Building on the City:
Inhabiting the Rooftops as a Strategy for the Urban Densification of Downtown Halifax, Nova Scotia

by

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Submitted in partial fulfilment of the requirements
for the degree of Master of Architecture

at

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DALHOUSIE UNIVERSITY

SCHOOL OF ARCHITECTURE

The undersigned hereby certify that they have read and recommend to the Faculty of Graduate Studies for acceptance a thesis entitled “Building on the City: Inhabiting the Rooftops as a Strategy for the Urban Densification of Downtown Halifax, Nova Scotia” by Samantha Lee Bruegger in partial fulfilment of the requirements for the degree of Master of Architecture.

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ABSTRACT

This thesis investigates the space above buildings, as an uninhabited layer of the city, possessing vast amounts of interconnected space. This idea will be pursued through the insertion of rooftop housing over the existing buildings of Barrington Street, in downtown Halifax, Nova Scotia, Canada. Through de-constructing the existing building fabric, as well as precedents of residential development, this project explores qualities of living above the city, as an alternative to urban sprawl and the notion of retreating from the city to live.

ACKNOWLEDGMENTS

To my studio friends, and family.

Thank you to Richard Kroeker and Catherine Venart for your encouragement, insight, and support throughout.

Thank you Mom, Dad, and Andreas, you inspire me the most.

CHAPTER 1: INTRODUCTION

This thesis investigates the urban condition of the rooftop, and the potential to use this space for the addition of people to a downtown core which has experienced a decline in population over the past fifty years. The growth of Halifax, Nova Scotia, Canada began on the peninsula and has expanded outward as a result of urban development. Halifax once had a bustling downtown, today the urban population is in decline, while suburban populations are rising. The rooftop addition could become a prototype for the concentration of the existing population within the city, as well as a place where families could live and work in close proximity.

An analysis of the urban fabric of Barrington Street will first be undertaken in order to determine structural and programmatic opportunities for add-on. Based on these findings, elements of a residential neighbourhood program, which take advantage of the rooftop environment will be reconfigured over the city.

Thesis Question

Is it possible to use the existing rooftops as a site for a housing program and amenities typical of residential neighbourhoods in order to densify the city?

Why Build Above?

The conventionally layered city has been in decline for the past 100 years. Residents and businesses have been moving to the suburbs and outskirts, as the automobile renders these places easily accessible (Melet and Vreedenburgh 2005, 9). Cities today occupy more space

with fewer people than they did 40 years ago. The roof holds the potential to become the foundation of a new layer which could accommodate this growth. In the book *Rooftop Architecture: Building on an Elevated Surface*, Ed Melet and Eric Vreedenburgh introduce their manifesto in support of rooftop architecture. Cities often assume a uniform character, with zones either exclusively for residential, commercial, or industrial purposes. Melet and Vreedenburgh question the validity of this, as they believe only complex urban systems have a chance of survival. While cities are growing, they are also being eroded of populations, businesses, and their existing fabric. Building on top of what already exists retains the story and complexity of the city, while presenting itself as an attractive place to live.

While the populations of many cities are in decline, populations in general are increasing. The economy and infrastructure must find ways of growing, in order to keep up with this demand. Simultaneously, many feel that landscape, and nature should be spared as much as possible. Therefore urban growth will have to take place mainly within cities themselves (Melet and Vreedenburgh 2005, 17).

The flat roof has emerged in many projects throughout the past century as a place to build upon. Le Corbusier was a major proponent of the habitable roof. He describes utilizing the rooftop as “re-conquering” the ground level, while gaining a new space on the crown of the building, a place that is green for “relaxation and for contact with nature” (Andres 2005, 121). The metaphorical and experiential value of being up high is something that has survived consecutive shifts in architectural ideas through history (Barley and Ireson 2000, 1).

Sprawl

Since ancient times, cities have achieved speed of exchange and interaction through the clustering of skills and population, at a single strategic point within a region to overcome rural isolation and promote face-to-face communication (Saunders 2005, xi). During the early 20th century, innovations in transportation and communication made possible what Lewis Mumford called “urbanization at any point in a region”. Interaction could now be attained with the automobile, and this resulted in the fragmentation of the urban fabric. As a result, the city centre, homes, factories, offices, and stores could spread and merge with the landscape (Saunders 2005, xii). This is what we now call urban sprawl–the horizontal growth of cities away from the urban core, which create multiple loci of commerce and amenity, farther apart.

Howard’s Garden City ideal portrayed in an early piece of propoganda for Welwyn (1920). From Ward, *The Garden City: Past, Present and Future* (1992)

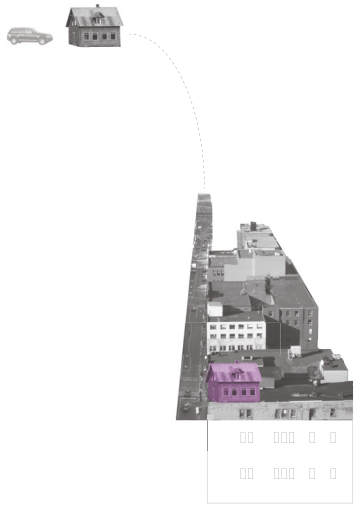
The idea of intentionally de-centralizing the city originated in the 19th century. Ebenezer Howard, wrote about town planning in his book *Garden Cities of To-morrow*, published in 1898. Howard saw cities as unsanitary and an evil affront to nature. His prescription was the Garden City. This idea sought to re-populate the countryside, so the poor could live close to nature. The aim was to create self-sufficient small towns. Industrial, commercial and cultural centres were to be separated from schools, housing and green space. This was an alternative to the city, and a solution to its problems. Howard’s ideas were widely adopted in the 1920s. His ideals resulted in the realization of several projects in England in the early 20th century, including Letchworth Garden City, north of London, and Welwyn Garden City. The result was decentralized cities, and

dispersed populations into smaller separated cities and towns (Jacobs 1961, 17).

There is not one universally accepted definition and measurement of urban sprawl, however different interpretations of the term, help to unveil its causes, and perceived impacts. It has been defined as the “unregulated growth expressed as careless new use of land and other resources as well as abandonment of older built areas” (Hayden 2004, 7).

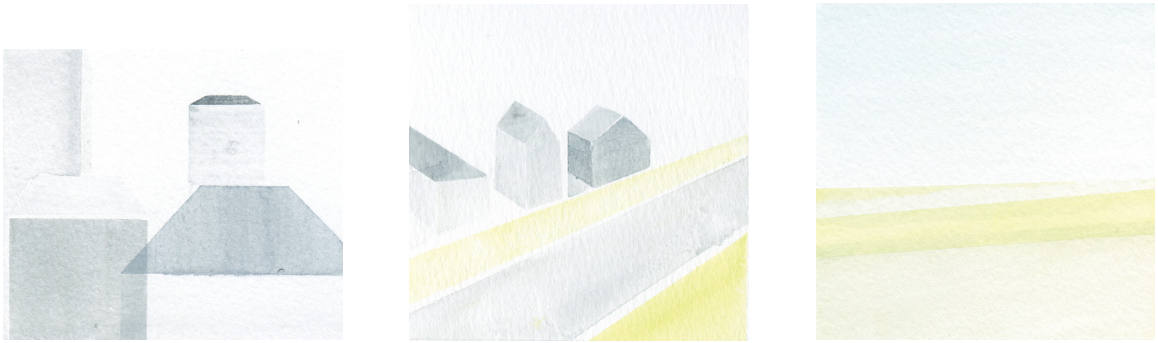
The Impacts of Sprawl

The mental and physical health impacts of sprawl have been identified, and most find a positive correlation between the adverse effects of urban sprawl and mental health (Gleeson and Sipe 2006, 31). The average American spends 443 hours per year driving a car, and commuters spend three to four times more hours driving than individuals living in dense areas. Studies have also shown that long commutes rob a person of time for recreation, voluntary associations, civic engagements, and self-care (Gleeson and Sipe 2006, 33).



Program study collage of the daily commute from the suburbs to the city versus living on the roof

Children have been identified as a high-risk group prone to the effects of sprawl. It has been suggested that movement to the suburbs is characterized by social fragmentation, and loss of a rich social life (Gleeson and Sipe 2006, 72). The development of private automobiles has led to a separation of connection between home, places of work, schooling, leisure, recreation, and shopping (Gleeson and Sipe 2006, 71). This thesis envisions the rooftop of the city as a space that could serve to provide qualities such as privacy and tranquility for families to dwell, as well



Watercolour painting comparing urban, suburban, and rural landscapes

as child care and outdoor amenities. Further, it seeks the re-integration of families, children, and their daily-activities back into the city.

The Domestic Expansion of Halifax

The Halifax Regional Municipality has a long history of suburban development. In the later half of the 20th century most suburban development occurred off the peninsula. Between 1976 and 1996, the old city of Halifax lost population, dropping from 117,882 to 113,910 while the population of the region increased from 278,531 to 342,966 during the same time period (HRM by Design 2008).

Evidence pointing to the migration of young families to the suburbs is shown by the 2006 Canadian census population distribution. The number of children between the ages of zero to nine accounts for 1.05% of the total population living in the downtown core census tracts, while the population of children in the same age bracket is 5.25% of the total population in a sample taken from the suburban communities of Bedford and Clayton Park, located North of the Halifax Peninsula (Statistics Canada, Census Tract Profiles 2006). Corresponding to these demographics is the lack of child care facilities and schools within the downtown core. Whether this is a result, or cause, of the low numbers of children and families within the downtown is debatable. This amenity is typical of most suburban neighbourhoods where families are abundant.

The downtown core of Halifax contains a smaller, less dense, population than most other neighbourhoods on the Halifax Peninsula. While many work within the downtown core every day, 67% of these people commute there

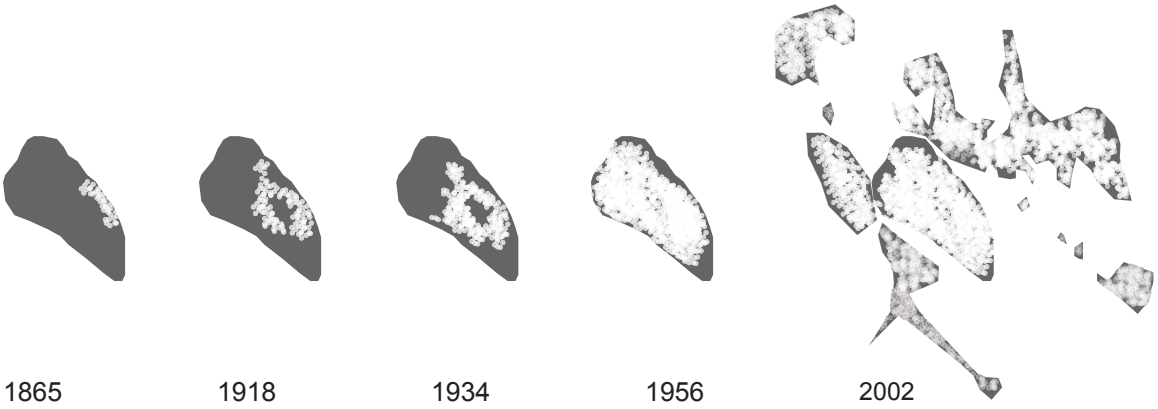
every day. Thus a large population exists for part of the day, however it does not possess intensity of use at all times of the day. The Halifax Peninsula has seen an average decrease in population and density as compared to certain suburban areas.

The use of the rooftops of Barrington Street as a site is an opportunity to add incremental growth within the downtown. Currently most of the predominant use of the downtown core is for commercial purposes, with housing concentrated in the south and north end of the city, and single family dwellings concentrated in the suburbs and the western edge of the peninsula.

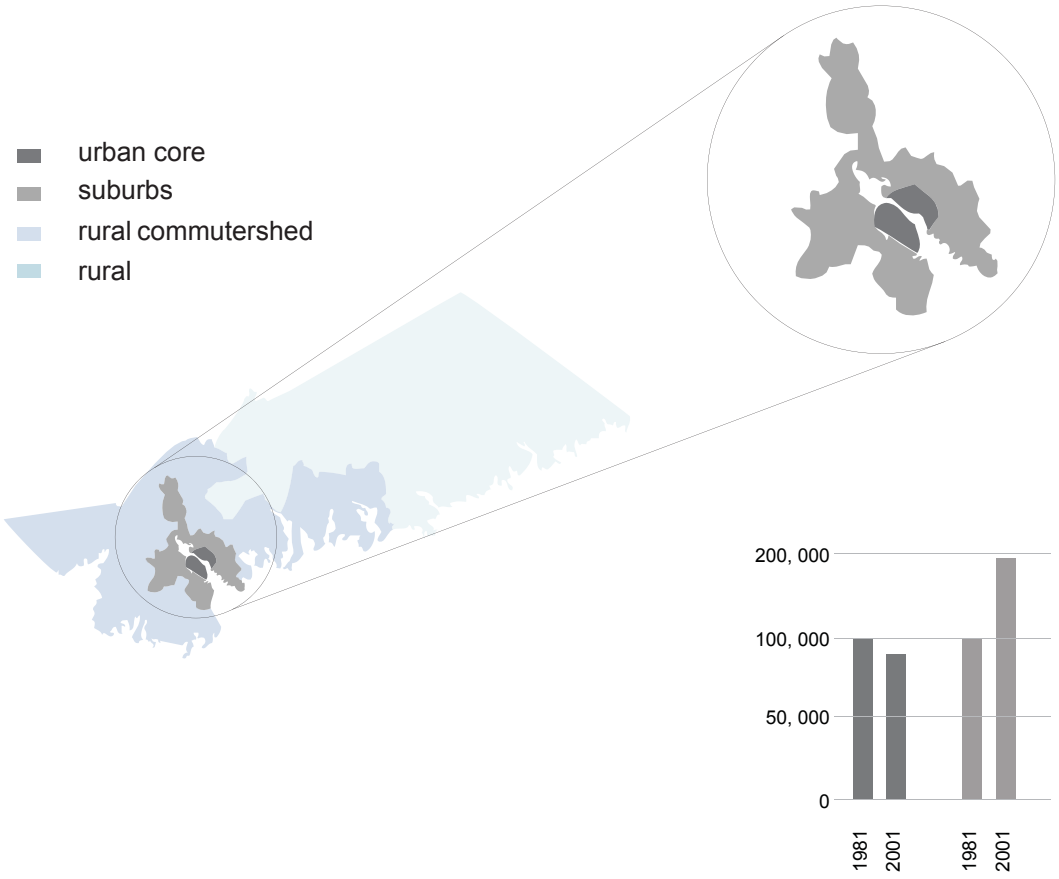
The Argument for Density

In the paper by Richard Rogers, titled “Let’s Cram More into the City” from *Cities for the New Millennium*, his arguments for population density rely on the inherent attractiveness of the city. He advocates for cities with strong public space, higher density and the creation of “ecologically strong” and “socially inclusive” cities. Rogers states that “we are devouring our countryside at an alarming rate”, and high-density environments provide the critical mass to make public service work more effectively. Density brings a sense of cohesion and community that contributes to safety and civic-pride. Rogers believe that density will “help generate the mix of uses, the sense of security and the quality of public spaces that make urban living attractive, with shops lining the streets and homes overlooking landscaped spaces, parks and playgrounds” (Rogers 1998, 9).

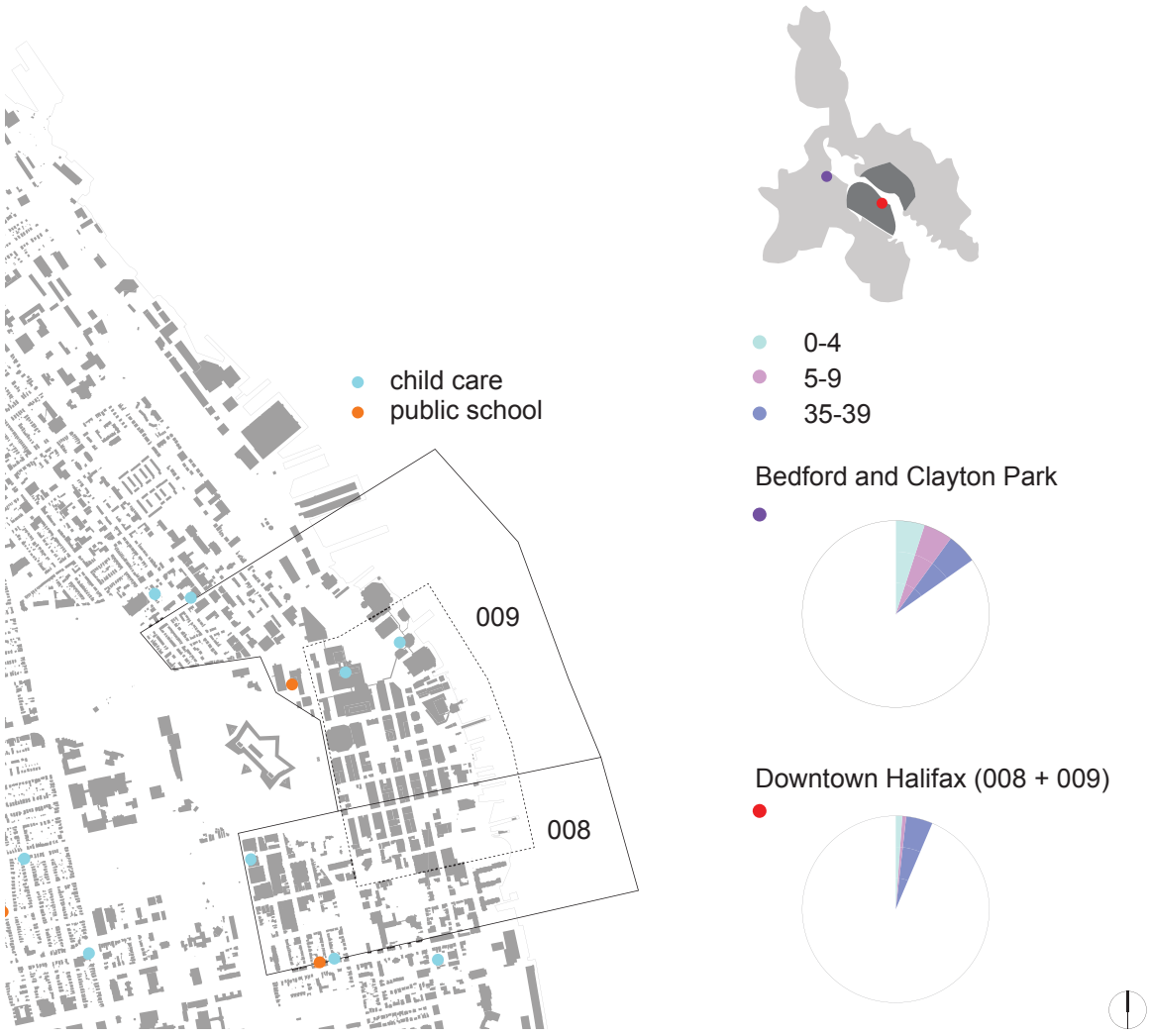
Jane Jacobs points out the need for mixed use development within North American cities, in *The Death*



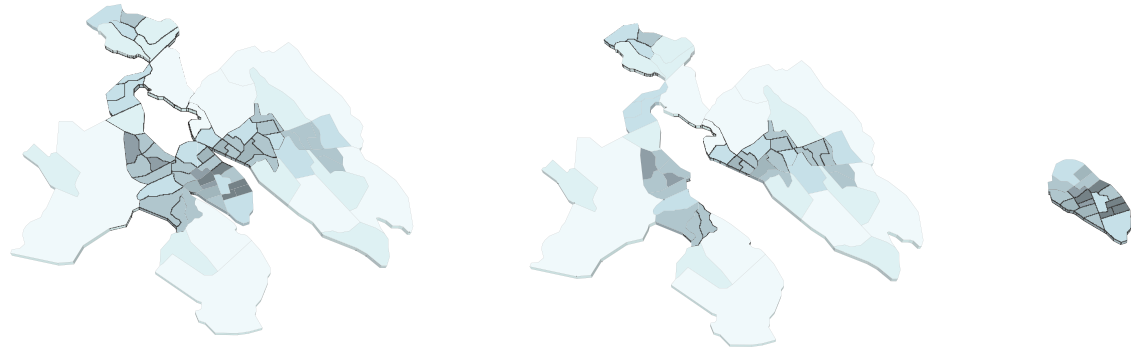
Urban outward growth patterns in the Halifax Regional Municipality. From Sandalack, *Urban Structure, Halifax: An Urban Design Approach* (1998)



Population growth in the suburbs and population decline in the urban core of the Halifax Regional Municipality. From HRM by Design (2008)



The population decline among children in the downtown core of Halifax, Nova Scotia and lack of child care amenities and schools. From Statistics Canada, Census Tract Profiles (2006)

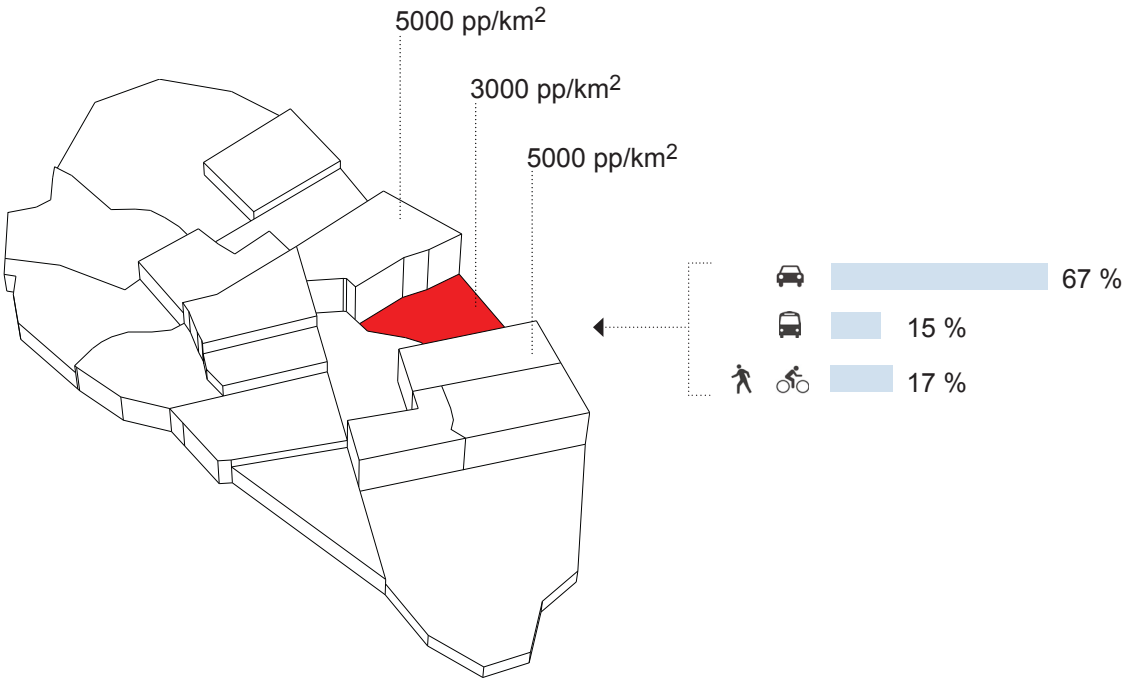


0-500 pp/km^2
500-1000 pp/km^2
1000-2000 pp/km ^{2}
2000-3000 pp/km ^{2}
3000-4000 pp/km^2
4000-5000 pp/km^2
5000+ pp/km^2

suburban

urban

Density of area, persons per km^2 in the HRM. From Statistics Canada, Census Tract Profiles (2006)



The Halifax Peninsula with the downtown core highlighted in red, indicating a lower population density within this area. From Statistics Canada, Census Tract Profiles (2006)

and Life of Great American Cities. The importance of time spread on city sidewalks, meaning people appearing at different times of the day throughout a day, is thought to be a necessary condition because it fuels commercial activity (Jacobs 1961, 152). Streets or districts, which have good primary mixtures and sufficient concentrations of dwellings are successful at generating diversity (Jacobs 1961, 176). There is a relationship between concentration in downtowns to diversity and conveniences. Dense concentrations of people are necessary for flourishing city diversity. Without this, there is no downtown.

General business/ commercial

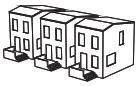
General residence

Single family dwelling

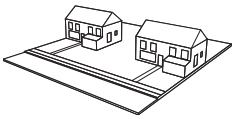
Multiple dwelling

Map illustrating the current zoning and corresponding building types on the Halifax Peninsula, with the downtown consisting of a mainly commercial program

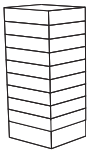
Downtown Halifax, 1850s-1970



The south end, 1850s-1900



The Hydrostone, 1920



The Trillium condominium development, 2011

Existing housing and building types of the Halifax Peninsula

CHAPTER 2: DESIGN

Site

Barrington Street

During the 19th century, the Halifax waterfront was the initial centre of community business and trade within the region. Residential uses stretched upwards towards the Grand Parade, the centre of civic life of the period, located along Barrington Street. Barrington Street, was predominantly residential, its fabric made up of wood frame houses and garden lots for middle income settlers. The residential character of Barrington Street incrementally changed from single family housing, to higher density, and rooming house uses, with garden lots being used for infill development. As the centre of commerce moved toward Hollis Street and Granville Street, Barrington began to emerge as a mixed-use residential and commercial area. In 1821, a fire destroyed the wood frame buildings along the east side of the street. The result was the reconstruction of a more substantial building type, incorporating both business and residential uses. Commercial use moved to Barrington Street, with the development of mostly stone and brick masonry buildings. From Spring Garden Road to Duke Street, stone, brick and terra cotta structures rose as monuments to the wealth, success, and civic pride of Halifax's leading families, organizations and mercantile businesses. The street was the commercial centre of a growing city, and many of these buildings remain intact.

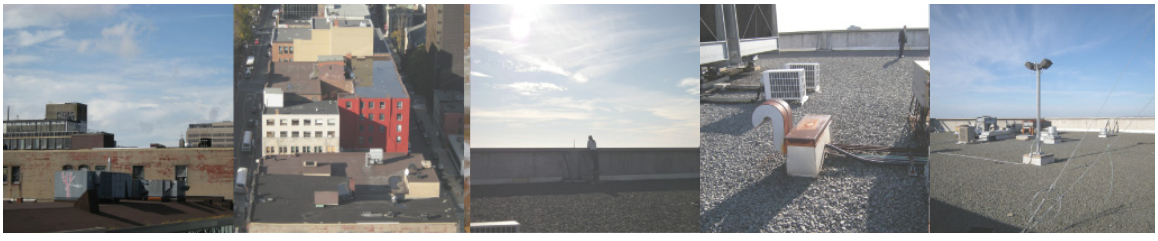
The outward expansion of the city, resulted in a massive shift toward suburban housing in the late 1950s. In recent years this has resulted in competition from a

growing exodus of major retailers to the outlying centres. With the increasing loss of major tenants the position and perception of Barrington Street as a major commercial centre was diminished (Lydon Lynch Associates Limited 1982).

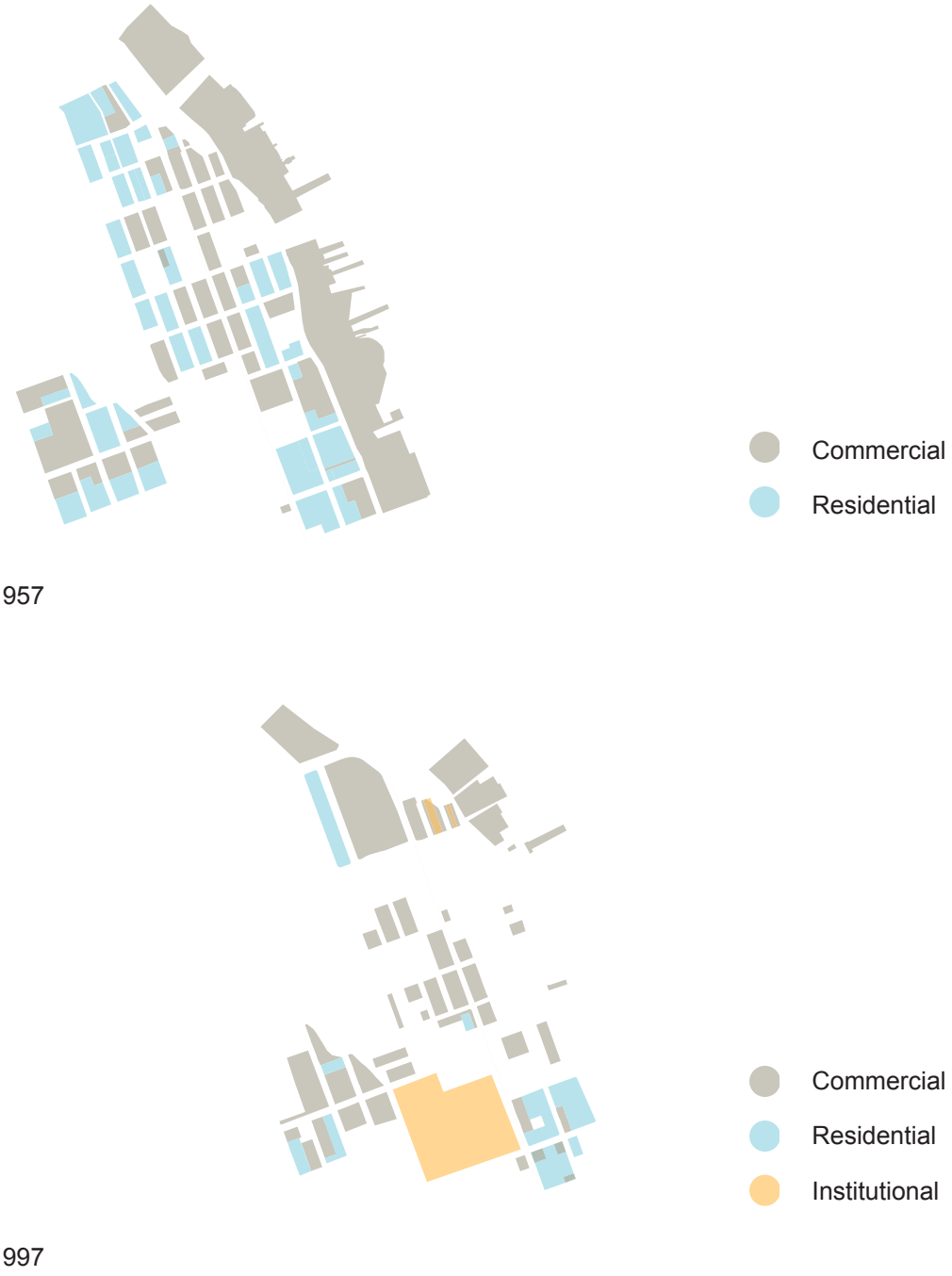
The Existing Building Fabric

The existing buildings which line Barrington Street are mostly three to five storey commercial blocks, within which empty lots and vacant buildings have emerged over the past few years. The low rise buildings were mainly constructed in the late 18th and early 19th centuries for commercial and light industrial purposes. After the fire, most were built of sturdy brick and stone, and are still used for commercial purposes today. In recent years, between 1950 and 1990, a few apartment and commercial buildings have been constructed.

The chosen site to be analyzed is defined as the buildings, rooftops and space above Barrington Street from Spring Garden Road at the south end to the Cogswell Interchange, at the north end. The street is a major artery of the downtown core, consisting of many businesses and historic buildings, yielding it an attractive place to build upon.



The rooftops of Barrington Street from above



Map illustrating the building uses surrounding Barrington Street (highlighted in red), in 1957 versus 1997. The evolution of program shows the shift away from a residential program, toward a commercial program within the downtown. From Sandalack, *Urban Structure, Halifax: An Urban Design Approach* (1998)

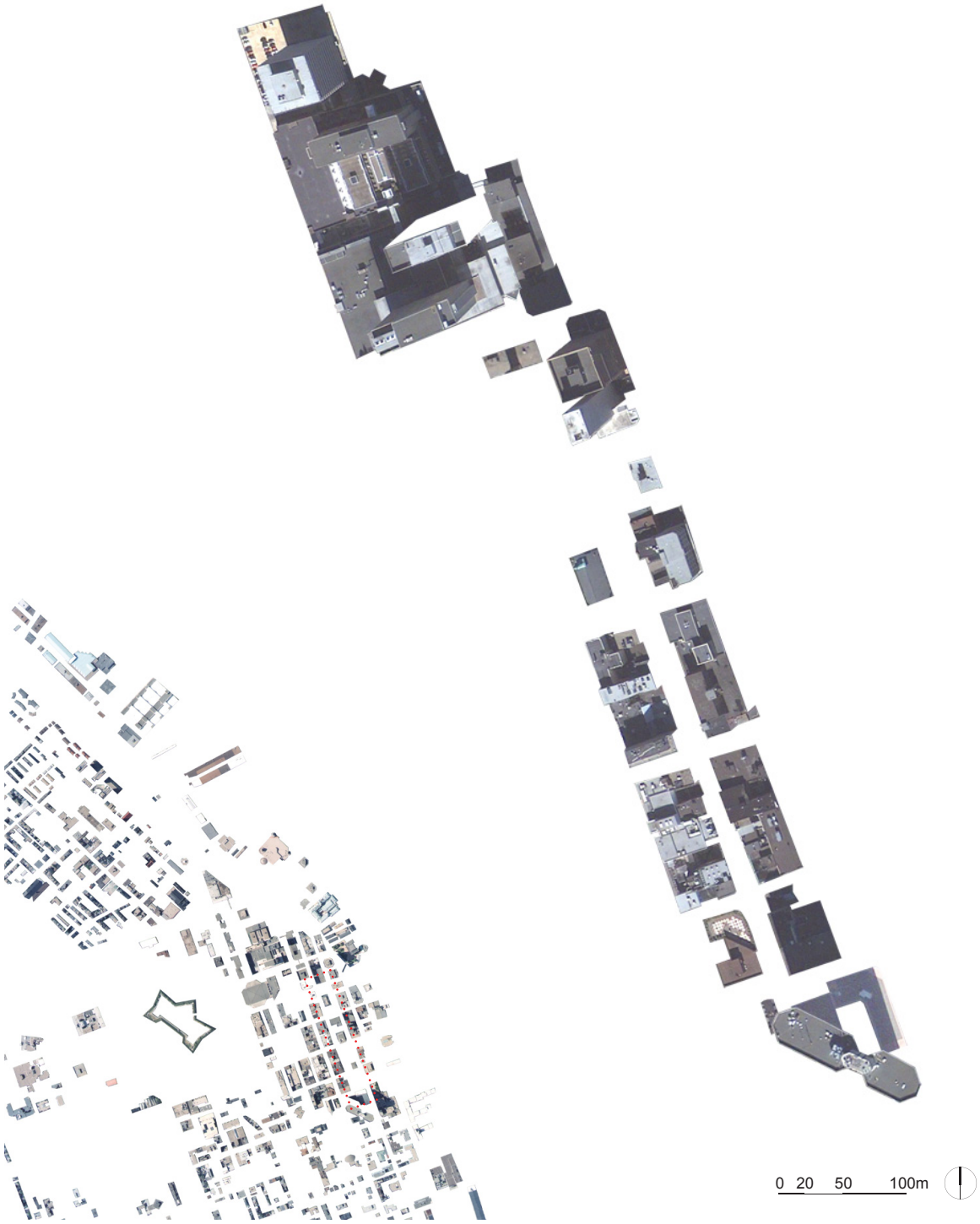
Symbiosis

The concept of a symbiotic relationship is defined in the dictionary as any interdependent or mutually beneficial relationship between two persons or groups. The site of the existing building fabric of Barrington street is currently predominantly commercial space, with some residential and institutional program as well. The rooftop as a host for a program of housing and amenity is conceived as a way of bringing people and families back to the street to live and work. This has the intention of creating a symbiotic relationship between the program of the existing commercial buildings and the new layer of rooftop housing. The existing structure and services of the buildings along Barrington Street, could be used or extended to serve the new architecture of the rooftops. Further, where interior housing and exterior public spaces along the street already exist, places of access to the new elevated community could be provided.

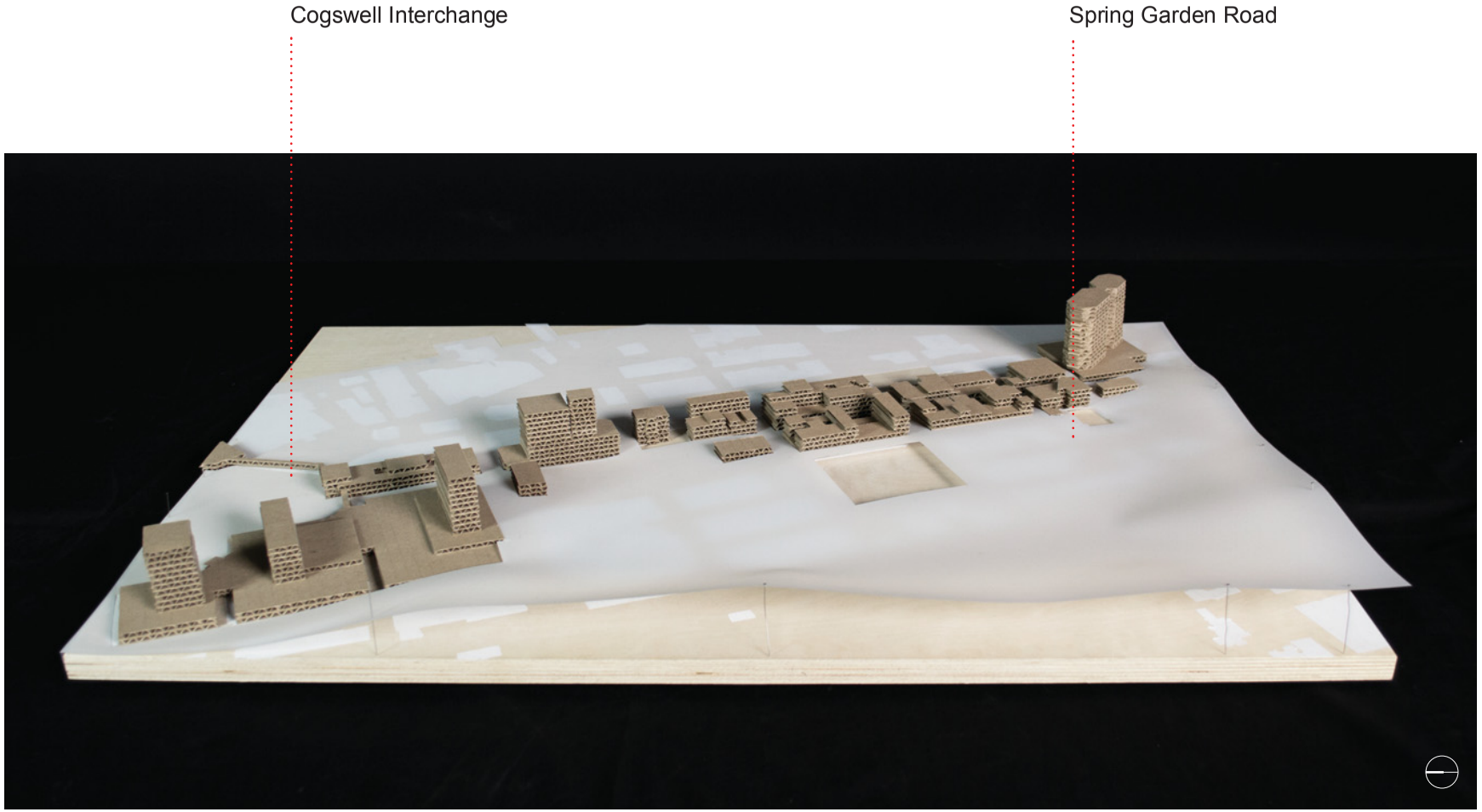
Determining Where to Build

Through mapping the existing building fabric of Barrington Street, key elements which inform where to build have been identified. The identification of existing use, public space, vacant lots, points of entry, service cores, and structure have been mapped.

Based upon reading the street and its components, it is evident that the building fabric between George Street and Spring Garden Road contains a concentration of vacant sites, and existing residential program. These programmatic elements of the street lend themselves to providing vertical points of access to the roof above, there-



A bird’s eye view of downtown Halifax zooming in on the site and the buildings flanking Barrington Street. From Google Maps



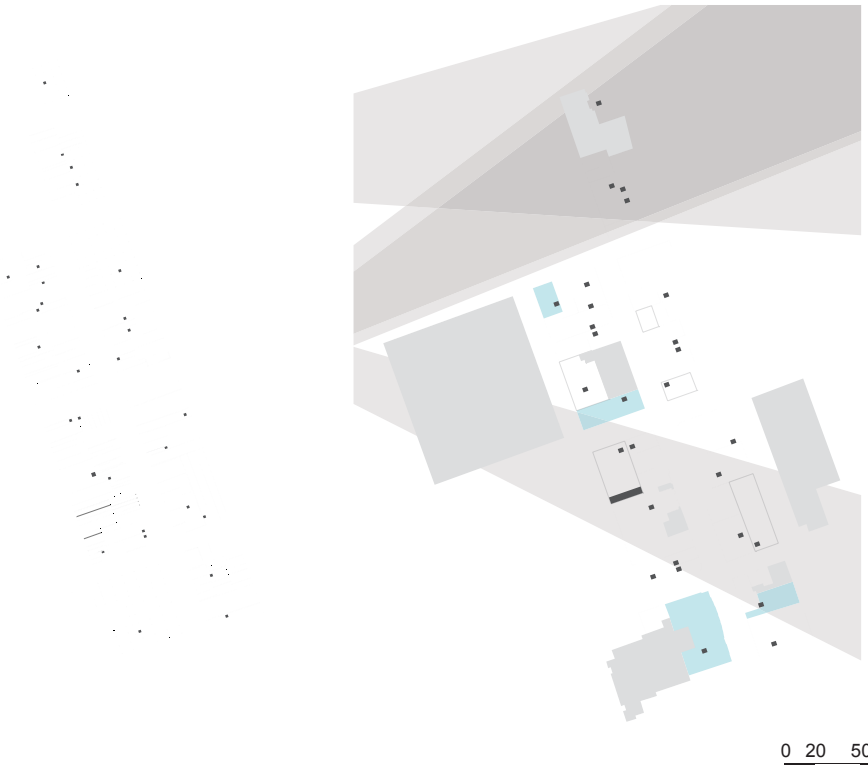
Site model (1:1000) representing the buildings and rooftop layer of Barrington Street from Spring Garden Road to the Cogswell Interchange

Map illustrating the existing building uses along Barrington Street

Map illustrating the existing vacant lots, points of entry and residential program

The site

Public space at ground level



Service cores and structural walls

Voids / cores / program / views

Analysis maps of the immediate site to be built upon

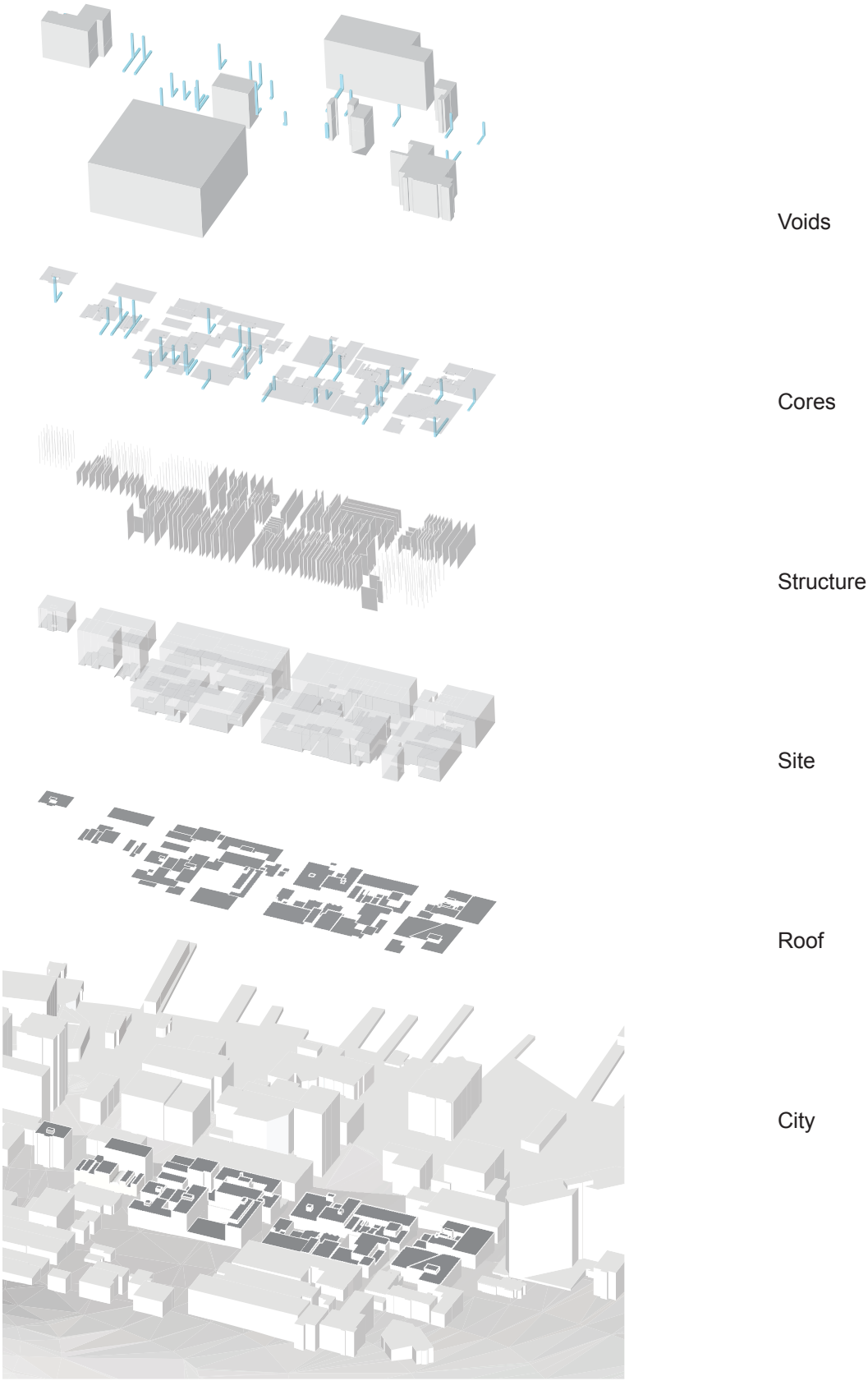


Diagram illustrating the layers of the site

George Street

Spring Garden Road

Photo elevations along Barrington Street from Spring Garden Road to George Street. From The Downtown Halifax Business Commission

fore this section of the street will become the focused site for this project. The public space, structure and services cores of the building fabric between Spring Garden Road and George Street have also been identified and will inform where new program will be layered over the site.

Program

The program is informed by the physical and programmatic qualities of the suburban home and neighbourhood, which could be realized in a denser form on the rooftops. The historical precedents of the Garden City, and the Unité d'Habitation will be looked at in order to inform the program. The Unité d'Habitation was a response to the typical Garden City pattern of development and sought to densify patterns of dwelling through the vertical arrangement of its units.

Precedents

Garden City, Ebenezer Howard

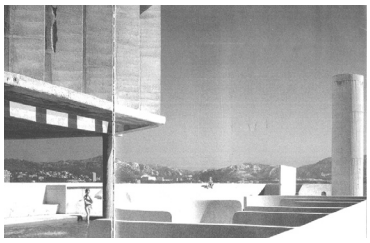
The objective of the Garden City was to combine desirable aspects of country and city life. Ebenezer Howard envisioned a hybrid place called the "town-country". The Garden City was composed of a 6,000 acre estate, with 1,000 acres for the city itself and 265 acres for parkland, with the rest reserved for agriculture. The plan of the city is based on concentric rings of program and parkland. In the centre are buildings for administration, flanked by a central park, surrounded by an all weather shopping arcade. Towards the periphery of the circle, blocks of housing flank circular and axial avenues. The grand avenue contains schools and religious buildings. Access to industry is provided by a railway, which connects to other Garden Cities.

Diagram of Ebenezer Howard's Garden City plan. From Ward, *The Garden City: Past, Present and Future* (1992)

An agricultural greenbelt surrounds the city (Work Architecture Company 2010, 36).

Unité d' Habitation, Le Corbusier

The Unité d'Habitation, located in the city of Marseilles, France is a 19 storey, 377 unit building, accommodating 1600 people, designed by Le Corbusier. The building was rooted in the architectural model of the Garden City. The Unité d'Habitation has been described as the "vertical Garden City" because it represents a synthesis of the two models of urban development which dominated Europe since the early 20th century–the suburban Garden City and the city proper. From the horizontal Garden City, Le Corbusier took the concept of the individual dwelling and the relationship between architecture and nature. From the city proper, he borrowed notions of complexity and density, combining them with his idea of the machine for living (Jenkins 1993, 5).



The roof of the Unité d'Habitation. From Jenkins, *Unité d'Habitation, Marseilles: Le Corbusier* (1993)

The building sits on raised concrete piers creating a sheltered plaza and entry on the first level. The dwelling units are supported above this, beginning on the second level. The majority of units are double height spaces, which wrap vertically around horizontal streets occurring on levels 2, 5, 10, 13, and 16. Space was allowed for ample services including a laundry facility, butcher, bakery, salon, pharmacy, and commercial offices, reinforcing the idea that the community should be self-sufficient. The majority of communal spaces do not occur within the building, but rather on the roof. The roof becomes a garden terrace that has a running rack, a club, kindergarten, gym, and shallow pool.

Le Corbusier's objective was to challenge the traditional housing block on a spatial and functional level. He aimed to "provide with peace and solitude before the sun, space and greenery, a dwelling which will be the perfect receptacle for the family" (Jenkins 1993, 7).

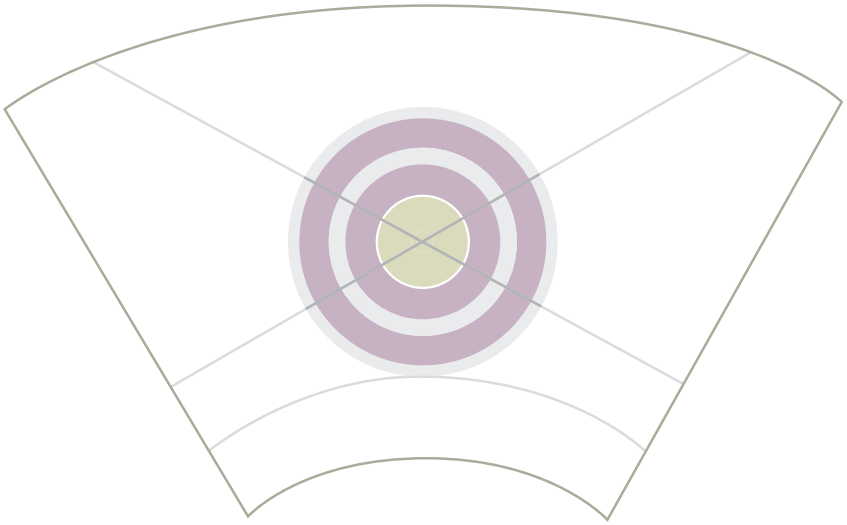
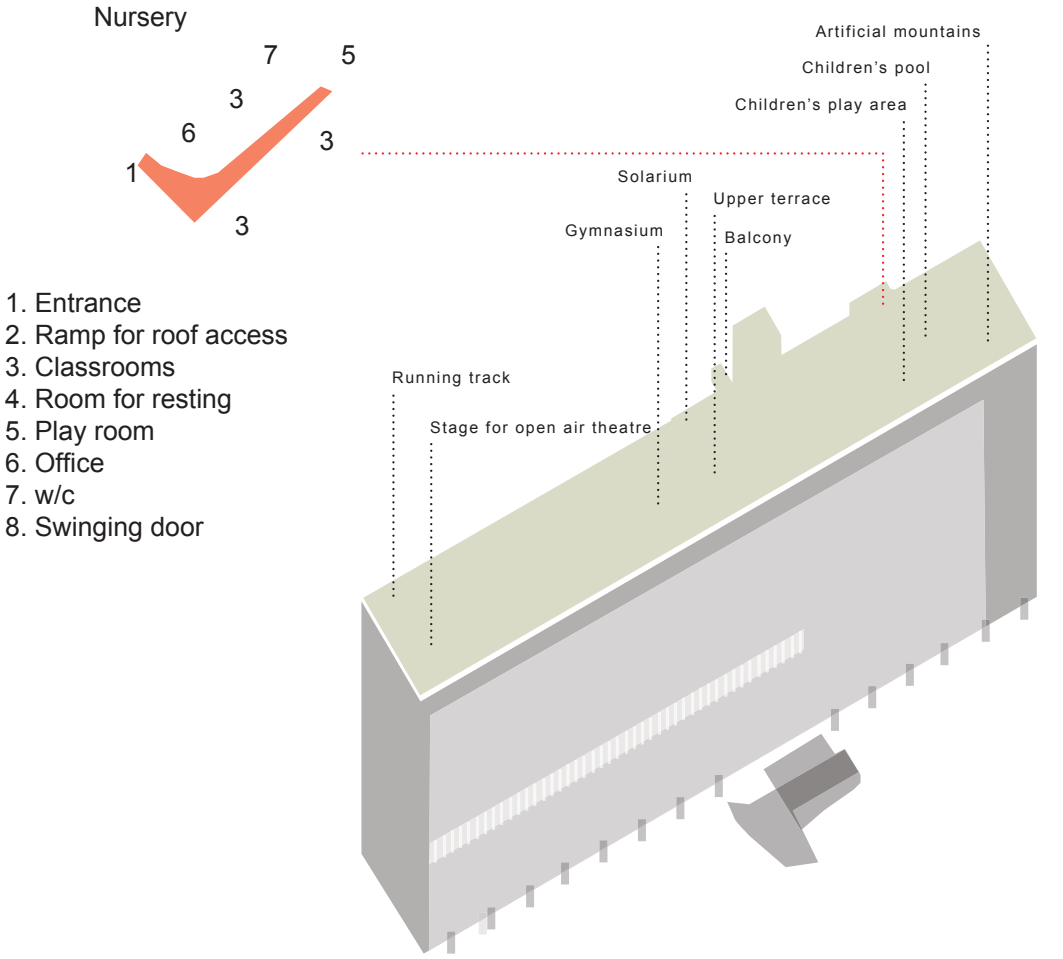
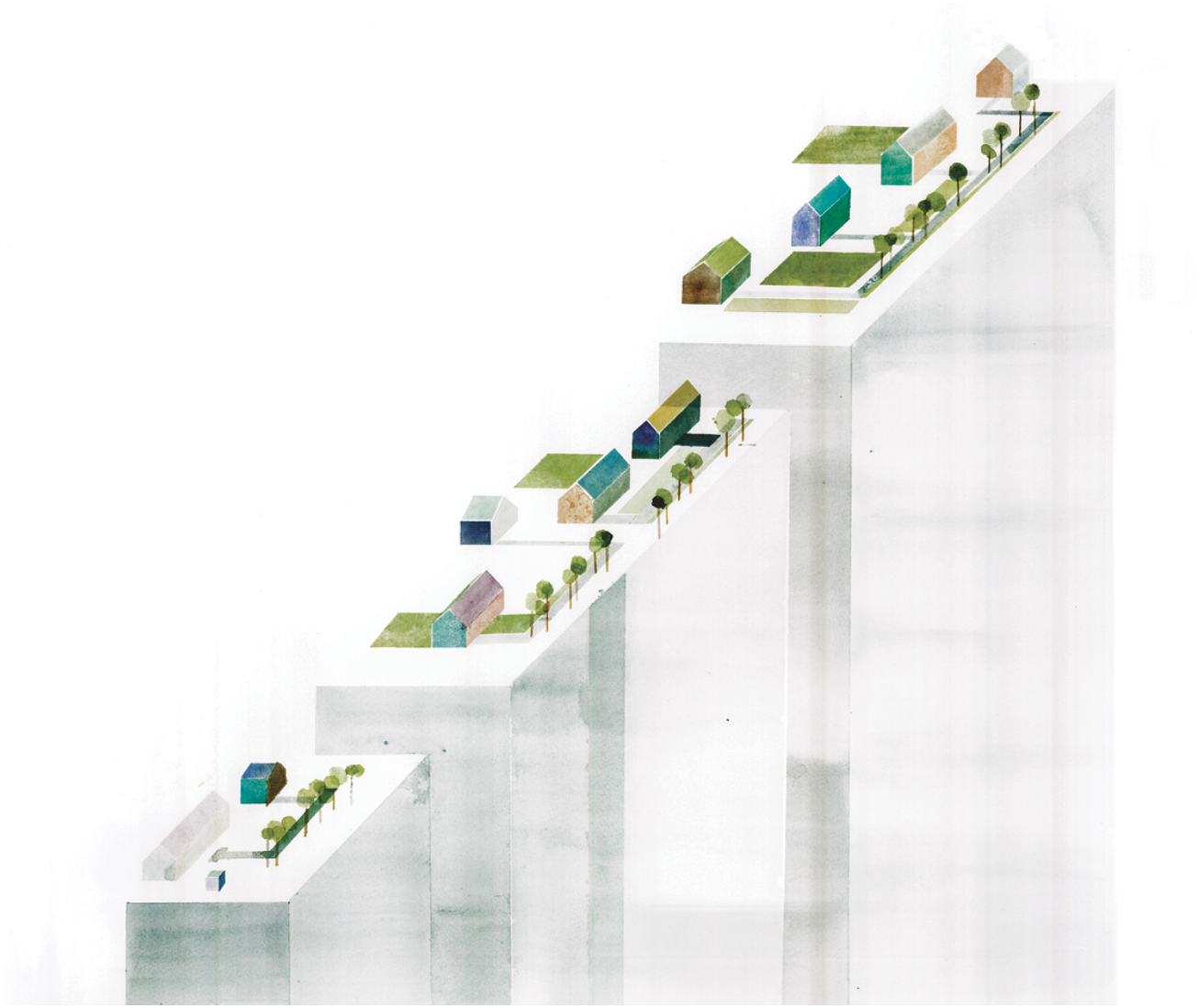


Diagram of Ebenezer Howard's Garden City plan, the suburban ideal to which the Unité d'Habitation was a response

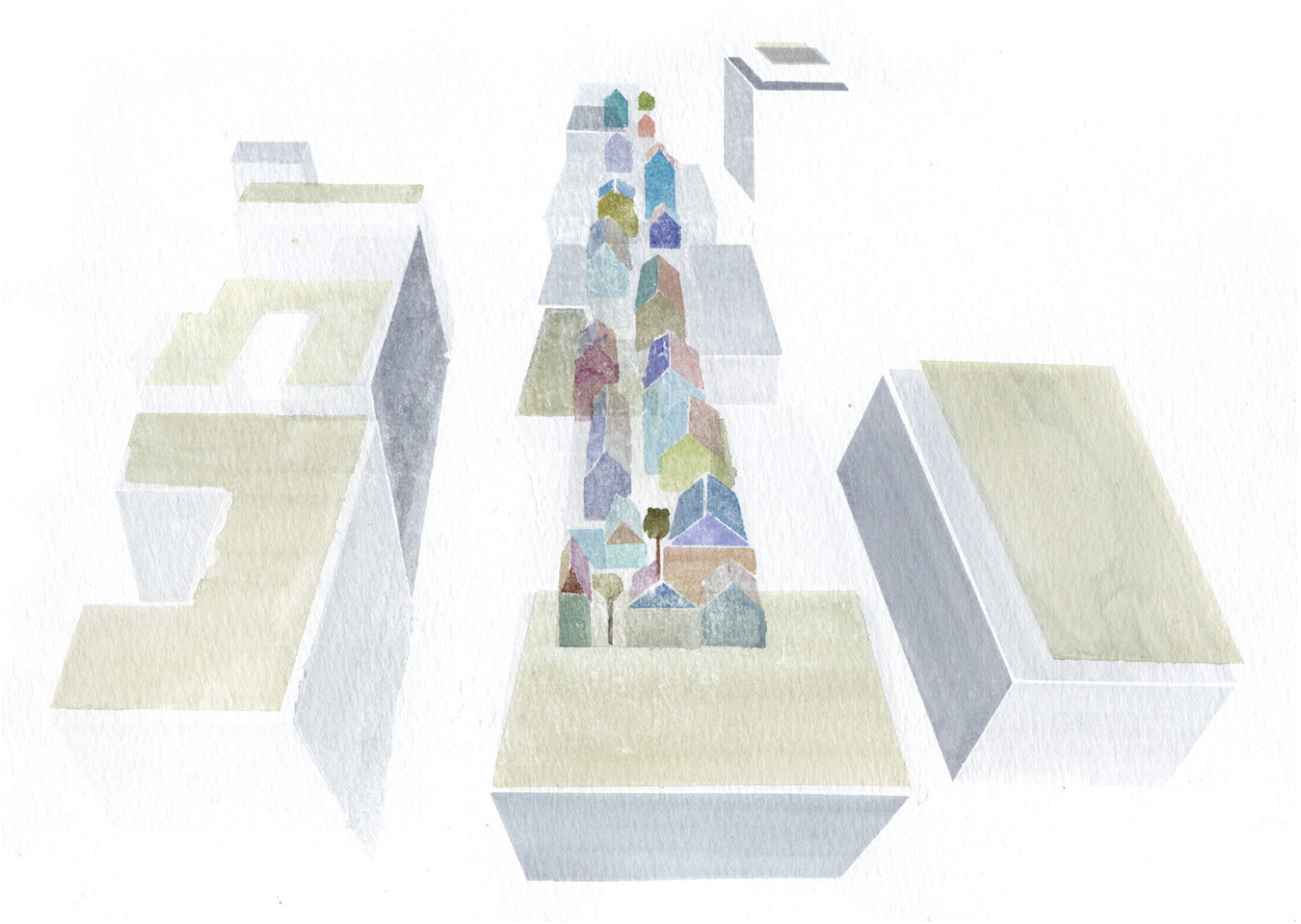


The Unité d'Habitation in Marseille by Le Corbusier is a buildings which utilizes its rooftop for communal programs specifically a nursery, serving the families living within the apartments below

Watercolour painting of the existing rooftop condition along Barrington Street



Watercolour painting of the existing rooftop condition along Barrington Street with a residential program layered over top



Watercolour painting of the existing rooftop condition along Barrington Street with a residential program layered over top

Users

Families who might otherwise choose to move outside the city to obtain qualities of space and amenity for their families are the users. The suburban home is an architectural representation of the ideal place to dwell and raise a family. The traditional family, as well as different configurations of this, such as single parent families, and extended families will be considered within the design response of this project.

Programmatic Elements

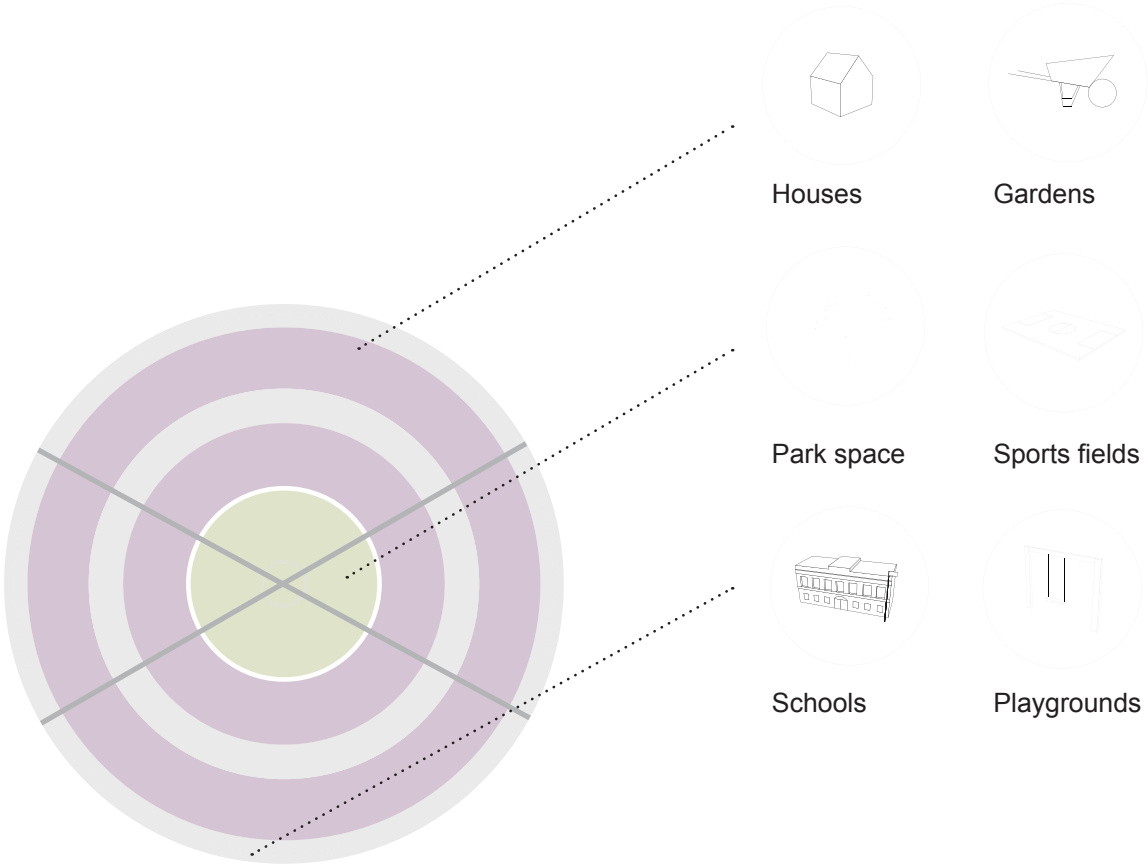
The elements of the program were derived from deconstructing the single family home and amenities of a residential neighbourhood. The program will reinterpret the traditionally private amenities of laundry and yard space, in order to densify the site and begin the process of redirecting suburban sprawl.

Programmatic Qualities

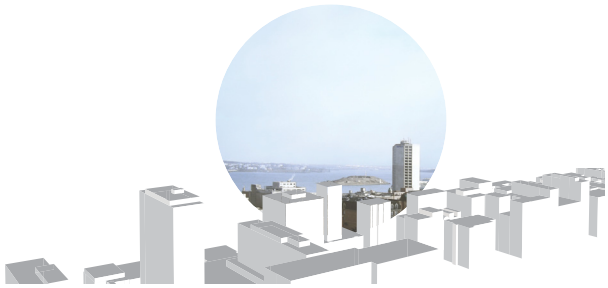
The rooftop provides a various spatial qualities that will be harnessed to incorporate the elements of the program. Qualities of views, light, privacy and green space, will be sought to within the design.

Unit Types

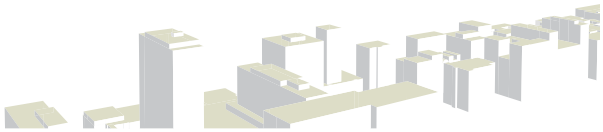
The units are designed to have space for two or three bedrooms. The spaces intend to be flexible in order to accommodate growing and shrinking families, which vary from the traditional nuclear family.



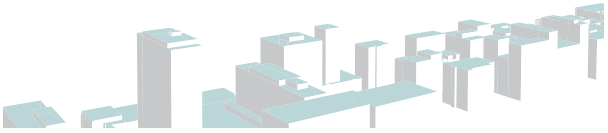
Garden City layout and corresponding programmatic elements to be incorporated into a rooftop program



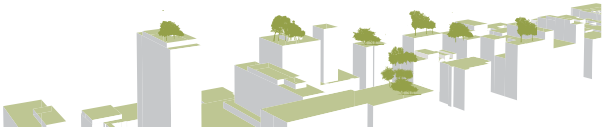
Views



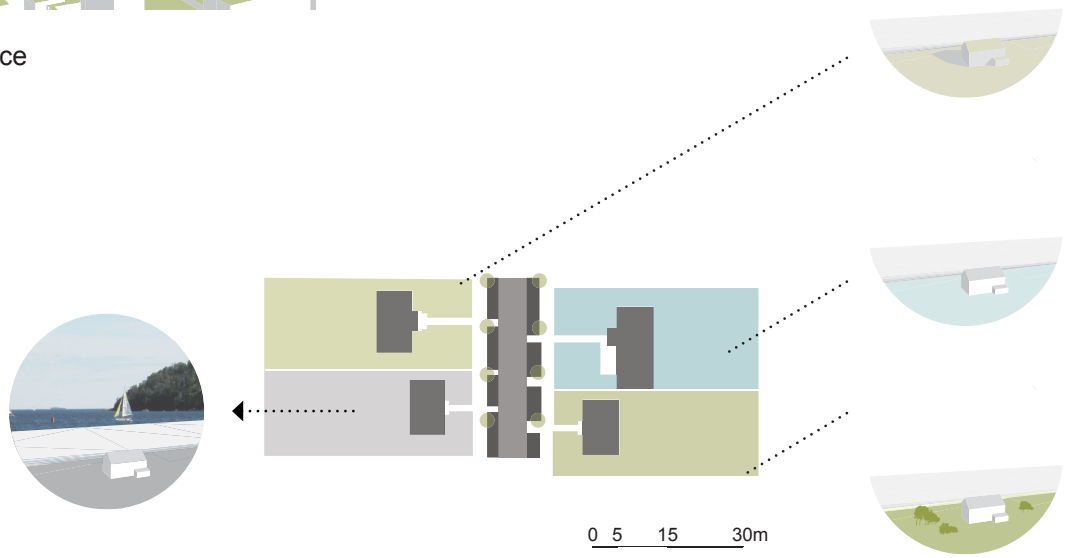
Light



Privacy

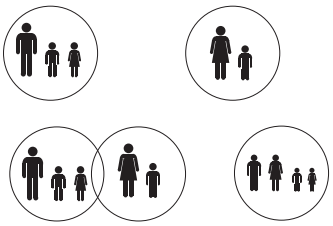


Space



Garden City precedent neighbourhood scale and corresponding programmatic qualities which could exist above the city

Traditional user for the garden city model (1920)

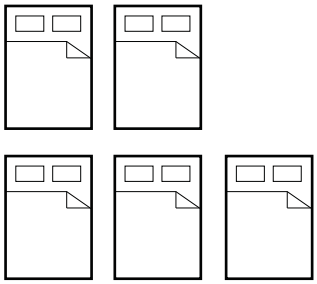


Users today, variations of family size and configuration

The evolving family

+ Parents
+ Children
+ Teenagers

2 and 3 bedroom units



Users configurations and unit types

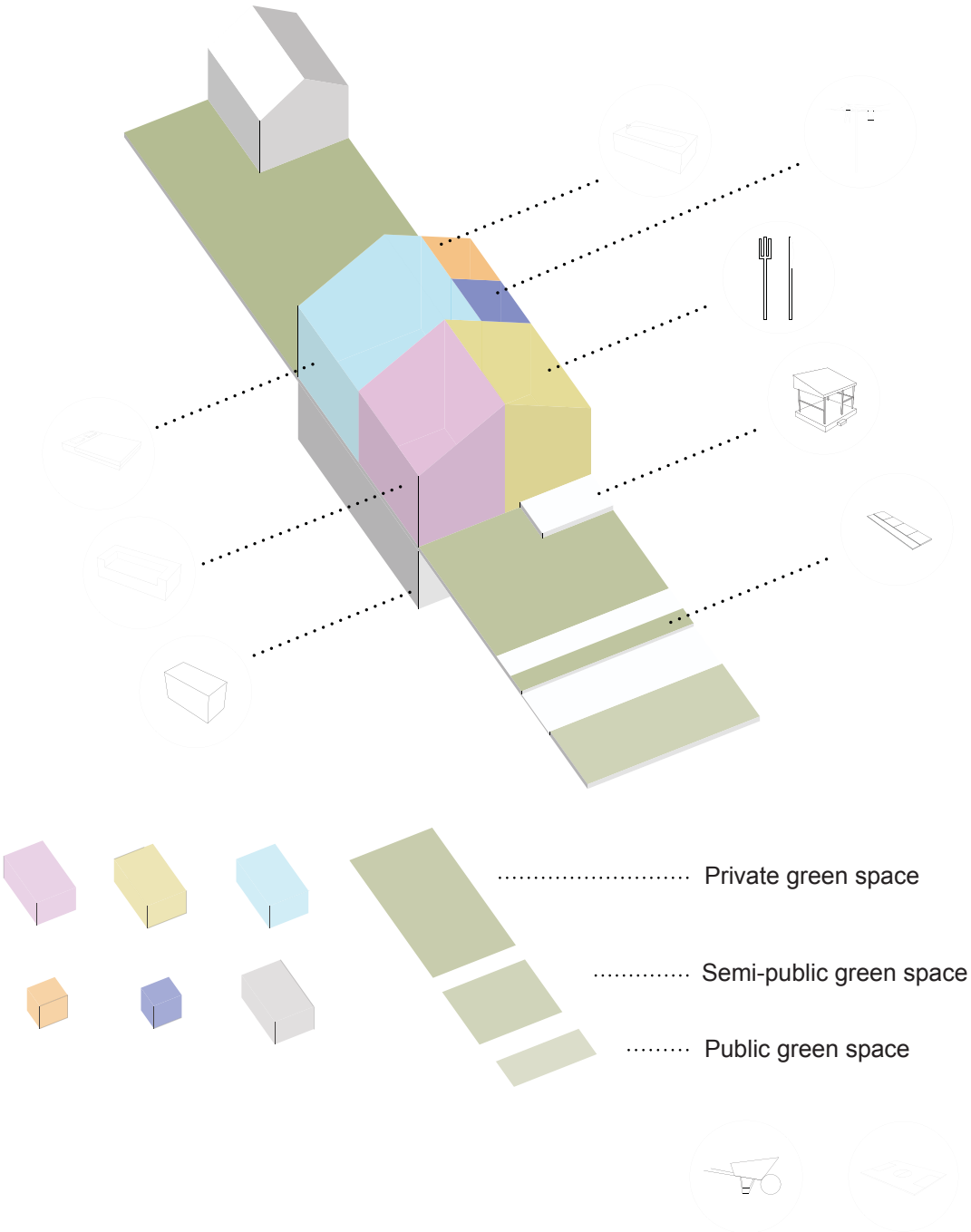
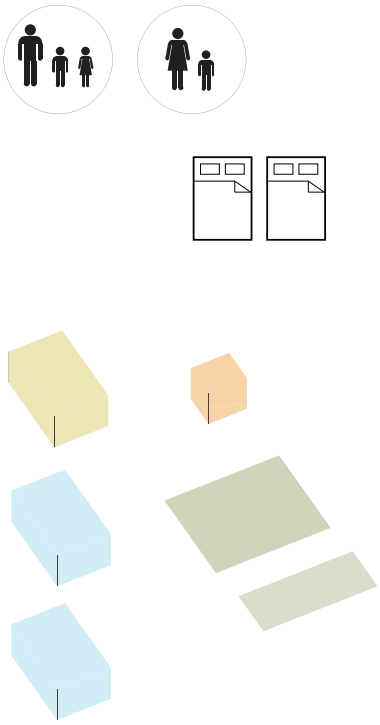


Diagram showing a typical configuration and program of a single-family detached home from which the program will be rearranged and made denser above the city

2 Bedroom unit



3 Bedroom unit

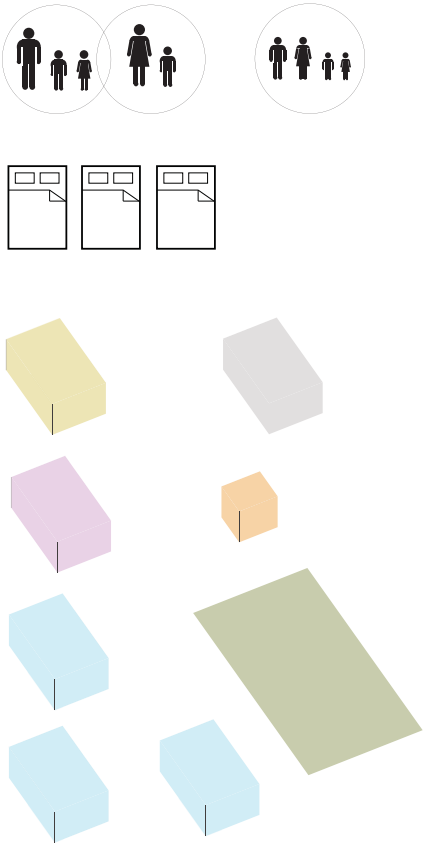


Diagram showing the elements of the single-family detached home, reconfigured for two and three bedroom units

Shared

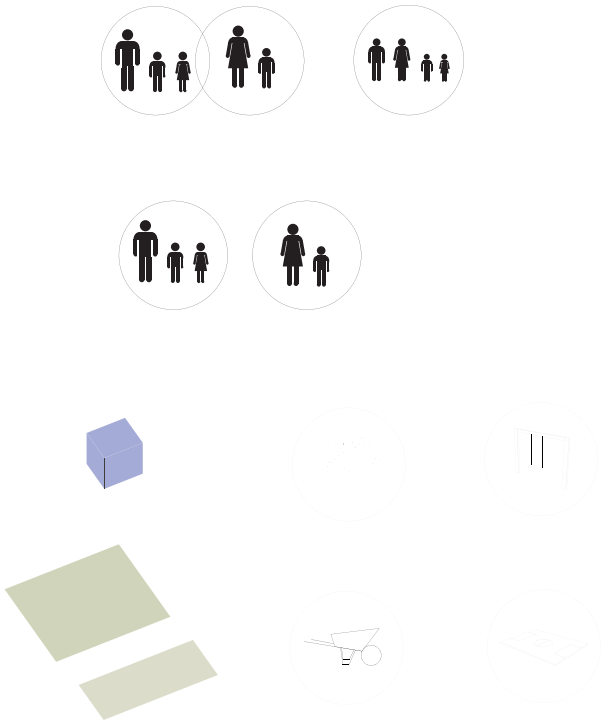


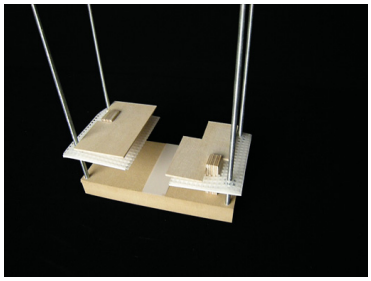
Diagram showing the elements of laundry, yard space, park space, playgrounds, and gardens to be made communal on the roof

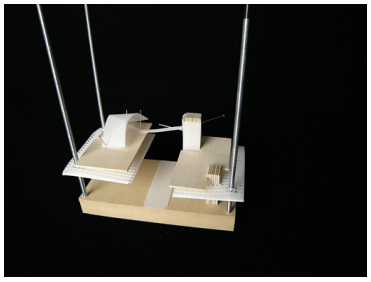
Final Design

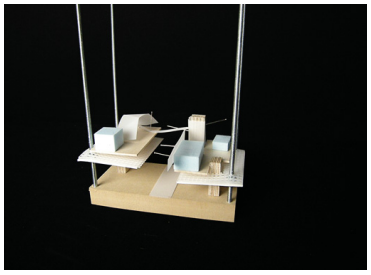
The design will be informed by the urban analysis of Barrington Street, and the programmatic analysis of the Garden City and Unité d'Habitation, in order to illuminate a strategy for realizing architecture over top of, and within, the existing buildings along Barrington street.

Strategy

The buildings along Barrington Street, between Spring Garden Road and George Street, were built mainly for commercial purposes, and are still used for commercial purposes today. Therefore the load they were originally designed to withstand is potentially still being placed on them. After mapping where the existing structural walls, as well as elevator and stair cores exist, their substantial structure and access to the rooftops above, render them ideal spots to provide support for the architectural interventions. This strategy allows for interaction between the street and the space above, as well as a means of tapping into the existing infrastructure and services of the buildings below. There is also potential to reinforce the structural cores if they are not strong enough to withstand the additional weight. The dwellings will be hung from a truss that spans between these structural cores. Further, this allows for the rooftops below to become open space from which program could be accessed by residents.







Study models (1:500) exploring possibilities for add-on and the relationship between the existing cores, the layer of the rooftop, and space above

Method

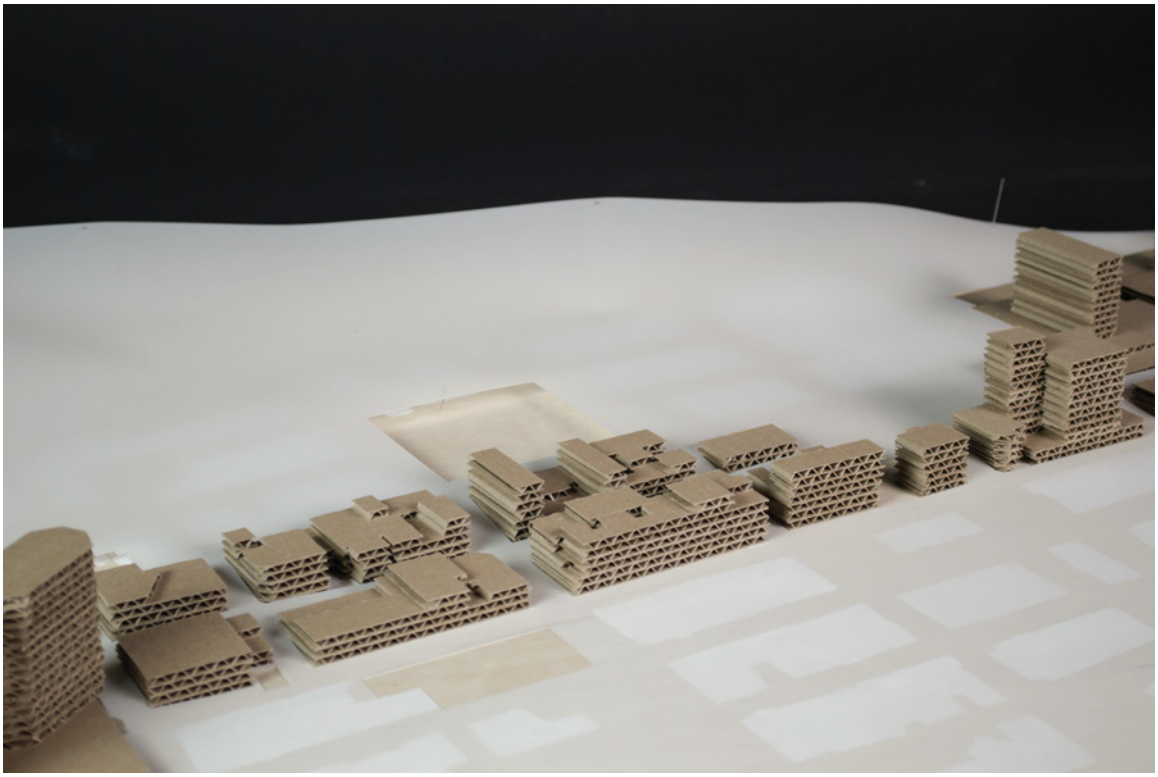
The levels and heights of the buildings along Barrington Street were modelled in order to gain a sense of their configuration and patterns. From here, the space above these buildings was modelled as solid, giving a

sense of the void volumes of space above, and the imprint of the rooftop terrain. The roofline was then translated into a model which only showing the line of the roof. The idea of the existing building cores was then added to this model in order to support the hanging roof profiles. The cores are imagined as points of access between the street below and the additions above. The idea of hanging a new layer of housing program above the existing roof line became the central design concept, and the cores are imagined as the structural support for this. A box truss becomes the type of structure which will enable the program to span between cores.

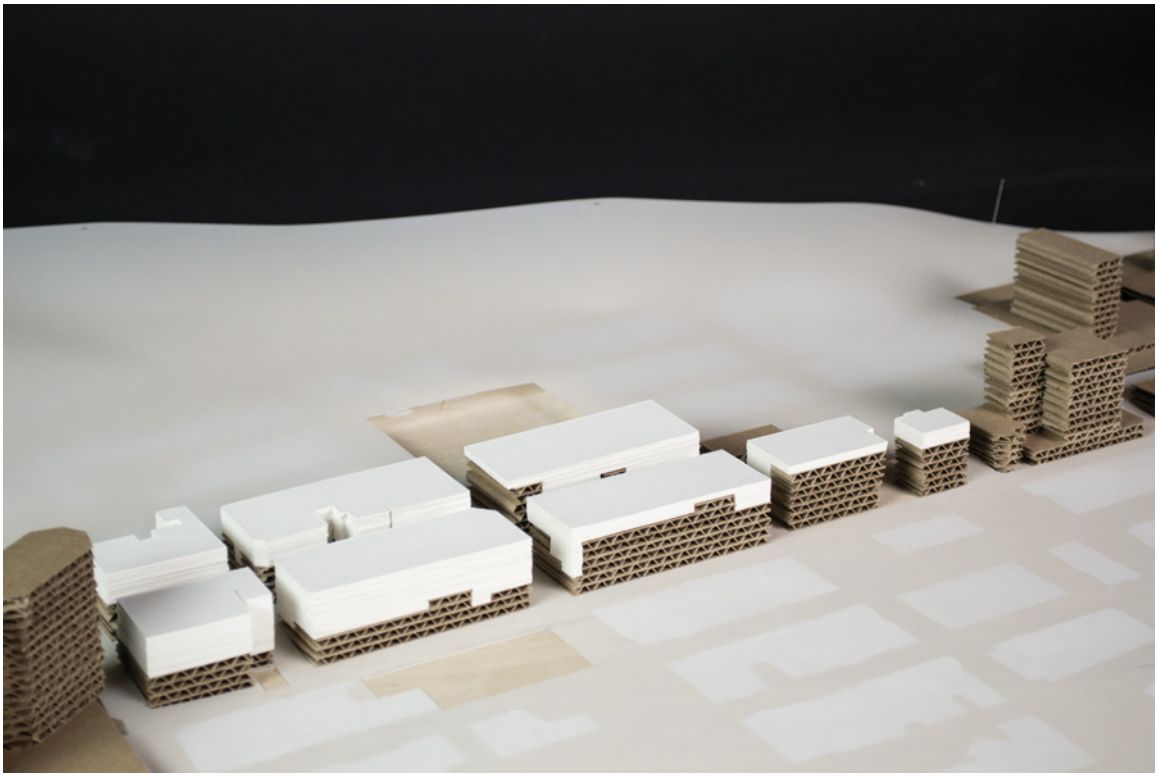
Proposed Addition

Housing

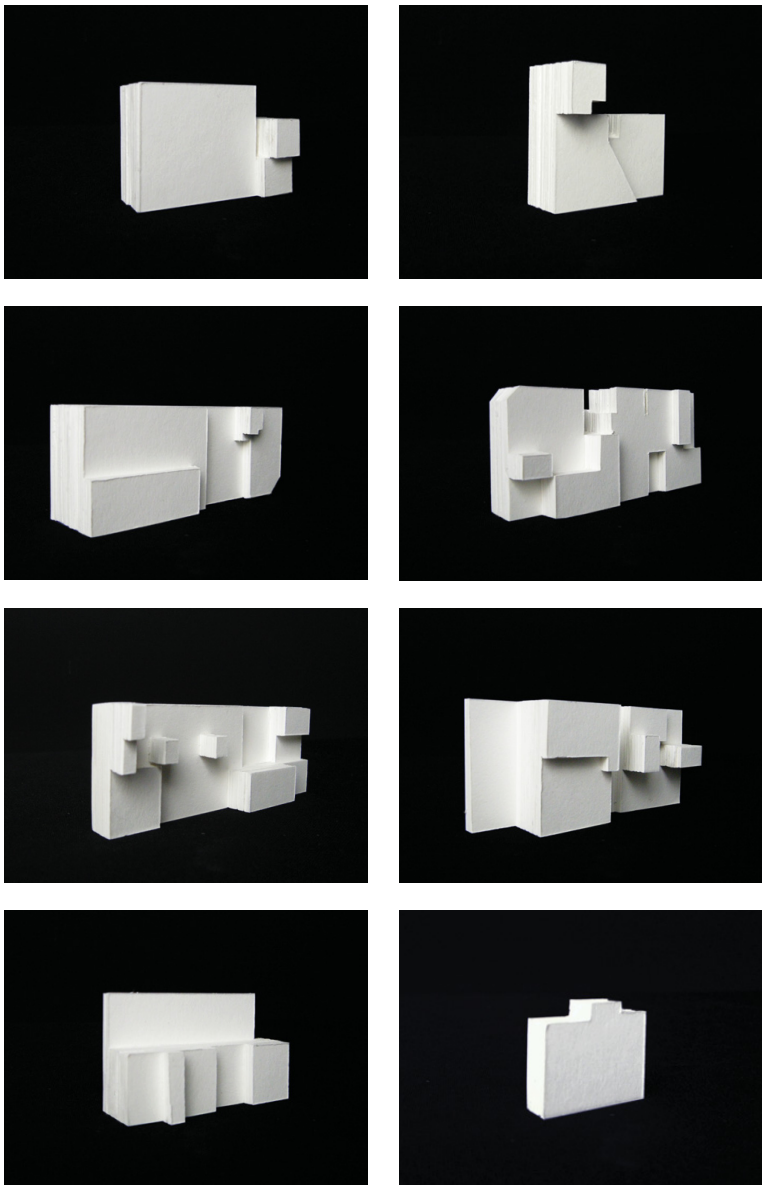
The housing program is inserted within the box truss, interacting with it, pushing up and down, forward and backward. This enables the units to take advantage of the rooftop space of the truss, which contains communal laundry facilitates, park space, benches, trees, and playgrounds. The units which hang below, engage with the existing roof layer below, and the units which push horizontally outside the truss gain extra space, and as well as private balcony space. The cores exist at approximately every 60 metres, in order to provide a means of egress. The proposed number of units added to the site is 166. Therefore with an average of two and a half persons per unit, approximately 500 people will be added to the street, within units providing qualities of light, space, privacy and green space. The population increase also serves to benefit the commercial space below.



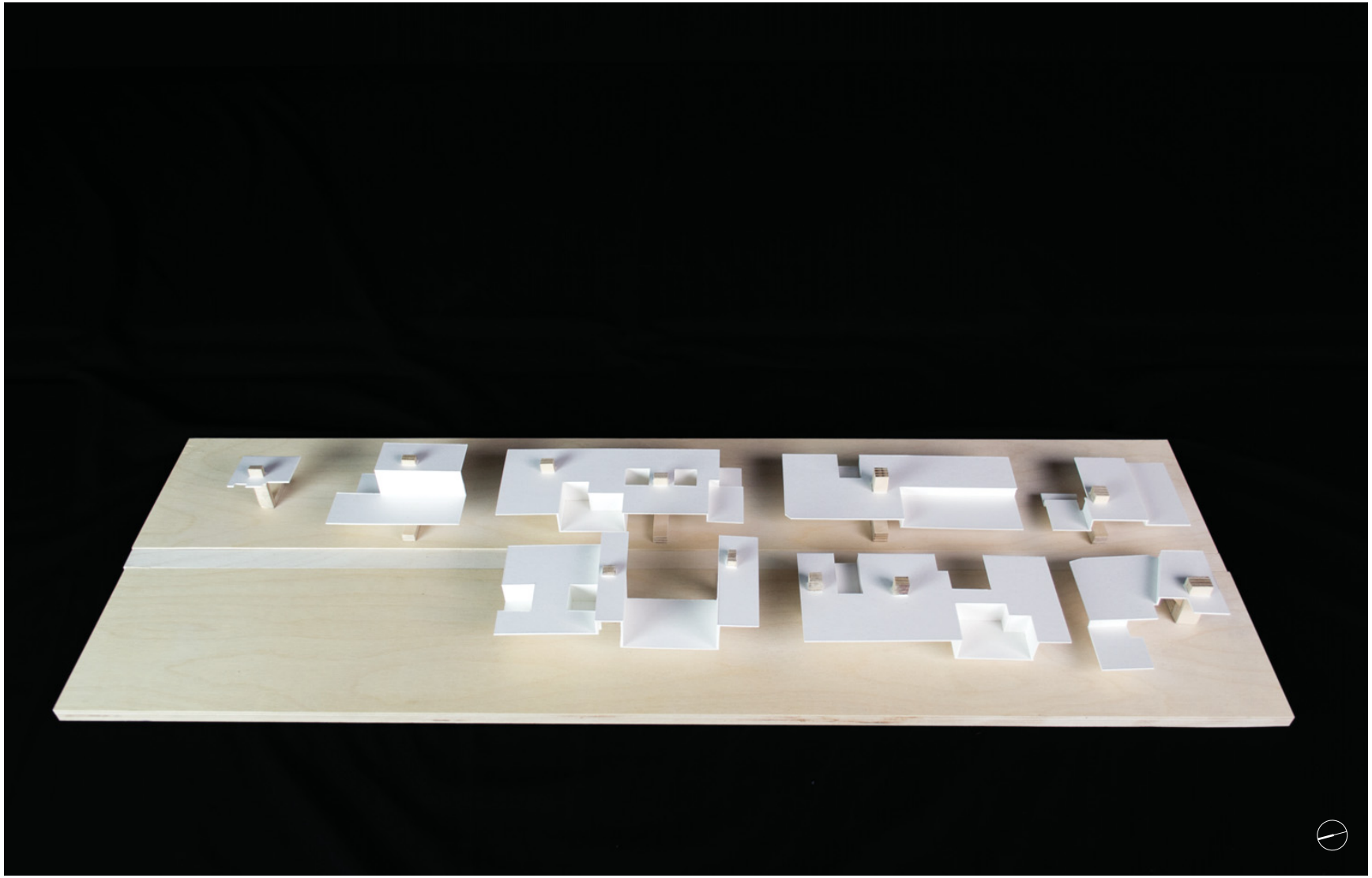
Site model (1:1000) of Barrington Street and its buildings



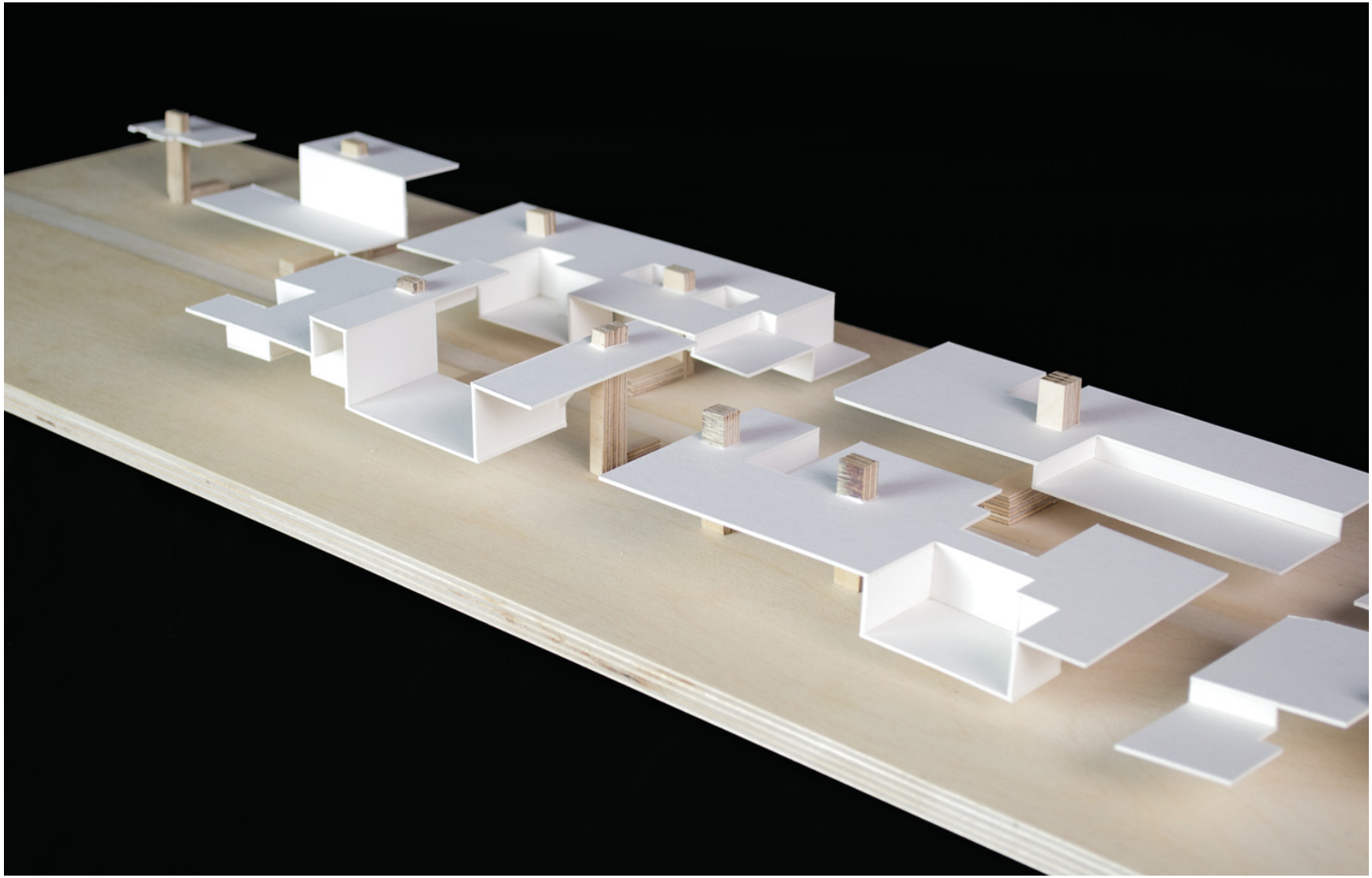
Model (1:1000) of Barrington street and the space above its buildings modelled in white



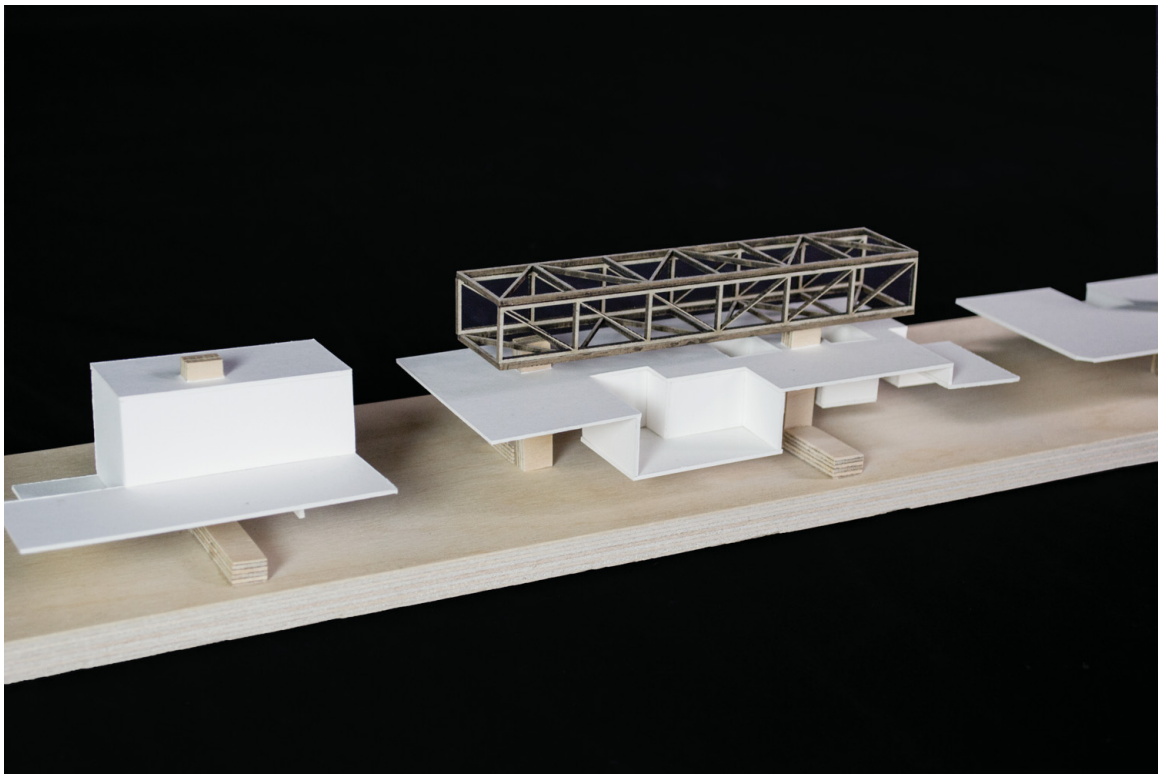
Study models (1:1000) representing the negative space above the rooftop layer along Barrington Street



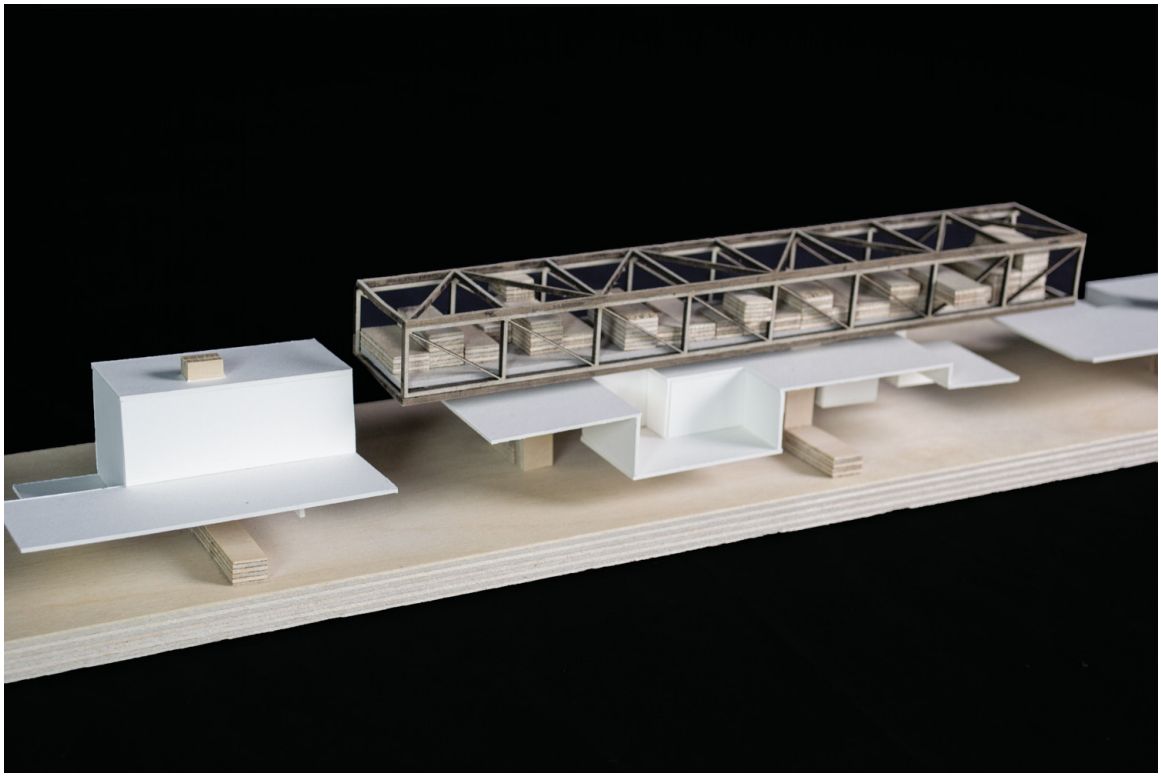
Study model (1:500) isolating the rooftop layer of the city and its interaction with the existing building cores and access to the street



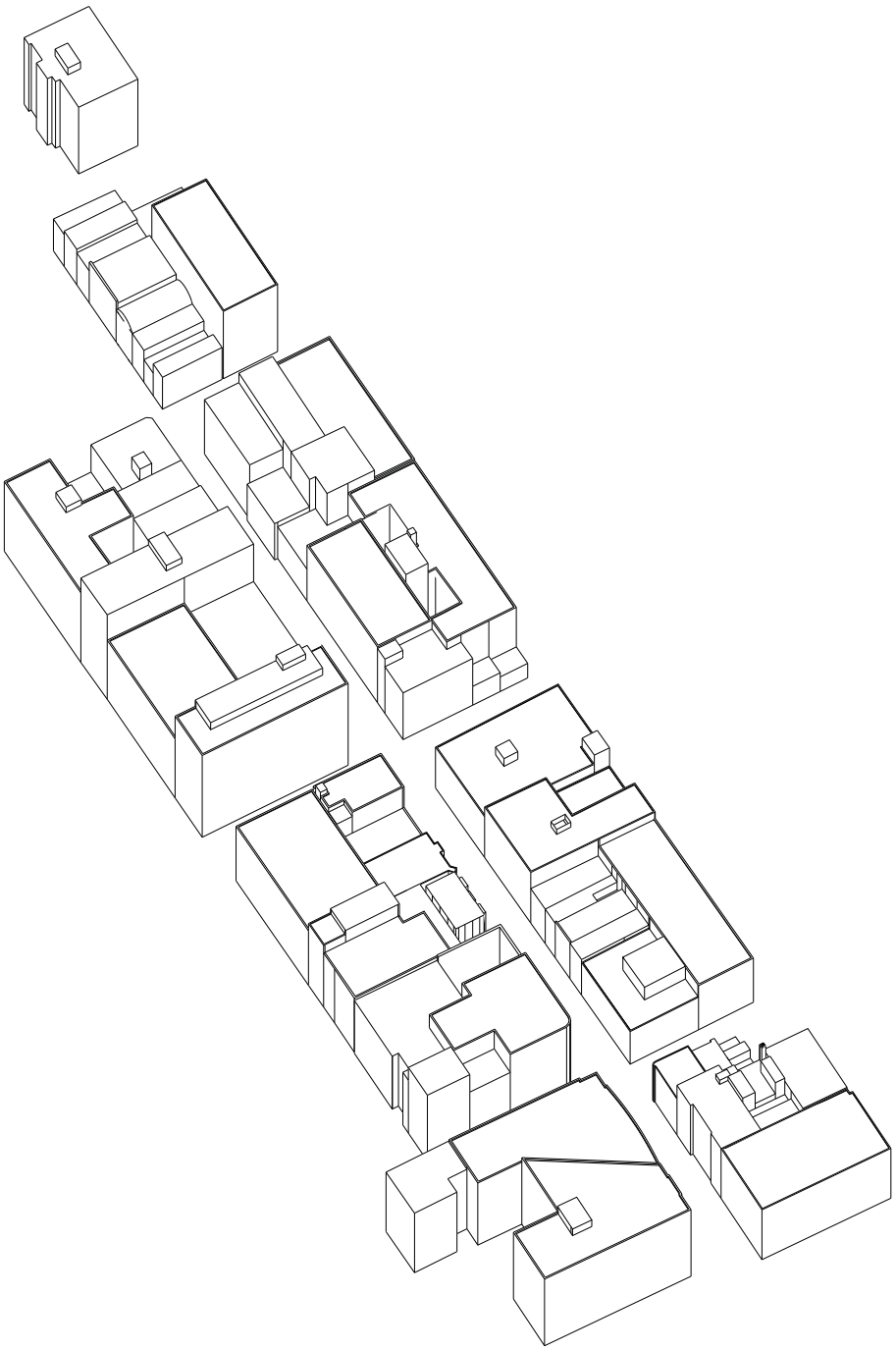
Study model (1:500) isolating the rooftop layer of the city and its interaction with the existing building cores and access to the street



Study model (1:500) of spanning a truss between existing building cores

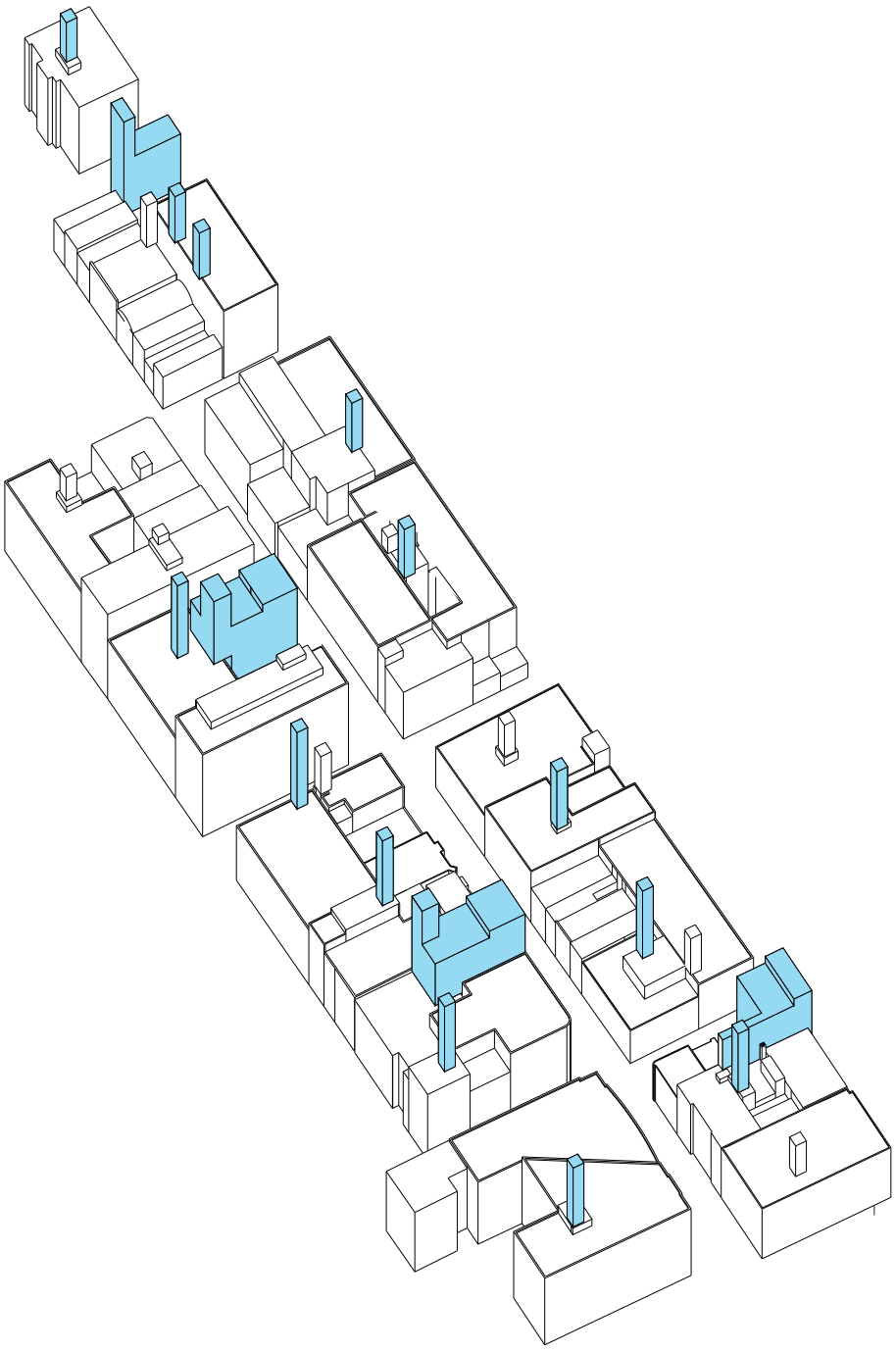


Study model (1:500) of this truss becoming filled with dwelling units



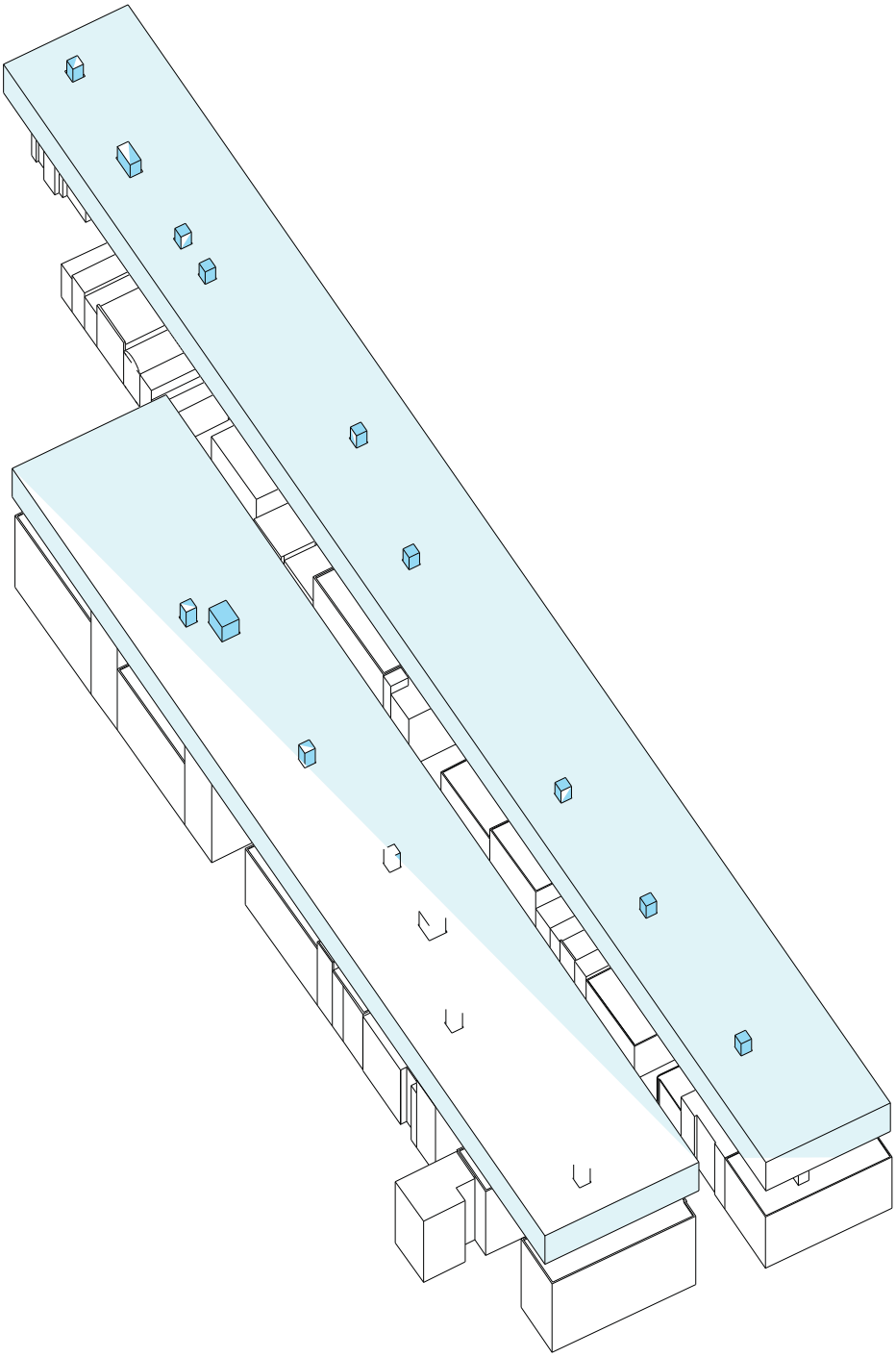
0 5 20 40m

The existing site



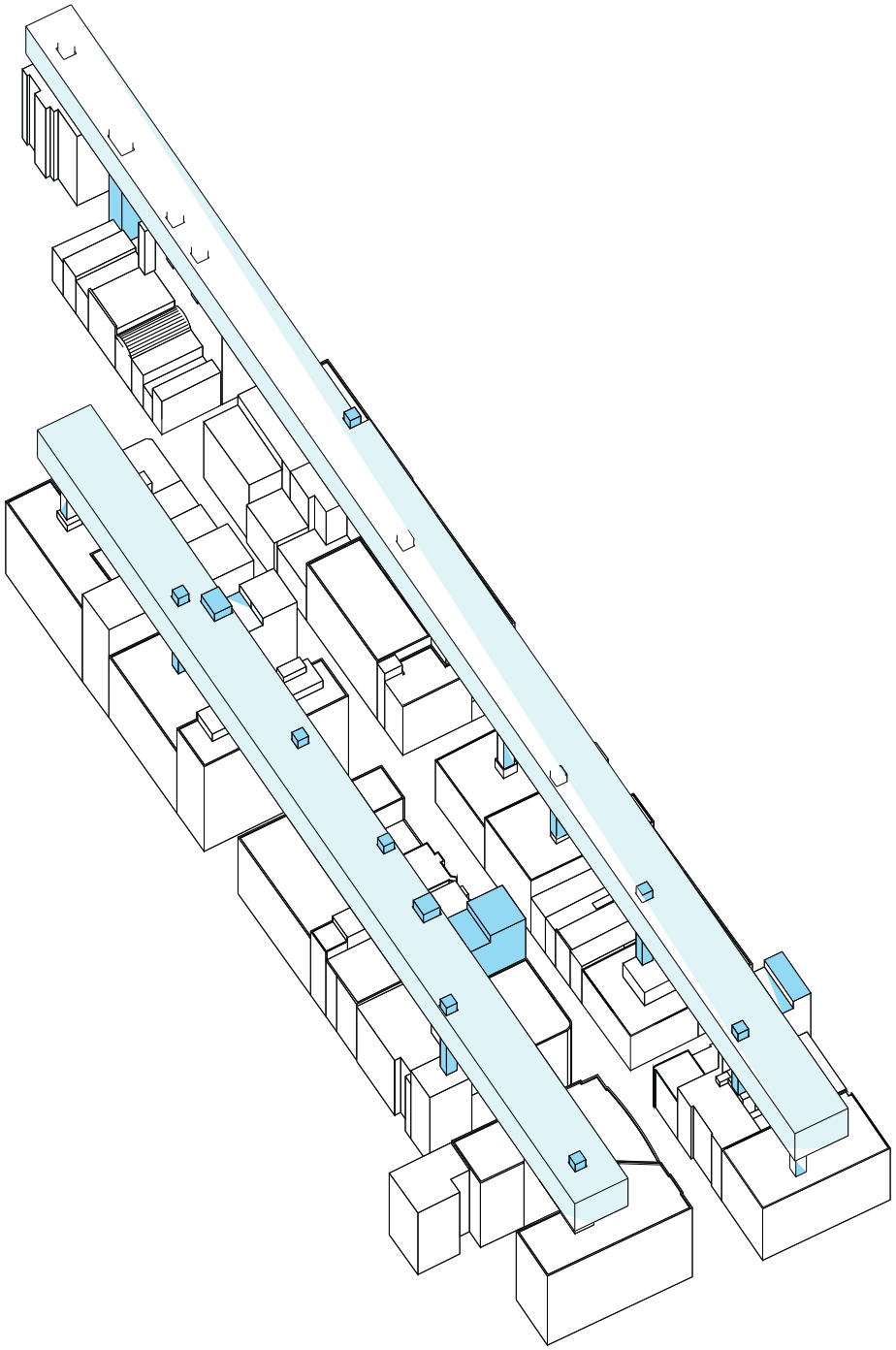
0 5 20 40m

The points of access of existing building cores, and commercial and daycare programs which occupy the vacant lots of the street, and whose rooftops become daycares which interact with the truss



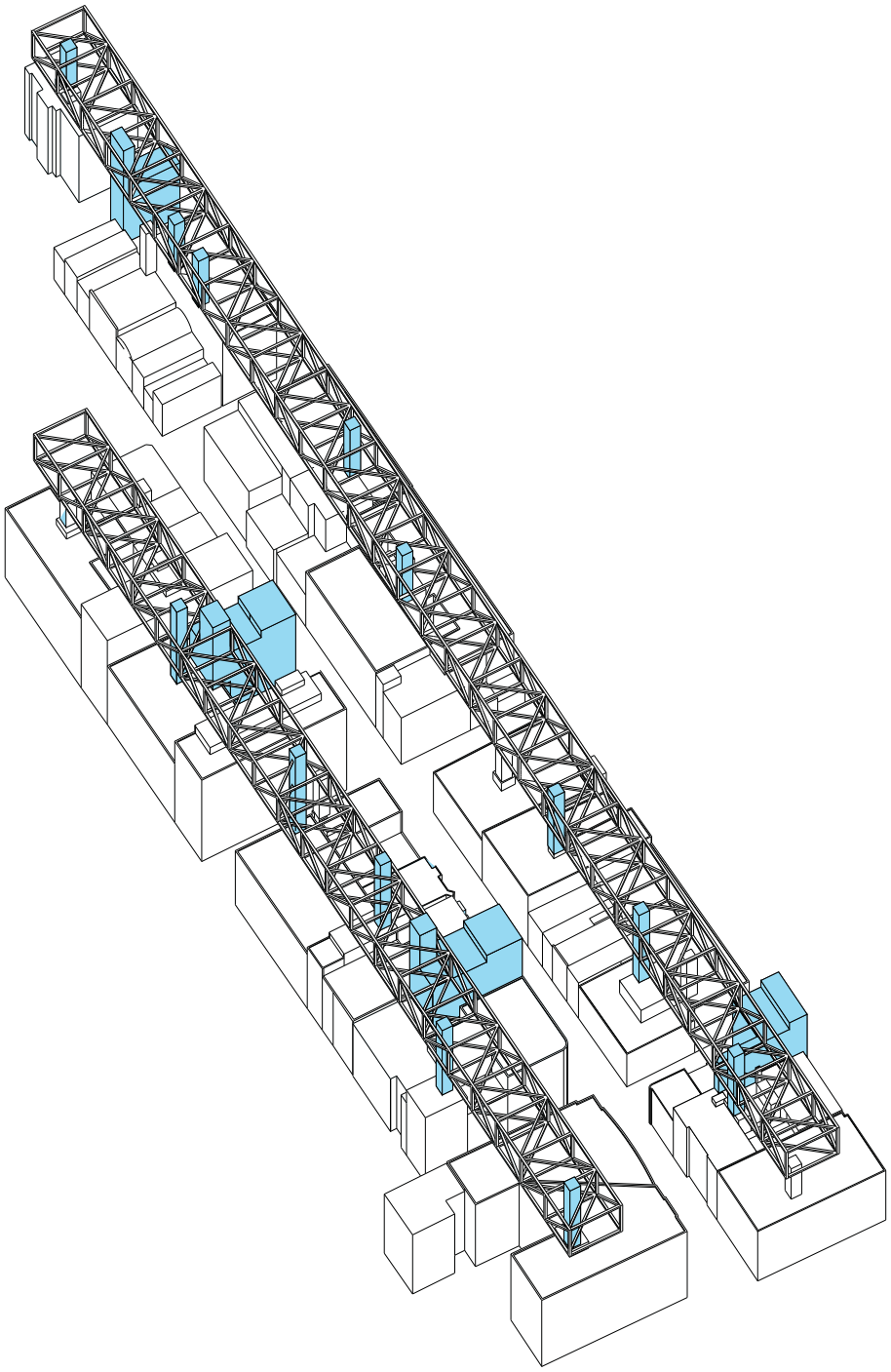
0 5 20 40m

The housing program is layered over the buildings resting on the cores



0 5 20 40m

The housing program is narrowed to 15 metres wide in order to be hung and supported by the existing cores



0 5 20 40m

The box truss becomes a means of spanning between cores, enabling the inside to become inhabited

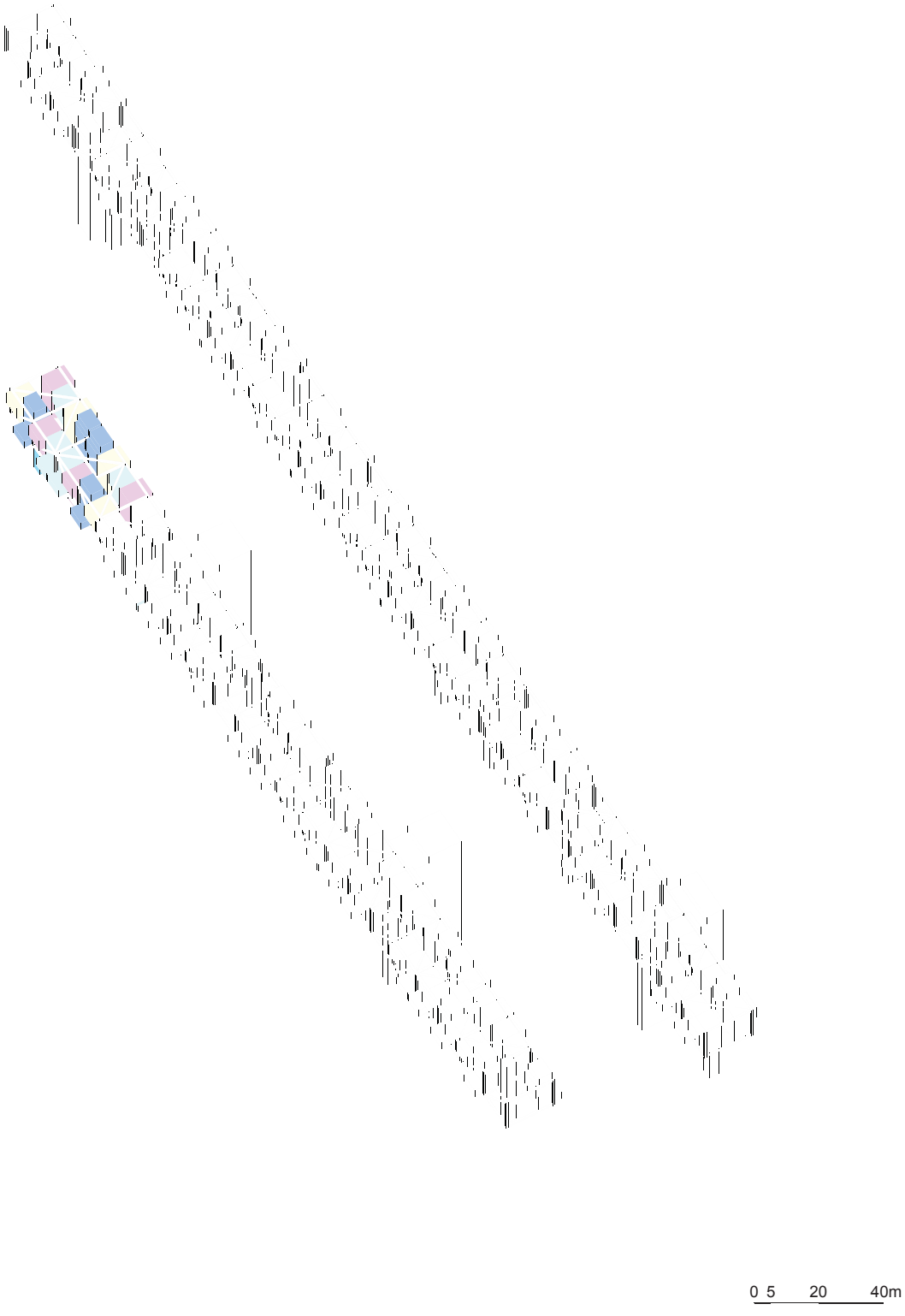
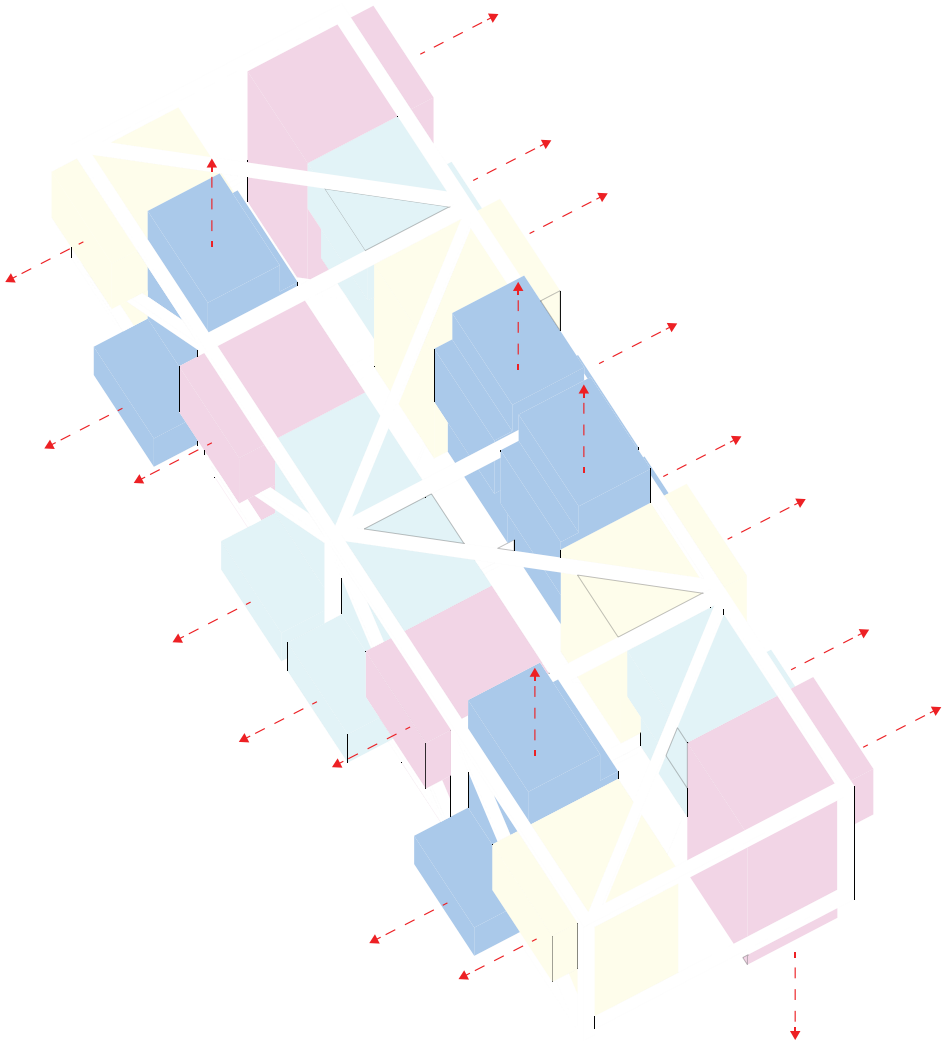


Diagram highlighting a section of the truss, typical of the structure, to be looked at in more detail

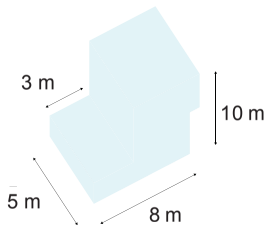


Section where the box truss spans across the rooftops, within which the program can push and pull within and beyond to interact with the site of the rooftops below

2 Bedroom

100 m^2

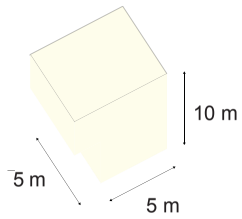
44 Units



2 Bedroom

95 m^2

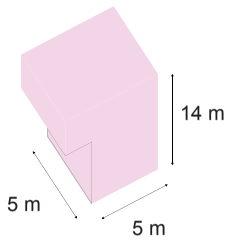
44 Units



3 Bedroom

122 m^2

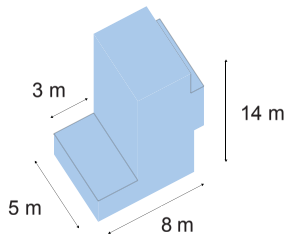
39 Units



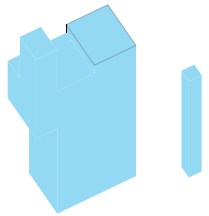
3 Bedroom

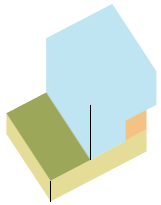
122 m^2

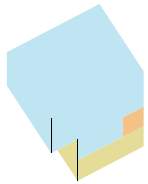
39 Units

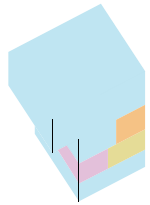


Points of Access and Services
Daycares
Playgrounds









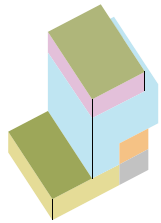
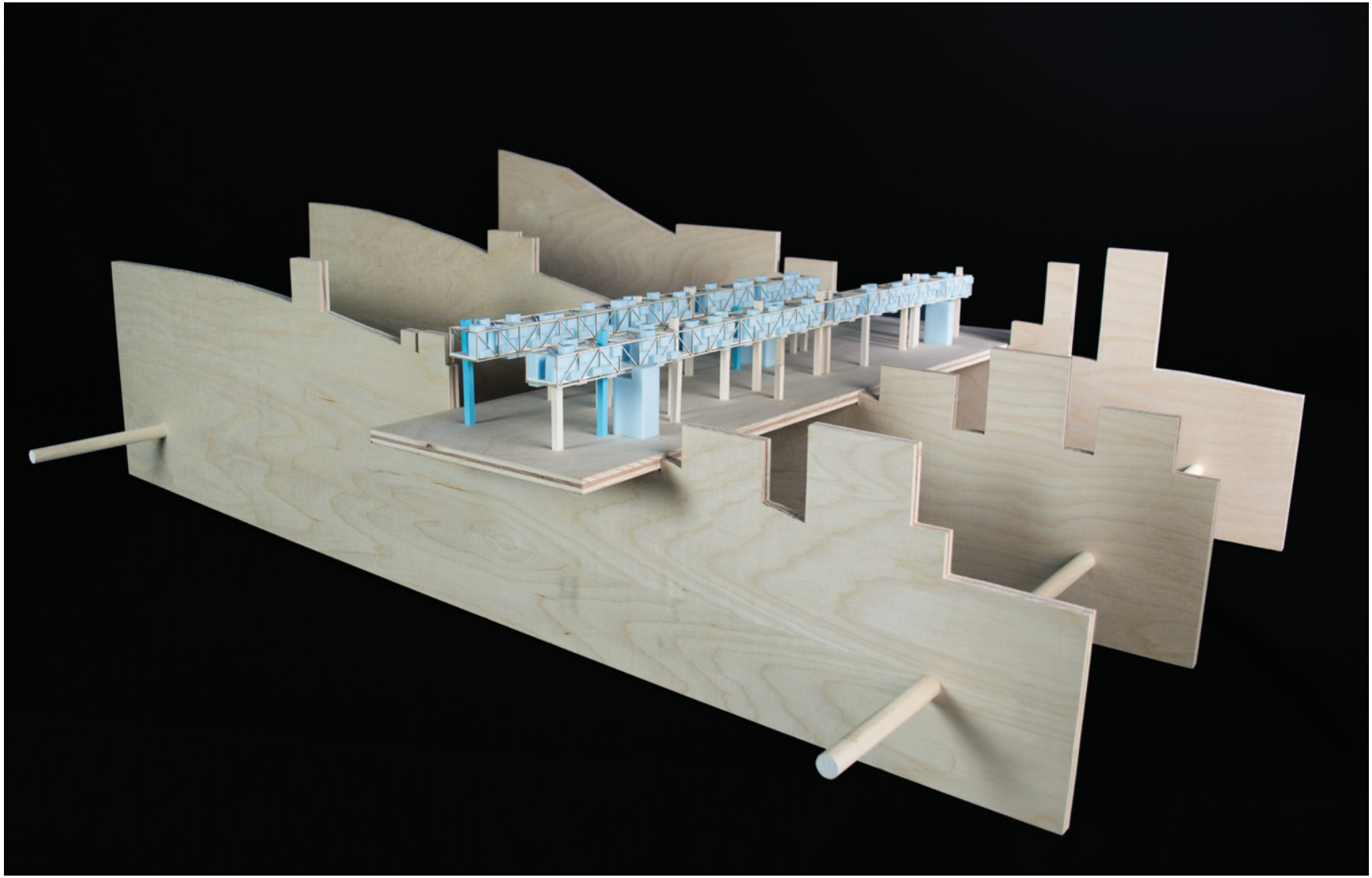
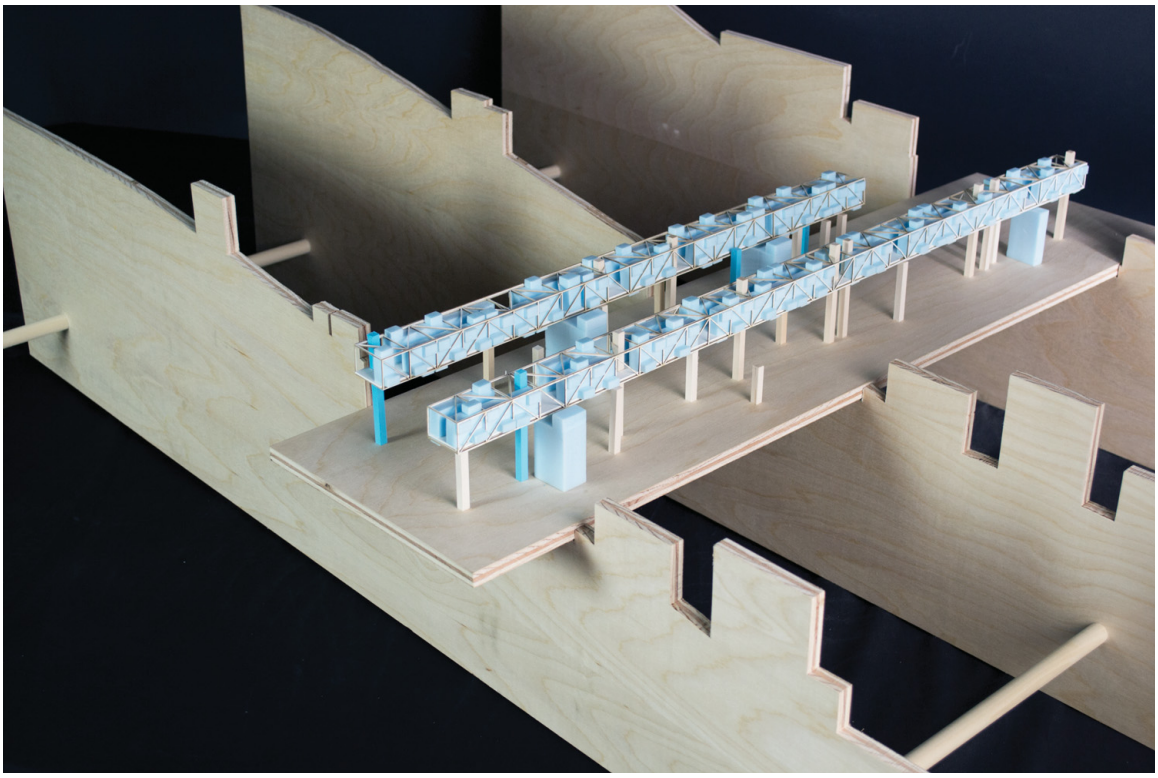


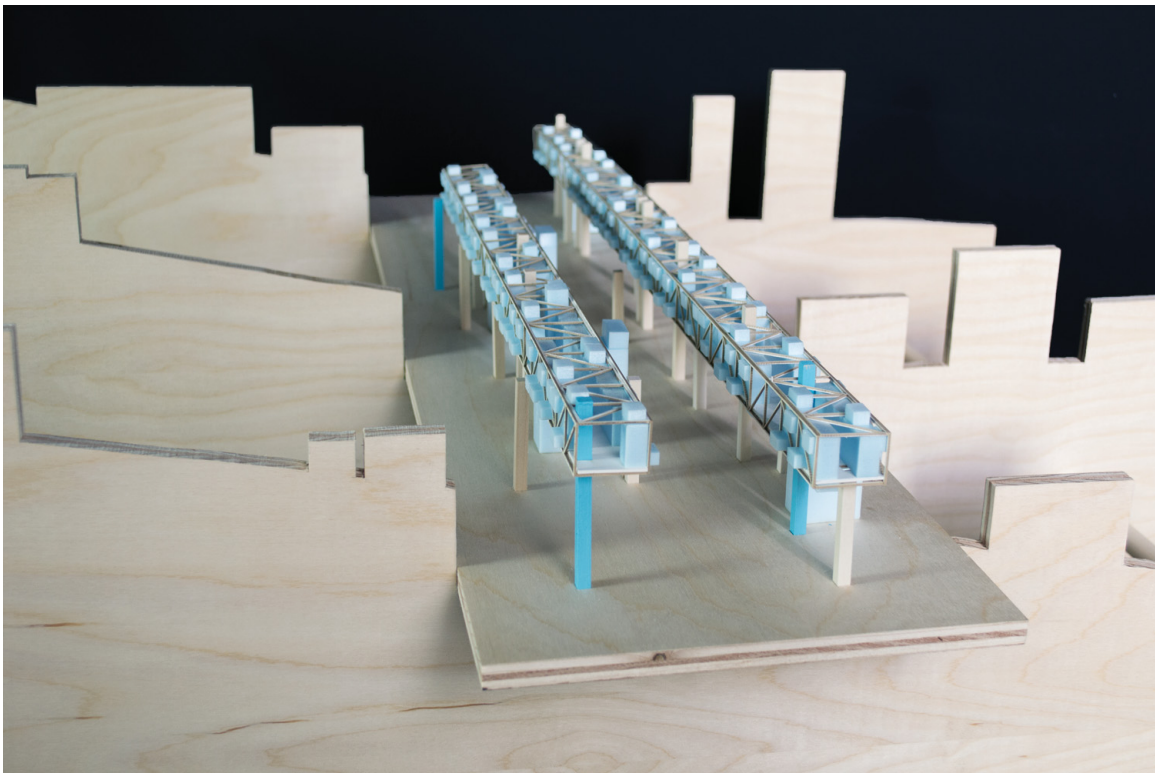
Diagram of unit types, sizes and programs which push and pull within the box truss



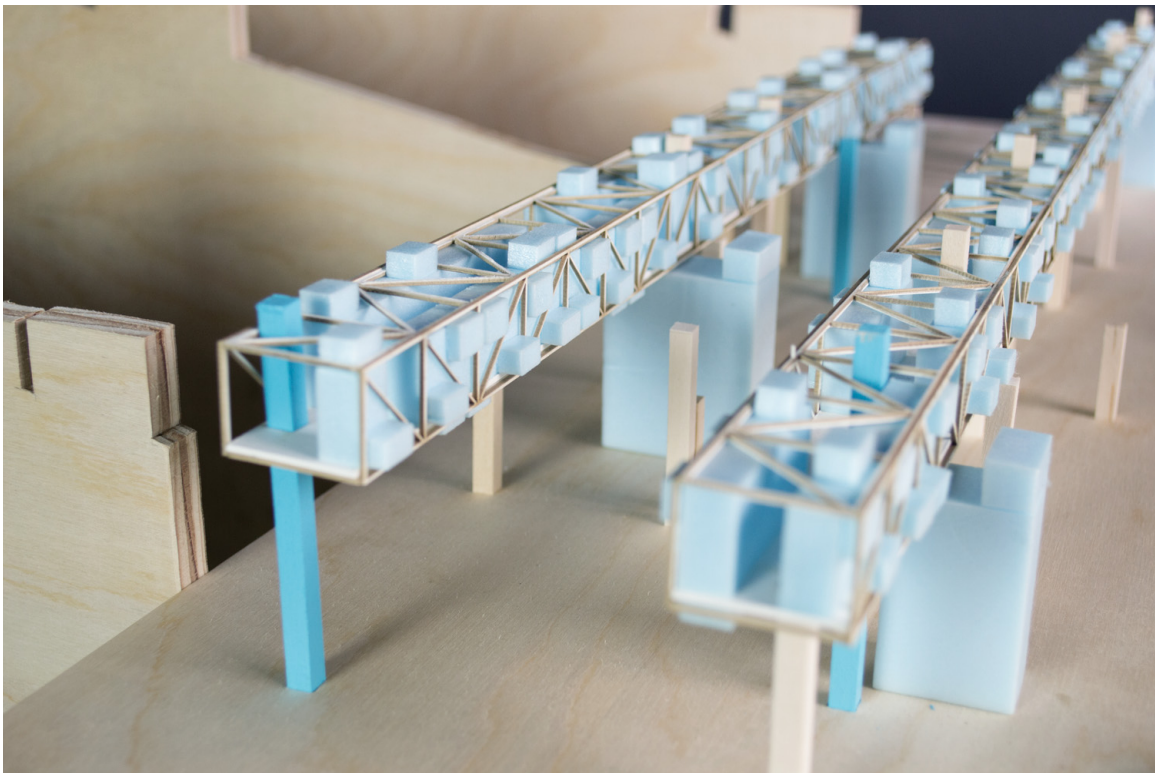
Model (1:500) showing the existing cores, housing and daycare program, hung within the truss spanning between cores



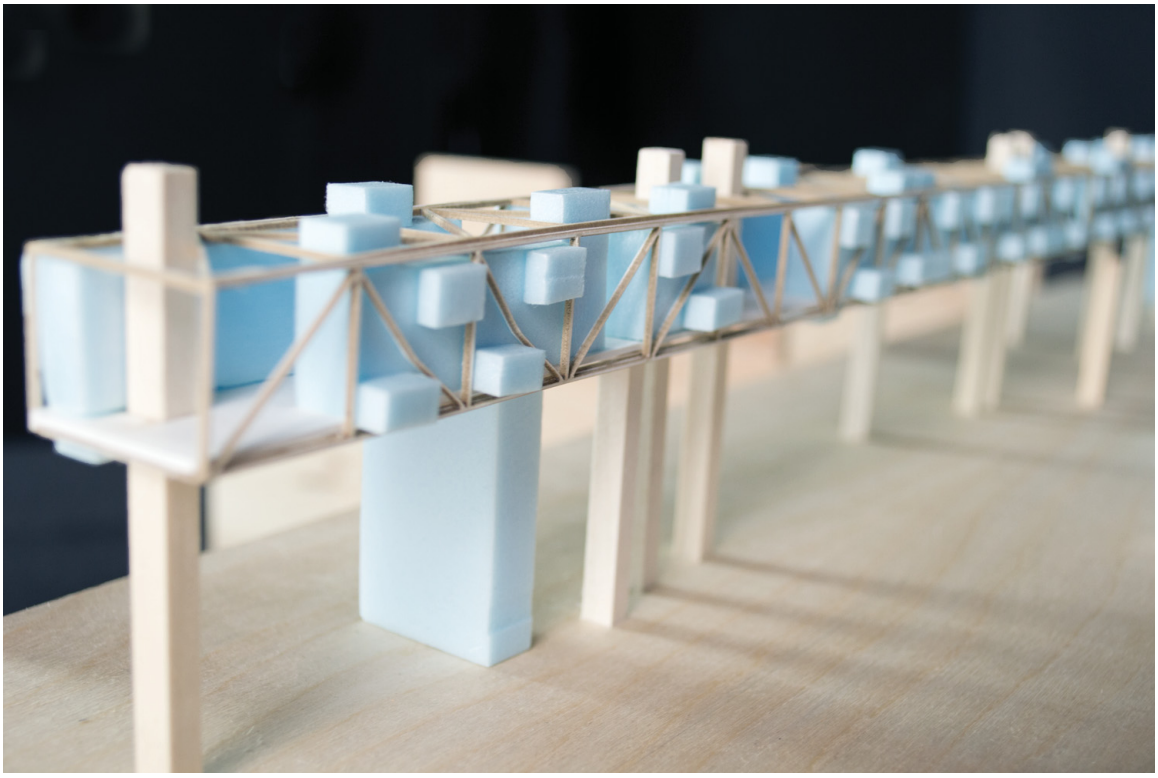
Model (1:500) showing proposed addition within the context of existing building heights



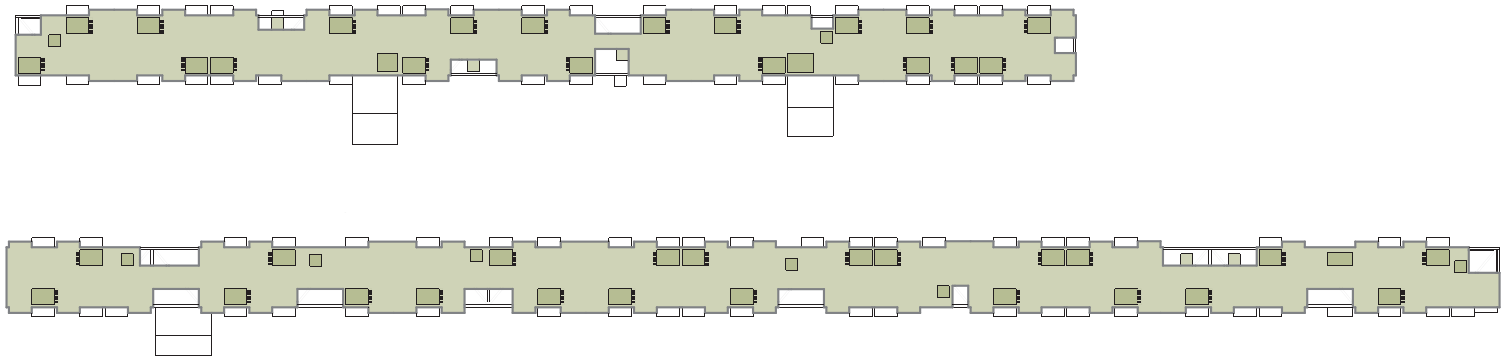
Model (1:500) showing the proposed addition from above



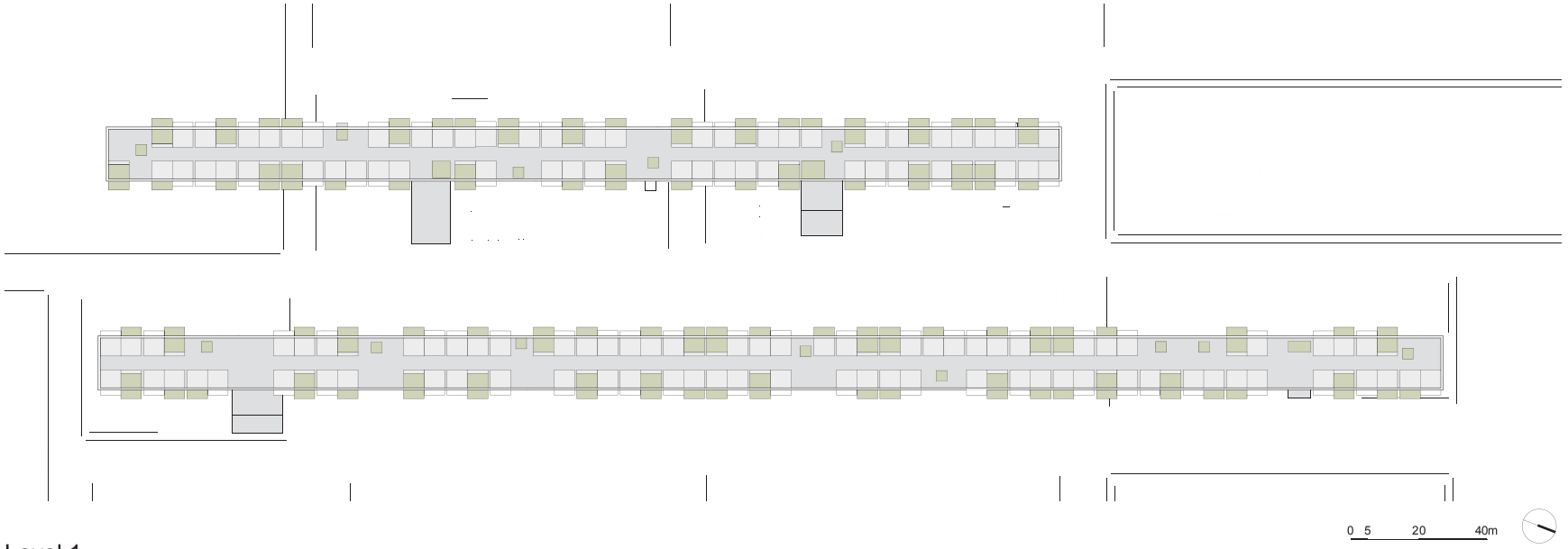
Model (1:500) showing the proposed addition



Model (1:500) showing the proposed addition in elevation

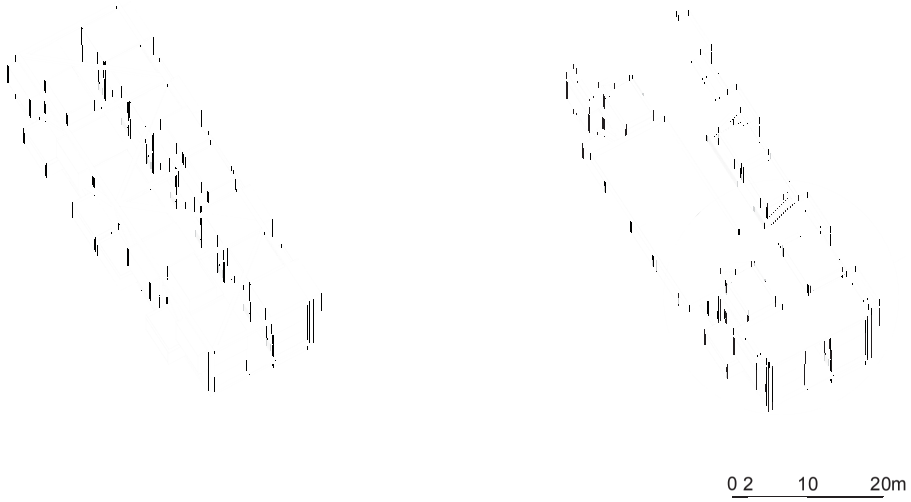


Roof Level

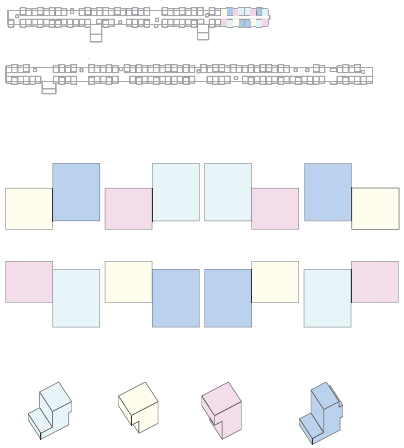


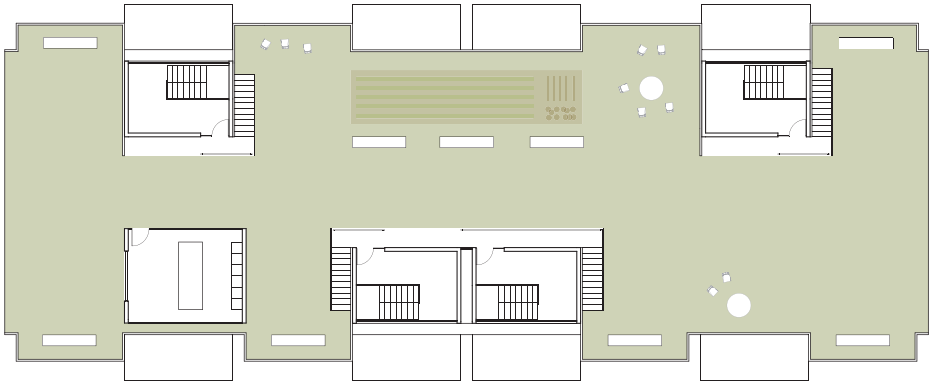
Level 1

Urban scale plans of units within the truss



Axonometric drawing of the highlighted section of the truss showing the hierarchy of private and public green space, with the darkest green being private and the lightest public, as well as the public nature of the rooftop

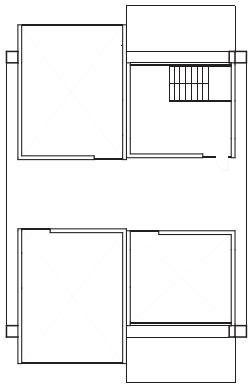




Roof Level

0 1 4 8m

Plan of the roof level



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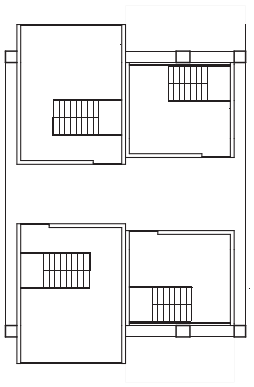

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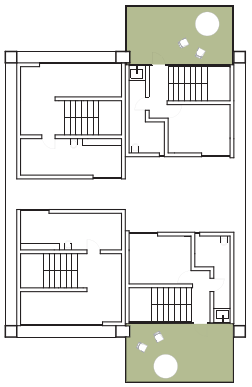

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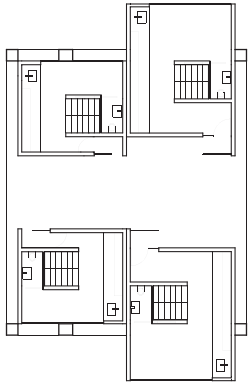

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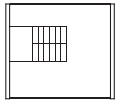


0

0 1 4 8m

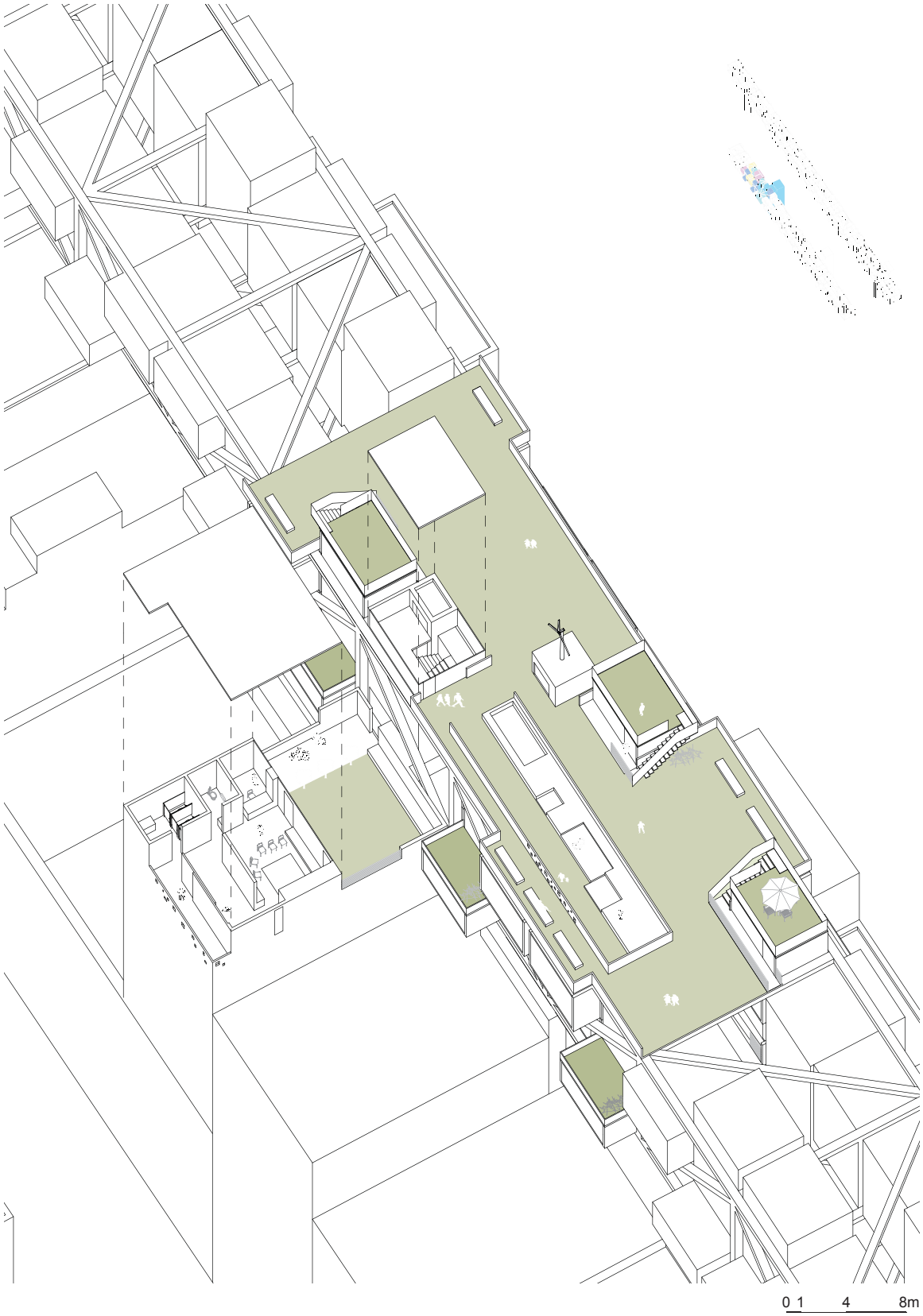
Plan of each unit type and how they sit together within the truss

Daycares and Playgrounds

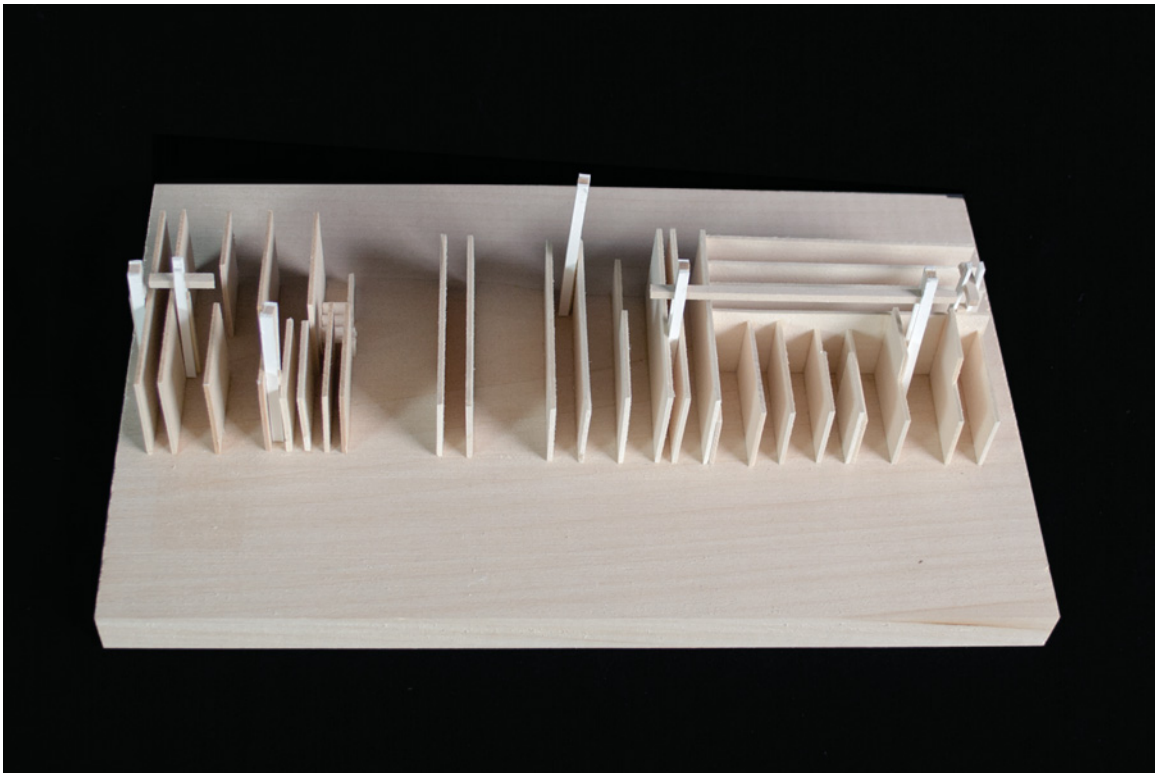
The daycares exist at the points where infill extends below to the street within the vacant lots. They occupy the roof of these allocated commercial spaces, and feed into the sidewalk (level 1) of the truss, which runs along the length of the addition, and acts as an outdoor hallway, providing access to the housing units. The daycares are separated from the truss by an outdoor courtyard, which also provides security through placing the administration office facing outward to this space. The daycares contain many of the same programmatic elements of the Unité d'Habitation, such as a nap room, bathrooms, offices, and classrooms. Above them, on the roof level will be playgrounds, serving as public spaces, which are convenient for the daycares to have in close proximity.

Public Space

The limits of the housing program are pushed with the idea of further hanging additional public space from the truss to interact with the existing rooftops below. The identification of existing structural walls and parti walls was important to establish in order to support this additional load. The possibility of the need to reinforce these structural elements prior to placing this load should be considered. The public space is imagined as park space, sports facilities, such as a basketball court, and additional commercial space.



Axonometric drawing illustrating the daycare and how it interacts with the truss, and uses the roof-top as a playground



Establishing the pattern of the existing structure below

Commercial and public space

Existing structural walls

Cores with services

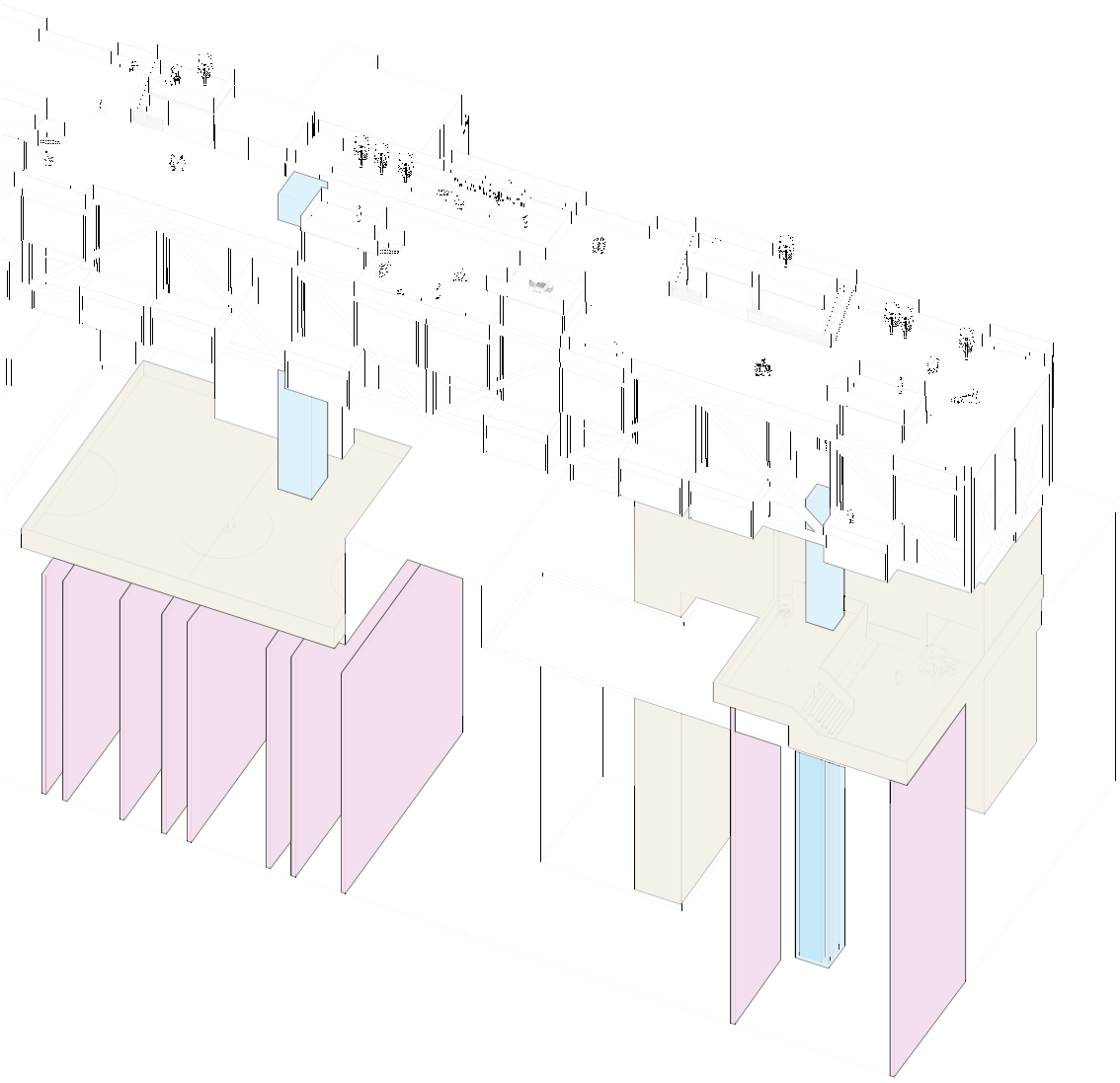
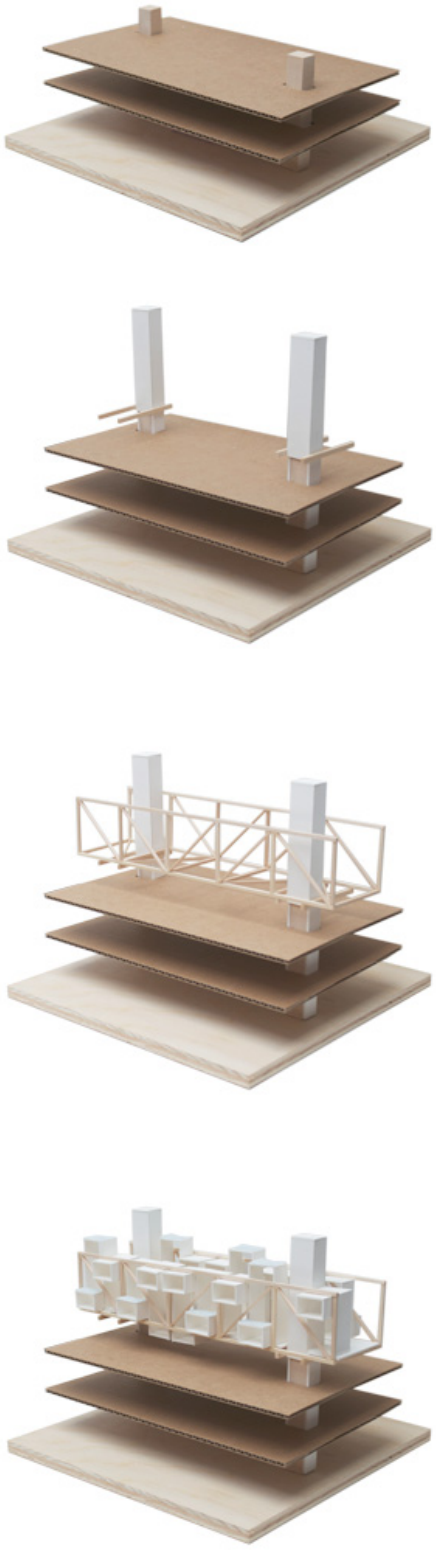
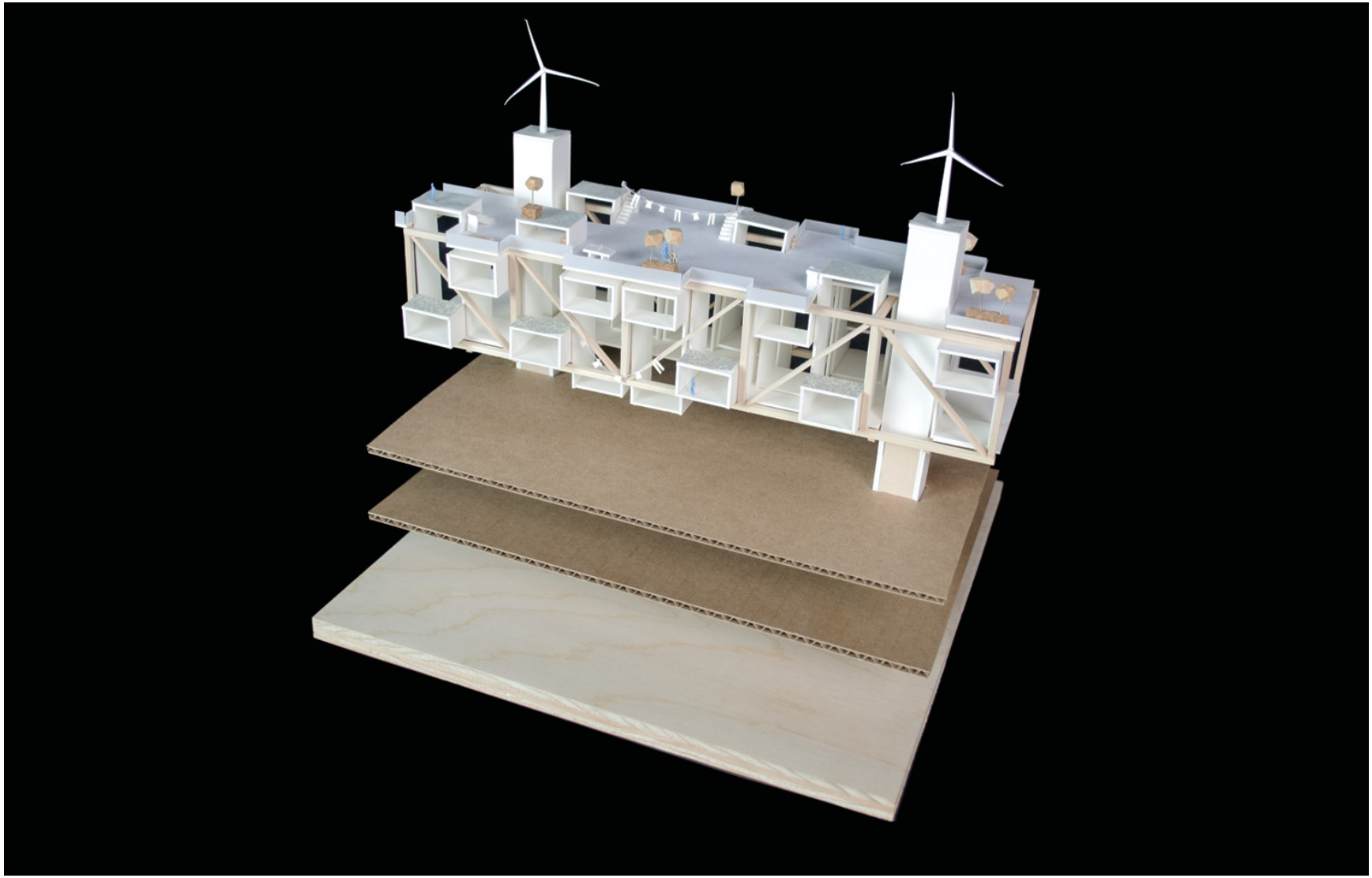


Diagram showing the potential use of space below the truss for hanging commercial and public space, as well as a strategy for relying on the existing buildings



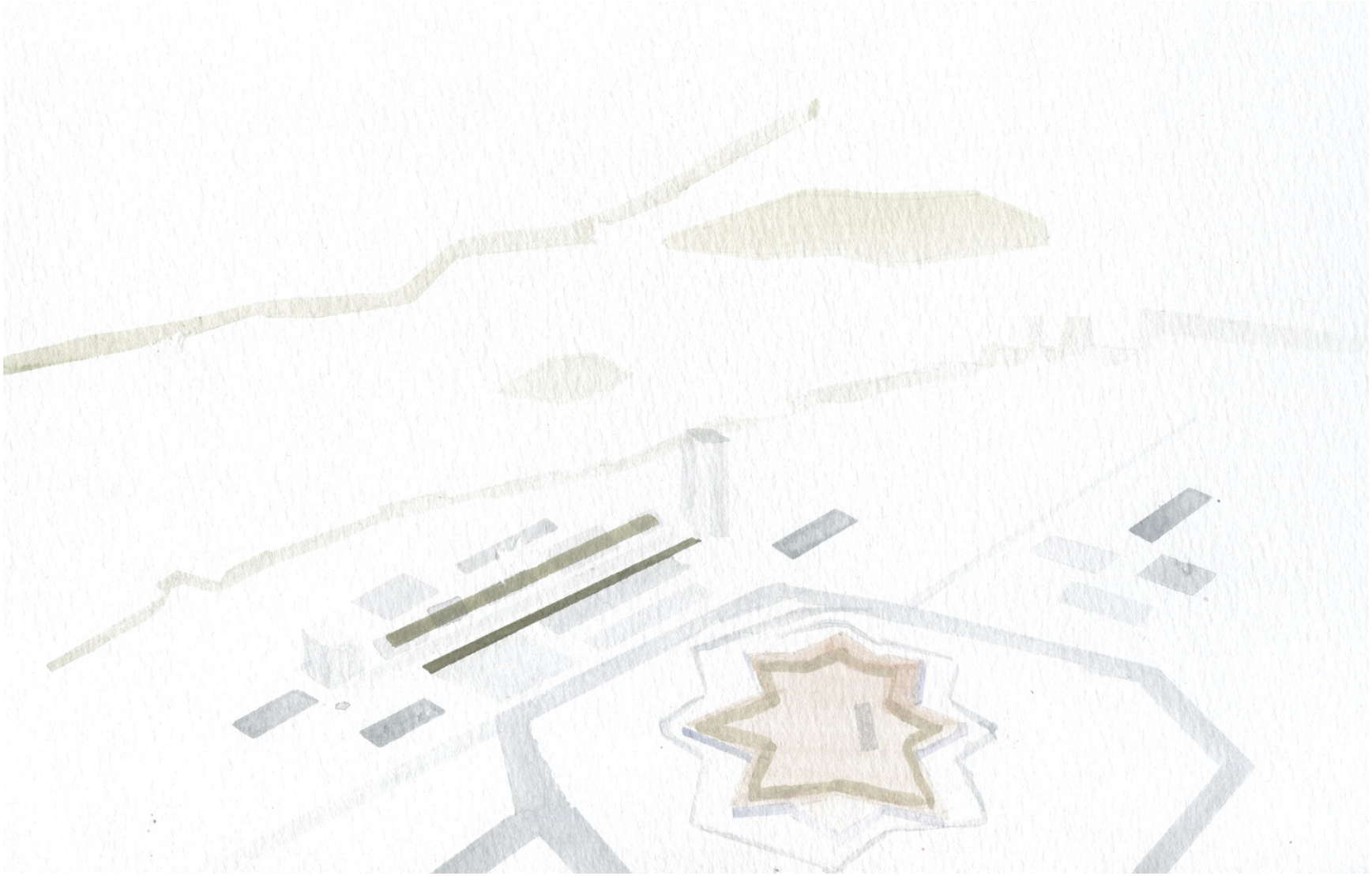
Model (1:200) explaining the structural strategy for attaching onto existing building cores, through reinforcing existing cores by adding structure around them, and inserting structure between levels to the foundation



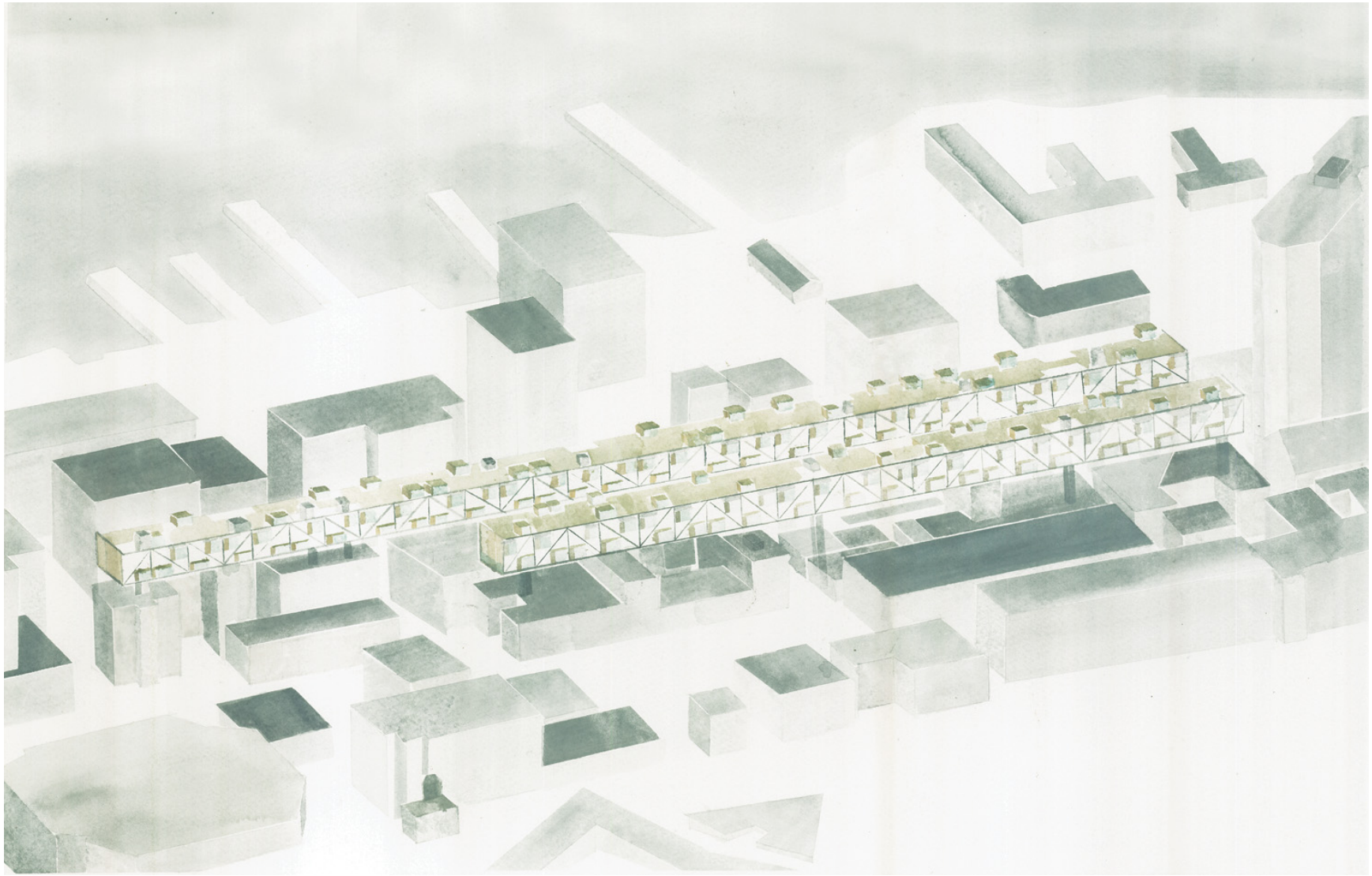
Model (1:200) of a section of the proposed addition, above the existing

Model (1:200) of the proposed addition, showing the public use of the roof space for laundry, and park space, as well as for access to units below

Model (1:200) of the proposed addition in elevation



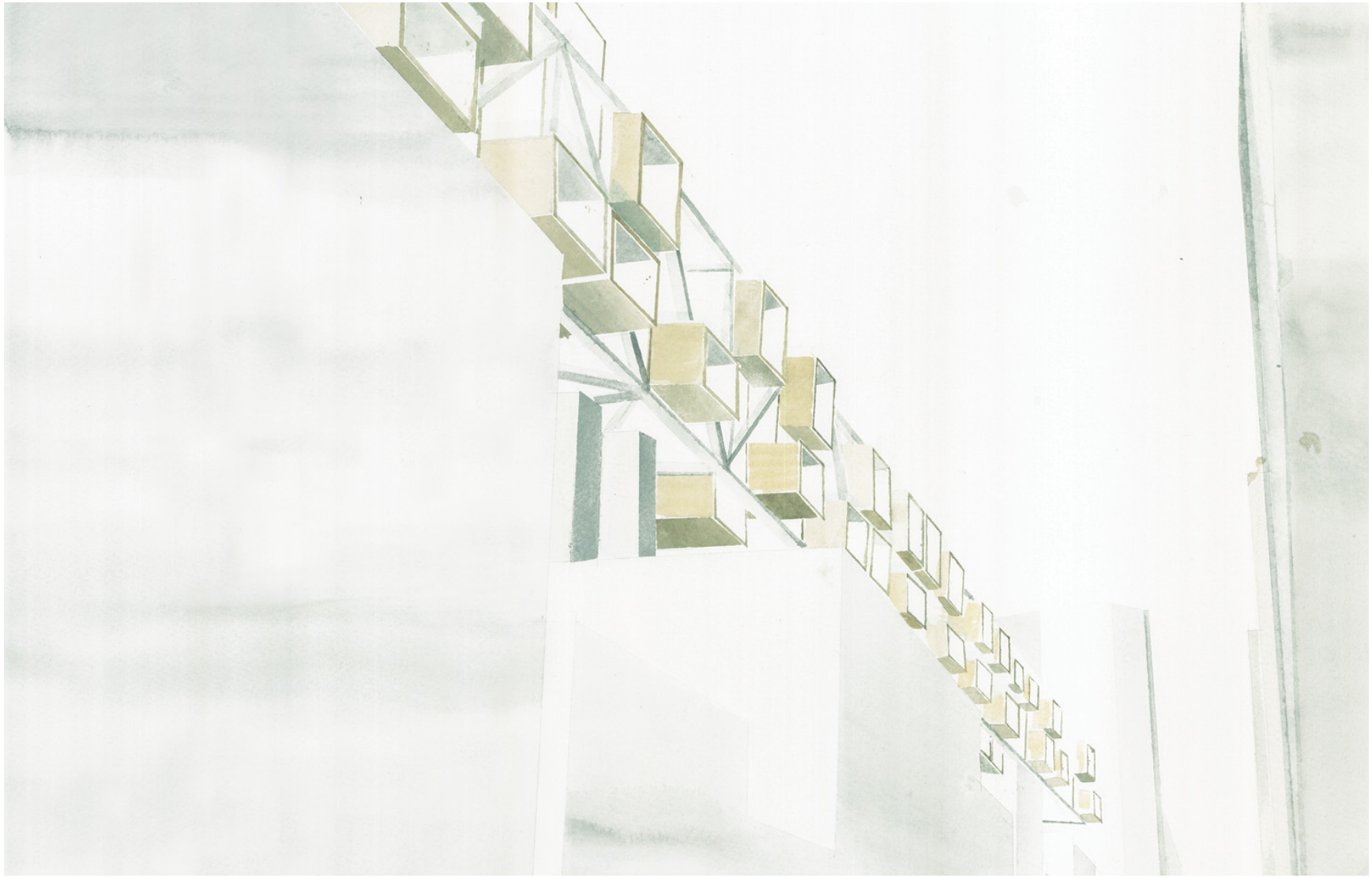
Watercolour painting of the proposed addition on a city scale



Watercolour painting of the proposed addition on a city scale

Watercolour painting of being on the rooftop

Watercolour painting of being in the public sidewalk within the truss



Watercolour painting of seeing the truss from the street below

Density and Scale Comparisons

The following pages are a summary of the density levels, and amount of housing, public, and green space provided by the addition, as compared to the precedents of the Garden City and Unité d'Habitation.

Scale : 1:5000

Garden City

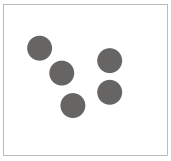
Total Population 32,000

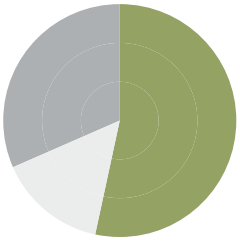
Total Site Area 5.85 km^2

Density: Total Population/ Total Area (people per km²) 5,464

= 1000 people

= 1 km



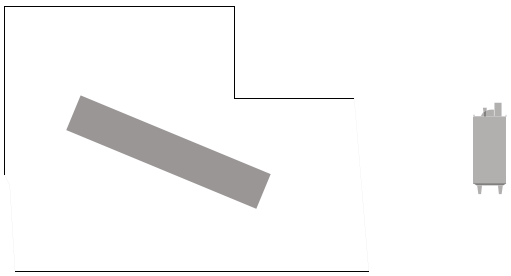


Green space	53%
Infrastructure	18%
Built Area	29%
Housing	30%
Public	17%
Industrial	53%

Population density and scale comparison diagram for the Garden City precedent

Scale : 1:5000

Unité d'Habitation



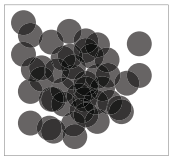
Total Population 1600

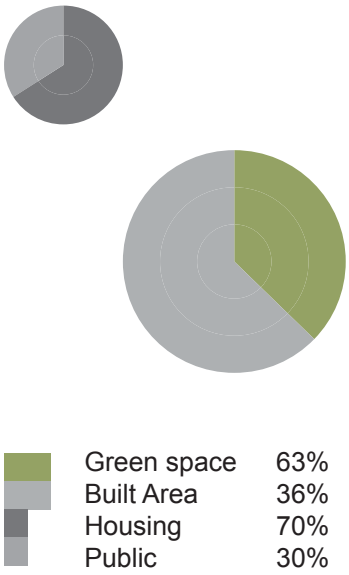
Total Site Area 0.035 km^2

Density: Total Population/ Total Area (people per km²) 45,261

= 1000 people

= 1 km





Green space	63%
Built Area	36%
Housing	70%
Public	30%

Population density and scale comparison diagram of Unité d'Habitation precedent

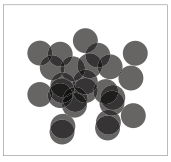
Scale : 1:5000

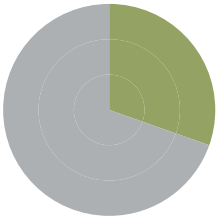
Rooftops of Barrington Street

Current Population	270
Current Population Density	14,084
Proposed Population Increase	500
Total Population	780
Total Site Area	0.01917 km^2
Density: Total Population/ Total Area (people per km^2)	26,604

= 1000 people

= 1 km





Green space	30%
Built Area	70%
Housing	65%
Public	37%

Population density and scale comparison of proposed rooftop housing over Barrington Street

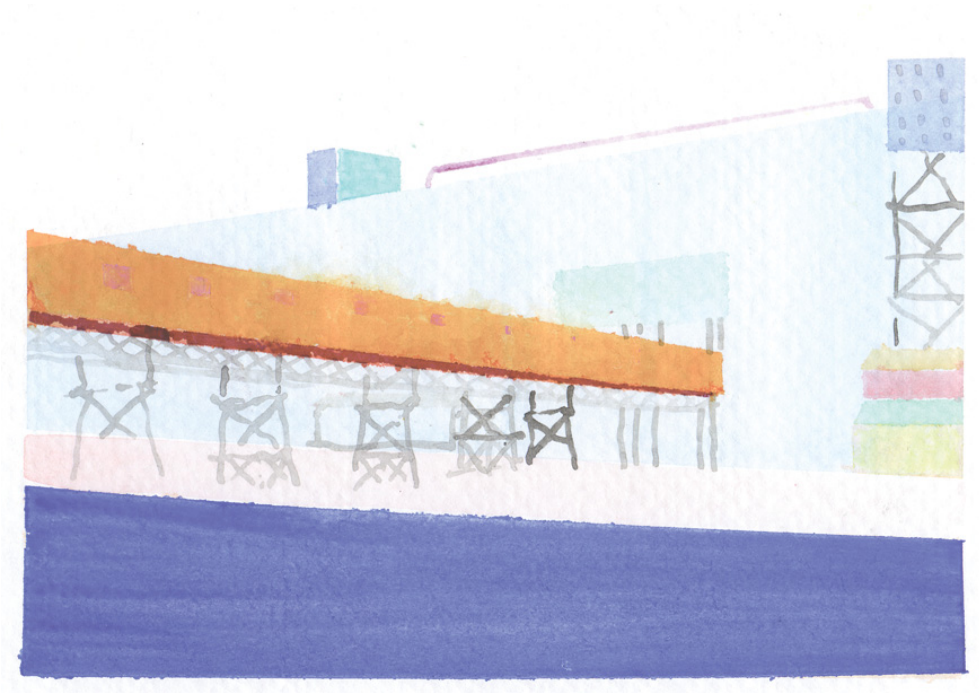
CHAPTER 3: CONCLUSION

The initial motivation for pursuing the idea of being on the roof emerged from an interest in mixing the old and the new building fabric, and establishing a dialogue between these two elements. After considering the qualities of being on the roof, and why one would want to live up high, the landscape of the rooftop site revealed itself as a place which is separate yet connected to the city below, calm, yet engaged, and brighter than the spaces within existing buildings. It became evident that the roof is an attractive place to live. After looking at the specific site of Barrington Street, and the need for density within the downtown, as well as the problem of urban sprawl within the region.

The limits of this idea have perhaps not yet been reached. The next step this project could take would involve expanding to other buildings of the downtown, and testing the limits of spaces to occupy in between and over top of the existing city. The notion of building on top of our cities suggests a new paradigm of future development. Halifax has been used for the purposes of this investigation, however one could imagine this idea being applied to other North American cities suffering the effects of urban sprawl.

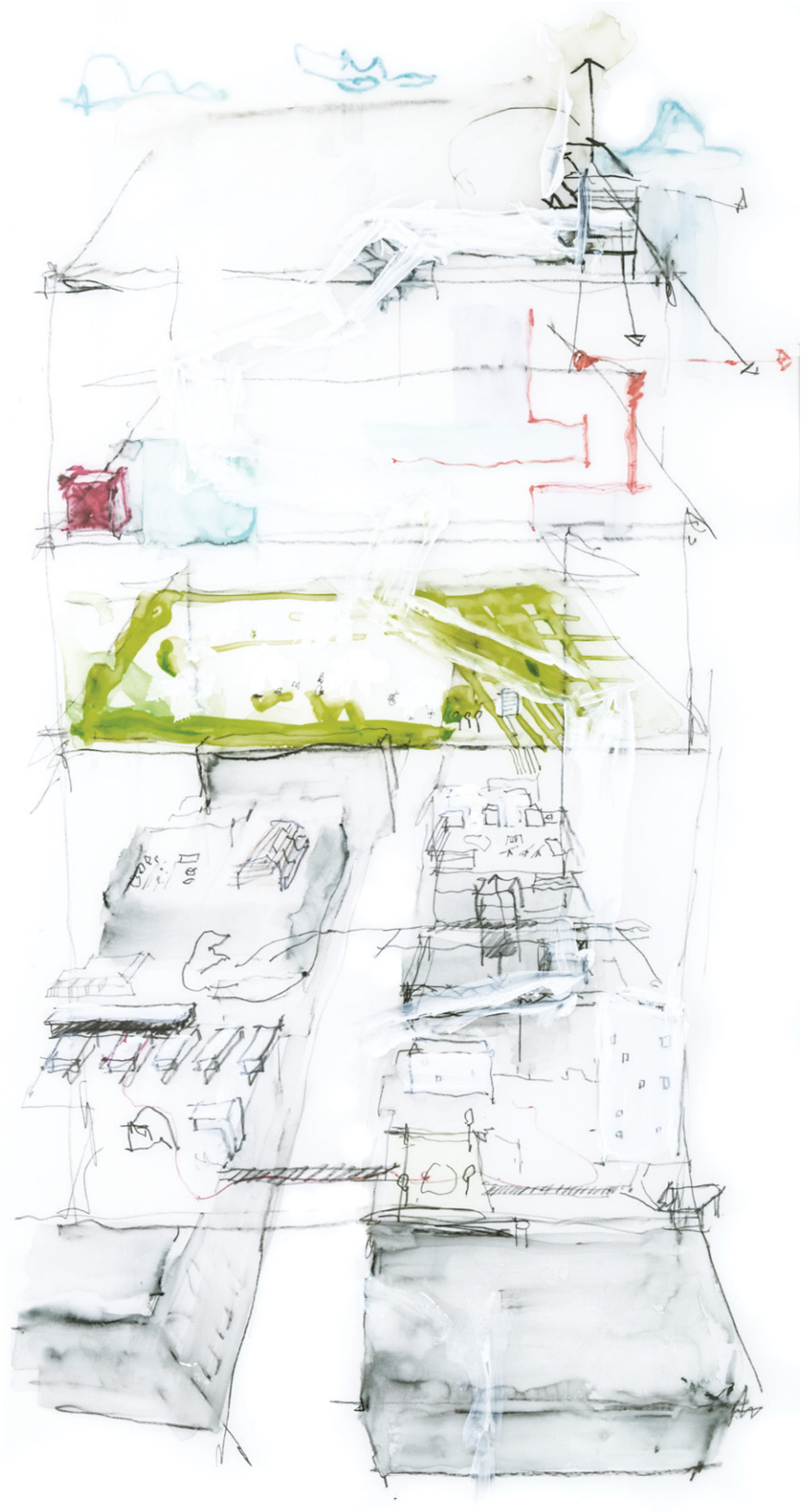
APPENDIX: WATERCOLOUR STUDIES

The development of the concept and proposed design was developed in parallel with this series of watercolour paintings. They served as conceptual imaginings of the idea of living above the city.

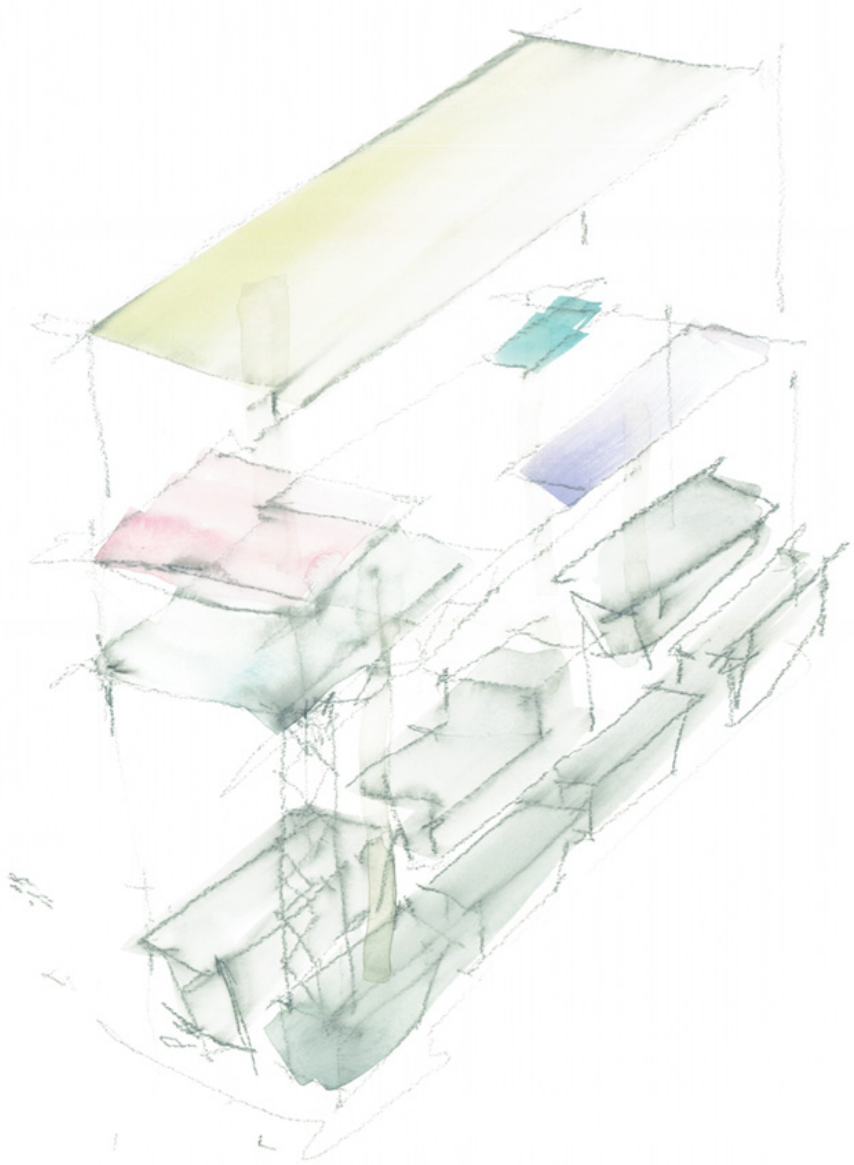


The Halifax grain elevator, documenting the local context and strategies for buildings above the ground level

Sectional study of building on top



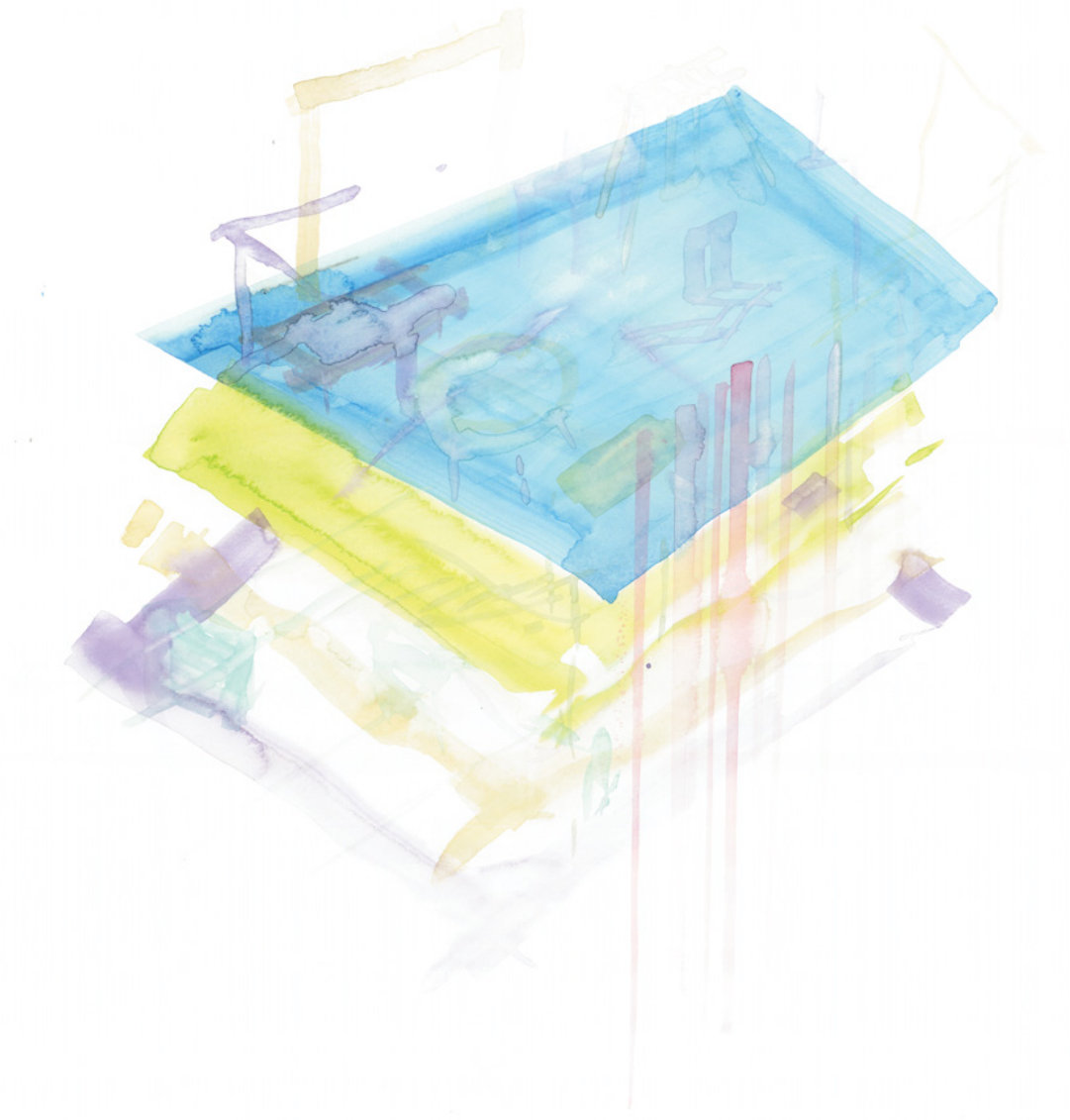
View from above study of building on top and layering program



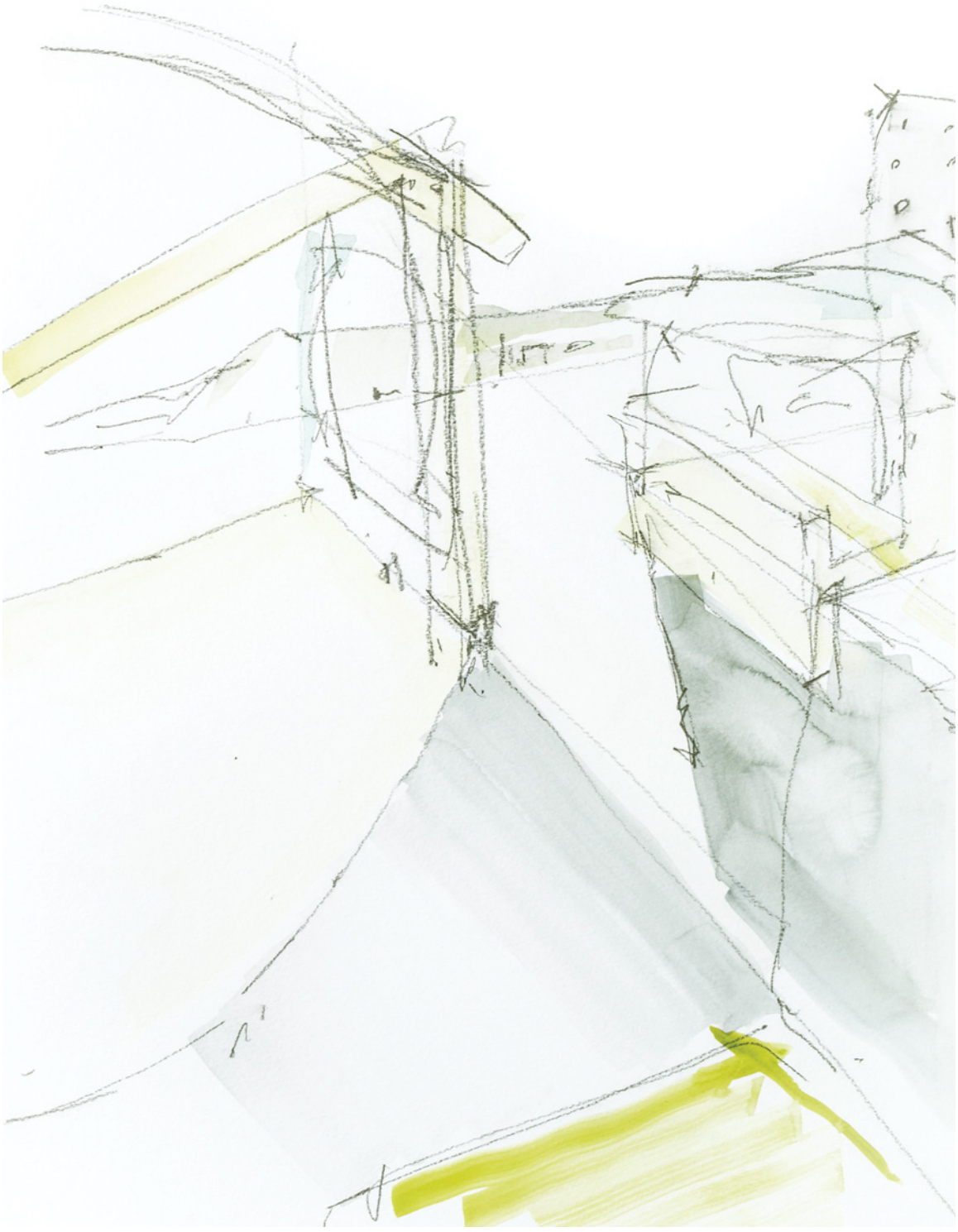
Layering the new above the old

Layering the new above the old

Layering the new above the old



Layering the new above the old



Qualities of views and light

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