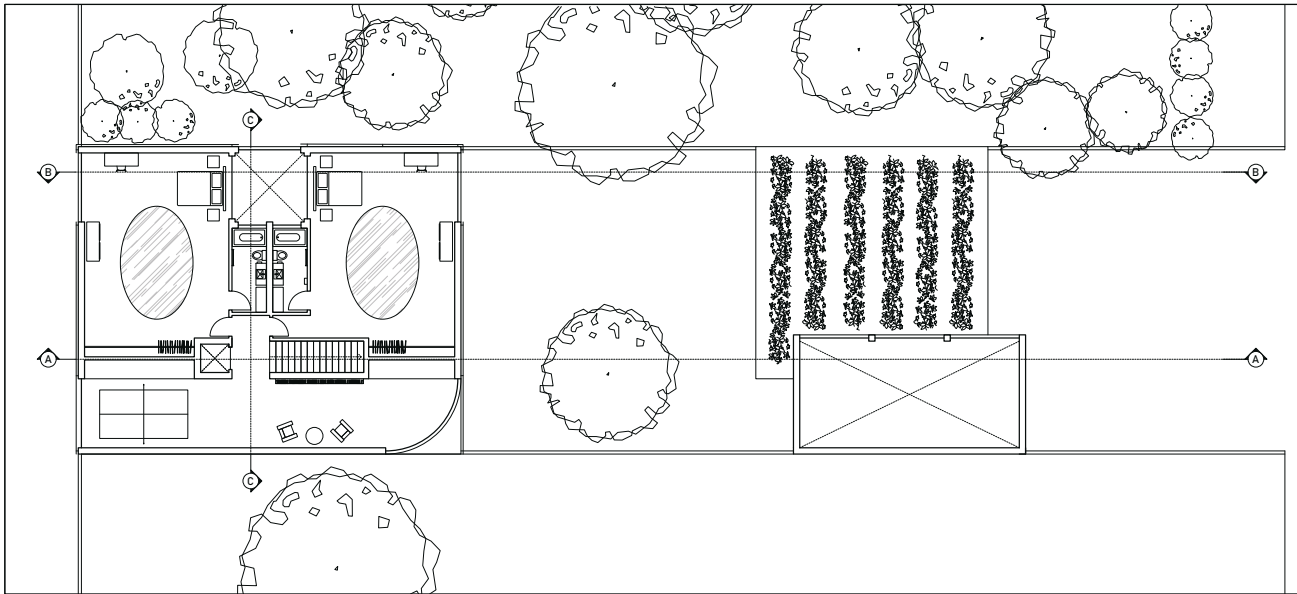


0' 6' 12' 24'

Inspired by Lewis, Tsurumaki, & Lewis' "Manual of Section," I found that the section perspective vastly improved my section drawings and created a much better overall impression of how the building might fit into its landscape. Operating on the section unlocked new and unexpected methods for managing the complexity of a below-grade ground floor and adding interest to the otherwise geometric massing. Section A highlights circulation elements, Section B shows how the courtyard might be used to host seasonal events, and Section C focuses on the elegant integration of structure and landscape.

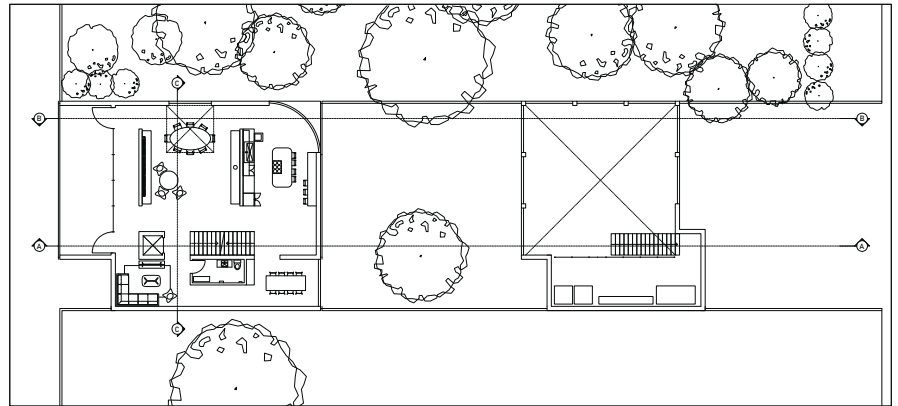


0' 6' 12' 24'

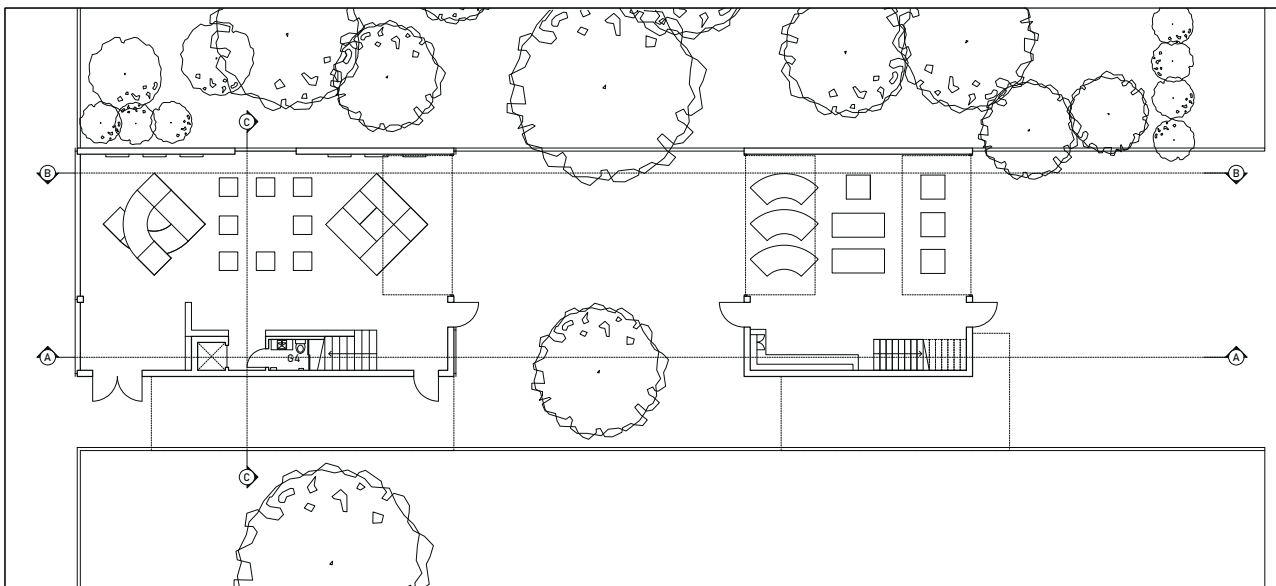
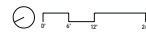


PLAN: THIRD FLOOR

The combination program of gallery, studio, and housing presented a complex of use cases and circulation. To simplify the task, each component was separated across two buildings which mimic the residential house-and-garage typology in the area. The main building consists of the gallery on the ground floor, a common space on the second floor, and bedrooms on the third floor. The out-building is a double-height space with a loft and provides plenty of room for a large studio and workshop. The entire site plan has been shoved forward to abut the sidewalk and create an urban gallery-window feel in this otherwise frontage-averse neighborhood. Interior design, landscaping, and green roof details were also included here.



PLAN: SECOND FLOOR



PLAN: GROUND FLOOR







Deliverables included models at 1/32", 1/8", and 1/4", the latter of which is shown here. Constructed in layers and stacked up, the model features accurate topography, landscaping, and a full interior.. See more materials at [ziegelmueller.me/projects](http://ziegelmueller.me/projects)

## COURTHOUSE

spring 2021  
architecture studio  
prof. Sung-Ho Kim

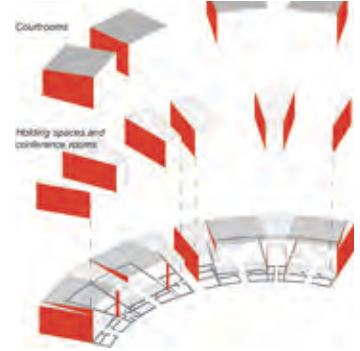
Convert a historic Saint Louis office building into a courtroom courthouse using detailed observation, fundamental means of 2D representation, study models, and physical-digital modeling techniques. My proposal, modeled here at 1/4" scale, rotated the first floor on its foundation.



The design process began with studies of several existing courtroom designs. This interior view of the Federal Courthouse in Springfield, MO inspired careful consideration of lighting and sectional qualities in later study models. This research work was performed in a group with Maya Yidrim and David Ye.



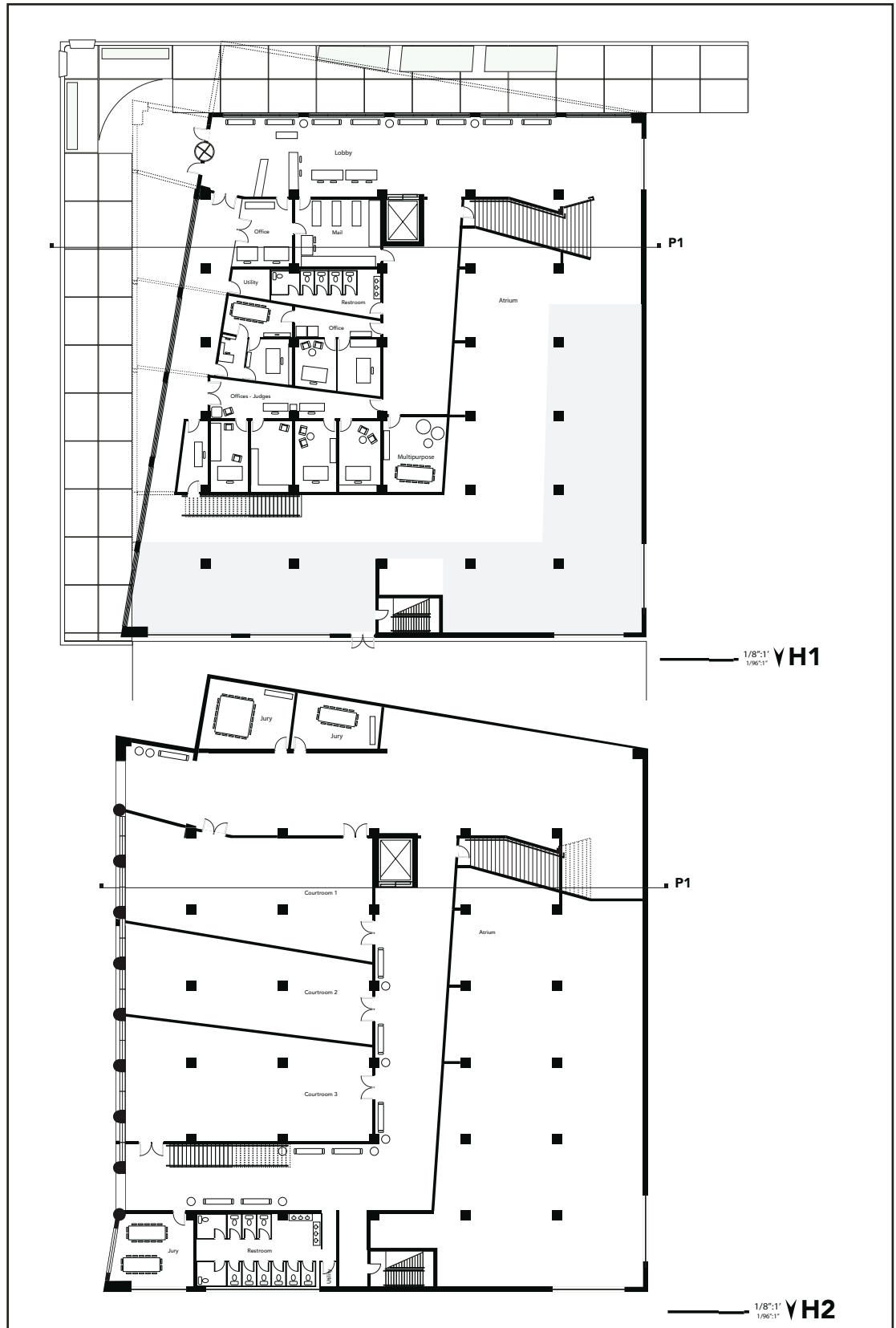




After examining the courtrooms in Springfield, we moved our attention to the courthouse itself. Using first collages created from existing photographs and then a representational study model, elements of interest were extracted. These were then re-imagined in more conceptual modular models.



These plan drawings show the complexity involved with shifting the floor plans without causing awkward poché spaces. Each courtroom wall lies on a ray projected across the grid and is perpendicular to the angled outer wall. Special consideration was given to separate circulation for judges and the public. Also depicted in H1 is the extended sidewalk space to the left of the building's first floor.







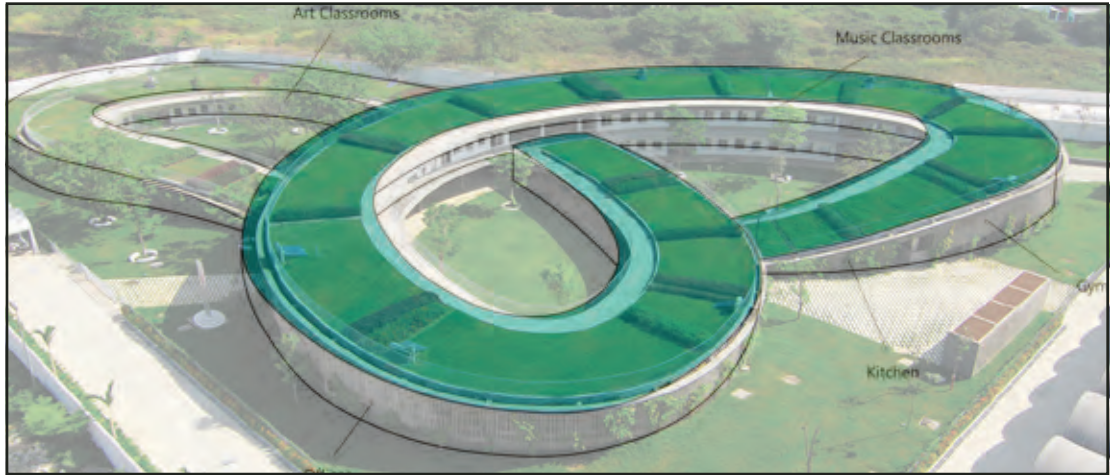
A 1/4" scale study model was used to interrogate the interactions between column and facade. A diagonal section cut was used to open up the back of the courthouse, a difficult modeling decision.

# KINDERGARTEN

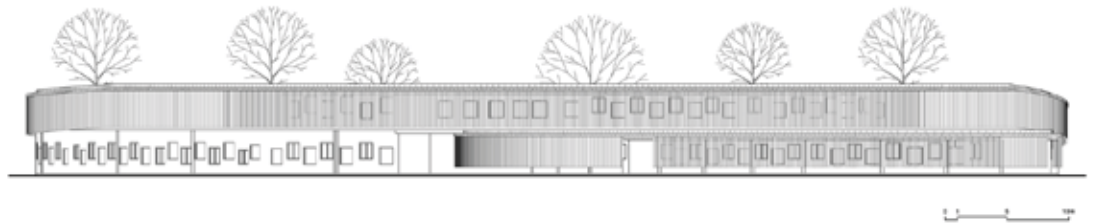
fall 2020  
architecture studio  
prof. Bruce Lindsey

case study

"Fremont Park Kindergarten" combines site-aware landscaping and whimsical cube-modules to create a vibrant space for learning in Soulard, an upscale Saint Louis neighborhood. Challenged to design for a balance of play and education, precedent studies of existing education projects and basic 3D modeling were used to shape a collaborative proposal for a kindergarten on the site.



Dong Nai Farming Kindergarten by Vo Trong Nghia Architects (2013) was selected as an example of innovative programming and effective engagement with site conditions to create a highly specialized learning environment. Because Dong Nai is an industrial-agrarian area (the kindergarten was built by a shoe factory for its workers' families), the curriculum and design integrates agricultural learning.



site work

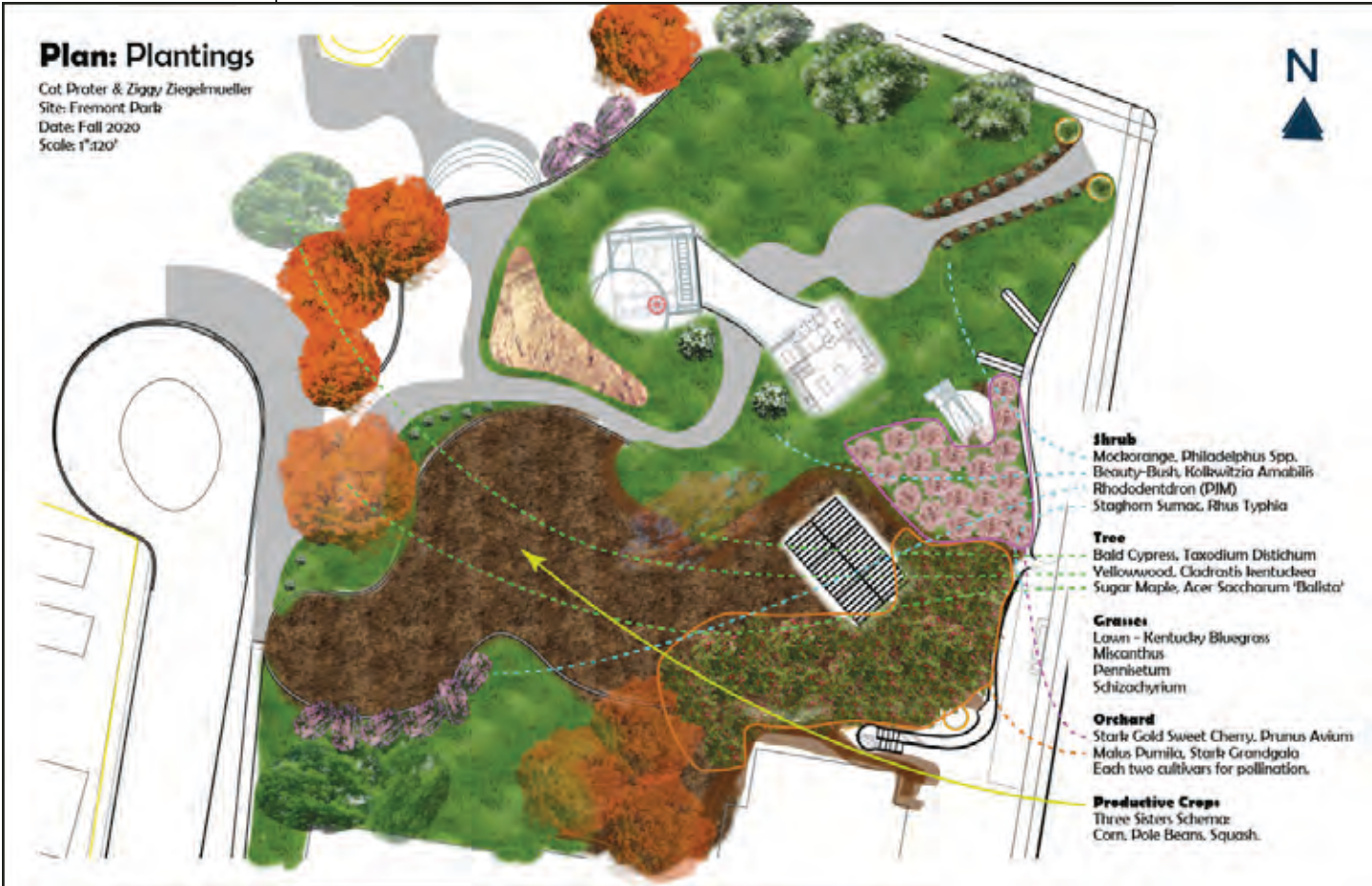


Visiting our site was important to me despite restrictions on group activities due to COVID. Inspired by Vo Trong Nghia Architects' focus on locale-specificity, I looked mostly outwards from Fremont Park to the surrounding neighborhood to find design cues. Soulard is peppered with historic architecture, mostly red brick manors with corner entrances and hardwood molding. This photo collage is an impression of a park-goers' experience and very effectively evokes the timbre of the place despite being rather messy!



# Plan: Plantings

Cot Prater & Ziggy Ziegelmueller  
 Site: Fremont Park  
 Date: Fall 2020  
 Scale: 1"=20'



- Shrub**
  - Mockorange, Philadelphus Spp.
  - Beauty-Bush, Kolkwitzia Amabilis
  - Rhododendron (DJM)
  - Staghorn Sumac, Rhus Typha
- Tree**
  - Bald Cypress, Taxodium Distichum
  - Yellowwood, Cladrastis kentuckea
  - Sugar Maple, Acer Saccharum 'Ballista'
- Grasses**
  - Lawn - Kentucky Bluegrass
  - Miscanthus
  - Pennisetum
  - Schizochyrium
- Orchard**
  - Stark Gold Sweet Cherry, Prunus Avium
  - Malus Dumica, Stark Grandgala
  - Each two cultivars for pollination.
- Productive Crops**
  - Three Sisters Scheme:
  - Corn, Pole Beans, Squash.

Effectively deploying landscaping while providing and transforming the massive grassy field into a multi-use park with the potential to bring together students and neighbors was a top priority. Here, plan drawings of three buildings (two academic buildings and a greenhouse) are combined with a planting plan to communicate this focus.

## Fremont Park Kindergarten: References

Cot Prater & Ziggy Ziegelmueller  
 Site: Fremont Park  
 Date: Fall 2020

Davling, Pam. "The Year-Round Hoophouse: Polytechnic for All Seasons and All Climates." Canada: New Society Publishers, 2018.  
 Davling describes the advantages of the Hoophouse while providing plans and material specifications for the construction of a polyhouse to suit anyone's needs, the ethos of self-sufficiency, independence, and ecological consideration within provided a useful model for creating a productive garden within our site.

Harold, Fisk. "THE ALLUVIAL VALLEY OF THE LOWER MISSISSIPPI RIVER." Map across 17 plates, 1944, Radical Cartography, Accessed December 2020. <http://www.radicalcartography.net/>

Hemenway, Toby. "Soko's Garden: a guide to home-scale permaculture." White River Junction, Vermont: Chelsea Green Pub. Co., 2002.  
 Hemenway provides a library of suggestions for the home gardener who maintains a productive garden responsibly designed to protect ecology and produce efficiently. The scale at which "Soko's Garden" operates matches our goals closely; this informs our choices around productive permaculture spaces, such as the use of cover crops and orchard placement.

Low, Jim. "Roadsides, Industrial Sites, Mining Areas." Discover: Nature Field Guide. Missouri Department of Conservation, Accessed December 2020. <http://www.mdc.mo.gov/nature/naturefieldguide/roadsides-industrial-mining-areas/>

Missouri Department of Conservation. "Cliffs." Discover Nature Field Guide. Missouri Department of Conservation, Accessed December 2020. <http://www.mdc.mo.gov/nature/naturefieldguide/cliffs/>  
 Cited here twice: the Missouri Department of Conservation Field Guide was imperative to our site-specificity because it provides information about the natural surroundings and geology. Our research focused specifically on the Limestone cliffs around the St. Louis area, the species of flora and fauna that occupy them, and the human influence on conservation efforts across Missouri. These will be critical elements of Kindergarten curricula in the future; our design is couched in a careful consideration of teachable elements related to these research areas.

Vivian, John. "The Three Sisters: Corn, Beans, and Squash." Mother Earth News. Ogden Publishers, Inc., February 2003, Accessed December 2020. <http://www.motherearthnews.com/food-gardening/2003-02-03/food-gardening/03fe03vivian.asp>  
 Vivian describes the use of the Three Sisters in Native American and other agricultural traditions. Corn, pole beans, and squash both provide a complete diet and maintain soil health; this combination has likely been planted in Missouri fields for millions. Connecting the future of food-education to this history was an imperative.

## Plantings Reference

Date	Sun	Type	Bloom	Common, or in Cultivar
SH-01	●	P	Spr	Rhododendron, PJM
SH-02	●	P	Spr	Staghorn Sumac, Rhus typha
SH-03	●	P	Spr	Beauty-Bush, Kolkwitzia Amabilis
SH-04	●	P	Sum	Mockorange, Philadelphus spp.
SH-05	●	P	Sum	Goodyera Spirea, (various cultivars)
SH-06	●	P	Sem-FE	Smoothleaf Hydrangea, (various cultivars)
SH-07	●	P	Sum	Box Saver, Moraea, Gardennew Scarlet
SH-08	●	P	Sum	Lavender, (various cultivars)
SH-CR-01	●	P	Sem-FE	Raspberry Bush, Rubus, (various cultivars)
SH-CR-02	●	P	Sem-FE	Rubus, (various cultivars)
CR-01	●	A	Spr-FE	Bean
CR-02	●	A	Spr-FE	Pole Beans
CR-03	●	A	Spr-FE	Yellow Squash
CR-04	●	A	Fl	Carrots, (various cultivars)
CR-05	●	A	Fl	Radishes, (various cultivars)
CR-06	●	A	Fl	Lettuce, (various cultivars)
GR-01 LW	●	-	-	Kentucky Bluegrass
GR-02	●	P	-	Miscanthus
GR-03	●	P	-	Pennisetum
GR-04	●	P	-	Schizochyrium
TR-01	●	T	-	Bald Cypress, Taxodium Distichum
TR-02	●	T	Apr	Yellowwood, Cladrastis kentuckea
TR-03	●	T	Apr	Sugar Maple, Acer Saccharum 'Ballista'
TR-OR-01-0	●	T	Apr	Stark Gold Sweet Cherry, Prunus avium
-1	●	T	-	C: Bing
-2	●	T	-	C: Stark Tartarian
-3	●	T	-	C: Stella (Note: self-compatible)
TR-OR-02-0	●	T	Apr	Apple tree, Malus Dumica
-1	●	T	-	C: Stark Grandgala
-2	●	T	-	C: Starkspur Golden Delicious

Note: Dwarf, semi-dwarf rootstock, all TR-OR-02.

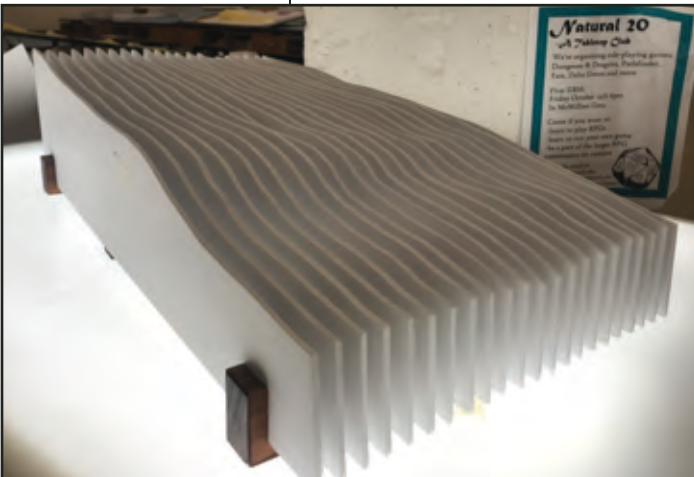
Plant Information Missouri Botanical Garden, "Plant Finder" Database, Accessed December 2020. <http://www.missouri.edu/obot/garden.org/PlantFinder/PlantFinderSearch.aspx>



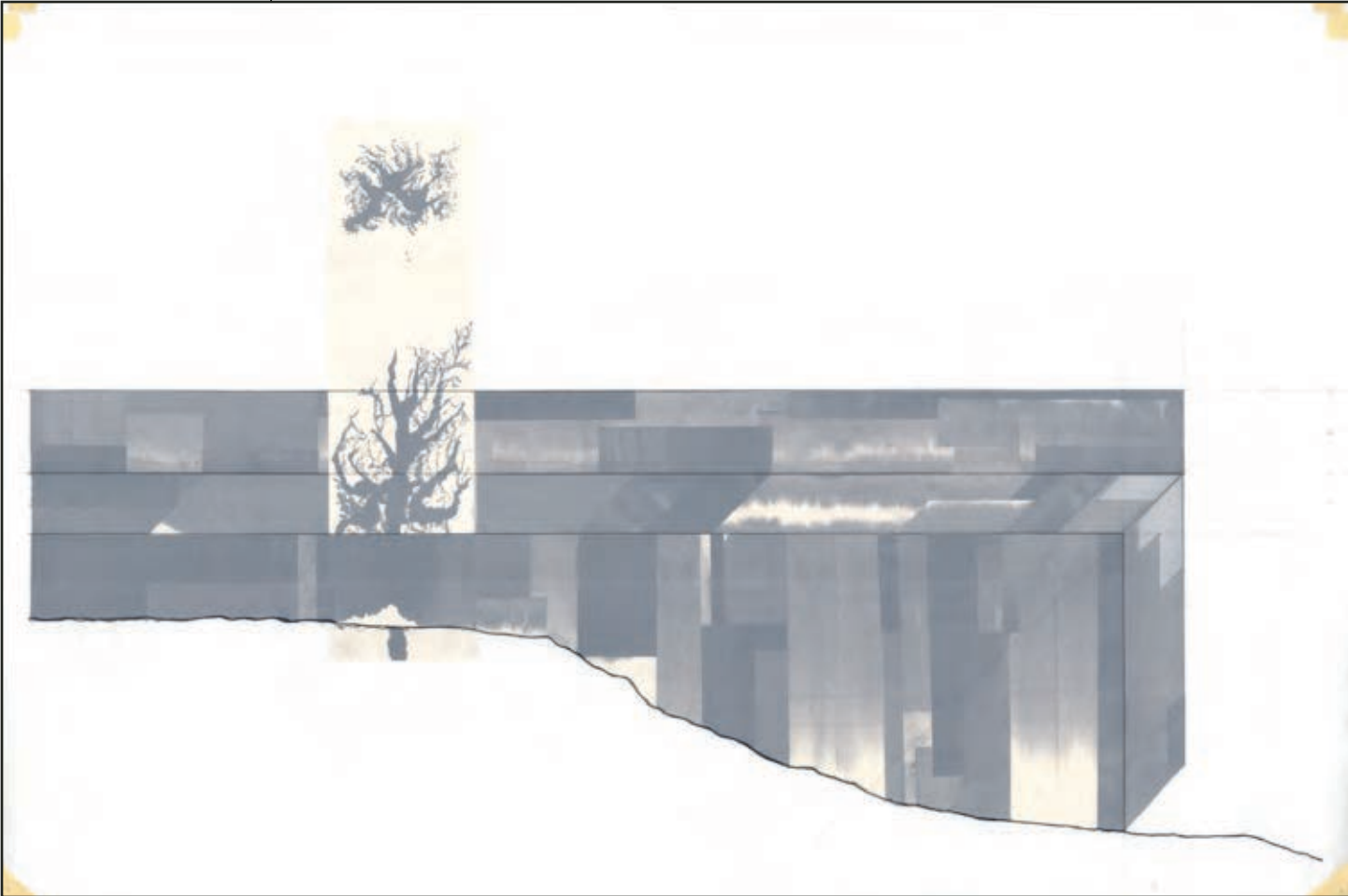
# MONOLITH

fall 2019  
introductory studio  
prof. Carl Karlen

Create a space for dialogue or a meeting place amidst the trees which line Art Hill in Forest Park, Saint Louis. Inspired by Ursula K. Le Guin's cinematic sci-fi writings, I used a single gesture to exploit the existing topography and create a space above and apart where a conversation may take place in private.



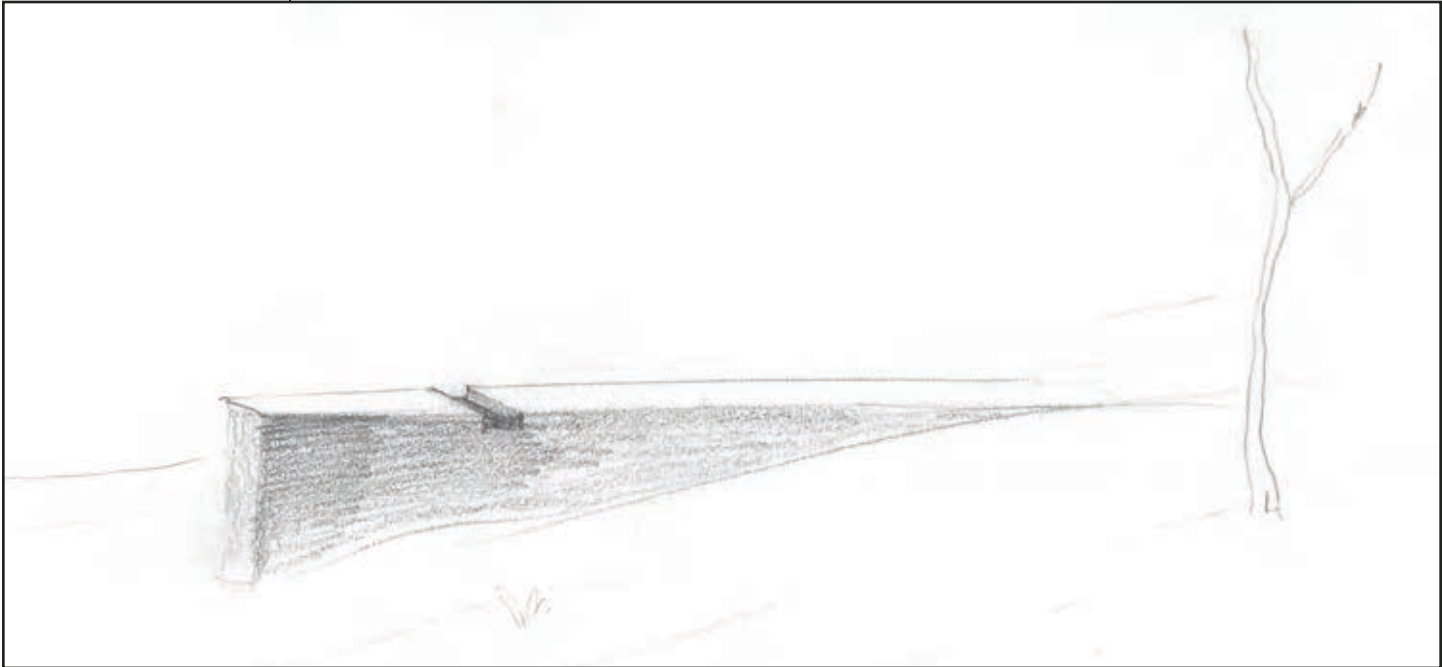




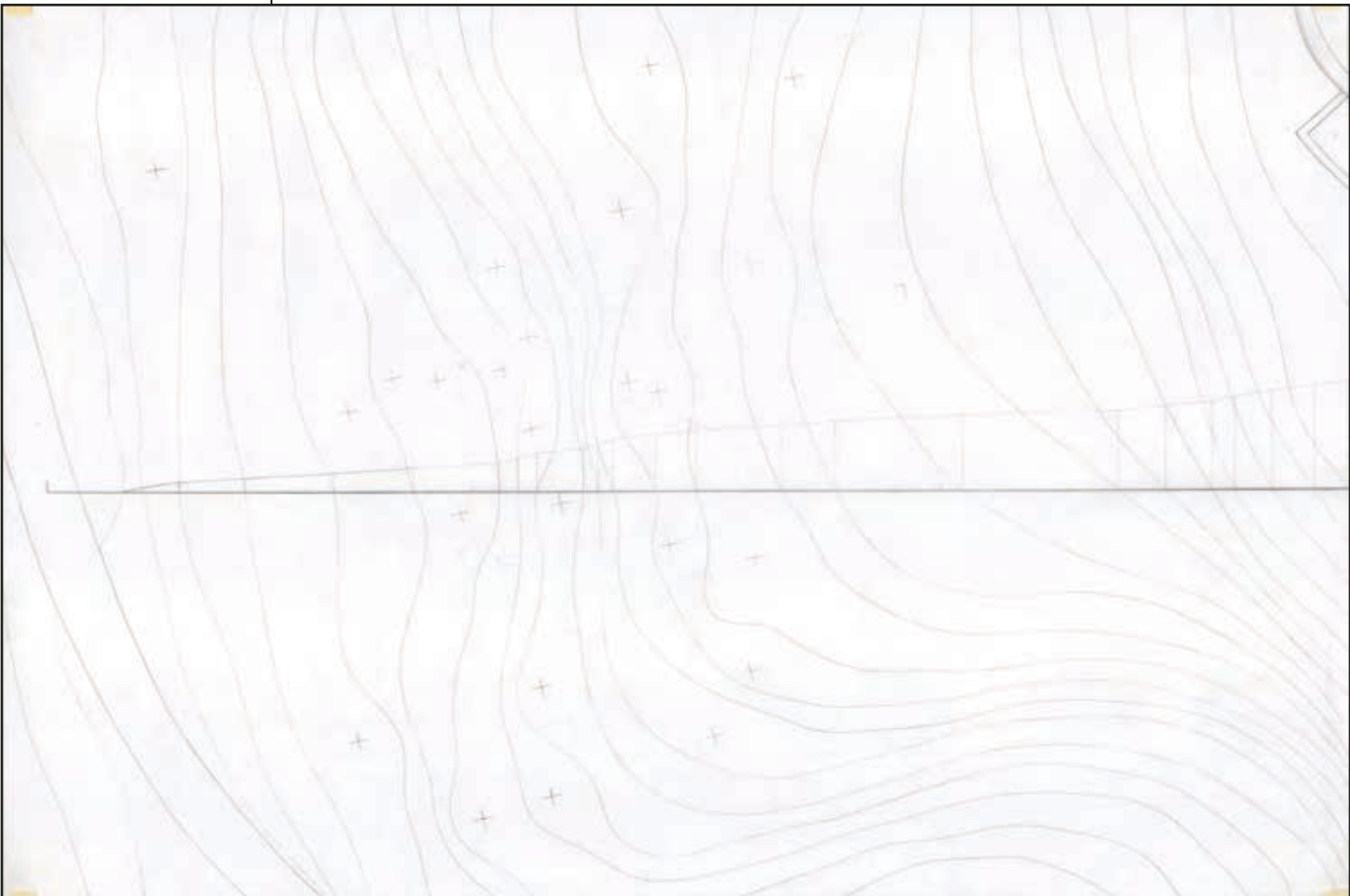
Previous page: a 1/8" scale model was created from USGS topographic data and on-site observations to capture the terrain characteristics and to provide a base into which the design proposal could be inserted.

Above: rice paper, sumi ink, and pencil on arch D size mylar and stonehenge backing are combined to create a multiview collage which captures concept, scale, and materiality. The topographic section cut, plan view, and an isometric perspective are all arranged next to each other in a sort of origami pattern. A tree provides scale in plan and section. Experiments with dyed rice paper provide texture and evoke a washed concrete material. Measurements from this drawing were used to create the drop-in structural model shown on the previous page.

Left: a photograph from the site shows a beautiful prospect line-of-sight around which the proposal is centered.



Above: Quick-and-dirty sketch from a desk crit shows a simple modification I considered. While this space is more architecturally interesting, I felt it too prescriptive and preferred the simpler solution. Below: Scale topographic drawing on mylar (Arch D) made from USGS data and site observations. This was used to create the section profiles (one of which is shown) for the model shown on page 16.

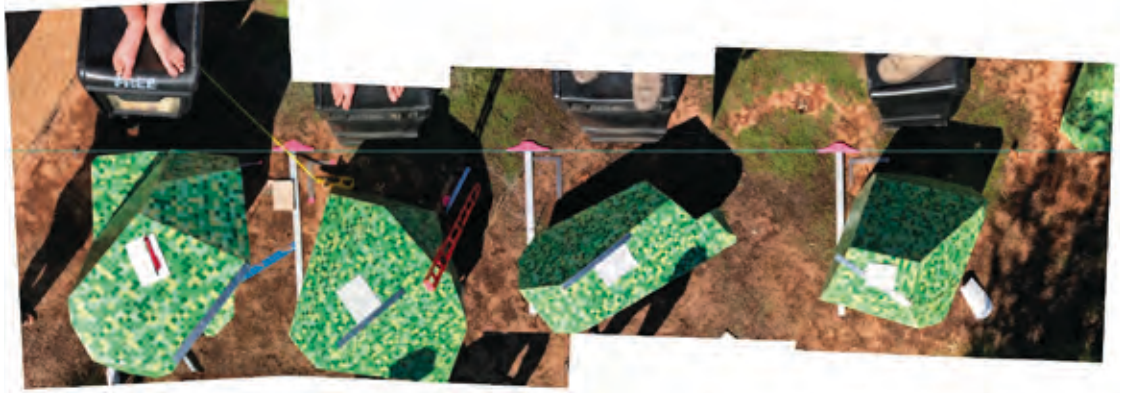




# "PLACES"

fall 2019  
introductory studio  
prof. Carl Karlen

Create a measured multiview drawing and collage of the on-campus sculpture entitled "Places" by Iranian artist Ayşe Erkmen using original survey measurements, careful observations, and field sketches.



The most challenging part of this project was undoubtedly obtaining accurate measurements of these irregular objects. I worked with a group to develop a photogrammetry workflow that let us extract dimensions from photos and compare those to a limited number of known measurements taken onsite to establish a scale factor. Without the use of CAD or even spreadsheet software, this factor was used to calculate reasonably accurate dimensions entirely by hand. The drawing itself was therefore a breeze!

