

**South Boston Ex-Urban
A New Living Paradigm for Harbor Revitalization**

by

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Master of Science in Conservation, The University of Hong Kong, 2009

Submitted to the Department Of Architecture
in Partial Fulfillment of the Requirements for the Degree of

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Special thanks to Samuel Bo Feng, for your forever encouragement and warmness. Accompanied by you in this professional path is an extraordinary present in my life.

Lastly but most importantly, I also want to express my deepest gratitude to the infinite support and incredible tolerance from my parents. I am the lucky one who is your daughter.

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by You Jin

Submitted to the Department of Architecture on January 14, 2016
in Partial Fulfillment of the requirements for the degree of Master of Architecture

ABSTRACT

All around the world, old harbor areas stood empty once the city maritime functions began to wane in the early twentieth-century. Due to the excellent views, the location on the water, and the proximity to the city center, these areas have been rapidly redeveloped to facilitate urban expansion in the last three decades. The overlap of industrial decline and new revitalization has prompted new issues.

Living in the city and urban demographics are changing. On the macro-level, because of the emptiness of the newly developed site, the density is not comparable and is difficult to evaluate in its integrated context. On the micro-level, an urban apartment is highly efficient means to provide living containers for urban

dwellers; however, it sacrifices high living quality to enjoy sunlight, fresh air, the view, and private garden to every housing unit. A single family house symbolizes a success of personal life; however, it compromises urban public space and usually is exclusive to social activities in a shared economic era.

This thesis project addresses the issue of livability as part of the harbor revitalization in a transitional site of a rapid redevelopment district, empty industrial zones, and suburban residential areas. I aim to create a three-dimensional, micro-urban living system in which residential, commercial, recreational, educational functions are merged together.

Thesis Supervisor: Andrew Scott
Title: Professor of Architecture

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1 INTRODUCTION

THE WORLD ACCORDING TO URBAN LIVING

Urban



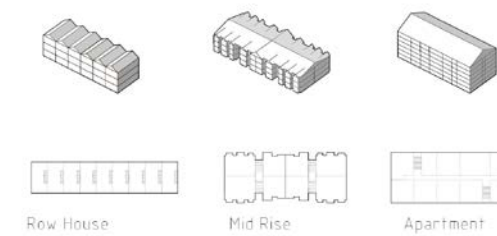
Suburban



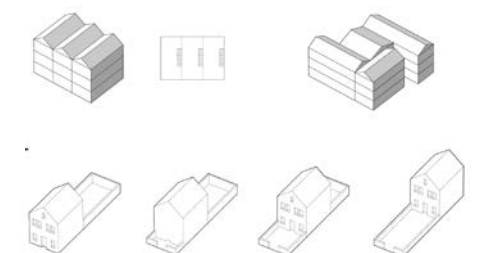
Based on a panorama of 65 urban housing projects, this thesis first collects, analyzes and compares the data for each project. Using these data, the transitions from the rural or suburbs into urban areas were measured. The new criteria are evaluated when justifying the high price of urban land and the desire of large homes during the new occupation of environment.

The intention of this scientific method is to explain the complexity of urban housing, which includes subjectivity of living standards and objectivity of design innovation. Nevertheless, urban housing is the main reality in a city.

Apartment
(Fort Point, Boston)



Single Family House
(Telegraph Hill, Boston)



65 Urban Housing Projects



HOUSING TERMINOLOGY

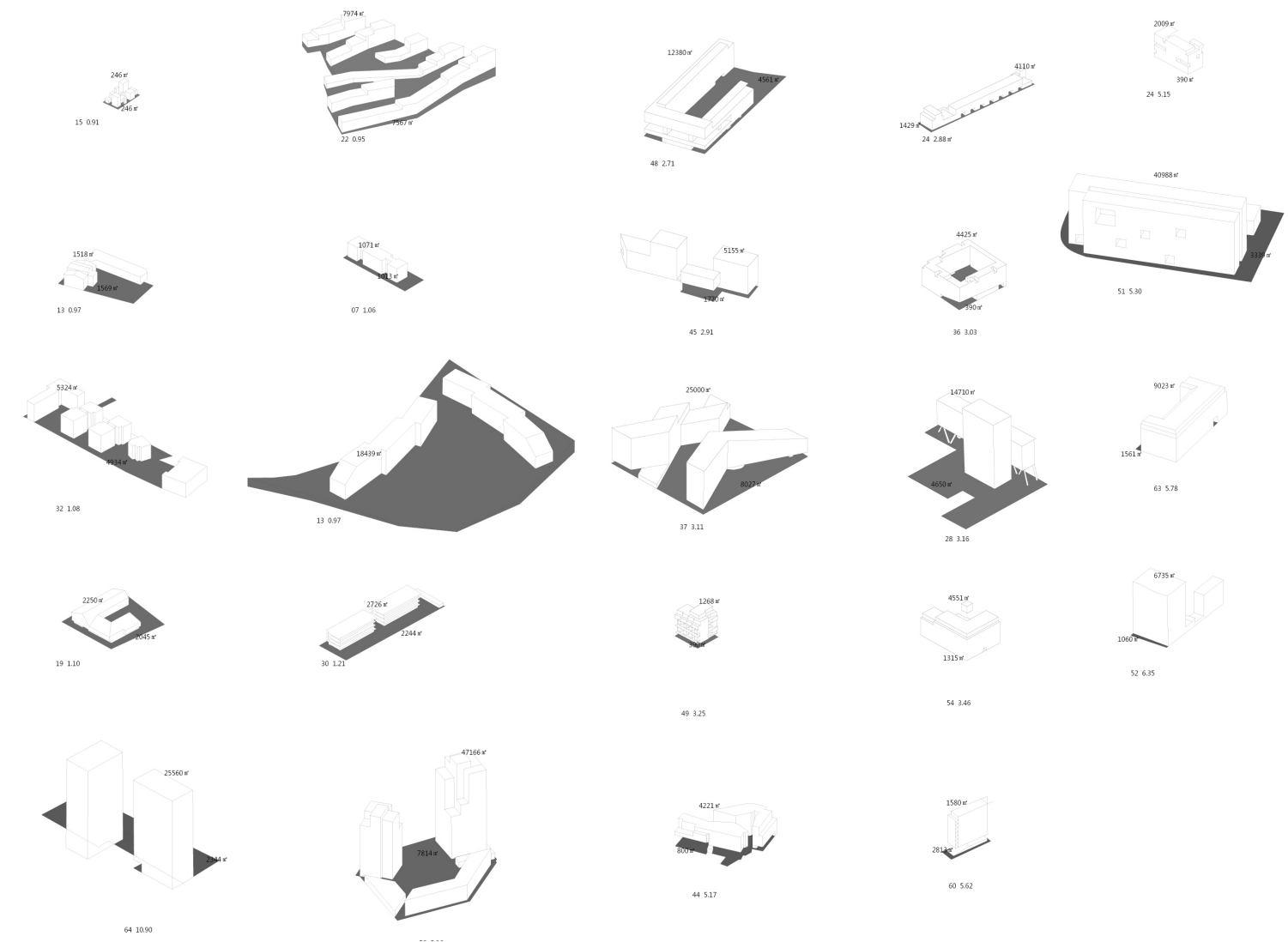
DENSITY

The density has been measured since it represents precisely the people and the compactness of a region. There is no way to define a right or wrong density in itself, however, density becomes discussible in its integrated urban context. Density is distinguished between urban and rural.

FAR (Floor Area Ratio): Constructed surface area above ground level / plot area

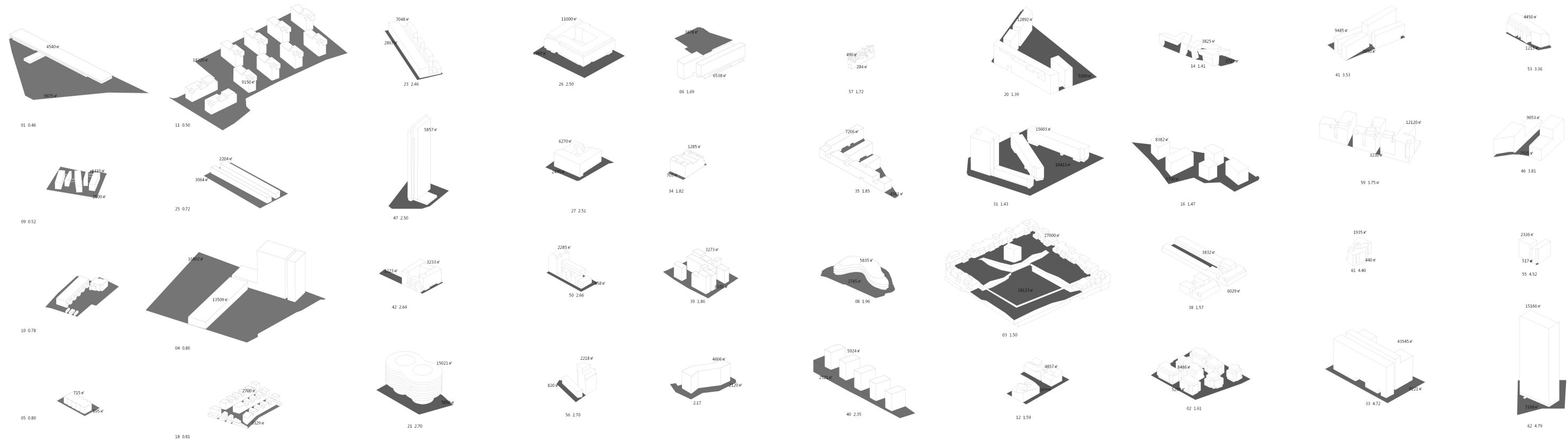
Population density in the city: inhab/ km2
 Population density in the district: inhab/ ha
 Net Residential Density on the plot: inhab/ ha

Units Density on the plot: units/ ha



Axonomic perspective and its plot

Data: F.A.R.
 Constructed surface area above ground level: m²
 Plot area: m²



COVERAGE RATE

Covered-Building area
Landscape
Road

SHARING SPACE

Within constructed area, such as circulation (entrance, halls, stairways), facilities (laundry, nurseries, meeting areas, terraces, and balconies) .

PUBLIC SPACE

Not occupied on the plot, such as gardens, pedestrian, road, play areas, sports fields.

POPULATION

Population on the plot(inhab) = housing units (unit) * inhab(inhab/unit)

Fc =a factor of conversion

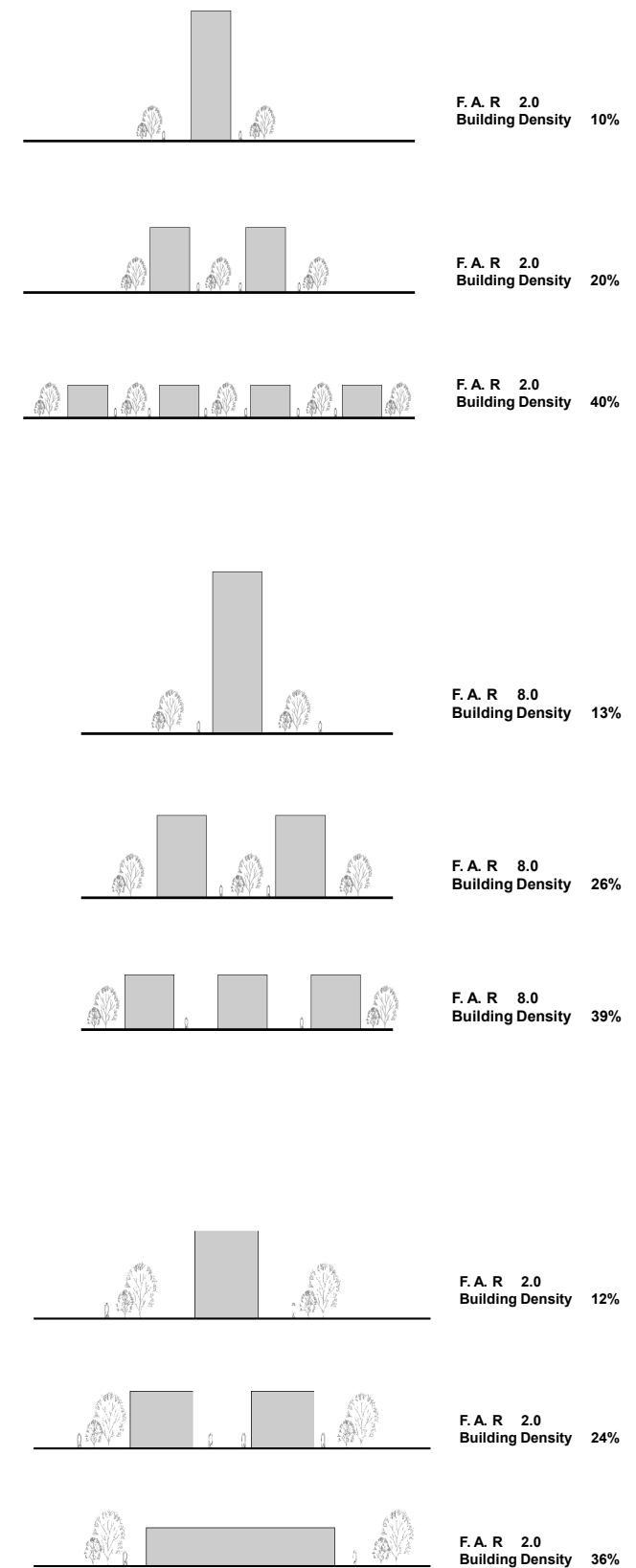
Studio: 1.25 inhab/unit

One bedroom unit: 1.25 inhab/unit

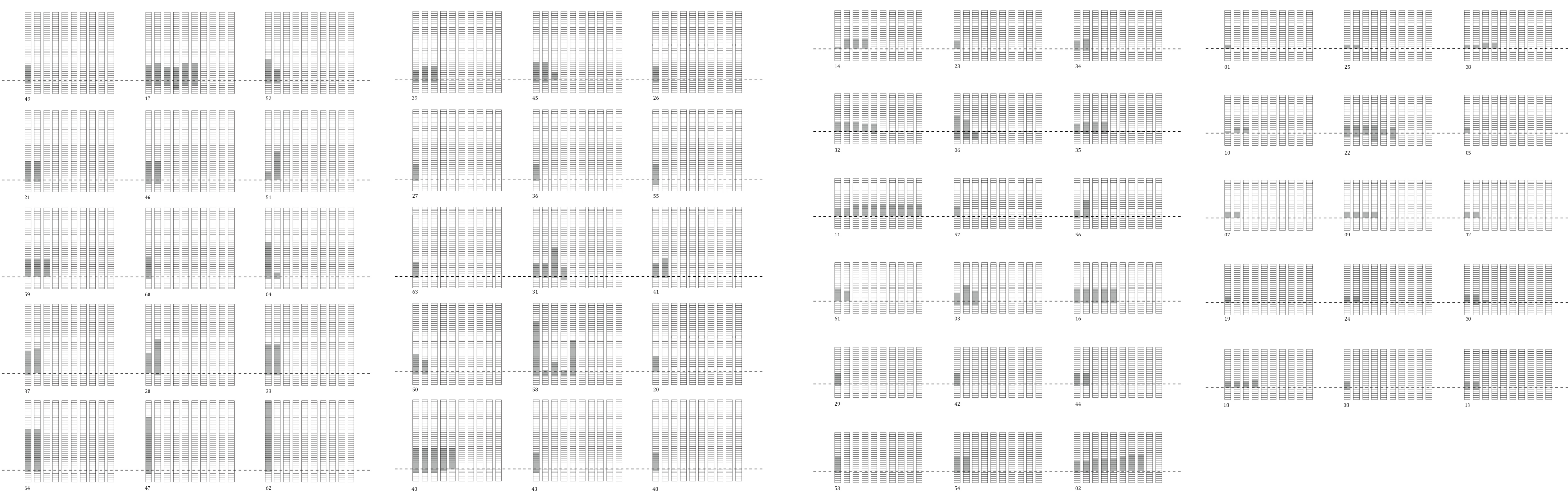
Two bedroom unit: 2.50 inhab/unit

Three bedroom unit: 3.75 inhab/unit

Four or more bedroom unit: 5.00 inhab/unit



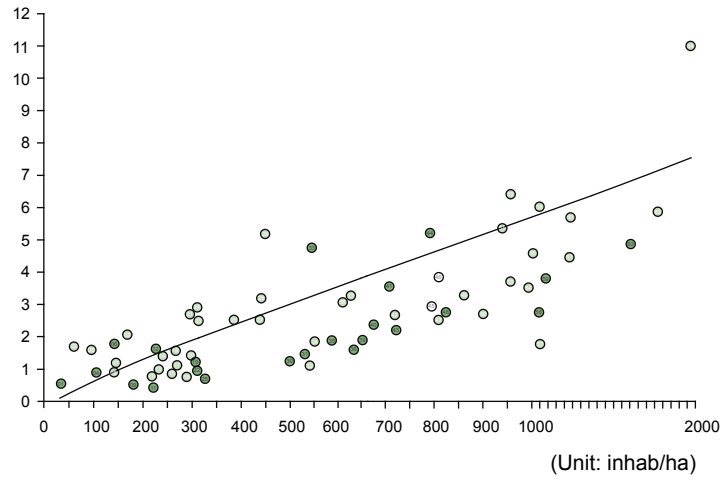
Density & Height



Height

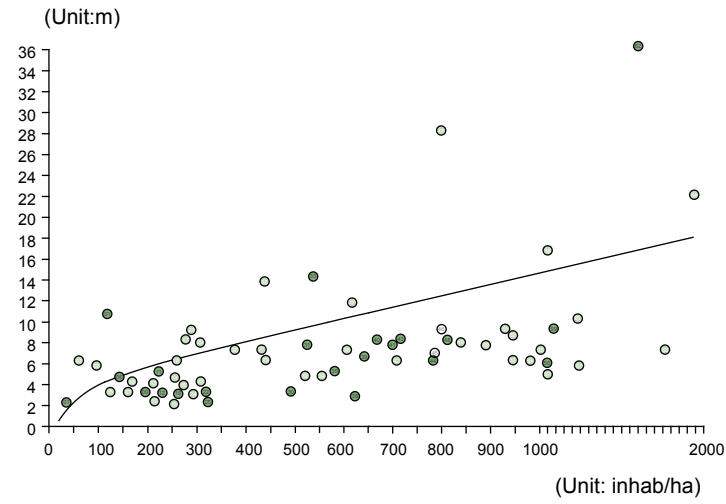
Data: Columns represents the height of different massing on the plot

F.A.R



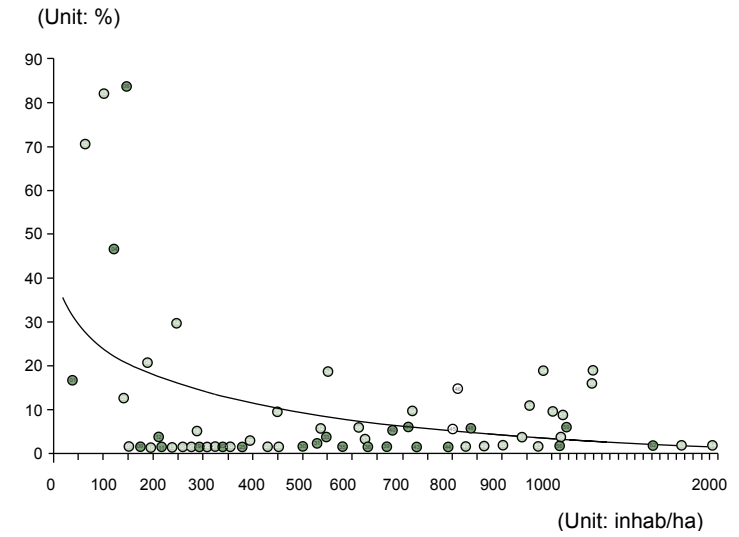
Residential Density

Average Rise



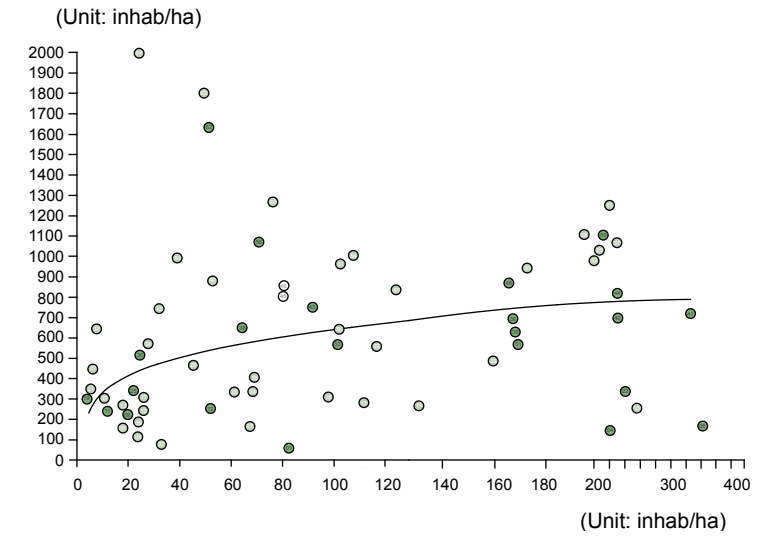
Residential Density

Coverage ratio



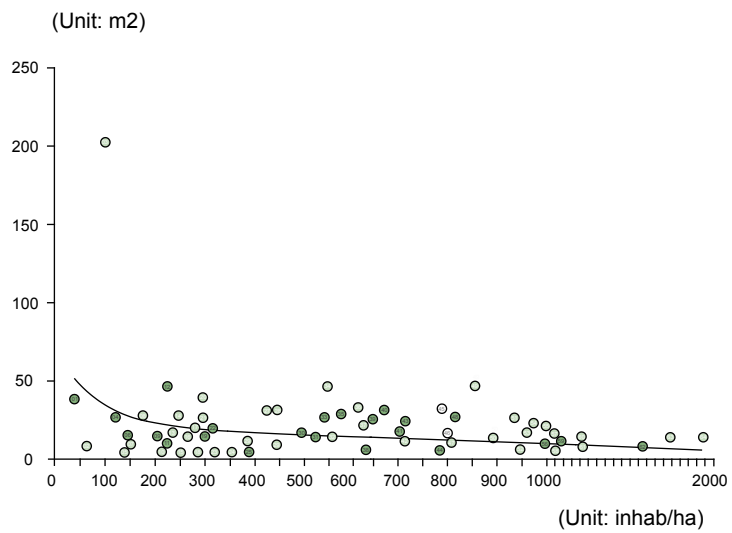
Residential Density

Residential Density On the Plot



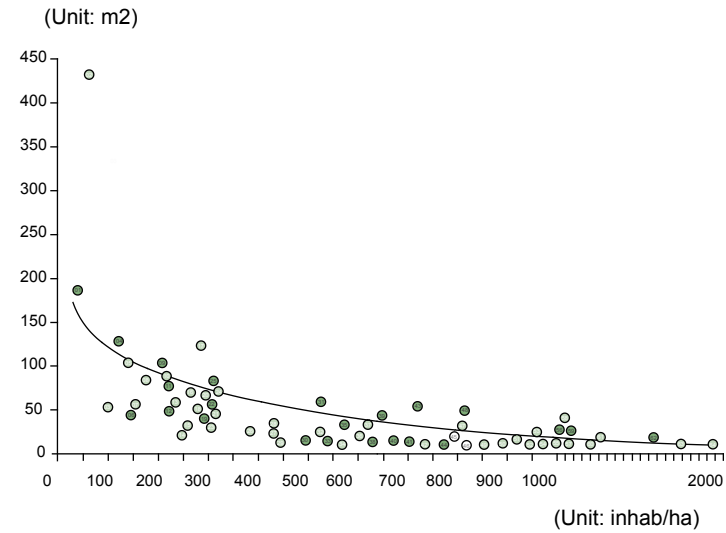
Gross Residential Density On the District

Non-residential Space



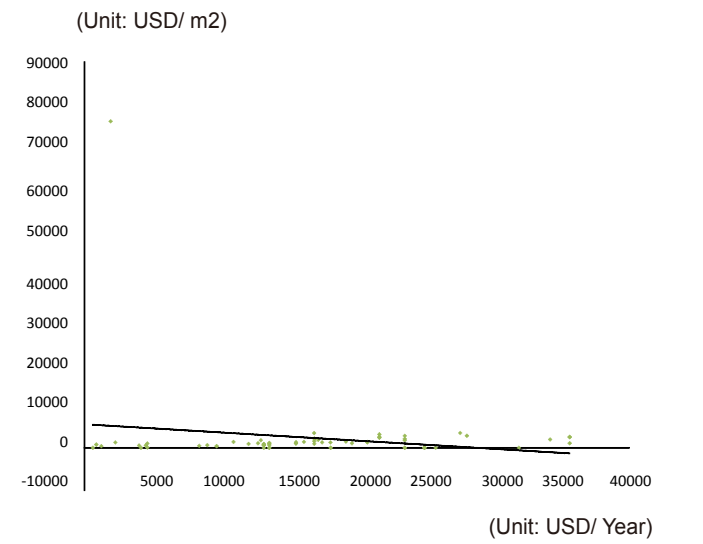
Residential Density

Not Covered Space



Residential Density

Cost Per Sqm



Average Annual Income

Statistics

NEW LIVING PARADIGMS

Seewurfel Apartments & Office: This project proposes an alternative to luxury single family houses, which take up large areas of space with a very low population density. A maximum of two housing units occupies each building. Offices on the lower floors are complemented, which generates activities. The other aspect of luxury is that each house is designed in different volumes and constructed with varied materials and finishes.

De Citadel: This block is designed with a variety of programs, from parking and the underground infrastructure up to the green open space. The plan's proposal aims to recreate the density of a medieval city with regard to population and mixed uses.


FRØSILO: This adaptive reuse project shows the transformation of old industrial or sea port areas which are near the center of the city into new

residential community. A large central atrium is used as a public circulation and view contact joint between floors.

Macallen Building Condominiums: The project is a pivotal development in the urban revitalization of South Boston. The building negotiates different scales and urban configurations. A staggered steel truss system is designed for the residential levels that provides interior column-free modules.

VM Houses: This project aims to characterize the plot with a variety of programs and vertical distribution of collective space. The architect efforts to diversify the open or closed sharing space and to give freedom to each individual apartment, as there are more than 60 different housing units.

Seewurfel Apartments & Office



PROJECT DATA


ARCHITECT: *Camenzind Evolution*
 YEAR: 2005
 LOCATION: *Zürich, Switzerland*

NO. OF UNITS: **8**


FAR: 1.61
 COVERAGE RATIO: 35%

COST: 2475 USD/sqm


URBAN CONTEXT




SECTION



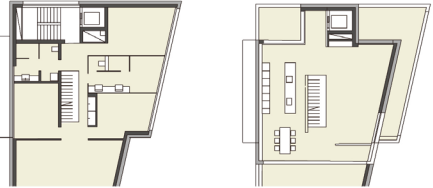
ELEVATION



SUSTAINABLE DESIGN- Geothermal Heating



UNIT PLAN



DE CITADEL



PROJECT DATA

ARCHITECT: *Christian de Portzamparc +OMA*
 YEAR: *2006*
 LOCATION: *Almere, Netherlands*

NO. OF UNITS: **52**

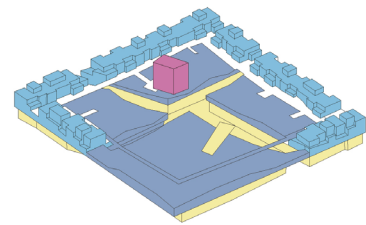
FAR: *1.5*
 COVERAGE RATIO: *86%*

COST: *1250 USD/sqm*

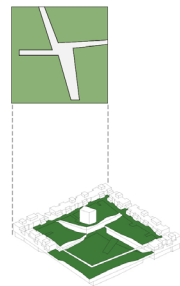
URBAN CONTEXT



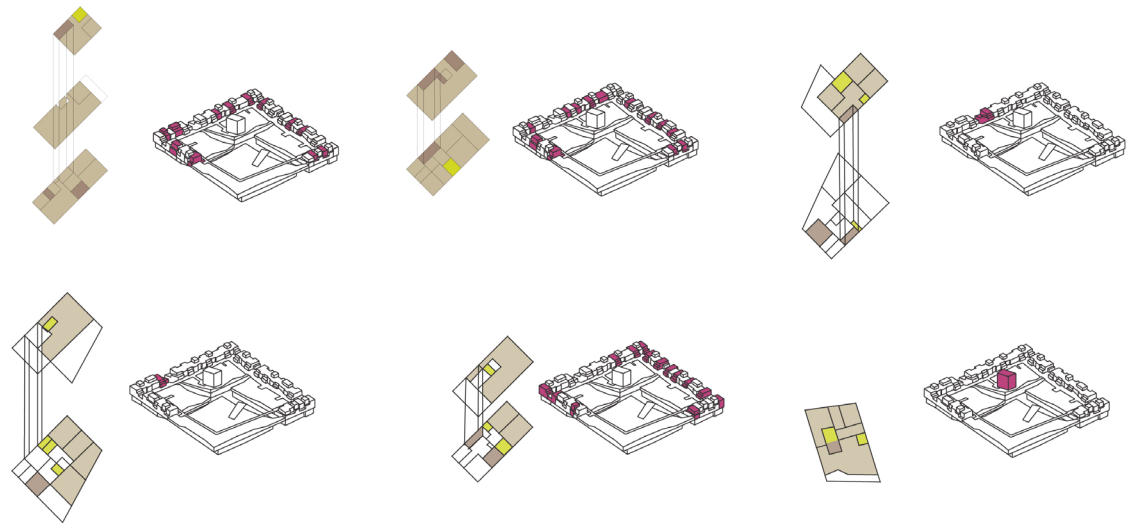
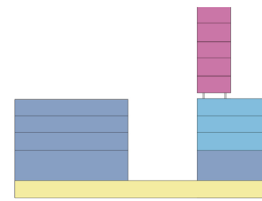
PROGRAM



■ Apartment Type
 ■ Terrace Type
 ■ Commercial
 ■ Entrance and Parking



SECTION



FRØSILO



PROJECT DATA

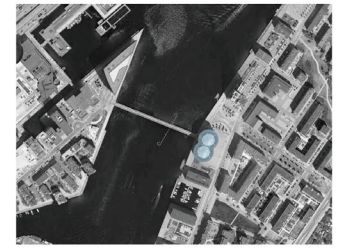
ARCHITECT: *MVRDV*
 YEAR: *2005*
 LOCATION: *Copenhagen, Denmark*

NO. OF UNITS: **84**

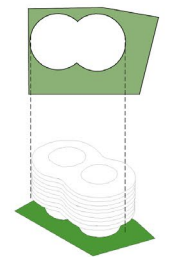
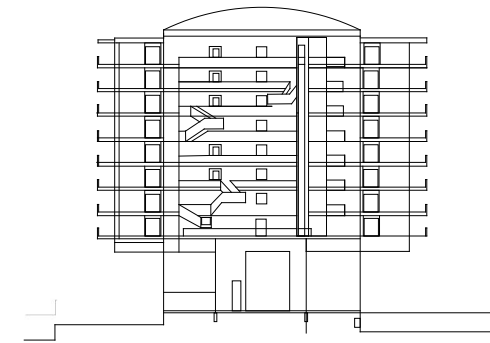
FAR: *2.7*
 COVERAGE RATIO: *38%*

COST: *2781 USD/sqm*

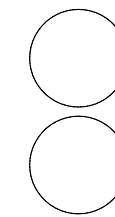
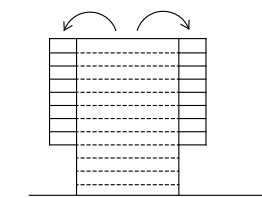
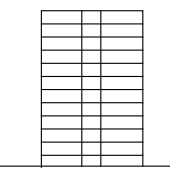
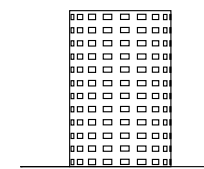
URBAN CONTEXT



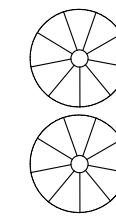
ORIGINAL CONDITION



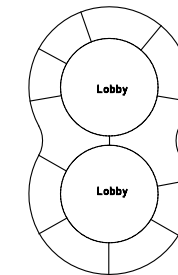
STRUCTURAL STRATEGY



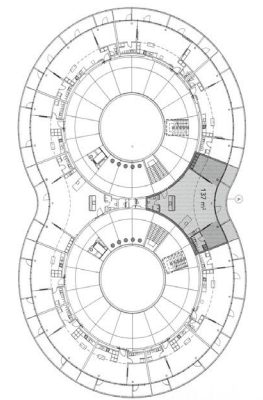
Maximum amount of possible new window openings in existing silo



Apartment lobby



FLOOR PLAN



VM Houses



PROJECT DATA

ARCHITECT: *BIG + JDS*
 YEAR: 2005
 LOCATION: *Copenhagen, Denmark*

NO. OF UNITS: **230**

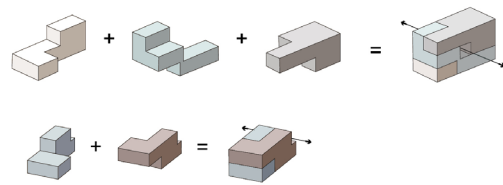
FAR: 3.11
 COVERAGE RATIO: 44.3%

COST: 1719 USD/sqm

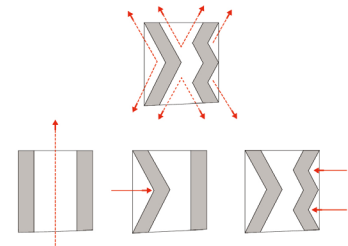
URBAN CONTEXT



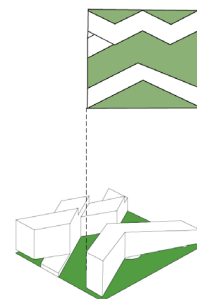
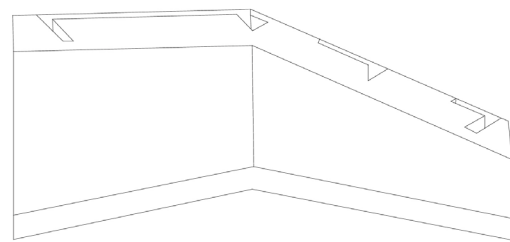
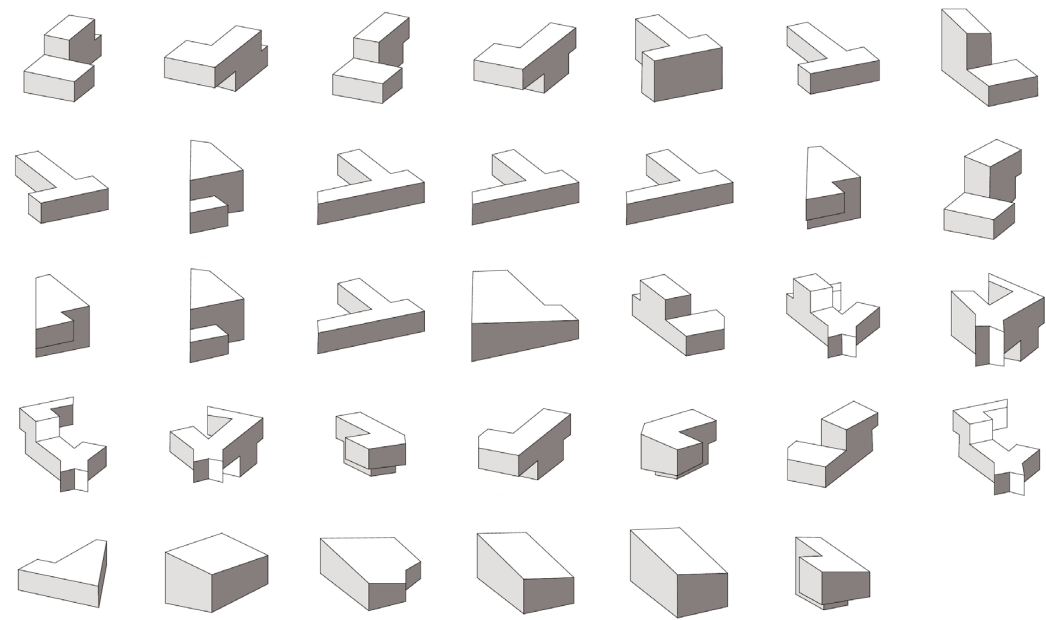
ASSEMBLY



SITE STRATEGY



UNIT TYPES



Macallen Building Condominiums



PROJECT DATA

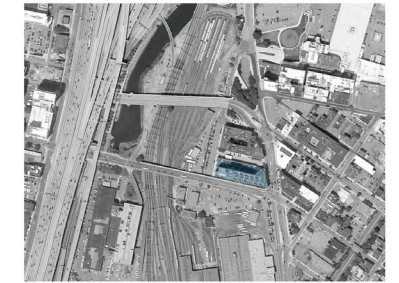
ARCHITECT: *office dA*
 YEAR: 2007
 LOCATION: *Boston, MA*

NO. OF UNITS: **144**

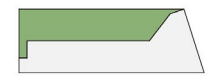
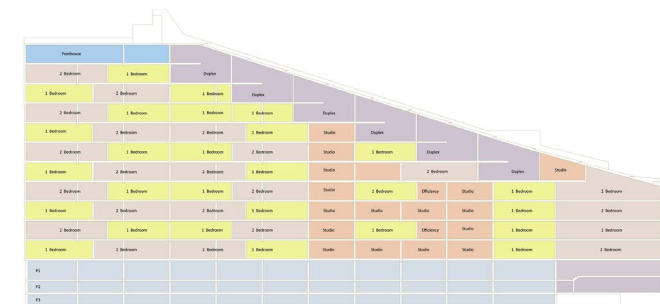
FAR: 7.85
 COVERAGE RATIO: 47.6%

COST: 2153 UDS/ sqm

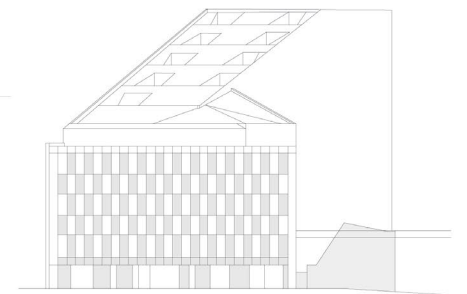
URBAN CONTEXT



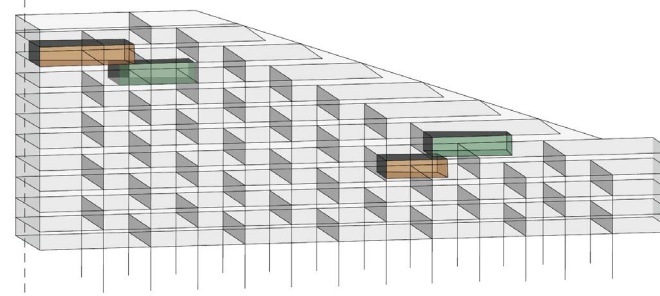
SECTION



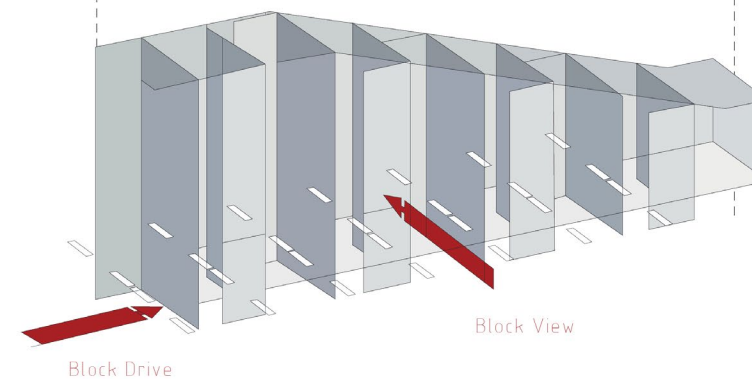
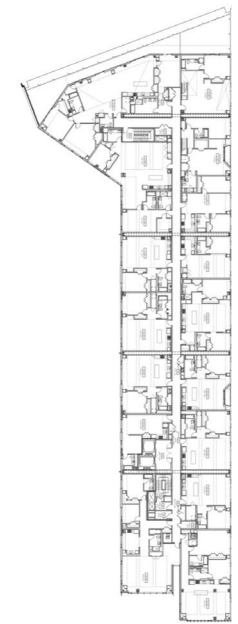
SUSTAINABLE DESIGN



STRUCTURAL STRATEGY



FLOOR PLAN



Block Drive

Block View

2 BACKGROUND

SOUTH BOSTON

As the old peninsula became more and more compact, the city began to develop toward new districts such as South Boston at the end of 19th century.

The city focused on South Boston's port facilities, aiming at the realization of Boston's importance as a port in the US. In 1960s, the "Big Dig" Tunnel under South Boston and Boston Harbor was dedicated in 1995 and connects the Seaport District with Logan Airport.

The most influential development of South Boston is the Seaport Public Realm Plan in 1999. The BRA prepared guidelines for the downtown expansion towards South Boston, to protect and enhance Fort Point Channel, to ensure that mixed use architecture, open space and civic development in the waterfront area.

BOSTON: Form and Urban Development from 1630–2008.
Michael Dennis.

THE DEVELOPMENT HISTORY OF SOUTH BOSTON

South Boston Flats, 1897-1901

focused on Boston's port facilities, aimed at the realization the Boston's importance as a port in the US.

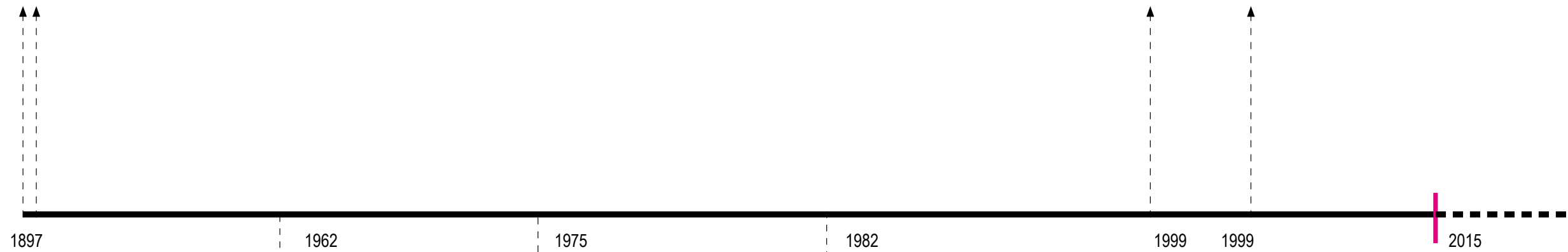
Commonwealth pier: 1897 and 1901.
 Fish Pier: 1910-1913, for use by Boston fishing fleet.
 The largest day dock in the world: 1914-1919



The Seaport Public Realm Plan, 1999-2004

The BRA prepared guidelines for the downtown expansion in the direction of the so called Commonwealth Flats, in South Boston.

ICA, Convention Center



1897

1962

1975

1982

1999

1999

2015

The Waterfront, 1962

The project for the waterfront, designed in 1962 by Sy Minsk, Jack Myer, and Kevin Lynch, was the sister project to the scheme for Government Center.



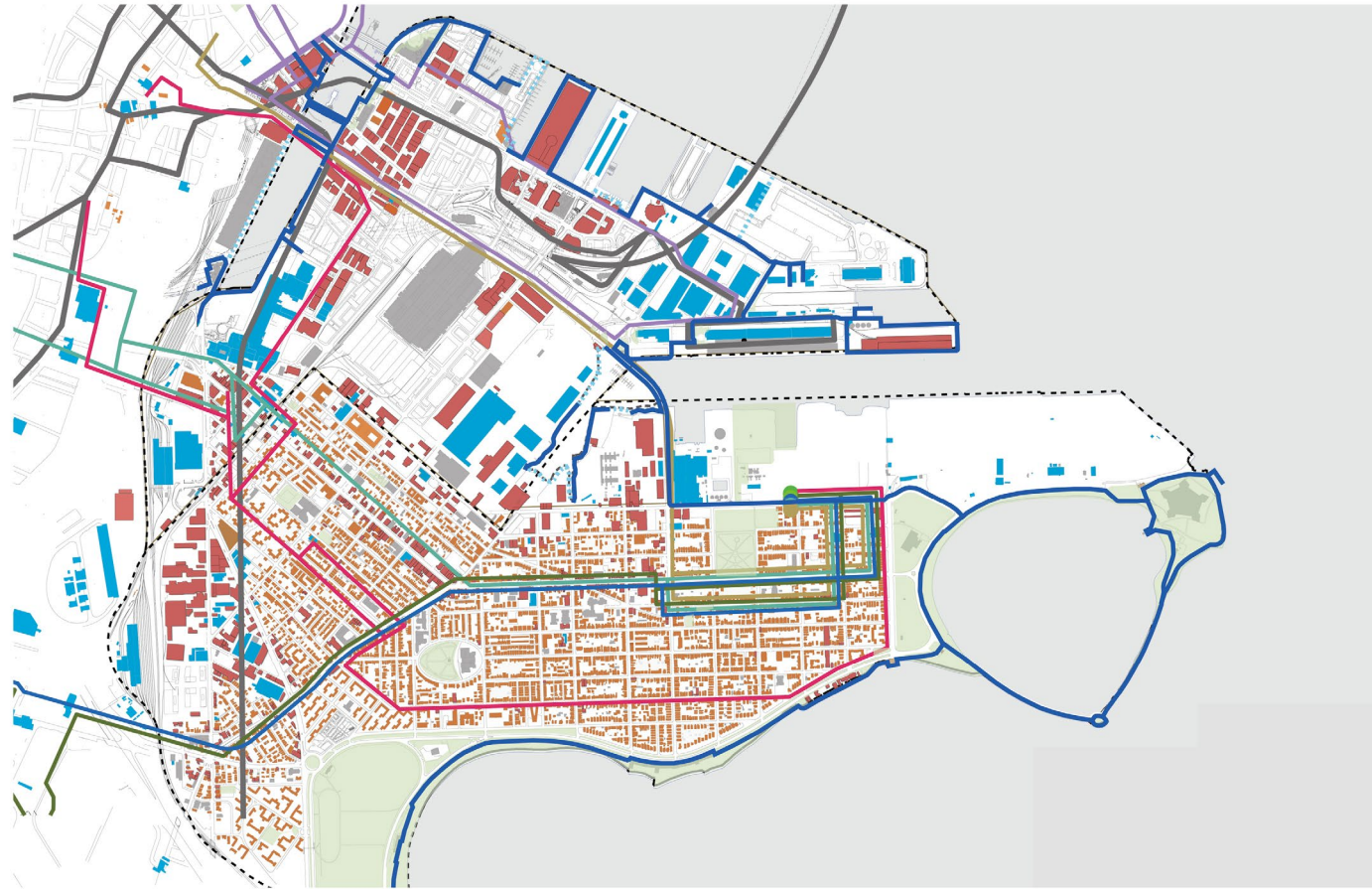
The Revival of Urbanism, 1975

A new sensibility about architecture, urbanism, and planning was beginning to emerge.

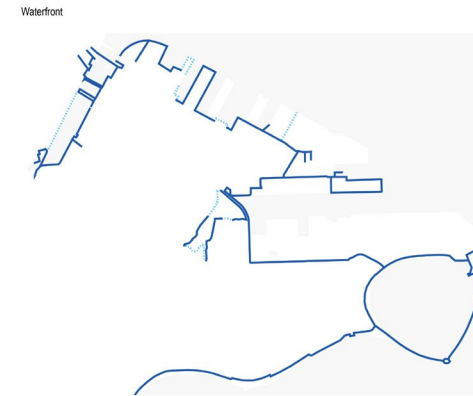


The "The Big Dig" - Tunnel Project, 1982

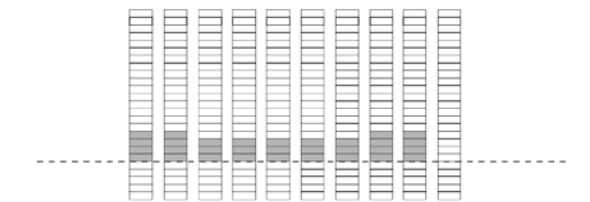
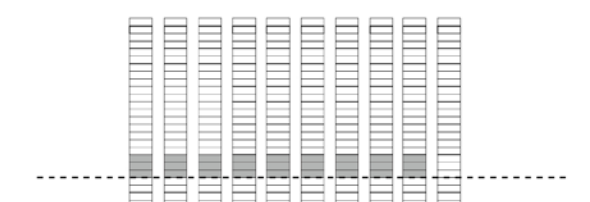
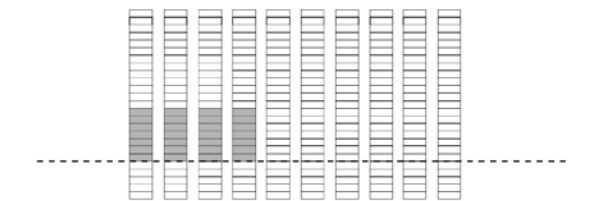
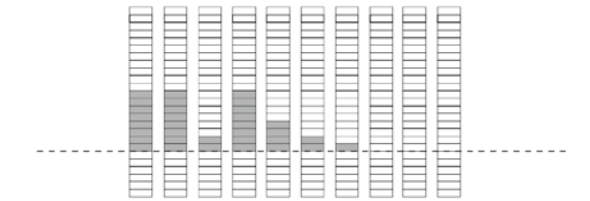
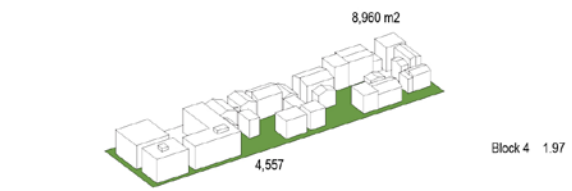
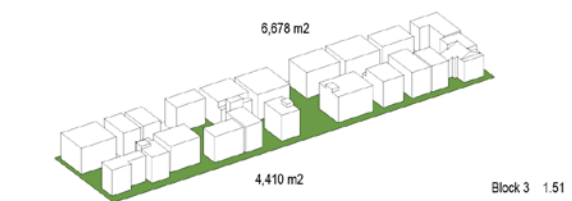
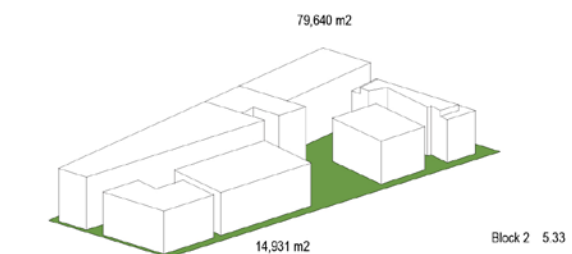
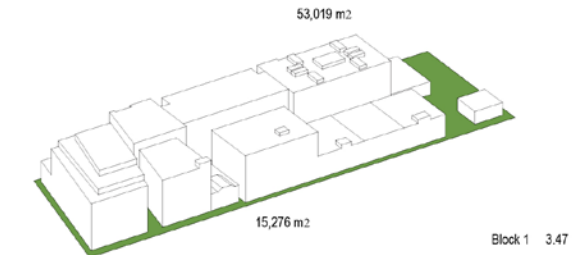
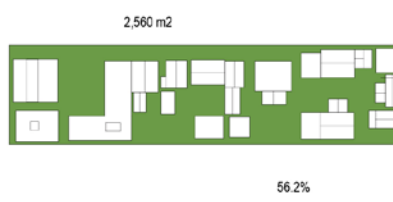
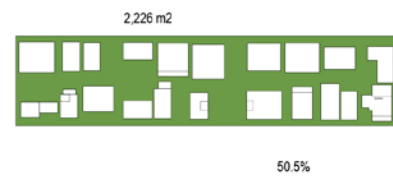
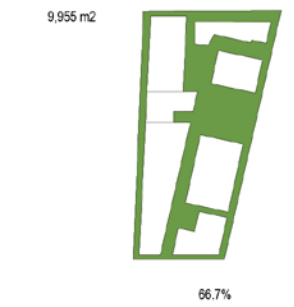
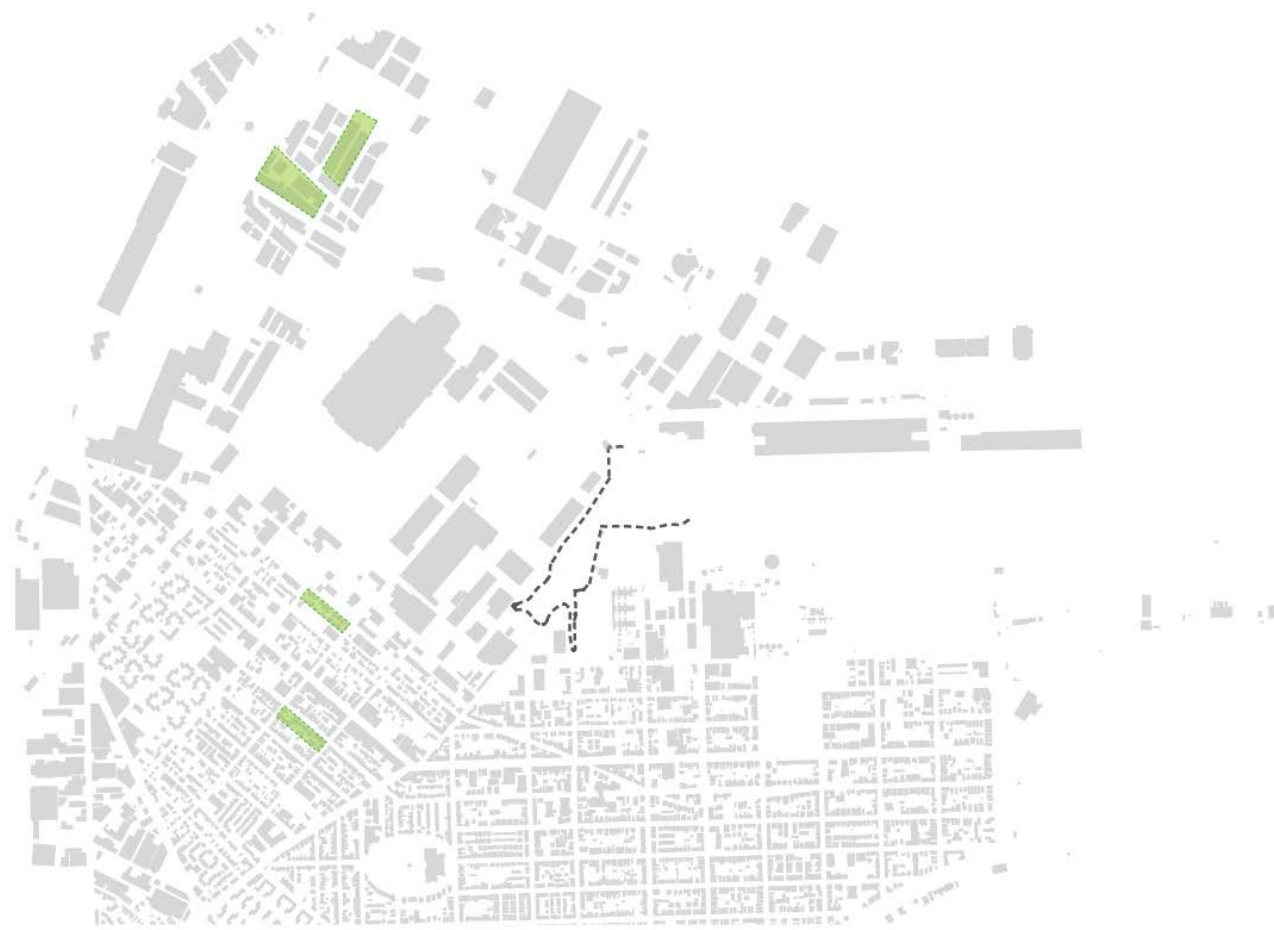
The I-90 Ted Williams Tunnel under South Boston and Boston Harbor was dedicated in 1995 and connects the Seaport District with Logan Airport



Urban Context: South Boston



DENSITY IN THE CONTEXT OF SOUTH BOSTON



THE SEAPORT PUBLIC REALM PLAN

In 1999, the Boston Redevelopment Authority prepared guidelines for the Seaport Public Realm Plan to revitalize the South Boston area. However, data published by Social Explorer show that from 2009 to 2013, income households experienced financial obstacles in South Boston. The households in the Innovation District indicates barely increase in the annual income. Even worse, the annual income of the households in the

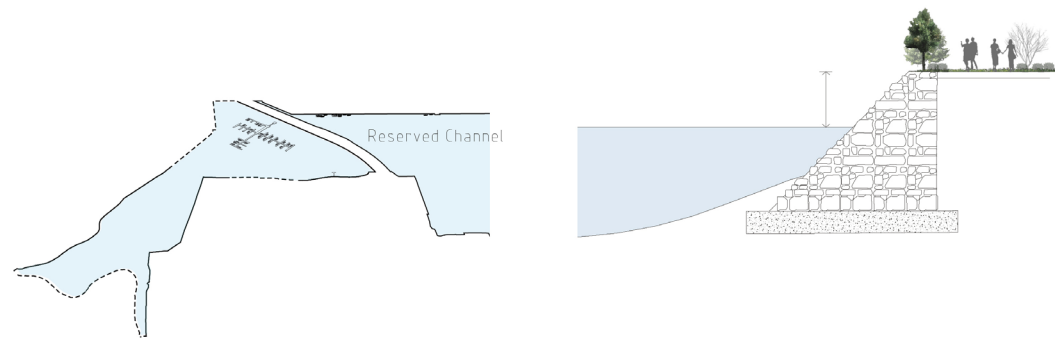
Saint Vincent Neighborhood showed a severe decline from \$85,000 in 2009 to \$71,000 in 2013. In fact, residents are not benefitting from the harbor revitalization and the South Boston urban renewal plan has not been effectively active.

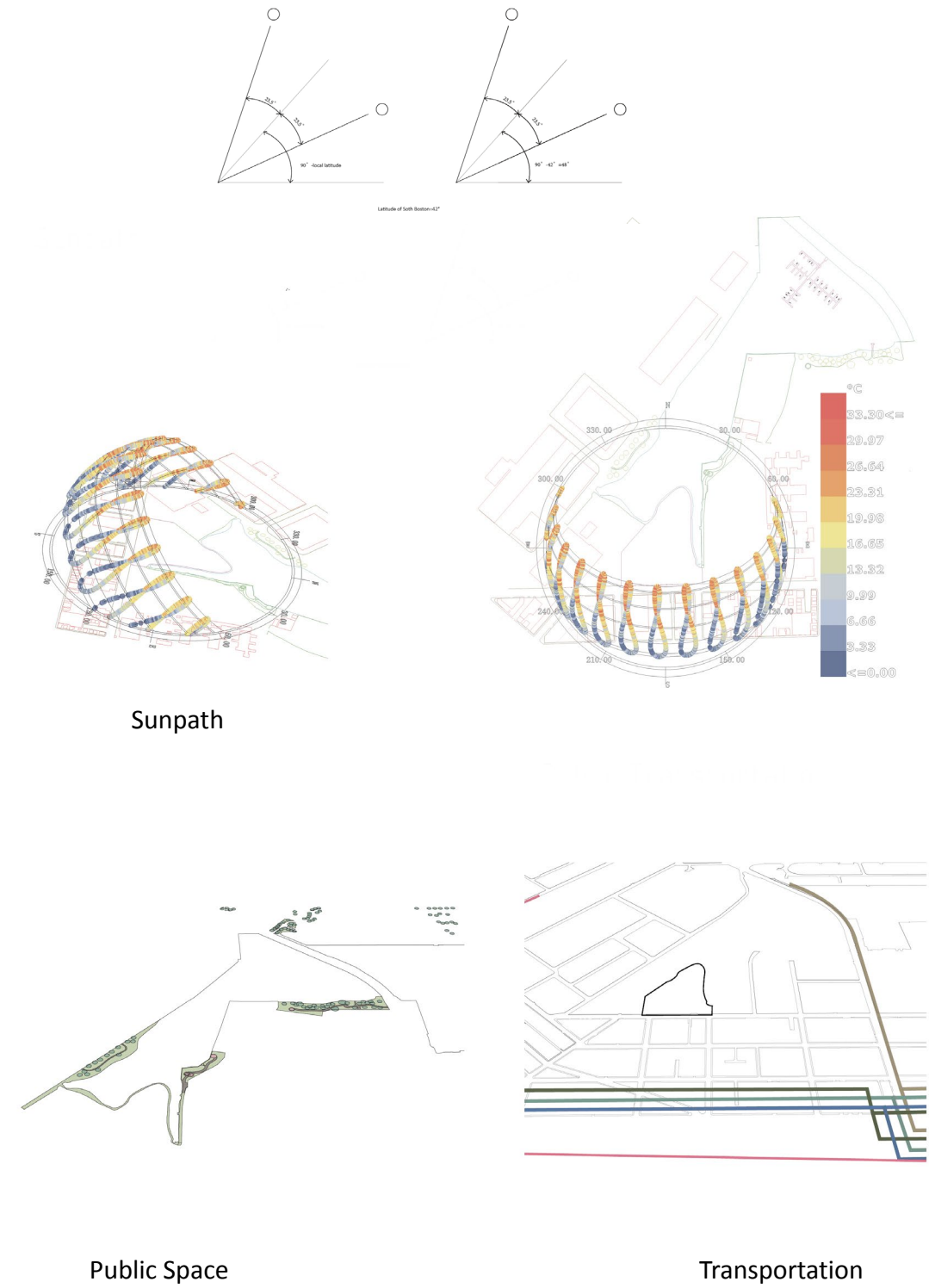
Income	Medium Income/ household (Unit: USD/ Year)		
South Boston	Community 1	Community 2	Community 3
2014	62974		
2013	95000	71000	21000
2012	90000	69000	19000
2011	90000	67000	17000
2010	90000	66000	17000
2009	85000	85000	17000

	Downtown	Cambridge	East Boston
2014	77000	84000	77000

SITE

The thesis will be played out on a site in South Boston, in waterfront land facing the Reserved Channel, currently occupied by a private factory. It is adjacent to one of Boston's fastest growing development zones, the Innovation District. It is bounded to the south by a low-income neighborhood called Saint Vincent and to the north by undeveloped industrial land.





3 URBAN STRATEGY

TRANSFORMATION

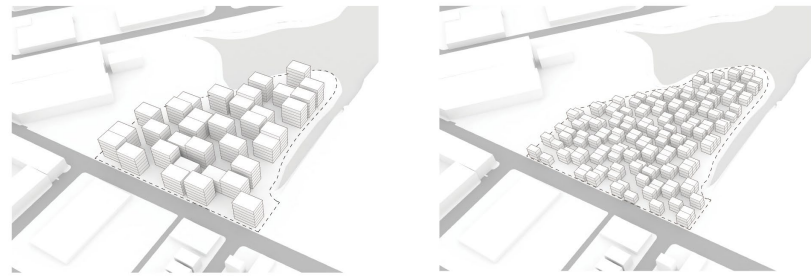
Urban system is a city's anatomy of major public spaces and buildings. Different urban fabric, their gestures and their interaction are the most importance in the making of the public realm of the city. On the other hand, the density has been measured since it represents precisely the people and the compactness of a region.

Boston is a public city which is formed over time, reflecting the condition of

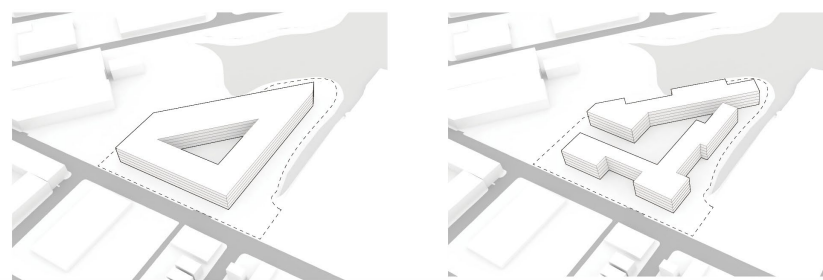
society as well as the situation of the city itself. The urban strategy experiments with various urban systems and the density through different parameters, aiming to keep sizable parcels, to increase building density on a limited plot area, as well as keep the quality of living condition.

URBAN SYSTEMS

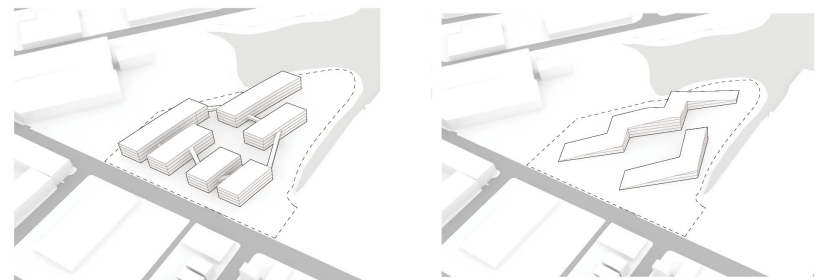
Grid



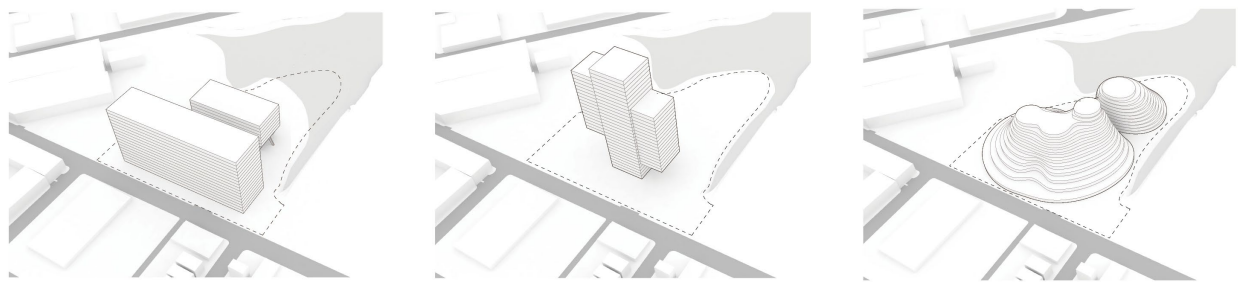
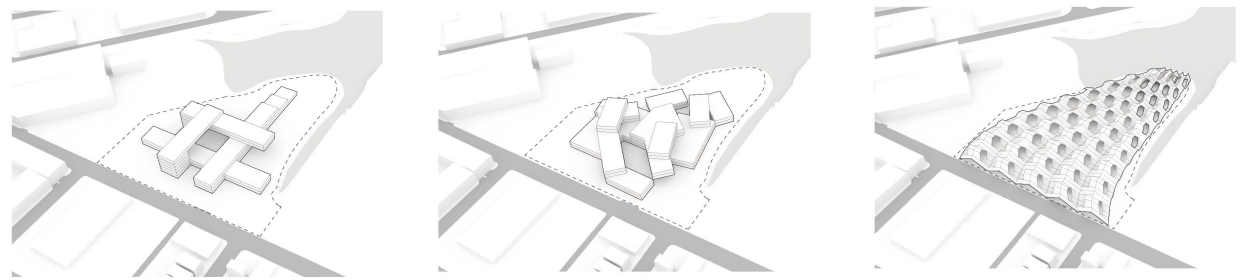
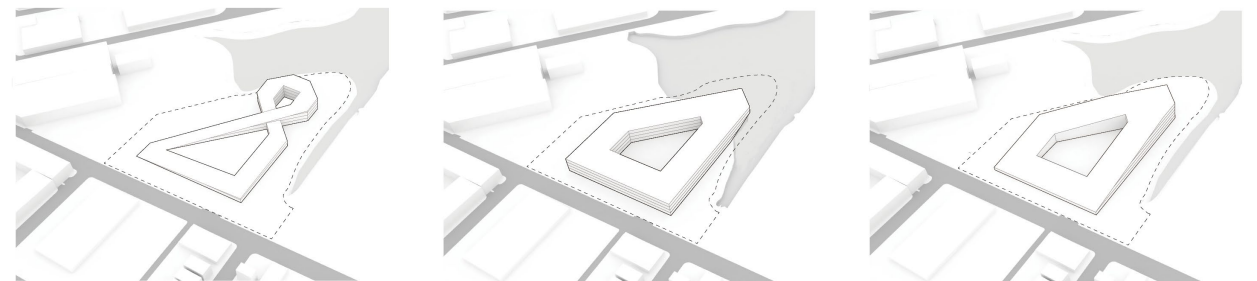
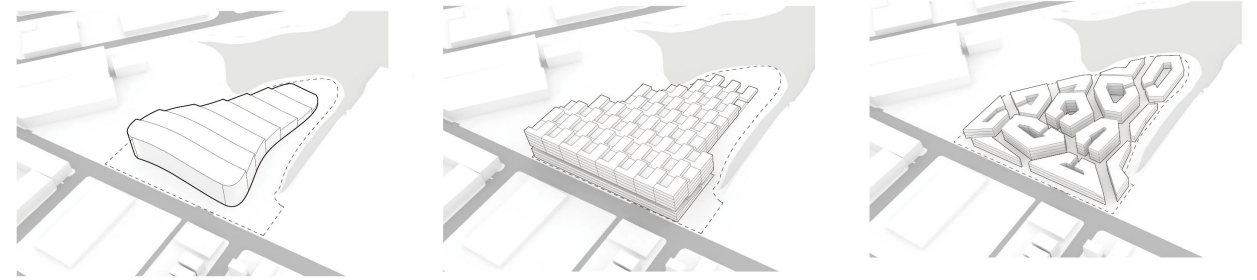
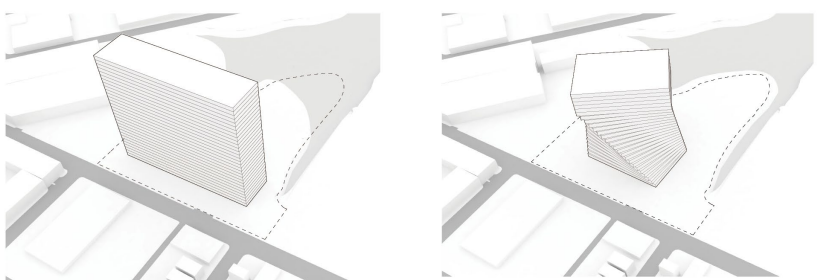
Perpheral



Linear



Super Blocks

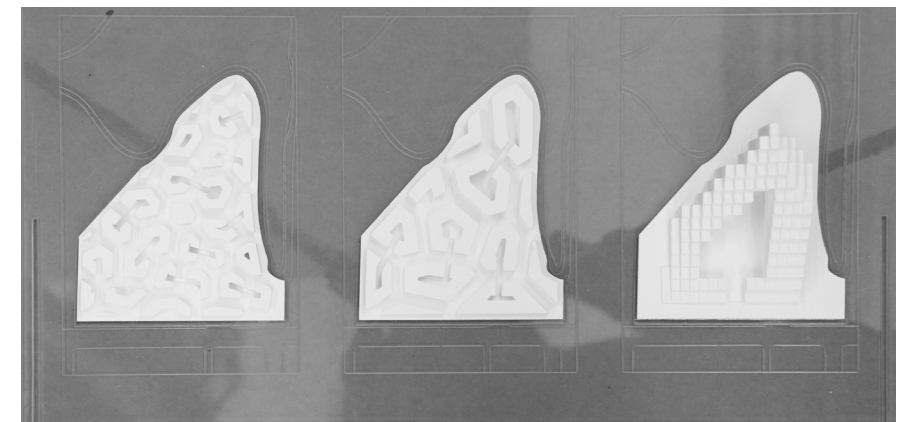
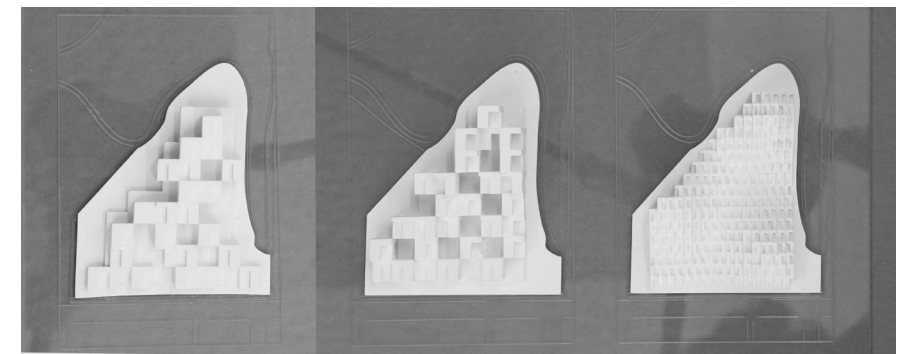
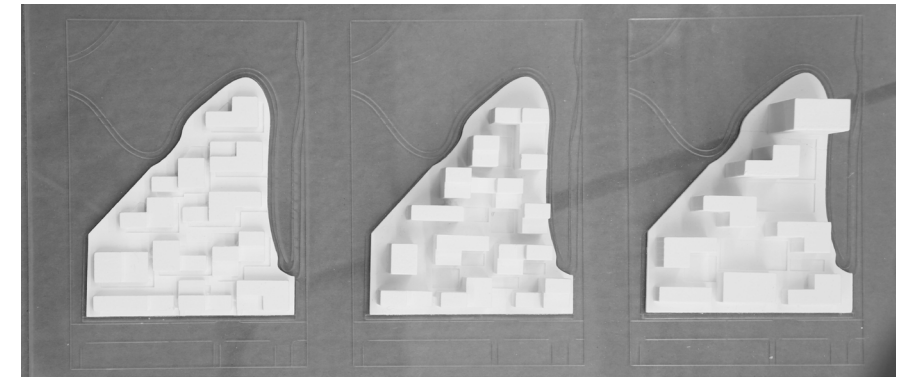
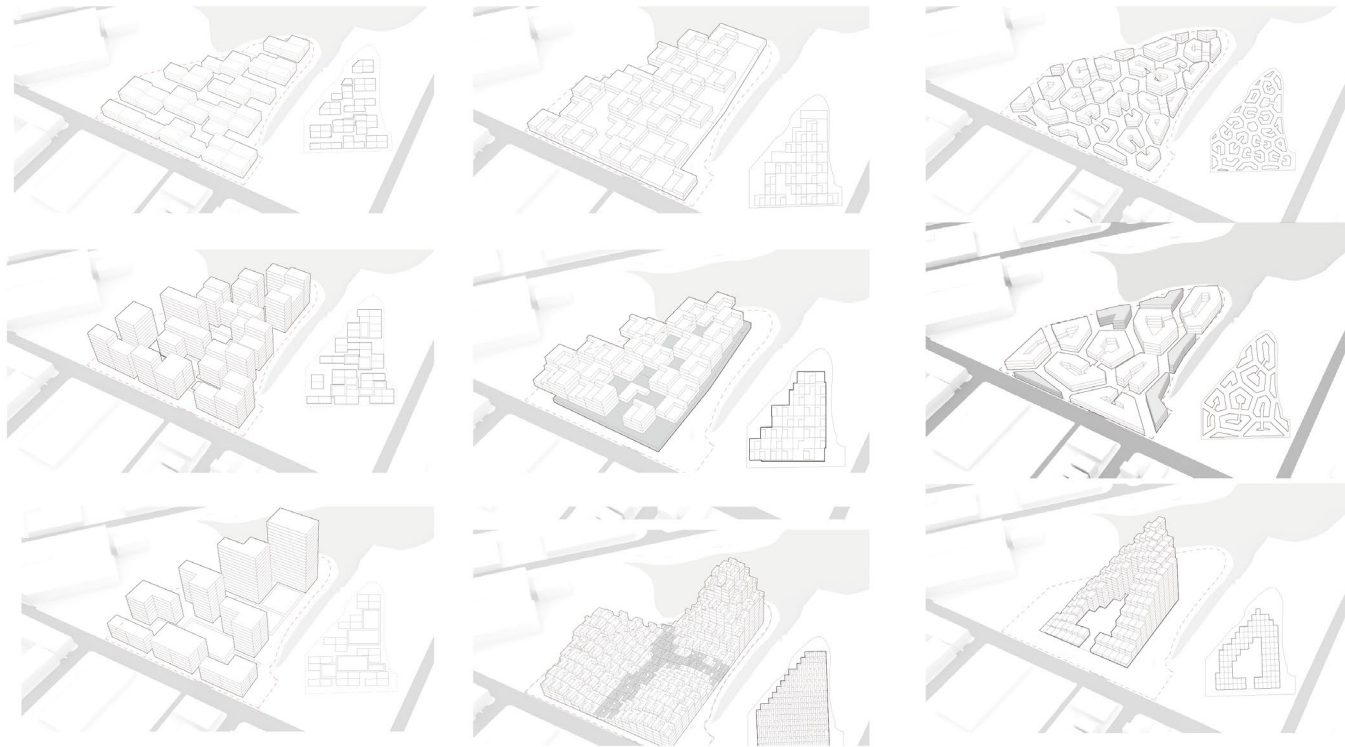


PARAMETERS

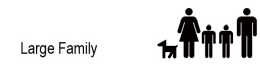
Coverage Ratio 35%

45%

85%



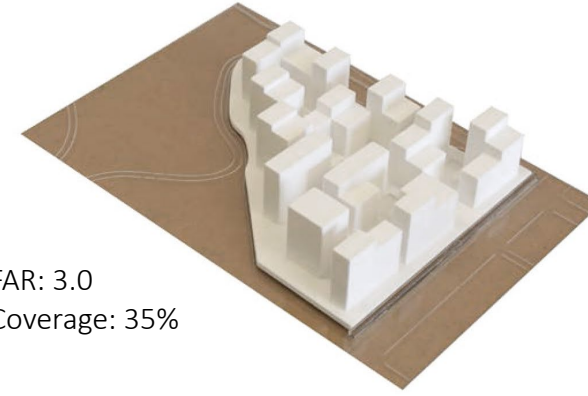
F.A.R. 1.5
Single Family House



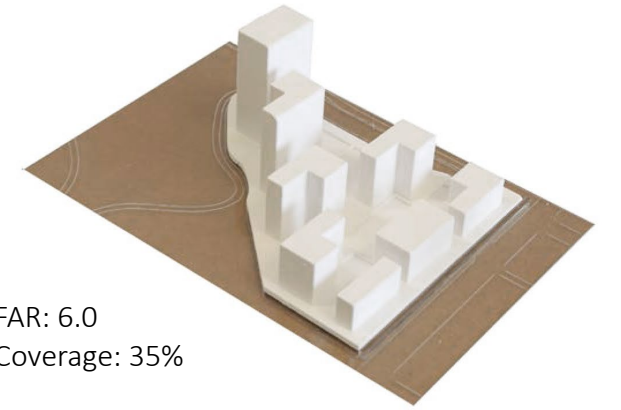
FAR: 1.5
Coverage: 35%



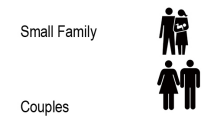
FAR: 3.0
Coverage: 35%



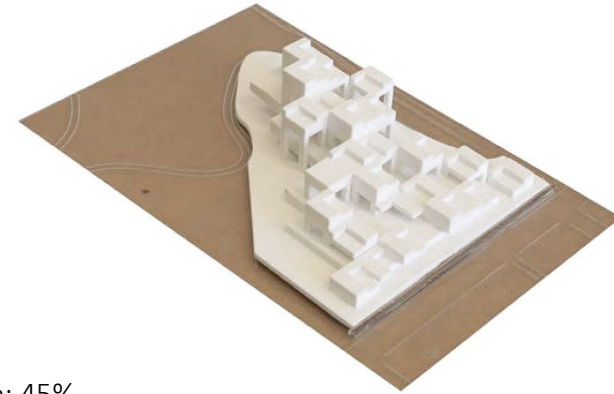
FAR: 6.0
Coverage: 35%



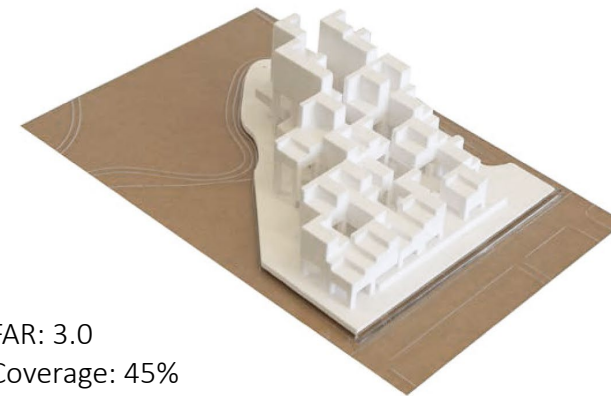
F.A.R. 3.0
Multi-Family Houses



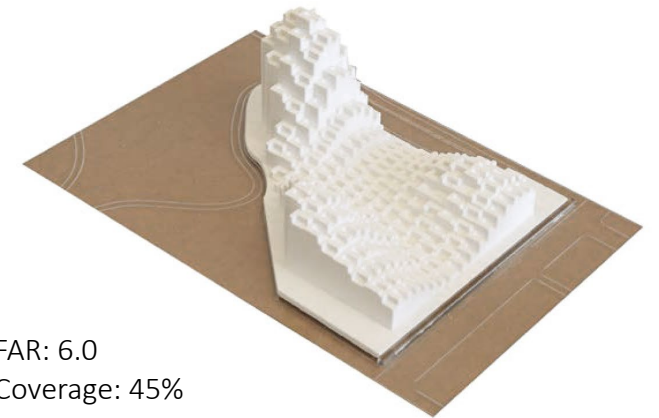
FAR: 1.5
Coverage: 45%



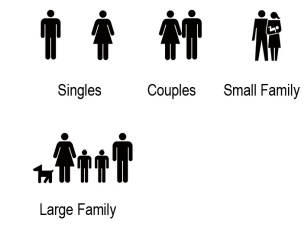
FAR: 3.0
Coverage: 45%



FAR: 6.0
Coverage: 45%



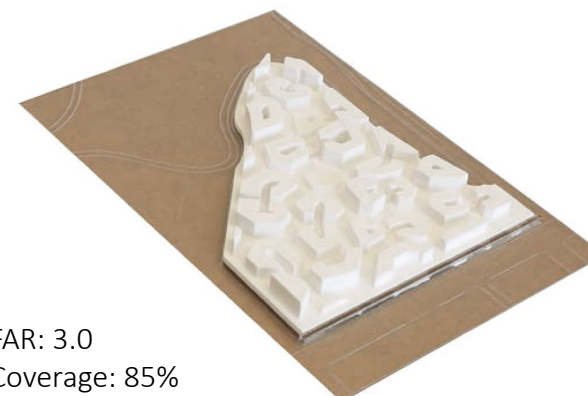
F.A.R. 6.0
High Rise Apartments



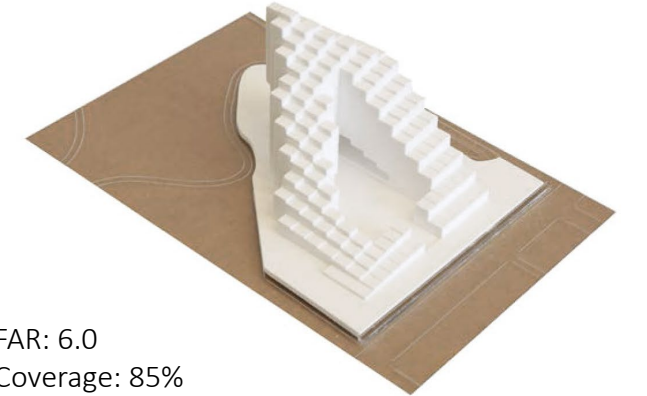
FAR: 1.5
Coverage: 85%



FAR: 3.0
Coverage: 85%



FAR: 6.0
Coverage: 85%

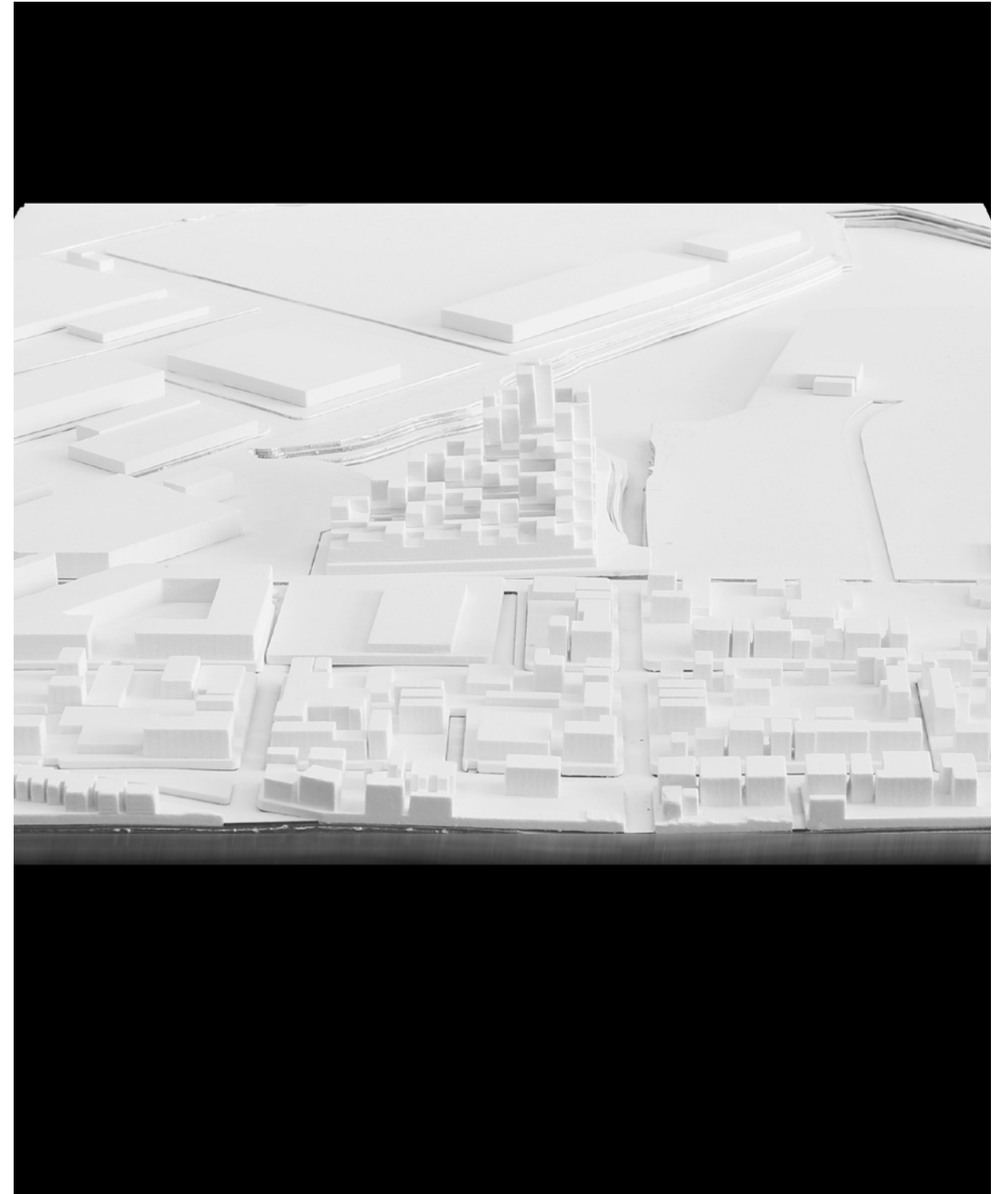
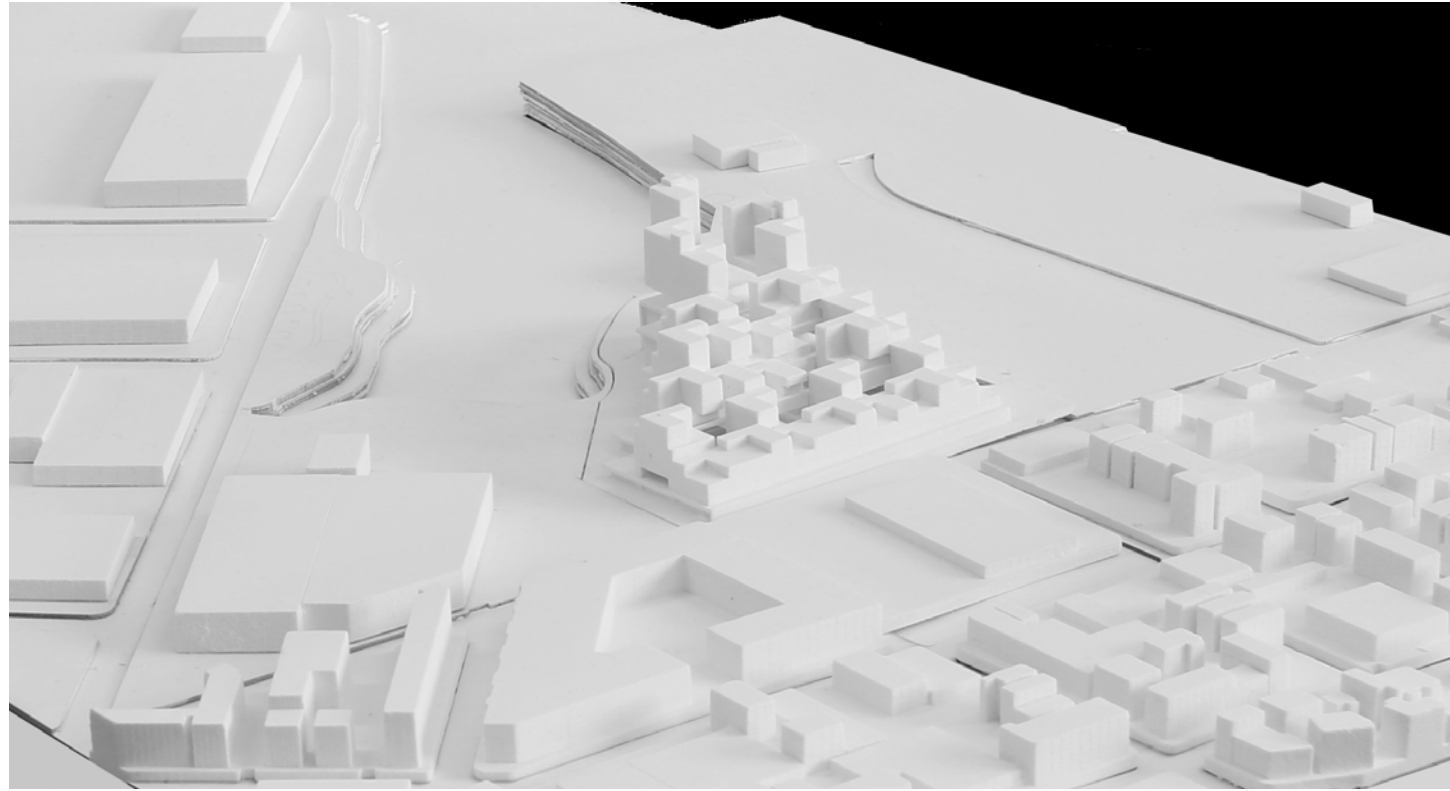


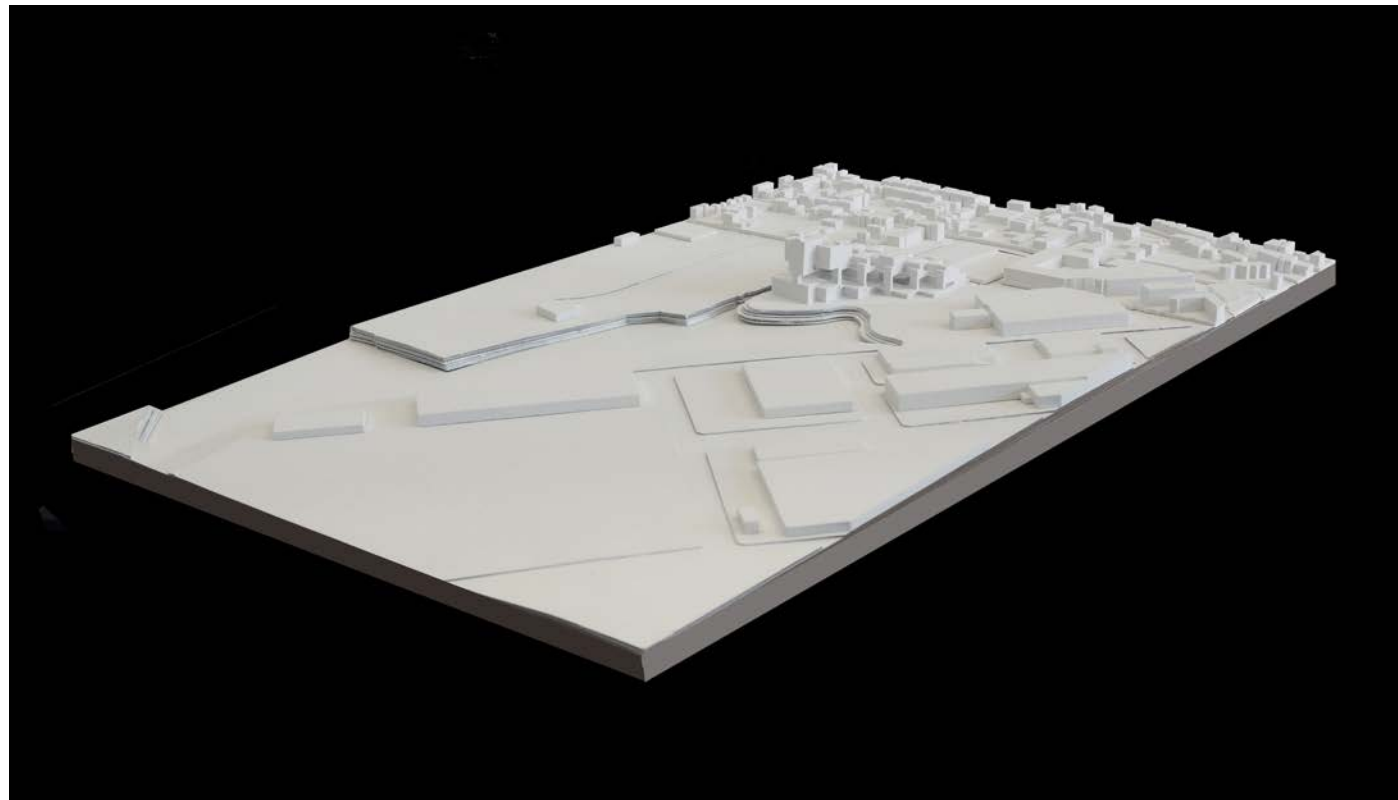


Site Plan 1:3000



1:1000 Master Plan Physical Model





4 ARCHITECTURAL PROPOSAL

DESIGN PROPOSAL

Cheap travel and cheap land supported the ideal of suburban life, and helped middle class launch an exodus from the city. The influx of many immigrants made the urban area crowded and collapse. An urban apartment is highly efficient means to provide living containers for urban dwellers; however, it sacrifices high living quality to enjoy sunlight, fresh air, the view, and private garden to every housing unit. A suburban single family house symbolizes a success of personal life; however, it compromises urban public space and usually is exclusive to social activities in a shared economic era.

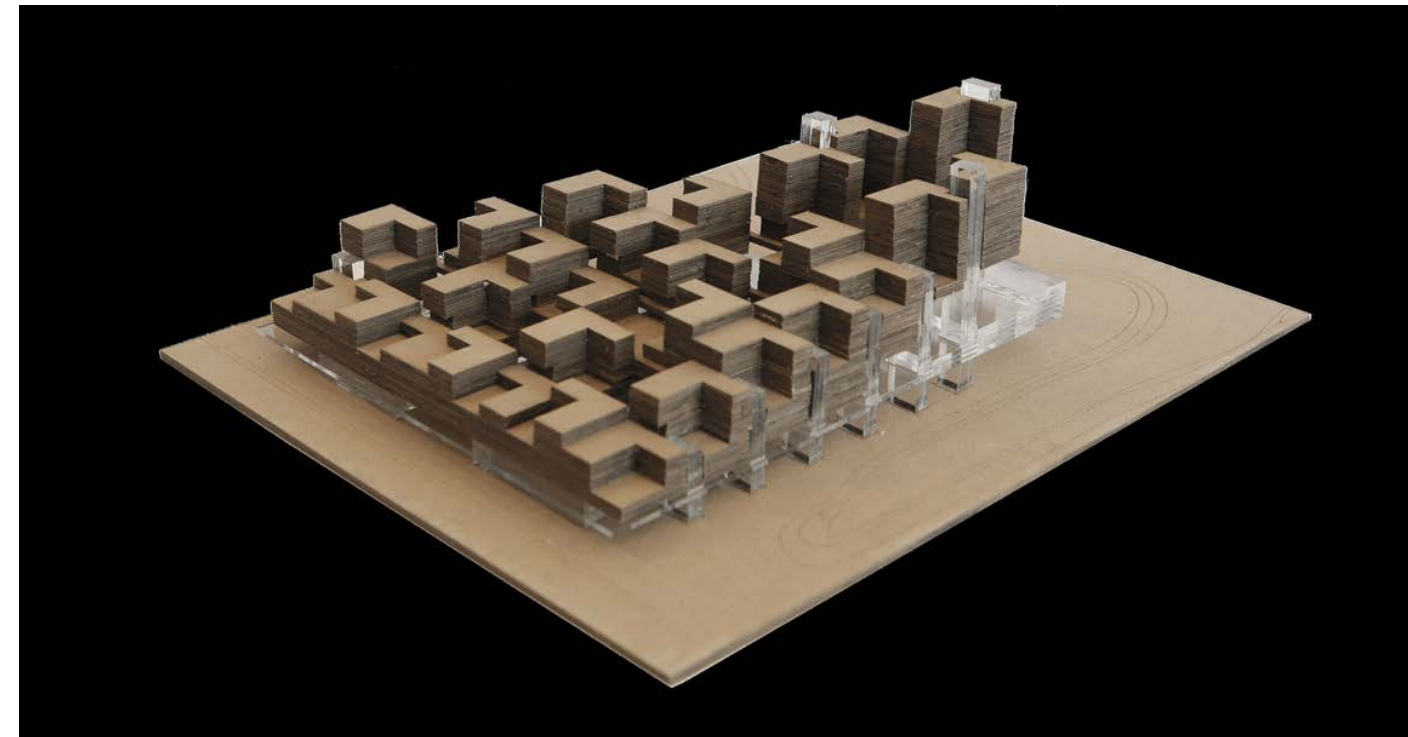
The new architectural proposal introduces a three-dimensional, micro-urban living hybrid in which houses, amenities, public services and open space are merged together for middle class to remain in the city.

Ground level: to complete the waterfront functions of Boston and create urban parks along the boundary of the site. Ground level is welcomed to all people, including residents and visitors. It is porous from every side towards the waterfront. The large site is

broken into small scales, including small retail space, plaza, green space and waterscape.

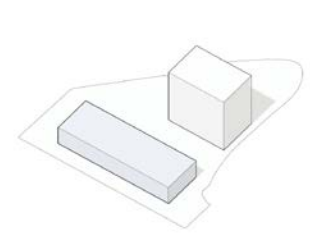
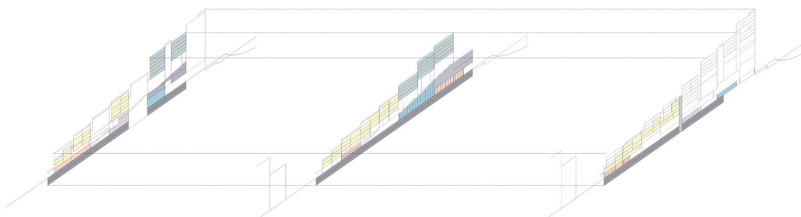
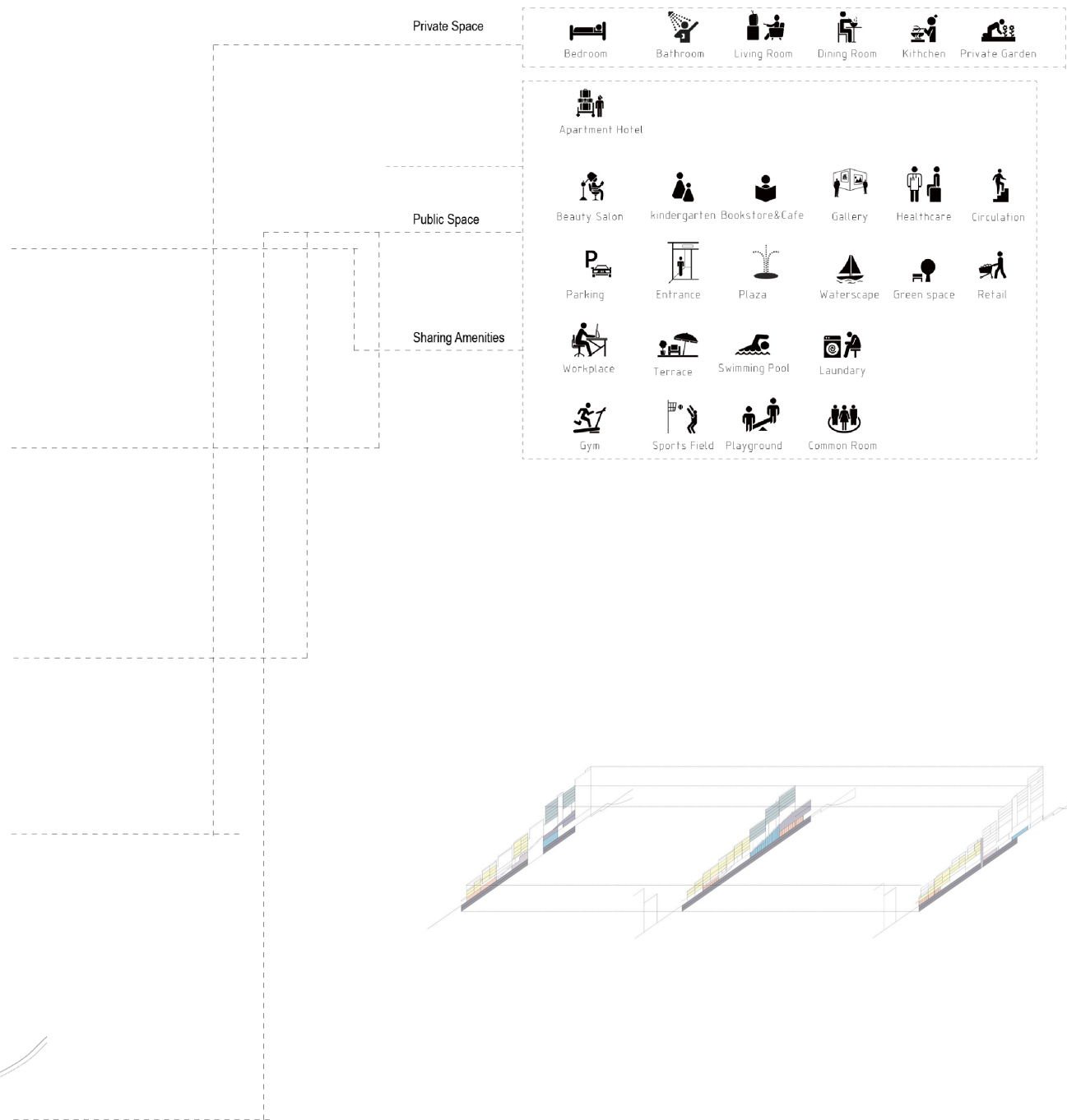
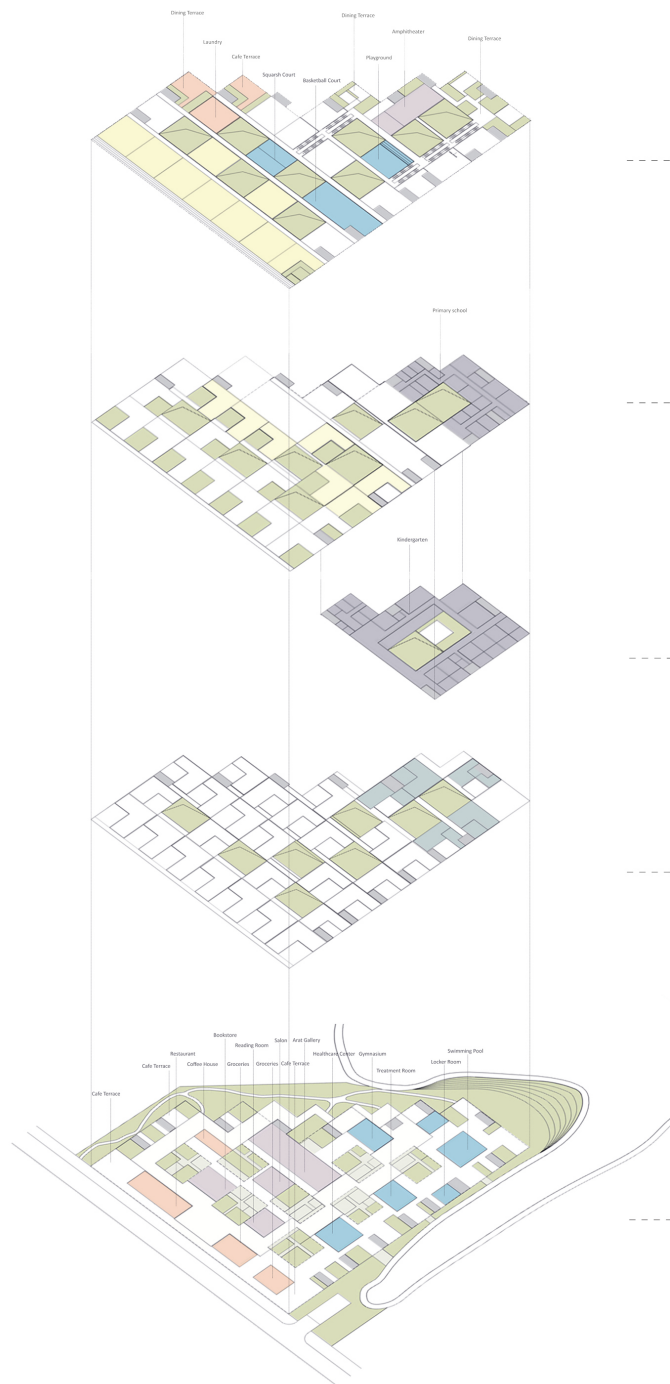
Middle level: to live independently as well as sharing collective activities; to provide affordable education for the middle class to remain in the city; to provide multi-functional shared amenities for both permanent and temporary residents.

Housing level: the elevator brings residents to another scenario of lifestyle on higher levels. The upper level provides multi-family houses for both urban settlers and apartments for immigrants. Meanwhile, suburban axioms are provided that each family will have private garden, sunlight, air and each individual will express their freedom to identify one's residence as opposed to accepting standard housing units and routine hallways. The L-shape plan will let all the bedrooms in every apartment have access to light and fresh air. And some of the units may also have their own private roof gardens.

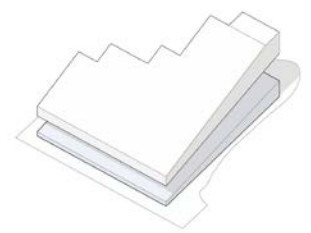


1:400 Final Physical Model

3-Dimensional, Micro-Urban Living Hybrid



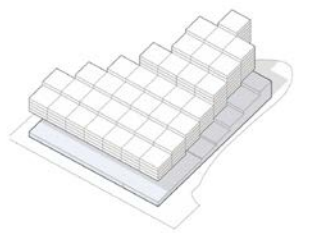
Transform conventional program zoning.



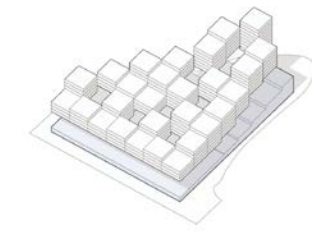
Create a new, three-dimensional living hybrid.



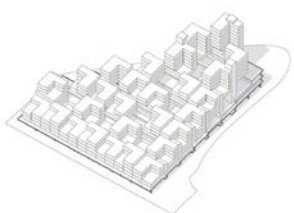
Keep sizable parcels by 15m x 15m.



Increase building density on a limited plot area.

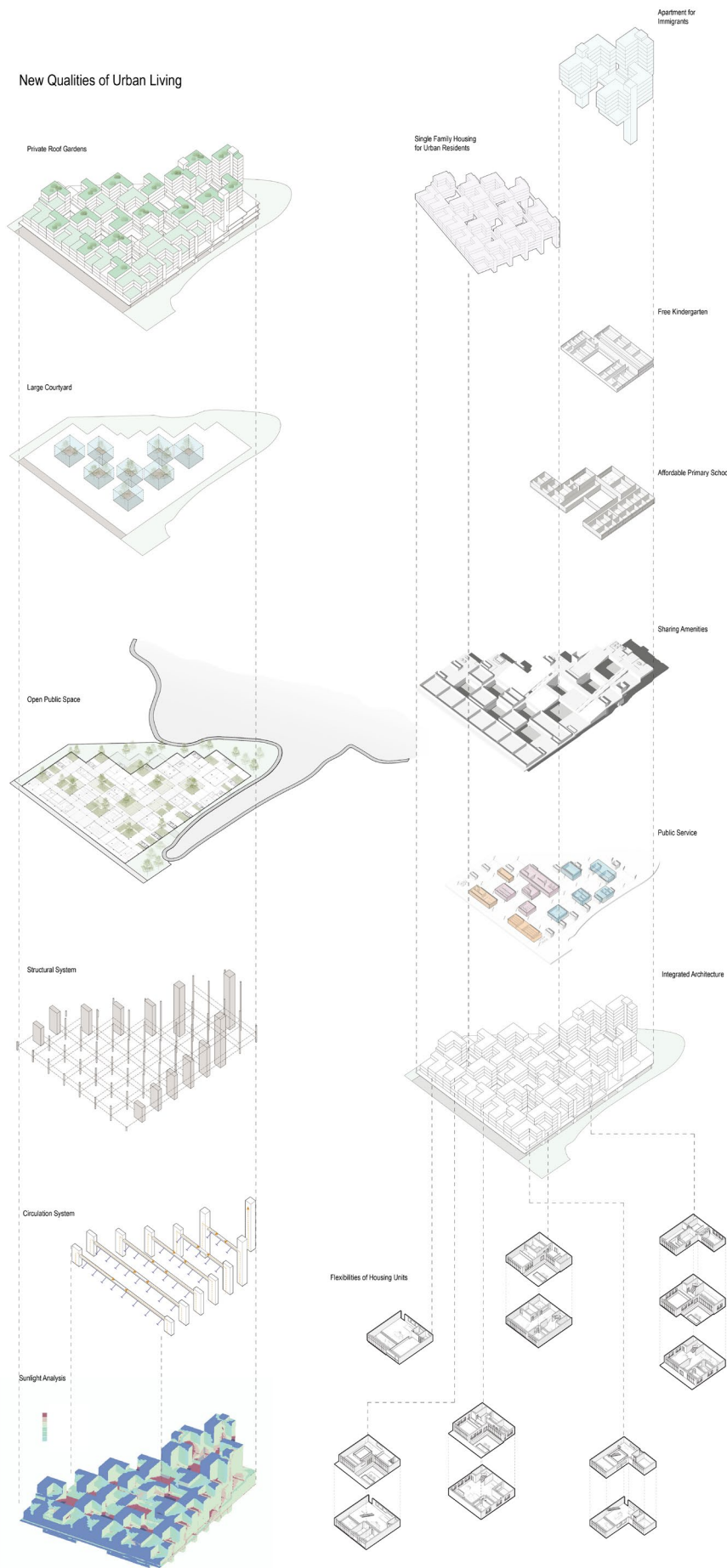


Improve the quality of living.



Enjoy sunlight, fresh air, the view, and private garden to every housing unit.

New Qualities of Urban Living



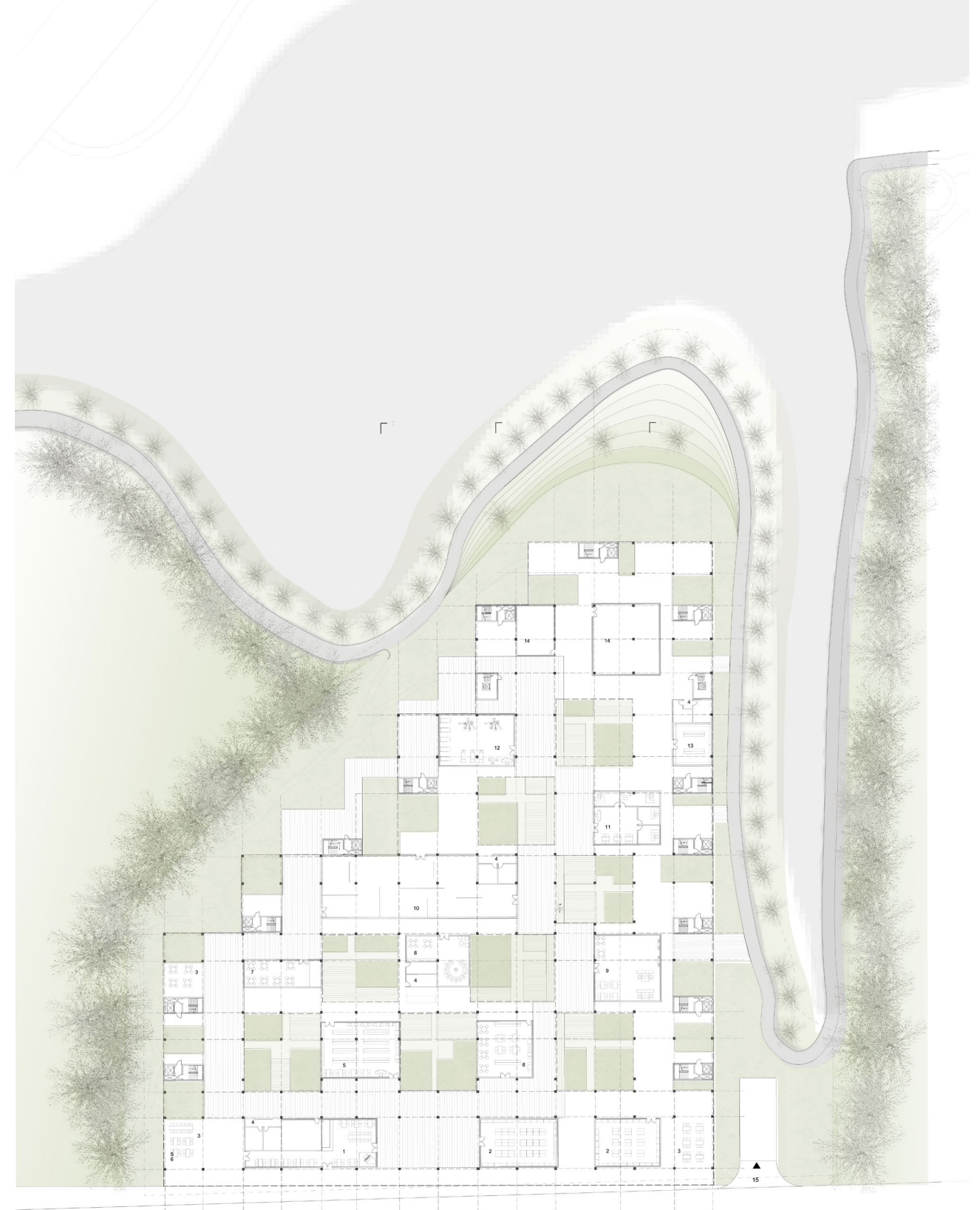
Axon: the Complexity of Urban Housing



Public Access to the Ground Level



Completion of the Waterfront Function



Ground Level Plan 1:200
(Open Public Space and Public Service)

- 1 Dining
- 2 Offices
- 3 Cafe
- 4 Restroom
- 5 Bookstore
- 6 Reading Space
- 7 Coffee & Bakery
- 8 Beauty Salon
- 9 Healthcare Center
- 10 Art Gallery
- 11 Training Room
- 12 Gymnasium
- 13 Locker Room
- 14 Swimming Pool
- 15 Parking Entrance



1:400 Final Physical Model



Level 2 Plan 1:200



Level 4 Plan 1:200
(Houses for Urban Residents)



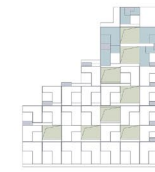
Level 4 Plan 1:200



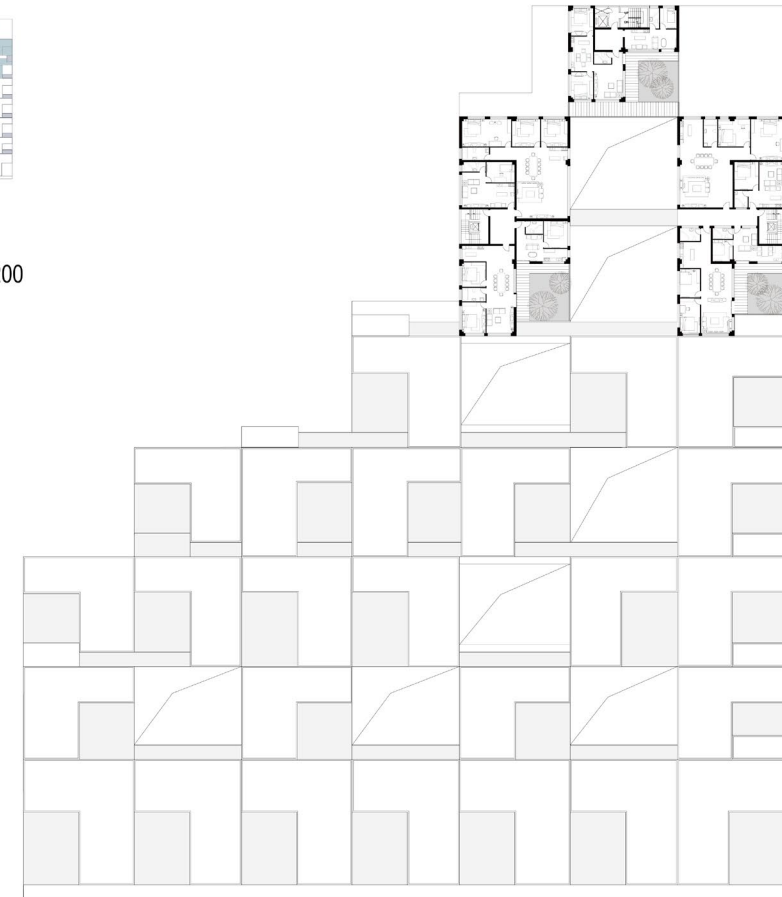
Each family unit will have their own private roof garden.



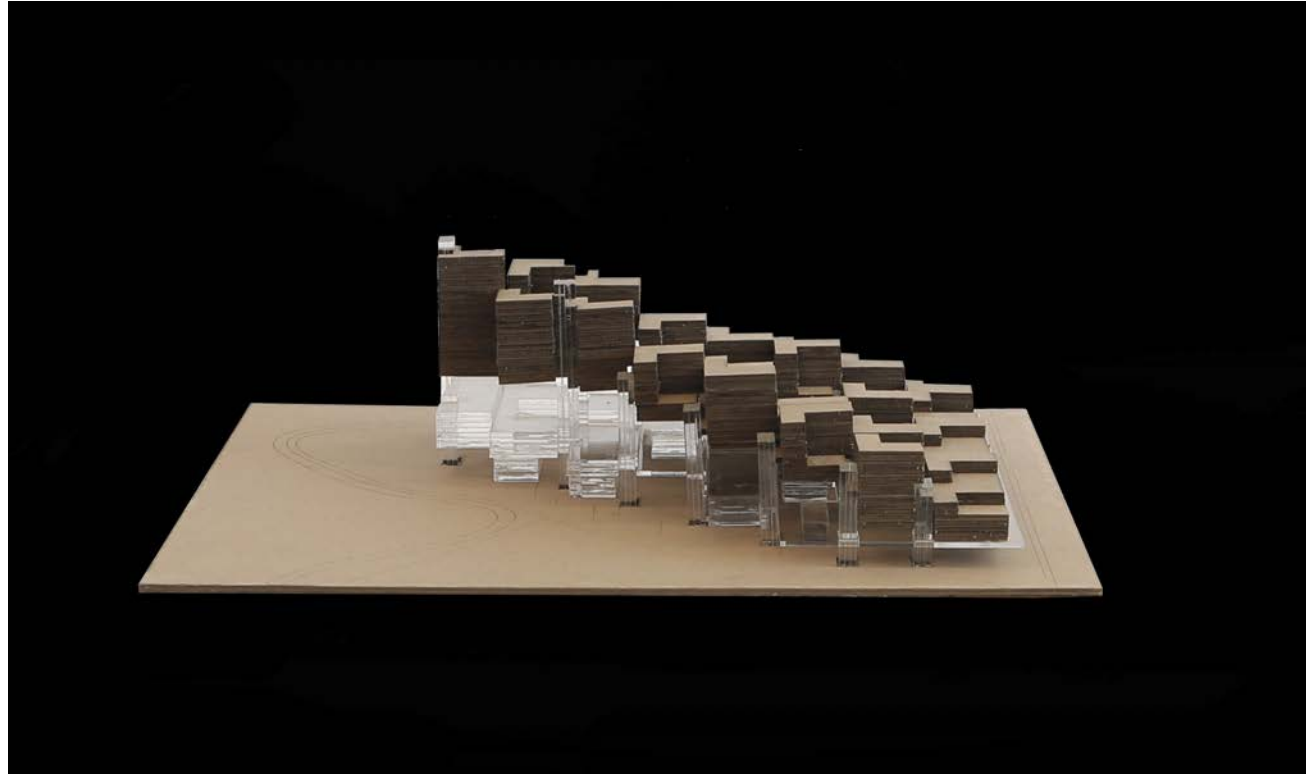
The L-shape plan will let all the bedrooms in every apartment have access to light and fresh air, and roof roof gardens.



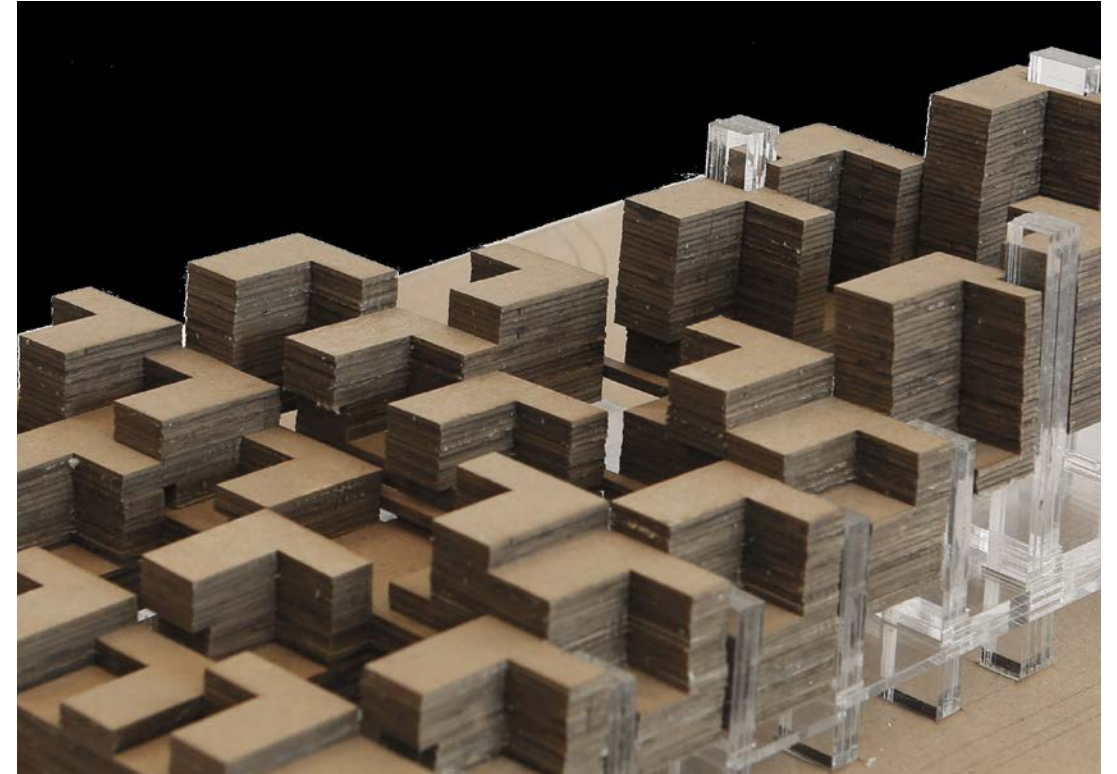
Level 9 Plan 1:200
(Apartment for Immigrants)



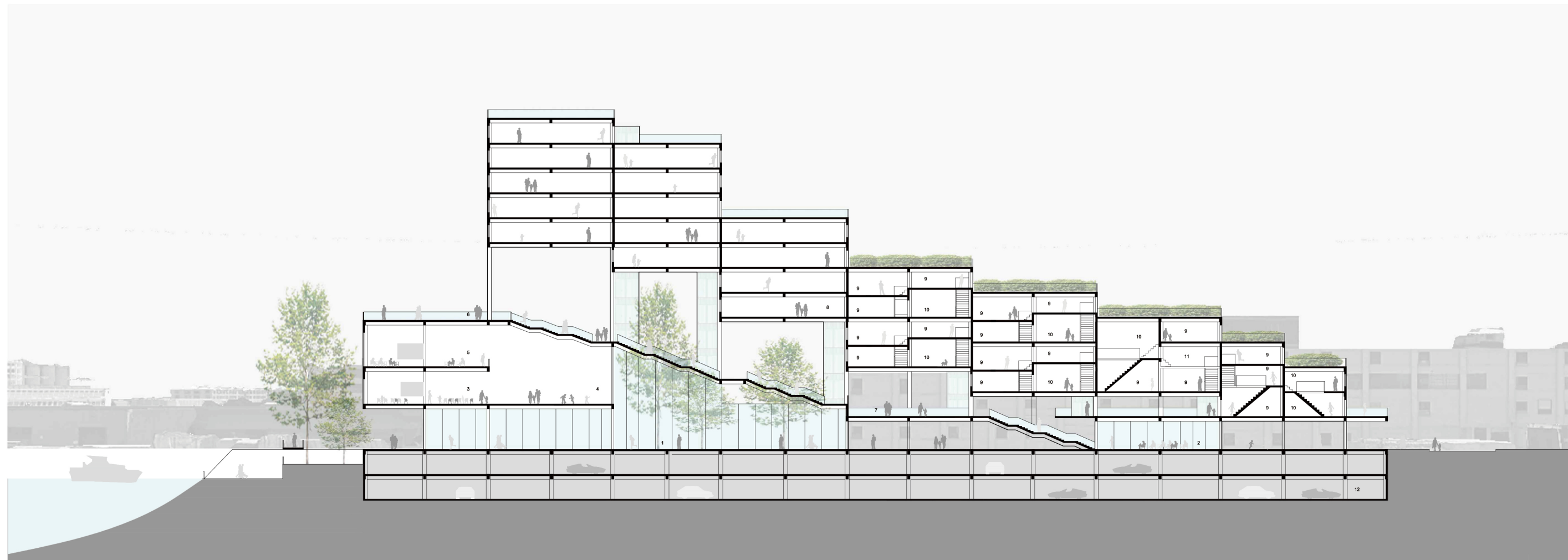
Level 9 Plan 1:200
(Apartment for Immigrants)



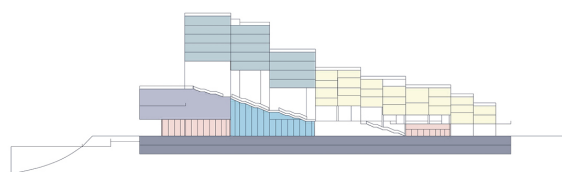
1:400 Final Physical Model

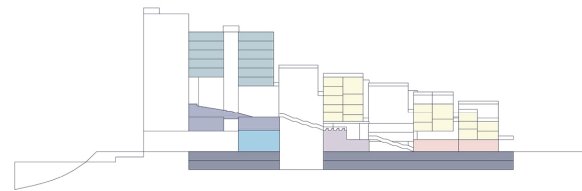
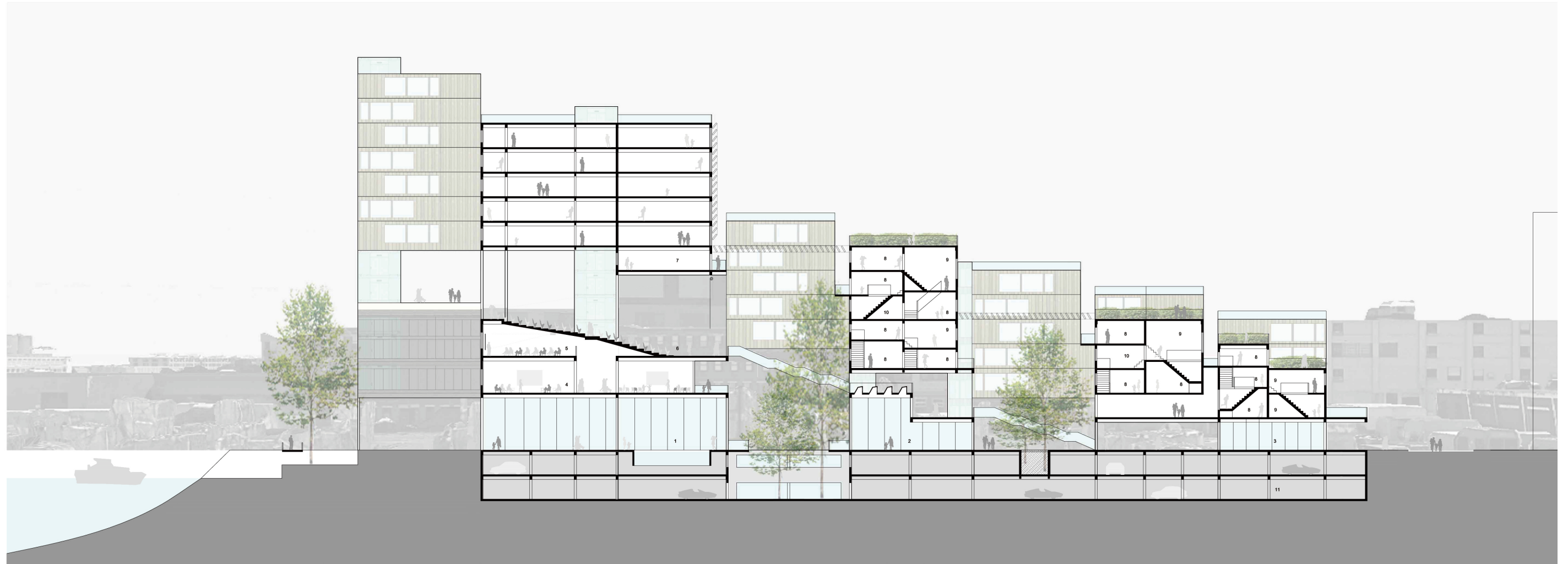


1:400 Final Physical Model

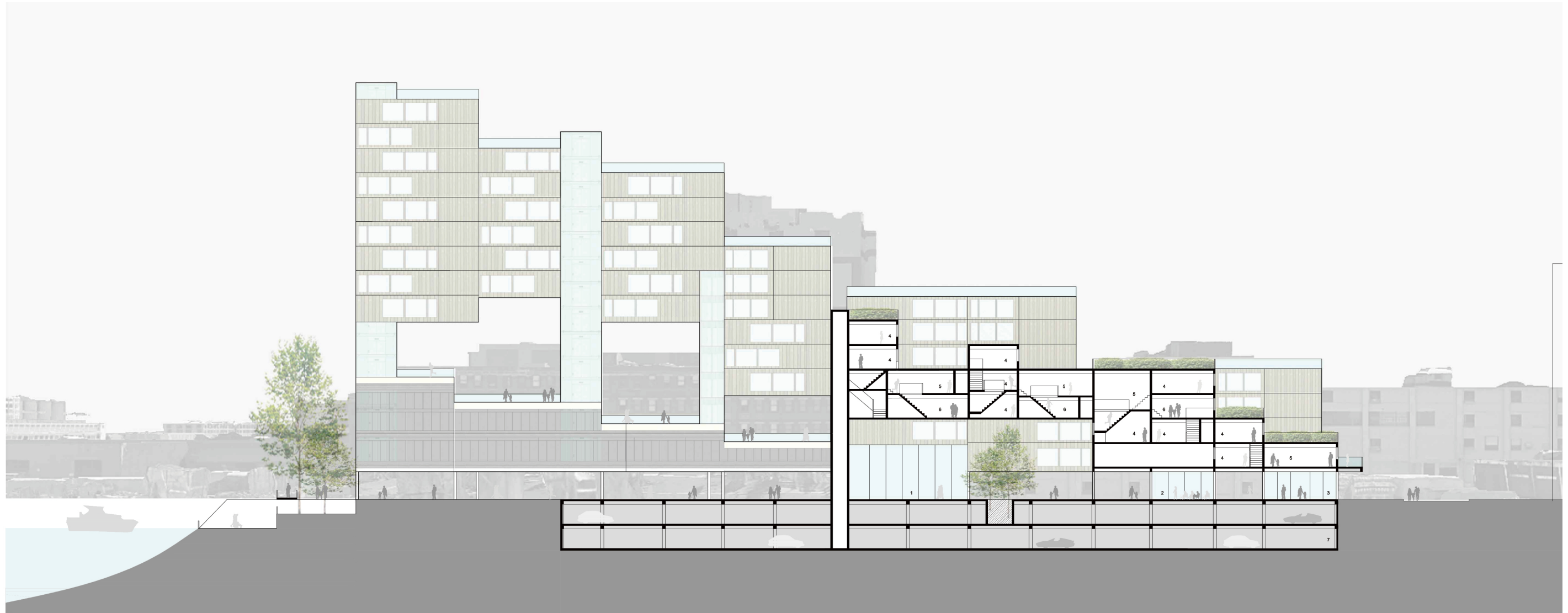


Section A - A 1:200

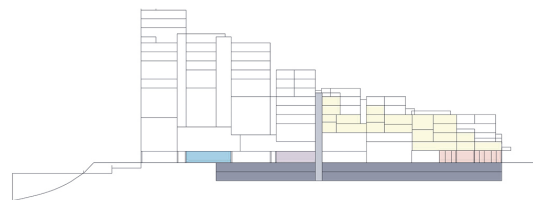












Section B - B 1:200



Section C - C 1:200



- | | | | |
|---|--------------------|----------|----------------------------------|
|  | Residential | 1 | Art Gallery |
|  | Education | 2 | Bookstore |
|  | Cultural | 3 | Dining |
|  | Health | 4 | Bedroom |
|  | Commercial | 5 | Living Room |
|  | Terrace | 6 | Kitchen & Dining Room |
|  | Landscape | 7 | Parking |
|  | Entrance & Parking | | |
|  | Core | | |

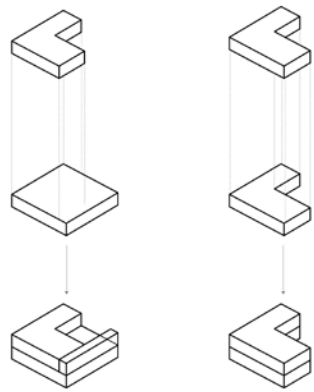
Apartment Plan 1:100

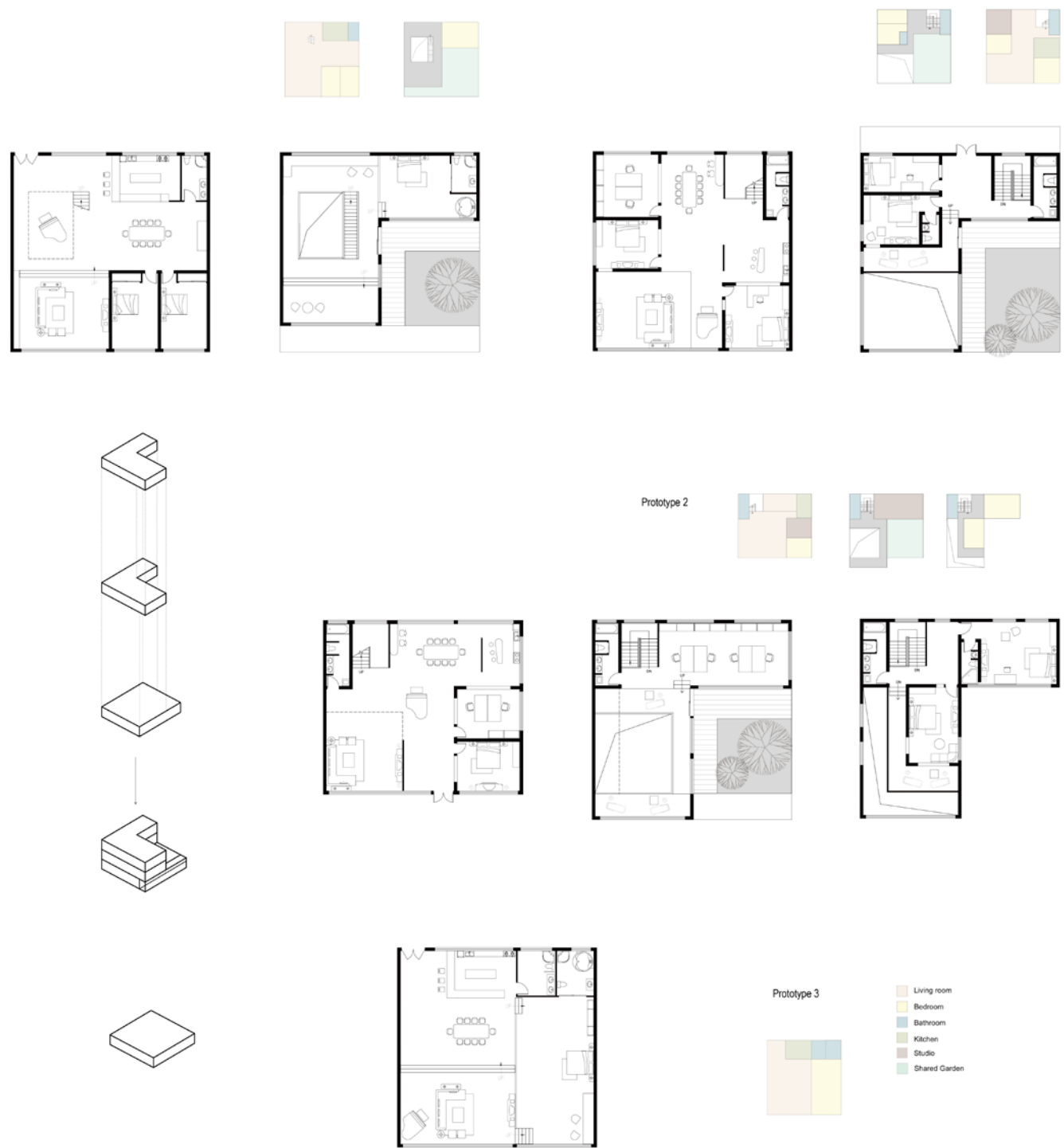
Prototype 4



Unit Plan 1:100

Prototype 1





APPENDIX

THESIS FINAL REVIEW

Presented on Dec. 17th, 2015

at MIT Media Lab





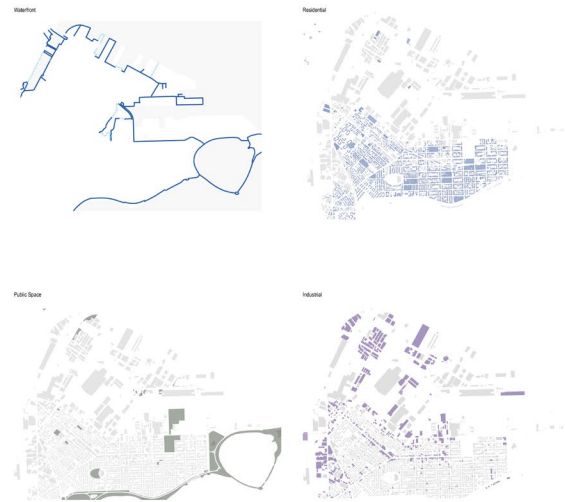
FINAL BOARDS

SOUTH BOSTON EX-URBAN

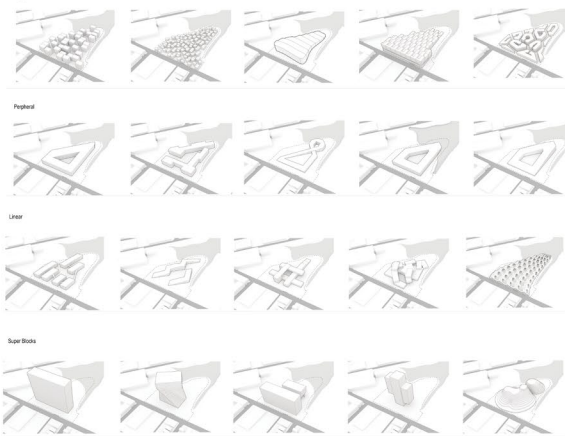
A New Living Paradigm for Harbor Revitalization



South Boston



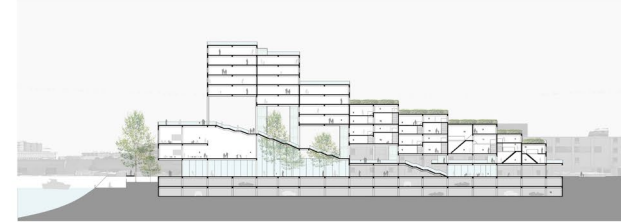
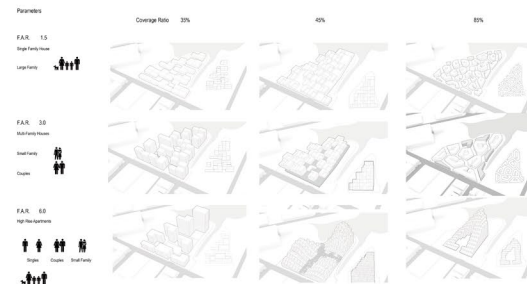
Urban Systems



Design Strategies



Density



Section A - A 1:200



Section B - B 1:200



Section C - C 1:200



DATA COLLECTIONS

	USD/m2	Dwelling price/ income (%)	Cost ERO/m2	Cost USD/ m2	Covered area (%)	Roads (%)	Landscape (%)
1	1219	19	300	375	27.82	8.07	64.11
2	35610	12	1980	2475	34.9	1.59	63.51
3	20750	10	1000	1250	85.59	0	0
4	17433	16	1015	1269	22.19	0	40.27
5	25770	10	not available	0	44.2	32.66	23.14
6	13553	37	not available	0	51.78	0	29.87
7	21634	30	2017	2521	39	7	18
8	19625	13	840	1050	47.7	7	45.3
9	16100	15	1094	1368	28.36	20.44	51.2
10	2250	6	1000	1250	29.25	38.66	32.09
11	3993	12	425	531	17.39	13.17	69.44
12	8411	17	370	463	40	19.66	27.59
13	4133	24	not available	0	44	3.4	52.6
14	16848	11	2745	3431	81.62	0	18.38
15	24950	17	not available	0	44.56	0	55.44
16	4596	35	64	80	24	2.39	73.61
17	35610	12	2046	2558	16.65	4.83	74.37
18	21634	30	2493	3116	44.04	37.37	0
19	849	17	600	750	43.52	28.85	14.67
20	23500	21	1645	2056	17.8	26.97	43.85
21	23500	21	2225	2781	38.23	1.32	60.45
22	12933	29	1415	1769	47.18	0	52.82
23	18060	19	not available	0	82.46	2	15.51
24	18060	19	not available	0	52.76	2.1	12.53
25	9000	22	497	621	37.25	0	21.11
26	23500	21	not available	0	51.33	4.94	3975
27	23500	21	not available	0	45.13	8.14	46.73
28	18046	12	1000	1250	41.72	15.27	43.01
29	4490	18	446	558	82	3	15
30	19180	22	1165	1456	48.22	0	51.78
31	1903	36	60940	76175	23.75	1.92	74.33
32	21634	30	1900	2375	30.48	1.42	68.1
33	24950	17	not available	0	64.71	0.54	34.75
34	17145	15	1495	1869	92	8	0
35	13153	36	499	624	51.95	3.59	44.46
36	12030	19	717	896	61.3	0	38.7
37	23500	21	1375	1719	44.3	0	46.79
38	9688	20	307	384	82.54	0	0
39	13153	36	640	800	31.07	17.44	51.49
40	12721	25	846	1058	76.87	1.39	21.74
41	13553	37	524	655	57.88	0	42.12
42	28061	19	2240	2800	62.84	29.89	7.31
43	34174	10	1548	1935	27.6	6.6	65.8
44	13553	37	909	1136	69.28	0	30.72
45	15510	22	804	1005	76.73	4.54	18.73
46	15510	22	823	1029	100	0	0
47	10926	35	1097	1371	14.5	22.82	62.68
48	13153	36	484	605	42.68		54.08
49	16859	11	1230	1538	85	0	0
50	16859	11	1700	2125	72	0	19
51	24950	17	not available	0	78.28	0.9	20.82
52	27571	41	2760	3450	100	0	0
53	35610	12	850	1063	61.32	6.17	3.25
54	4596	35	800	1000	100	0	0
55	13153	36	688	860	79	0	21
56	13153	36	not available	0	51	11	20
57	600	72	not available	0	100	0	0
58	13553	37	not available	0	29.2	0	6022
59	15518	44	1040	1300	58.64	0	41.36
60	31880	13	not available	0	92.89	7.11	0
61	13553	37	774.81	969	86.36	0	13.64
62	16859	11	1700	2125	22.73	0	77.27
63	16859	11	740	925	83.66	1.34	15
64	20750	10	1100	1375	50.34	10.88	0

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BIBLIOGRAPHY

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South Boston Ex-Urban
A New Living Paradigm for Harbor Revitalization

by
You Jin

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