Lowell Maker's Space

By: Dante Egizi and Jordan Chapman

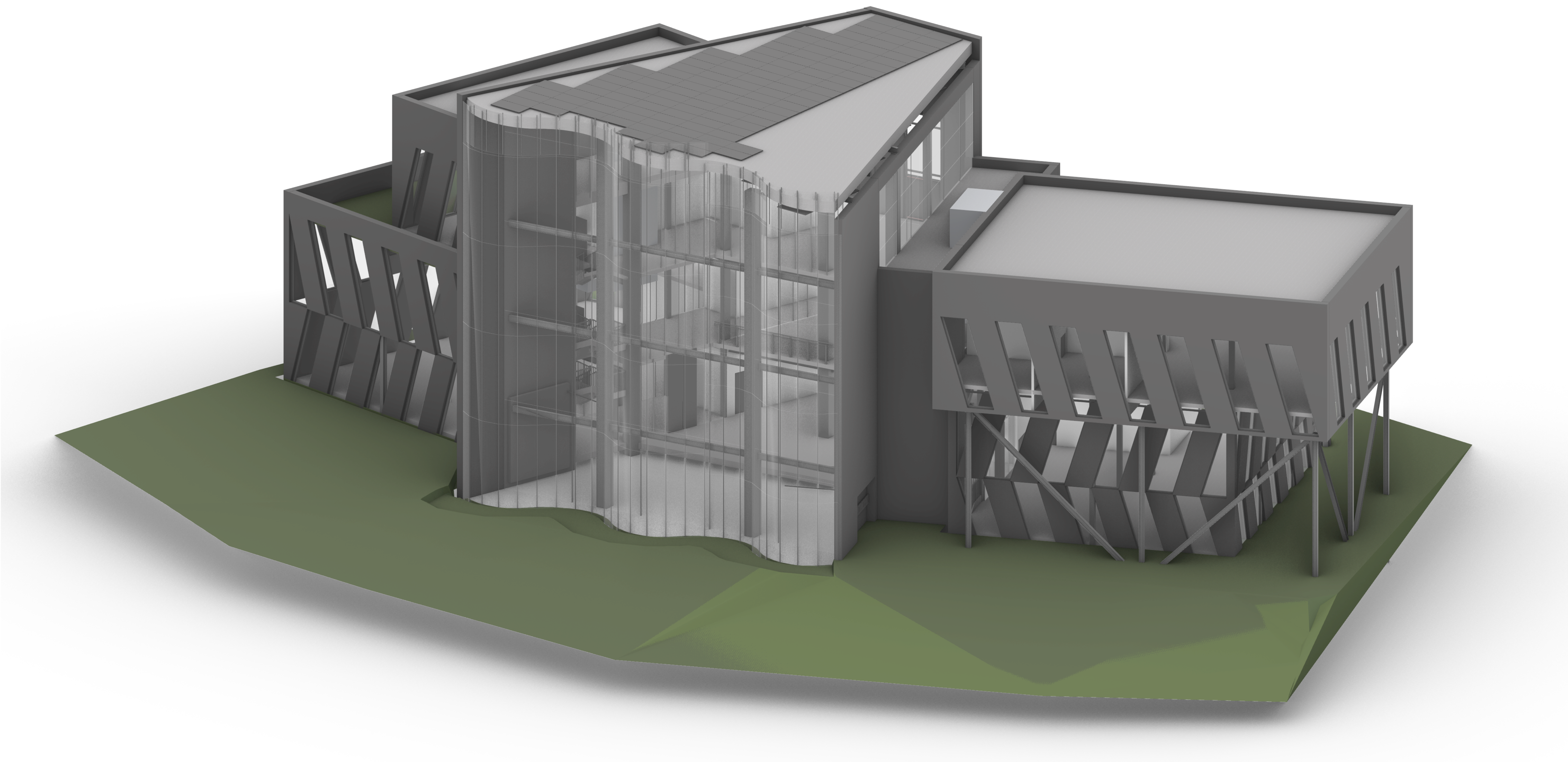
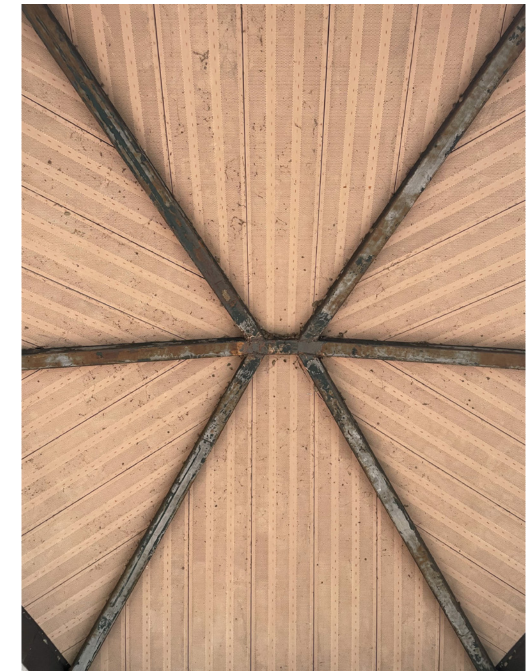


Photo Essays

Exploring the Lowell site, I explored connections, specifically the merging of materials both naturally and artificially.



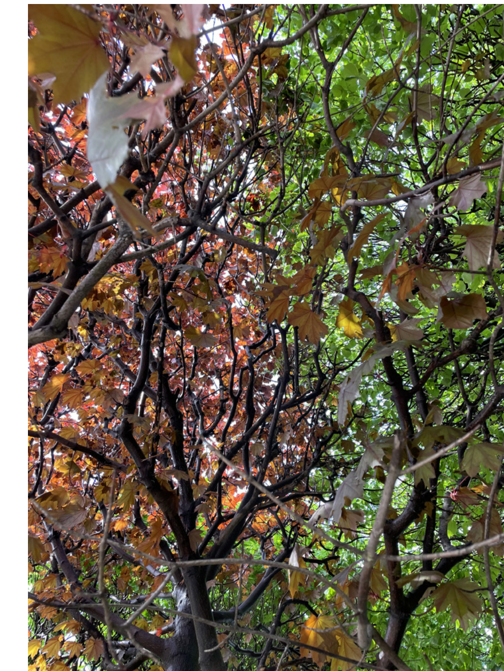
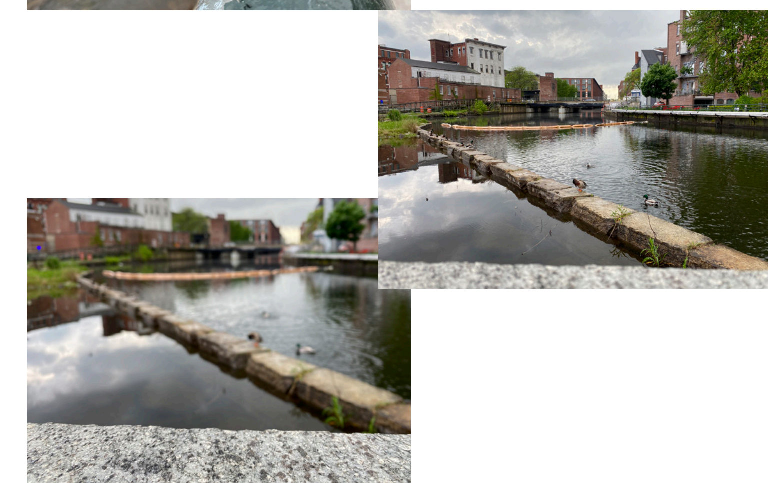
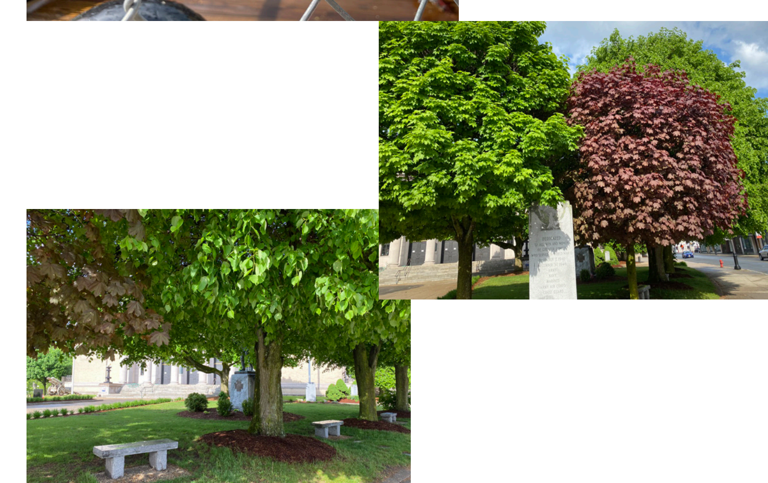


Photo Essays

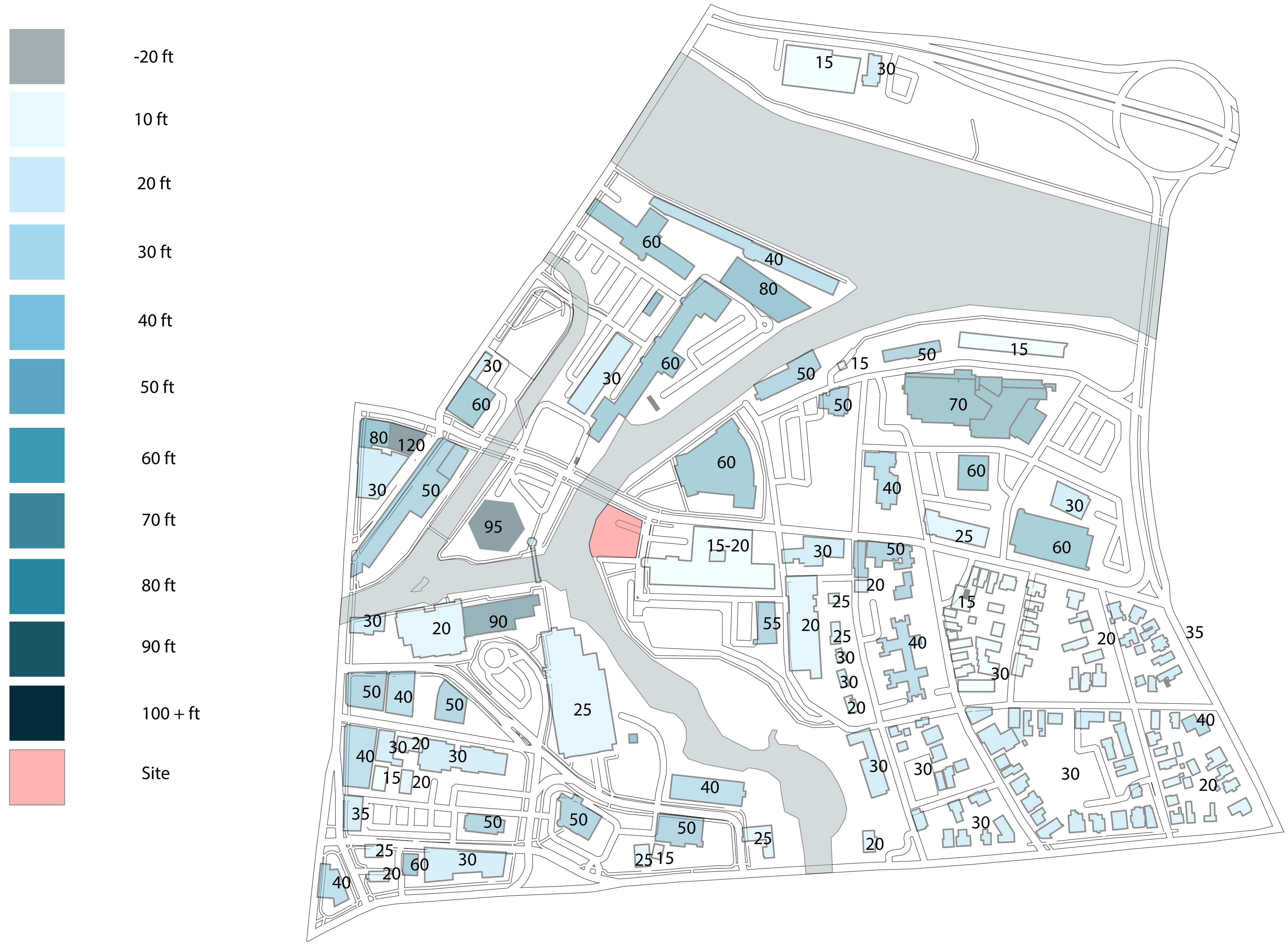


This site analysis focuses on shifting of perspectives of surrounding landmarks and how the shift can change the way we see the same object.

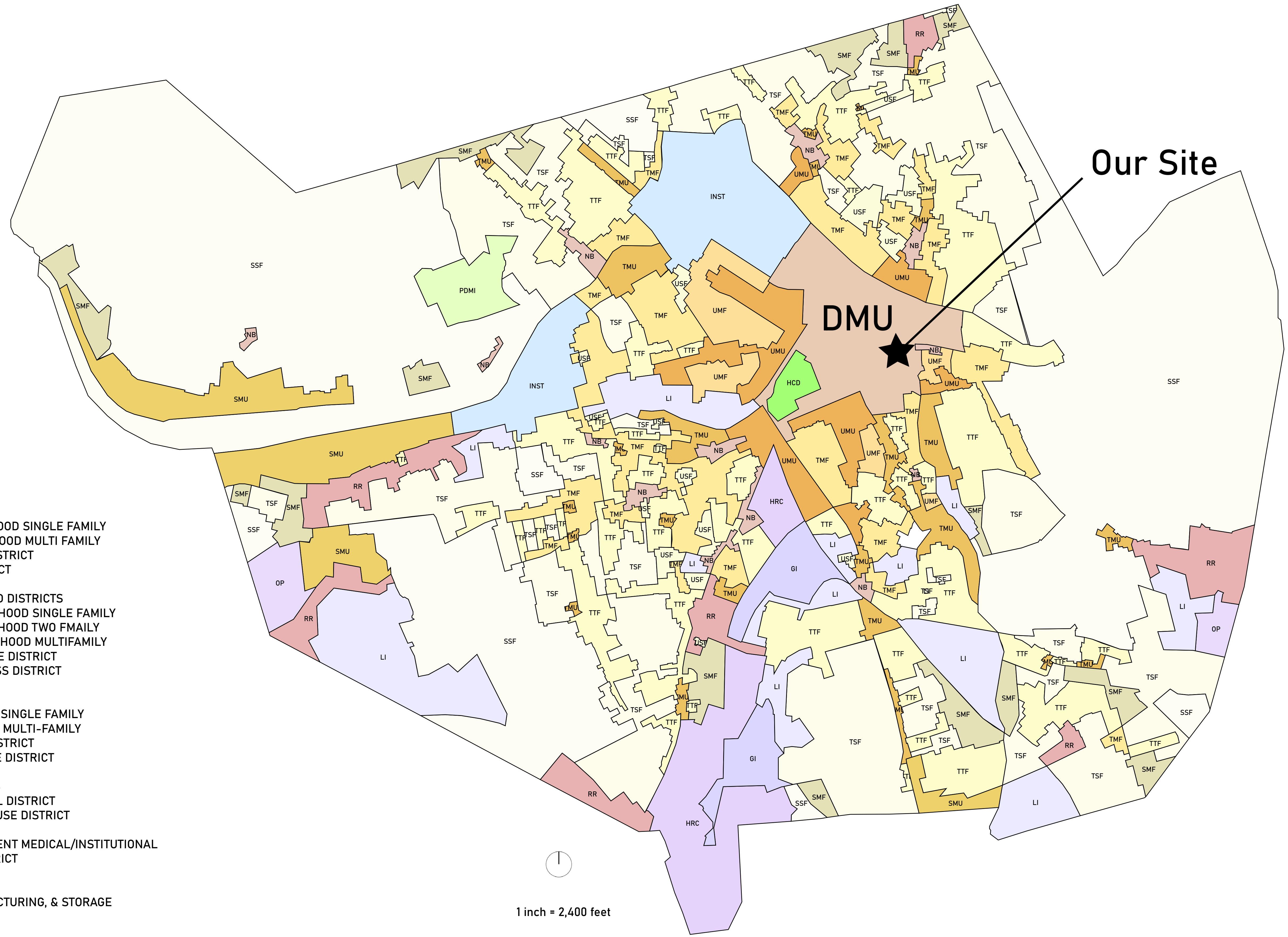


Site Analysis

Height Diagram



Zoning Diagram



1 inch = 2,400 feet

- USF
- HCD
- INST
- NB
- RR
- LI
- GI
- OP
- HRC
- SMU
- UMU
- PDMI
- SSF
- TSF
- SMF
- TTF
- TMF
- UMF
- DMU
- TMU

SUBURBAN DISTRICTS
SSF: SUBURBAN NEIGHBORHOOD SINGLE FAMILY
SMF: SUBURBAN NEIGHBORHOOD MULTI FAMILY
SMU: SUBURBAN MIX-USE DISTRICT
RR: REGIONAL RETAIL DISTRICT

TRADITIONAL NEIGHBORHOOD DISTRICTS
TSF: TRADITIONAL NEIGHBORHOOD SINGLE FAMILY
TTF: TRADITIONAL NEIGHBORHOOD TWO FMAILY
TMF: TRADITIONAL NEIGHBORHOOD MULTIFAMILY
TMU: TRADITIONAL MULTI-USE DISTRICT
NB: NEIGHBORHOOD BUSINESS DISTRICT

URBAN DISTRICTS
USF: URBAN NEIGHBORHOOD SINGLE FAMILY
UMF: URBAN NEIGHBORHOOD MULTI-FAMILY
UMU: URBAN MIXED-USES DISTRICT
DMU: DOWNTOWN MIXED-USE DISTRICT

SPECIAL PURPOSE DISTRICTS
HRC: HIGH-RISE COMMERCIAL DISTRICT
INST: INSTITUTIONAL MIXED-USE DISTRICT
OP: OFFICE RESEARCH PARK
PD-MI: PLANNED DEVELOPMENT MEDICAL/INSTITUTIONAL
HCD: HAMILTON CANAL DISTRICT

INDUSTRIAL DISTRICT
LI: LIGHT INDUSTRY, MANUFACTURING, & STORAGE
GI: GENERAL INDUSTRY

ARTICLE V. DIMENSIONAL REQUIREMENTS

SECTION 5.1 TABLE OF DIMENSIONAL REGULATIONS

No building or structure shall be built nor shall any existing building or structure be enlarged which does not conform to the regulations as to maximum ratio of floor area to lot area, minimum lot sizes, minimum lot area for each dwelling unit or equivalent, minimum lot frontage, minimum setback dimensions of front, side and rear yards, minimum open space, and maximum height of structures, and all other dimensional requirements in the several districts as set forth in the Table of Dimensional Regulations, except as hereinafter provided.

	District	Type of Use	Dimensions (in feet or square feet unless otherwise noted)													
			Max FAR	Min. Lot Size	Min. LA/DU	Min. Frontage	Front Yard Setbacks Min.	Front Yard Setbacks Max.	Front Yard Setbacks Projections	Front Yard Setbacks Porches	Front Yard Setbacks Garages	Minimum Side Yard	Min. Rear Yard	Minimum UOS/DU	Max. Height	Max. Stories
SUBURBAN DISTRICTS	SSF	All permitted uses	0.35 †††	10000	10000	75	25	----	22	17	30	10 SUM 25	25	750	35	2.5
	SMF	All permitted uses	0.75	20000	3000	25	25	----	----	----	30	20	25	750	40	3
	SMU	Residential Dwellings	2	20000	3000	25	25	----	----	----	30	20	0†	300	----	----
		All other uses	2	----	----	25	----	----	----	----	----	0†	0†	----	----	----
	RR	All permitted uses	2	----	----	25	----	----	----	----	----	0†	40	----	----	----
TRADITIONAL NGHBRHD. DISTRICTS	TSF	All permitted uses	0.35 †††	7000	7000	55	15	20	12	9	24	10 SUM 25	20	300	32	2.5
	TTF	1 family dwelling	----	6000	6000 ††	55	15	20	12	9	24	10	20	500 ††	32	2.5
		All other uses	----	6000	4000 ††	65	15	20	12	9	24	10 SUM 25	20	500 ††	35	2.5
	TMF	1 family dwelling	----	4500	4000 ††	50	15	20	12	9	24	5 SUM 20	20	500 ††	32	2.5
		All other uses	----	6000	4000 ††	65	15	20	12	9	24	10 SUM 25	20	500 ††	35	3
	TMU	1 family dwelling	----	4500	2500	50	*	*	*	*	21	5 SUM 20	20	250	32	2.5
		Other Residential Dwellings	----	6000	2500	65	*	*	*	*	21	10 SUM 25	20	250	45	4
		All other uses	1	----	----	25	----	8	----	----	21	0†	0†	----	45	4
	NB	Residential Dwellings	1	6000	2500	40	*	*	*	*	21	0†	20	250	35	3
		All other uses	1	----	----	25	----	8	----	----	21	0†	0†	----	40	3
URBAN DISTRICTS	USF	1 family dwelling	0.75	3000	2500	35	10	15	7	4	21	3 SUM 17	15	225**	32	2.5
		All other uses	----	5000	2500	35	10	15	7	4	21	3 SUM 17	15	225**	32	2.5
	UMF	All permitted uses	----	3400	1000	40	*	*	*	*	*	3 SUM 17	15	----	65	6
	UMU	Residential Dwellings	----	3400	1000	40	*	*	*	*	*	3 SUM 17	15	----	----	----
		All other uses	4	----	----	25	----	----	----	----	----	----	----	----	----	----
	DMU	All permitted uses	4	----	----	25	----	----	----	----	----	----	----	----	----	----
SPECIAL PURPOSE DISTRICTS	HRC	Residential Dwellings	3	43560	----	25	25	--	----	----	30	20	25	100	200	15
		All other uses	5	----	----	25	----	----	----	----	----	----	----	----	200	15
	INST	All permitted uses	2	----	----	25	----	8	----	----	----	0†	0†	----	100	8
	OP	All permitted uses	2	----	----	25	40	----	----	----	----	20	40	----	50	4
INDUSTRIAL DISTRICTS	LI	All permitted uses	2	----	----	25	----	----	----	----	----	----	----	----	----	----
	GI	All permitted uses	2	----	----	25	----	----	----	----	----	----	----	----	----	----

----Denotes no dimensional requirement.
* Front setbacks in these districts shall be consistent with existing setbacks on the block.
† Side and rear yard setbacks in these districts must be at least 15 feet when abutting a residentially-zoned lot.
** [Ord. 11-29-05]
†† [Ord. 4-18-06]
††† [Ord. 4-3-07]

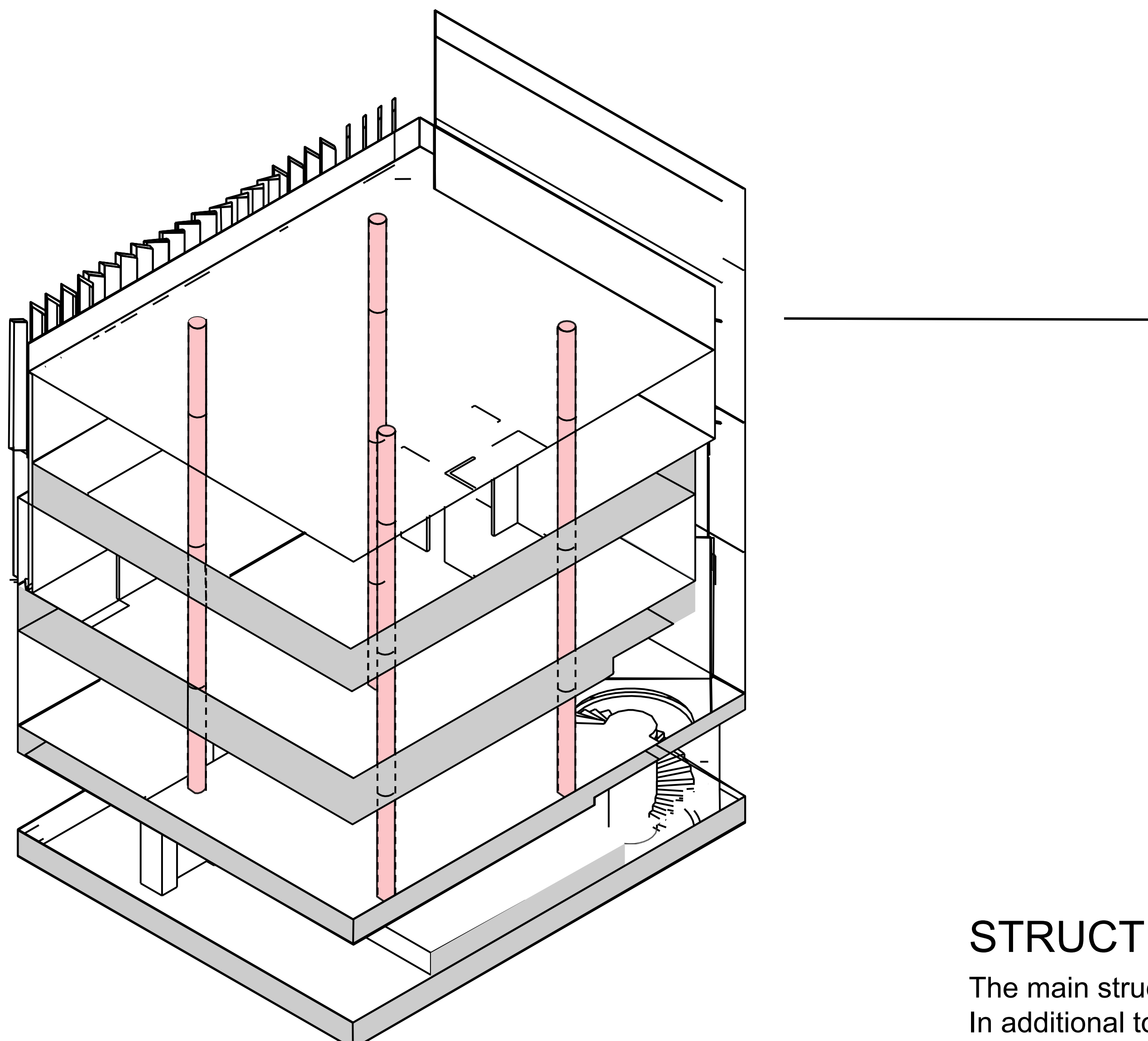
Precedent Study

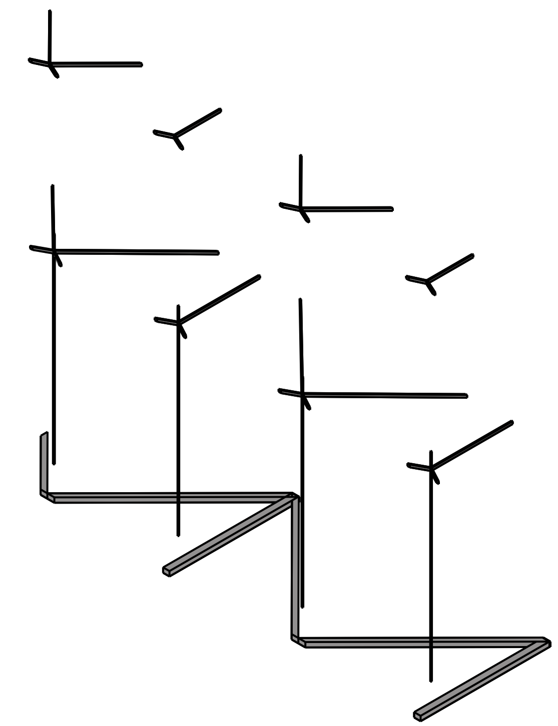
Surry Hills Library and Community Centre

405, Crown Street, Surry Hills, Australia

Dante Egizi and Jordan Chapman

STRUCTURE





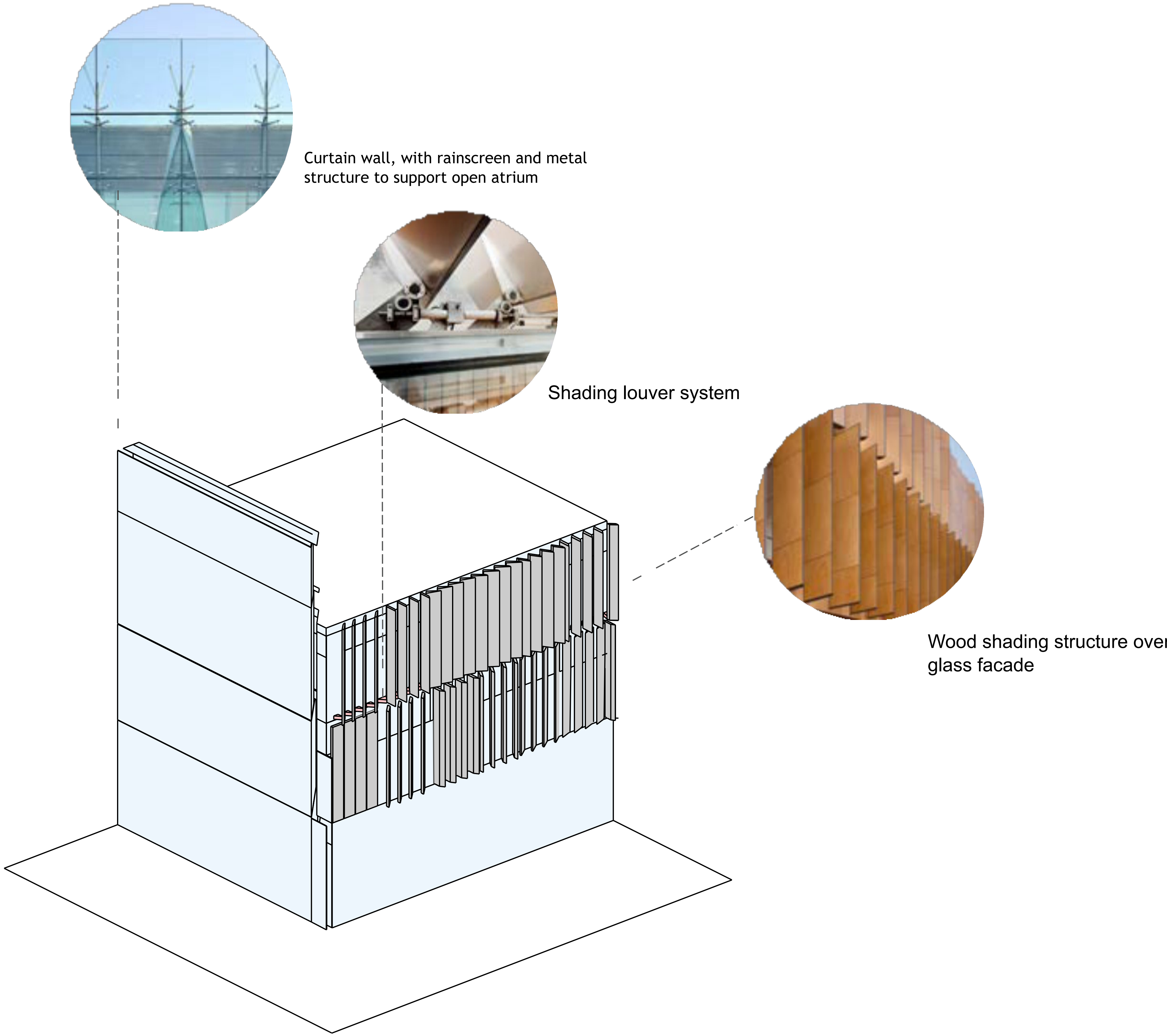
CURTAIN WALL STRUCTURE

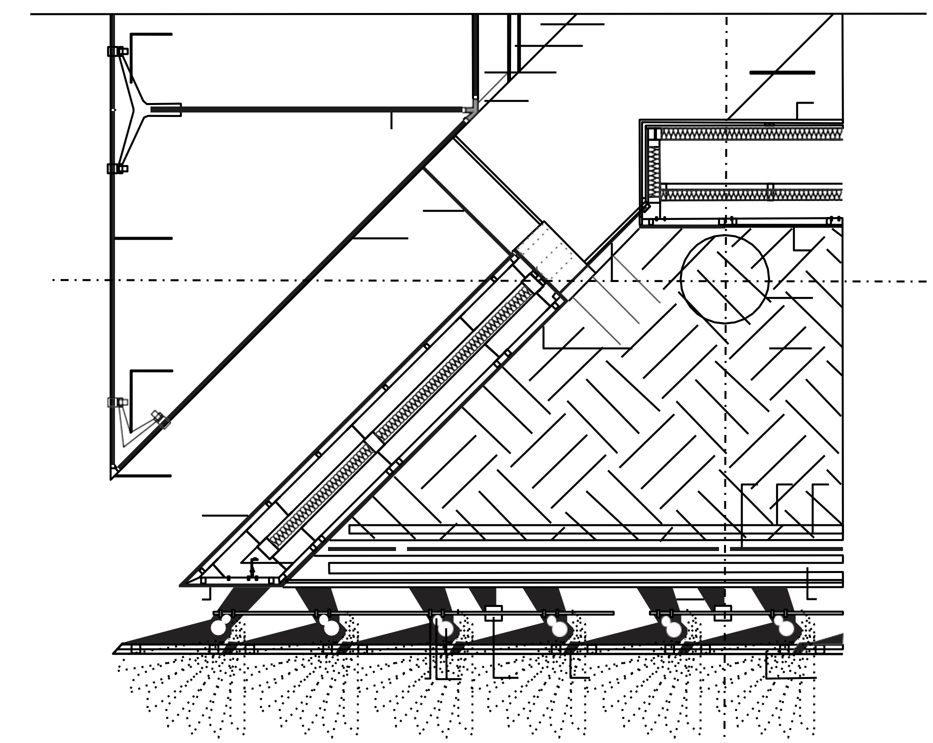
This curtain wall structure contains a stainless steel system that helps to support the double skin facade to create a cavity for an interior atrium space that reaches to the top floor of the community center. Using the stainless steel structure that the community center does, helps to also keep the facade open and sheer as to allow even more light as well as a visual connection to the outside community which keeps the sense of connection flowing through the internal spaces.

STRUCTURE

The main structure of the building is concrete columns that have an ice white polished render finish. In additional to these columns, there are a few supporting load bearing walls located throughout, where necessary. Some of these columns are exposed and few are hidden inside walls to show a square column as opposed to a cylinder.

ENCLOSURE





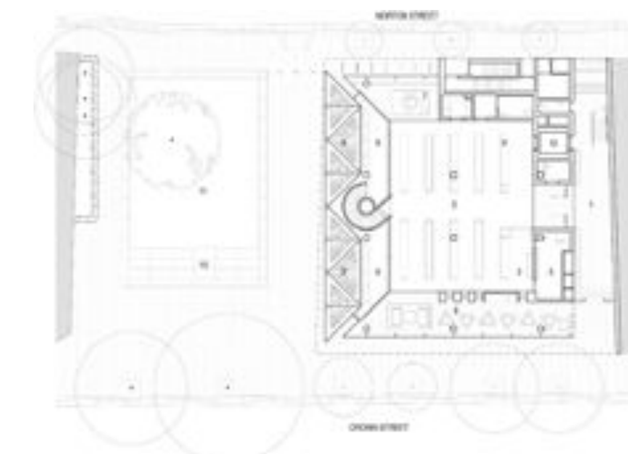
Shading louver system mechanism

The vertical, timber veneer clad louver system is located on three of the four elevations of the community center. Though located on multiple facades, all are designed with different shading needs and purposes. These louvers are run with an automated system that follows the sun throughout the day to consistently shade the interior spaces as needed. The movement of the louver system creates constant changing vantage points from within the interior spaces. The use of the louver system helps to create a comfortable interior environment that helps lower the need of other heating and cooling systems.

OVERVIEW

Location: Surry Hills, Australia
Firm: fjmtstudio
Year: 2009
Size: 2,500 sq meters (approx 8,200 sq ft)

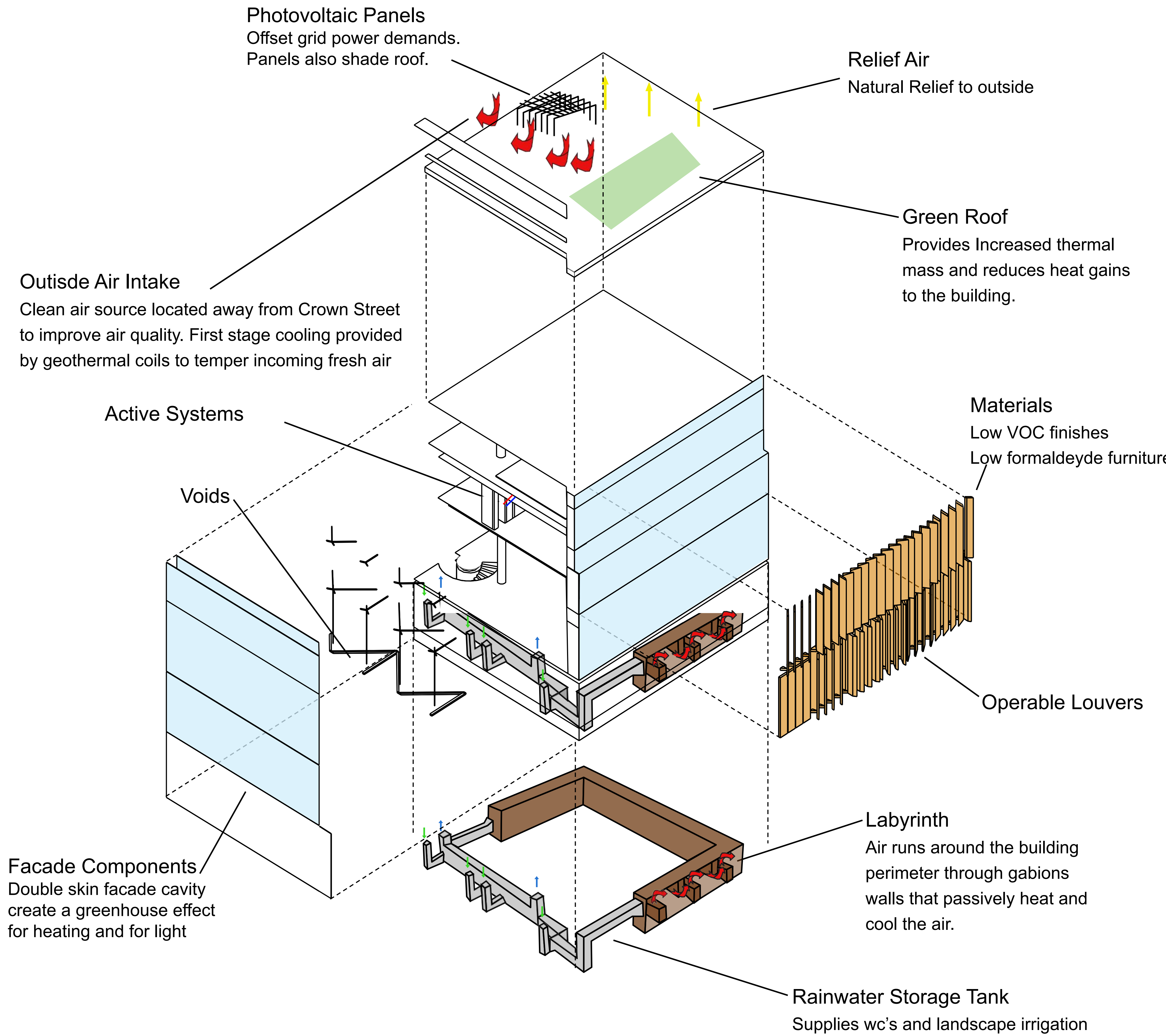
Once considered a slum, the community of Surry Hills has been developed into a vastly cultural and social neighborhoods of Sydney, Australia. With the need for a space that can hold community events and not just be used as a library, in 2004 FJMT Architects began to consult residents of the area to design an elaborate space that the community badly needed. Throughout the Surry Hills Library and Community Centre, each room is programmed differently and designed to suit the needs of the community. The building was not only designed in such a way that it was aesthetically appealing, but was also greatly sustainable with passive systems throughout the structure. This community center has a library and resource center, a community and neighborhood center, and chilcare center all designed into one well functioning building. Through reserch involving those in the surrounding community, the main goal was to design a single facility that everyone could share. This being done, created a shared space that the entire community could meet in and en- joy. On the ground and lower-ground levels the library is housed, community center located on level 1, and level 2 holds the childcare center that can hold up to 26 children while including an out- door landscaped play area. With the combination of innovative design strategies and technologies, they were able to develop a sustainable, low-energy-use buildings while still maintaining the functionality of a public building.



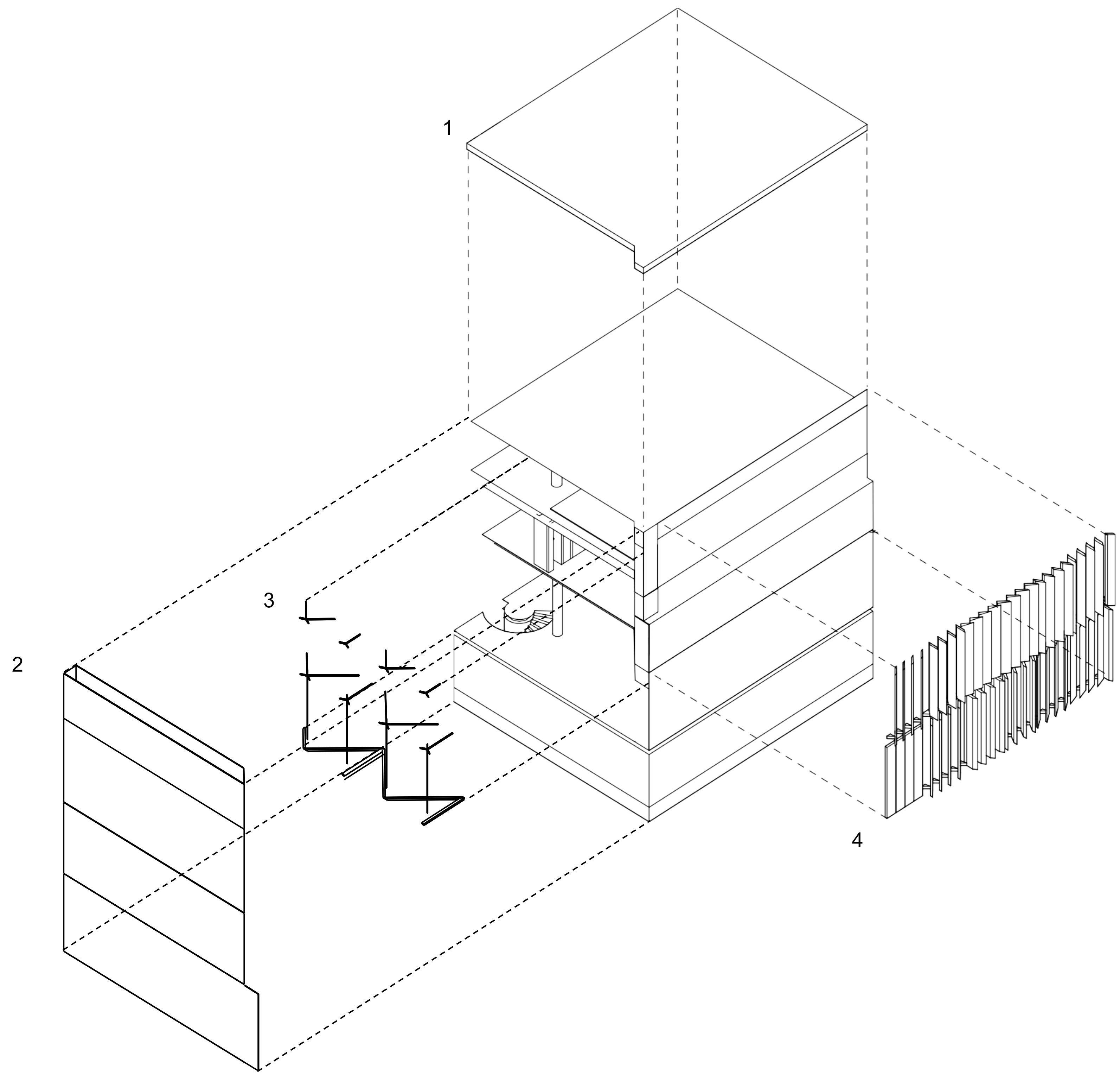
ENVIRONMENTAL CONTROL SYSTEMS

The Surry Hills Community Centre has a mostly passive environmental control system. A main factor that effects thhe control of the interior environment is the roof. This includes a green roof that provides increased thermal mass and reduces heat gains to the building, natural
relief air to the outside, photovoltaic panels that offset grid power demands as well as shade the roof, and outside air intake which is first stage cooling provided by geothermal coils to temper the incoming fresh air and is located high above and facing away from Crown Street to help better improve the air quality. Anothr component is the double skin facade cavity that cre- ates a greenhouse effect for heating and light and allows for an atrium space from ground floor through to the top. On the other facade, they have an additional oper- able louver mechanism to help control the shading, which impacts the temperature in the internal environment. The next passive system is under the lower ground level and contains a labyrinth that the air flows through aroud the perimeter of the building through gabions walls that passiveley heat and cool the air. This is followed by a rainwater storage tank that supplies wc's and landscape irrigation. The final passive system for this overall sustainable build- ing is the material choices that include low VOC finishes and low formaldeyde furniture choices.

Active systems, although minimal, include air conditioning and artificial heating. These systems are hidden in the ceiling spaces.



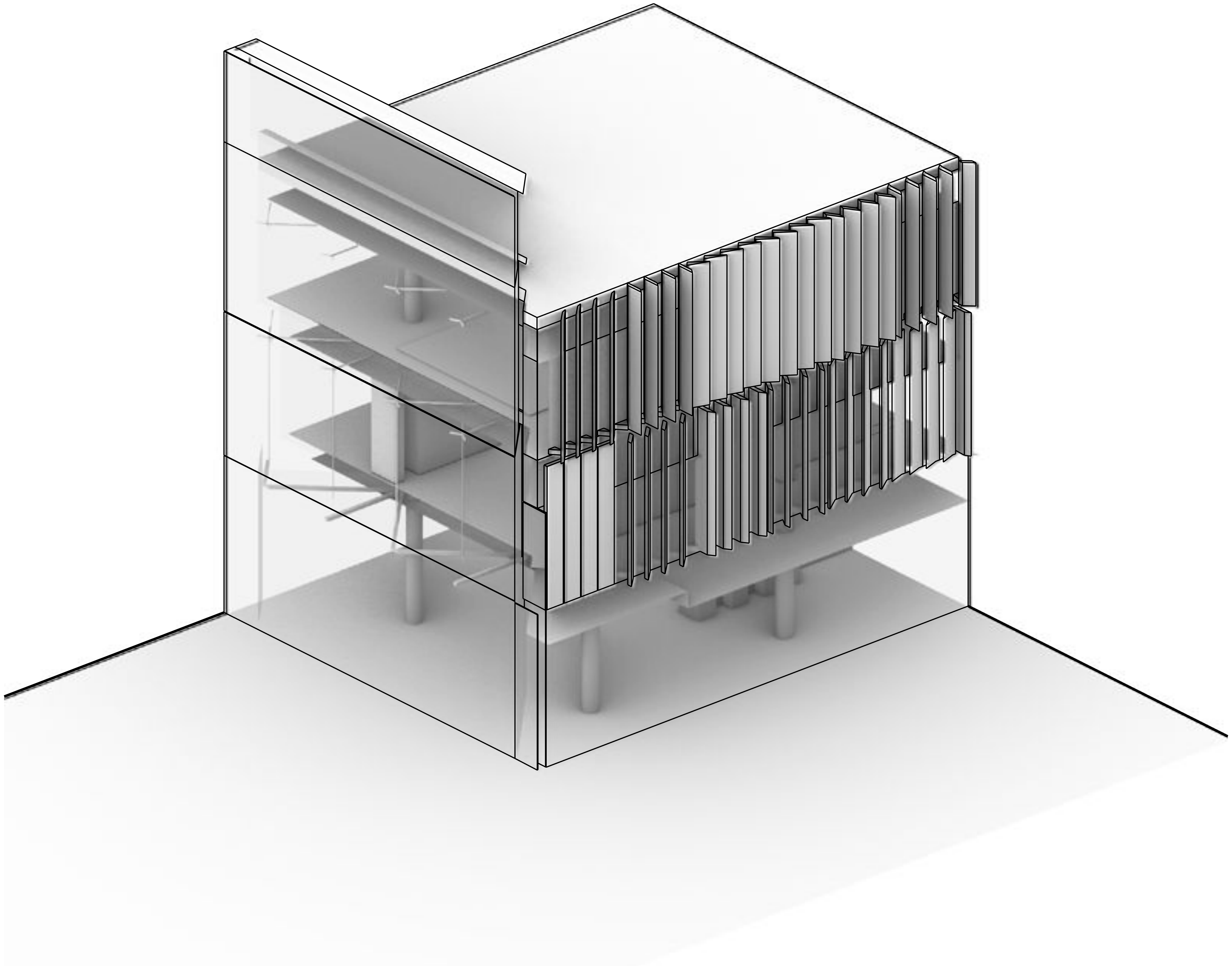
ENCLOSURE



1. Green roof that also contains photovoltaic panels
2. Glass facade structural system which holds the outer glass facade away from the inteirior to create a green atrium space between the 2
3. The south elevation has a glass facade that overlooks an outdoor green area and does not get direct sunlight during the daytime
4. Timber shading structure on the east elevation that sits on the exterior of a glass wall which helps to regulate lighting depending on the ongoing activities within the space.

The enclosure of the Surry Hills Community Centre is made up of wooden facades and curtain wall systems. These glass facades also contain ventilated rainscreens. These louvers run on an automated system that shift throughout the day in response to the suns movement. Each facade addresses different needs as the sun impacts the interior spaces having different amounts of panels, windows, and shading louvers. These elevations also react to the site the surrounding site and change constantly as the environment around it does. The east elevation has the most shifting throughout the day and remains the most perforated. While the north elevation stays completely flat while the west has elements of both included- this being a combination of a majority flat facade with few window openings scattered throughout the facade. The use of these systems positively impacts the goal of sustainability, and helps towards the environmental controls and keeps cost of active heating and cooling lower.

COMPOSITE MODEL



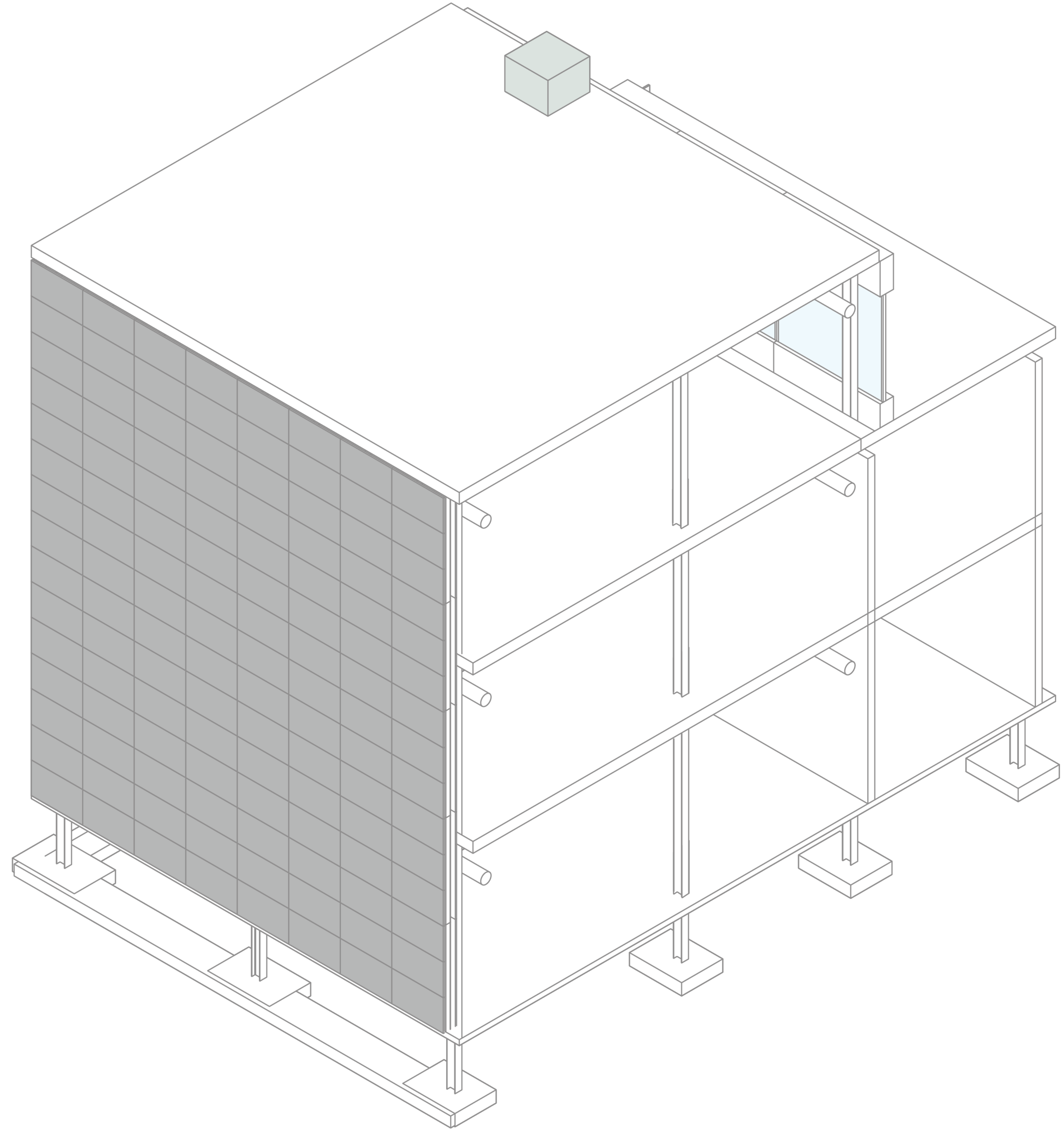
This angle was chosen to the change of facades seeming like two different buildings. There is a large focus on light into the building which is shown in these facade materials either creating a very light open feel with the glass, or a heavy, closed feel with the shading devices when closed. When the shading devices are open, it can allow light into all sides of the building too. The closed devices also create a false sense of structure from the exterior walls when the whole building is held up through the column and bearing walls.

Prototype Study

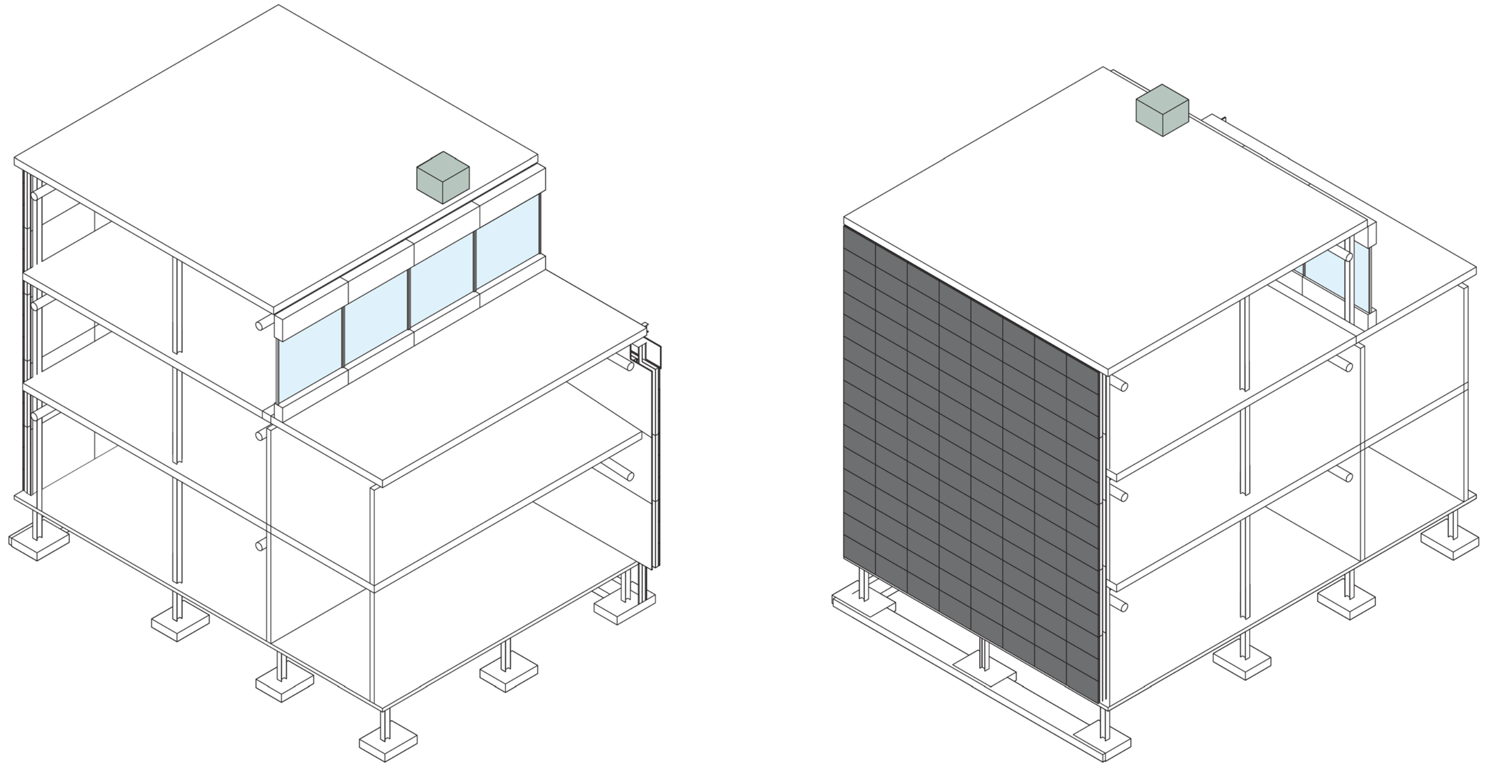
Building System Prototypes

Dante Egizi & Jordan Chapman

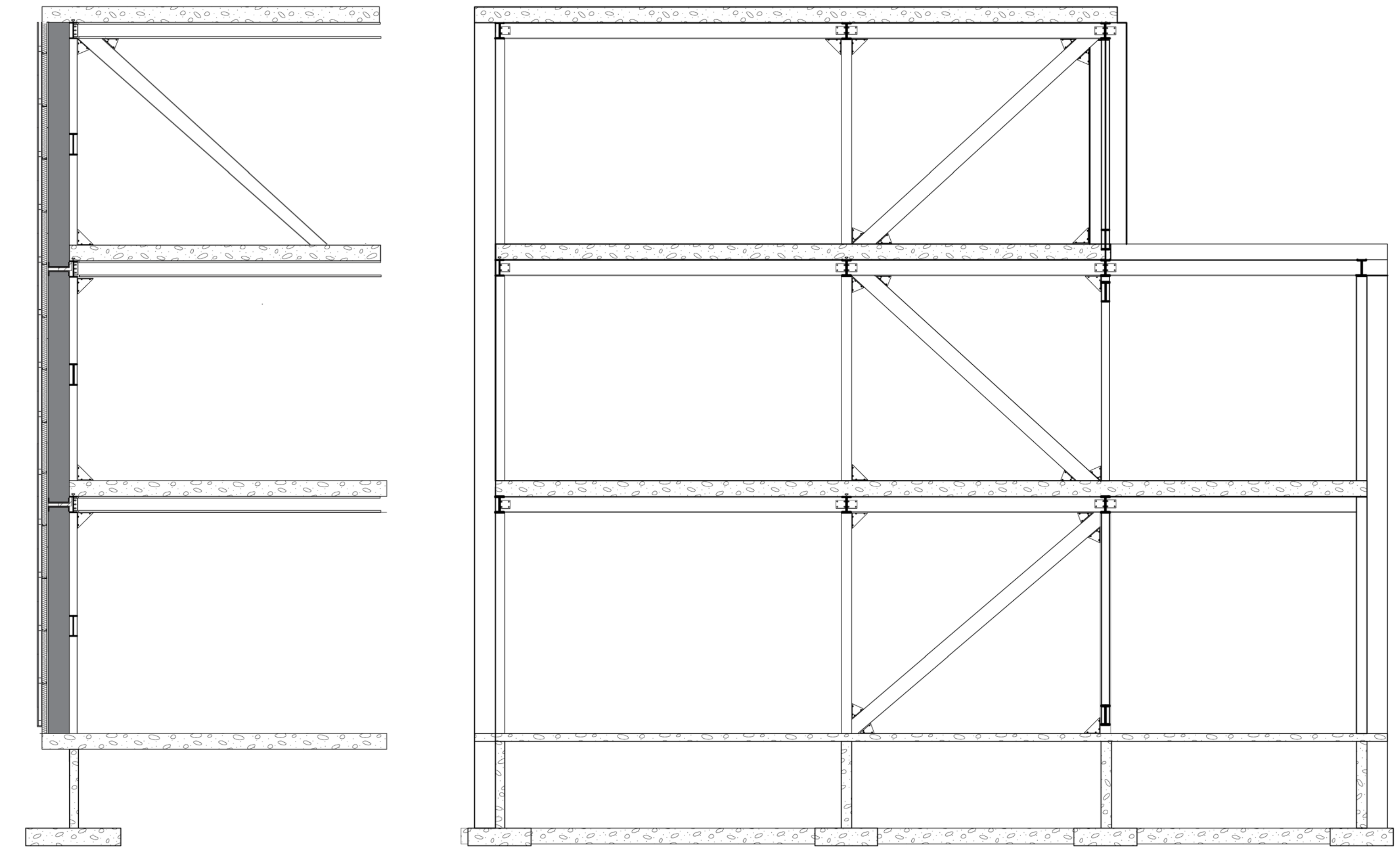
These systems are chosen to provide a light, industrial feel to a maker space. It allows for a wide open area with exposed systems creating an environment similar to a factory which inspires creation. These systems were chosen with cost, efficiency, and space in mind. Basing the whole building around a column grid, the program can become modular with movable walls. This can allow for changes in setup allowing a refreshed space, again inspiring creativity. The façade is metal paneling with cutouts for windows in random panels. The roofs will have outdoor areas, so these metal paneling and glass curtain walls will create reflections heating up any greenery and making a comfortable outdoor area with a view of the river.



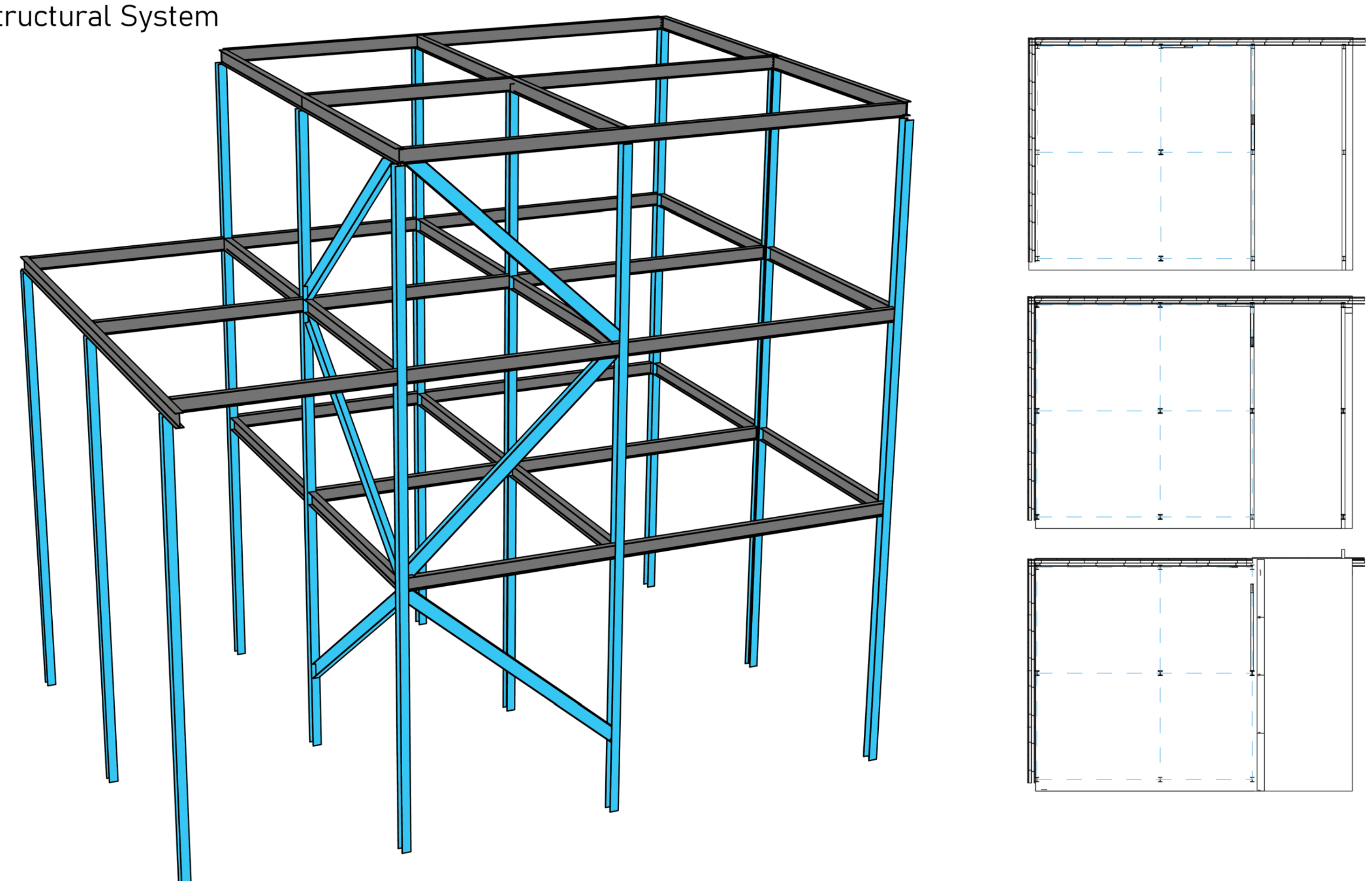
Axons



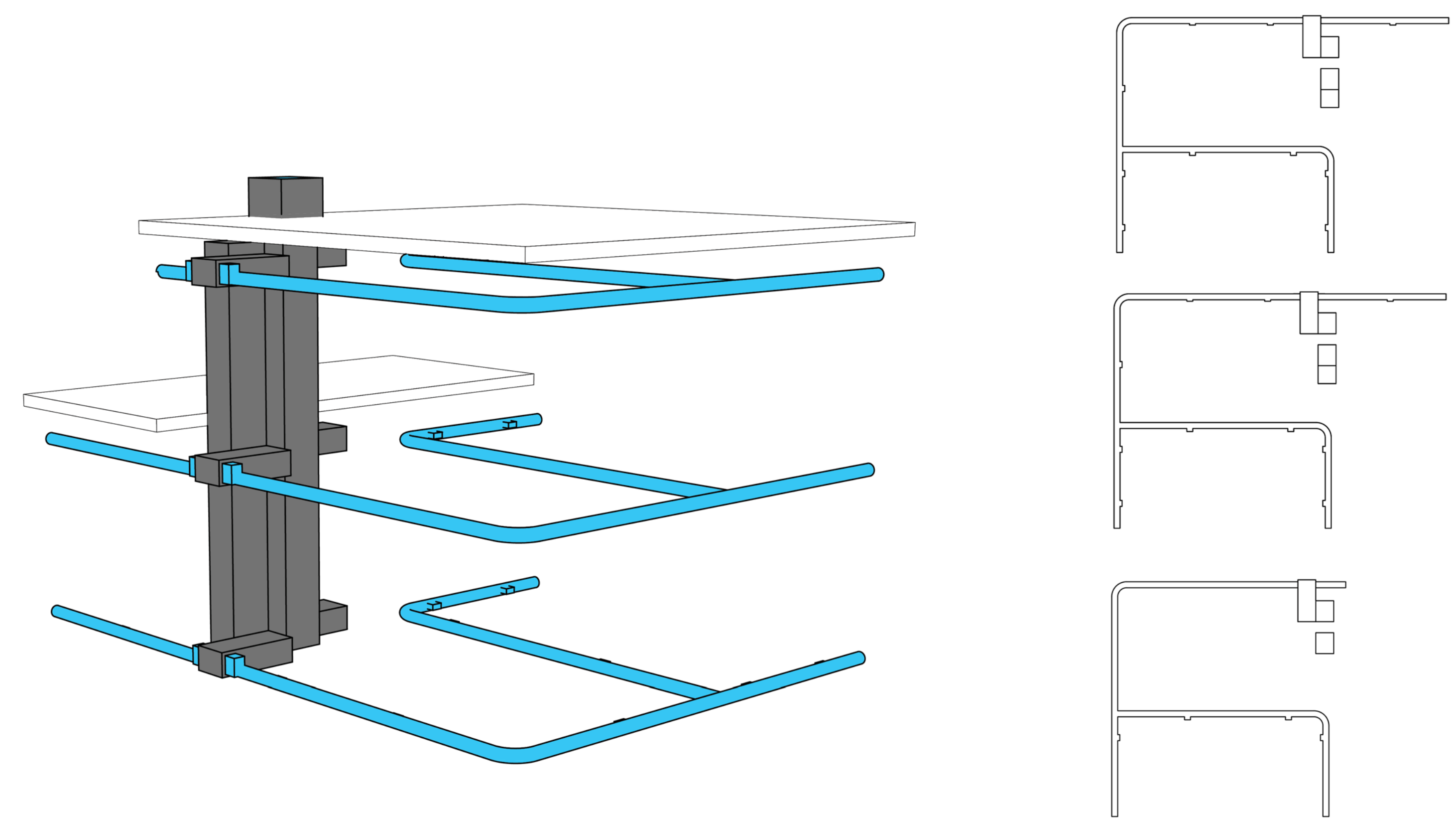
Sections



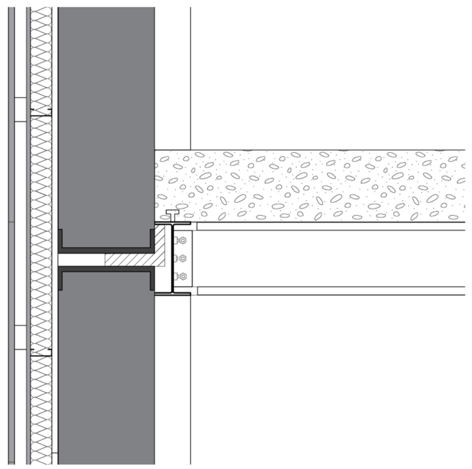
Structural System

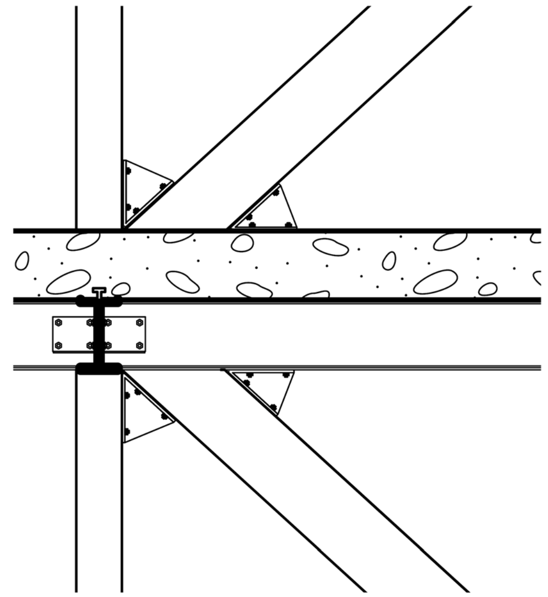


Mechanical System



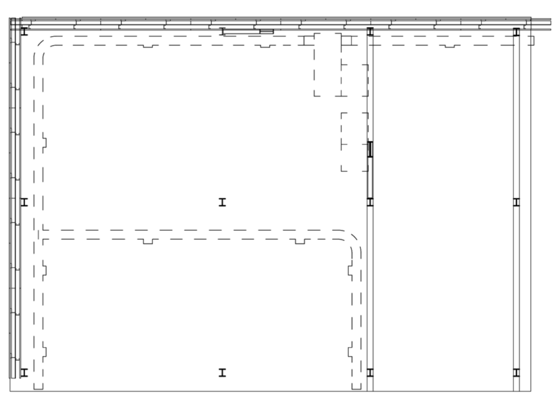
Attachment Methods



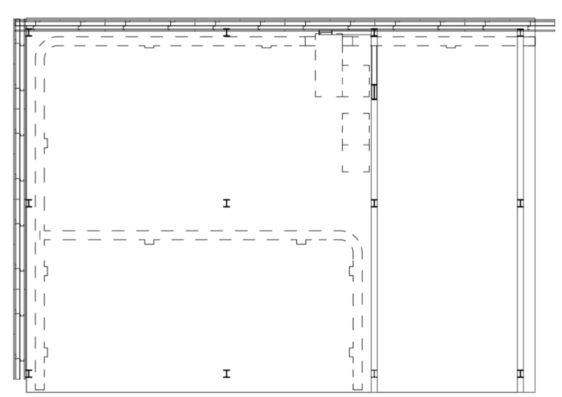


Elevations

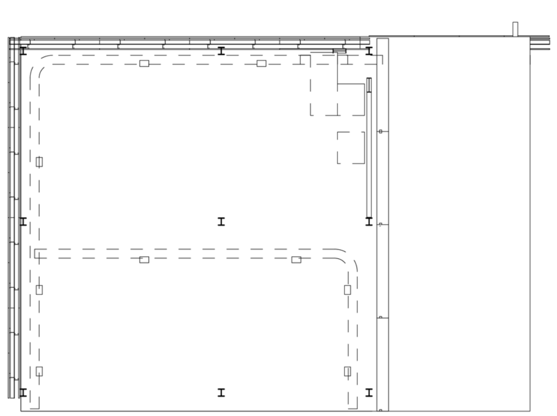
Plans



Floor 1

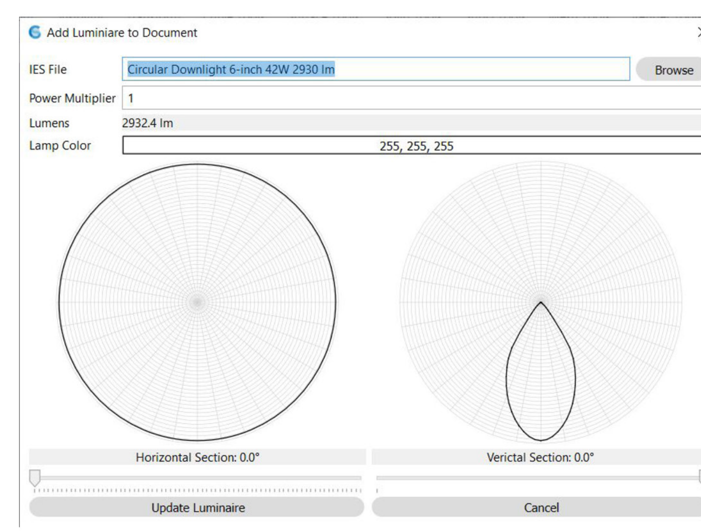


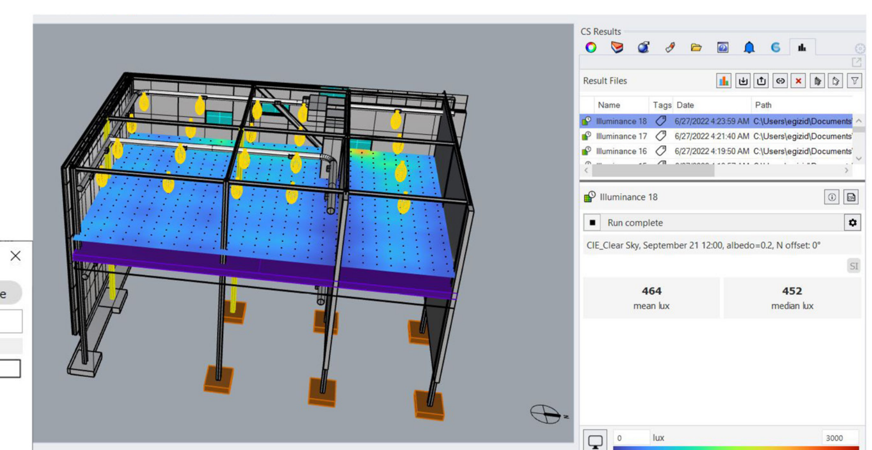
Floor 2

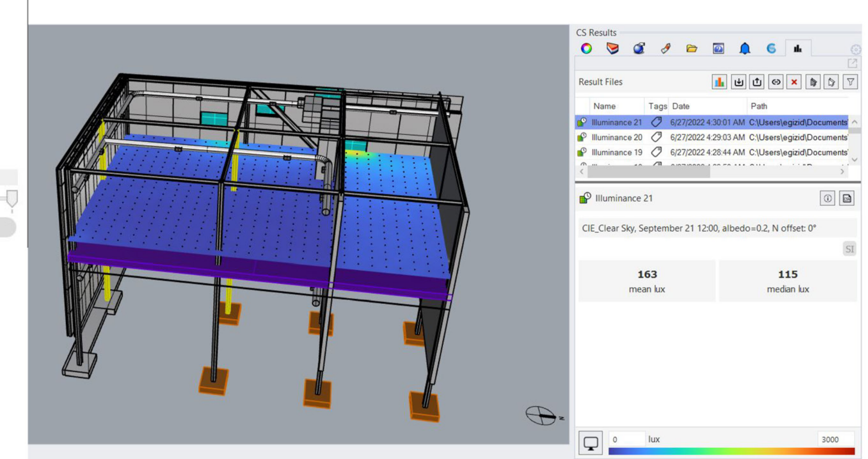


Floor 3

Climate Studio

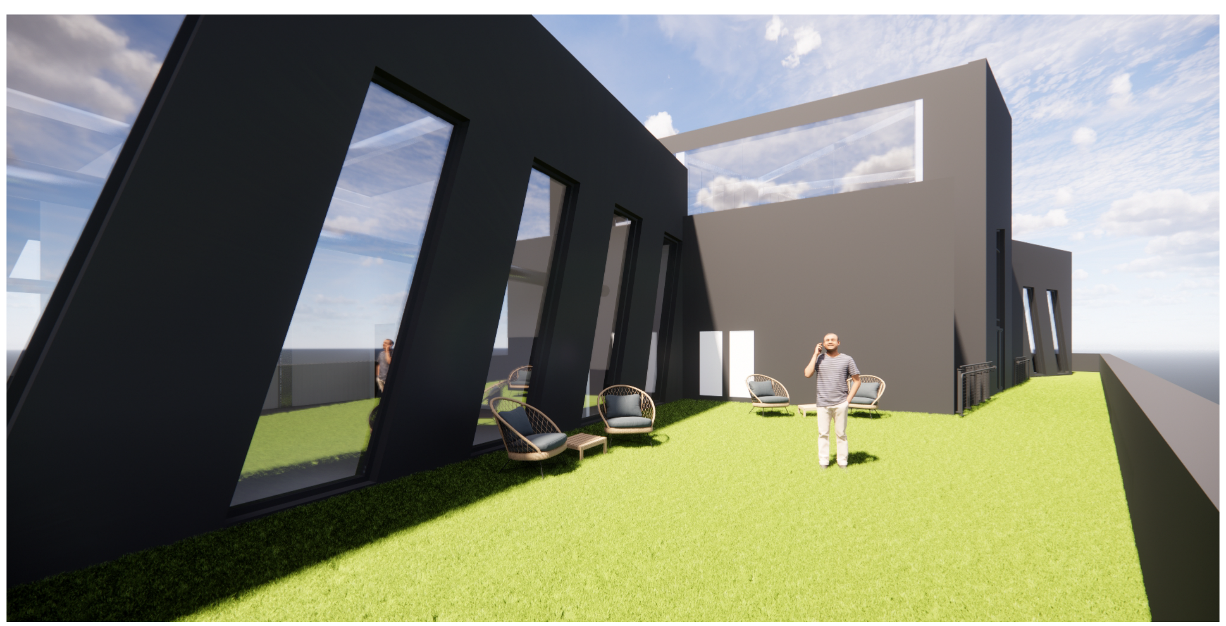






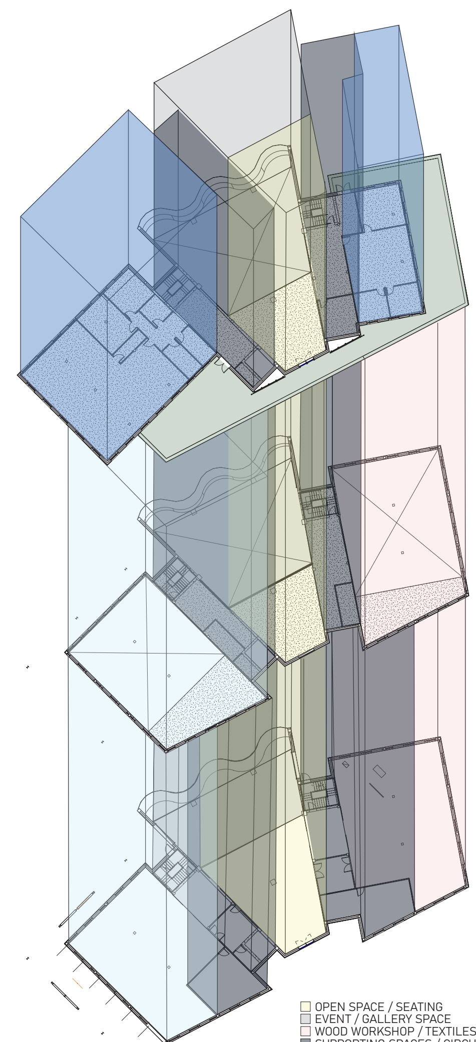
Final Project

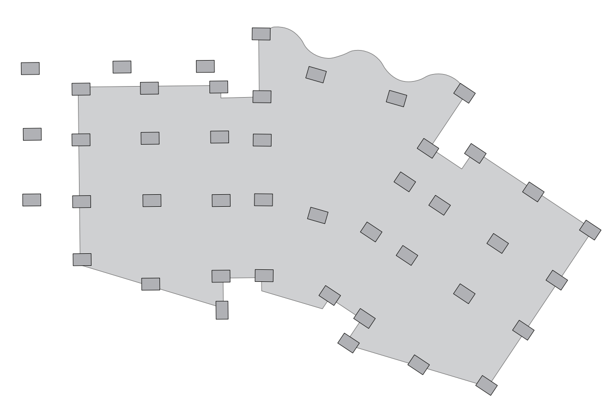





CIRCULATION DIAGRAM
HORIZONTAL AND VERTICAL

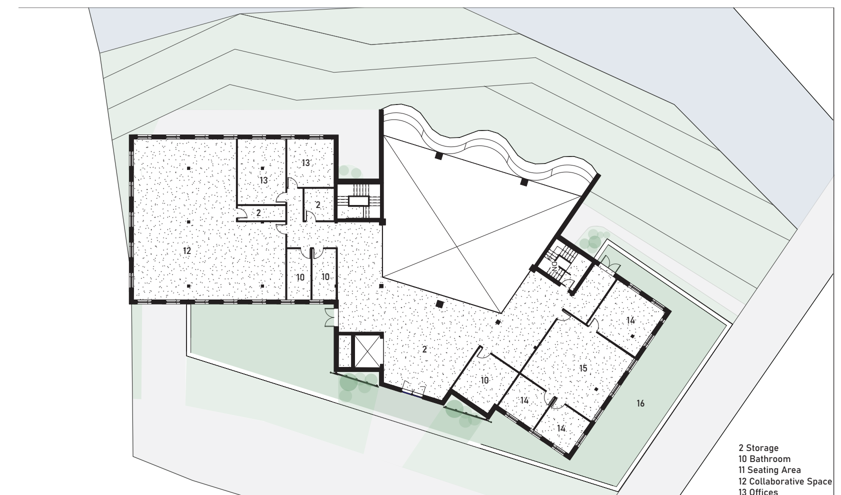
PROGRAM DIAGRAM





FOUNDATION PLAN

Plans

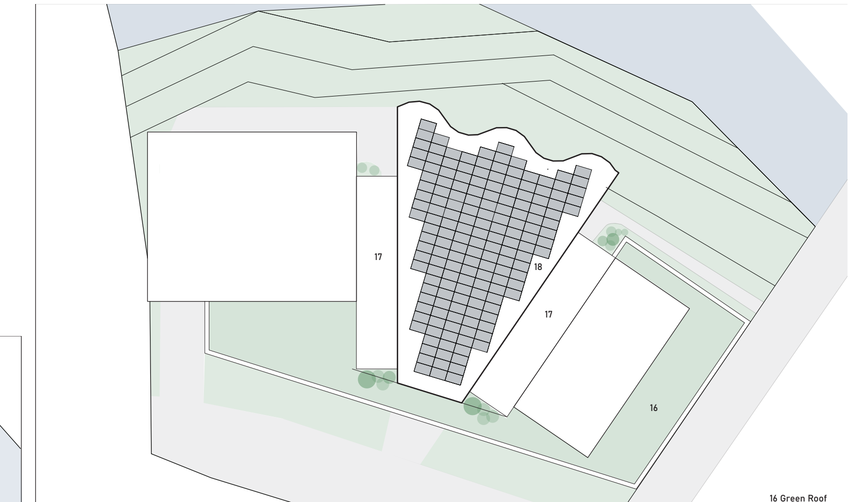


THIRD FLOOR

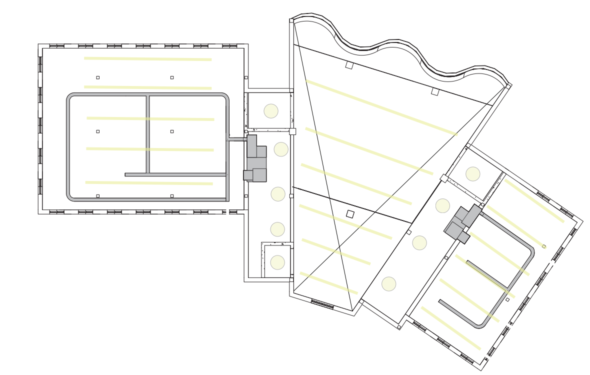
SECOND FLOOR

GROUND FLOOR

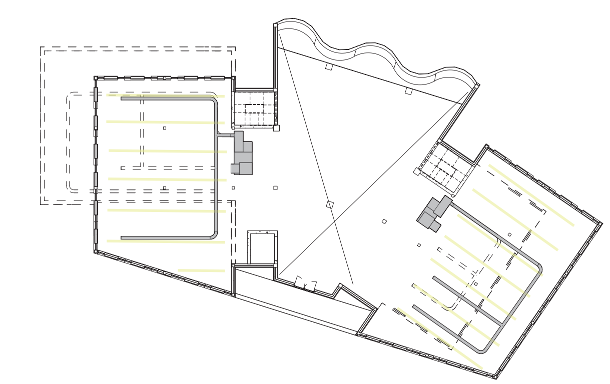
RCP's



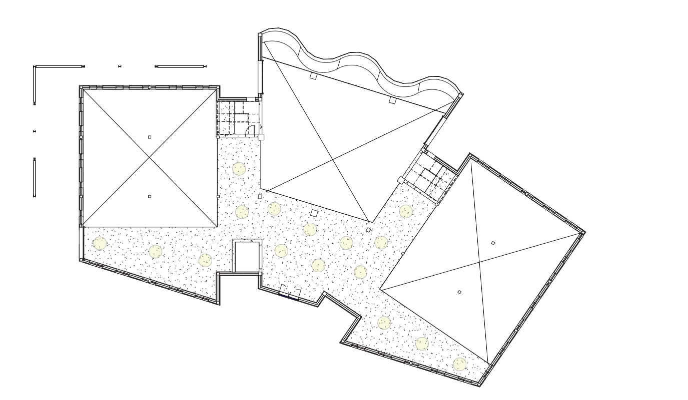
ROOF PLAN



THIRD FLOOR

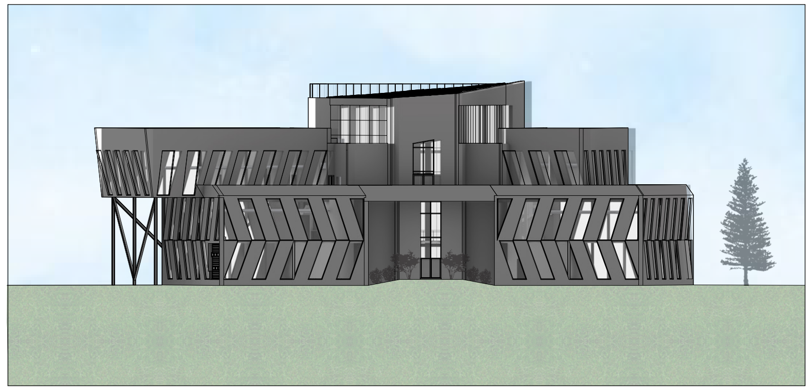


SECOND FLOOR



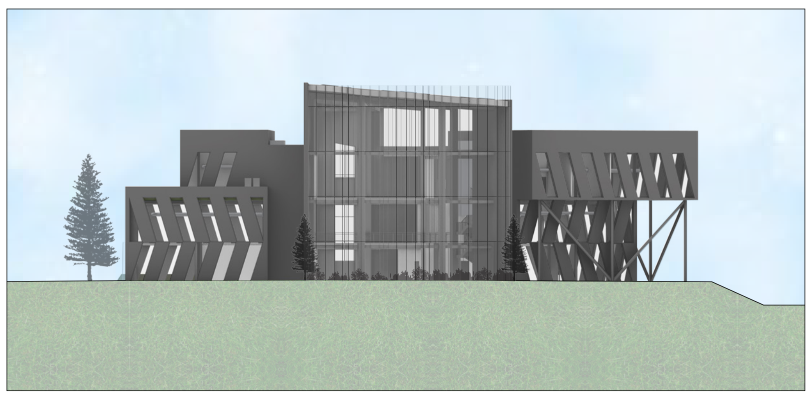
GROUND FLOOR

EXTERIOR ELEVATIONS 1/16"

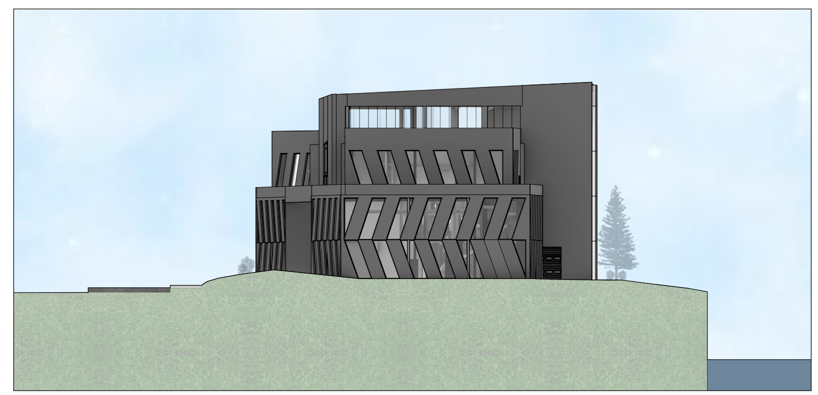


FRONT ELEVATION

LEFT ELEVATION

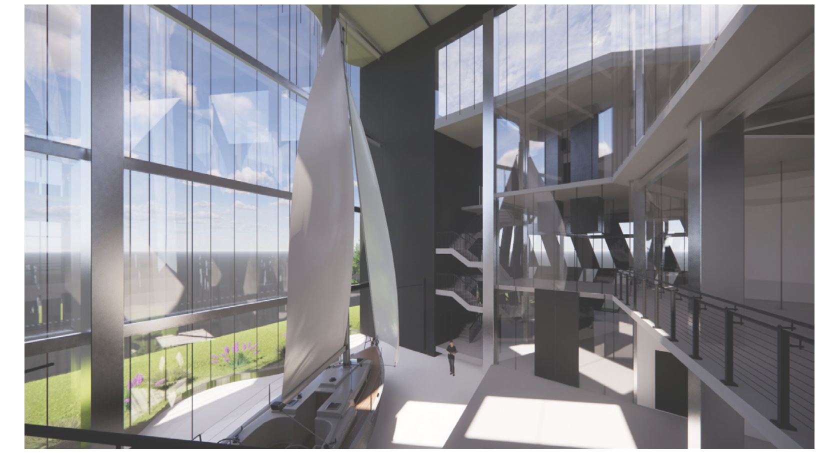


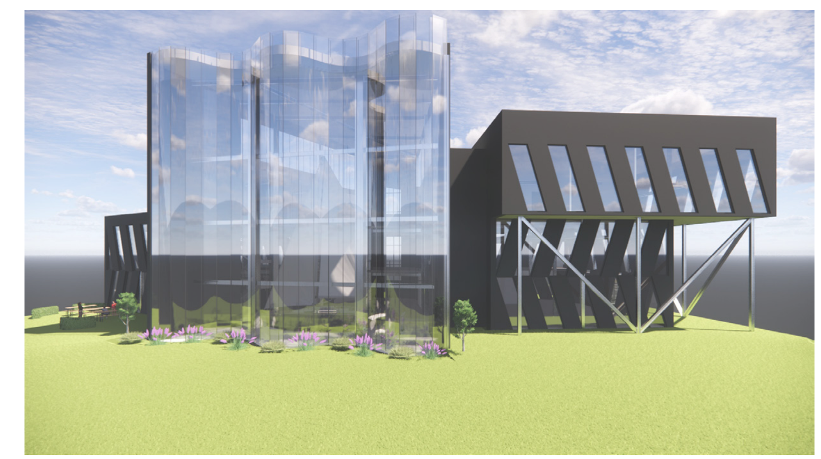
BACK ELEVATION



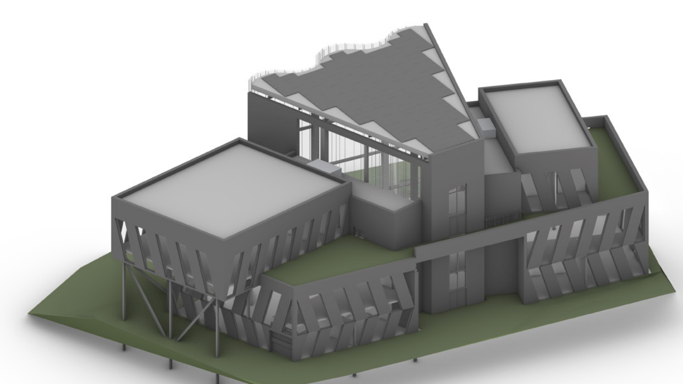
RIGHT ELEVATION

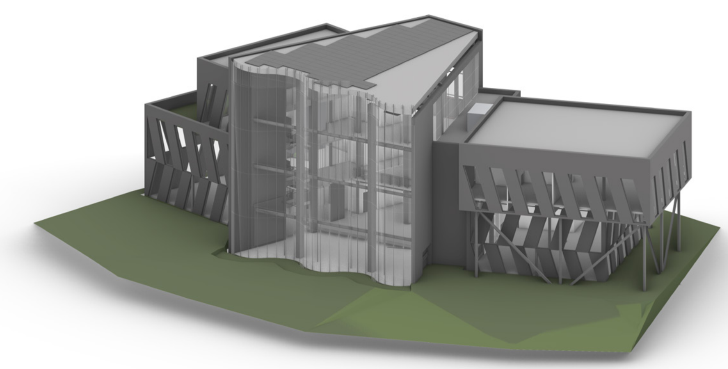
PERSPECTIVES



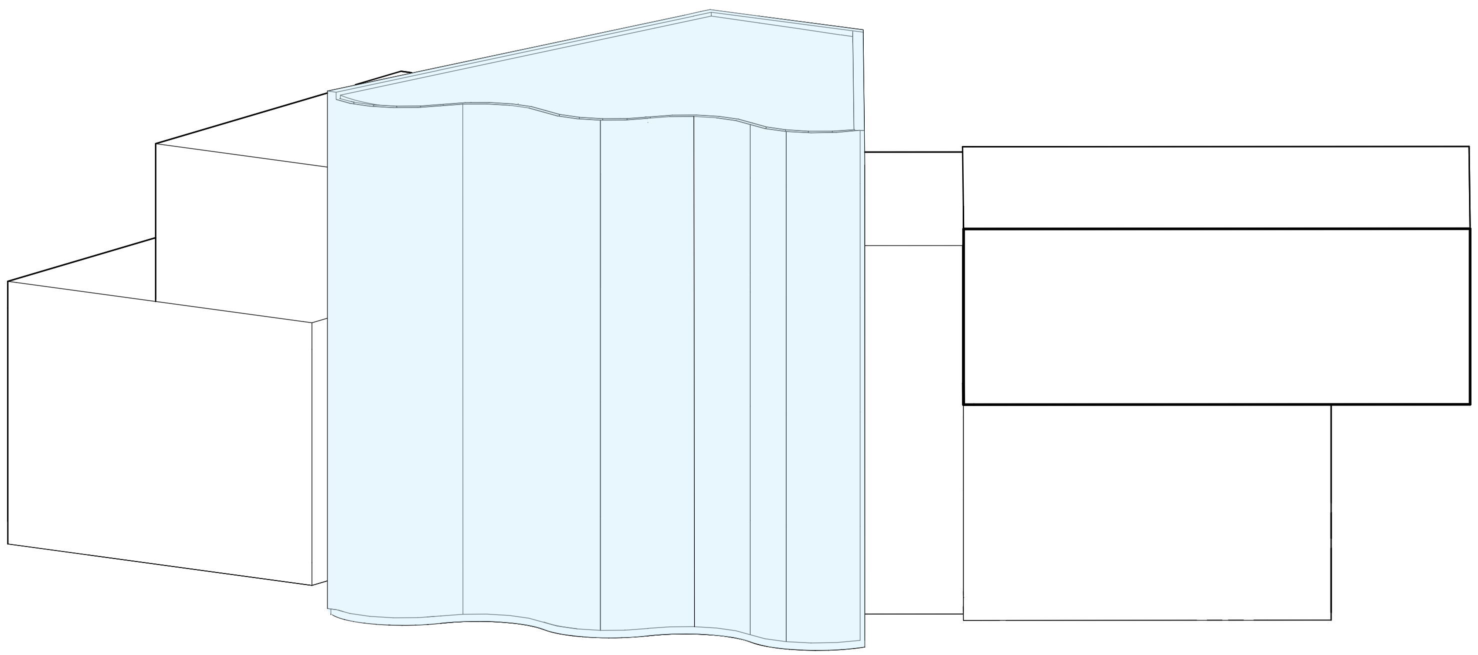


AXONS



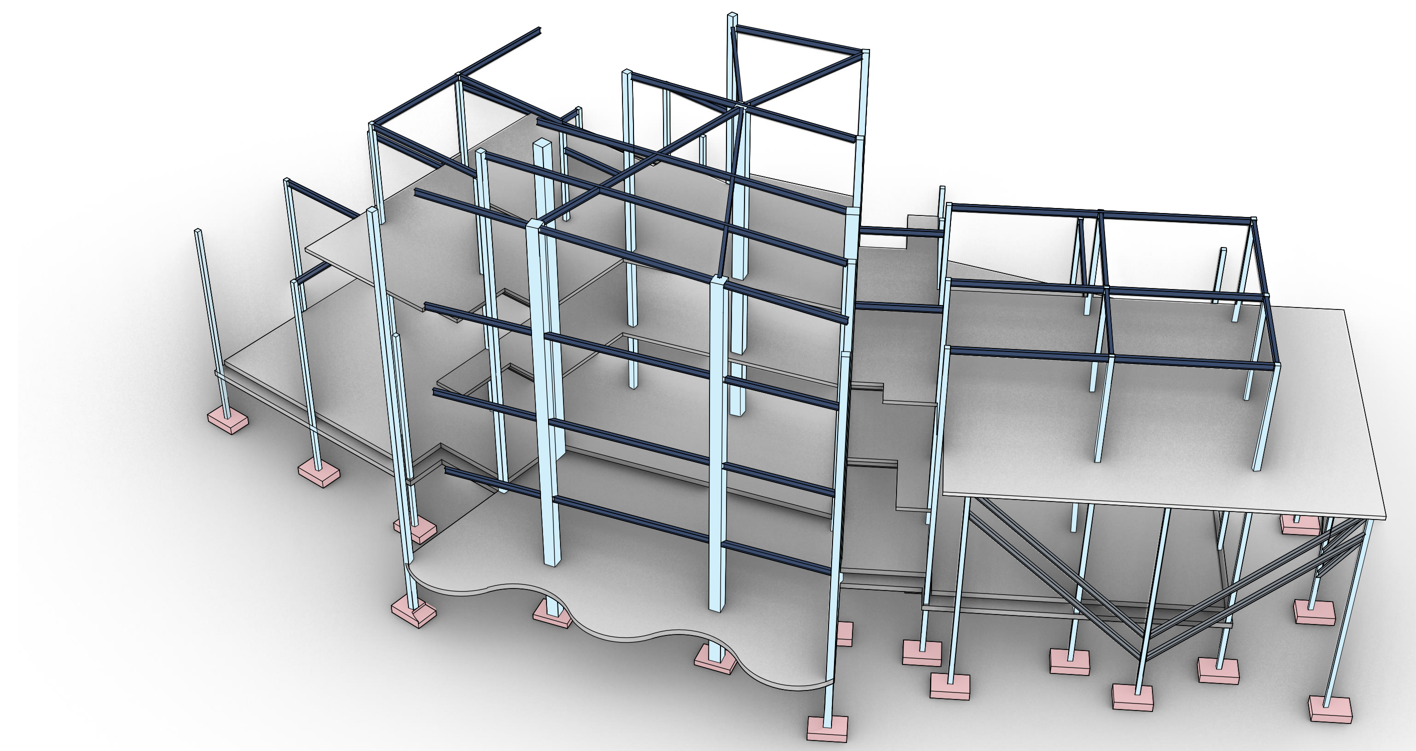


STRUCTURE DIAGRAM/ SIMPLE AXON OR PARTI



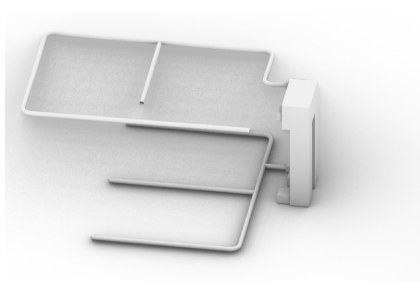
A MASSIVE VOLUME THAT HAS SMALLER SUPPORT SPACES THAT FEEDS INTO AND SUPPORTS THE SPACE

STRUCTURE DIAGRAM

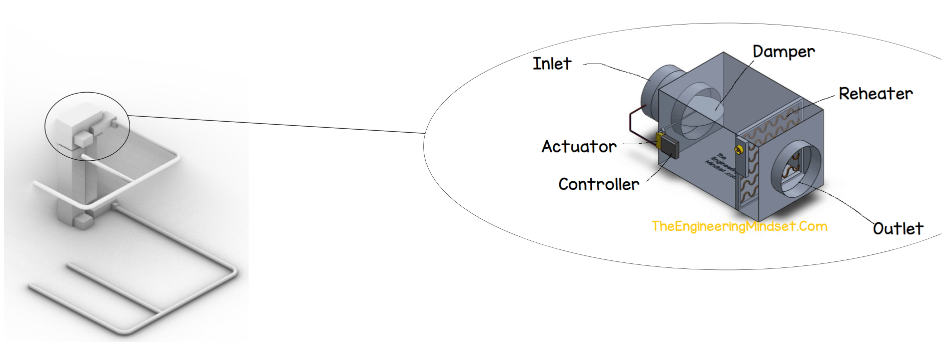


CONCRETE FOOTINGS
STEEL ENCASED SQUARE COLUMNS
STEEL CROSS BRACING
STEEL I-BEAMS

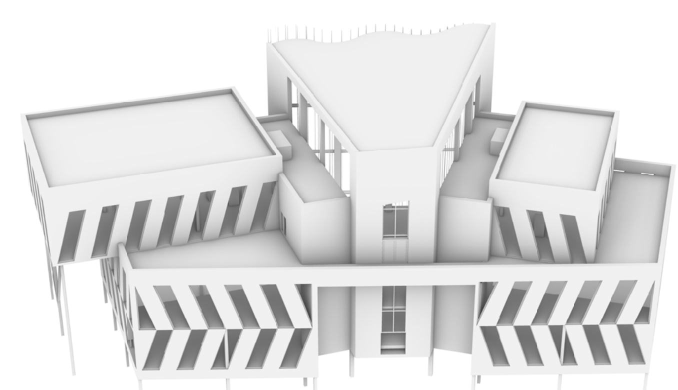
MECHANICAL SYSTEM

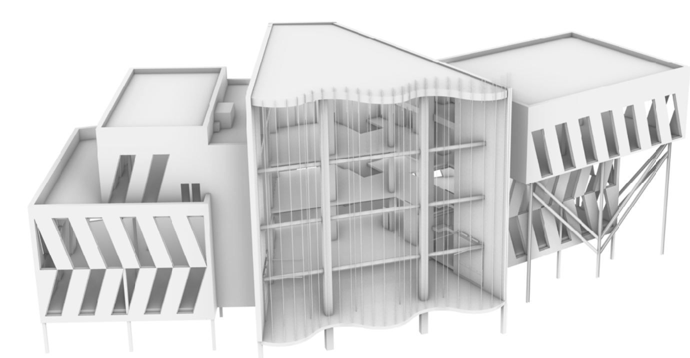


VAV HVAC SYSTEM

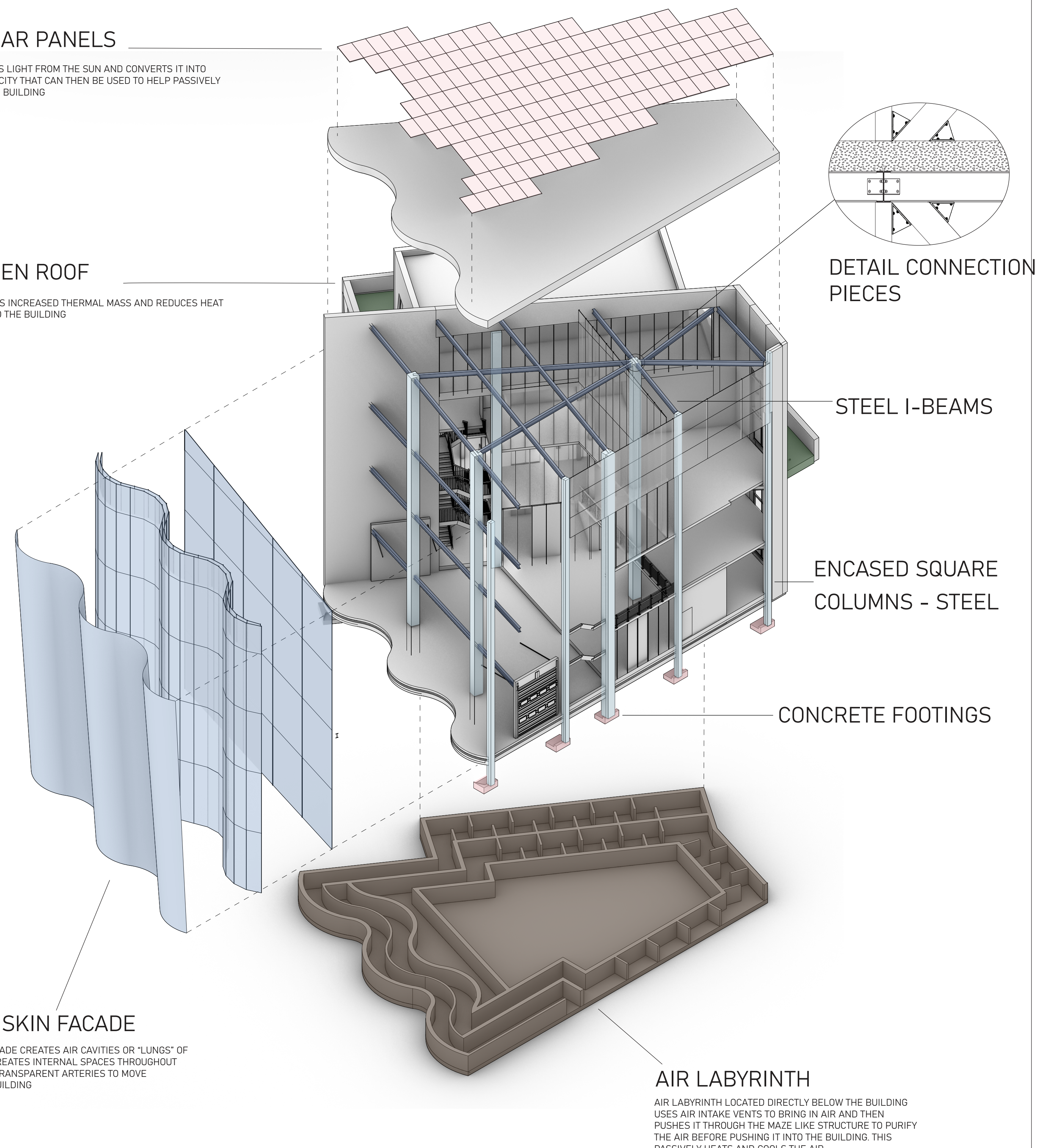


ENCLOSURE





EXPLODED AXON



WALL SECTION / ELEVATION / PLAN DRAWING