

# SELENA ZHEN

ARCHITECTURE  
WORK SAMPLE

**04 ENVIRONMENTAL CHARTER SCHOOL**

**10 CITRA**

**14 MATERIALS + ASSEMBLY**

**16 LUNAR GALA - SURFACE**

**20 HIGH RISE 'UNTITLED'**



I'm currently a student at Carnegie Mellon University pursuing my Bachelor's Degree in Architecture and Minor in Human Computer Interaction as well as a passion for the beauty of experience and detail. I strongly believe in the process of design and its applications to situations outside of architecture and design, and am looking forward to ways I can improve human experience, expand my skillset, and develop new methods of approach to design.

# ENVIRONMENTAL CHARTER SCHOOL

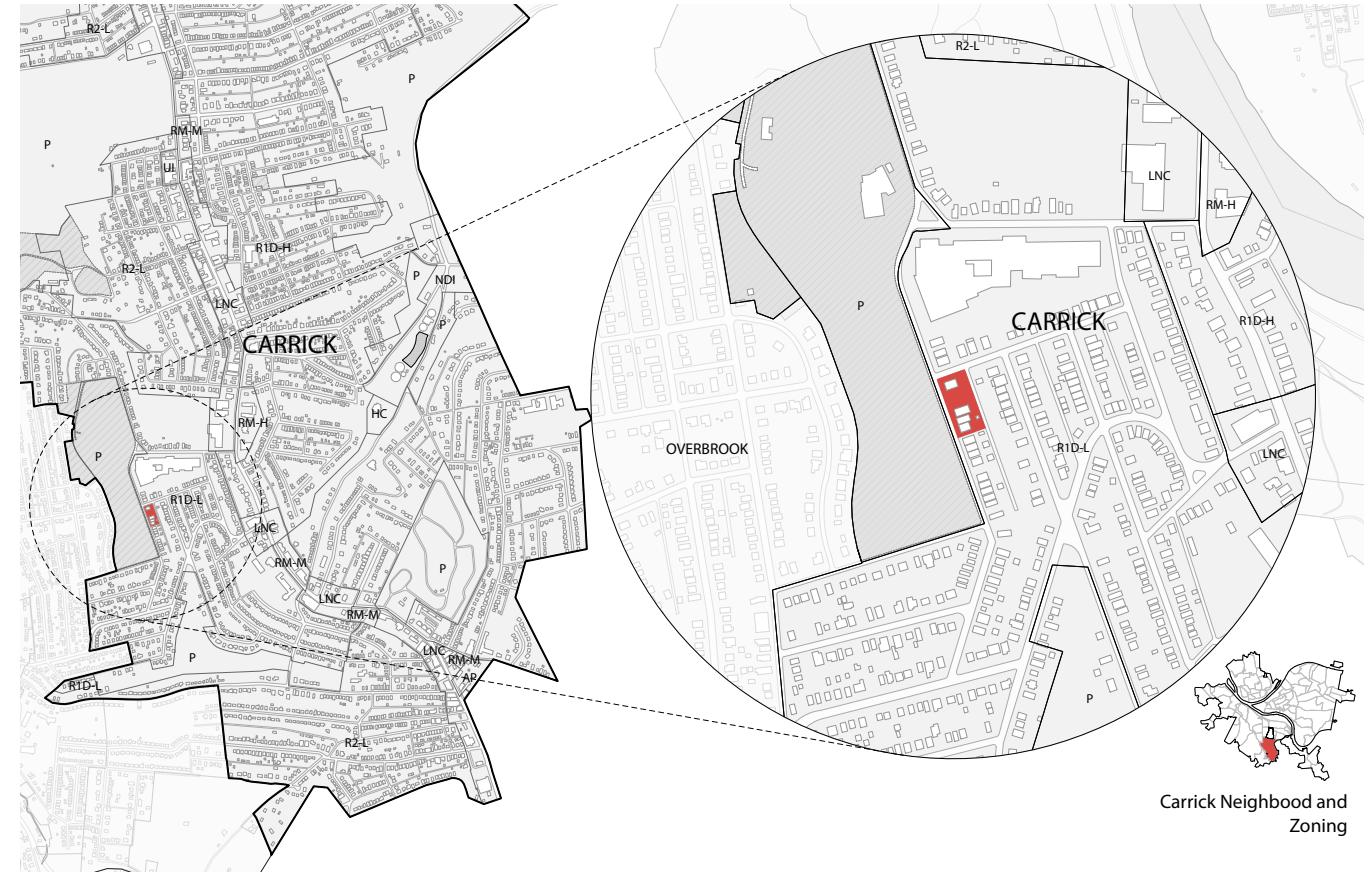
3rd Year | Spring 2018  
Advanced Construction Studio

## GOAL:

The Advanced Construction Studio project focused on working together with the leadership, teachers and students of the Environmental Charter School (ECS) in Pittsburgh to explore concepts for the design of their next generation of middle schools. I was asked to prototype a charter middle school for 6th to 8th graders based on their school values. A fundamental aspect of ECS is to teach ecological literacy. To this end, students and teachers must be provided the opportunity to actively engage in the operation of the building - from passive strategies to active strategies to measuring and verification of performance. The goal of the project was also to use previous knowledge of design methods and extend those skills to understand spatial systems, structural systems, enclosure systems, material systems and construction systems for the building.

## FROM THE PA DEPARTMENT OF EDUCATION WEBSITE:

"Charter schools were created to provide opportunities for teachers, parents, students and community members to establish and maintain schools that operate independently from the existing school district structure as a method to accomplish the following: improve student learning; increase learning opportunities for all students; encourage the use of different and innovative teaching methods; create new professional opportunities for teachers; provide parents and students with expanded choices in the types of educational opportunities that are available within the public school system; and be accountable for meeting measurable academic standards."



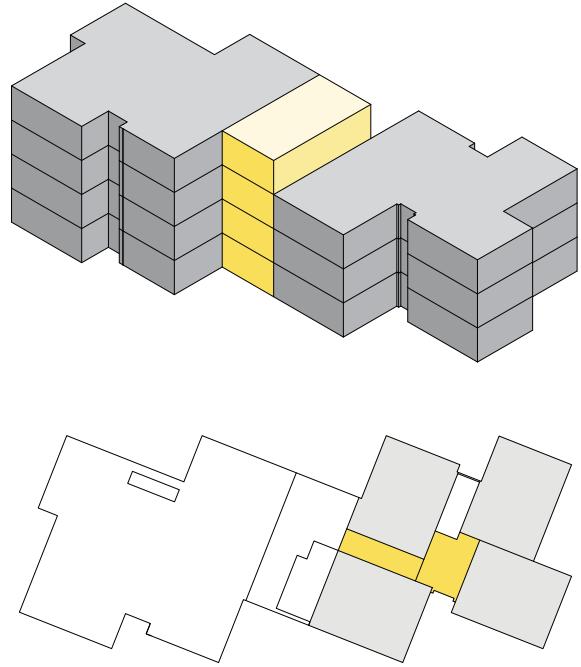
## SITE

Carrick Neighborhood, near Phillips Park and Carrick High School

- 2237 Spokane Ave
- 2241 Spokane Ave
- 2245 Spokane Ave
- 2249 Spokane Ave
- 2251 Spokane Ave

## LOCATION DESIGN

The site for the Environmental Charter School project is down the street from Carrick High School, across the street from Phillips Park. After speaking to residents of the neighborhood, we found that it was a popular commuting area, and many families have to send their students to middle schools in other neighborhoods. This site is ideal for students of the Carrick neighborhood, as this neighborhood does not have a 6-8 school.



## CONCEPT

The building is separated into three parts; the North and South wings, connected by circulation and social spaces. Each wing on each floor holds a different purpose, and the program is spread throughout these areas; for example, every grade is located within its own 'neighborhood' wing of 4 studios. Also, the building is situated so it faces the direct cardinal directions, allowing the school to have direct views of Phillips Park, and to take advantage of the solar benefits. The 4th Floor South Wing is designed as an Outdoor Learning Space, allowing opportunities for students to learn about the passive and active systems of the building, as well as urban garden systems.

## STUDIO DESIGN

The floor plan of the building is designed so that each studio has at least 2 directions of natural light and a small outdoor patio for individual outdoor learning opportunities. The studios' windows are designed to double as a learning space as well as fenestration. The brick rainscreen between two windows works as a screen to allow in various types of light and provide an interior design opportunity for seating or shelving.

## STRUCTURE

The Environmental Charter School is designed as a steel structure system, with a brick rain facade. Because of the steep slope of the given site, the three parts of the building are connected by ramps, allowing for accessibility access throughout the building.



## PROGRAM

**Multipurpose Assembly/Cafeteria Room:** 4,500 sf (minimum double height & maximum triple height space)

**Think Lab/Project Resource Center:** 3,000 sf (minimum double height space). The Think Lab is a facility to support specialized science, math, art, design, and making activities, and is staffed by two faculty during school hours.

**Studios:** Twelve (12) @ 1,250 sf each. The studios must support multiple configurations to accommodate learning from lectures to small groups.

**Lobby/Reception/Medical/Principal/Conference Suite:** 1,000 sf

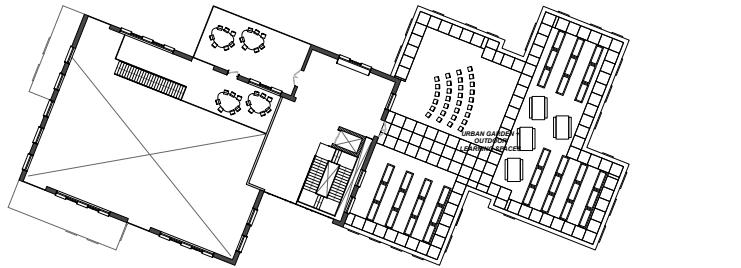
**Shared Teacher Office:** 1,000sf

**Kitchen:** 1,000sf

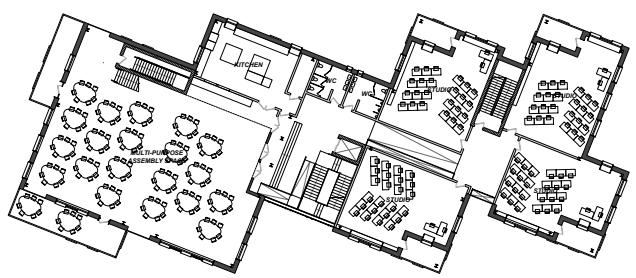
**Support Spaces:** 2,750 sf (custodial, storage, MEP, toilets)

**Outdoor Learning Spaces:** 4,000 sf (can be located on the ground or on the roof(s))

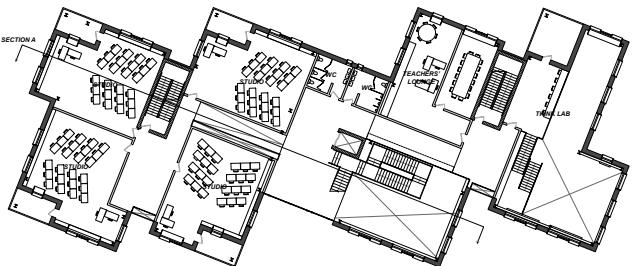
**Outdoor Service Area:** 500 sf



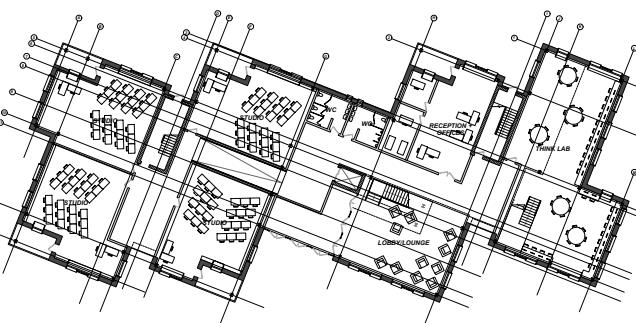
FLOOR FOUR ◎



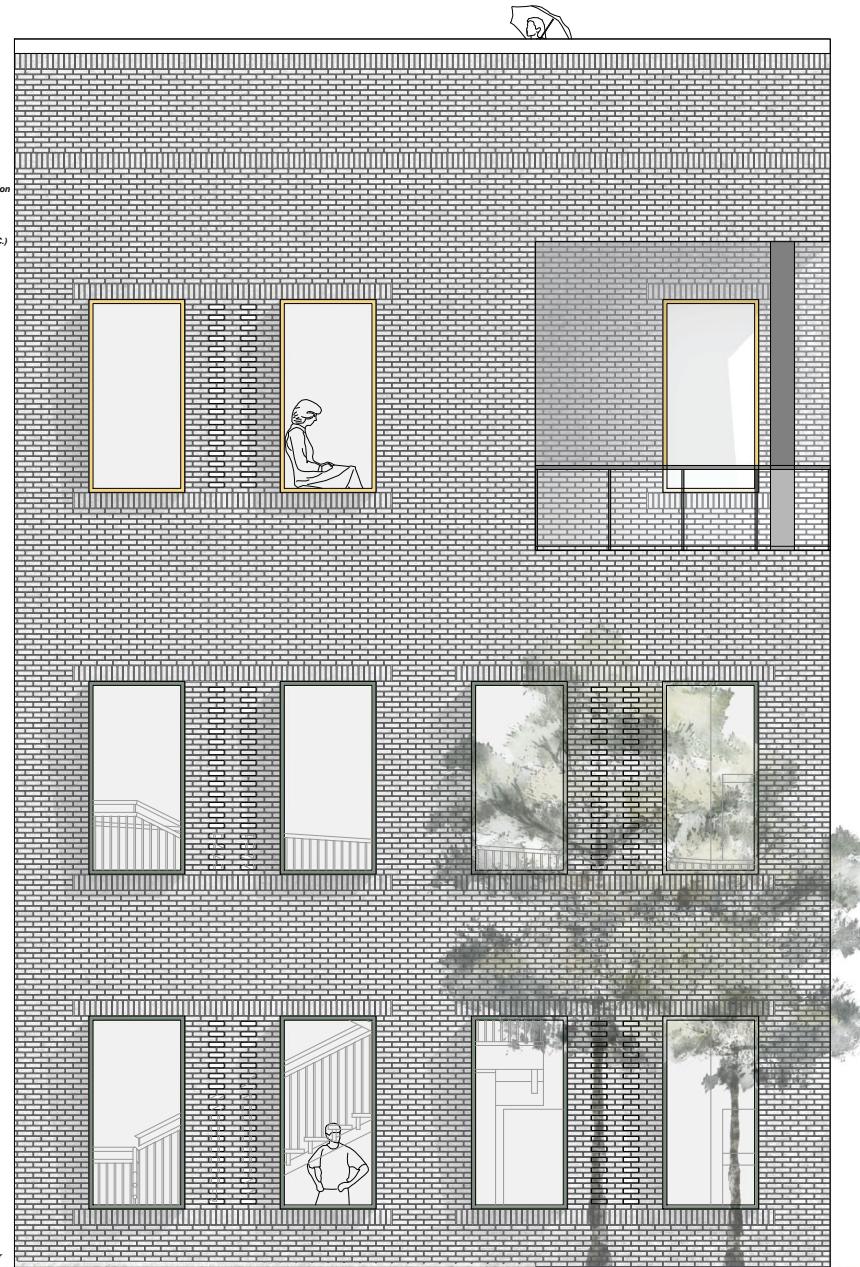
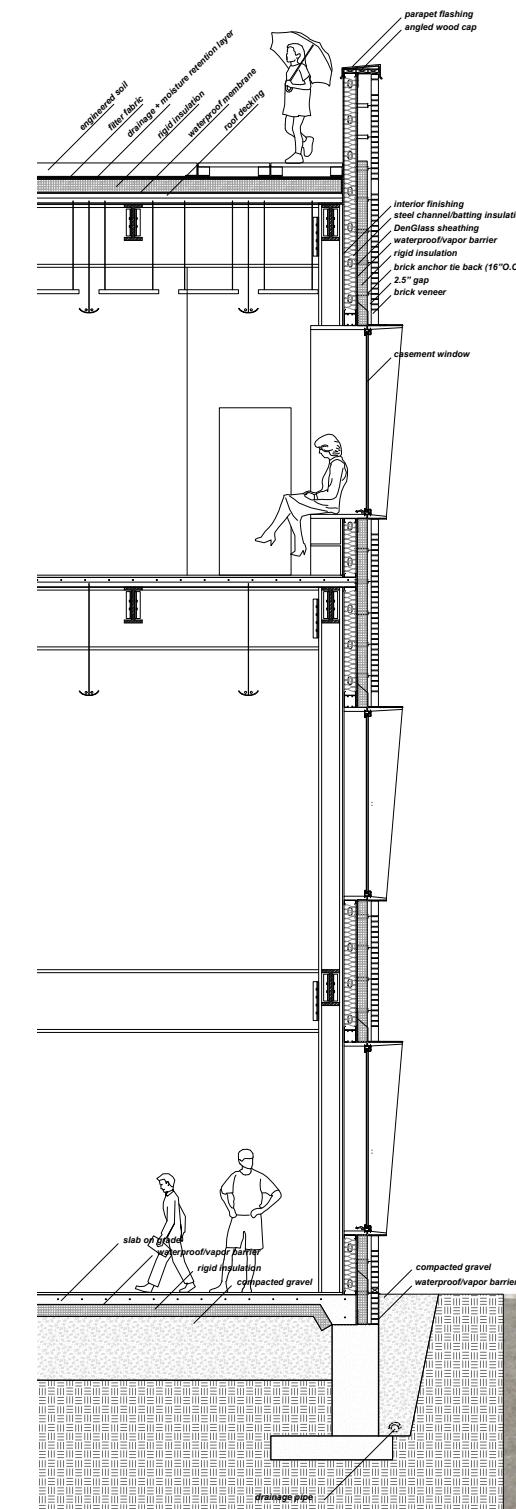
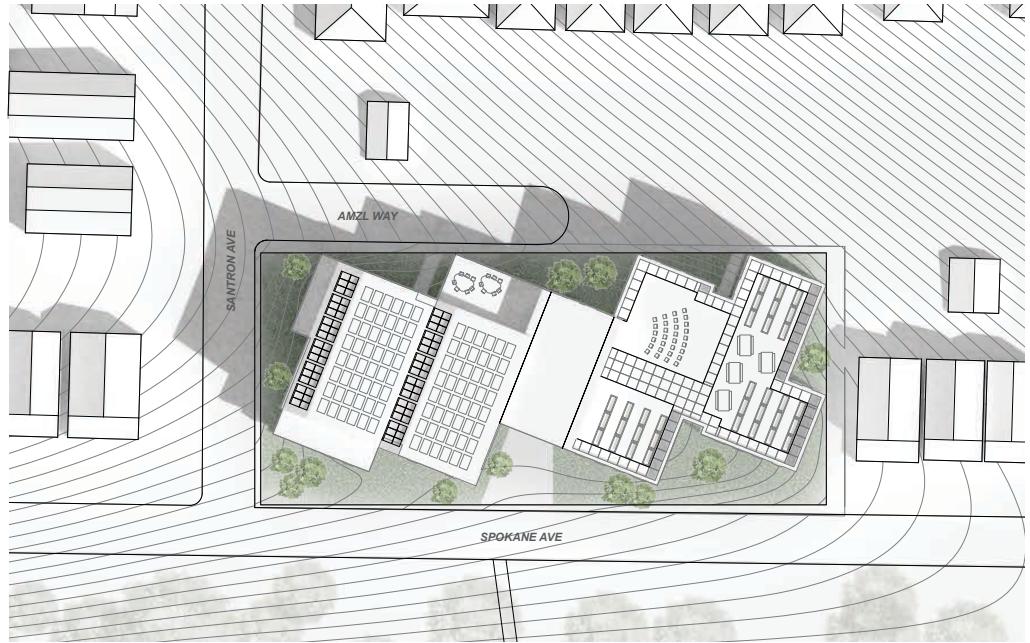
FLOOR THREE ◎



FLOOR TWO ◎



GROUND FLOOR ◎



# CITRA - HOOP HOUSE

Second Year | Fall 2016

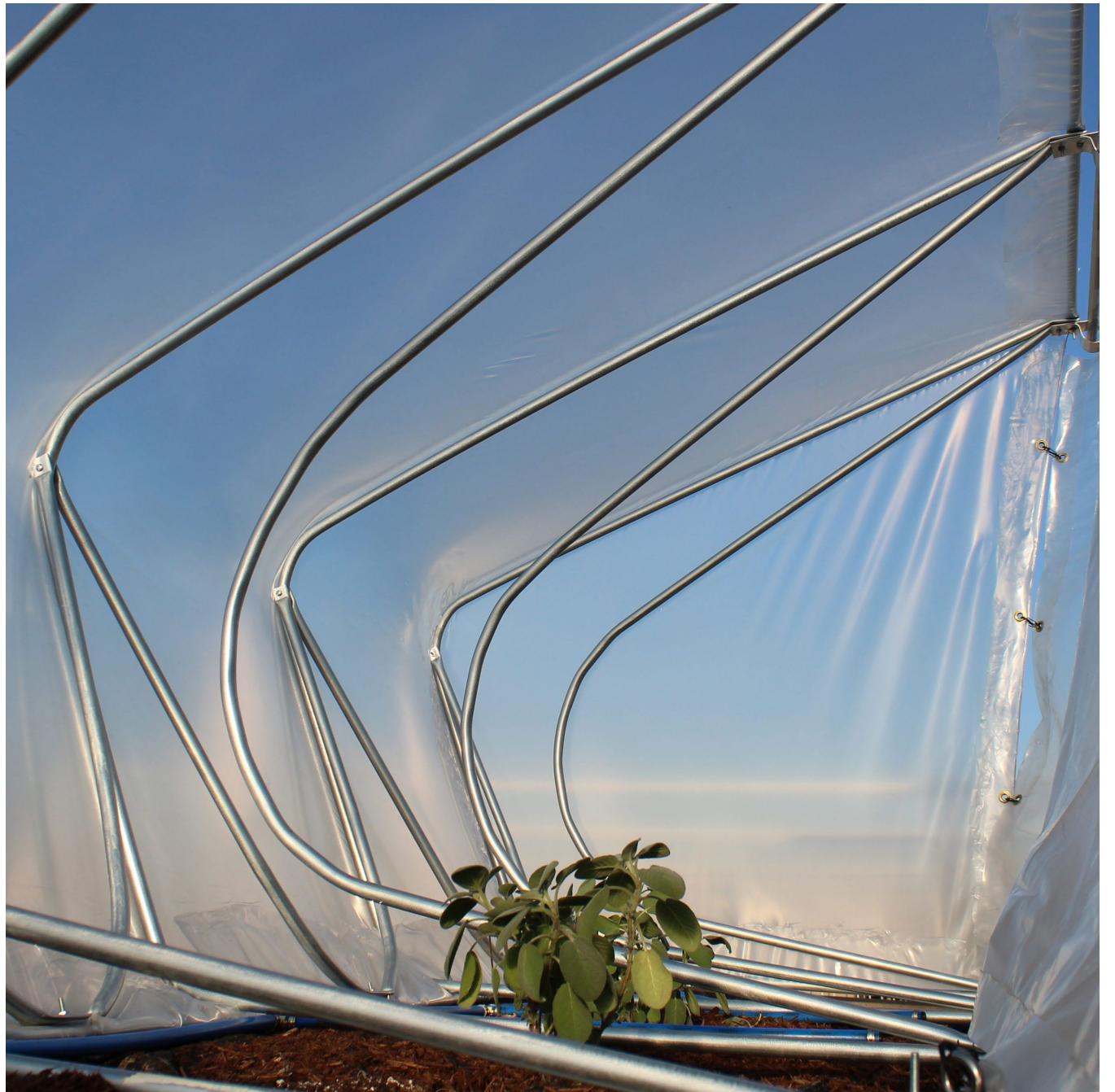
## GOAL

To design and build a portable greenhouse to extend the growing season of a raised planting bed in an urban garden.

## DESCRIPTION

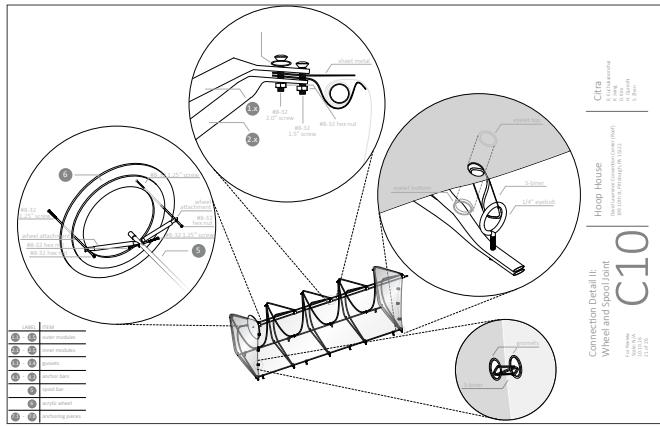
The word "CITRA", of Latin origin, translates to "without," which drove the creation of a collaborative hoop house project that emphasizes the importance of accessibility, removing unnecessary structure that could obstruct a user's reach. CITRA uses a unique cantilever system to leave an entire side completely open at the user's discretion. This design choice is complemented by a spooled system, which can unroll and clip together per the user's purposes. The form mimics its contextual situation on the roof of the David L. Lawrence Convention Center in the Cultural District of Pittsburgh, PA, meeting the lower slope of the roof line and drawing forth the steep angle of the building. These systems work in tandem to create a hoop house that achieves ideal ventilation and enclosure, provides the most accessibility possible, and interacts positively with the geometric patterns found in its context.

In collaboration with Kornrat  
Euchukanonchai, Kevin Jiang, David  
Kim, and Hamza Qureshi.

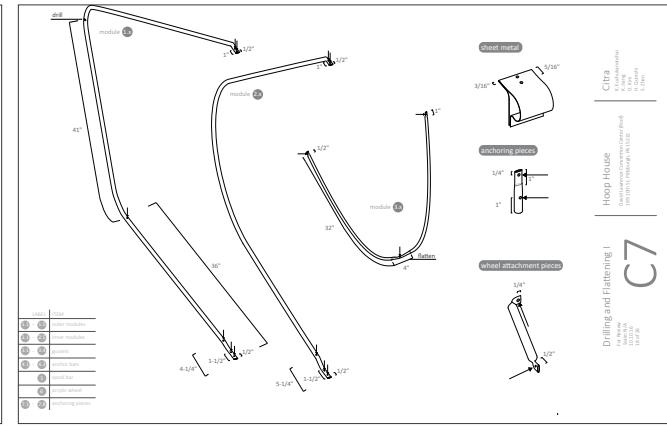


Citra: Final Structure and Installation

## CONSTRUCTION DOCUMENTS



Construction Drawing: Connection Detail II: Wheel and Spool Joint



Construction Drawing: Drilling and Flattening I

## SCALE MODEL (2"=1')

Aluminum Tubing, Greenhouse Plastic, Galvanized Wire, Basswood



## FINAL CONSTRUCTION AND INSTALLATION

Greenhouse Plastic, 1/2" Conduit

Final Construction Video

[https://youtu.be/mjdTv\\_zwFyA](https://youtu.be/mjdTv_zwFyA)

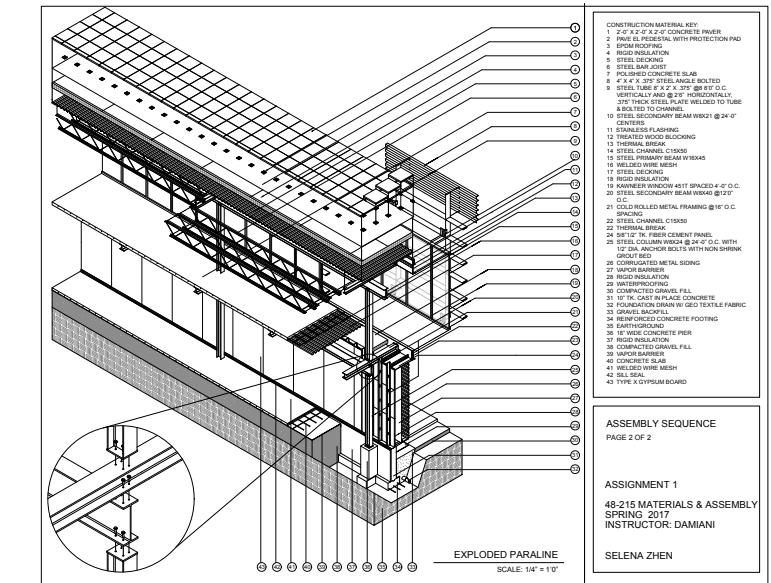


- (A) Construction of Frame
- (B) Heat Shrinking Greenhouse Plastic
- (C) Loading
- (D) On-Site Installation
- (E) Connection Detail

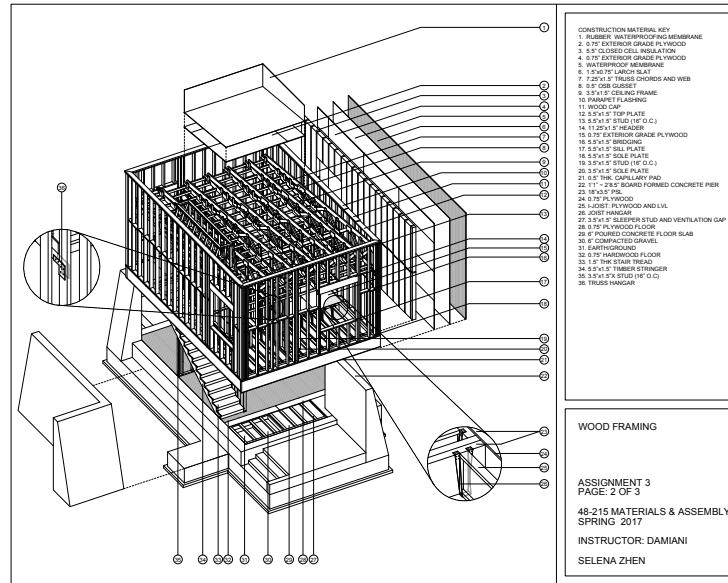


# MATERIALS + ASSEMBLY

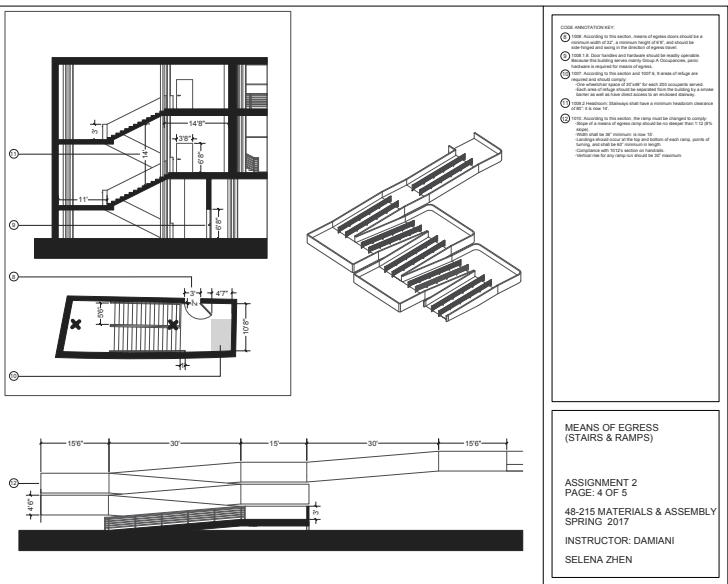
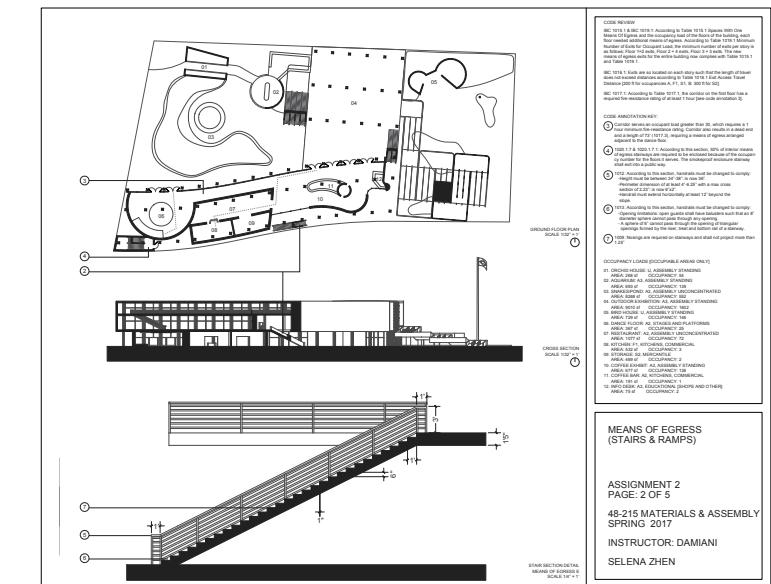
PROJECT 1: ASSEMBLY SEQUENCE AND MATERIAL STUDY



PROJECT 3: WOOD FRAMING (CASA EL VIGILANTE)



PROJECT 2: MEANS OF EGRESS AND CODE REVIEW (THE BRAZILIAN PAVILION)



# LUNAR GALA - SURFACE

Fall 2017 - Spring 2018

SURFACE explores the issue of the distortion and trivialization of the human body into objects of desire. The veneer of mesh, overlayed with cut contours, is a constructed external appearance that illustrates areas of the socially ideal body, exposing those who wear it to appreciation and admiration, but also leaving them vulnerable to objectification. As the line progresses, the body becomes more clearly exposed than upon first impression. It is meant to represent an exaggerated set of physical attributes that emphasize the scrutiny of our bodies – conscious and subconscious, external and internal.

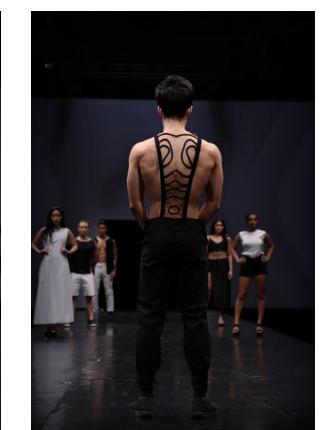
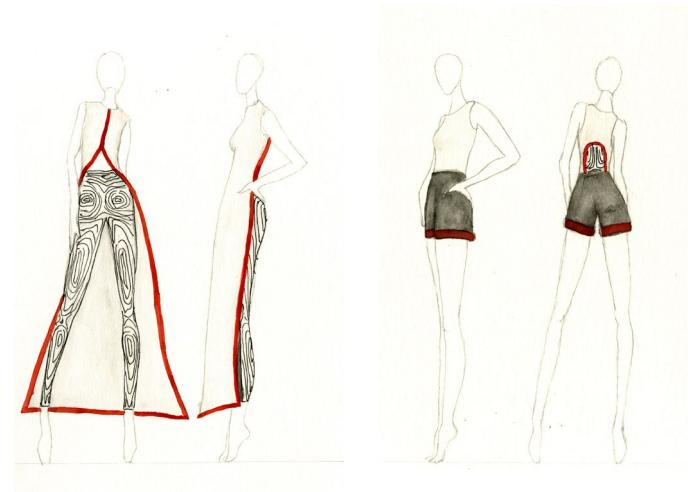
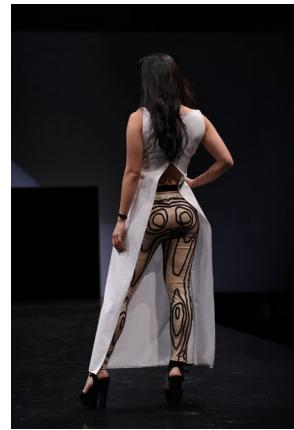
#### About Lunar Gala:

Originally created in 1997 to ring in the Chinese New Year, Lunar Gala has transformed into a highly anticipated event that hundreds hope to be part of and thousands hope to come see. While staying true to its original intent, it has developed into a much larger production and has become a more impactful organization to the CMU and Pittsburgh community. Every year, the theme of the show is centered around the Zodiac animal of the lunar calendar.

Now, Lunar Gala is arguably one of the largest fashion events in Pittsburgh, having sold out over 1200 seats each year with 140+ students involved in producing, designing, modeling, and dancing in the show. Students across all majors and cultures create original and creative lines, infusing technology and complex materials with wearable fashion.

In collaboration with Michael Powell.





# HIGH RISE 'UNTITLED'

4th Year | Fall 2019  
Advanced Synthesis Option Studio 48-500  
High\_Rise 'Untitled' 2018, New York, NY

## PROJECT INTRODUCTION

The introduction to the studio was initially written by Professor Gerard Damiani, and is paraphrased here.

"This studio will look at the role of the architectural promenade and how it can be adapted to the typology of the high-rise. The promenade architecturale first described by Le Corbusier as a sequence of spaces and direction of movement in the Acropolis in Athens is a way of constructing views, vistas and experiences. The high-rise, an American typology, acknowledges maximizing building area but does not address the role of the architectural sequence. This studio will investigate the high-rise typology through the hybridization of the typology with the architectural promenade.

This studio will focus on the writings and artistic output of Donald Judd as the intellectual underpinning of the studio, which will inform the spatial and detailing agenda of the studio project. Often considered an artist of obdurate space, Judd's works are highly refined being conscious of their context (what he called fundamental realities), space, material, color and detail. An inspiration to architects such as Steven Holl and Herzog & de Meuron, the works of minimalist artist Donald Judd (1928-1994) spanned both art and architecture through a search for autonomy and clarity for the objects and the spaces they occupy."



Exterior Render - Mercer St.

## PROGRAM

The program will focus on a urban high-rise structure located in SoHo in New York City directly across from the Judd Foundation. The building is to be a high-rise construction (75 feet or higher) consisting of vertical galleries, a museum store, studio workspaces for visiting artists, and apartments.

## MUSEUM ANNEX

This mixed-use tower is to provide additional exhibition space for artists curated by Flavin and Rainer Judd. The spatial container provided must allow for artwork to be presented in a number of formats.

1 Gallery: Interaction with daylight

1 Gallery: Integration within a neutral spatial container (white box)

1 Gallery: Integrated within the architectural context you provide  
Museum Store  
Ticketing Desk  
Public Restrooms

## Staff Offices

Director & Assistant Office Suite

Special Programs Director Office

Docent Lounge

Administration Assistant Office

Conference Room & Research Library

Conservation Room

Staff Unisex Restroom

Public Entry for Museum

Building Service Entry

Central Mechanical Floor Servicing both Galleries and Residential Units

## RESIDENTIAL TOWER

The residential tower is to accomodate any number of residences while creating an understanding of Donald Judd's residential spaces.

Unit types must contain:

Entry & Entry Closet

Kitchen

Dining

Living

1/2 Bath

Full Bath (tub and shower)

Master Bedroom with Walk-In Closet

One to Two Bedrooms with Closets

Shared Bath

Or

Entry & Entry Closet

Kitchen

Dining

Living

Full Bath (tub and shower)

One Bedroom with Closet

## CONCEPT

*...These ideas were precedents for some small pieces and then for the 100 mill aluminum pieces in the Chinati Foundation. The renovation of the building and the permanent purpose of the building are precedents for the larger spaces in my place in Texas, La Mansana de Chinati, for the Chinati Foundation, and will be for Ayala de Chinati.*

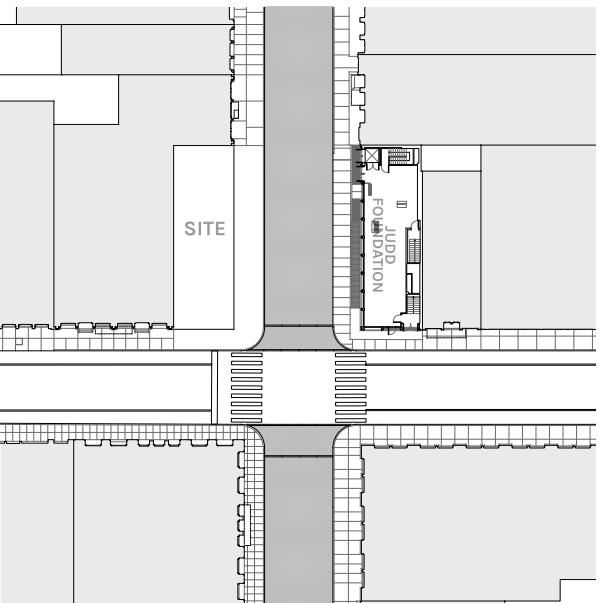
- Donald Judd, "101 Spring Street, 1989"

This section from Judd's writings looks at his renovation of 101 Spring St. as inspiration and precedent for many of his later works and for the Chinati Foundation. I found this statement insightful on his ideas as an artist and an architectural designer, particularly when understanding how he drew from his previous ideas as precedent for all of his later work, and that all of his pieces are inherently precedents of each other.

In the same way that Donald Judd used 101 Spring St. as precedent for many of his later work in Marfa, TX, I wanted to use his projects in Marfa, TX as precedent for the new Museum Annex and Residential Tower adjacent to 101 Spring St. in New York City.



101 Spring St. (SoHo, NYC)



## MOMENTS

When visiting Marfa, I was struck by the incredible scale of each work in the 15 Untitled Works In Concrete. Each concrete piece that was cast and assembled on the site is of the same dimensions, making the layout of these pieces the varying factor in the designs. The potential habitable scale of these works left an impression on my experience at the Chinati Foundation, which I used as inspiration for creating habitable moments within my building.

For the residential tower, the 15 Untitled Works In Concrete served as inspiration for indoor/outdoor flexible living spaces, and for the museum annex, the pieces served as inspiration for key gallery moments.



15 Untitled Works In Concrete - The Chinati Foundation

## FACADE

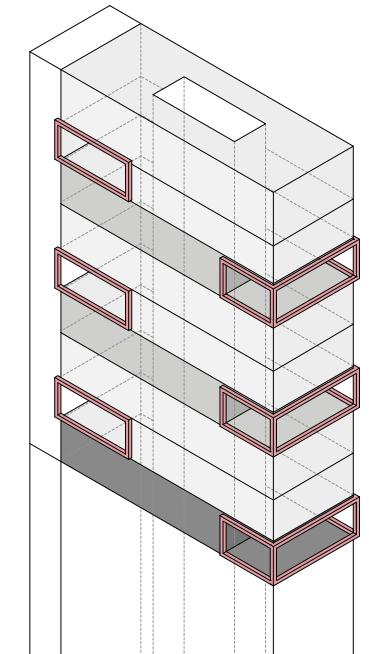
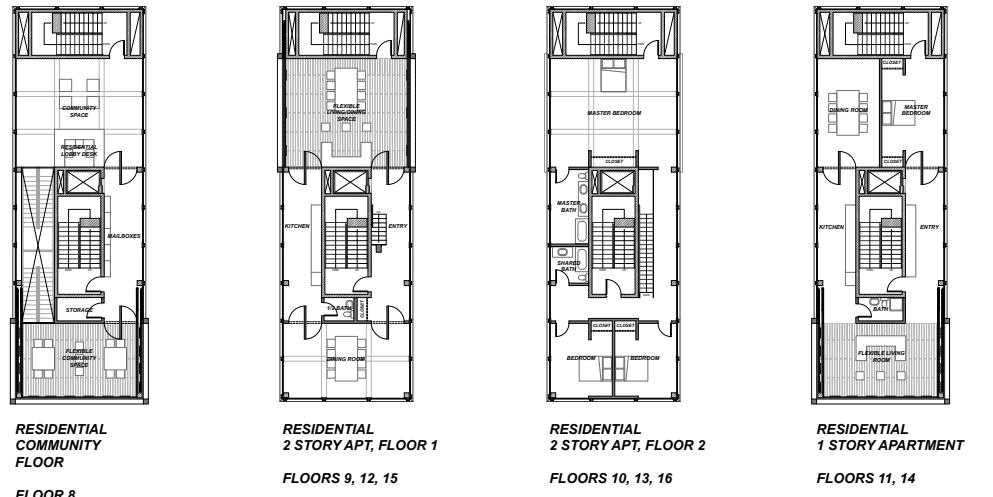
For the exterior facade of the building, I chose to use a 10 x 3 bay system, as a reference to the same bay system as the adjacent 101 Spring St. This allowed the building to fit in with the rest of the Soho context, as well as draw a visual connection to the neighboring Judd Foundation. When considering the more detailed aspect of the exterior facade, I looked to another of Donald Judd's pieces, a small extruded colored aluminum piece that looked as though it could be an adaptation of a mullion. I saw this extrusion piece as a representation of what Judd would perhaps consider a 'detailed' piece in his design studies, and used it as inspiration for a Miesian, modernized, neo-classical facade system.

A larger collection of these works were later manufactured and displayed at the Judd Foundation (101 Spring St.) as an installation titled '15 x 105 x 15 Installation of 12 Extruded Aluminum Pieces.'

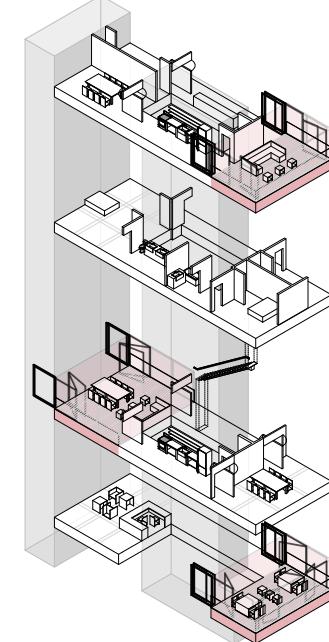


15 x 105 x 15 Installation of 12 Extruded Aluminum Pieces.

## RESIDENTIAL TOWER

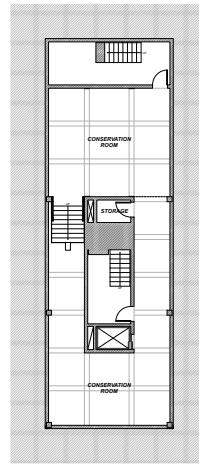


Residential Moments Diagram

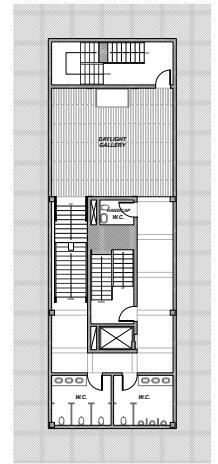


Residential Sequence

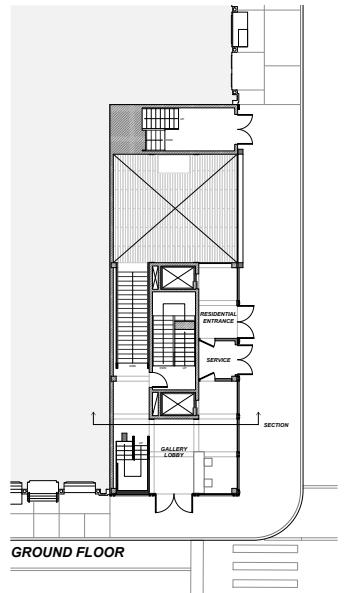
## MUSEUM ANNEX



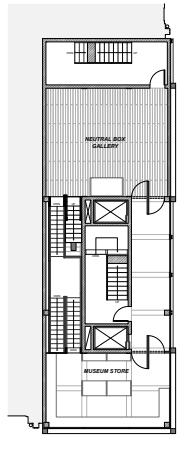
FLOOR 2B



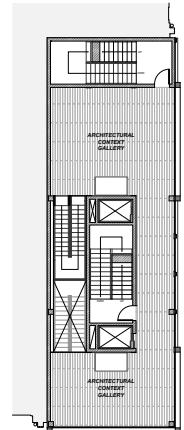
FLOOR 1B



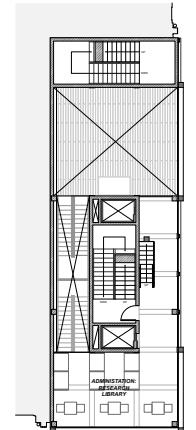
GROUND FLOOR



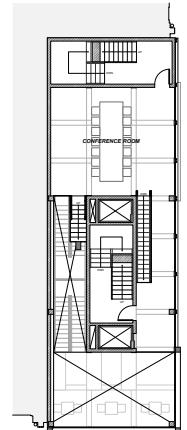
FLOOR 2



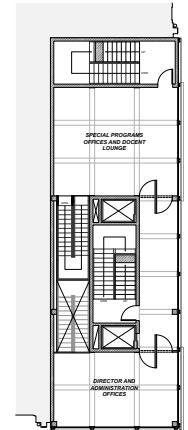
FLOOR 3



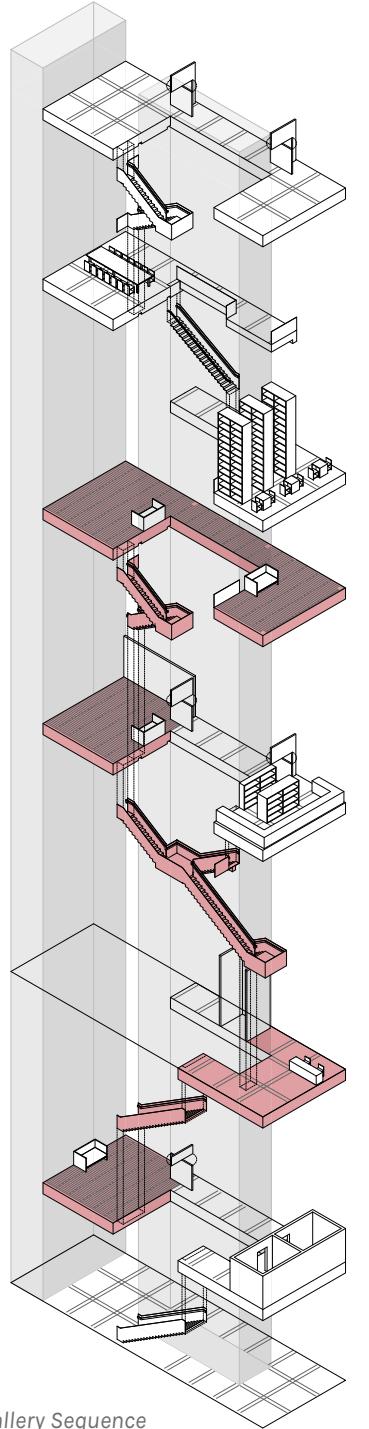
FLOOR 4



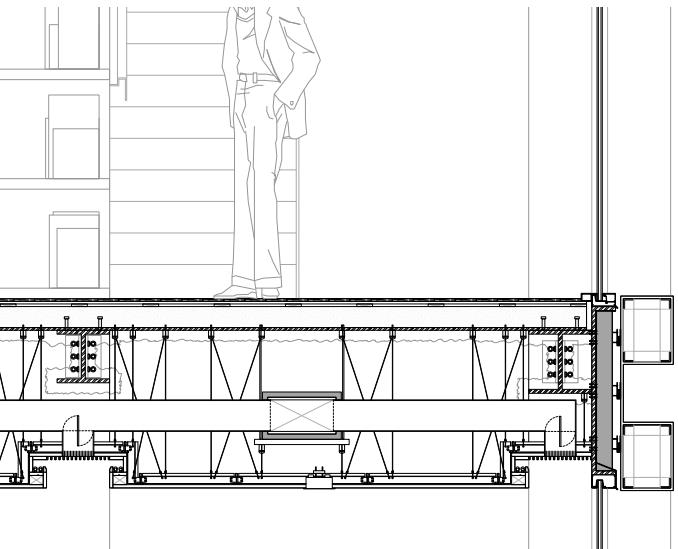
FLOOR 5



FLOOR 6



Gallery Sequence



Section Detail



SECTION PERSPECTIVE



Architectural Context Gallery



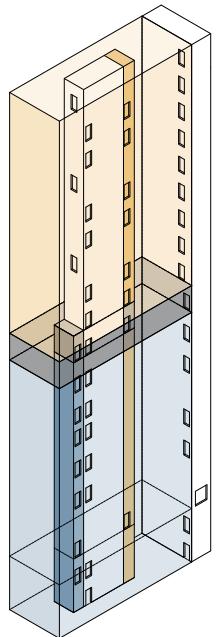
Neutral Room Gallery - Dan Flavin Inspiration



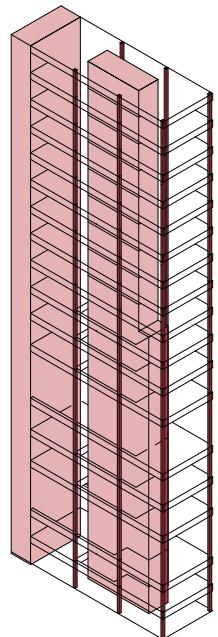
2 Story Apartment Dining



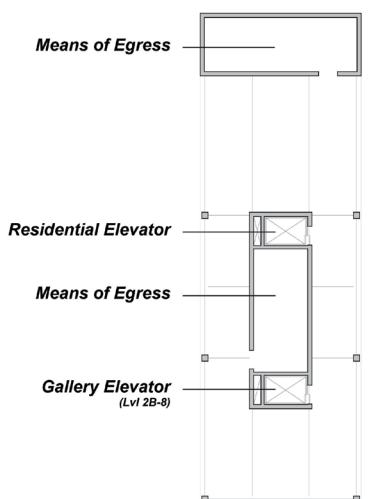
1 Story Apartment Living



Core Diagram



Structural Diagram



Egress Diagram



Spring St. Elevation



Mercer St. Elevation