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Spring 2019

### Adaptive Layers: Preservation in high speed urbanism

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*Syracuse University*

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# ADAPTIVE LAYERS

Preservation in high speed urbanism

ALEX CHEN

First Semester Advisor: Maya Alam

Second Semester Advisor: Anne Munly

5/8/2019

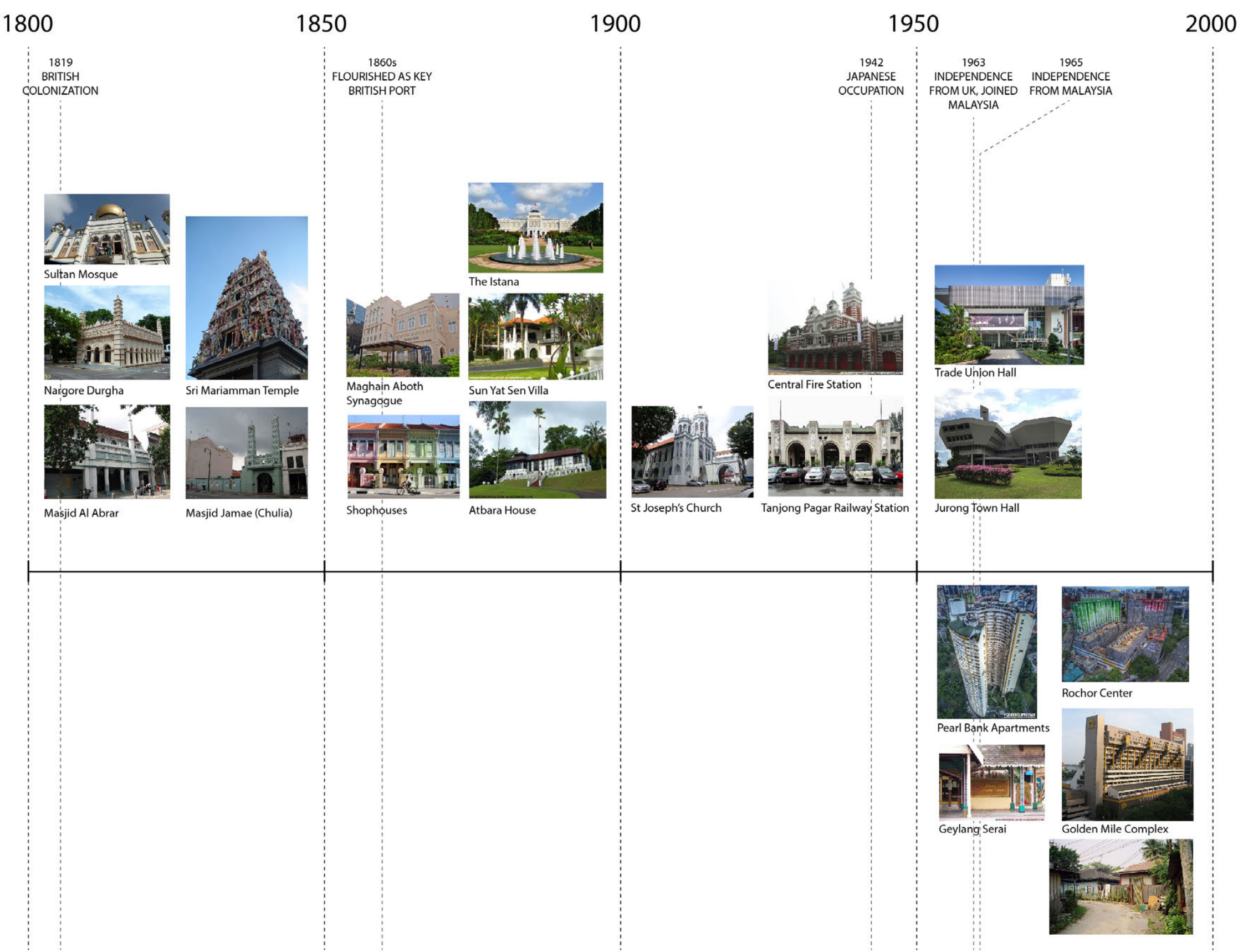
Singapore's historical identity is often considered secondary to the pragmatic need for densification. As a city built in 30 years, the rapid rate of modernization has created a disconnect between our historical background and architecture today. The loss of a tangible built history has led to many feeling that Singapore has a lack of a cultural identity.

Using a system of layering, this thesis speculates on a new building typology that overlap and intermix the past with the contemporary.

HISTORICAL CONSERVATION IN SINGAPORE

The world's population is growing at a rapid rate. In most countries, more than half of the population lives in urban areas. Urban densification has spiked in the last 50 years, with some cities doubling or even tripling their populations. The UN Urbanization projections predicts that in 2050, most countries will have more people living in urban areas than rural areas. This push for high speed urbanism and the clustering in super dense cities is partially driven by the benefits of density. Super dense cities often correlate with an increased level of living standards and economic growth. Clustering in dense cities also minimizes the damage to the environment. As people are drawn towards the city, the infrastructure faces a need to densify. The typical approach is to tear down and rebuild. In countries like the United States, where there is still space to create satellite towns and edge cities if needed, there is still the leisure to choose exactly what gets torn down. In cities like Singapore, Hong Kong and Tokyo that are much more saturated with infrastructure and people, it becomes a much more difficult choice.

With a population density of 20191.5 people per square mile and 279 square miles of land, Singapore is the world's 3rd densest country. 100% of the population lives in an urban area. Per year, the population increases by an average of 100 000 people while land shrinks due to rising sea levels. For Singapore, the only option is densification. With the country's top down, Robert Moses approach to city planning, buildings in Singapore have an incredibly short lifespan. Many buildings that are only 30 years old are torn down despite their cultural significance. For Jane Jacobs, preservation is not just preserving the building but also the streets, the community and the self-organization within neighborhoods. As a young country, many of these sites for preservation are still very much in use, retaining the characteristics of the community that will be lost if destroyed. In fact, most of the country's first public housing projects have disappeared, along with their informal markets, corridor gardens, businesses and communities. This has led to people in their 50s remarking that "the Singapore they grew up in is gone."



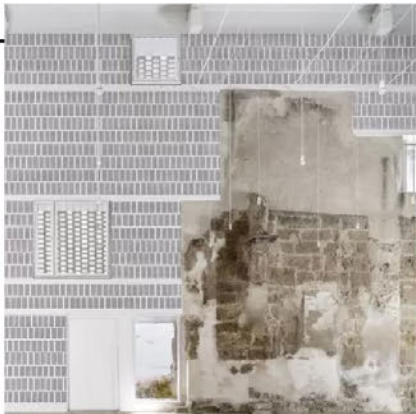
A NEW TYPOLOGY

This thesis proposes an alternative that examines an intersection between urban densification and organic growth as a solution to the preservation of culture and identity in the future of high-speed urbanization. A tangible history is important in preserving a culture and fostering an identity. In cities like Singapore, it gives citizens a tangible item to ground their heritage and cultural identity in a rapidly globalizing world. Preservation in this context is the retention of a community and a way of life, rooted in a physical building. The project investigates an alternative to preservation through layering, addition, insertion, multiplication and transparency to create a new typology through a system of adaptive layers that is geared towards a dense population yet familiar to Singaporeans. The thesis explores the degrees of legibility between layer v base, layer v layer and layer v whole, questioning the degree to which you can add, blur and distort without losing the historical image of the base.

HISTORICAL PRESERVATION

JANE JACOBS

ADAPTIVE REUSE



Preserving without constraint of density

ADAPTIVE REUSE



Preserving while densifying slightly via addition

LAYERED FACADE



METABOLIST ARCHITECTURE



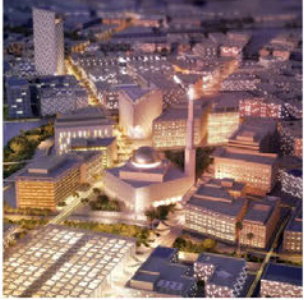
Opportunity for organic growth

KOWLOON WALLED CITY



Organic, uncontrolled growth

SINO OMAN NEW CITY



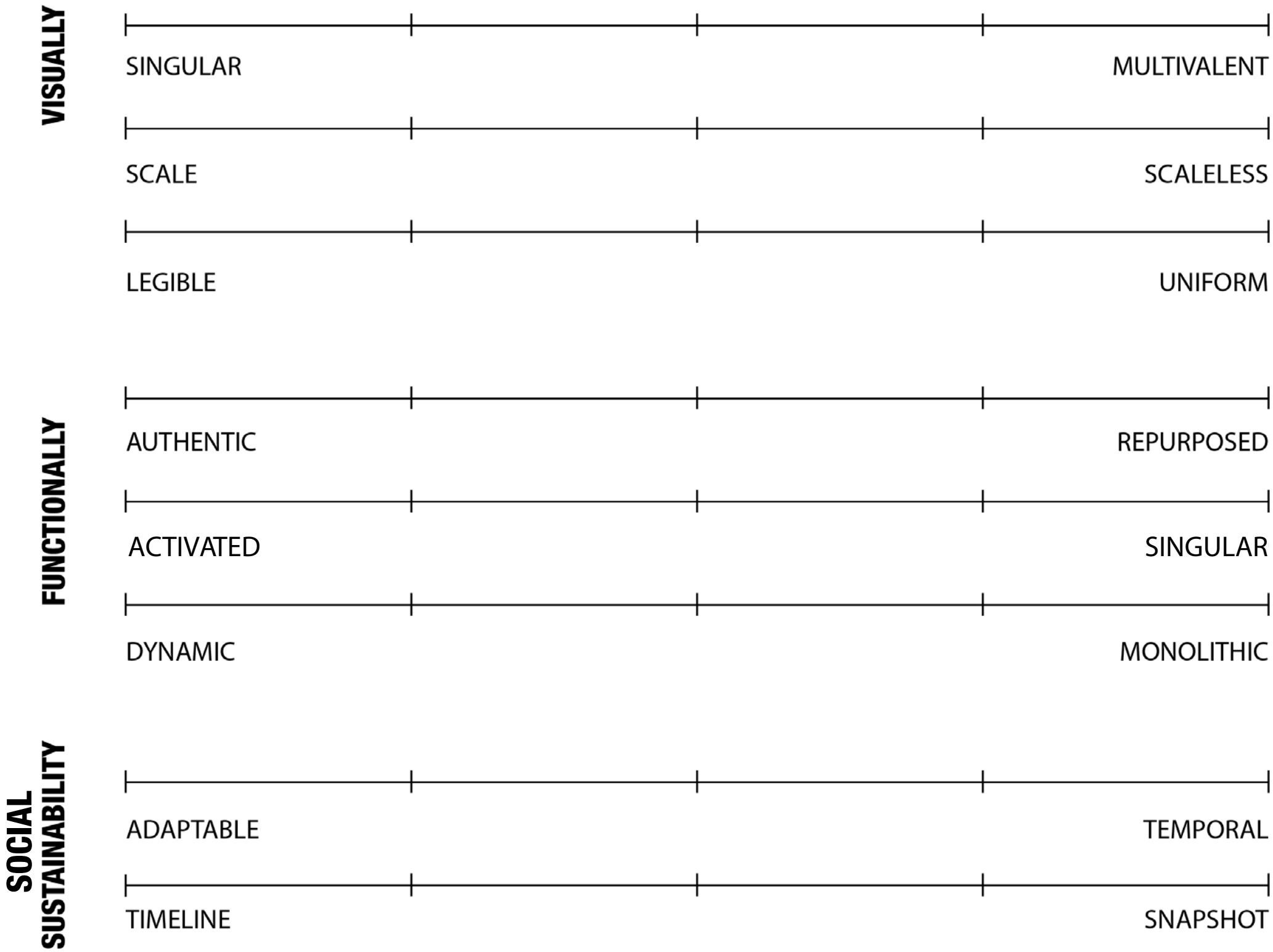
Top down, planned city

ROBERT MOSES

NEED FOR DENSITY

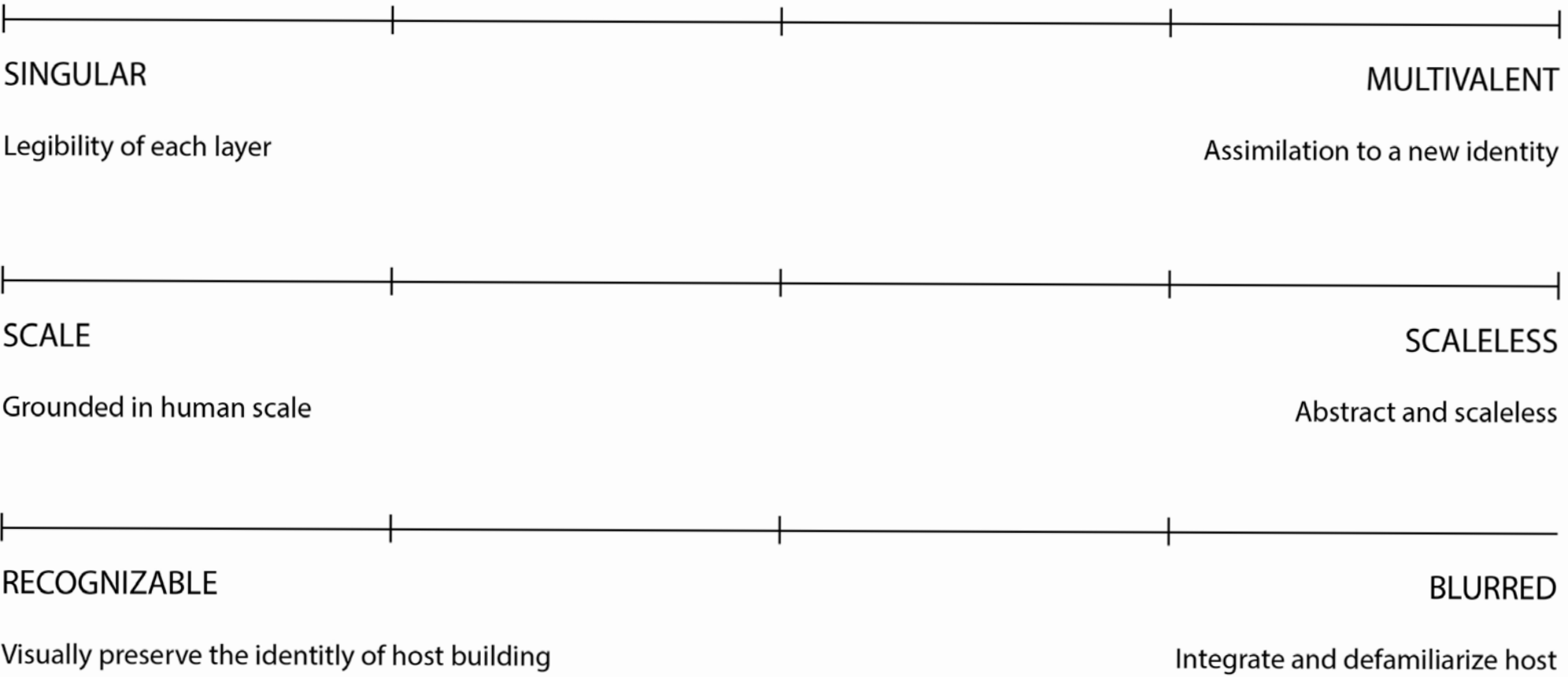
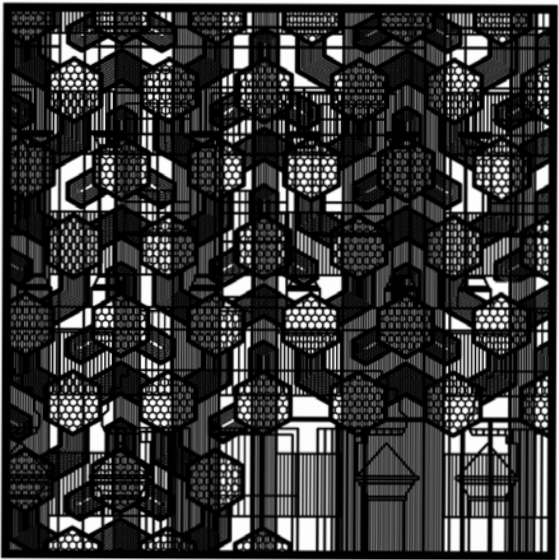
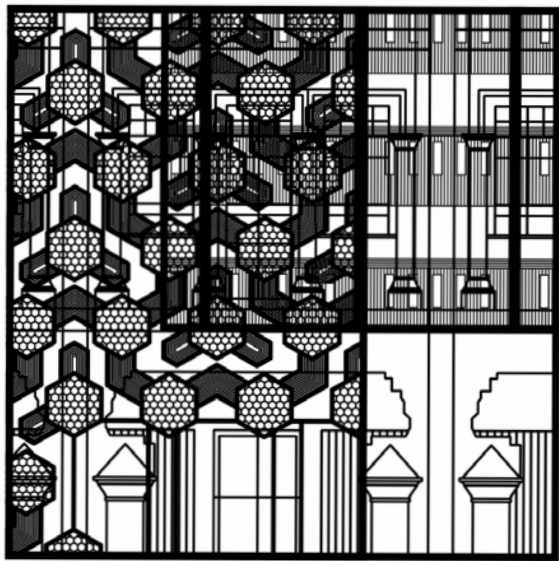
CRITERIA

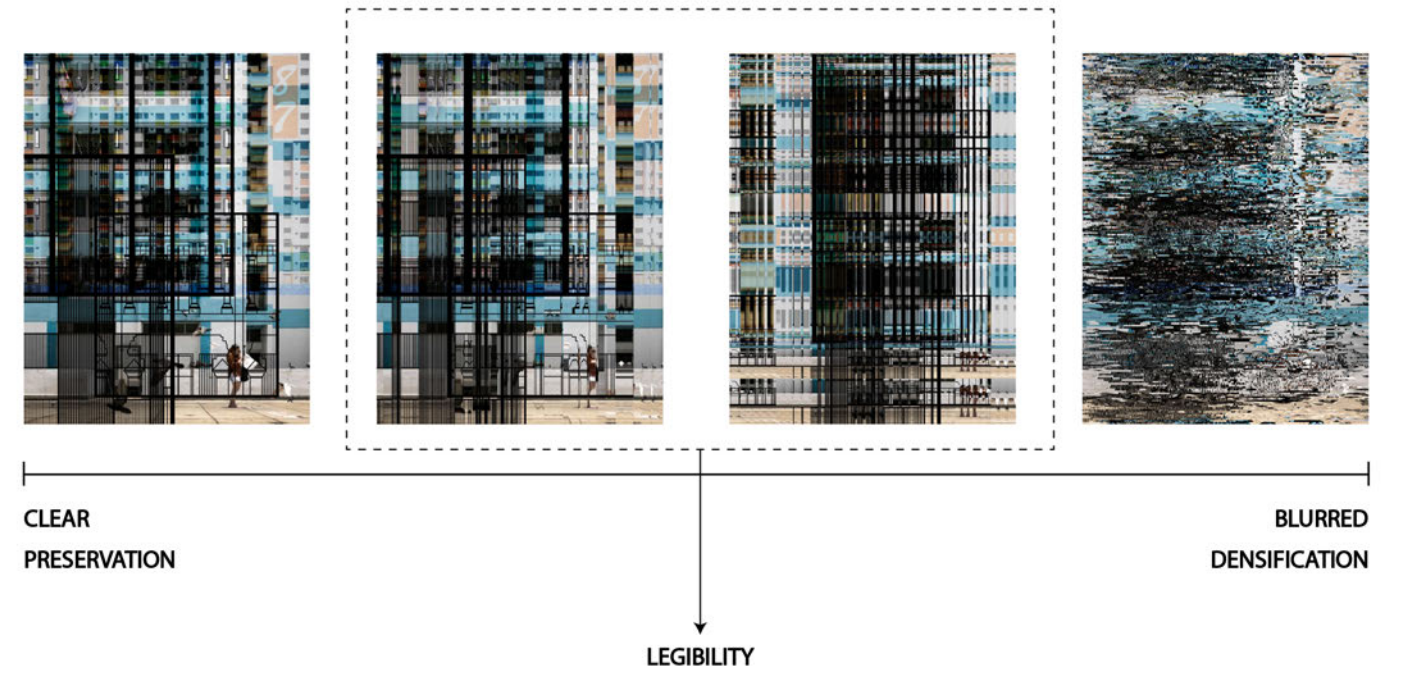
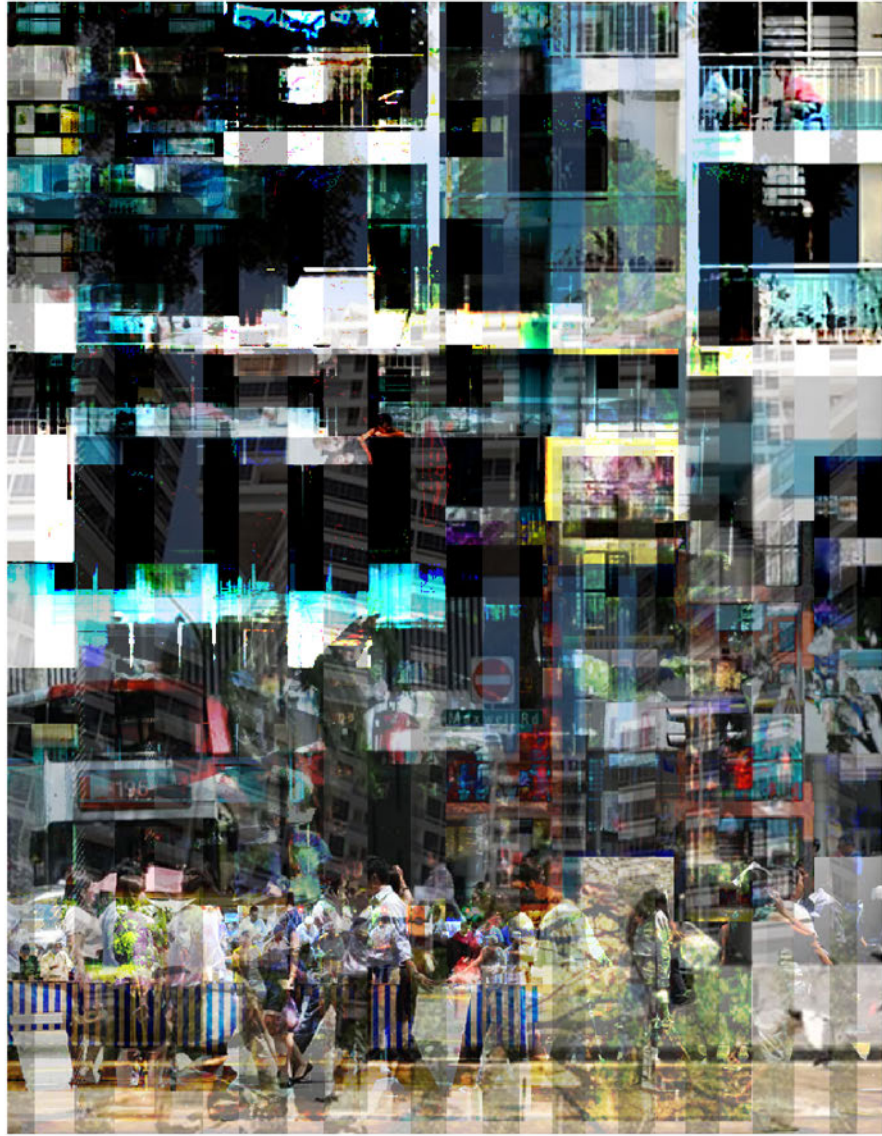
Three categories were identified that would be important ways to judge how well a building was preserved while being densified. Visually addresses the importance of a visible link to one's history and the link between culture and identity. Functionally refers to how well the building suits a Singaporean lifestyle. Social Sustainability refers to how well the new typology promotes the wellbeing of its inhabitants while also supporting the ability of future generations to maintain a healthy community.



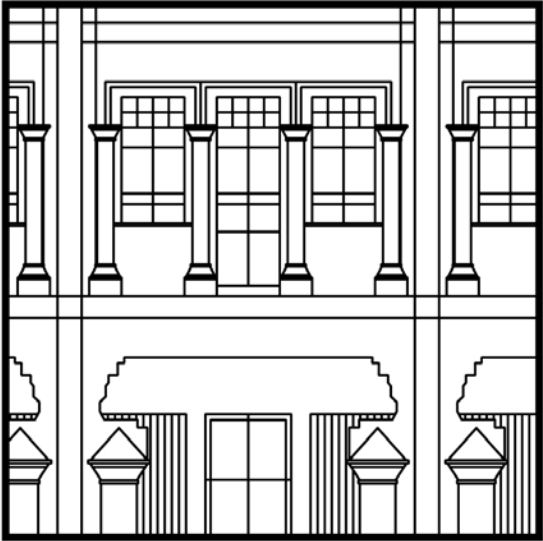
VISUALLY

Visually refers to how well the new typology can blend existing facades to create a new identity while maintaining the legibility of the individual layers. Legibility becomes key in the following explorations.

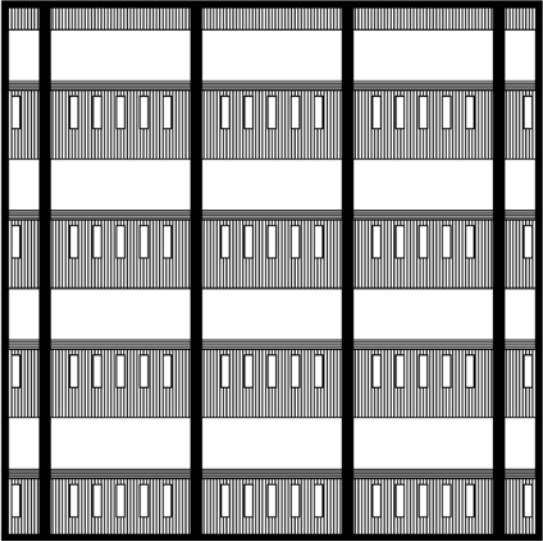




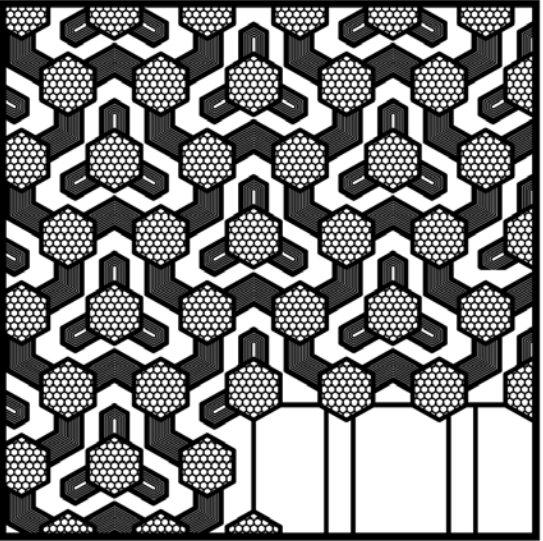
SHOPHOUSE



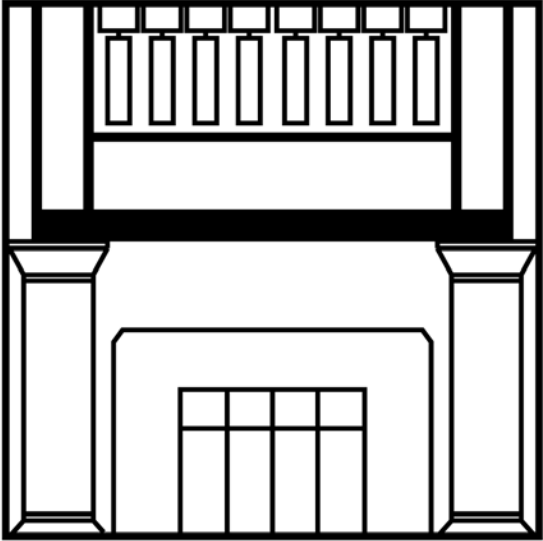
HDB 1950s



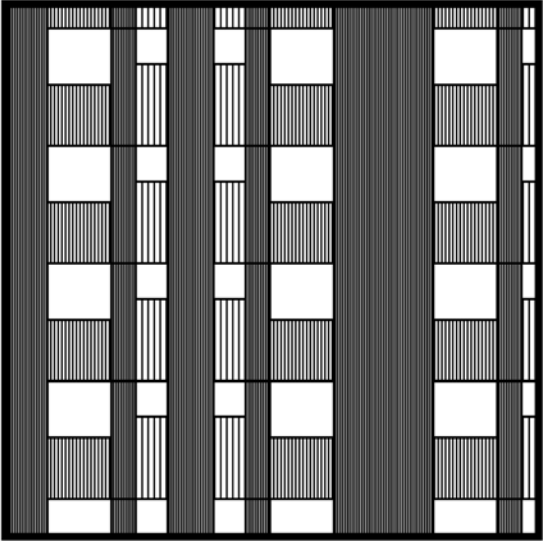
BUGIS+



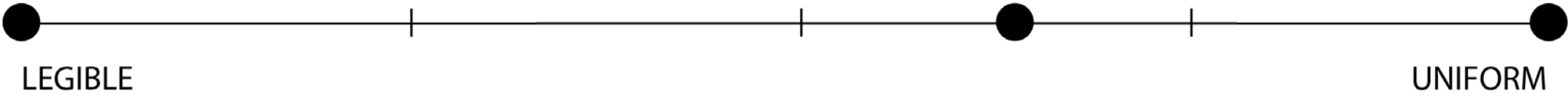
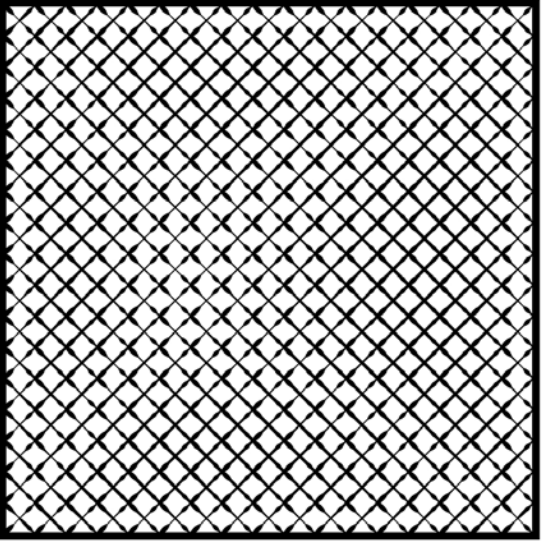
BLACK AND WHITE HOUSE



HDB 1970s



CROWNE PLAZA CHANGI

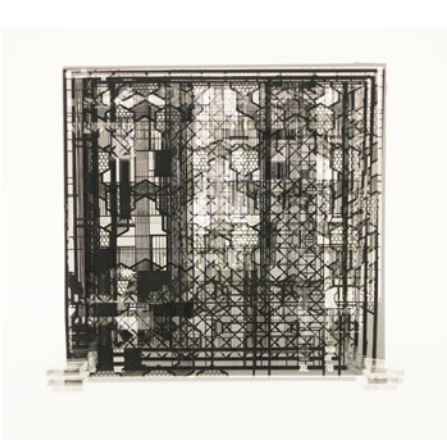
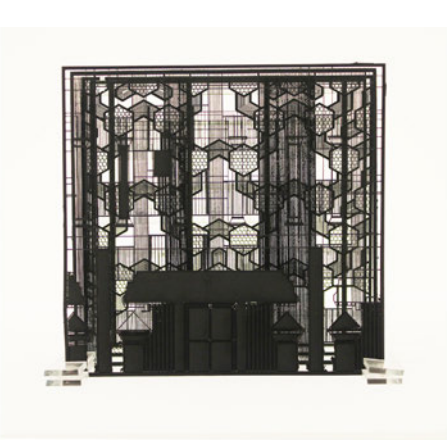
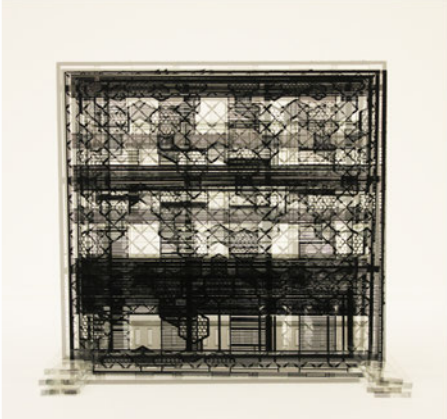
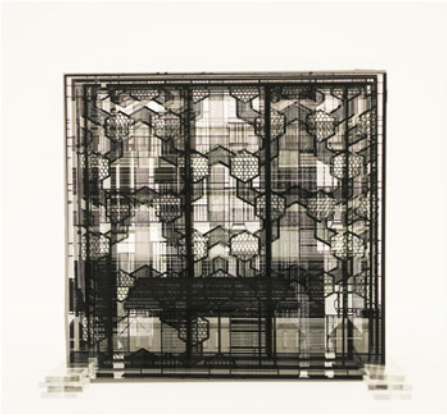
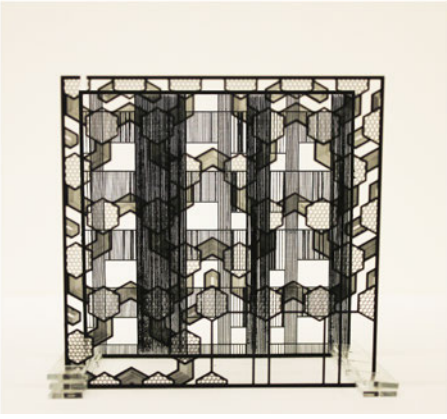
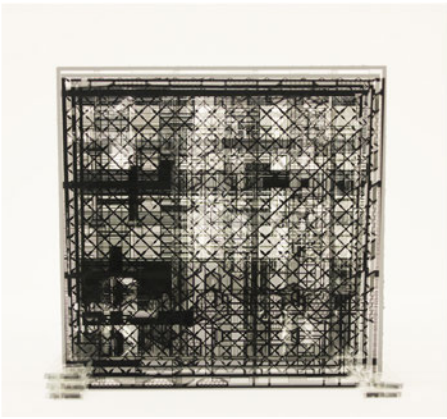


LEGIBLE

UNIFORM

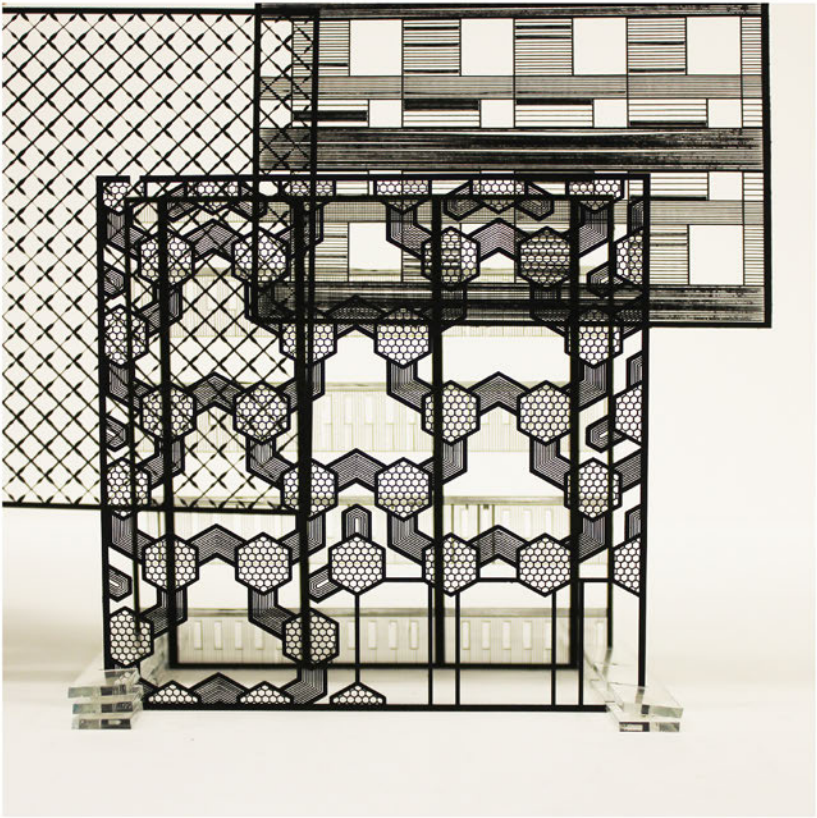
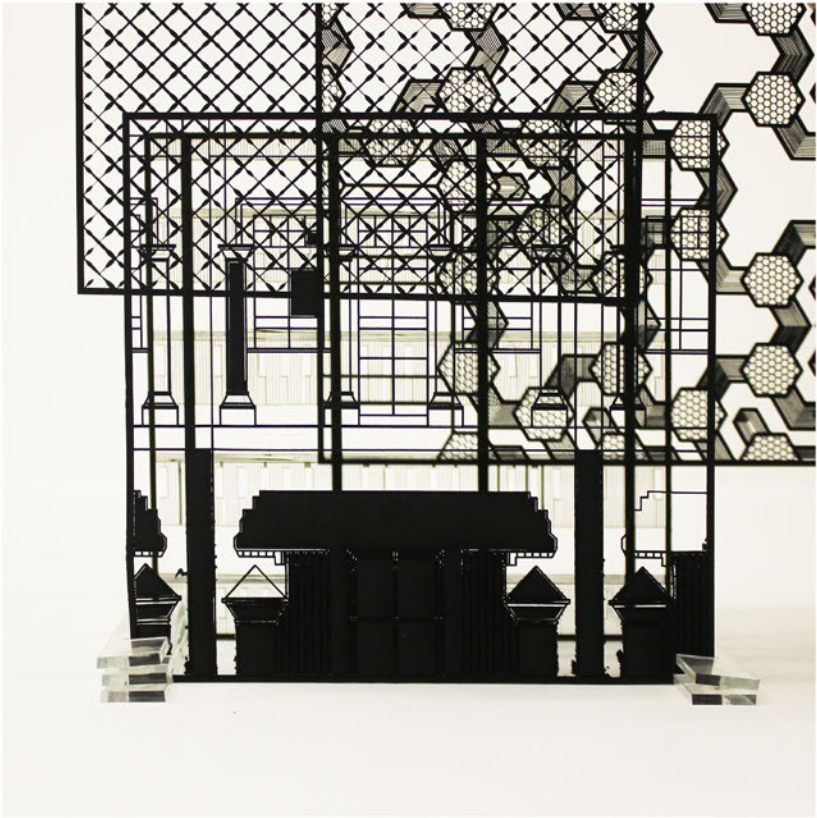
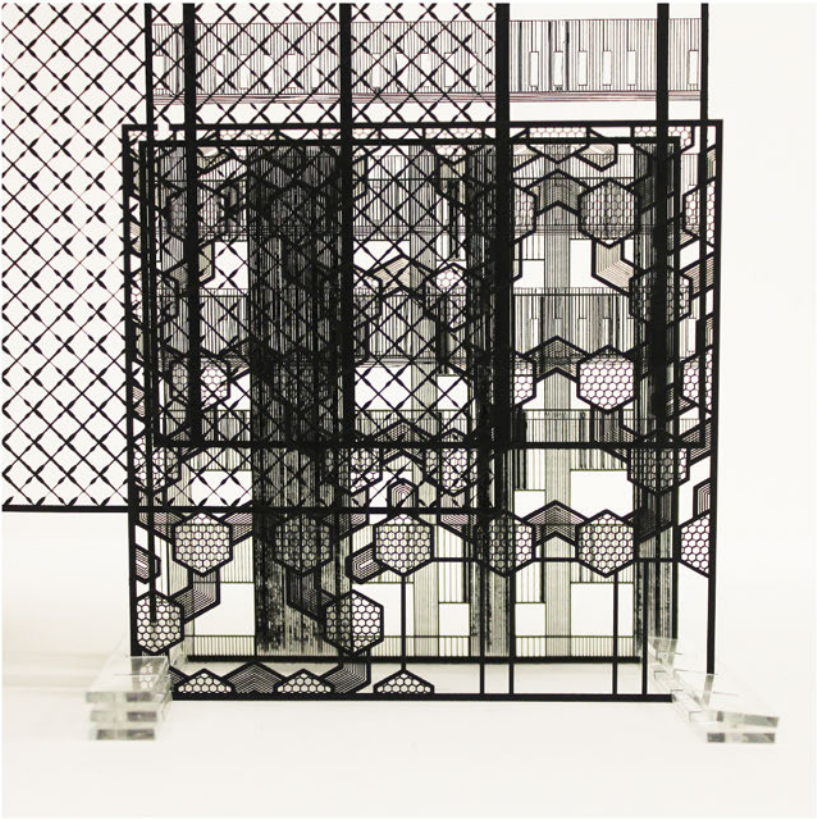
## 2D EXPLORATIONS

The 2D explorations focus on legibility. It looks into how much you can densify a base building before you lose its individual identity. Using the 6 layers taken from three distinct Singaporean typologies, I tested the visual legibility of each layer both physically and digitally. Through this, it is clear that there is a limit to legibility. After four or five layers, the facades blend into each other and is read as a new, blurred object. This effect is made worse with the addition of digital layering. As I am aiming towards a sustainable densification with the opportunity for unlimited growth, this illegibility is not ideal.



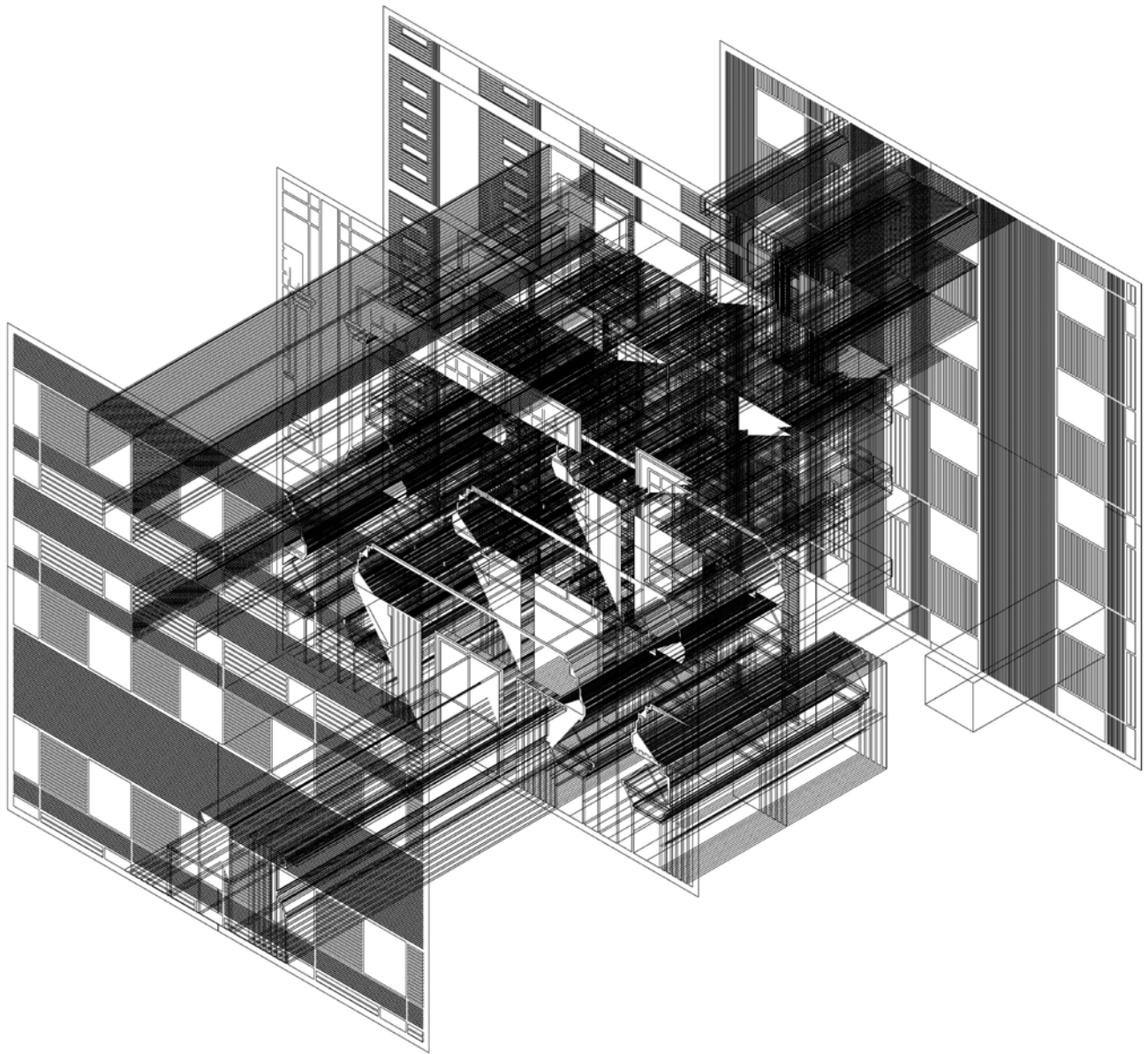
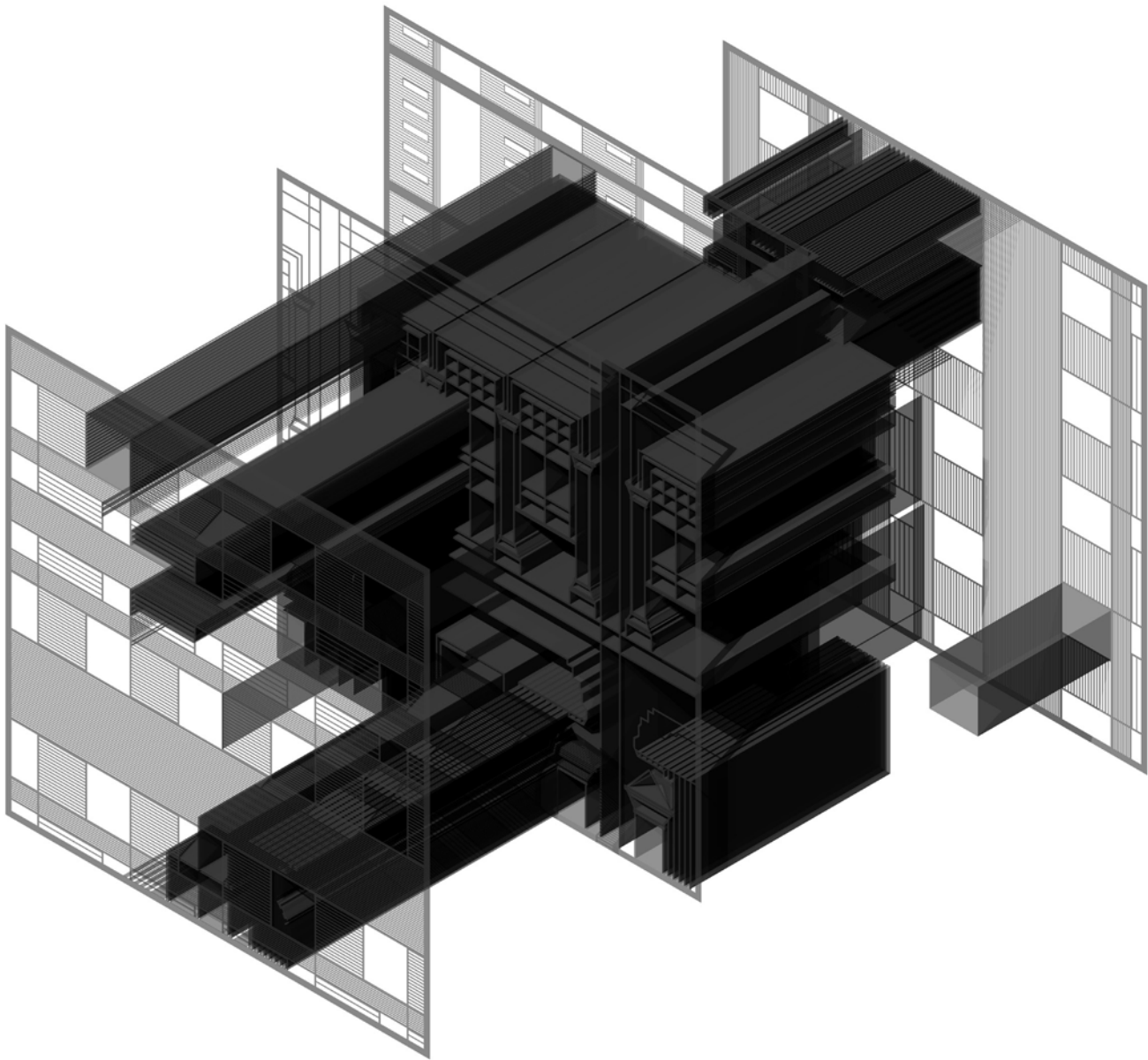
2D EXPLORATIONS

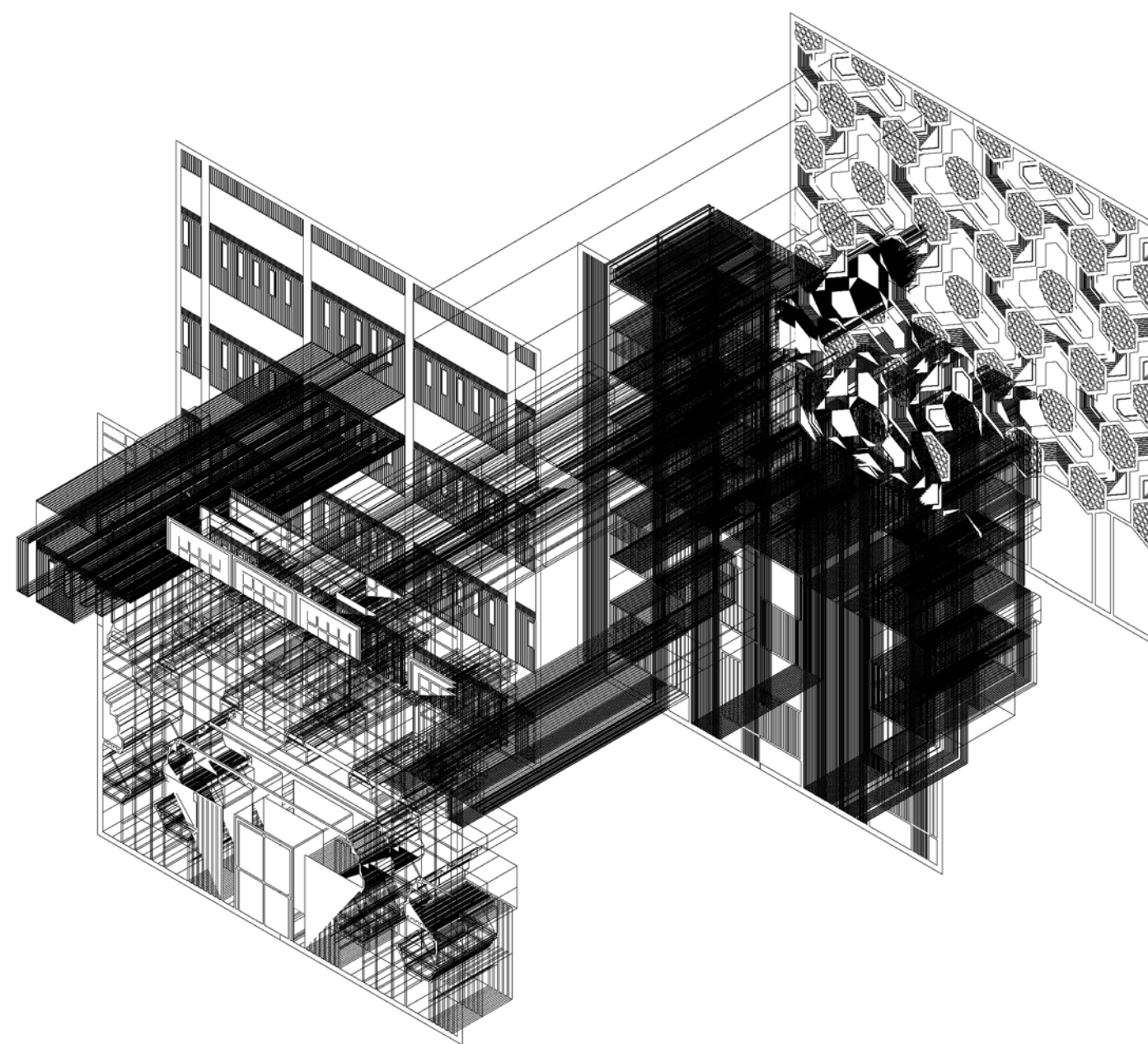
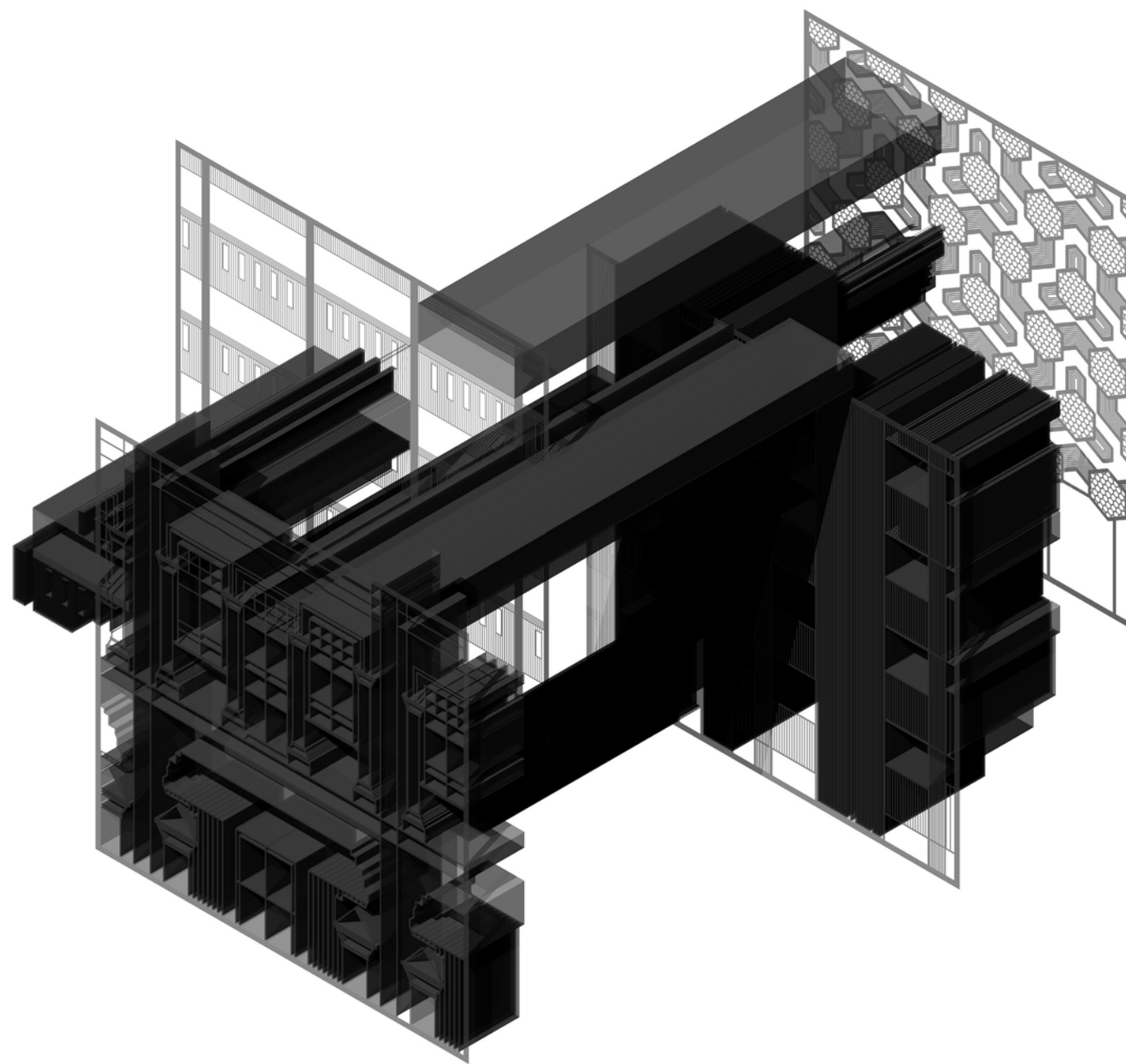
These displaced layers were much more interesting to me. Certain areas become palimpsests, blurring together into a new thing. However, each individual layers are still read as separate as they are framed by the rest of the whole.

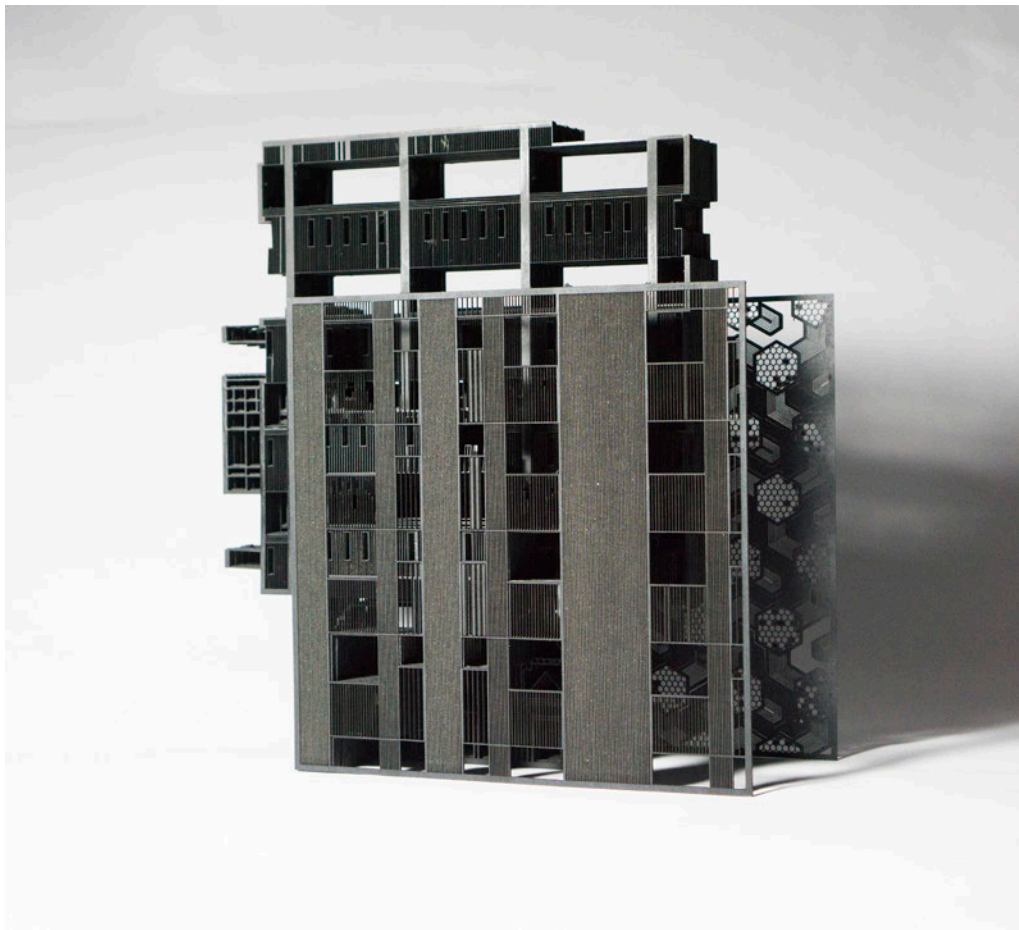
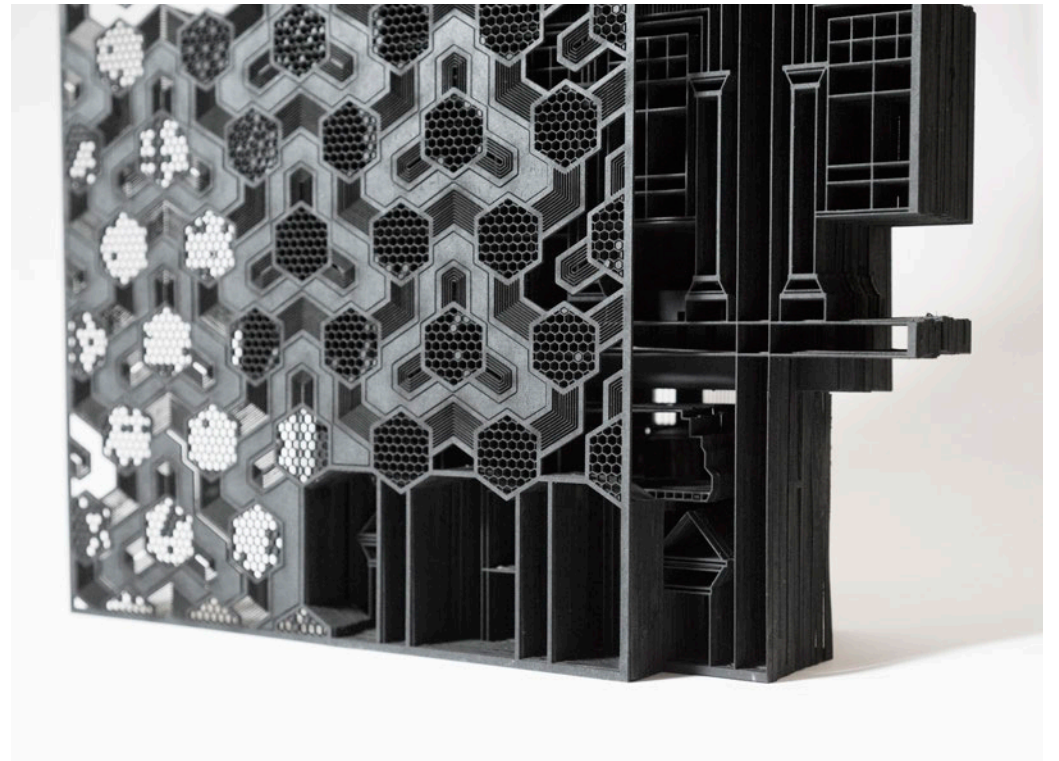
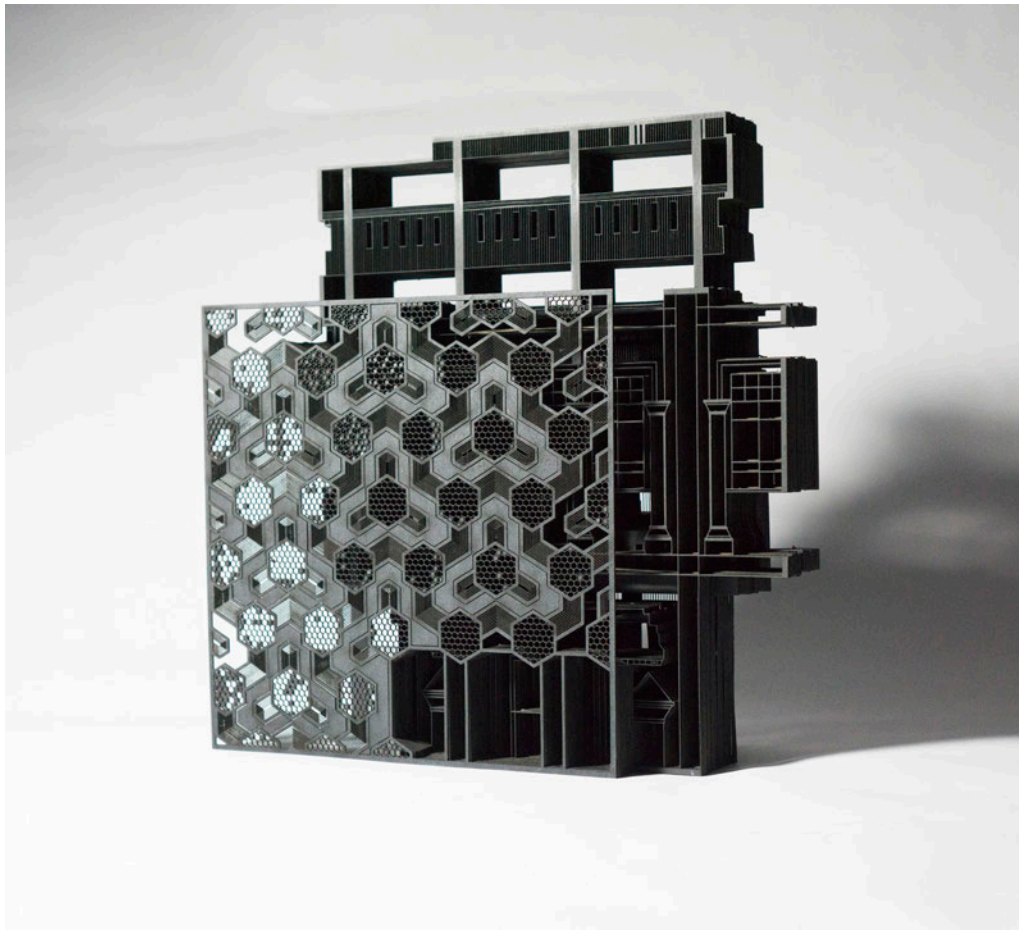


### 3D EXPLORATIONS

The 3D explorations focused on density, desnifying a base solid by extruding elements of another facade into it, creating new areas of collision. The line drawings attempt to recapture some of the transparency present in the 2D explorations.

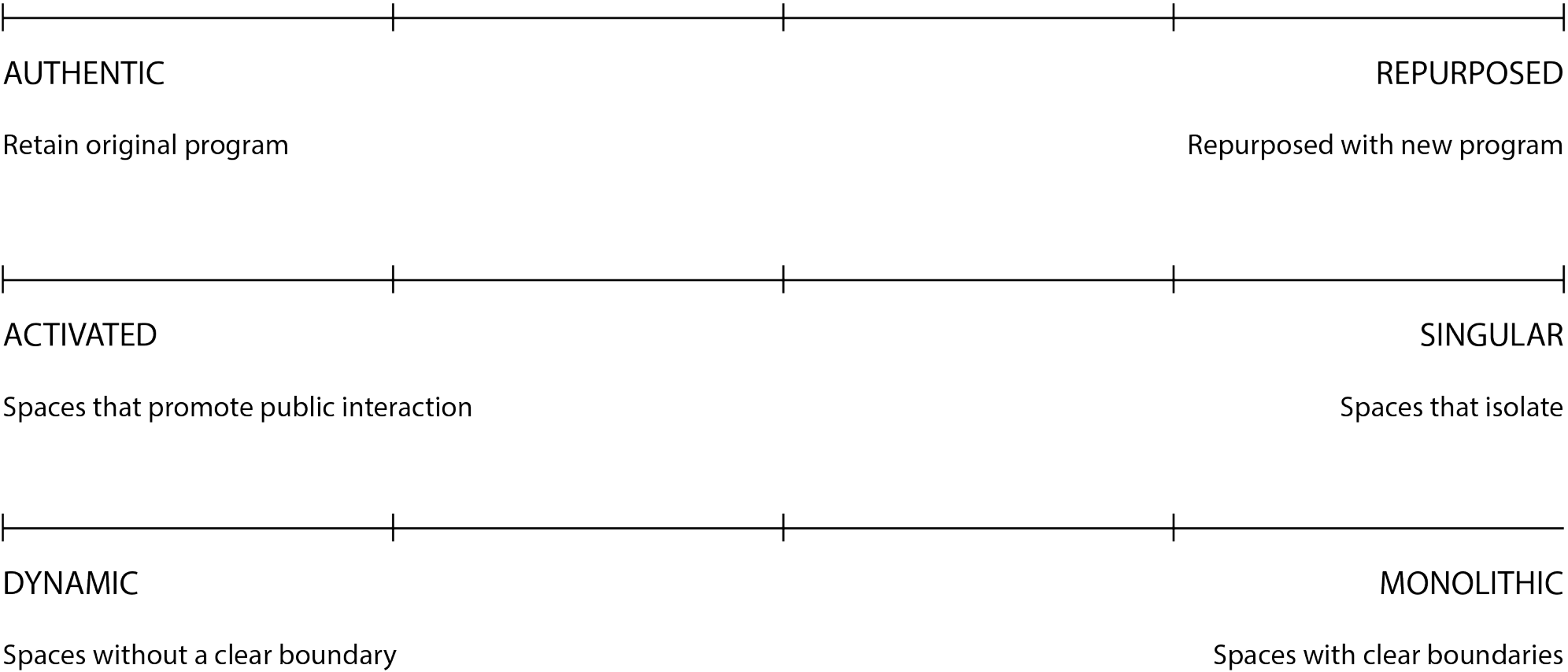






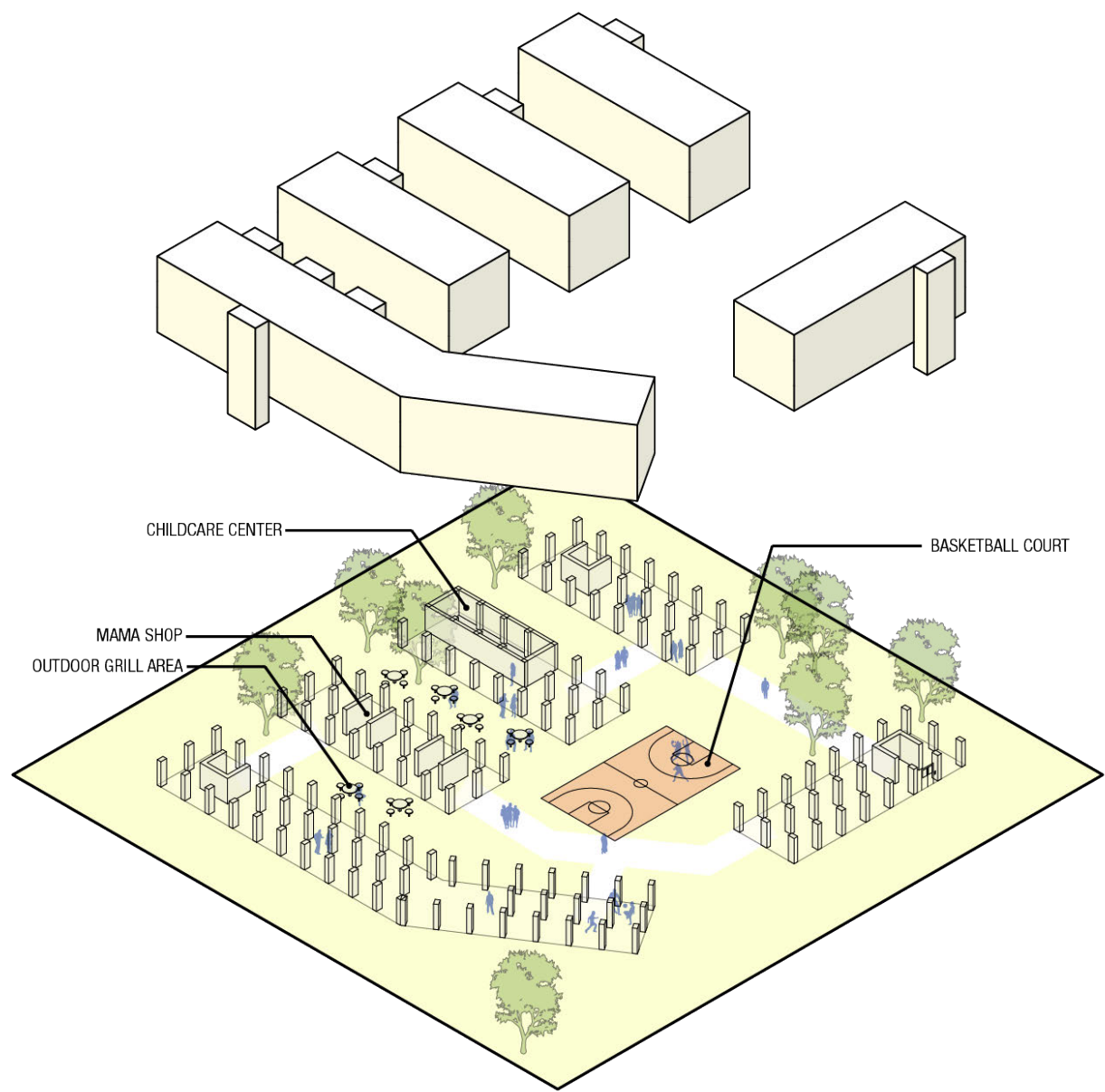
FUNCTIONALLY

Functionally refers to how well the new typology sustains a typical Singaporean way of life while coping with the demands of a highly dense population. Typical Singaporean typologies operate very differently from Western typologies, owing to a more community-centric way of life.



HDB

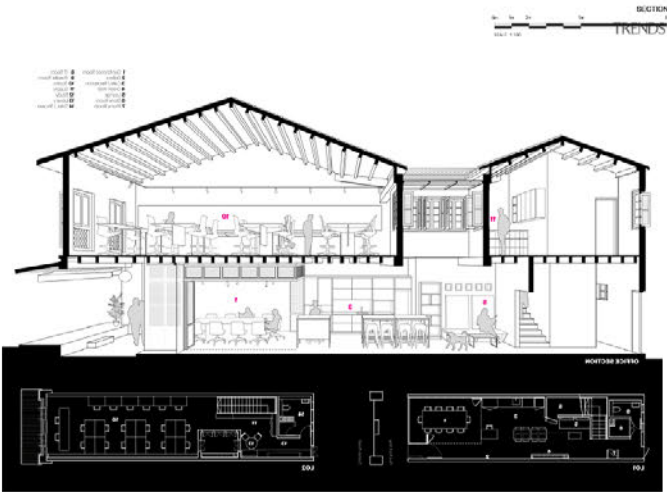
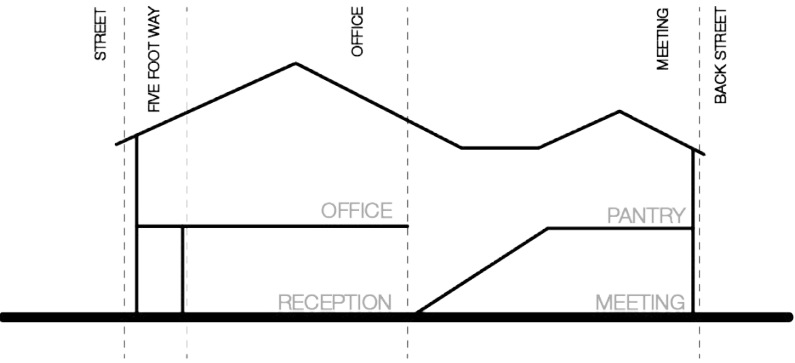
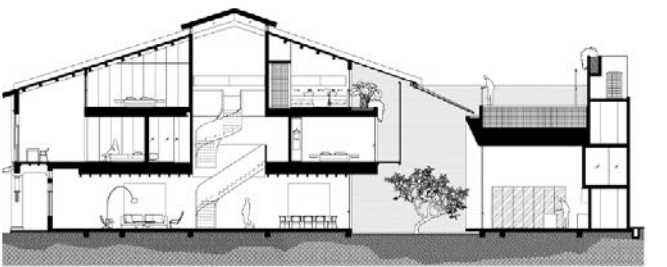
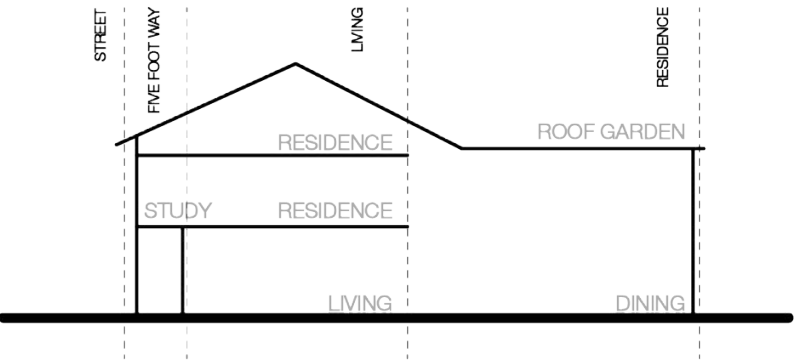
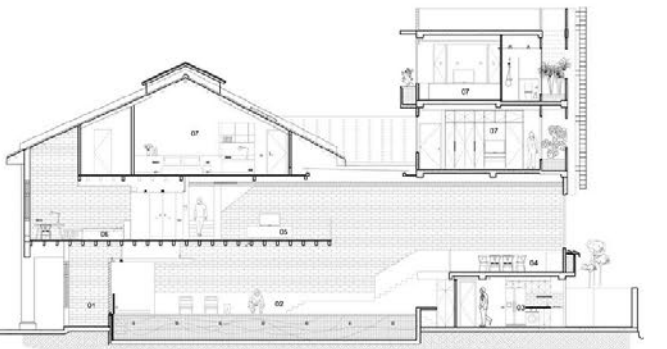
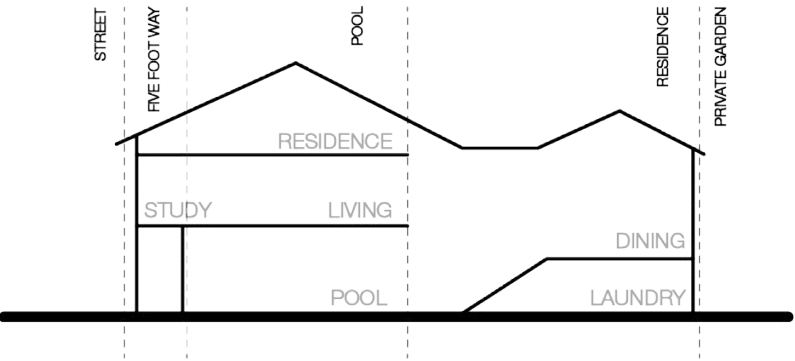
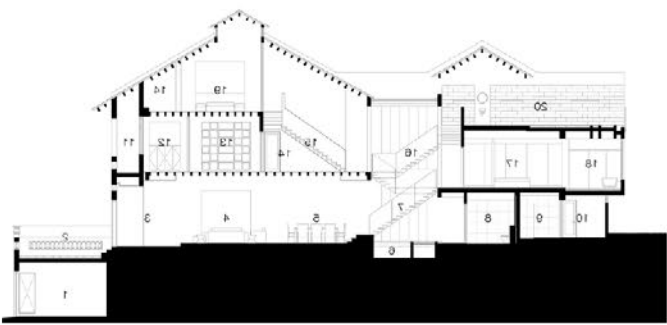
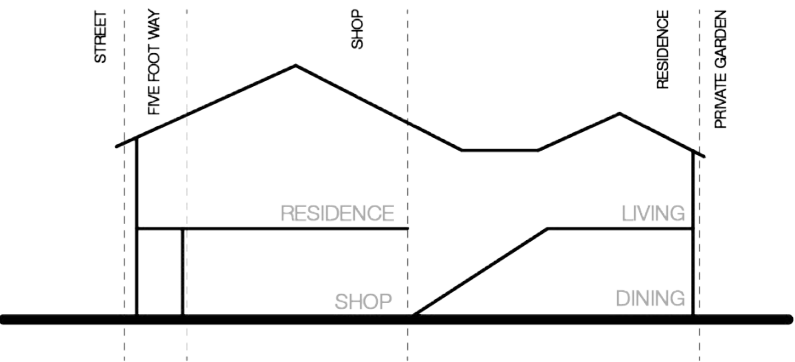
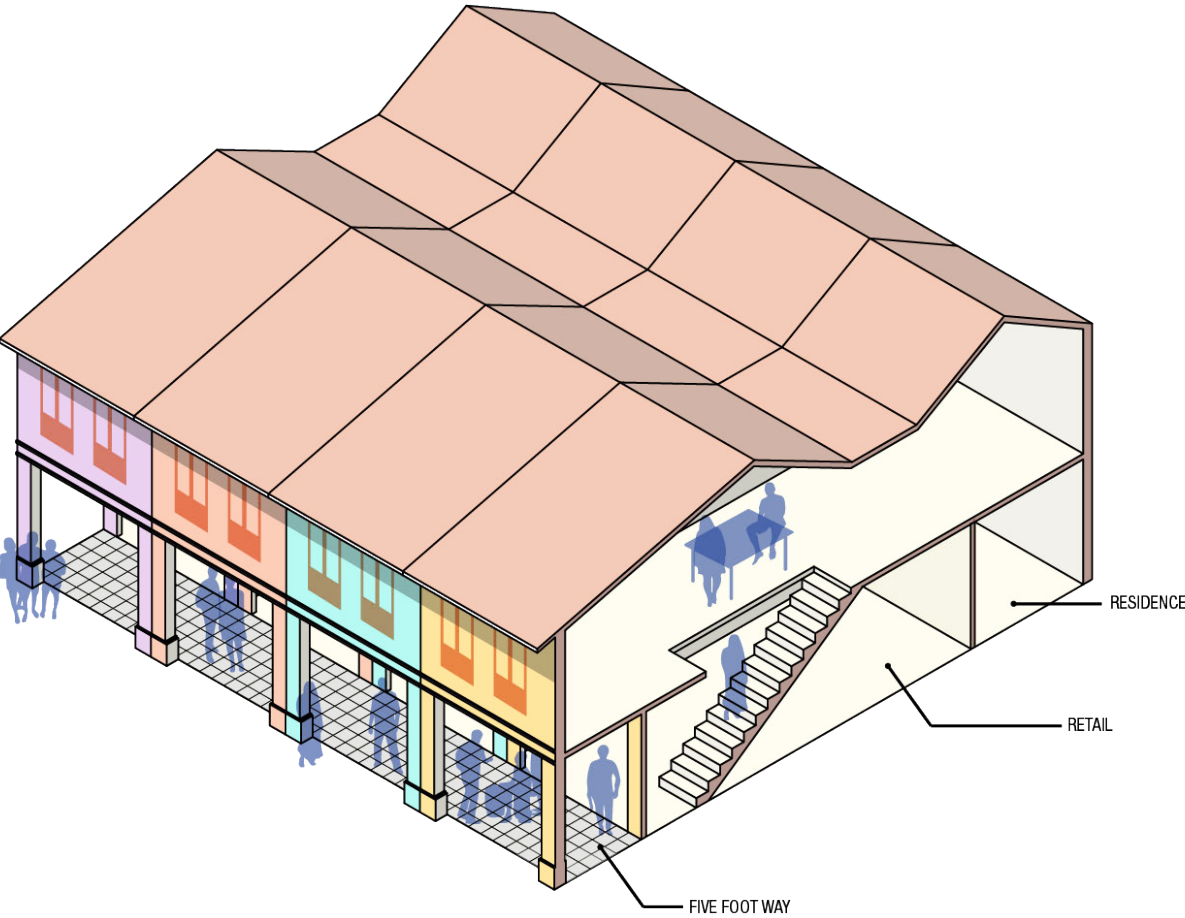
The HDB (Housing Development Board) flats are Singapore's housing typology. 80% of Singaporeans live in these HDBs. They consist of large, concrete blocks grouped around a communal area, usually consisting of basketball courts and gardens. The ground floor of all HDB flats are an open colonnade. This open space is often appropriated by the community and some have been turned into shops, gathering spaces and even galleries.





SHOPHOUSES

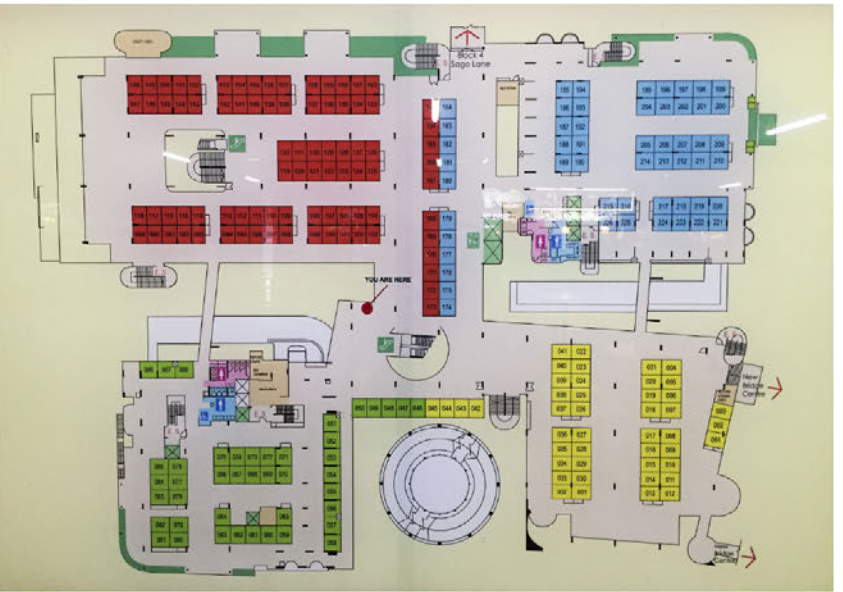
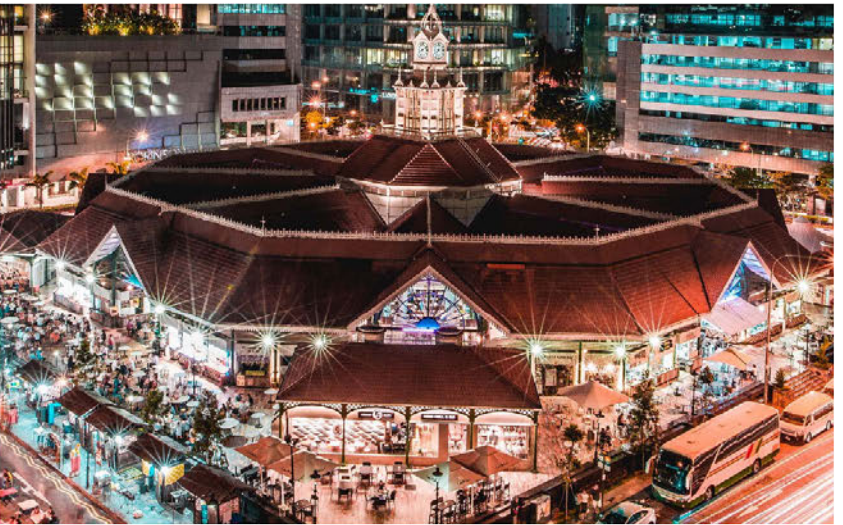
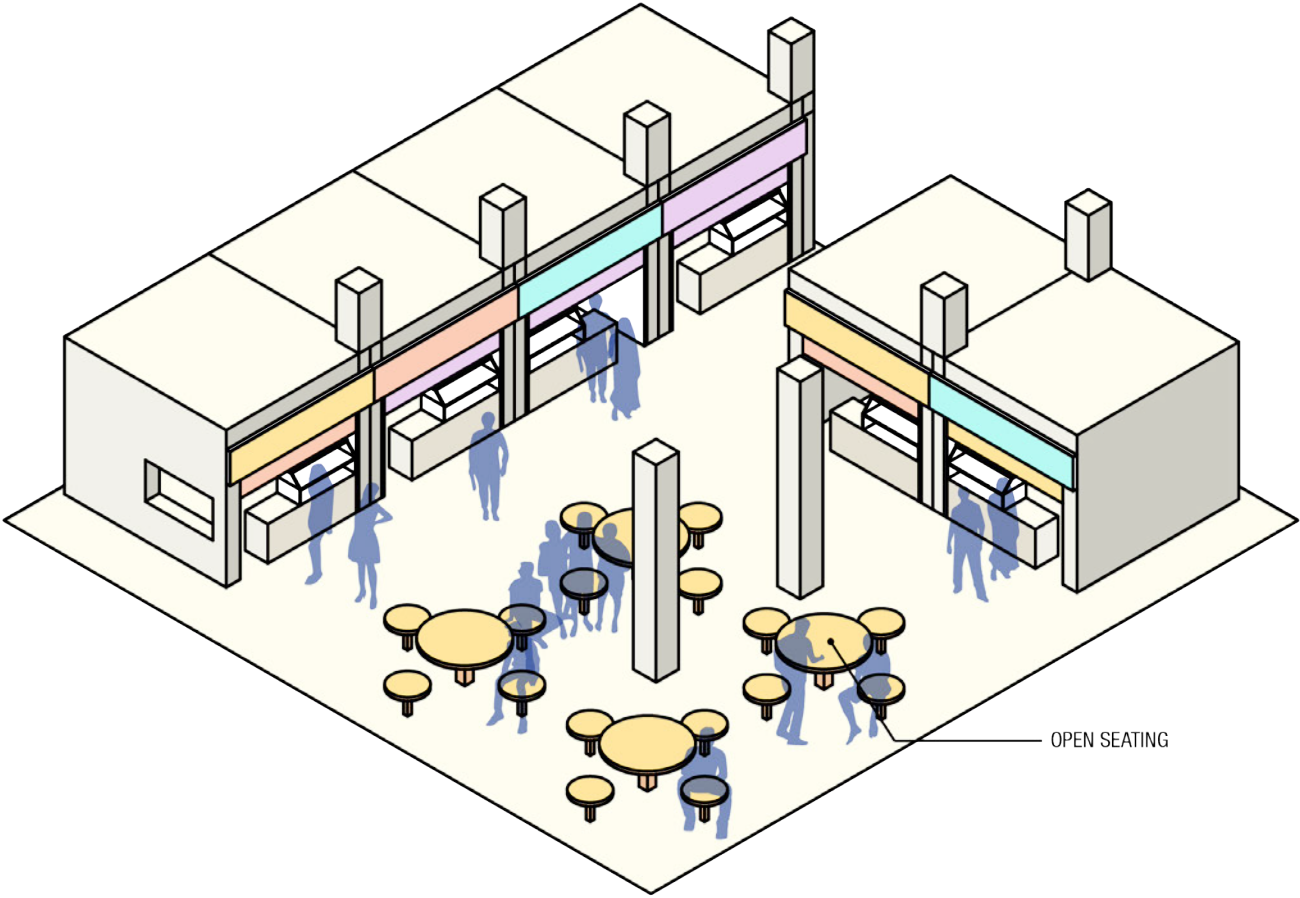
The Shophouse is a traditlial Singaporean typology that combines retail and housing. The ground floor is dedicated to mostly retail while the upper floor is for housing. A five foot way is iconic for a shophouse. It is a five foot covered walkway in front of the building. The five foot way connects the shophouses as well as extends the retail out into the street, blurring the line between public and private. This five foot way becomes a mingling space.





# HAWKER CENTER

The Hawker Center is Singapore's dining typology. It is a large, open air pavillion filled with food stalls. Hawker centers can get quite large, sometimes carrying up to 100 different food stalls serving a variety of local cuisines. Tables are scattered throughout the pavillion. Diners would usually eat as a group, with each person buying a different dish and sharing it among the group, creating a communal dining experience.

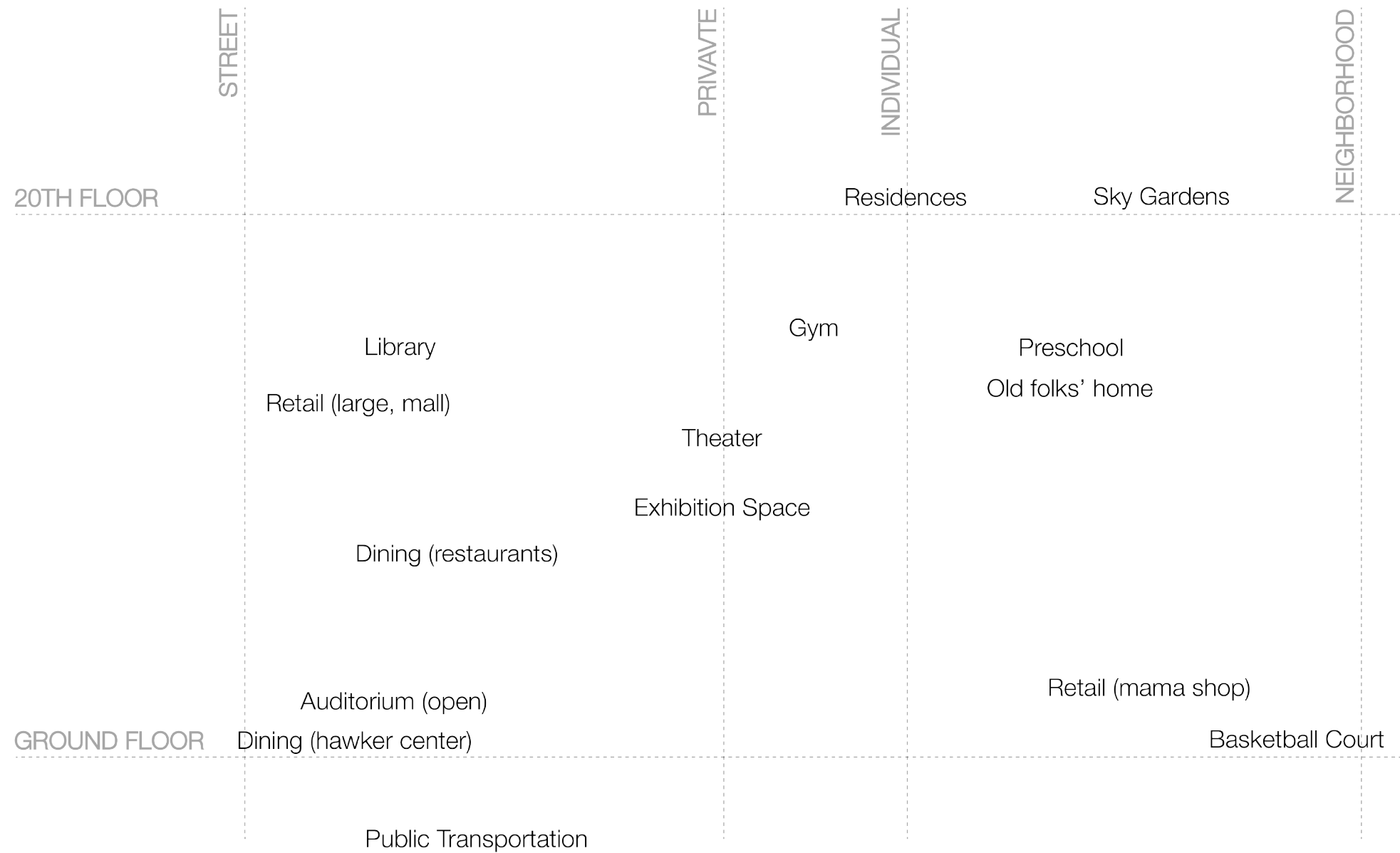




PROGRAM

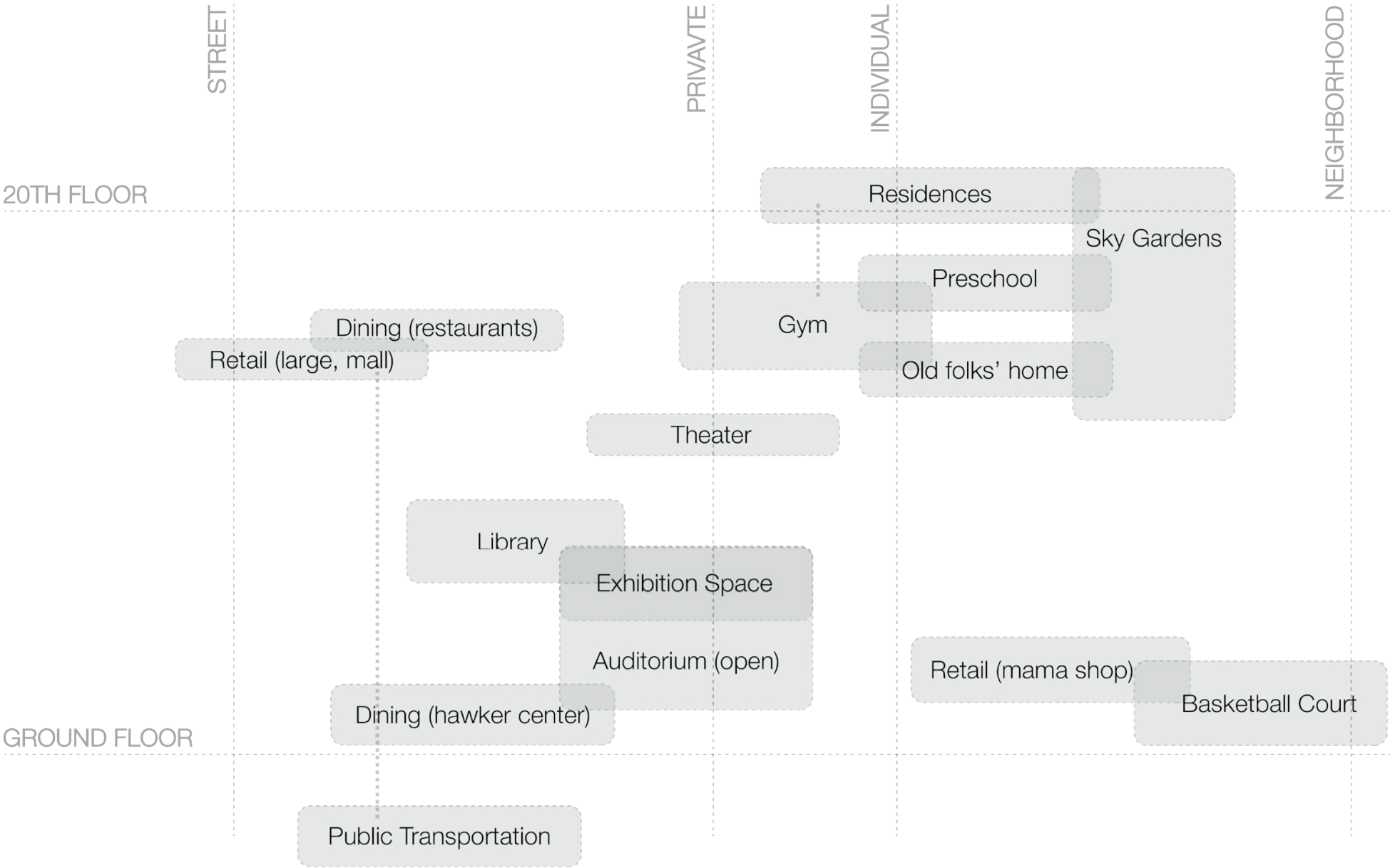
Analyzing Singapore's traditional typologies, there were two key elements that were uniquely Singaporean. Firstly, there is an emphasis on communal living that seemed to stem from a kampung, or Malay fishing village, lifestyle. Secondly, programs lacked a clear boundary, with different programs seamlessly blending into each other. This was mostly due to Singaporean's warm climate, with most buildings being open air and allowing for unhindered circulation.

The proposed new typology would contain all the programs a typical Singaporean would want in their immediate neighborhood, therefore creating a mixed use hub that becomes a point of attraction for the neighborhood. These programs were analyzed and laid out in order of private v public v neighborhood as well as height.



OVERLAPS

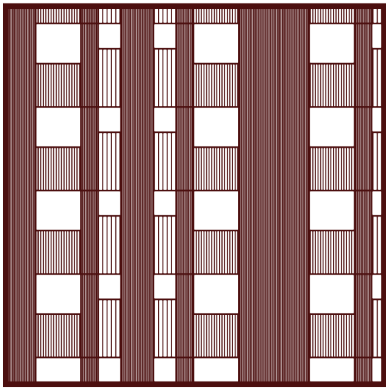
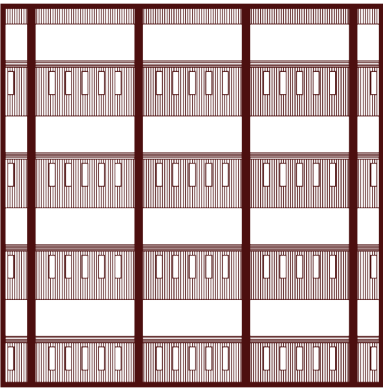
Singapore's warm climate allows for many overlapping programs, with one able to move seamlessly between a residential HDB to a Hawker Center connected via void decks. With this diagram, I highlighted several such overlapping programs that exist already, while proposing new overlaps that make sense.



FACADES

These are the set of facades used. Derived from iconic buildings in Singapore, these facades would be easily recognizable to most Singaporeans.

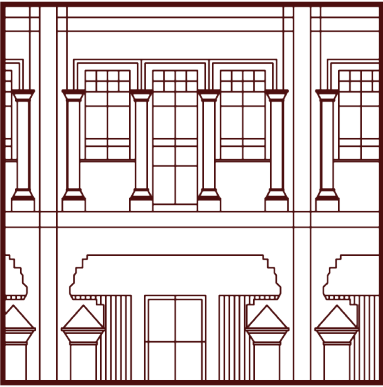
HDB  
NURSERY  
OLD FOLKS'  
MAMA SHOP



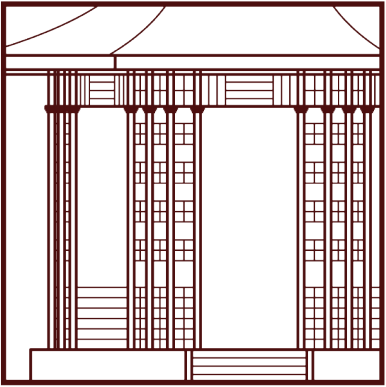
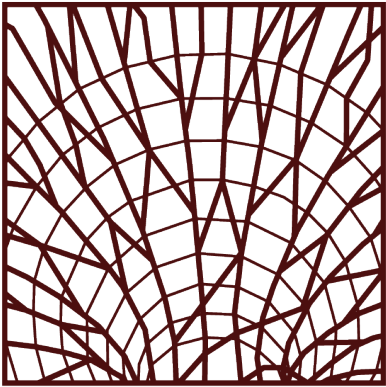
THEATRE



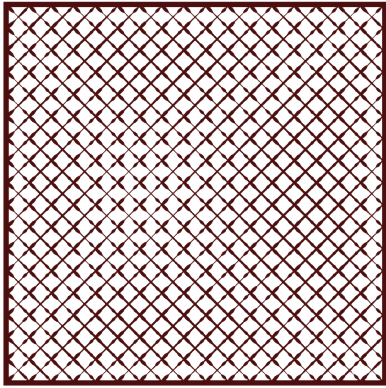
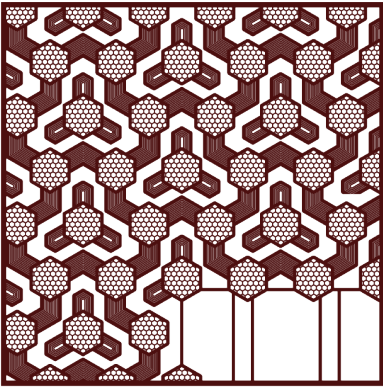
SHOPHOUSE



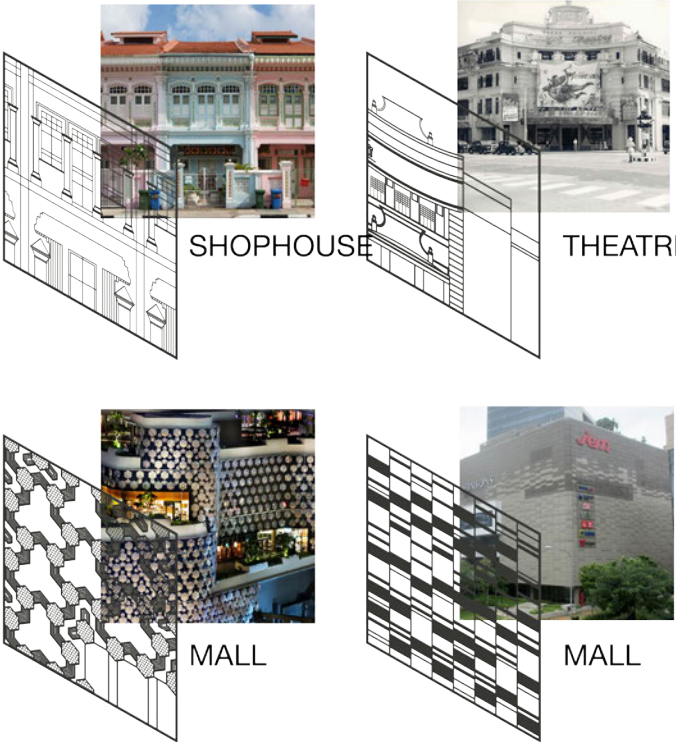
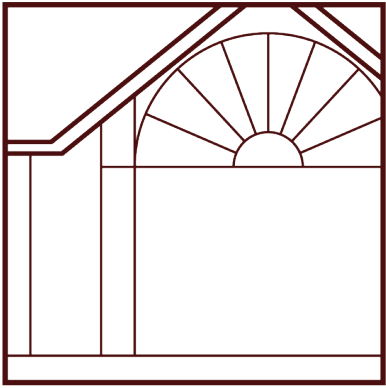
GARDEN



MALL  
RESTAURANT  
LIBRARY

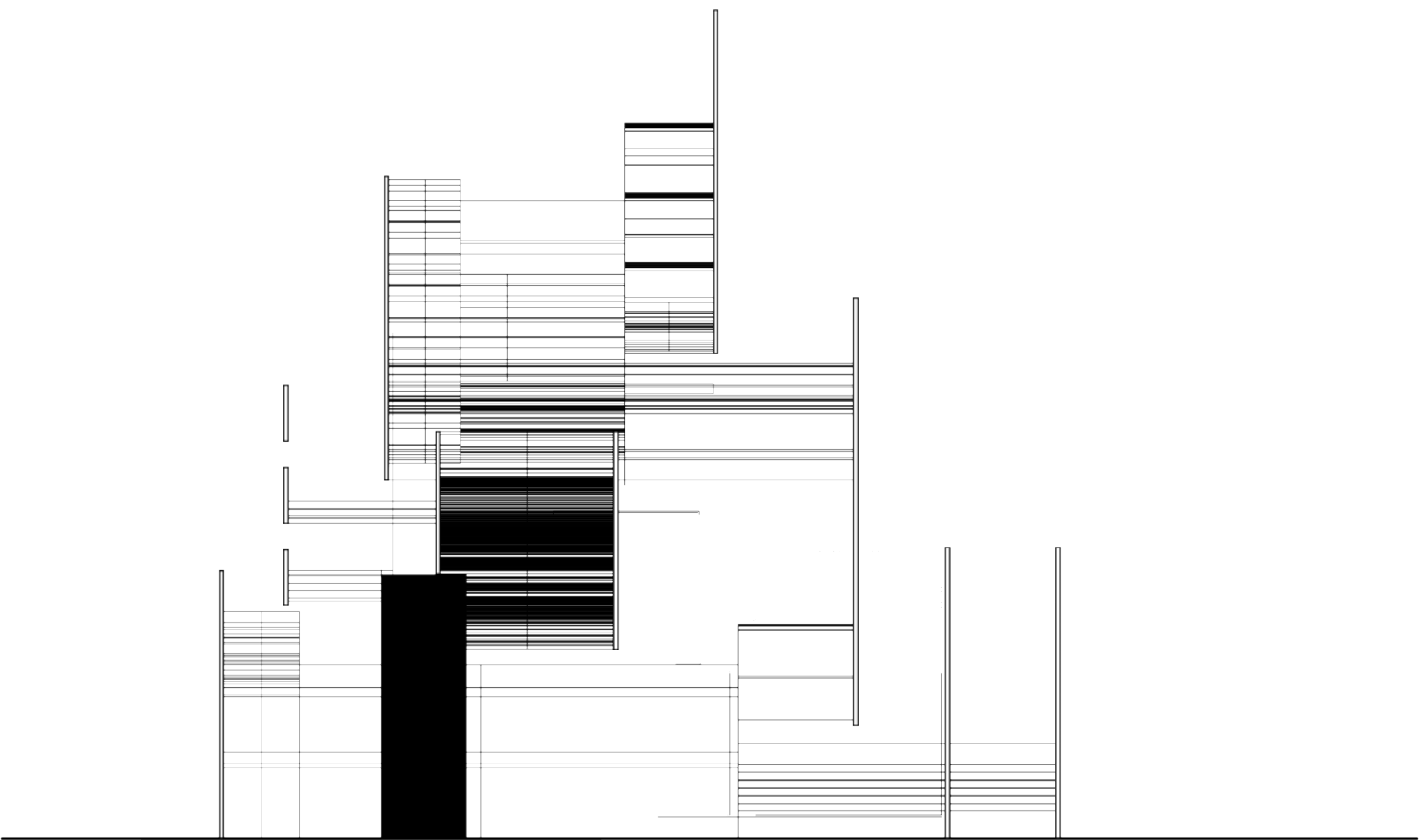
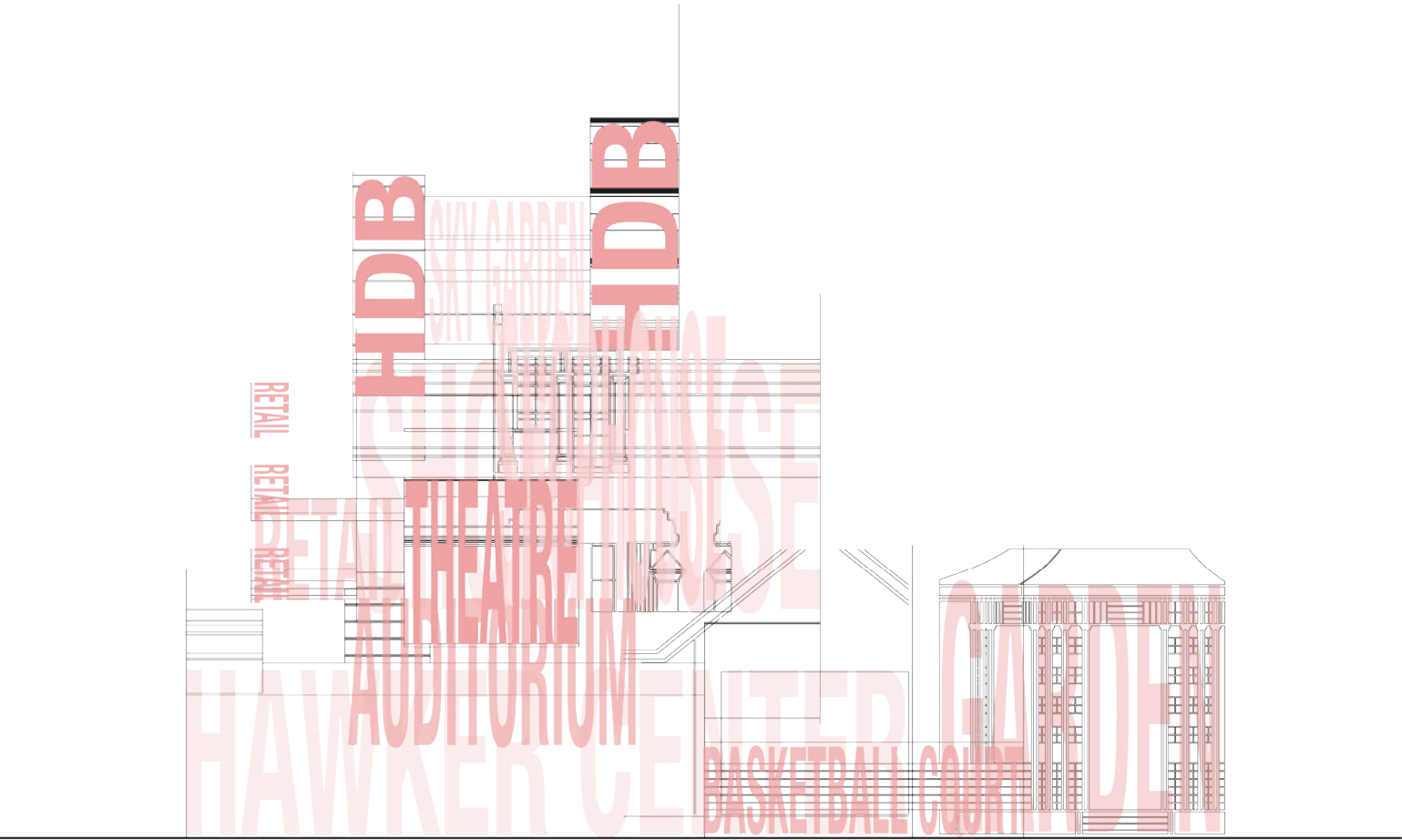


HAWKER  
CENTER



SECTIONS

The proposed typology would have interconnected programs that bleed into each other. The building would have varying degrees of public space that continue upwards through the building. This public space connects everything and links the building together.

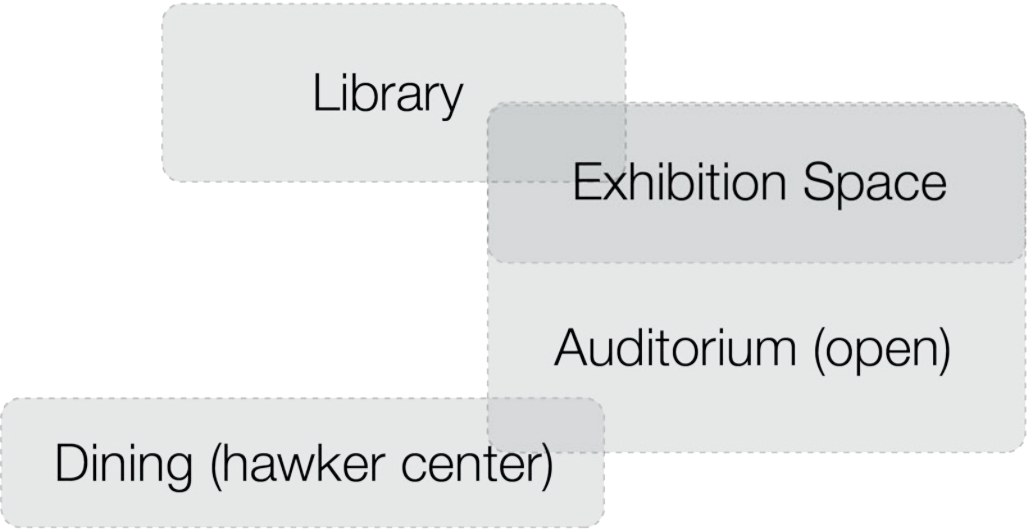


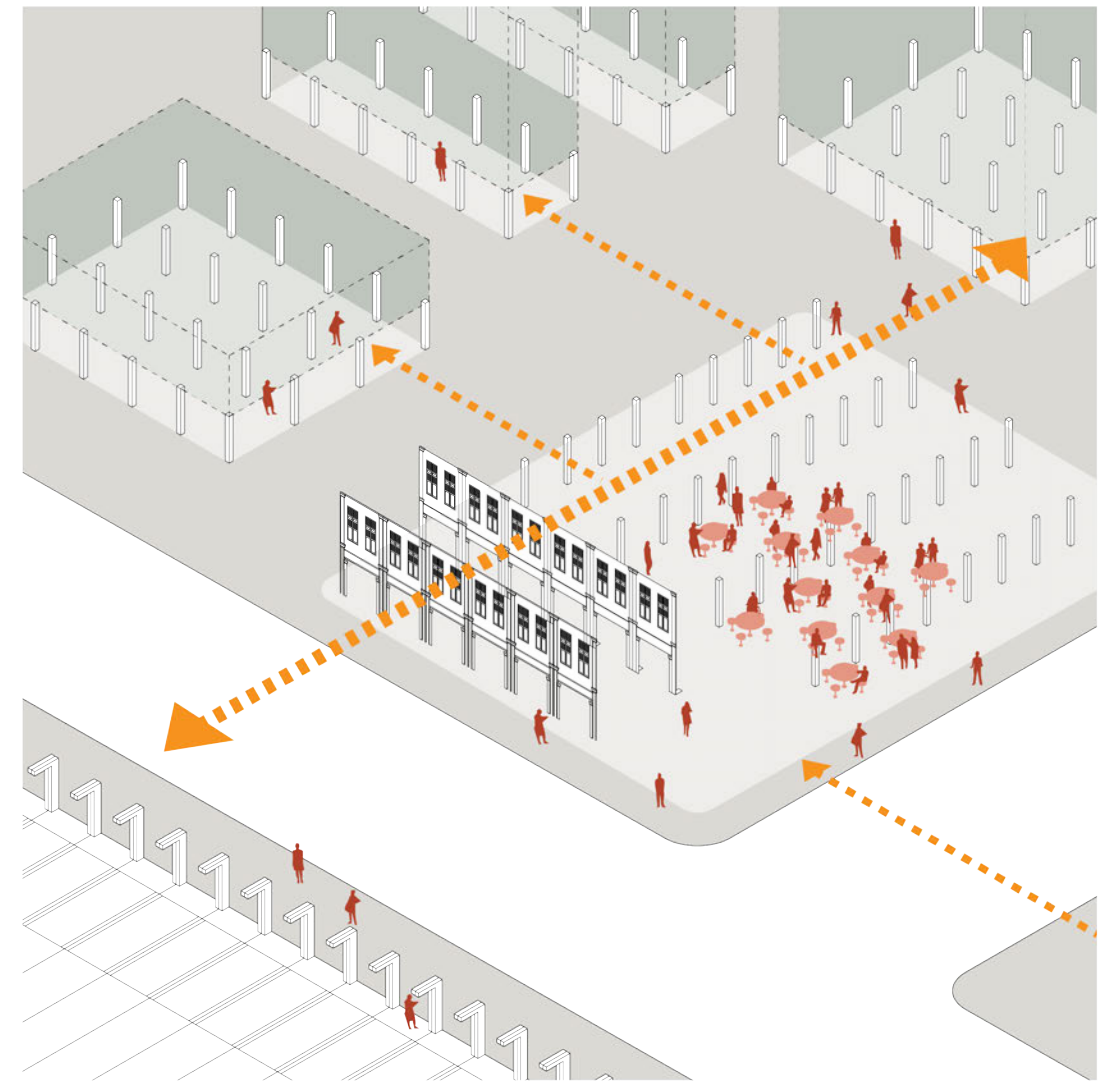
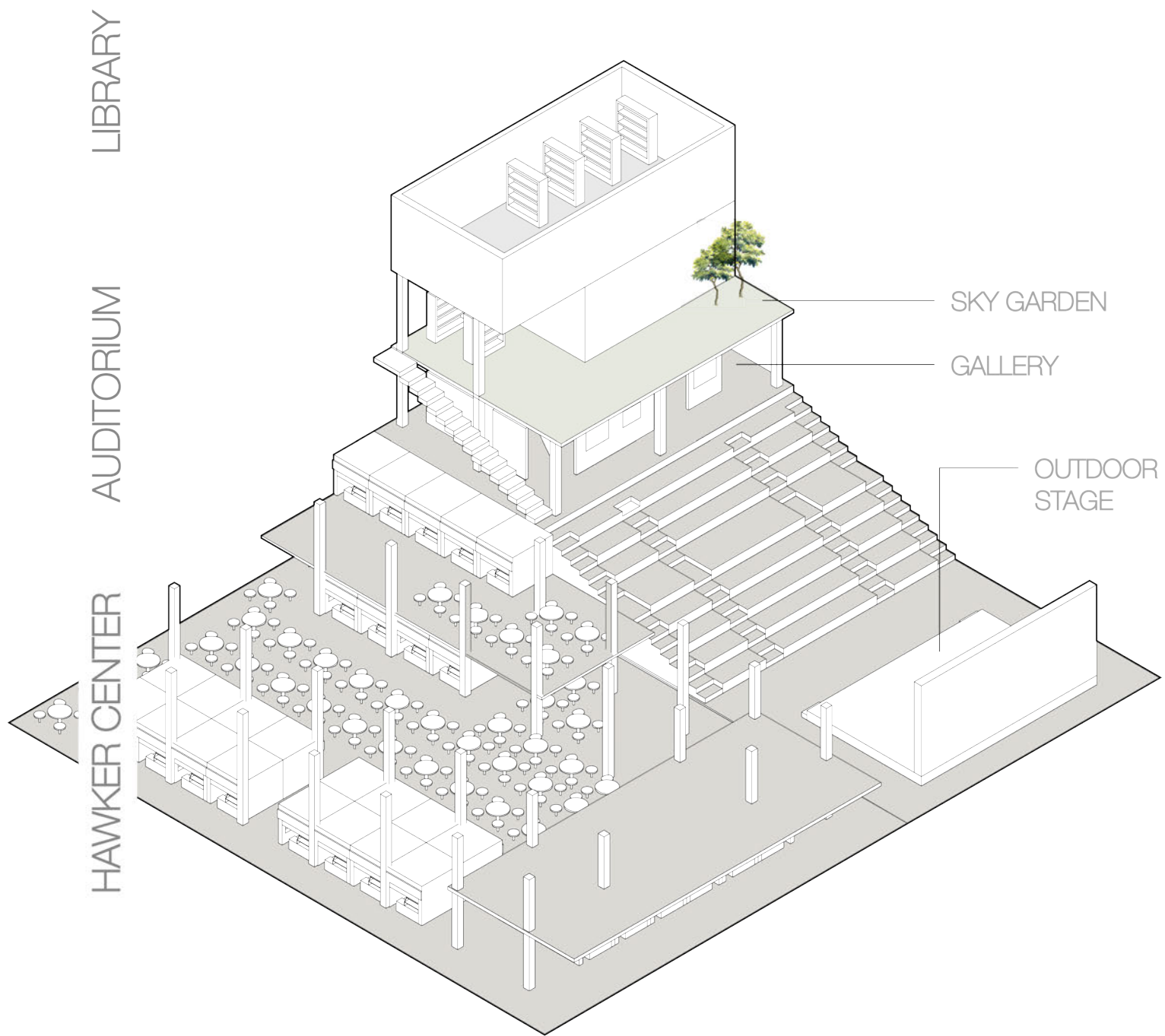
NODES

I chose 4 distinct nodes from the overlap diagram to expand upon. These four nodes represent the public, private, neighborhood and semi-public programs in Singaporean life.

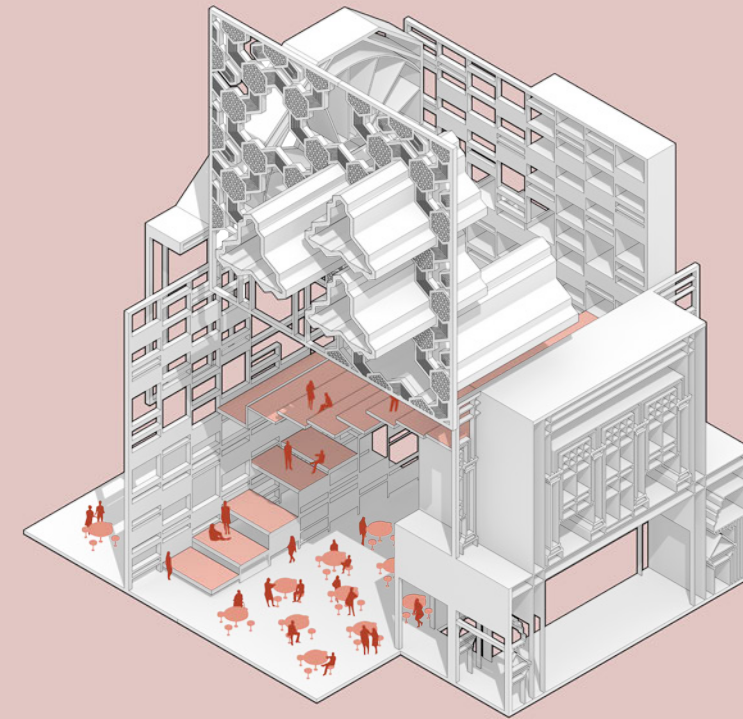
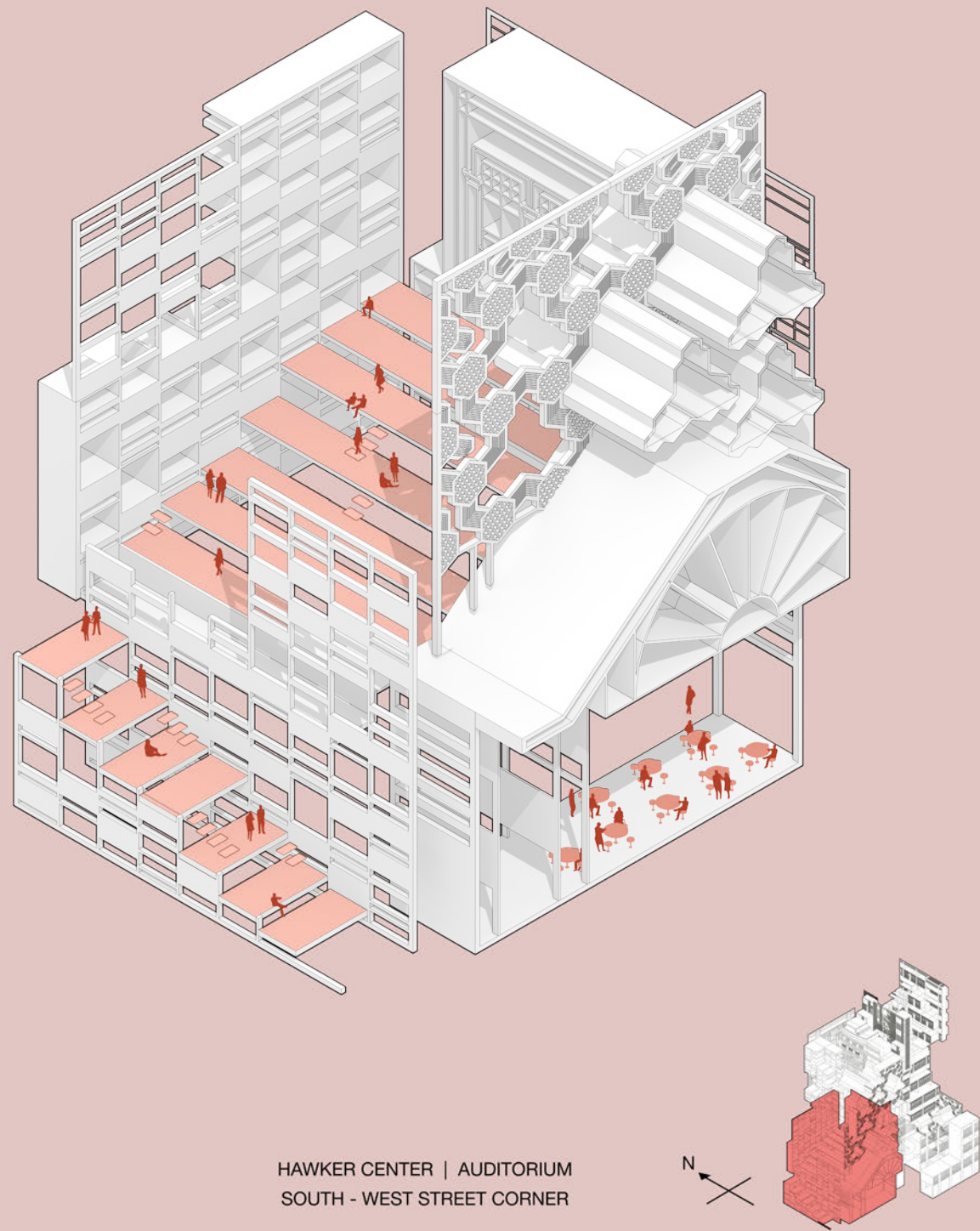
HAWKER | AUDITORIUM | LIBRARY

This node consists of the open, public programs of the typology. This is the node that will be accessible to the entire neighborhood. The node is very open, with the entire ground floor being open air. The auditorium connects the hawker center upwards and to other programs.

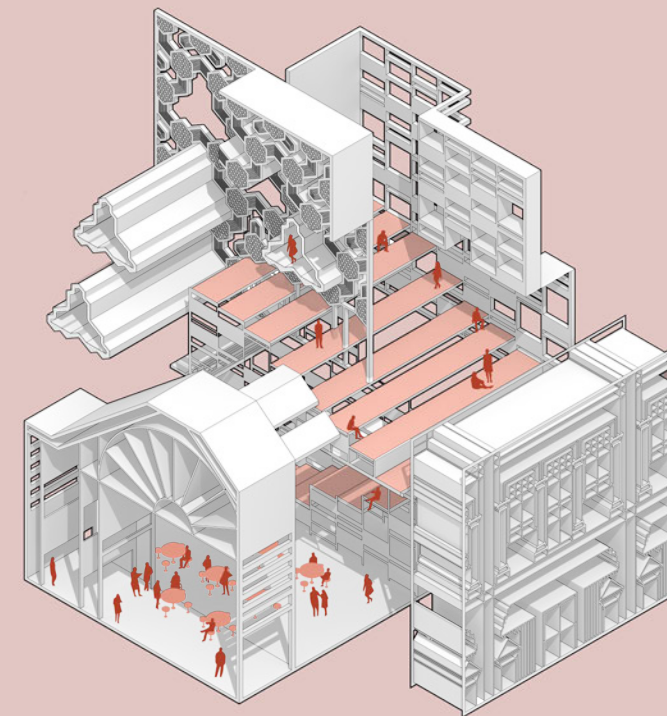




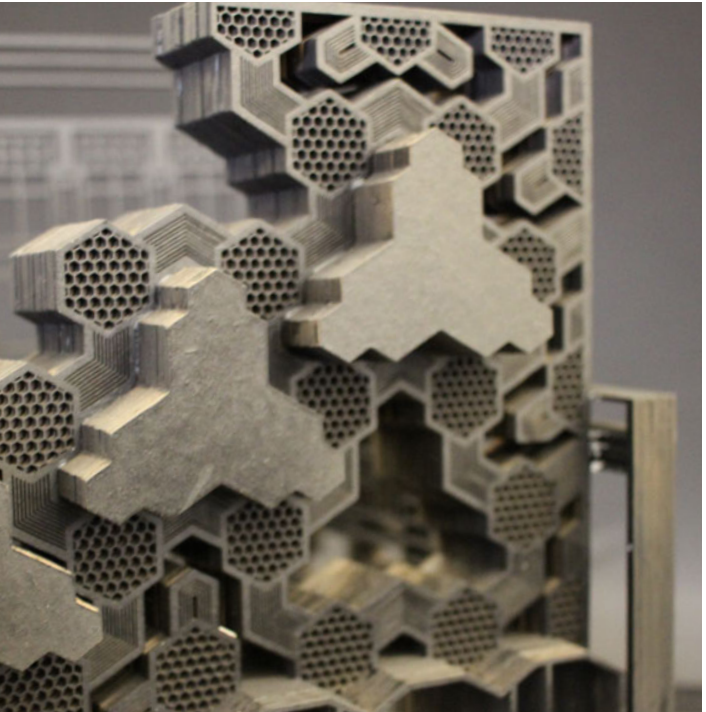
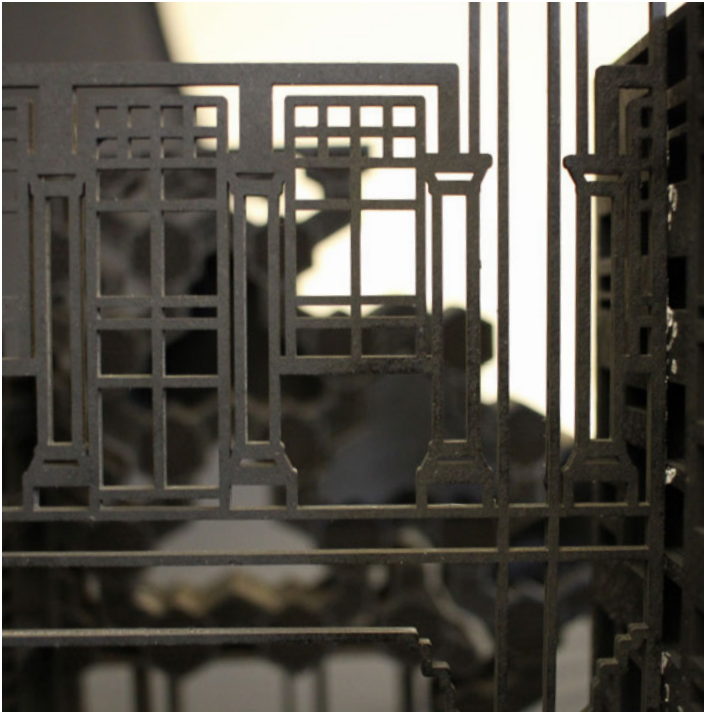
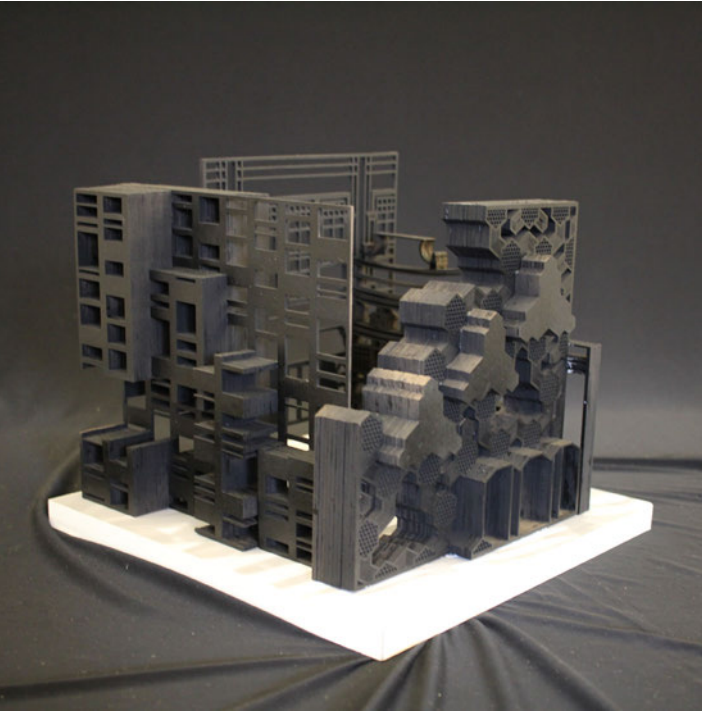
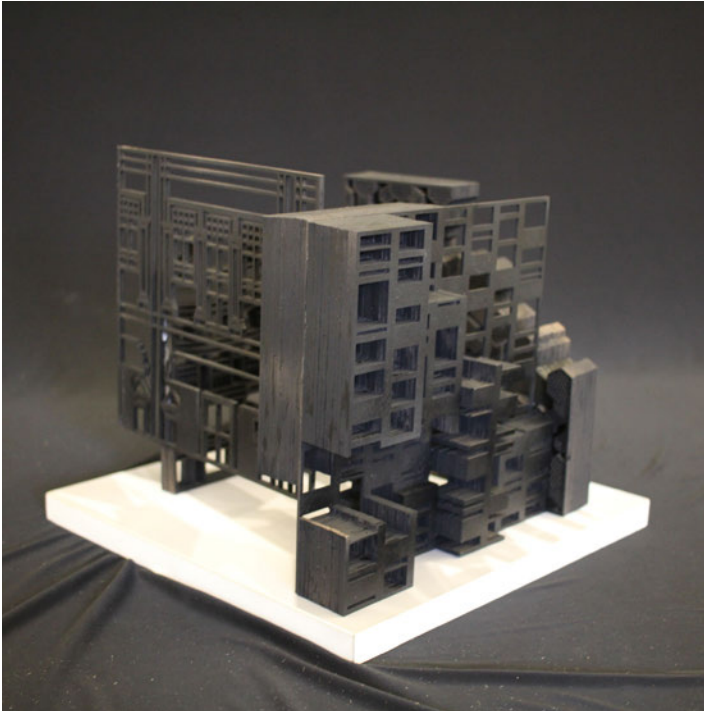
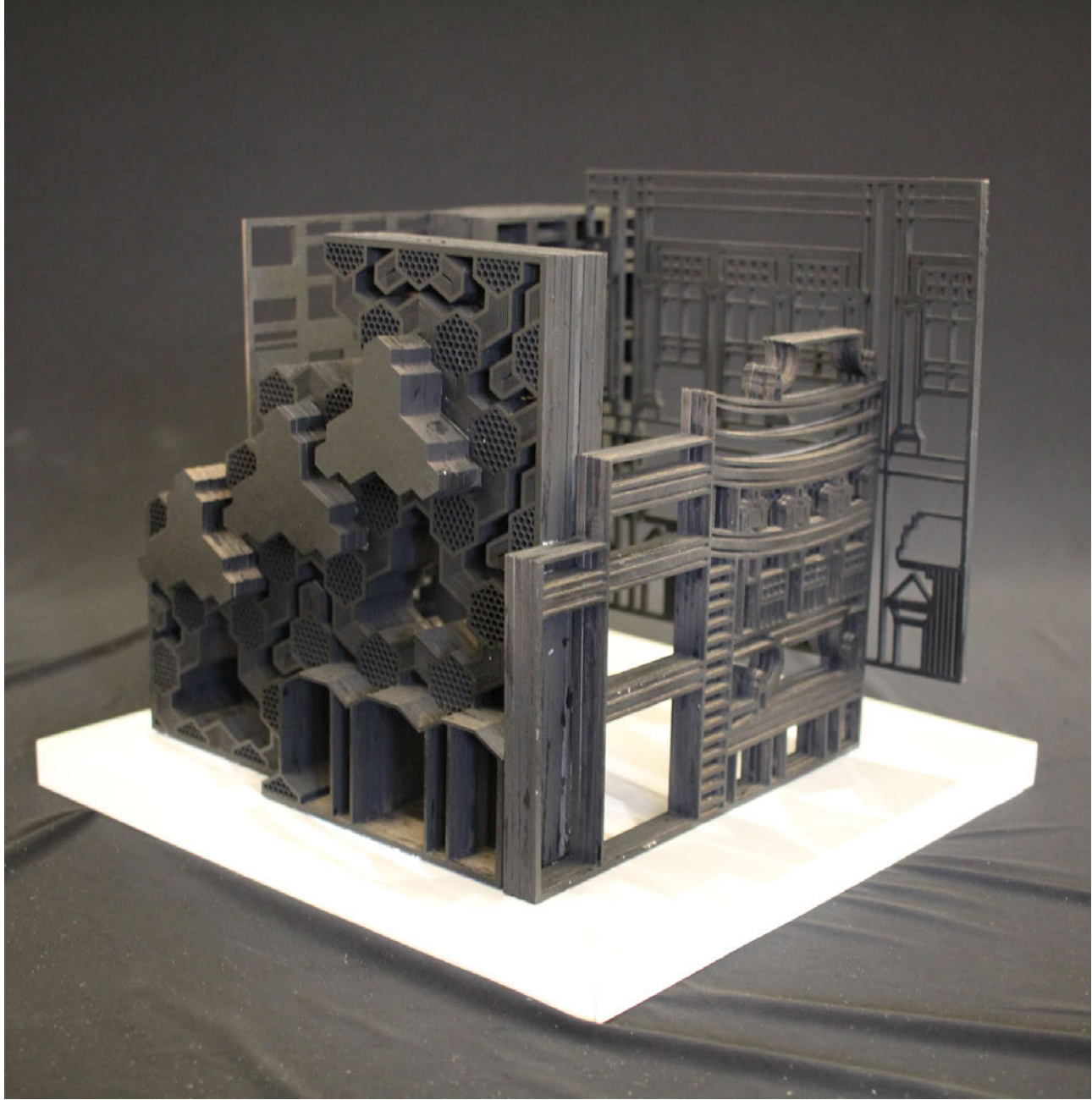
OPEN GROUND FLOOR  
INTERCONNECTED WITH SURROUNDING BUILDINGS



HAWKER CENTER | AUDITORIUM  
SOUTH - WEST STREET CORNER

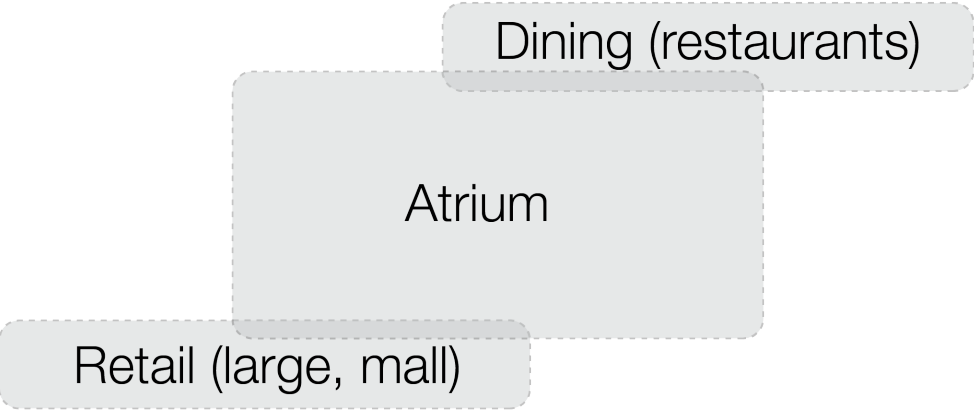


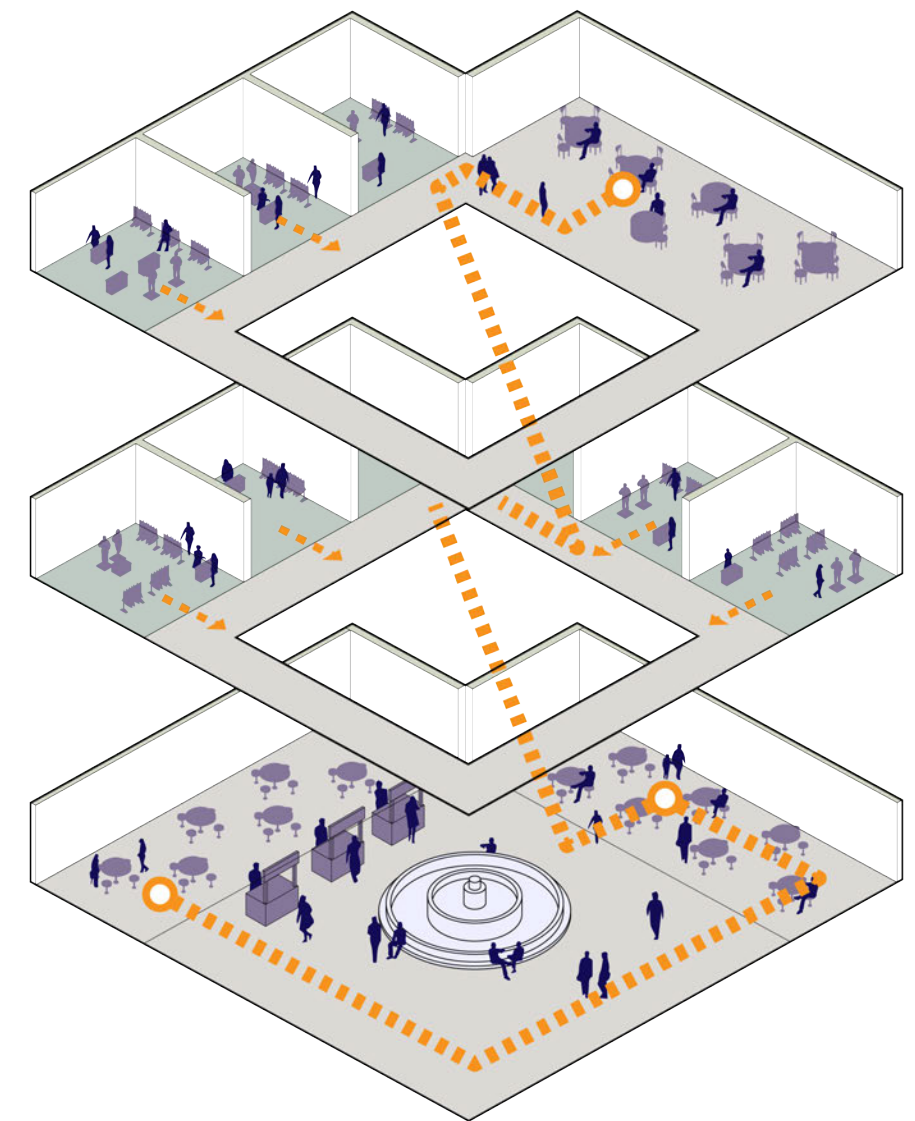
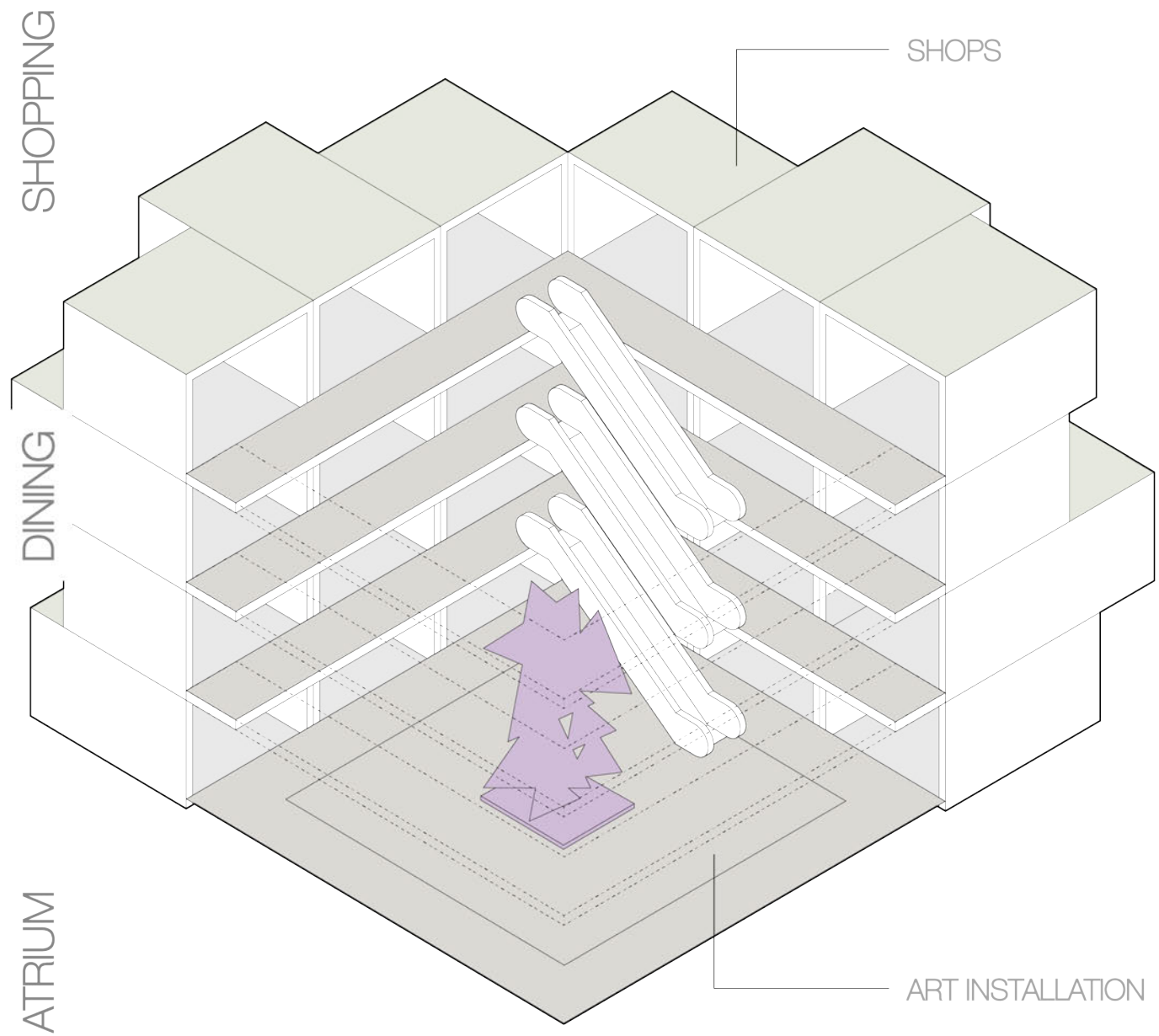
HAWKER CENTER | AUDITORIUM  
EAST - WEST STREET ACCESS



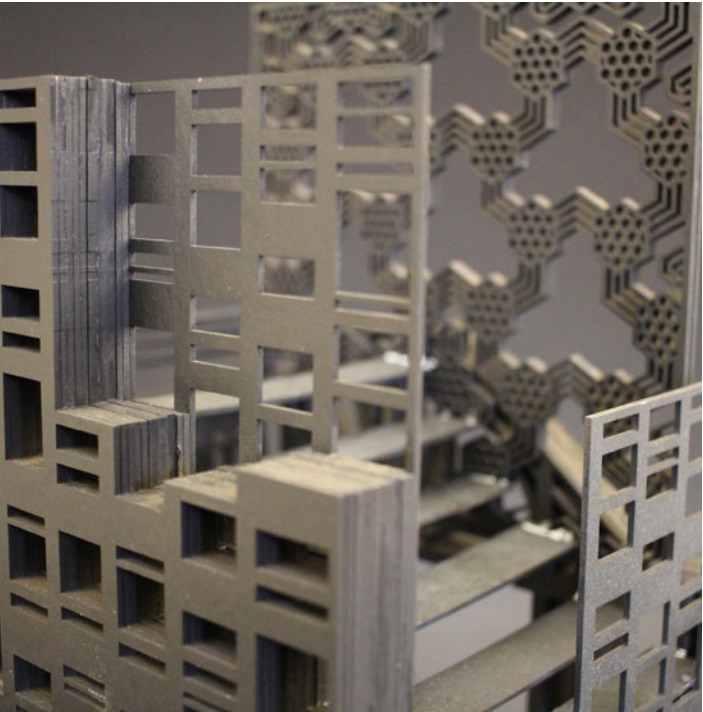
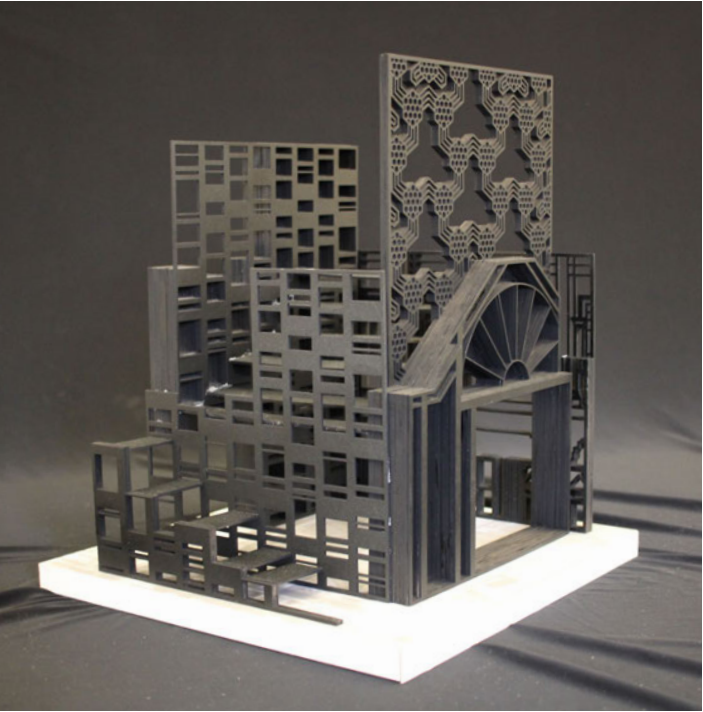
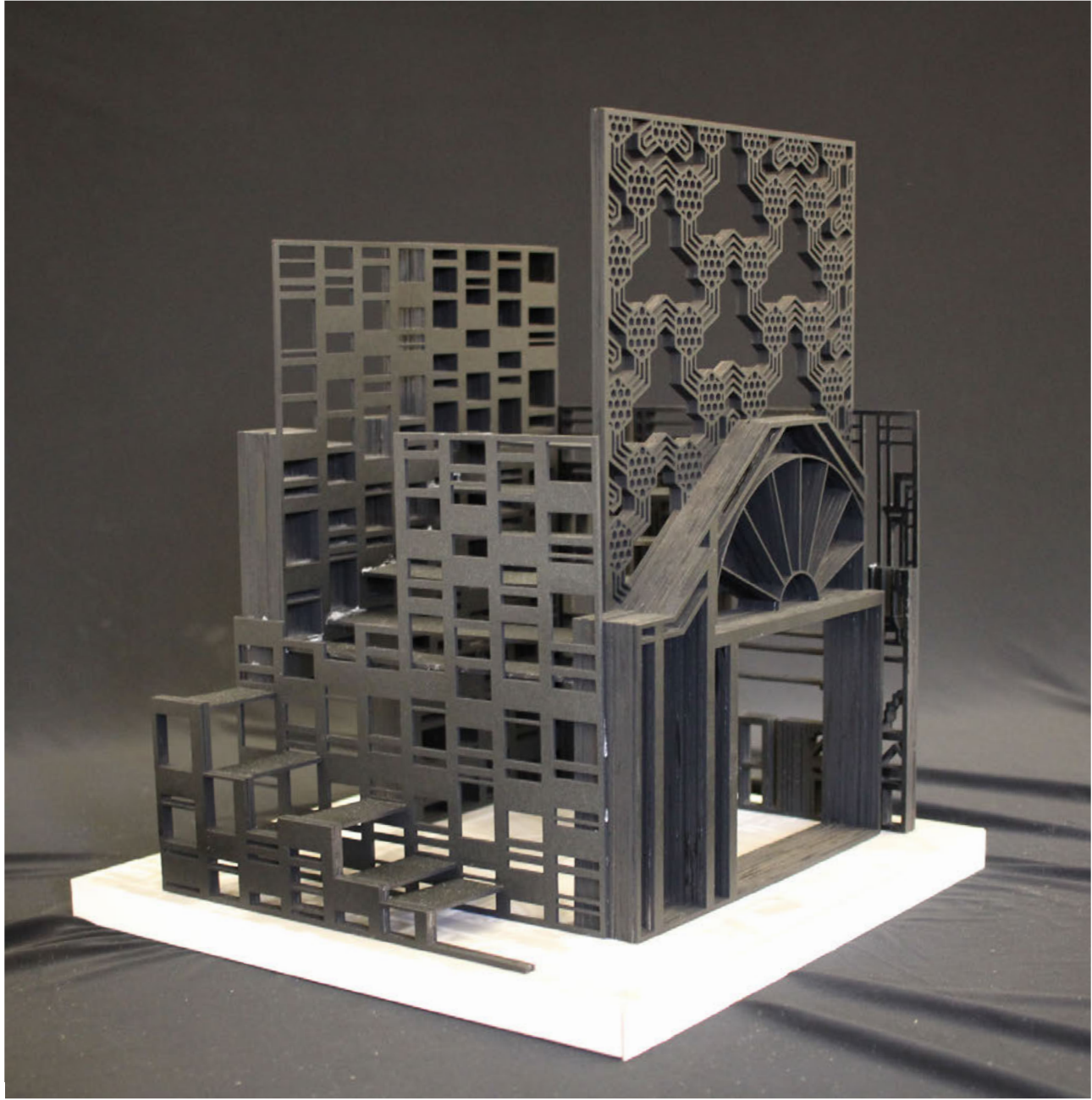
RETAIL | ATRIUM | RESTAURANTS

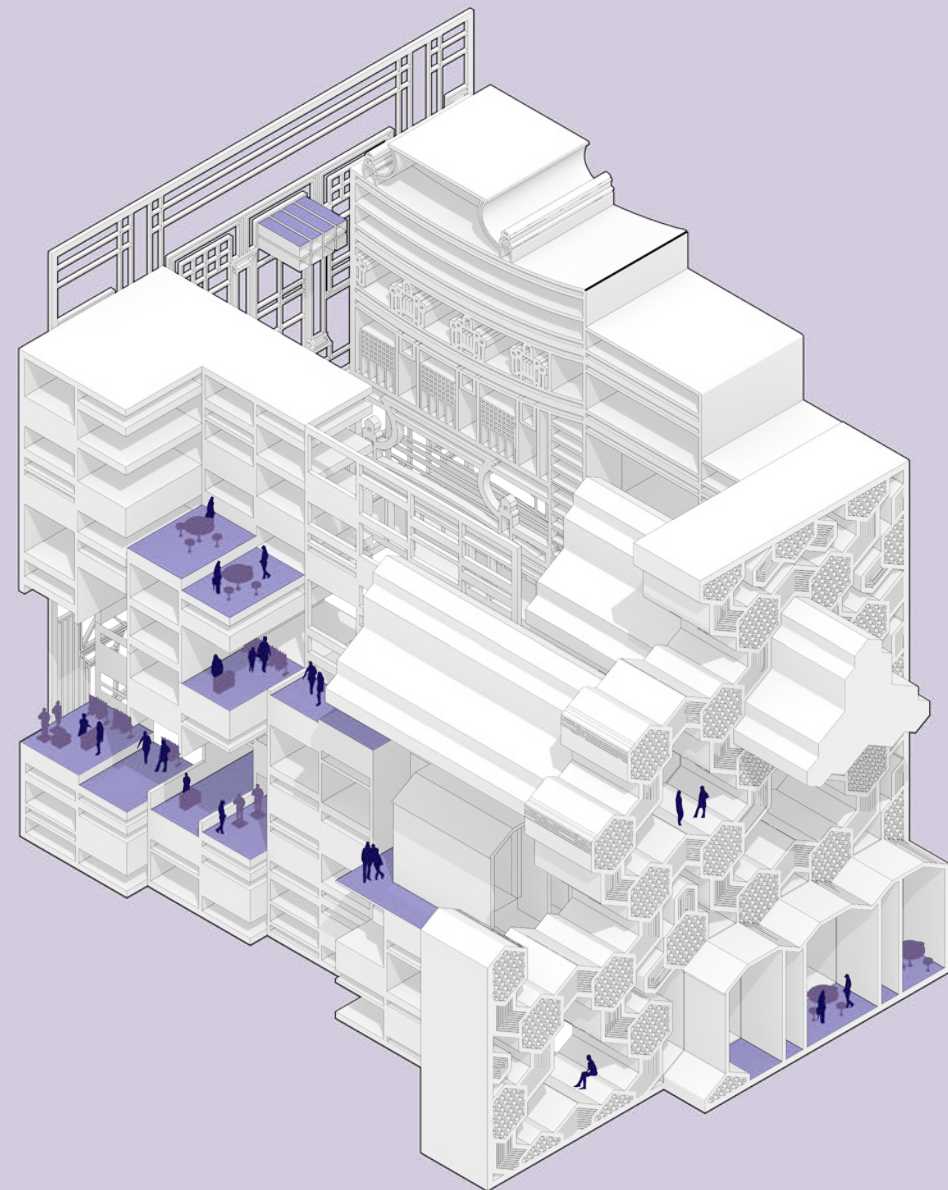
This node consists of the semi-public programs. The programs are located on a higher level. Retail and dining occurs on a more intimate scale than in the hawker centers below. There is still the aspect of communal living, with a large atrium that connects this node that houses fairs and bazaars.



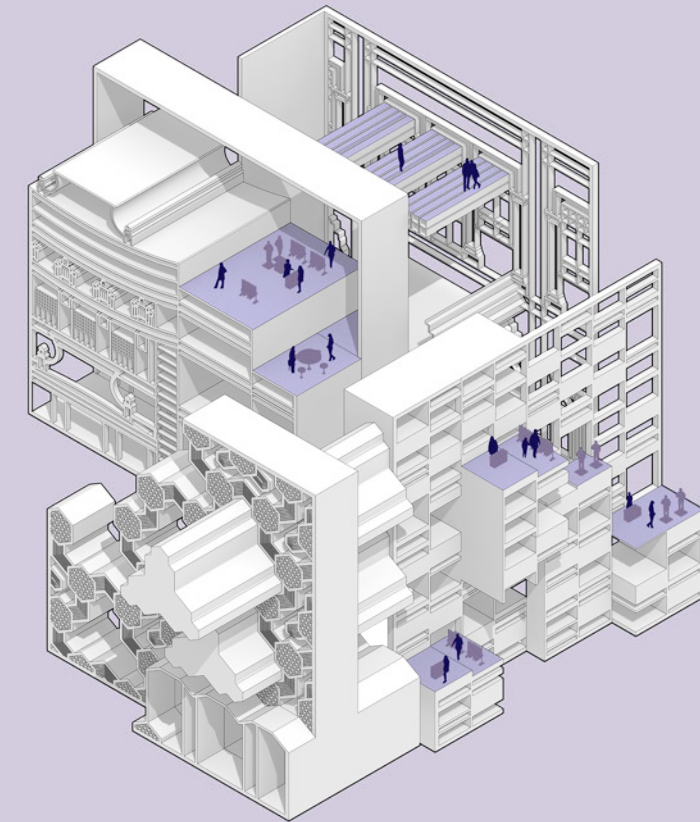
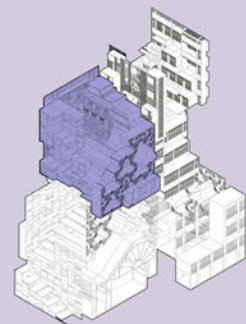


ATRIUM DINING-SHOPPING HUB  
MALL AS A GATHERING SPACE

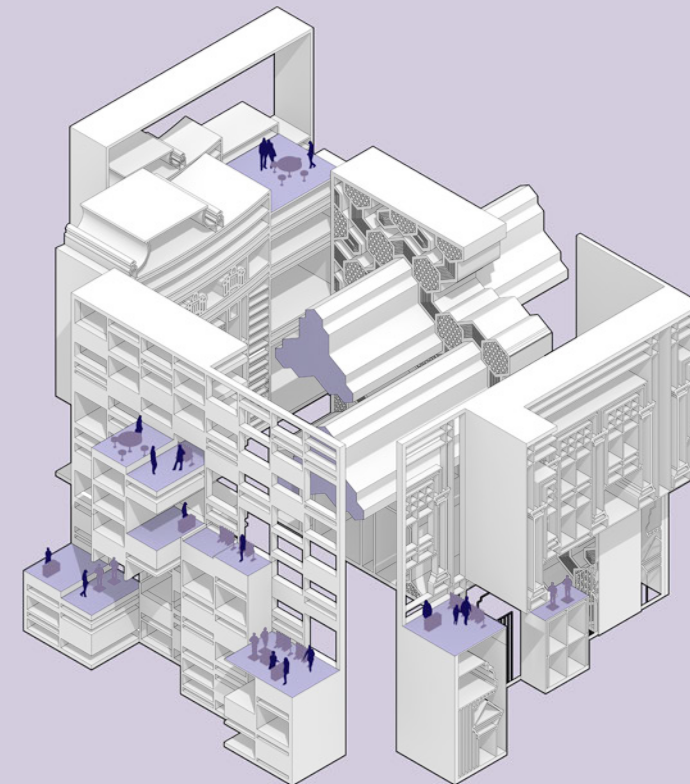




DINING | ATRIUM | SHOPPING  
SOUTH - WEST STREET CORNER



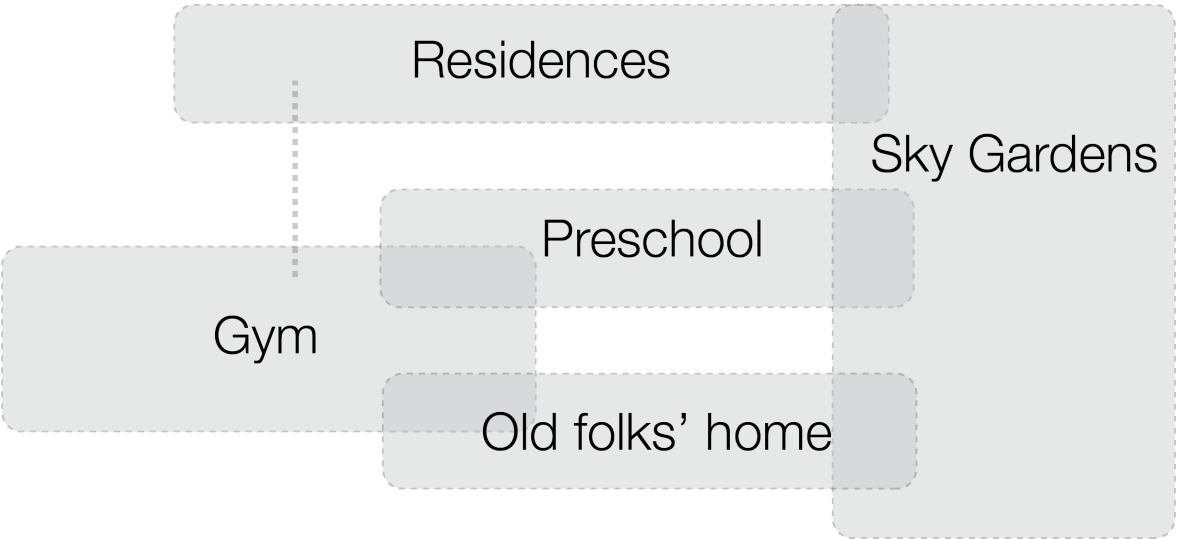
DINING | ATRIUM | SHOPPING  
THEATRE CORE



DINING | ATRIUM | SHOPPING  
INDOOR FOOD HUB

APARTMENT | SKY GARDEN | NURSERY | OLD FOLKS' HOME

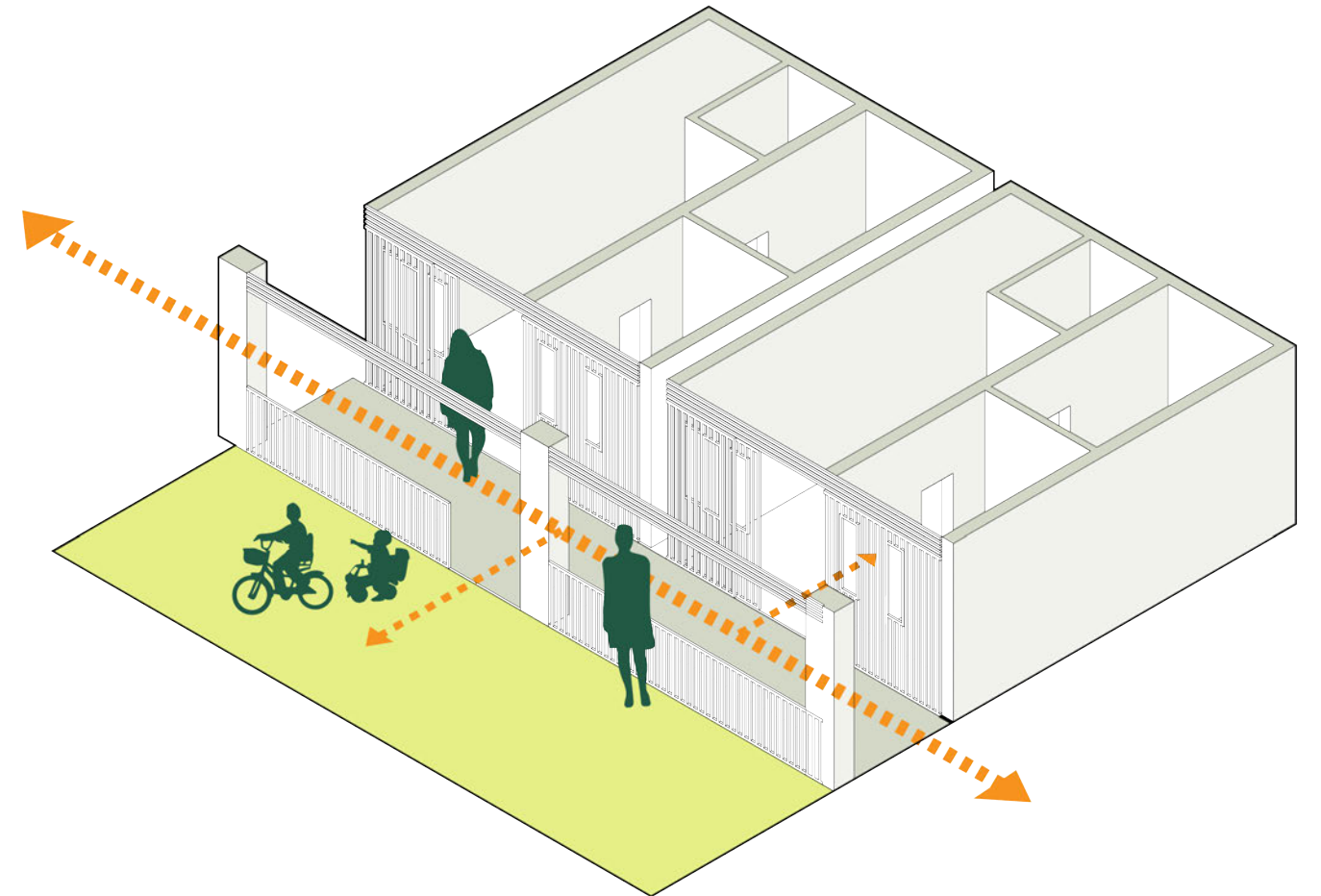
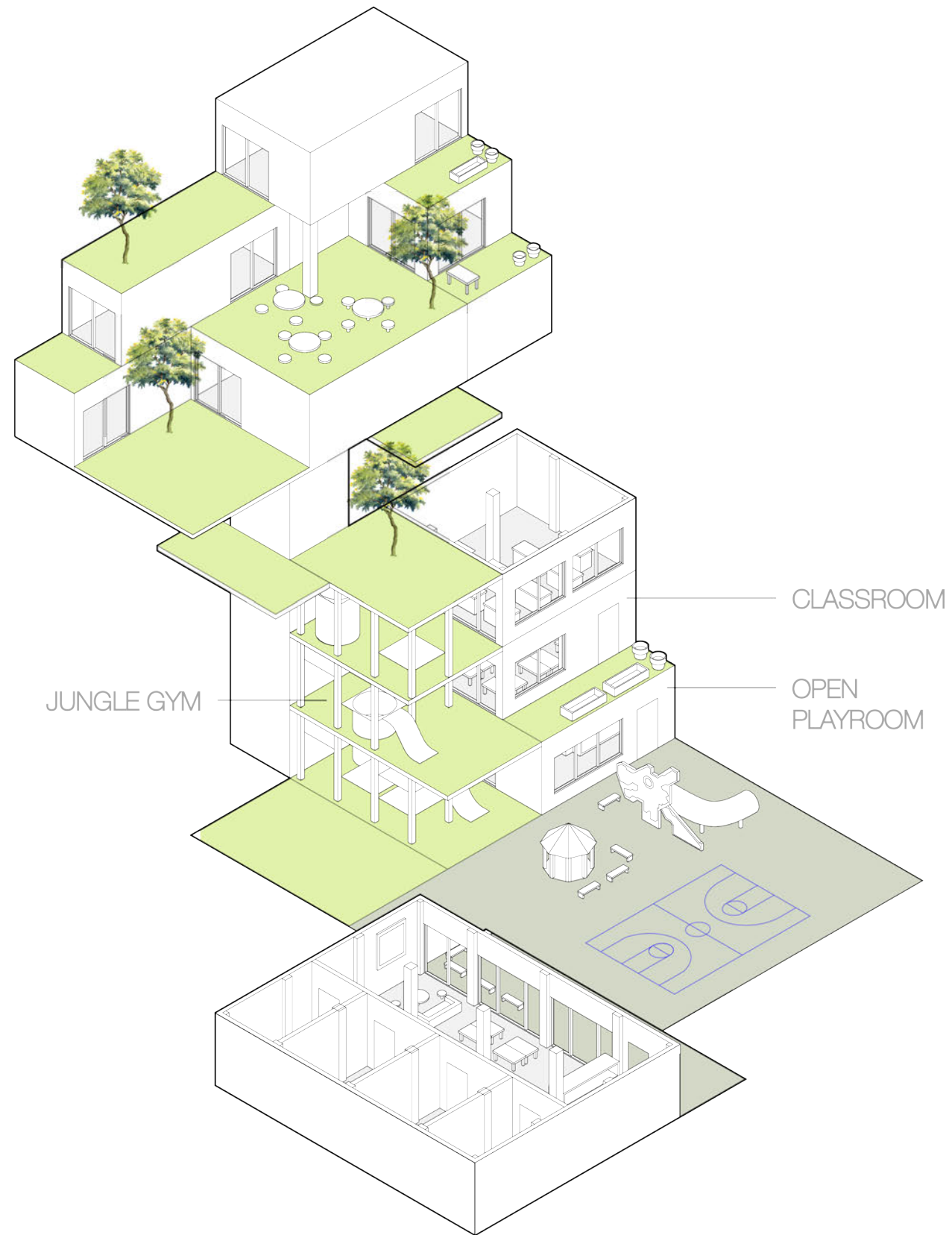
This node consists of the private programs of the new typology. The new typology is designed for communal living. Smaller residential spaces are linked together via sky gardens terracing upwards. Each apartments are connected to at least one sky garden and these sky garden double as circulation, encouraging residents to circulate through and interact with communal spaces to get to their apartments. A nursery and an old folks' home share the lower levels, linking into the sky gardens, gym and open space, much like how the void decks operate.



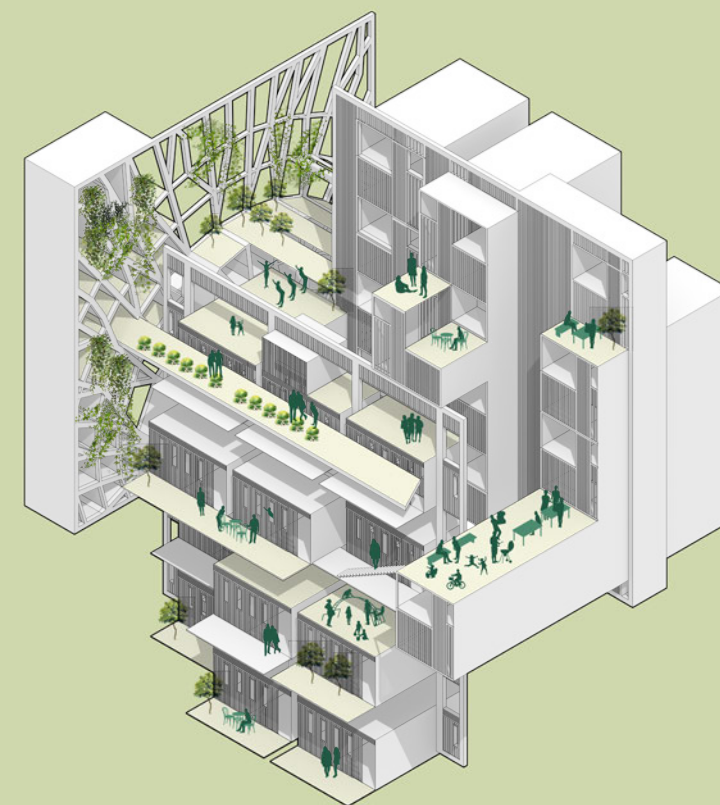
APARTMENTS

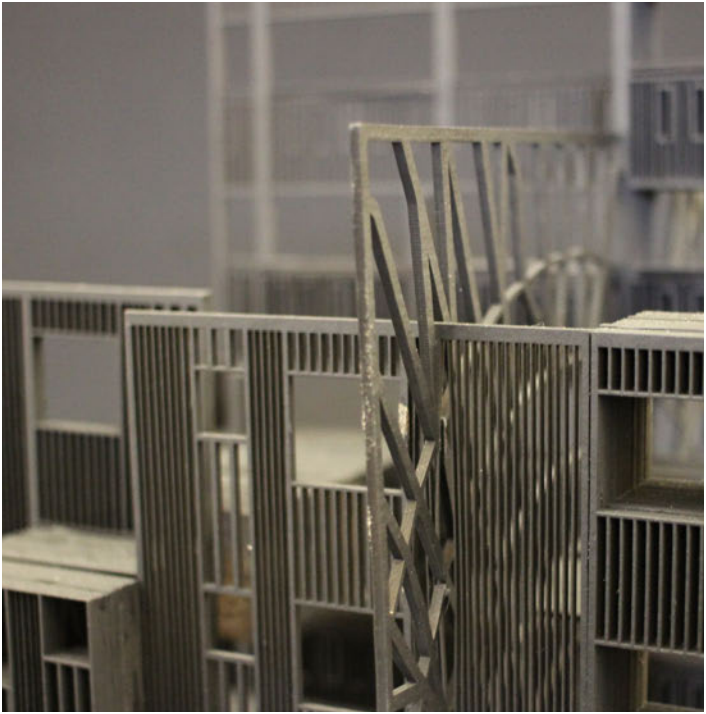
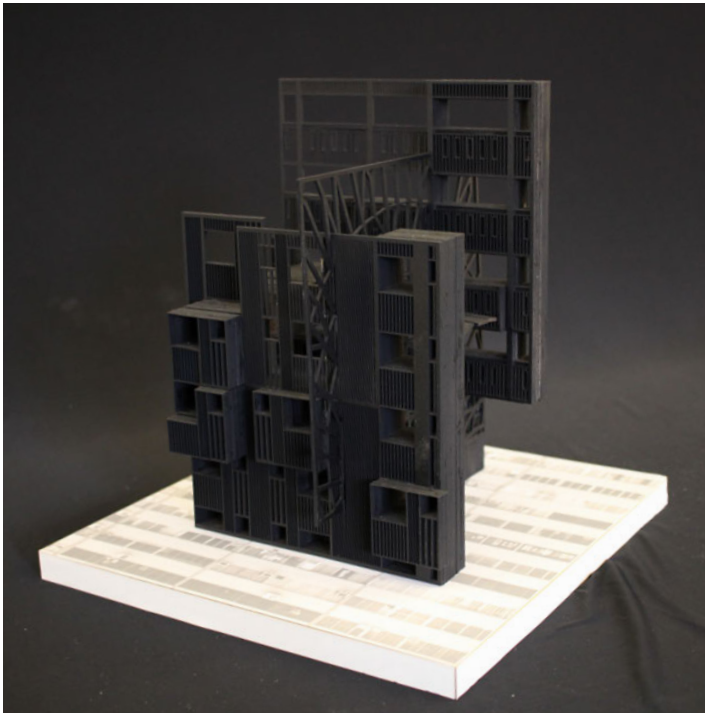
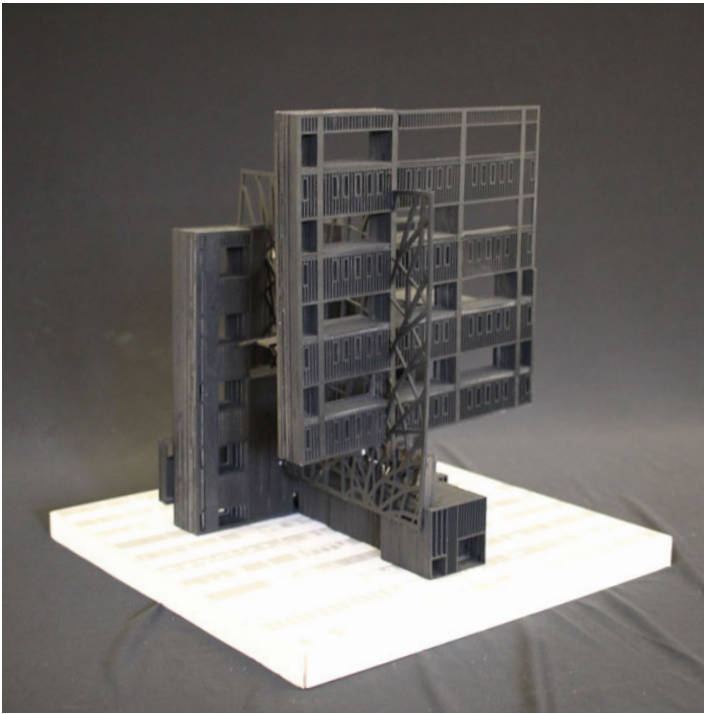
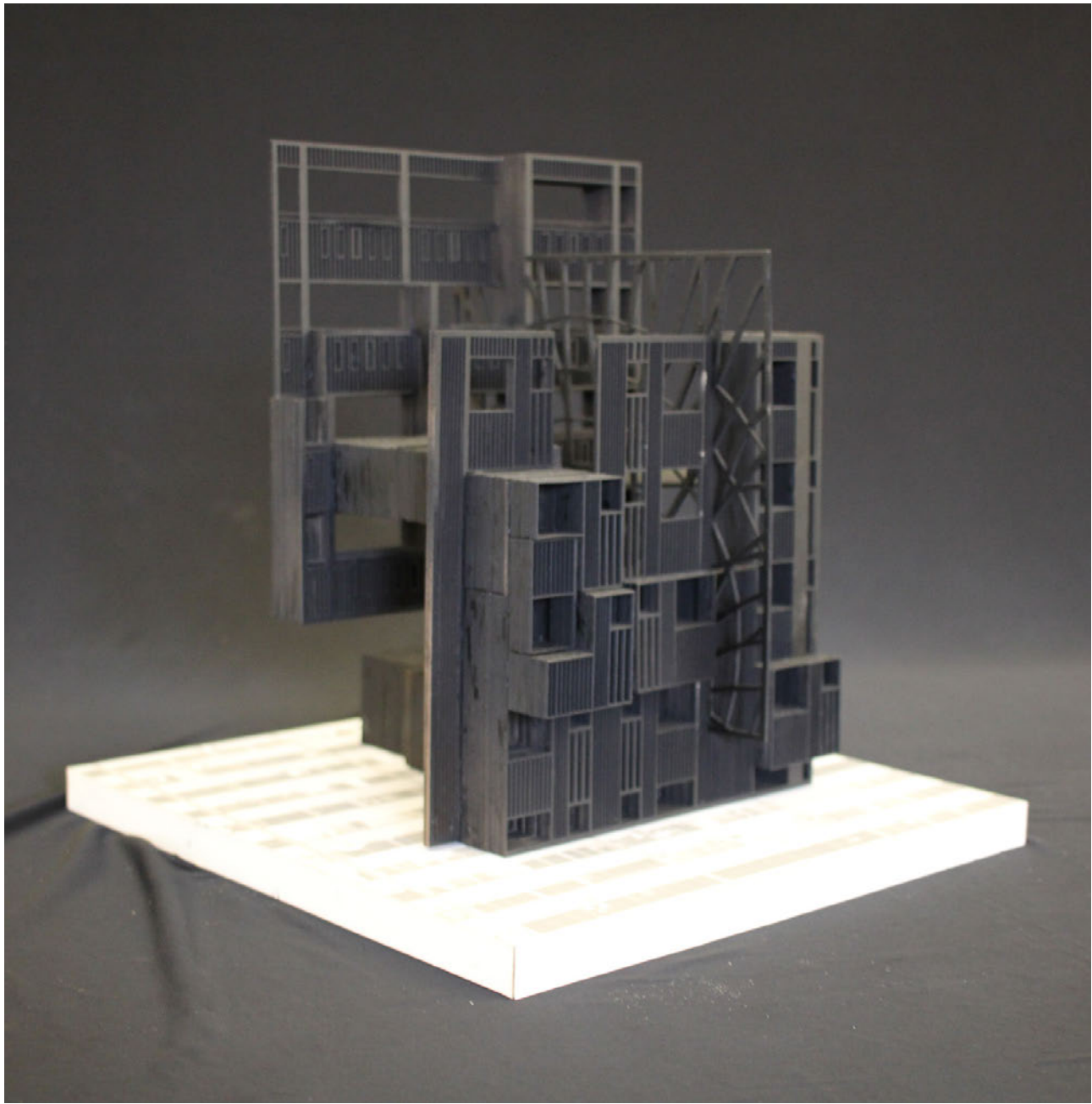
PRESCHOOL

OLD FOLKS' HOME



SHARED BALCONY CIRCULATION  
SKY GARDEN CONNECTION





MAMA SHOP | BASKETBALL COURT | GARDEN

This node consists of the communal programs of the new typology. With the design geared towards communal living, amenities that residents would wish to have are located in this node. Mama shops, little grocery stores selling popular snacks and daily necessities, are located around a central basketball court and green space. Most of this node consists of large, open colonnades and are reprogrammable according to what the residents need, similar to the Singaporean Void Deck.

Retail (mama shop)

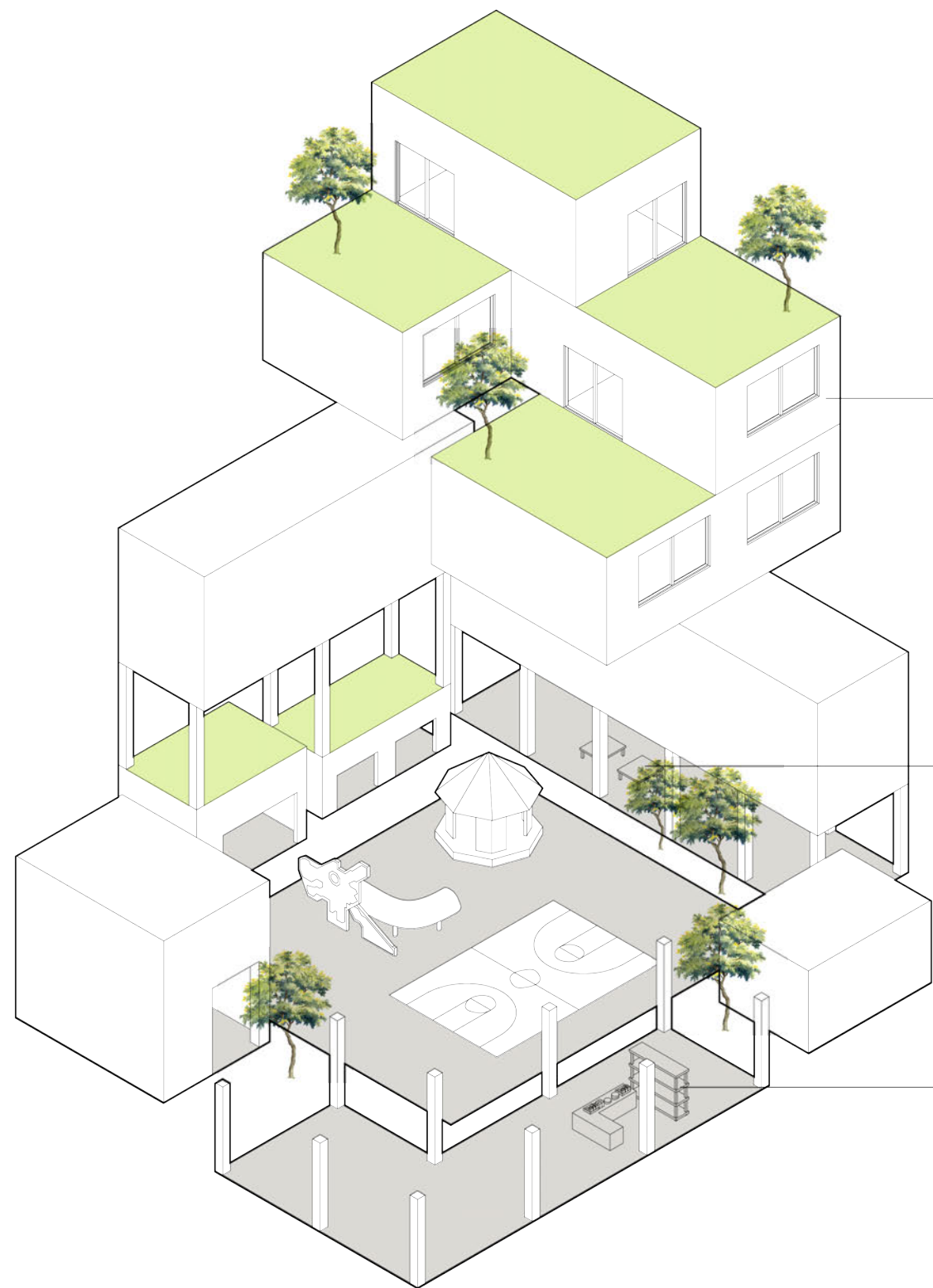
Basketball Court

Garden

APARTMENTS

MAMA SHOPS

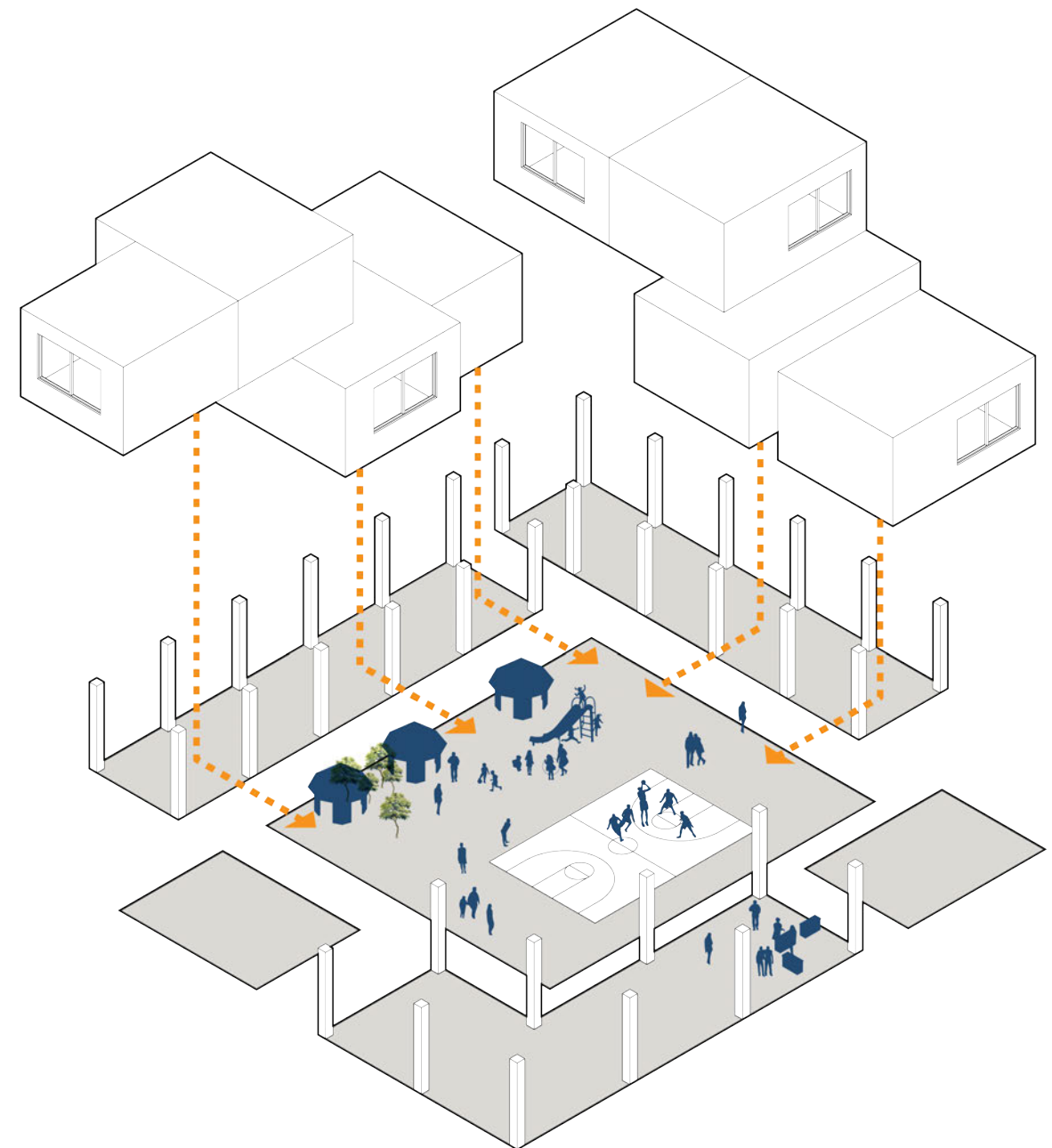
BASKETBALL COUF



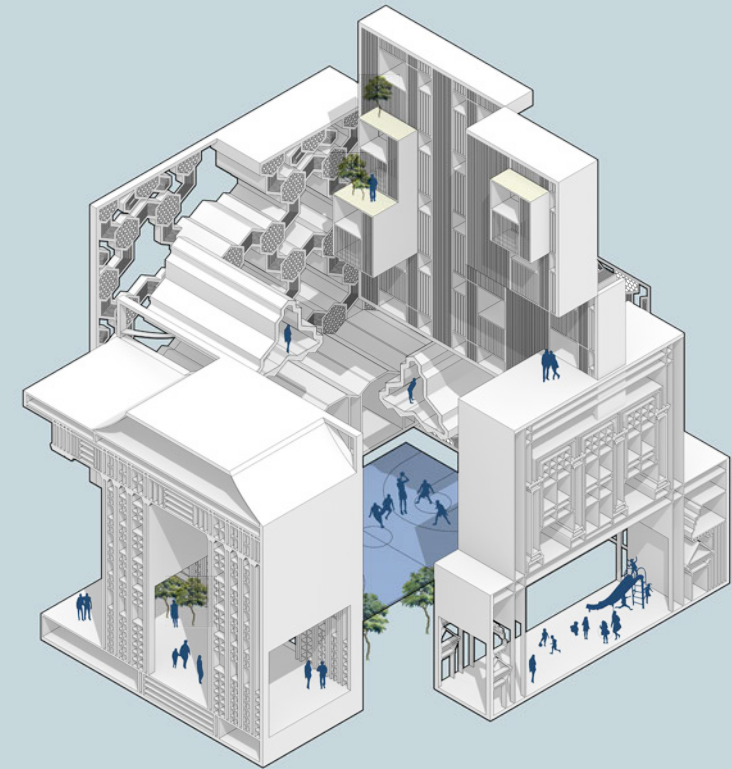
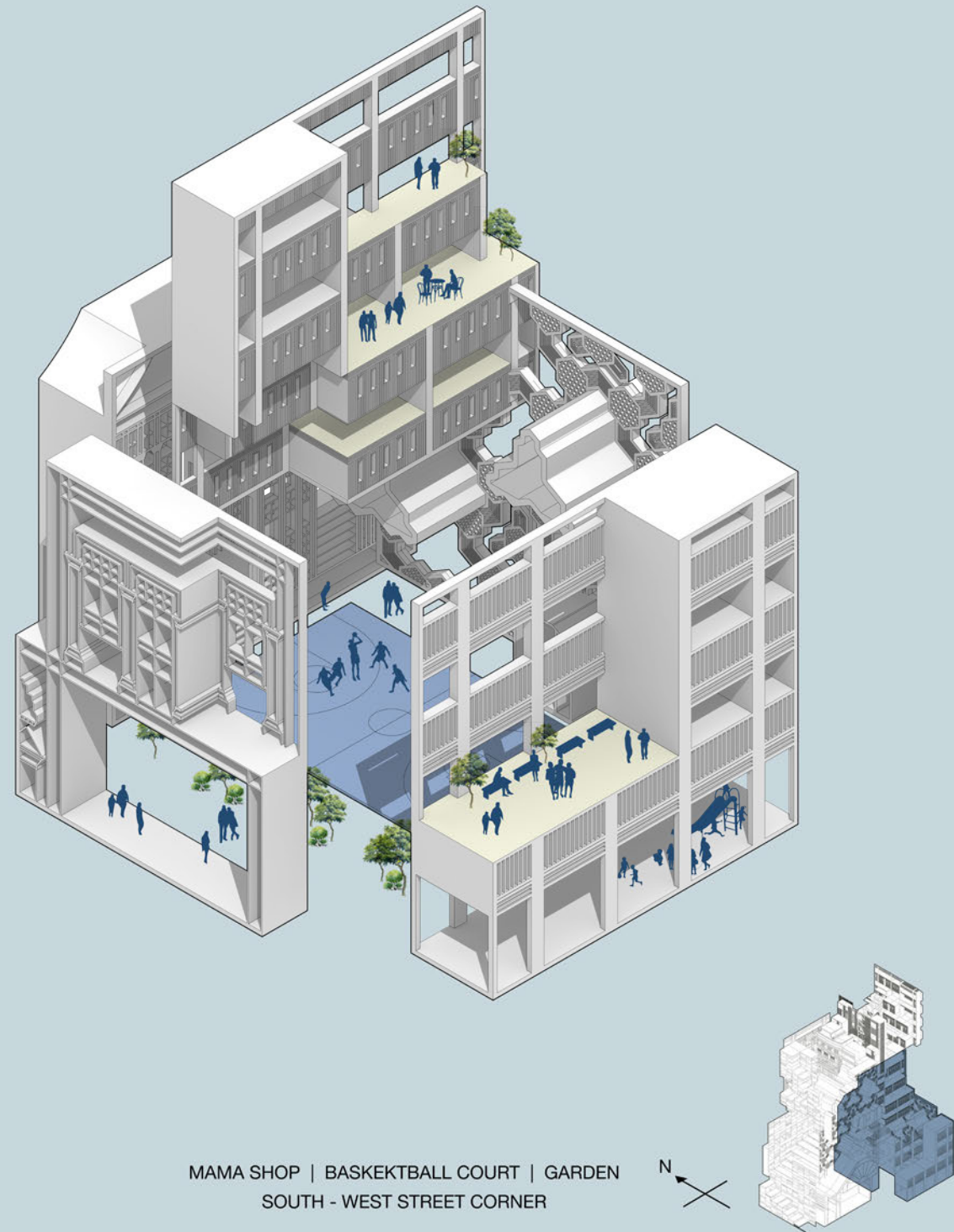
APARTMENTS

EXERCISE  
CORNER

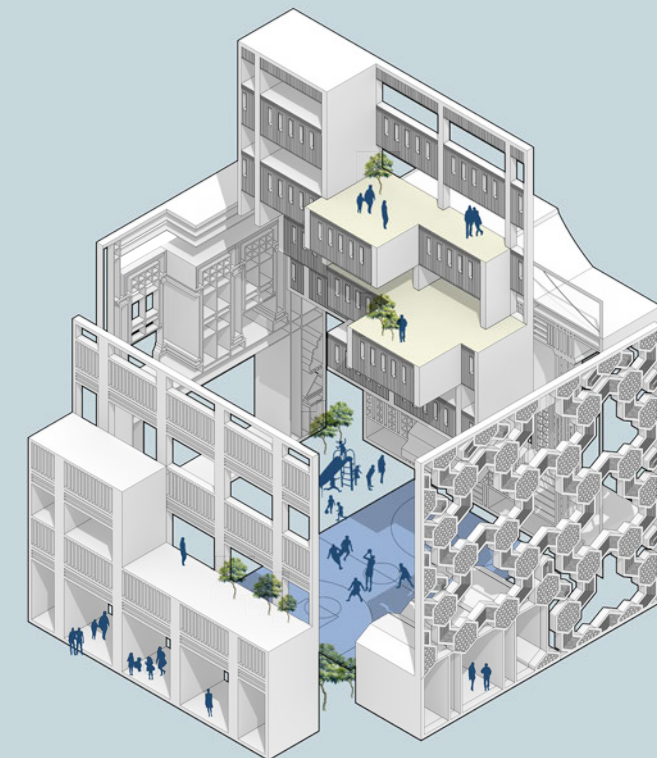
MAMA  
SHOP



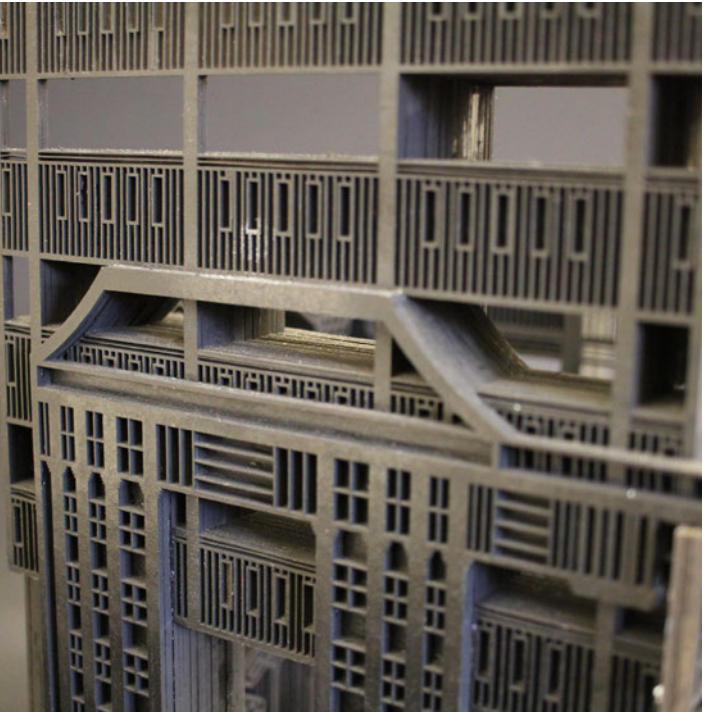
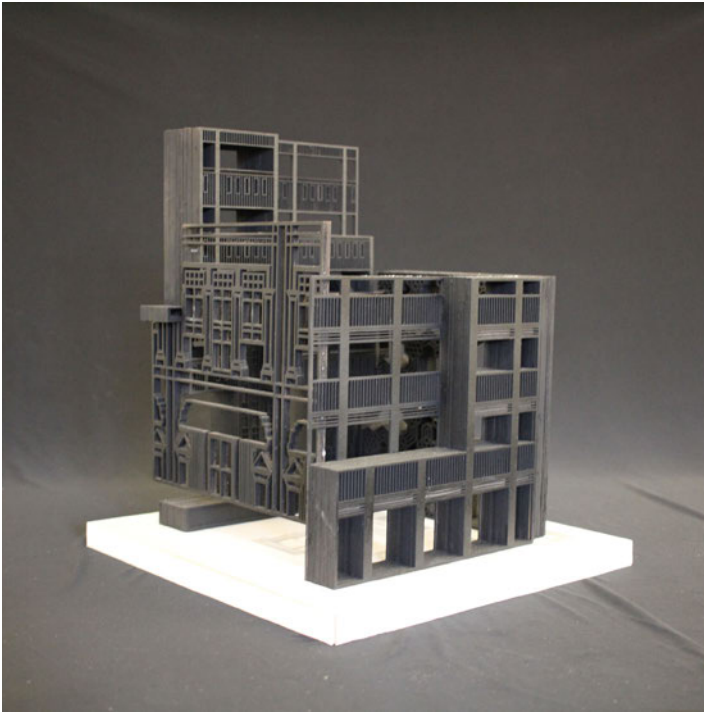
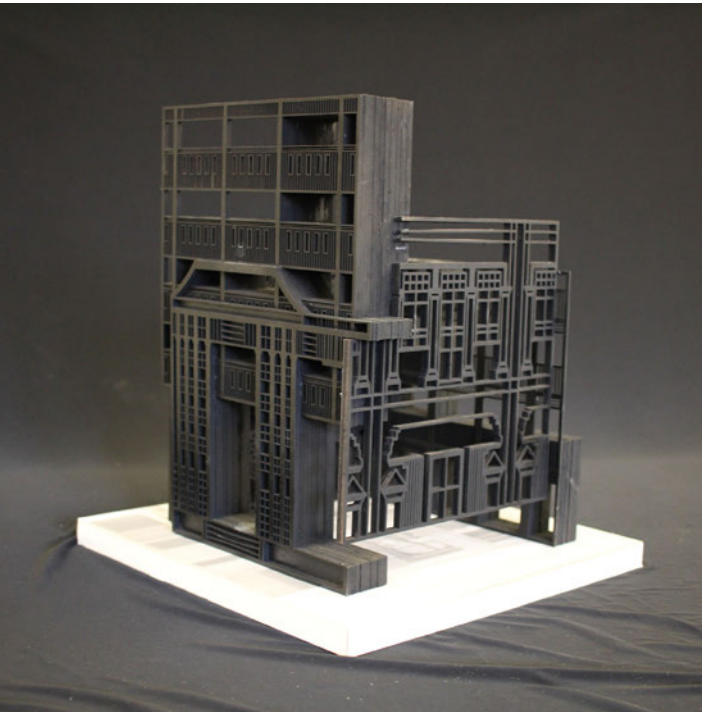
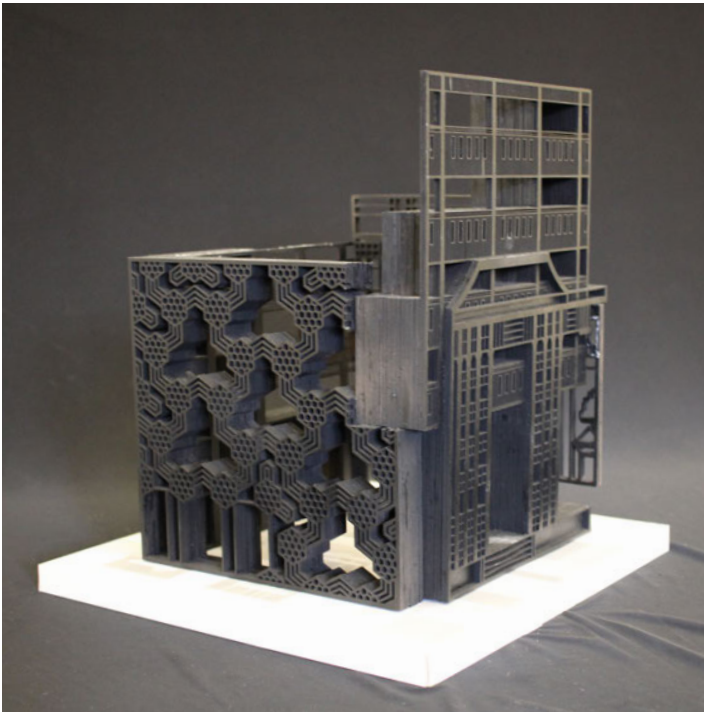
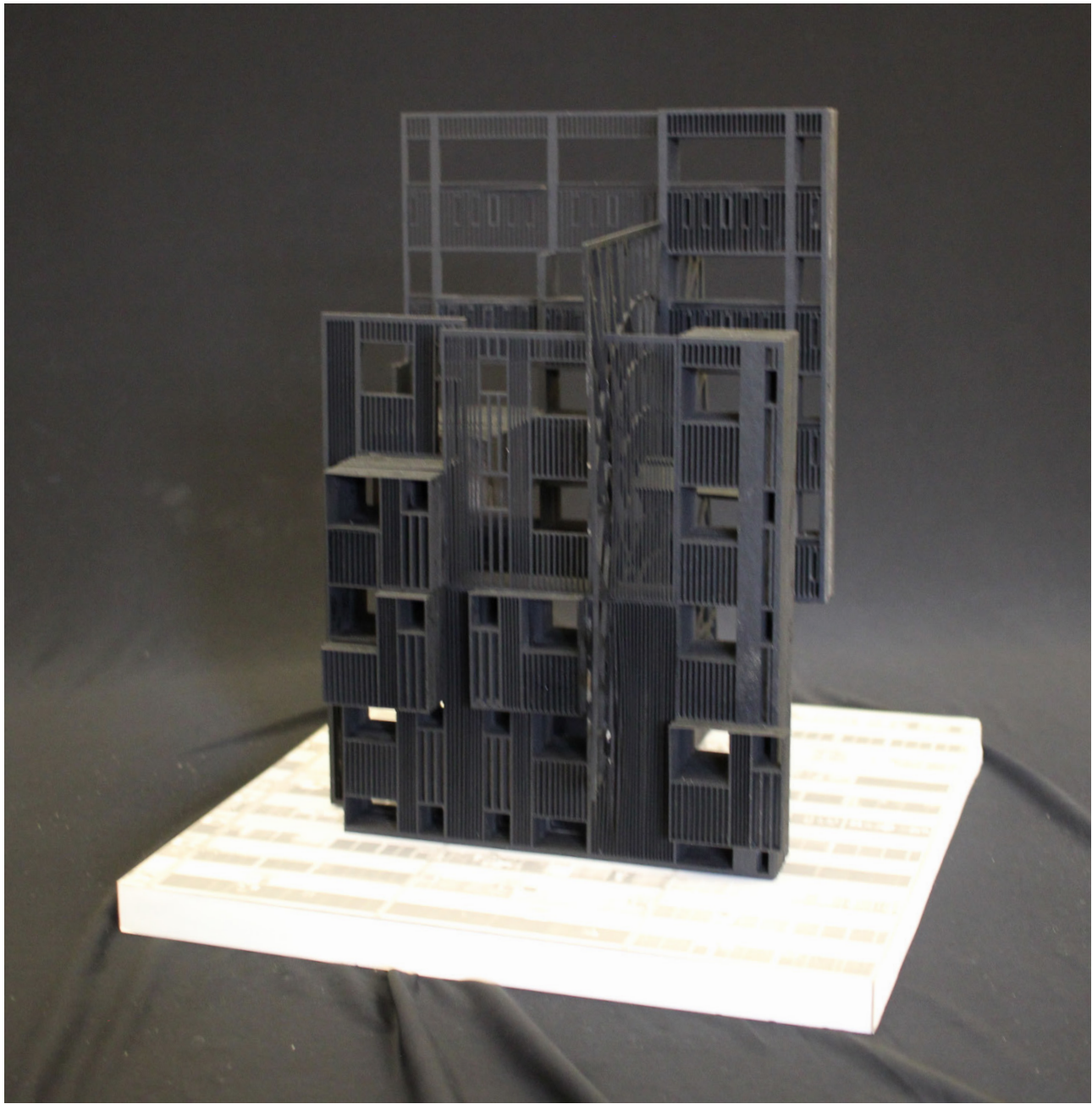
SHARED COMMUNITY AREA  
COMMUNAL LIVING

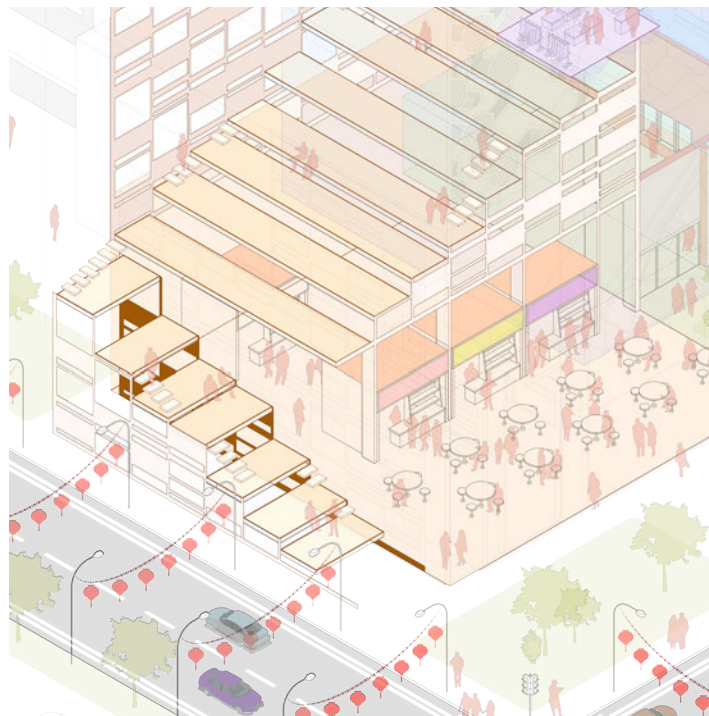
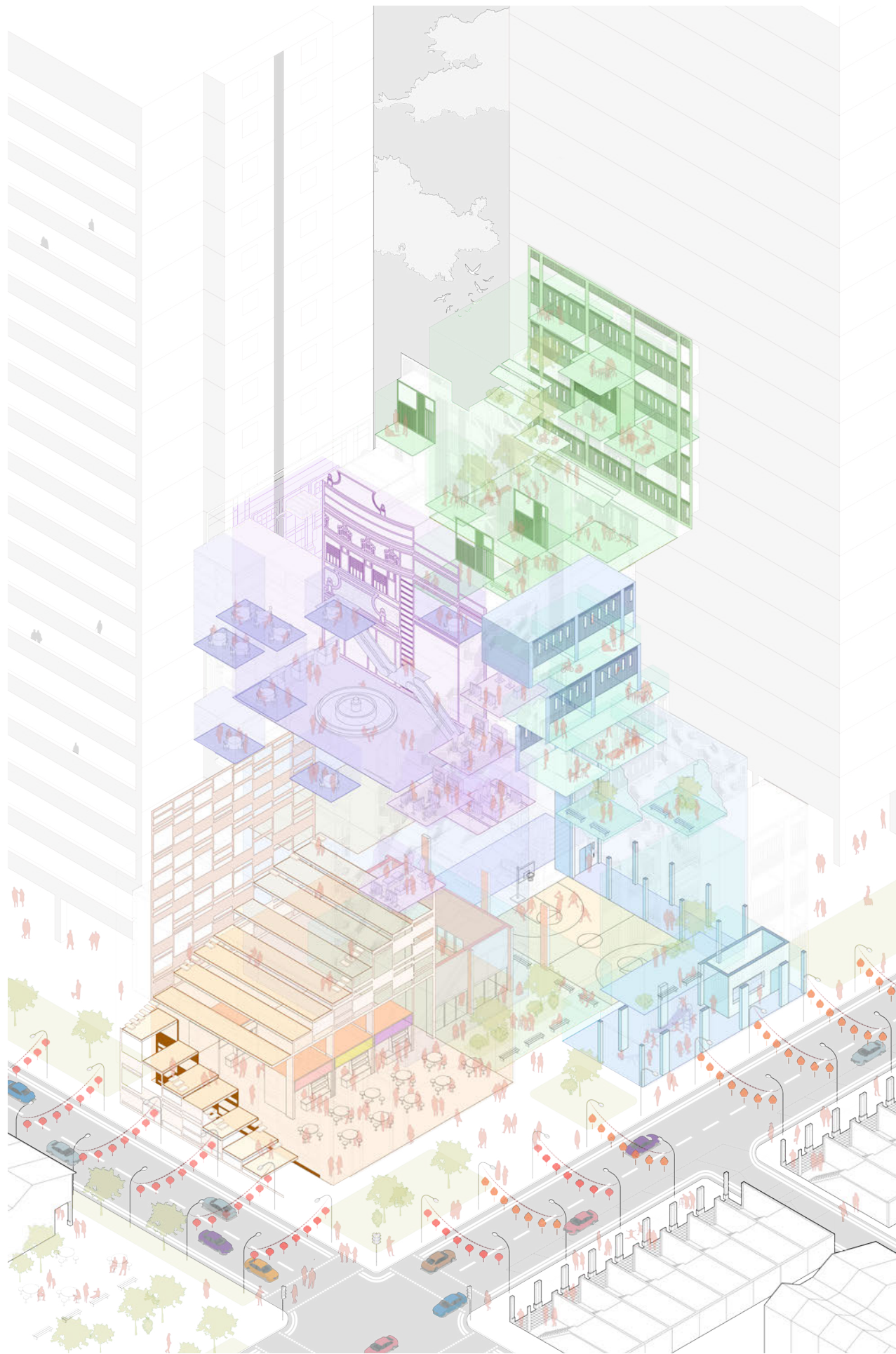


MAMA SHOP | BASKEKTBALL COURT | GARDEN  
COMMUNITY GARDEN



MAMA SHOP | BASKEKTBALL COURT | GARDEN  
HDB CONNECTION





## BIBLIOGRAPHY

Bandyopadhyay, Soumyen, and Guillermo Garma Montiel. *The Territories of Identity: Architecture in the Age of Evolving Globalisation*. London: Routledge, 2013.

Batista, Anamarija, Szilvia Kovács, and Carina Lesky. *Rethinking Density: Art, Culture, and Urban Practices*. Berlin: Sternberg Press, 2017.

Boyer, M. C. *The City of Collective Memory: Its Historical Imagery and Architectural Entertainments*. Cambridge, MA: MIT Press, 2006.

Cho, Im Sik., Chye Kiang Heng, and Zdravko Trivic. *Re-framing Urban Space: Urban Design for Emerging Hybrid and High-density Conditions*. New York, NY: Routledge, 2015.

Graham, Stephen. *Vertical: The City from Satellites to Bunkers*. London: Verso, 2018.

Girard, Greg, and Ian Lambot. *City of Darkness Life in Knowloon Walled City*. Surrey: Watermark, 1999.

Jacobs, Jane. *The Death and Life of Great American Cities*. New York, NY: Random House, 1961.

Littlefield, David, and Saskia Lewis. *Architectural Voices: Listening to Old Buildings*. Hoboken, NJ: Wiley, 2007.

Per, Aurora Fernández, Javier Mozas, and Javier Arpa. *Density Is Home*. Vitoria-Gasteiz: T Architecture Publishers, 2011.

Rowe, Peter G. *Emergent Architectural Territories in East Asian Cities*. Birkhäuser, 2012.

Schneider, Tatjana, and Jeremy Till. *Flexible Housing*.

Uffelen, Chris Van. *Re-use Architecture*. Berlin: Braun, 2011.

Vale, Lawrence J. *Architecture, Power, and National Identity*. London: Routledge, 2014.