

OTTAWA CITY BLOCK
BOX STORE COACH HOUSES

by

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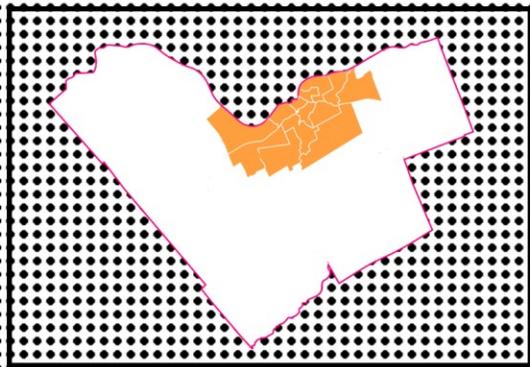
AZRIELI SCHOOL OF ARCHITECTURE AND URBANISM

CARLETON UNIVERSITY
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Ottawa City Block

Box Store Coach Houses



ABSTRACT

This thesis responds to a recent amendment to the City of Ottawa By-law that makes the construction of small houses within the lot lines of existing private yards legal. Prefabrication is a conventional form of production that can combine traditional materials with contemporary aesthetics in order to create innovative solutions and still be affordable. How is it relevant to today's practices? Prefabrication offers economic benefits under controlled factory manufacturing, without disrupting a promised aesthetic expression. This thesis addresses the process of making architecture in controlled industrial setting and argues in favour of the off-the-shelf architectural artifact for affordable construction. It explores the possibility of building components of kit-built houses in a place where off-the-shelf materials abound: the Home Depot hardware store. Out of this research a proposal is made demonstrating how the kit-of-parts home as a prefabricated solution conforms to the zoning proposal of the coach housing requirements in Ontario.

ACKNOWLEDGMENT

I would like to thank my family and friends in supporting me throughout my Master of architecture degree.

I would like to extend my gratitude to my thesis advisor, Janine Debanné, for her encouragement and guidance throughout this thesis. I also wish to thank Professors Federica Goffi, Roger Connah, and Yvan Cazabon for sharing their insights. Thank you to Basem Eid Mohamed from Abu Dhabi University and Carlo Carbone from Université du Québec à Montréal for introducing me to the prefab industry.

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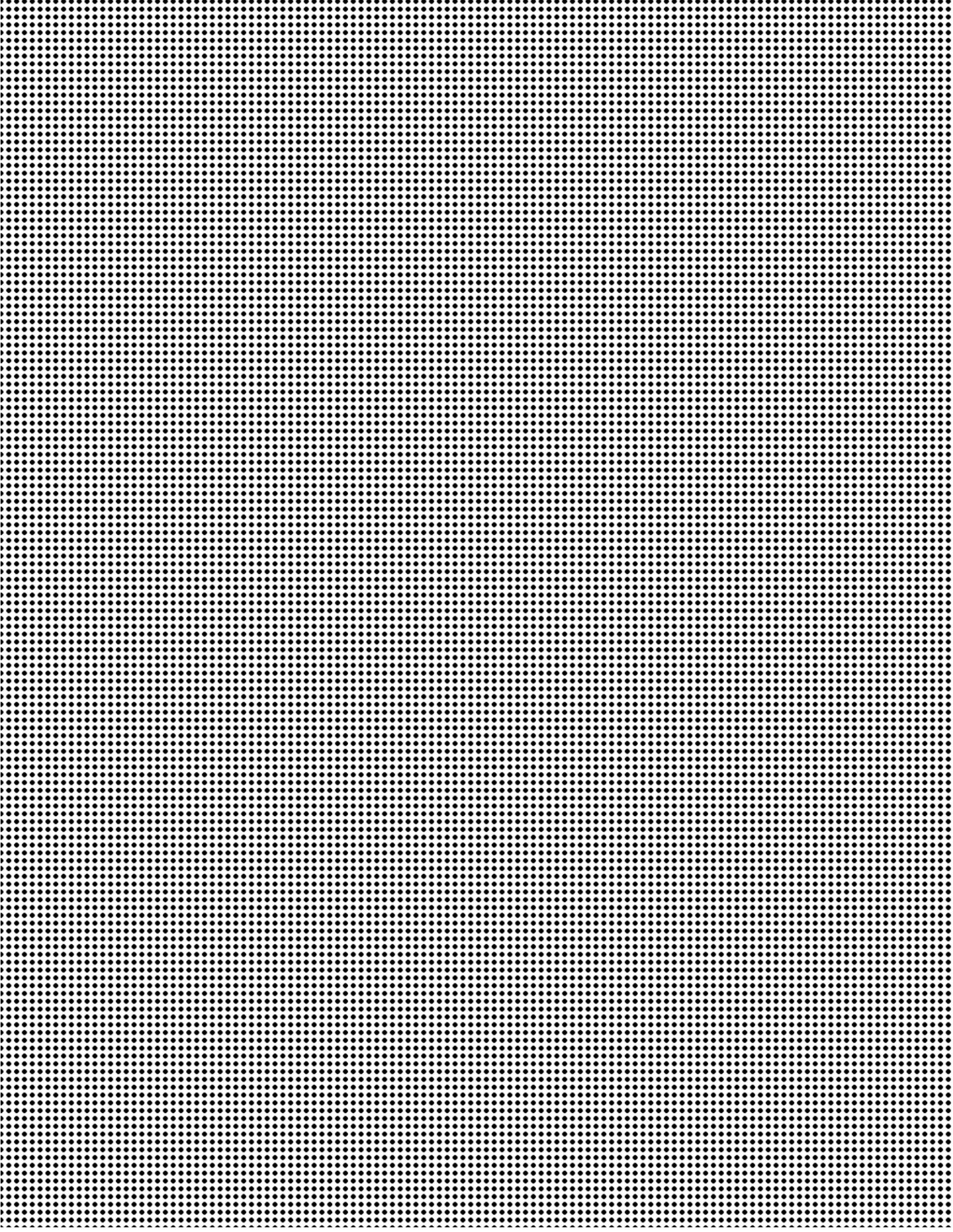
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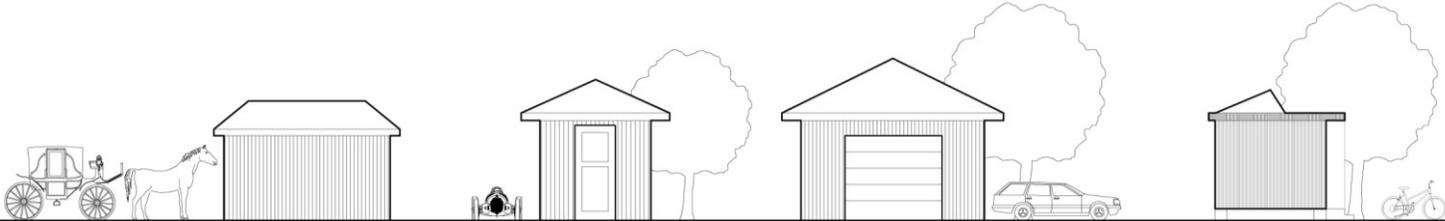
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INTRODUCTION



(i)

When one walks in the aisles of the Home Depot, one sees every element, part, and component of what one's home is made of. The Home Depot is thus a dreamland of potentials: houses yet to be built, organized in component parts, on systematically categorized shelves and aisles. One can almost envision a kit-of-parts collected from these shelves, and neatly organized in wall components; these elements offer a spectacle in which the public can engage and participate. One can imagine building your own customized coach suite.

Home Depot has centralized the hardware store industry and often, unfortunately put the privately-owned neighborhood hardware stores out of business. The generic box store has become an iconic element of the suburban landscape of Ottawa and other Canadian cities. When driving around Ottawa South suburbs, one sees the planning of a commercial zone combining the Home Depot, the grocery stores, the franchise restaurants, etc., organized around residential zone. Conversely, the Home Depot, beyond serving the construction industry, also caters to the creativity of the weekend builder as the one stop shopping destination for lumber, building materials, hardware, plumbing, paints, etc. Contradictory in this sense Home Depot is both an agent of homogenization of home building materials, while also the source of development and creation in (D-I-Y) labour, craft and making. For most members of the general public, however, house construction can only be experienced as a *fait accompli*: few build their own houses today. This is perhaps why the public embraces house renovation with so much enthusiasm.

*

This thesis accepts, as a valid architectural beginning, the material palette driven from the accessible North American ‘box’ hardware store; i.e. standard and available materials. From prototypical assemblies forming small living spaces, using standard Home Depot products and materials, elements of living spaces leave the Home Depot and are transported to the site for a final assembly phase. While solving the problem of small urban housing, how can architects, builders, and the home-building industry, avoid producing the most predictable solutions? Can a new know-how -- new and unexpected assemblies of conventional products, improvisations and a creative redefinition of standards, make its way into conventional construction? The imagined factory and its product -- kit-built houses destined for any number of suburban sites – together define an “urbanism of insertions” whereby an existing fabric is activated (and transformed) by a new set of small buildings, discretely inserted into it. The inserted network of small-sized houses into the existing fabric of Ottawa, collected in parts and prefabricated in the “Home Depot,” would add a new dimension to Ottawa’s residential landscape. However, beyond proposing a factory-addition to the Home Depot (in which to build small kit-built houses), and beyond designing the kits proper, this thesis also pursues a new ‘urban’ thinking about Ottawa’s residential landscape. This new thinking will take advantage of Home Depot’s importance in people’s lives, and will build on an existing reciprocity between Home Depot and the city and suburbs it serves.

(ii)

Today, Ottawa is working out the guidelines for a new house type: the *coach house*, or, “secondary dwelling unit in accessory structures.” This type of infill housing achieves additional housing and increased densities. The new dwellings are inserted into established neighbourhoods in a discreet way without affecting public spaces such as streets or sidewalks.

They also encourage the amalgamation of different socio-economic groups and ages within existing areas.

The recent amendment to the Zoning By-law allowing coach houses -- small, detached apartments on existing lots -- is an occasion to revisit the idea of the customized prefabricated home, at a small scale. In a way, the amendment is an opportunity to revisit the idea of mass-produced housing: the coach house is not geared toward being custom-built; by definition it wishes to be inexpensive. It is not likely that an owner would retain an architect for such a small commission. What is more, as a prefabricated building, the additional costs associated with custom design, would disappear. As an increasing number of young professional adults and baby boomers choose to opt out of the suburbs, many homebuyers must face the elevated prices of Ottawa's housing market. More options for affordable housing are needed. The coach house insertion is one such option, and constitutes an interesting alternative for living, working, playing, in the already-built fabric of the city. This thesis explores the architecture of these new houses, and speculates on the new sense of "minor community" that these would generate. At the end of this thesis, concluding remarks also speculate on expanded uses for these houses, and imagine mixed-uses including home-based offices/business, shops and studios.

(iii)

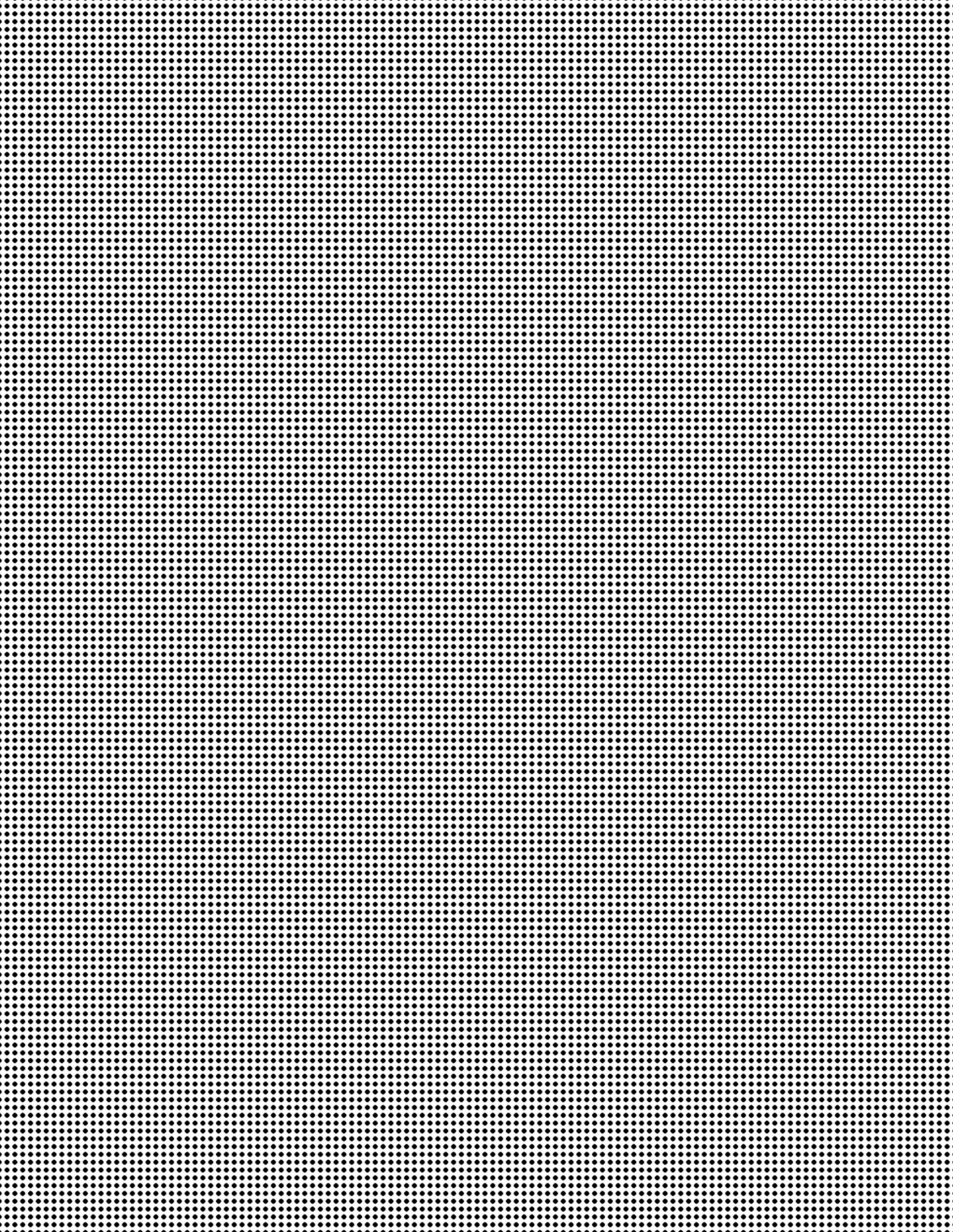
Thesis question:

Keeping in mind the City of Ottawa's mandate to increase density -- within the city's core as well as in the suburbs -- this thesis asks: do existing un-built spaces such as back or side yards offer new possibilities for developing more sustainable and viable communities within existing neighbourhoods? Going further, can the insertion of a new network of small homes -- beyond increasing density -- also make more interesting neighbourhoods? In her book *The Death and Life of Great American Cities*, Jane Jacobs saw a correlation between density and

diversity in residential neighbourhood.¹ Necessarily, the design of a smaller home on an existing lot demands a reconsideration of typical and familiar housing morphology and layout. This thesis embraces such a challenge, and uses the smaller home design problem as a lens to explore broader questions of urban dwelling.

This thesis pursues the question of accommodating Ottawa's new Coach House Zoning in a multifaceted way, and plays out the design scenario of an additional house on both traditional urban lots as well as on suburban lots. The insertion of coach houses poses interesting questions about lot sub-division and the identity of private property, while also stretching our thinking about what constitutes a buildable and liveable site. Territories such as laneways (that until recently existed in a sort of "state of invisibility") here take on new meaning. The coach house zoning and its architectural realizations bring about a heightening of community life on the block.

¹ Jacobs, Jane. *The Death and Life of Great American Cities*. New York: Avintage, 1961. Print.



**PART 1:
THE ZONING CHANGE:
INVITATION TO A
“NEW CITY”**

What: *Coach House Zoning*

The City of Ottawa has been recently working on a change in the Zoning By-law to allow the addition of self-contained secondary dwelling units in backyards of homes, or substitutions to, or alternations of, the detached garages of single family or semi-detached homes, duplexes, or townhouses. As of 2017, the Planning Act will require that coach houses be permitted by municipalities in their official plans. In January 2016, a Guiding Principles Report and a Recommendation Draft was released, setting a high-level strategic direction for detailed recommendations for Official Plan policies and Zoning By-law regulations. These units will be known as “coach houses” in the City of Ottawa Official Plan.²

This type of infill is an effort by the City of Ottawa to produce self-contained dwelling units (with their own kitchen and bathroom) that homeowners manage independently. The houses should be placed discretely and they are intended to be ancillary to the primary house; their size will be small relative to the existing house. The City of Ottawa’s *Guiding Principles and Draft Recommendations Paper* stipulates that 50% of the yard is the maximum area for coach houses.

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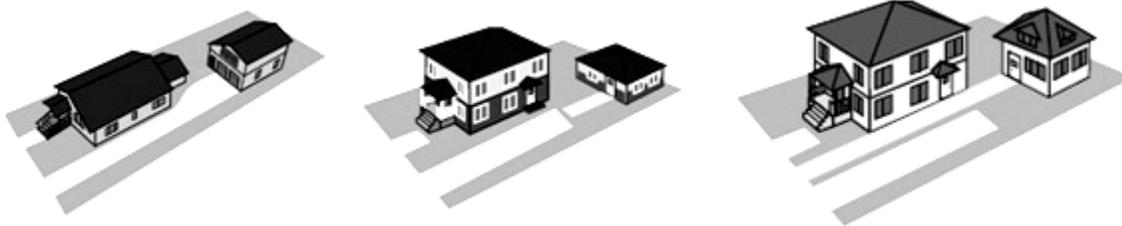


Figure 1: From the City of Ottawa Website on addressing access to coach houses

² City of Ottawa Policy Development and Urban Design Branch, *Coach Houses: Secondary Dwelling Units in Accessory Structures, Guiding Principles and Draft Recommendations Paper*, (January 2016): 5.

³ *Ibid.*, 18.

Historically, coach houses, also called “carriage houses,” were separate structures that belong to a house, for the purpose of sheltering horse-drawn carriages when they were not in use. They are typically open-fronted, single story buildings with a roof that is supported by grid-spaced columns. Their orientation was mainly dictated by access to roads and farm fields.



Plate 21 COTTAGE AND STORAGE SHED FOR SALE
East Bank of the Rideau River
February 1998

Figure 2: A 1998 house & Storage shed on Bank Street

Some coach houses of this kind can be found on older Ottawa properties, but in the main, ancillary structures of this kind were for cars. In neighbourhoods constructed in the inter-war years, like Old Ottawa South for example, derelict garages have sat on lots for decades, and been used as storage spaces. As owners were not allowed to transform them into dwellings, and because zoning would not allow them to rebuild them were they to tear them down, many are in poor condition today. They are sometimes quite charming for this reason. Nonetheless, the new by-law will likely lead to replacements. In newer neighbourhoods, the issue is slightly different. Coach houses are likely to be additions, because lots are larger, and there is more space to build on. But why are coach houses suddenly of interest to the City of Ottawa now?

Why: *Ottawa's Commitment to Intensification*

In the City of Ottawa's vision, coach housing is meant to benefit a diverse group of residents including seniors looking to downsize, multi-generational and extended families, young couples looking for starter homes, and renters looking for alternate options, and liveable detached rental housing. But the main reason for the City's interest in coach houses at this particular point in time is to prevent urban sprawl outside the Ottawa Green Belt. The term "urban sprawl" is often used to describe expansive, and poorly planned, development of suburban areas.⁴ Historically, local planning authorities unintentionally encouraged sprawling development by adopting Euclidian zoning: a method that pushed for a distinct separation of land uses.⁵ In Euclidian zoning, commercial zones are centralized and residential zones are spread out. The worker, home-keeper or child, must therefore rely on private vehicles to access different activities in the separated zones.⁶

The 2003 Official Plan has identified expected employment and population/ housing unit densities to grow in specific areas of Ottawa. The City of Ottawa and many Ottawa residents cherish the Greenbelt, and wish to preserve it. Therefore, the pressure for intensification within the urban core, and within the confines defined by the Greenbelt boundary, is expected to be very high as the city grows in the next five years.⁷ The City's target for residential intensification, as defined in Policy 1, is 40% in 2017-2021, allowing for minimum proportion of new residential dwelling units and accommodation.⁸ As stated in the Official Plan, the City of Ottawa also

⁴ Christina Anita Heydorn, *A Proud Legacy, A New Future: Bringing Ottawa's Growth Management Strategy Into the 21st Century* (Waterloo, Ontario, Canada, 2007), 38

⁵ *Ibid.*

⁶ *Ibid.*, 64

⁷ *Ibid.*

⁸ City of Ottawa Official Plan, *Managing Growth*, (2015), <http://ottawa.ca/en/official-plan-0/22-managing-growth>

encourages all intensification and infill projects to use green building technology so that any additional demands on existing infrastructure systems can be minimized.⁹



Figure 3: A recent Aerial view of Ottawa's Housing sprawl to the Green Belt in Findlay Creek area

Naturally, the City of Ottawa will have to take into consideration the potential downfalls of intensification such as an increase in vehicles, parking loads, or other consequences of additional dwellers within an existing density. A question to keep in mind is whether the City of Ottawa should consider other zoning changes that would contribute to the success of the coach house inserts. Might the City, for example, consider easements to create new, shared, circulation paths between the new coach houses, to help with access and transitions?

⁹ City of Ottawa Official Plan, Managing Growth, (2015).

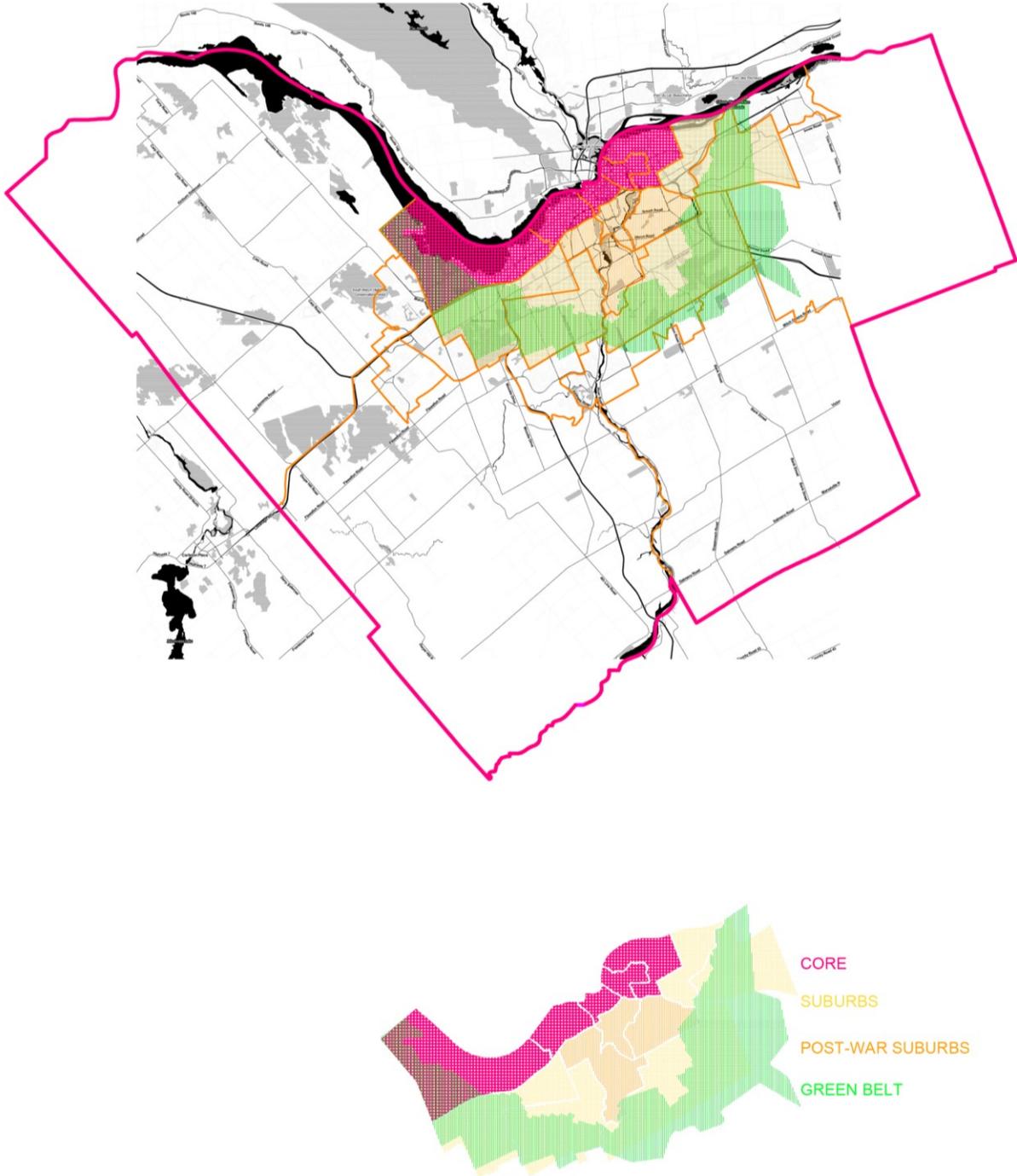


Figure 4: Mapping of Ottawa's Land core, suburbs and Green Belt's Boundaries

Grow Homes and Aging in place

Declining birthrates and long life expectancy have expanded the quantity of senior residents in most western social societies. In addition, baby boomers, who have had a major impact on the Canadian economy and housing market over the past several decades and while at the younger end of the age spectrum, are joining the senior population. In 2006, there were 103,620 seniors in Ottawa – an increase of 16% over 2001.¹⁰ By 2031, the number will increase more than double to 230,576.¹¹ Despite the fact that average income of seniors in Ottawa in 2006 was \$39,729 - among the highest in Ontario, economic pressures on seniors are high. For many seniors living on fixed incomes, staying in neighbourhoods where land values have drastically increased, or, “aging in place,” is unaffordable. They must move and downsize.

The Canadian Association of Gerontology states that the majority of aging Canadians want to stay in their own homes.¹² “Aging in place” is related to a design challenge that aims for barrier-free spaces that are suitable for those with reduced mobility and poor vision.¹³ This concept allows senior occupants to live independently in their own houses, reducing the need for costly support from their families or the government to move to retirement homes. It is also interesting to note that the tendency, when moving, is to move to a location that is close to their current home. The City of Ottawa has in fact drafted an “Older Adult Plan” to increase opportunities for housing for seniors.¹⁴ Coach houses provide the ability for seniors to grow old and independent in the same house or even downsize into a smaller secondary unit while remaining within the same neighbourhood. Thus the coach house not only fulfills the need for

¹⁰ The Council on Aging of Ottawa, *Housing Seniors: Choices, Challenges and Solutions*, (Ottawa, 2008), 4

¹¹ Ibid.

¹² Patrick Langston, “Growing Old at Home,” *Ottawa Citizen* (2011), <http://www.ottawacitizen.com/homes/Growing+home/5328445/story.html>.

¹³ Avi Friedman, *Innovative Houses: Concepts for Sustainable Living* (London: Laurence King Publishing, 2013), 22

¹⁴ City of Ottawa, *Coach Houses: Secondary Dwelling Units in Accessory Structures*. (September 14, 2015): 7, (http://documents.ottawa.ca/sites/documents.ottawa.ca/files/documents/secdwell_discpaper_s_en.pdf)

smaller retirement homes on the very site of a person's "family home" but also turns the "family house" into a potential source of added income.

Income Generator Homes

Since the mid-seventies until nowadays, many of Ottawa residential areas have been an attraction to middle-class families and individuals.¹⁵ However, with the rising real-estate prices, this reality is changing rapidly. According to the City of Ottawa, in 2013 the average price for a new single-family detached dwelling was \$510,000, an increase of 26.8% over the past decade.¹⁶ Ottawa boasts a population of 870,250, which represents an increase of 7.9% since 2001.¹⁷ With such rapid changes and growth rates, a demand for affordable housing is urgent. The renting market in Ottawa ranges from \$780 to \$800 for bachelor apartments, \$970 to \$1,070 for one-bedroom apartments, and \$1,170 to \$1,140 for two-bedroom apartments.¹⁸

Secondary dwelling units would allow homeowners to supplement their incomes and further the affordability of their homes. For developers, the new coach zoning represents an interesting opportunity from a design perspective. "Designing properties to accommodate secondary residential units, either within or as an accessory to the primary residential building, could attract buyers interested in earning income from their property without the challenges of owning two distinct properties."¹⁹ The coach house's potential to provide supplemental income

¹⁵ John H. Taylor, *The History of Canadian Cities; Ottawa*: (James Lorimer & Company Publishers, Canadian Museum of Civilization, & National Museum of Canada, 1986): 178

¹⁶ City of Ottawa, *Coach Houses: Secondary Dwelling Units in Accessory Structures*. (September 14, 2015): 7, (http://documents.ottawa.ca/sites/documents.ottawa.ca/files/documents/secdwell_discpaper_s_en.pdf)

¹⁷ City of Ottawa, Population (2015), <http://ottawa.ca/en/long-range-financial-plans/economy-and-demographics/population>

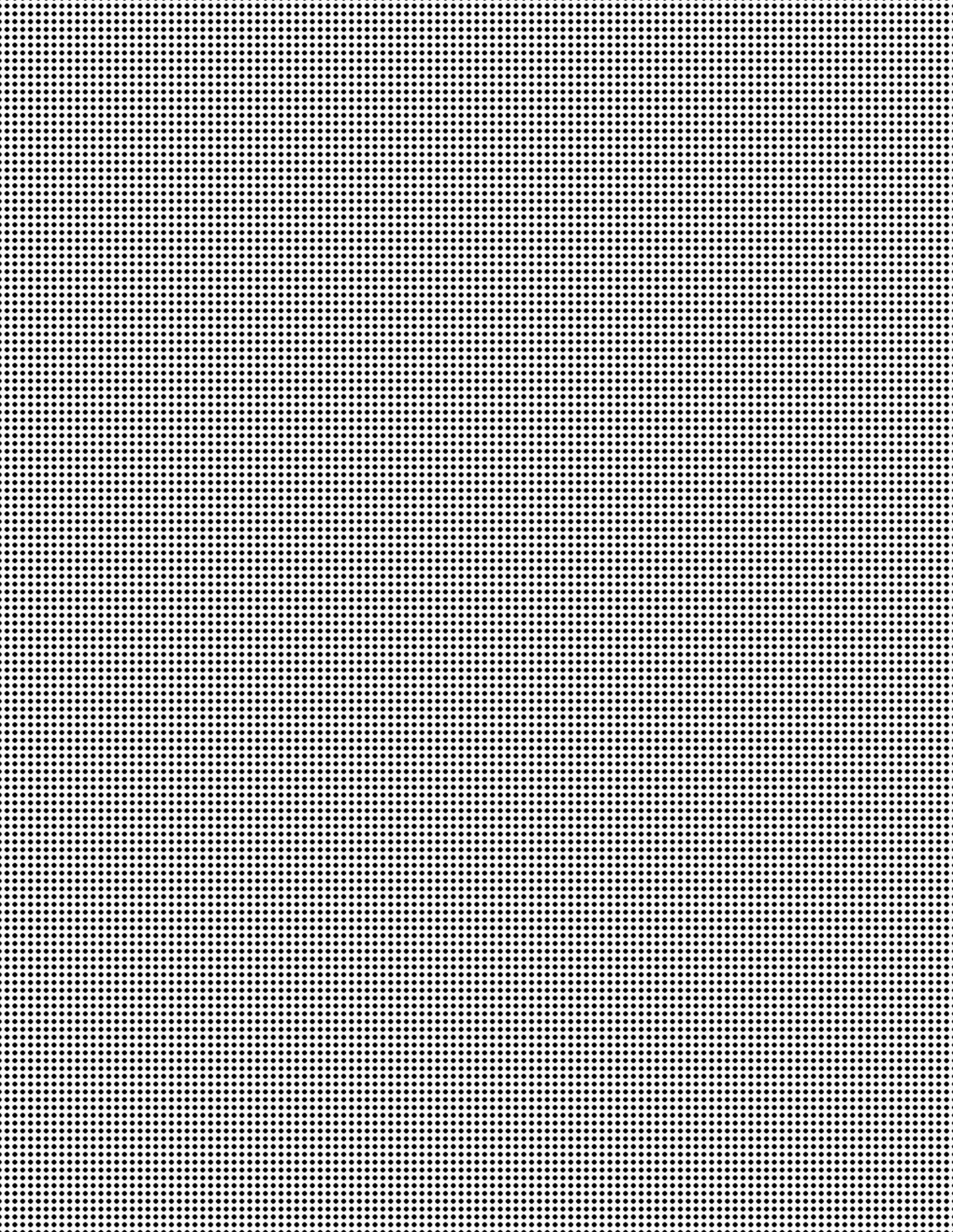
¹⁸ Canadian Mortgage & Housing Corporation (CMHC), Rental Market Report Ottawa-Gatineau CMA (Ontario, Fall 2015): 11. http://www.cmhc-schl.gc.ca/odpub/esub/64423/64423_2015_A01.pdf

¹⁹ David Reid, *The City of Ottawa Brings Back the Coach House*, (Ottawa Business Journal, September 27, 2015), <http://www.obj.ca/Blog-Article/b/27369/The-City-of-Ottawa-Brings-Back-the-Coach-House>

would also tend to attract different kinds of buyers than does the stand alone detached house. This new house form, therefore, might also tend to increase social diversity in neighbourhoods.

The Coach House: Public and Private Agreement

This thesis is interested in the coach house insertion as a strategy for creating affordable housing. In cities like Toronto and Vancouver, where land values are very high, the laneway house has evolved to become much like a detached home, that is to say, an expensive fully private property. Laneway houses often sit on lots that have been severed from the property they originally belonged to. But really, the idea of a network of rental houses remains much more interesting here, for such houses are necessarily more affordable. To this end, essential to the success and feasibility of the insertion of coach houses as a long-term affordable housing option, is the establishment of relationship between the City of Ottawa and those who will choose to take advantage of the By-law amendment, and build a coach house. The City could, for example, offer incentives to home-owners to build coach houses, and could have agreements with box stores for supplying construction materials, to keep costs low. The creation of a product line that allows for manufacturing modular structures presents an attractive private investment opportunity for a store like Home Depot, but the City of Ottawa also gets closer to its goal of building more homes inside the core, homes that, what is more, are likely to be less expensive than existing houses.



PART 2:
OTTAWA LOT TYPES:
VARIATIONS ON THE
COACH HOUSE

OTTAWA, ONTARIO

Ottawa is unique among Canadian cities for its sheer area, extending 2,790 square kilometers²⁰ to the east, south and west, from an urban Centre, to distant suburbs, with a southern green belt separating these two settlement forms, and the Ottawa River forming a finite northern edge. Ottawa includes new and old communities, and is surrounded by a large and varied countryside. The city map is organized in linear swaths from the Ottawa River, southward, as if guided by the suburbs' pull. From lumber town to metropolis, Canada's capital registers a story of development, its extended morphology clearly tracking a preference for detached houses on garden lots.

A lumber town hugging the Ottawa River, the pre-war city extended radially from Parliament Hill, to nearby farmlands. A streetcar line determined the city's limit. After the Second World War, as the capital city grew, and as the sawn lumber and pulp and paper industries moved out of the downtown, a first ring of suburbs replaced farmlands. The postwar city was taking shape, following modernist and car-oriented suburban development patterns: while the city revolved around the core, satellite concentrations of government buildings abutting new post-war suburbs were established. One example is Rothwell Heights, developed next to the National Research Council along Blair Road.²¹ Beyond them, the greenbelt encased the city along with its new suburban developments including Blackburn Hamlet, Elmvale Acres, Alta Vista, Nepean, and Kanata. Later suburbs including Orleans, Ottawa South, Kanata South and Barrhaven hopped over the greenbelt, greatly adding to Ottawa's land mass. The amalgamation of surrounding towns to Ottawa in 2001 resulted in Ottawa's enormous landmass of today.²²

²⁰ John Taylor, Ottawa (The Canadian Encyclopedia, 2012), <http://www.thecanadianencyclopedia.ca/en/article/ottawa-ont/>

²¹ John H. Taylor, *The History of Canadian Cities; Ottawa:* (James Lorimer & Company Publishers, Canadian Museum of Civilization, & National Museum of Canada, 1986): 186

²² John Taylor, Ottawa (The Canadian Encyclopedia, 2012), <http://www.thecanadianencyclopedia.ca/en/article/ottawa-ont/>

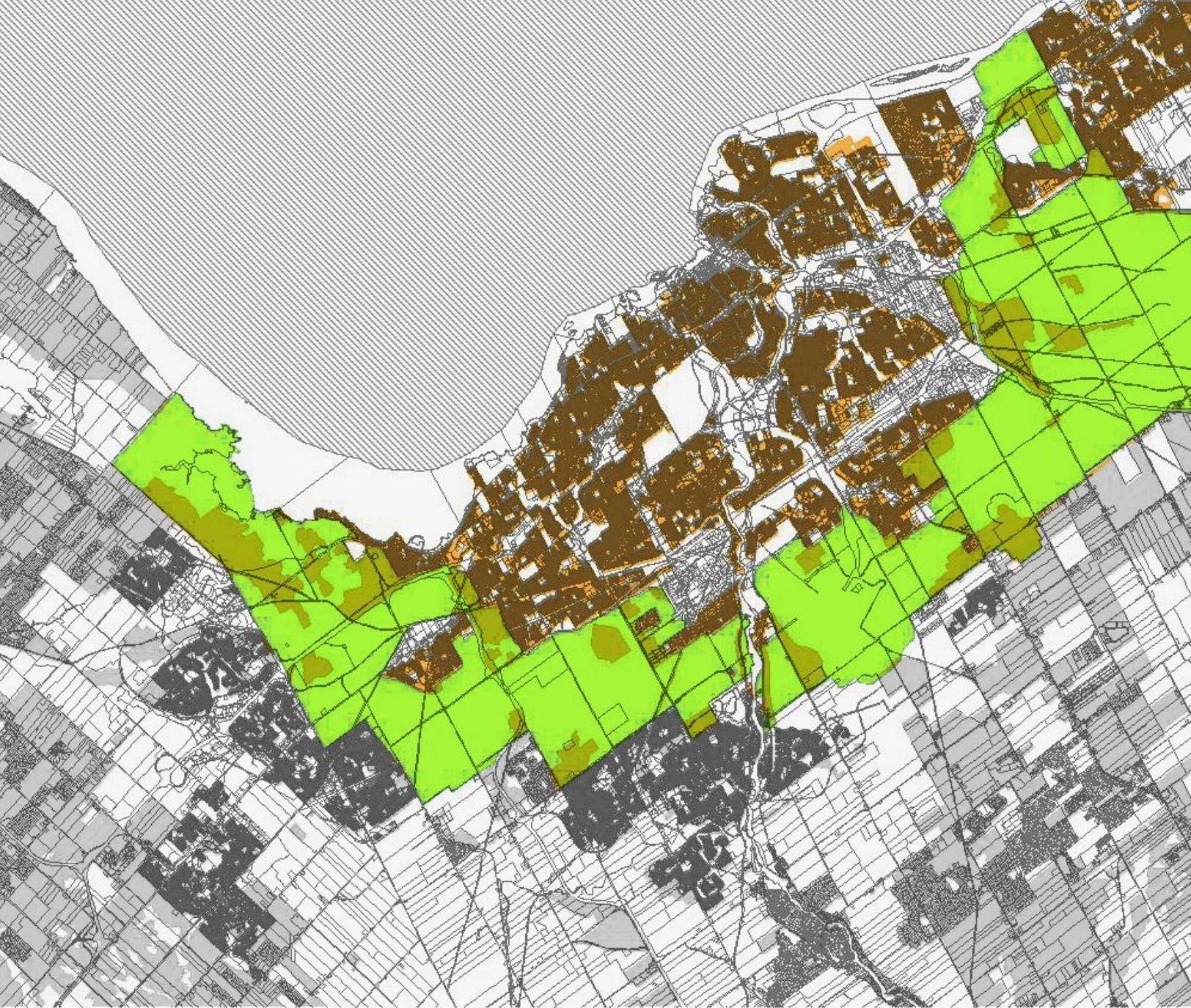


Figure 5: Mapping of Ottawa Residential Zone Density inside and Outside the Greenbelt Area

Ottawa Lot Typology

The opportunity to generate “micro architectural insertions” within Ottawa’s existing limits offers possibilities for a new, sustainable growth with the city’s existing limits. To be able to propose a language for such architectural insertions, an understanding of Ottawa’s urban form and the current housing practices is critical, since the new zoning by-law amendment considers the possibility of coach houses on sites that are already zoned for residential usage.

Residential lots in Ottawa can be categorized according to lot type, date of development, and size. Urban lots comprise one category, and these are typically small and compact, typically measuring 25’ to 50’ wide by 80’ to 130’ deep. Suburban lots can vary in size based on the era they were developed; suburban lots built between the Second World War and the millennium are typically larger, while the last fifteen years have produced suburbs with much denser settlement patterns, and lots that are small and compact.

From 1941 to 1971, Ottawa’s population tripled, and the city’s area increased five-fold.²³ Post-war expansion brought about dramatic changes in the urban landscape, and quickly outgrew Gréber’s forecast for the city’s growth. In the Canadian context, Canada Mortgage and Housing Corporation (CMHC) was established in 1946, in response to the housing needs of returning war veterans and to lead the nation’s housing programs in the post war period, as the nation geared itself towards maturation and modernization.²⁴ CMHC’s publication, *67 Homes for Canadians* (1948), containing house plans that Canadians could choose to build, was widely circulated and deeply influential for the following two decades, all across the country.²⁵

²³ John H. Taylor, *The History of Canadian Cities; Ottawa*: (James Lorimer & Company Publishers, Canadian Museum of Civilization, & National Museum of Canada, 1986): 171

²⁴ Canadian Mortgage & Housing Corporation (CMHC), *History — CMHC Milestone*, (2016), http://www.cmhc-schl.gc.ca/en/corp/about/hi/hi_001.cfm

²⁵ Ibid.

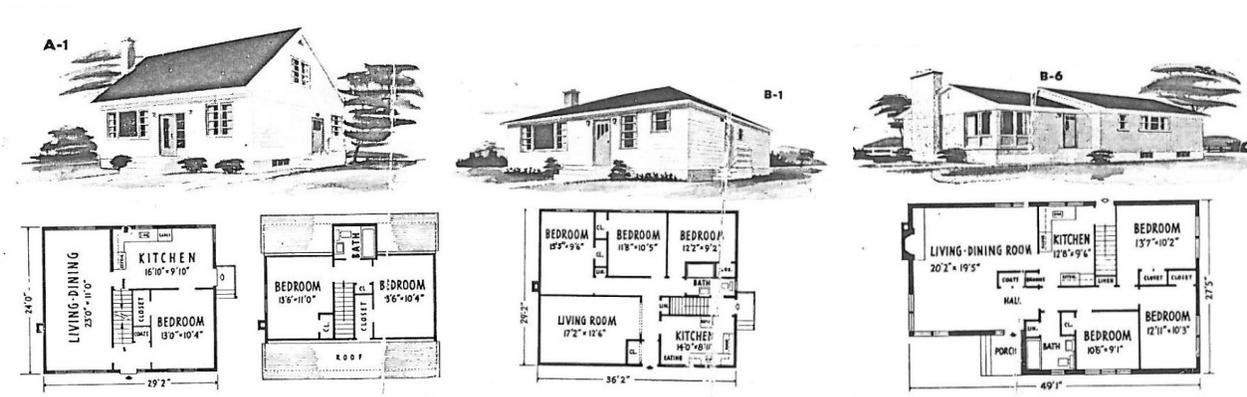


Figure 6: Examples of the 67 Homes CMHC Published in 1948.

By 1970, suburban growth had radically redefined Ottawa as a city of suburbs. With almost one million citizens today, Ottawa continues to grow.²⁶ The City of Ottawa’s growth projections describe a “low,” “reference” and “high scenario,” regarding the city’s share of international immigrants; in all cases, however, immigration will add to the city’s social makeup.²⁷ Anticipated arrivals of international immigrants totalling between 5,600 and 12,500 per year until 2031 will bring further increases to Ottawa’s population.²⁸ As the population grows, the demand for housing increases. Creative solutions for housing are therefore necessary, and the City of Ottawa’s coach house zoning is certainly a well-thought out strategic response to the problem.

Ottawa’s housing typologies and the density of its settlement pattern form a clear portrait of how the city has evolved over time. As the city grows, the need for more housing causes sprawl. New neighbourhoods are built farther and farther from the downtown, encroaching into

²⁶ City of Ottawa, “Growth Projections for Ottawa 2006-2031,” <http://ottawa.ca/en/city-hall/get-know-your-city/statistics/growth-projections-ottawa-2006-2031>. Accessed May 26, 2016.

²⁷ Ibid.

²⁸ Ibid.

less expensive agricultural and rural lands. Depending on the land value at the time of development, the lots are alternately large or small, the houses spread far apart from each other, or packed tightly together. The settlements are clear pictures of market forces. The Ottawa suburbs can be categorized based on the point in time they were developed:

- Streetcar suburbs were developed and built around the streetcar lines. Streetcars and related questions of walkability from streetcar line to home, led to the development of house lots that were narrow in frontage and long in depth. Such a settlement form (typically, twelve units per acre) can be found in Old Ottawa South, Westboro & Centertown.



Figure 7: Ottawa Street Car Running on Bank Street, 1942

- Post 1945 to 1960 suburbs are developed after World War II as a mean of addressing urban density and accommodating war workers and, after the war, returning veterans.²⁹ Swaths of cheap land on the urban border of Ottawa led to development of large lot sizes that were up 70 feet in frontage and 120 feet in depth. Such suburbs can be found in Alta Vista, Manor Park, & Elmvale Acres.



Figure 8: Ottawa Campeau Homes Construction - 60 acre at Billings Bridge suburbs, 1958

- From 1970 to 1990, affordability was a central theme for new suburbs. CMHC's then policy of encouraging home ownership for all Canadians led to the development of row housing in areas such as Walkley Road, Hampton Park, Gloucester, South Gate, & Orleans, in response to the climbing cost of the suburban detached home.

- From 1990 to 2010, developers altered the traditional suburb, and developed a settlement with small lots and bigger houses. In these suburbs, the house occupies most of the lot. The selling

²⁹ Gary Martin, M.A., *Manufacturing 'Home': Sustainability Discourses In Suburban Ottawa*: (Gary Martin, 2013 Carleton University)

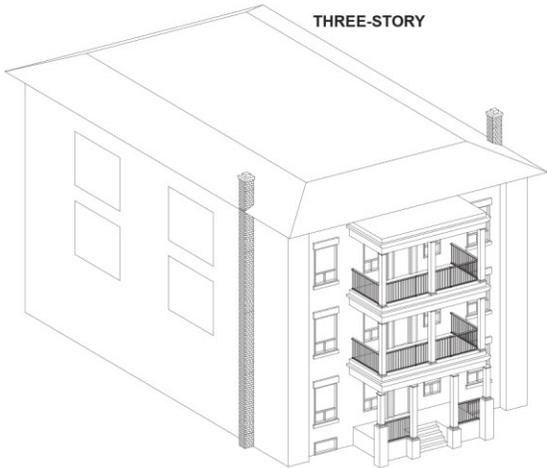
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point is the house, not the yard – representing a change from the original suburb. Such areas are found in South Ottawa (South Keys) and Orleans.

- 2010 to the present: this period continues trends of the previous period, but the house size and tightness of lots is accentuated. Suburbs like Barrhaven, Findlay Creek, and parts of Kanata follow this pattern. In these lots, where the garage falls within the width of the house, and where, therefore, there is no vehicular access to back yards (typically only ten feet separate the houses) adding a coach house is not realistic. Furthermore, most of the lot is already filled by the large house.

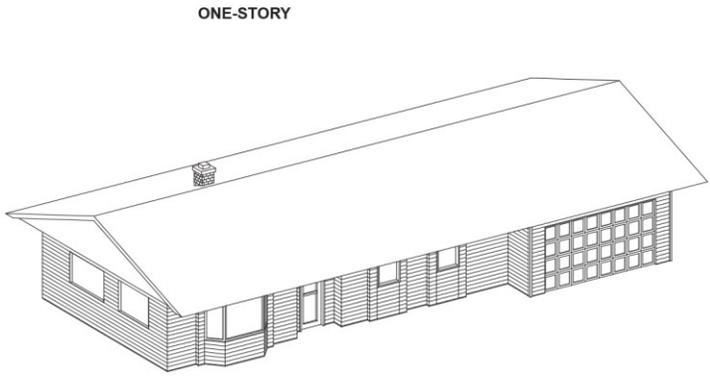


Figure 9: Ottawa Findlay Creek suburbs, 2011



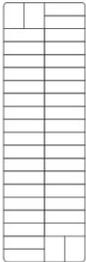
THREE-STORY

480 Cooper Street, Centre Town Area
Built in the 1930s



ONE-STORY

Alta Vista Area



LOT WIDTH VARIATIONS
Ranges from 35 ft. to 70 ft.

LOT LENGTH VARIATIONS
Ranges from 90 ft. to 120 ft.

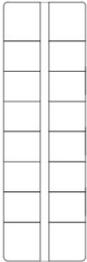
LOT COVERAGE
Approximately 55% in (Wartime to late 1930s
Suburbs)
Areas such as Old Ottawa South, Westboro, & Centre Town



LOT WIDTH VARIATIONS
Ranges from 35 ft. to 70 ft.

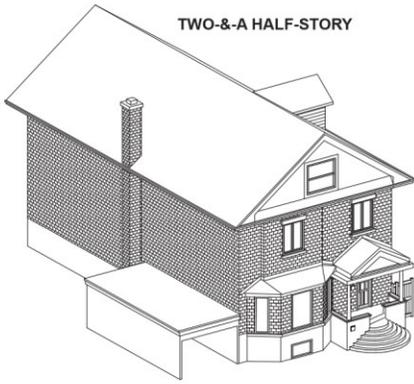
LOT LENGTH VARIATIONS
Ranges from 90 ft. to 120 ft.

LOT COVERAGE
Approximately 40% in (Post 1945 to 1960
suburbs)
Areas such as Alta Vista, Manor Park, & Elmvale Acres



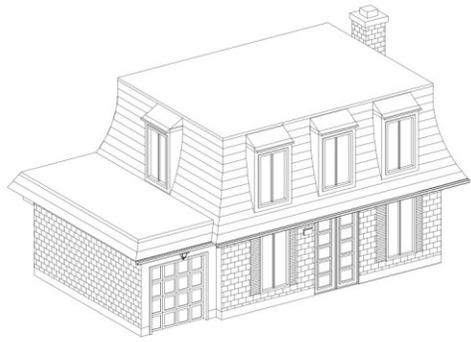
FUTURE CONSIDERATION TO
LANWAY CREATION IN BLOCK

Figure 10: Housing & lot typologies in Ottawa and the potential development of Laneways



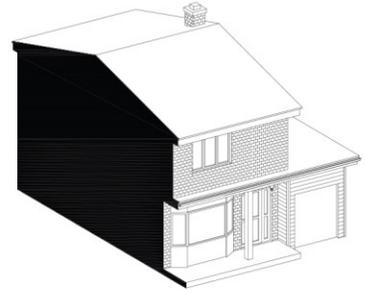
TWO-&-A HALF-STORY

22 Glen Avenue, Old Ottawa South Area
Built in the 1920s



TWO-STORY

3262 Clearwater Crescent, Southgate Area
Built in the 1970s

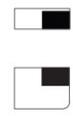


SEMI-DETACHED

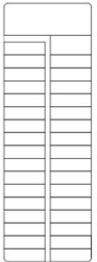
3507 Southgate Road, Southgate Area
Built in the 1970s



CORNER LOTS ARE APPROXIMATELY 10 FT. MORE IN WIDTH COMPARED TO INTERIOR LOTS - IN THIS DIAGRAM THE CORNER IS ADJACENT TO A COMMERCIAL CORNER LOT



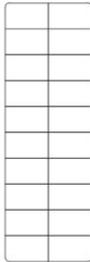
CORNER LOTS ARE APPROXIMATELY DOUBLE THE WIDTH COMPARED TO INTERIOR LOTS



LOT WIDTH VARIATIONS
Ranges from 35 ft. to 70 ft.

LOT LENGTH VARIATIONS
Ranges from 90 ft. to 120 ft.

LOT COVERAGE
Approximately 60% in (Streetcar Suburbs)
Areas such as Old Ottawa South, Westboro, & Centre Town



LOT WIDTH VARIATIONS
Ranges from 35 ft. to 70 ft.

LOT LENGTH VARIATIONS
Ranges from 90 ft. to 120 ft.

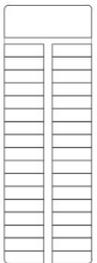
LOT COVERAGE
Approximately 35% in (1970 to 1990 Suburbs)
Areas such as Hampton Park, Gloucester, South Gate, & Orleans



LOT WIDTH VARIATIONS
Ranges from 20 ft. to 50 ft.

LOT LENGTH VARIATIONS
Ranges from 80 ft. to 100 ft.

LOT COVERAGE
Approximately 55% in (1970 to 1990 Suburbs)
Areas such as Hampton Park, Gloucester, South Gate, & Orleans



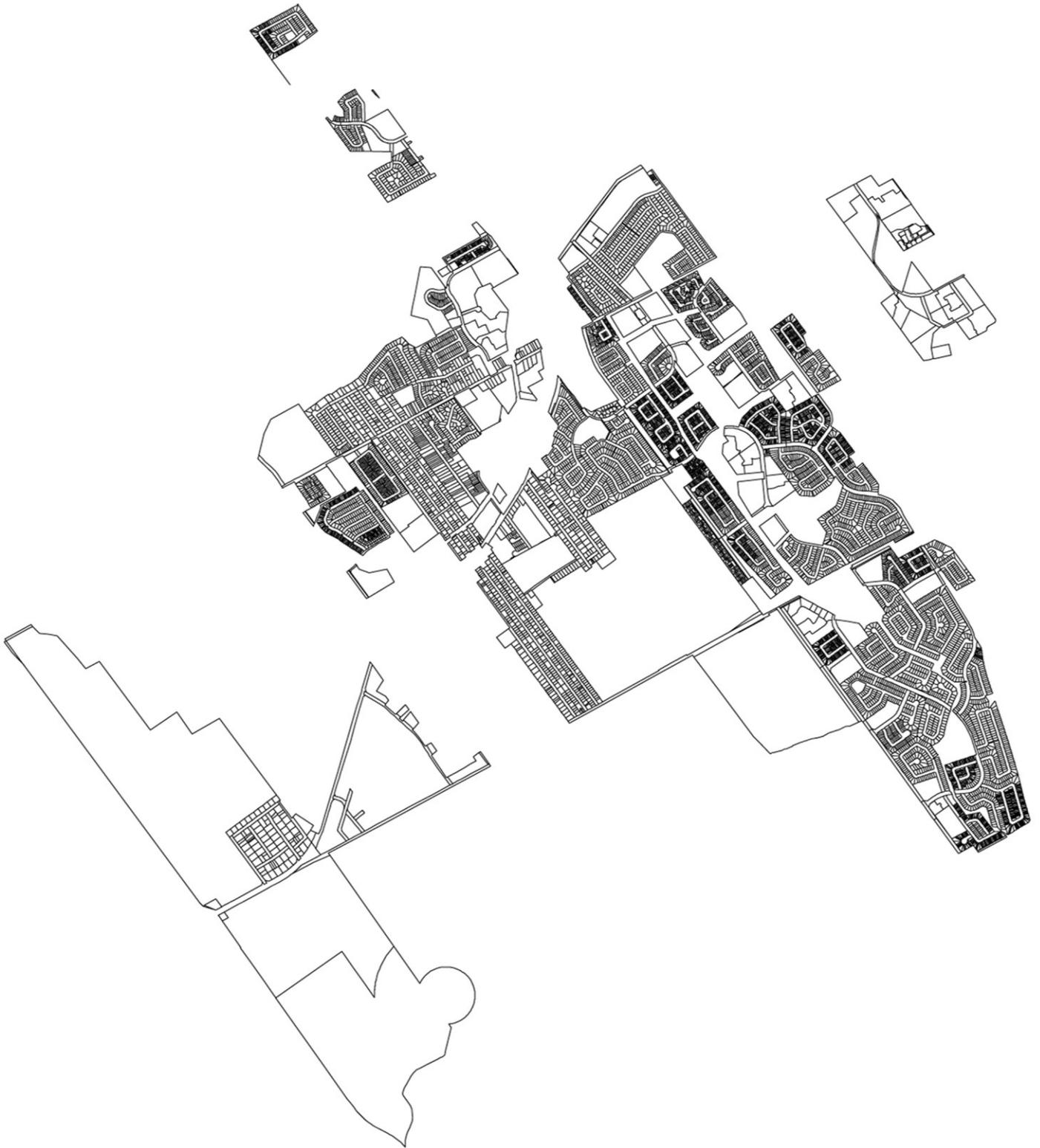
FUTURE CONSIDERATION TO LANWAY ADJUSTMENT IN BLOCK



FUTURE CONSIDERATION TO LANWAY CREATION IN BLOCK



FUTURE CONSIDERATION TO LANWAY CREATION IN BLOCK



LOT DIVISION AND BUILT FORM



1965



1976



1991



1999



2002



2005



2007



2014

Figure 11: This figure provides an example of development trend consistent across the city. This particular site is of Gloucester/ South Area suburbs current residential density of the area over time

PART 3:
READY-MADE
ARCHITECTURE

Off-the-shelf Standardized Construction Materials

Foreword: Before beginning this section, I share there that my experience in working in a generic hardware store, a Home Depot in fact, that offers material that is available to the everyday user drove me to analyse material availability and standardization of building components.

The idea of the ready-made and prototypical prefabricated architecture was the dream of the Modern Movement.³⁰ The progressive transition from handcrafts to machine-crafts in the early decades of the twentieth century culminated with the “machine made” house produced in the assembly line fashion from a kit of parts. Walter Gropius’s “House 16” and “House 17” at the Weissenhofsiedlung, the housing exhibition organized by the Deutscher Werkbund in Stuttgart in 1927, and curated by Mies van der Rohe, demonstrated the potential of prefabrication for house building, and were emblems of the modernist pursuit of affordable, functionalist housing.³¹ From the Bauhaus era to the present, architects have embraced technological advances in housing design in order to progressively respond to social and economic realities on a path to democratic housing.³² The school Gropius founded in 1919 in Weimar, the Bauhaus, explored the relationship between industrial techniques and the handcrafts, and embraced the idea that these should be integrated. Mass production and artistic impulse could be reconciled, and the aesthetic quality of mass-produced objects was raised. Bauhaus students made objects that are utilitarian and contemplative objects alike. In the teaching of

³⁰ Stephen Kieran, James Timberlake, *Refabricating Architecture: How Manufacturing Methodologies are Poised to Transform Building Construction* (McGraw-Hill, 2004): 5.

³¹ *Ibid.*, 7.

³² Gilbert Herbert, *The Dream of the Factory-Made House: Walter Gropius and Konrad Wachsmann* (Cambridge, MA: The MIT Press, 1984).

architecture at the Bauhaus, the “minimum dwelling” was questioned through the lens of functionality, affordability, and standardization.

With regards to the prefabrication of houses, two trends evolved in Europe in the 1920s. The Bauhaus explored the design and craft of industrial components properties, merging craft techniques, with machine capabilities. Machine aesthetics resulted from an understanding of modern materials and the manufacturing process. The other direction was to select ready-made elements. The aesthetic intent of the ready-made was based on choice rather than technique.³³ Le Corbusier illustrates the ethos of the selection of ready-made components and objects that were capable of expressing the machine’s aesthetic intentions of the age.³⁴

In the American context, Charles and Ray Eames, Pierre Koenig, and Craig Elwood, among others, investigated the idea of the ready-made and prefabricated housing in the Case Study Houses program (1945-1966). Commissioned by *Art & Architecture* magazine and led by publisher John Entenza, the experimental house-building program explored “kit-of-parts” housing to determine the shape and form of the post-war domestic life in America.³⁵ The competition and publication pushed industrialization as a way of building inexpensive and efficient modern homes in response to the housing boom caused by the end of World War II.³⁶

³³ Gilbert Herbert, *The Dream of the Factory-Made House: Walter Gropius and Konrad Wachsmann* (Cambridge, MA: The MIT Press, 1984).

³⁴ Stephen Kieran, James Timberlake, *Refabricating Architecture: How Manufacturing Methodologies are Poised to Transform Building Construction* (McGraw-Hill, 2004): 7.

³⁵ Paul J. Armstrong, *From Bauhaus to m- [h]ouse: The Concept of the Ready-Made and the Kit-Built House*, 76

³⁶ Charles Eames, *Case Study House #8*, (*Arts & Architecture*, 1945): 3.

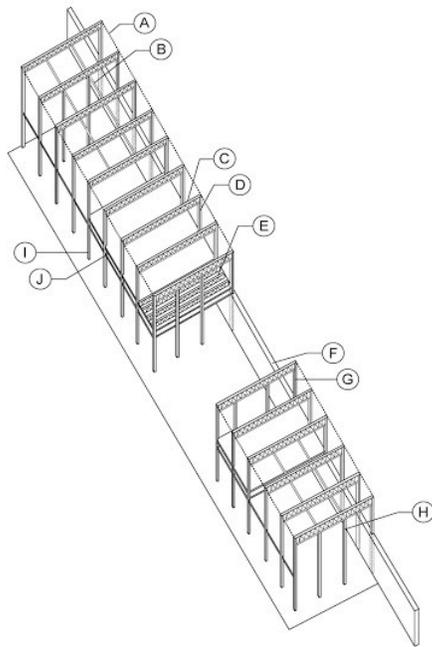


Figure 12: Eames House Frame Construction (Kit of Parts), using:

- A. 3 x 3 x 1/4" continuous steel angle at top. This was a truss part in the initial design.
- B. Bridging partially shown.
- C. OT 125 roof joists 7' 4" oc (RJ-1).
- D. 4 x 4" x 10 lb. column partially embedded in concrete wall.
- E. OT 141 floor joists 1' 10" oc (FJ-1).
- F. Concrete retaining wall.
- G. Studio framing similar to that of the house.
- H. Nonstructural 4 x 4" columns at ends. These do not support beams or joists, only windows.
- I. Two-story 4 x 4" x 10 lb. column.
- J. 12 C 10.2 channel at second floor to support floor joists. Similar members were used in the first design but were of different lengths and connections.



Figure 13-14: Eames House by Charles and Ray Eames, Los Angeles, California (1949)

Case Study # 8, designed by Charles and Ray Eames, was one of the 25 case study homes. Standardized components of prefabricated steel frame and windows were combined with custom made bright coloured panels. Not only did the Eames' house promote the use mass-production in architectural components, but also in furnishings and accessories. The house illustrates prefabrication and the use of stock components as the ideal way to achieve affordable and efficient design.

MOMA's *Home Delivery: Fabricating the Modern Dwelling* is a fundamental text about prefabrication in architecture. The architects of the twentieth century started what would be known as the modular house. Concepts such as flexibility, renovation, and modularity have been areas of research to these architects of that age and nowadays. By the twentieth century, new building material evolved in a standardized sizes and types, such as sheet roofing, linoleum, and plywood. Methods of transportations improved which made it promising for constructing houses in bulk and transporting them to sites.³⁷ Standard material were placed in a flat-pack truck as a kit of parts, and constructed in the site. Middle-class Americans found it possible to order houses from a catalogue from stores such as Aladdin, Gordon Van Tine, Montgomery Ward, Hodgson Company, and Sears, Roebuck Co., offered a range of affordable prefabricated houses. Aladdin introduced the first true Rradi-Cut house kit which composed of pre-cut, numbered pieces that were assembled on site.

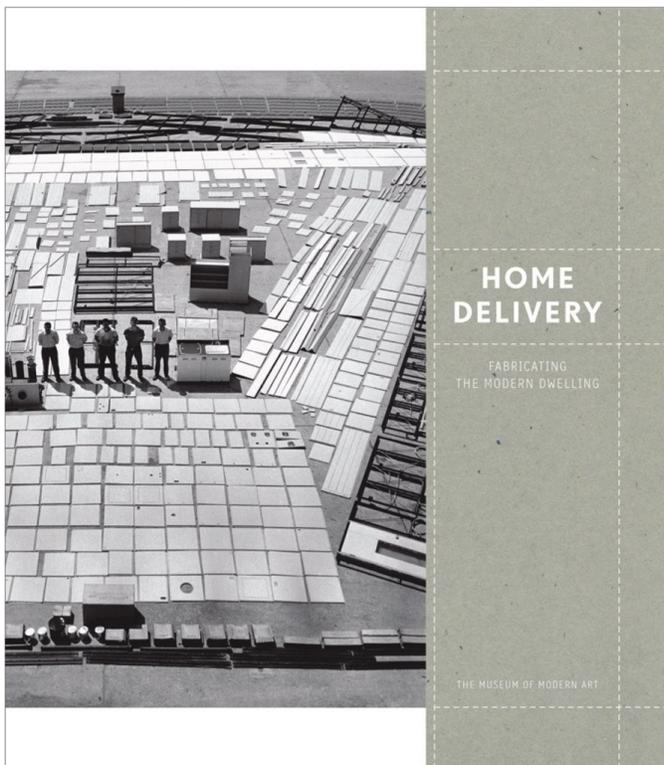


Figure 15: *Home Delivery: Fabricating the Modern Dwelling* Book published by (The Museum of Modern Art, New York)

³⁷ Paul J. Armstrong, *From Bauhaus to m- [h]ouse: The Concept of the Ready-Made and the Kit-Built House*, 73

In Europe, architects strived to create dwellings for returning soldiers following the devastation of World War I. In 1923, Walter Gropius & Adolf Meyer introduced the Toerten-Dessau housing system which explored a “building block” system of standardized flat roof housing.³⁸ The cubes, put back-to-back, were combined in groups, forming semidetached houses. The façades are composed of vertical and horizontal rows of windows. The load bearing walls are made of prefabricated hollow slag-concrete blocks (cheap building material). The furniture design was made and transported from the Bauhaus workshops. Most of this type of architecture pushed towards prefabricated architecture and was drive by function, technology, and program rather than by aesthetics.

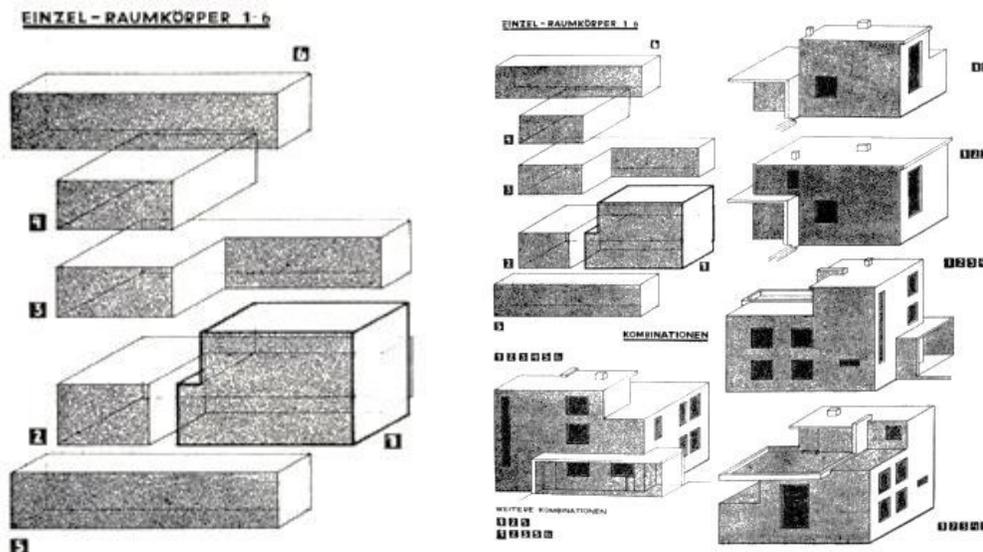


Figure 16: Walter Gropius & Adolf Meyer's *Toerten-Dessau* housing system

³⁸ Alicia Imperiale, *An American Wartime Dream: The Packaged House System Of Konrad Wachsmann And Walter Gropius*, (Temple University), 1

A relatively contemporary example of the ‘kit of parts’ housing is the 1968 *sistema moduli* by Finnish architects Kristian Gullischen and Juhani Pallasmaa. The two architects designed a system of modular structural columns and beams that connected to wall, floor and roof panels. The system, which explored flexibility and could be installed in different ways depending on the site, helped alleviate the shortage of vacation houses in Finland.³⁹ The wall/roof panels and the structure acted as insulation membranes. The panels were flexible to be changed from an array of design possibilities, using simple available materials such as wood, glass, and steel.⁴⁰ The *sistema moduli* permitted for the making of easily buildable dwellings specific to various sites.



Figure 17: *Sistema moduli* by Kristian Gullischen and Juhani Pallasmaa.

These precedents were used as points of departure to revive imagination about the modular structure. The coach suite zoning is a unique opportunity for imagining what the City of Ottawa could be in the long-term, and how the City might evolve for the next generation. This vision entails an intensified “future Ottawa” that aims to increase the richness of, respectively,

³⁹ Bergdoll Christensen, *Home Delivery: Fabricating the Modern Dwelling*: (The Museum of Modern Art, New York 2008): 152

⁴⁰ Ibid.

the urban and suburban residential environment, by relying on sustainable and efficient methods of fabrication.

Applicable Prefabrication Building Systems

Prefabrication refers to the making of parts in an offsite factory or controlled working environment prior to shipping and installation at the site. Methods of prefabrication have become valid and highly developed ways of producing architecture, especially for “micro”-sized buildings. In their book, *Refabricating Architecture*, Stephen Kieran and James Timberlake underline the dilemma of the expense of a handcraft approach to architecture. Their firm explores prefabrication for buildings of all sizes: craft, for them, is limited to “craft of installation” of a prefabricated system. Such a strategy avoids the “exclusive and unaffordable” expenses of custom design and handcrafted building.⁴¹ The less customization offered, the more affordable architecture becomes.

Prefabrication has always been present in the construction of massive buildings; an offsite fabrication allows for faster methods of construction, minimizes construction-related traffic disruptions and creates controlled and safe working environments. Nowadays with the available resources, industrial prefabrication of building elements contributes to various sizes of architecture. We see small elements of prefabricated hardware parts, finished windows and doors, to structural elements that are frequently shipped to construction sites and assembled there. A “box store” like Home Depot, which sells building construction materials, makes it possible for the regular shopper to access stock, prefabricated, elements. The Home Depot is thus primed to be a participant in a prefabrication cycle. Customers would need only select their products, and have them delivered in flat-bed trucks to a site, to be assembled.

⁴¹ Stephen Kieran, James Timberlake, *Refabricating Architecture: How Manufacturing Methodologies are Poised to Transform Building Construction* (McGraw-Hill, 2004): 9.

In 2002, the City of Ottawa initiated a 10-year Action Plan Ottawa with the goal of supporting the creation of 1,000 units of rental housing over four years.⁴² Affordability is commonly a term used as a marketing tool by developers for new suburban development. In exploring the meaning of affordability, we think of a cost of something relative to the amount that one is able, or willing to pay for. Affordability is generally measured by one's salary. But rarely does affordability consider products and material accessibility within a region. Affordability extends beyond the true price of a final "house;" a trail of affordable building material should also be considered when providing an affordable product. Home Depot might have a role to play. This idea will form part of the thesis proposition, presented further on.

Prefabrication can take several forms, from a panelized system that is assembled on site, to a fully shop-fabricated unit, shipped as a whole to a site. When the architecture is small in scale, architects tend to employ prefabrication to make complete modules. In this scenario, a method of construction is used where various components of the building are constructed in factory-controlled conditions as part of a sub-assembly line process, then fully connected prior to transporting. The result is a fully insulated, prefinished product ready for transportation and connection to foundation on site. A variation of this technique would complete "blocks" rather than the whole, and assemble the "blocks" on site. Whatever gaps between the blocks would be filled with a panel system. Such a hybrid combination of panelized and fully shop-fabricated systems is the subject of this thesis proposition.

A transition from handcraft to machine-craft was the Modernist dream throughout the 20th century. This shift brought about the conception of the house as a commodity of mass production. This was a key moment in the history of architecture, where the profession truly

⁴² City of Ottawa, *Program guidelines for Action Ottawa*, 2001.
Access: <http://ottawa.ca/en/residents/social-services/housing/program-guidelines-action-ottawa>

changed in response to social, economic, or environmental forces. Consumers of the 21st century are no longer solely concerned about affordability. Today's' consumers demand products that are well made, with added features, built in a reasonable time frame, all within a reasonable cost. Architects find themselves mandated by the rules of economy.⁴³ Increased costs happen when changes are made during the construction process, so prefabrication cannot be altered – it must be inserted in the design process from the start. Flexibility in customization can be acquired in two ways; one is during the controlled pre-design stage, where the customer could have options for layouts and materials. The second way, as researcher Basem Eid defines in his article “*Building without Nails*,” is designated “post-occupancy adaptability,” which are changes that the dweller can make later on, in response to changes in their life (arrival of a new child, etc.).⁴⁴ The system proposed here, because it is made of blocks and panels, lends itself to customization at the outset as well as at later stages.

⁴³ Stephen Kieran, James Timberlake, *Refabricating Architecture: How Manufacturing Methodologies are Poised to Transform Building Construction* (McGraw-Hill, 2004): 11.

⁴⁴ Basem Eid Mohamed, Frederic Gemme, Aaron Spencher, *Building without Nails: Enabling Flexibility and Structural Integrity through Digital Prototyping*. (McGill University School of Architecture, BONE Structure, 2015): 296.

PART 4:
BOX STORE COACH
HOUSES KIT OF PARTS

Introduction

The following chapter presents a prefabricated housing system intended to be implemented on Ottawa house lots, in answer to the City of Ottawa change of zoning By-law. The images and text here below present the system in steps, showing where the materials come from (the Home Depot), illustrating all the “blocks” that are used to form the houses, various configurations of block assemblies, the panels used to fill spaces between blocks, delivery and arrangement on selected blocks.

Home Depot = Source of Affordable Building Construction Materials

As discussed in Chapter two the coach house asks to be conceived with affordability in mind. And as alluded to in Chapter three, Home Depot is part of an affordability strategy. Not only limited to providing affordable materials but also to providing services like skill building, tool rental, van rental, etc., all of which add to homeowner skills and capabilities to do-it-yourself (DIY) culture, this ubiquitous big box hardware store increases the affordability and accessibility to materials and tools. We note here that Home Depot is simply an example of a building construction material box store that is accessible to the low and average income shoppers, but of course, there are other candidates.

In this proposal Home Depot would commit to the production of affordable coach housing suites, the materials collected in parts from its inventory. The houses, or suites, would be manufactured in the store. A factory component will be added to an existing Home Depot store at the South Keys location, and is presented here in diagrammatic form. This location offers the opportunity to create an architectural artefact that revitalizes the suburban area. The Home Depot will have the material components that will contribute to the construction of these suites. They will be sold to homeowners and developers.

PRE-DESIGN

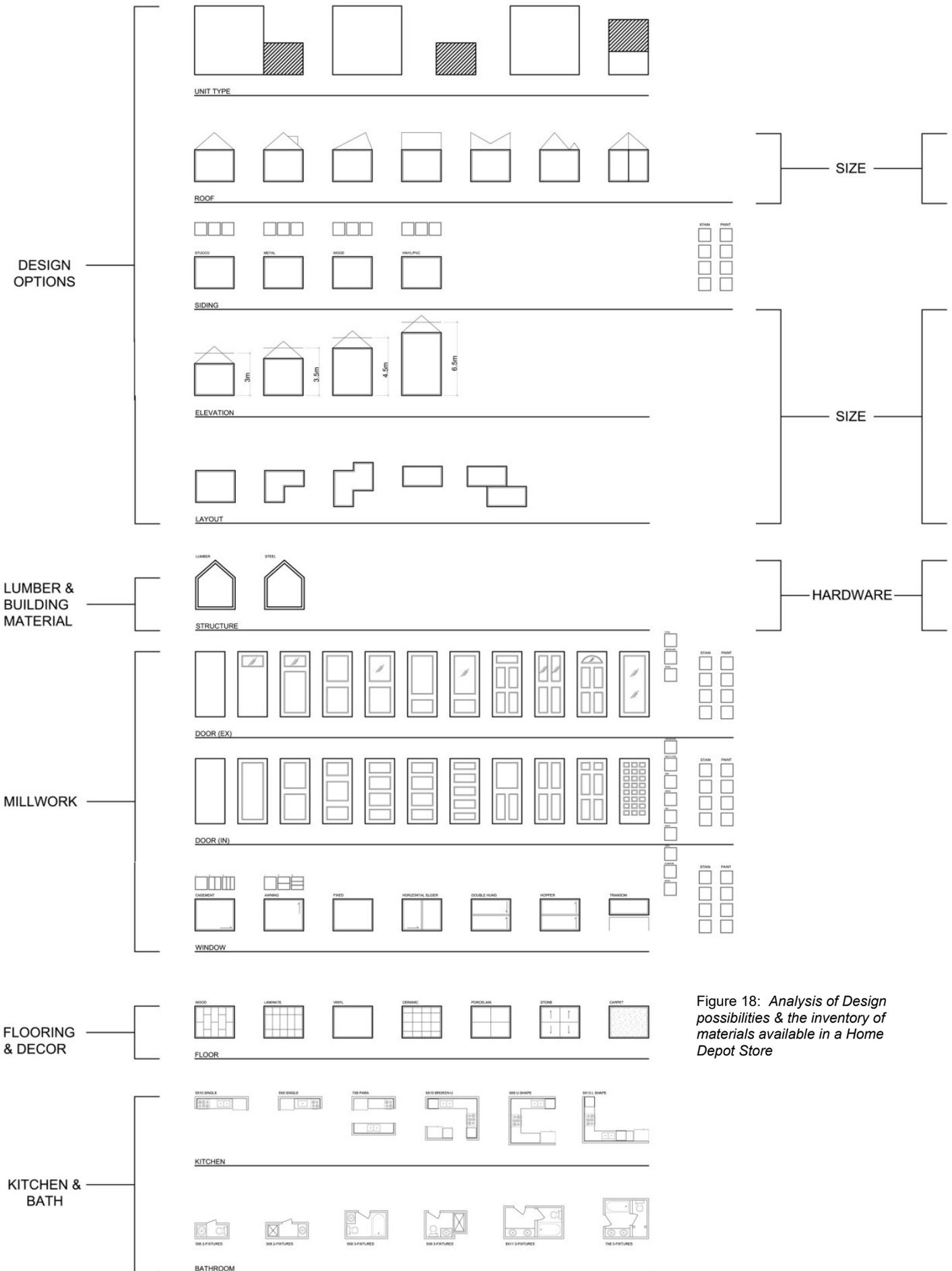


Figure 18: Analysis of Design possibilities & the inventory of materials available in a Home Depot Store

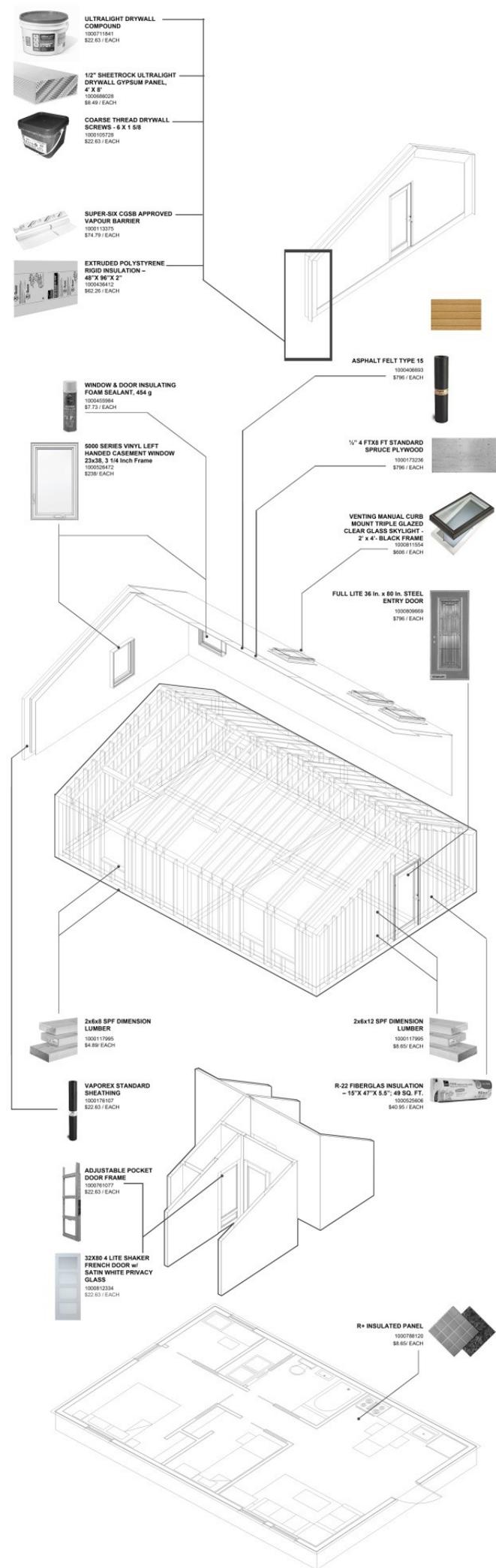


Figure 19: Analysis of standardized construction materials and connection to a home design and the Home Depot SKU inventory system; a concept driven from Refabricating Architecture by Kieran and Timberlake

Parts taken from the Home Depot Shelves are connected to an inventory system allowing for the tracking of quantity, material documentation and prices. This could assist in ease of construction and future alterations

***“Big things come in small parcels”
How much can you fit in to 64 sq.ft?***

Adam Cvijanovic’s illustration of the American lifestyle captures both the vulnerability and the excesses of the North American house and its content. In an untitled art piece, what seems to be a traditional model of a North American house is depicted with debris and junk items coming out of it. Cvijanovic’s work is useful in opening up the question of house size and meaning. The question of how much one needs in a space is changing drastically from accommodating the 100 feet long lot with a single family house to a pattern as small as 200 to 300 sq.ft. The Small Housing Society, which was founded as a result of the tiny house movement, defines nine forms of small housing. Small houses can range from approximately 480 sq.ft to a ‘micro house’ which is about 160 sq.ft.⁴⁵

“It is not a movement about people claiming to be ‘tinier than thou’ but rather people making their own choices towards simpler and smaller living however they feel best fits their live.”⁴⁶
-Jay Shafer

A small house can be defined as any form of housing that is sized to meet the occupant’s needs with less excess space. Today, this micro-housing culture is accompanied by an increased awareness of rapid changes in urban landscape. The growth of cities and suburbs is beginning to make many people question the most ideal way of living, and there is a growing interest in unconventional forms of domestic design. This begs the question – how much space does one really need? Living in smaller quarters requires fewer construction materials and occupies less land area – all at a lower cost than conventional building standards. *Box Store Coach Houses* -- the coach houses designed as part of this thesis -- fall into the micro-house tradition. In the next section, we discuss exactly how they are built.

⁴⁵ Akua Schatz. *Small Houses: Innovations in Small-scale Living from North America*. (Small Housing British Columbia, 2015): p 11

⁴⁶ *Ibid.*, 2.

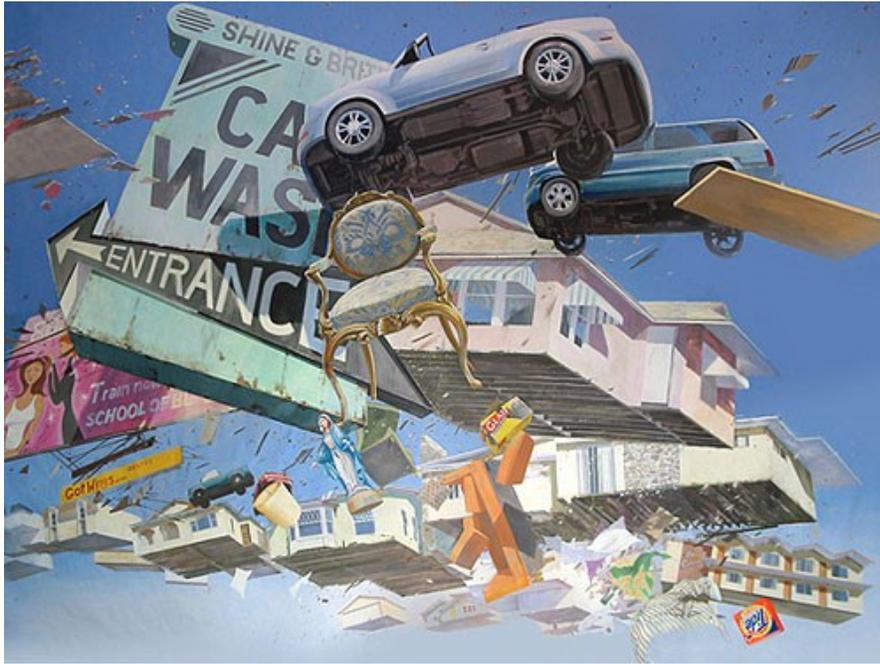


Figure 20: Adam Cvijanovic,
Flashe and latex on Tyvek, 2007

Programmatic Variations:

Simply explained, *Box Store Coach Houses* uses modular prefabrication methods that can be customized to suit the needs of various family structures and lot types. Individual modular "pods" can be arranged in a variety of configurations, allowing for a high level of flexibility and individual customization. These modules are fitted with flexible pod furniture; when more space is needed a bed "cavity" can be hidden away (Murphy bed), kitchen storage and dining table can be pushed back. Dwellers can also take advantage of wall surfaces for a variety of uses. Each house would also include a central core that holds all the mechanical systems. An exterior wall contains all the plumbing. While the kitchen and bathroom are usually placed against this exterior wall, these rooms can also plug into the mechanical core in cases when they are located internally, in the floor layout.

The system here presented refers both to Walter Gropius and Adolf Meyer's Toerten-Dessau system and to Kristian Gullischen and Juhani Pallasmaa's *sistema moduli*. The system proposes a set of modular blocks that are developed based on basic living requirements for example: the entrance, mailbox, and the coat closet with the bike rack is one group. The blocks are limited in size to a modular size combination of (4 feet wide x 8 feet long x 8 feet high, 8 feet wide x 8 feet long x 8 feet high, 12 feet wide x 8 feet long x 8 feet high, & 8 feet wide x 8 feet long x 16 feet high). The size configuration of the modules is confined to the standard measurements of a flat-deck trailer of (8.6 feet wide x 48 feet long) and allows for an overload capacity of (48,000 lb).⁴⁷ So, in essence, this thesis proposes a 'building block' system of standardized, prefabricated materials.

⁴⁷ *Prefab City*, (Northeastern University): 20, accessed: <http://www.slideshare.net/ssuser9fc5af/prefab-city>

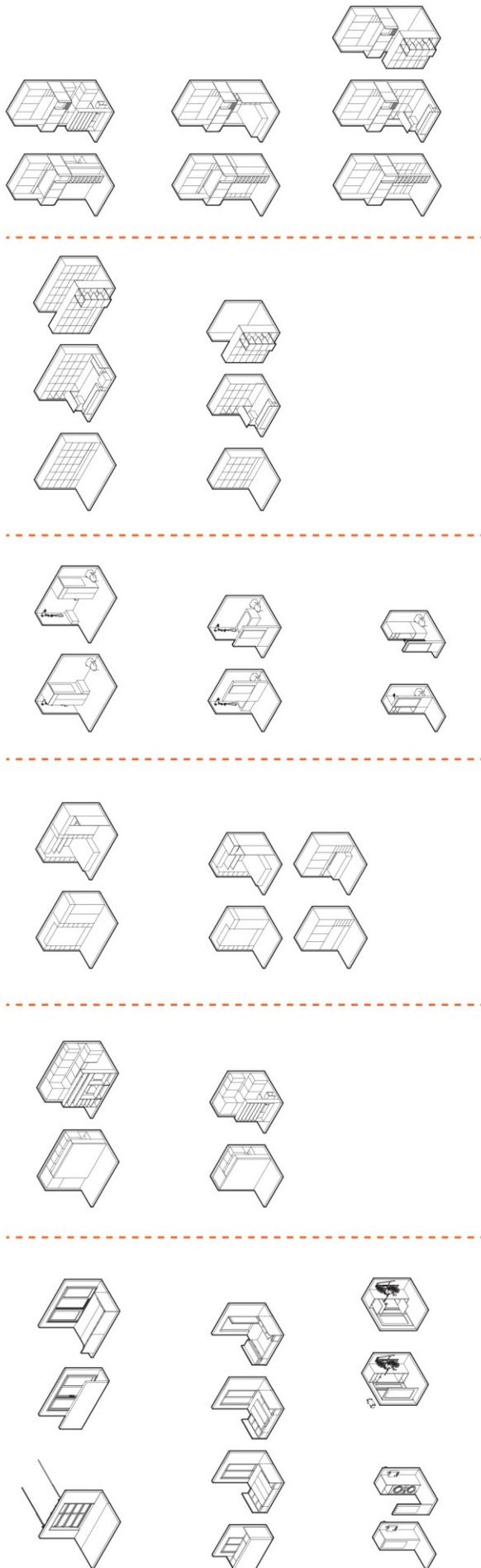
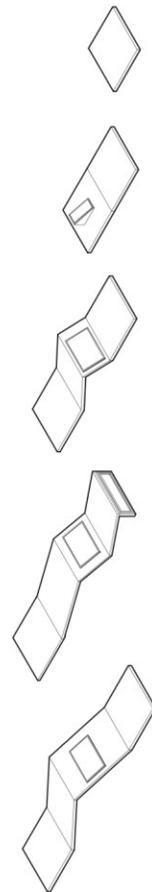
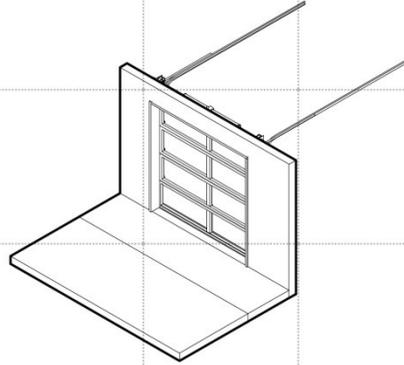
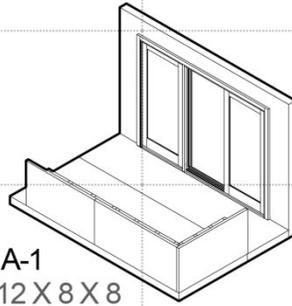
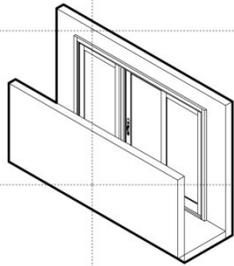


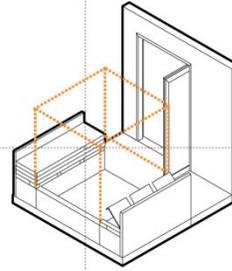
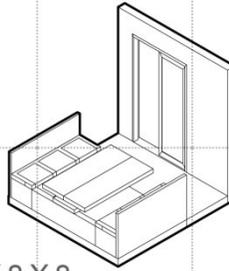
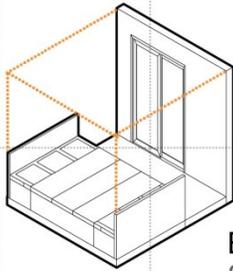
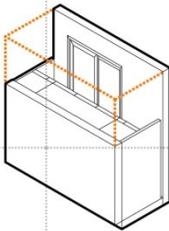
Figure 21: A catalogue of the proposed combined modules & roof options, merging standard materials with universal design possibilities



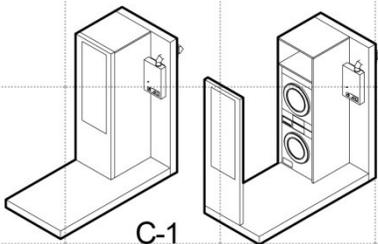
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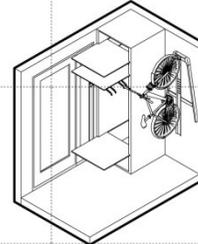
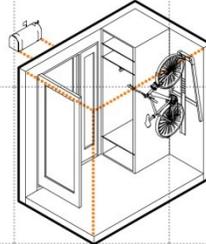
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12 X 8 X 8



B-1
8 X 8 X 8

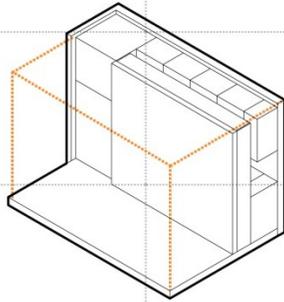


C-1
4 X 8 X 8

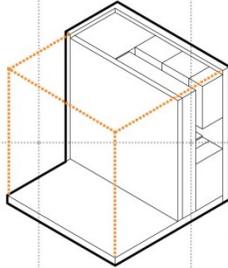
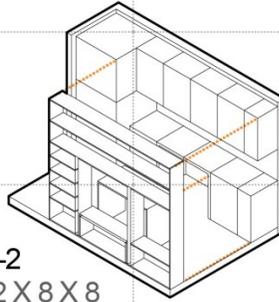


D-1
4 X 8 X 8

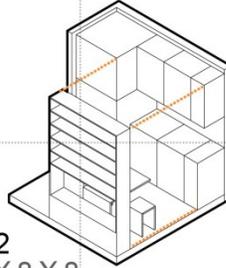
GROUP 2



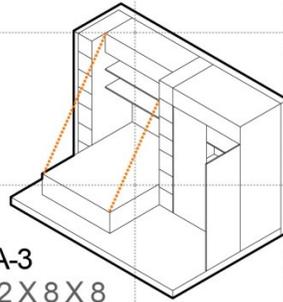
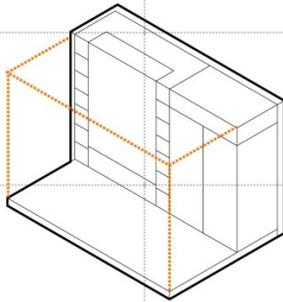
A-2
12X8X8



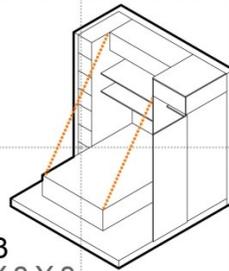
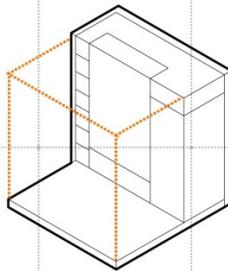
B-2
8X8X8



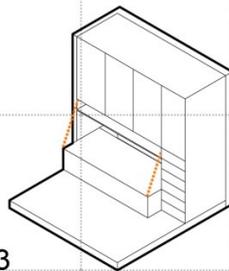
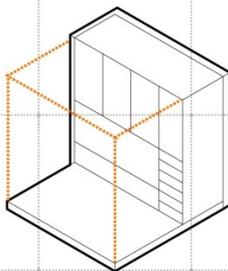
GROUP 3



A-3
12X8X8

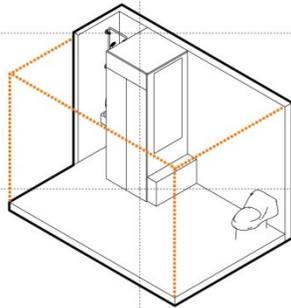


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8X8X8

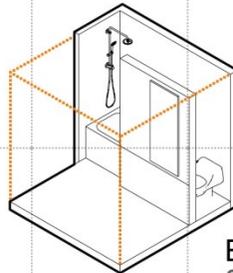
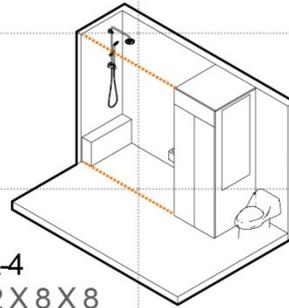


C-3
8X8X8

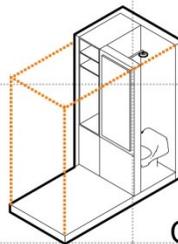
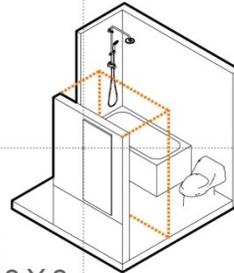
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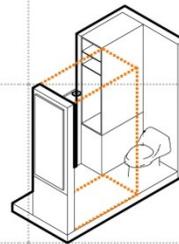
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12X8X8



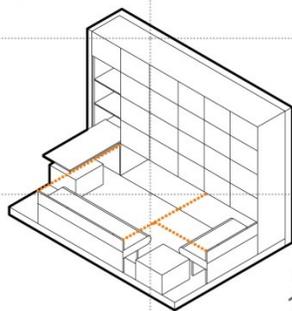
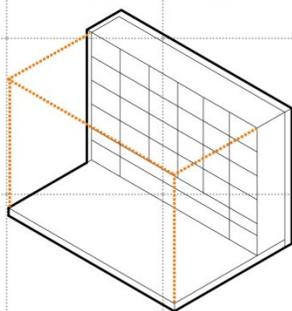
B-4
8X8X8



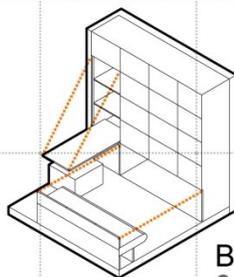
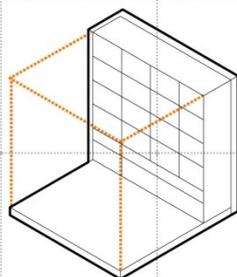
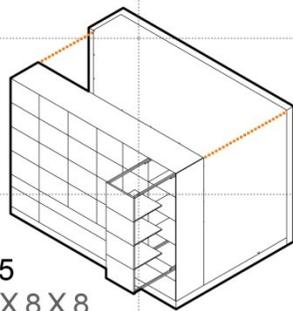
C-4
4X8X8



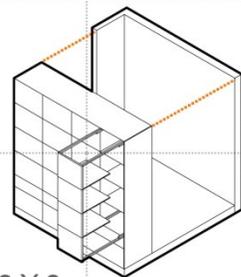
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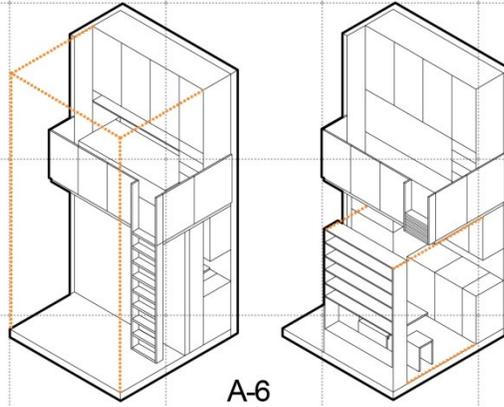
A-5
12X8X8



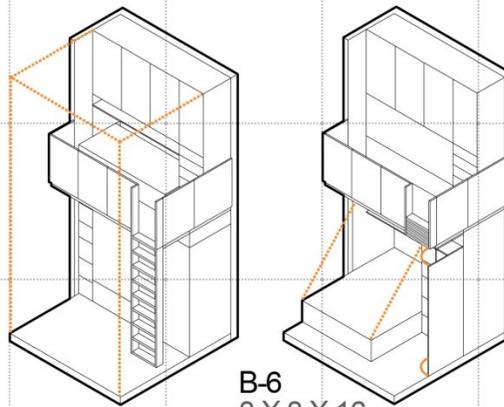
B-5
8X8X8



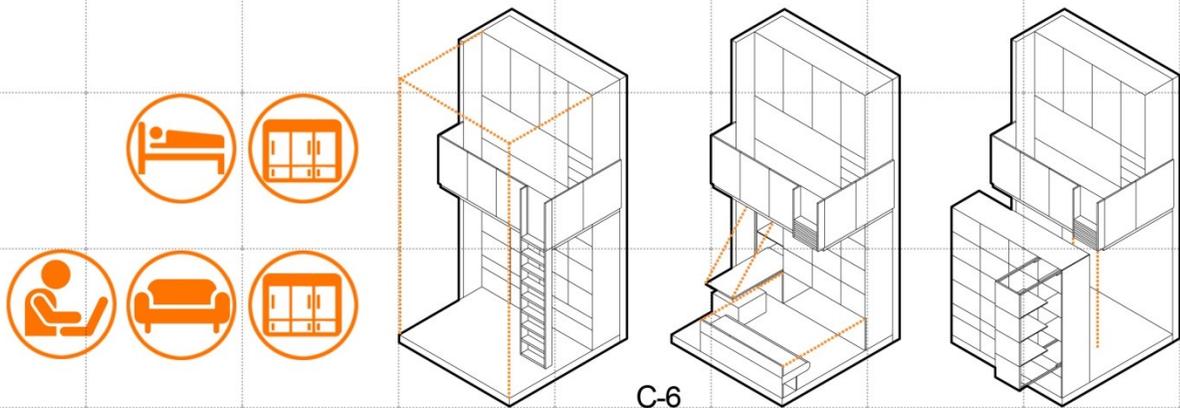
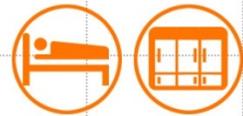
GROUP 6



A-6
8 X 8 X 16



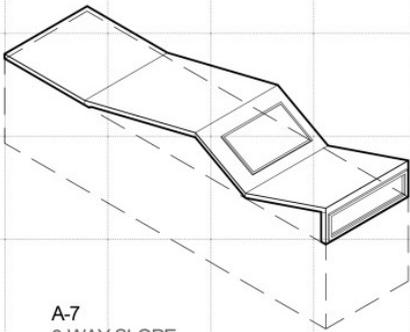
B-6
8 X 8 X 16



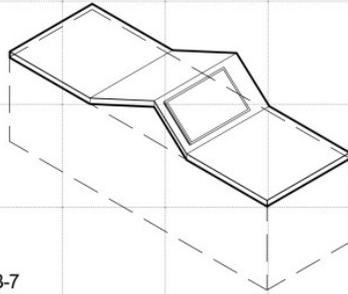
C-6
8 X 8 X 16



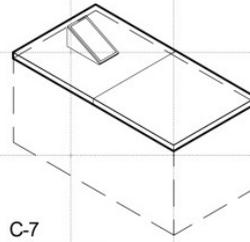
GROUP 7



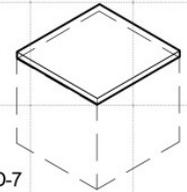
A-7
3-WAY SLOPE



B-7
PITCHED ROOF

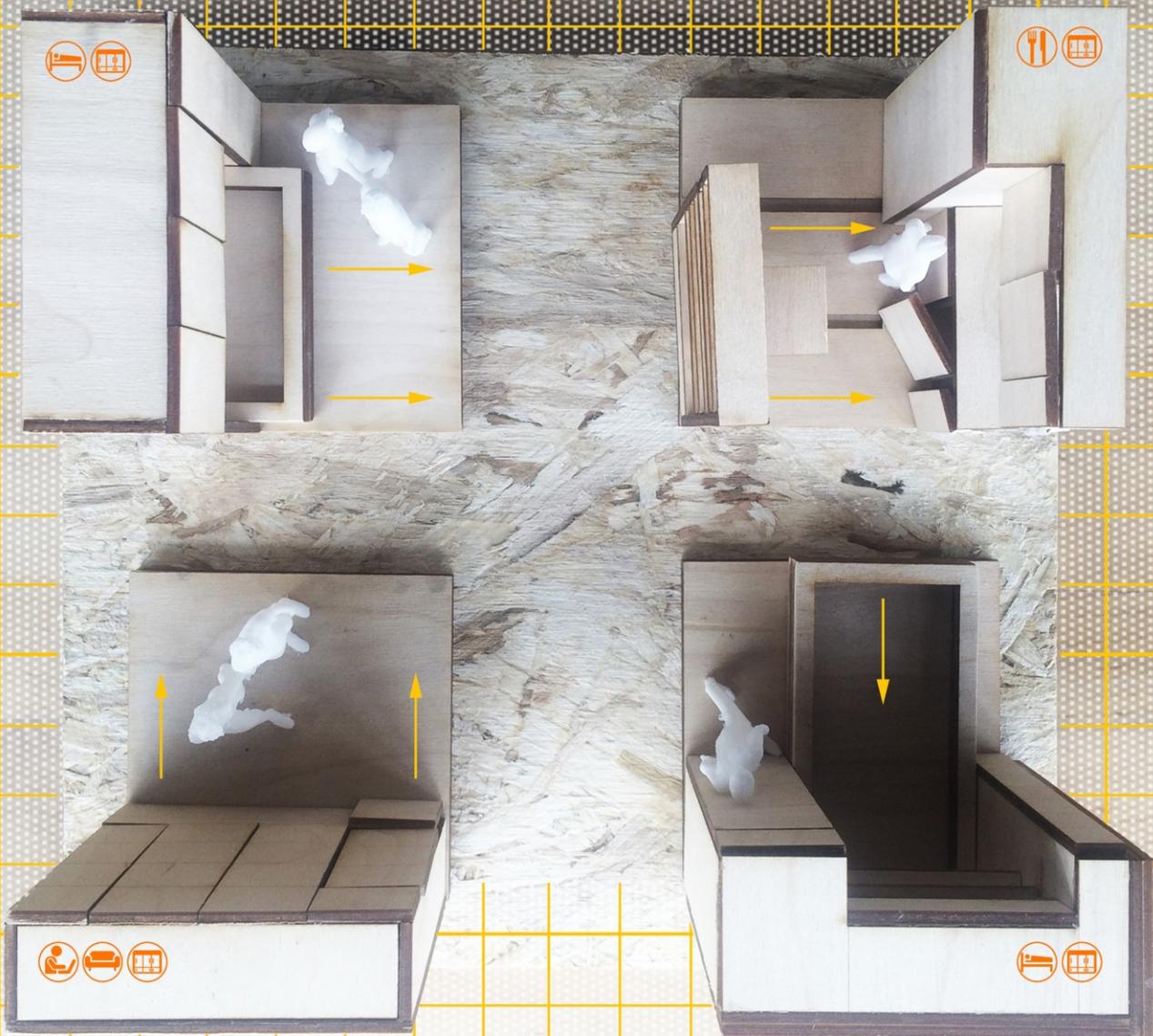


C-7
SKYLIGHT



D-7
FLAT

This section proposes a series of design-guiding components, or 'kit of parts,' that will be used to form various architectural compositions that react to and engage with the existing fabric of Ottawa. These design-guiding components are simple and minimal in nature to allow for flexibility of manipulation and alteration in design.



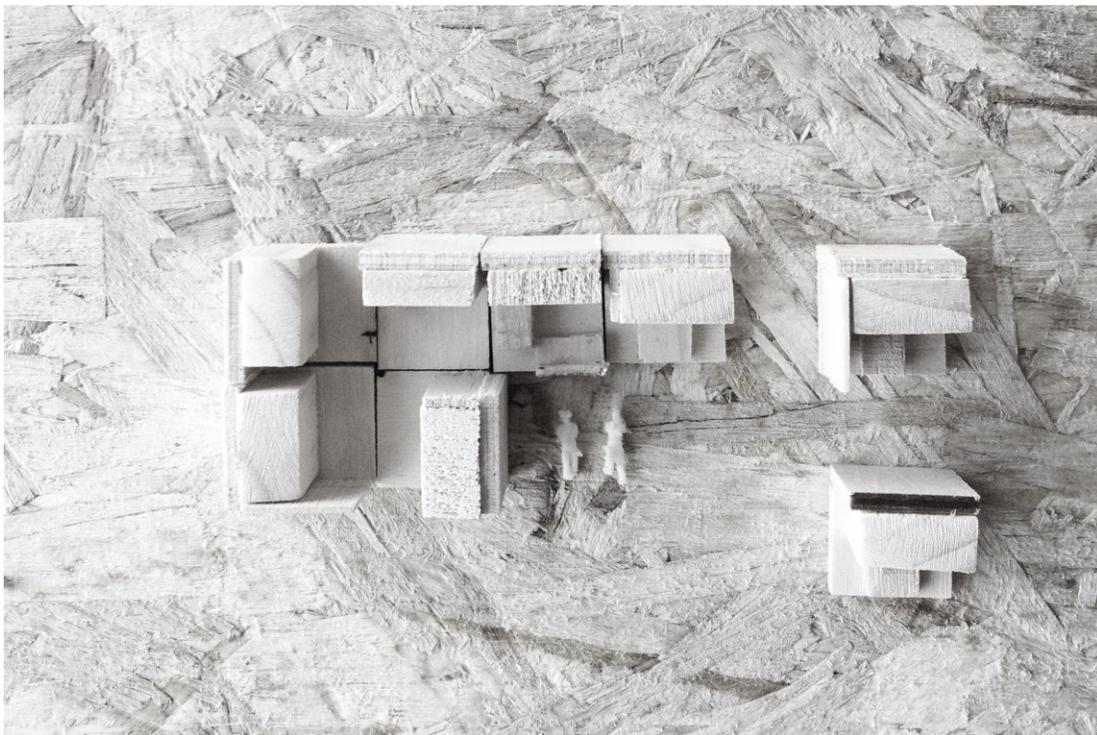
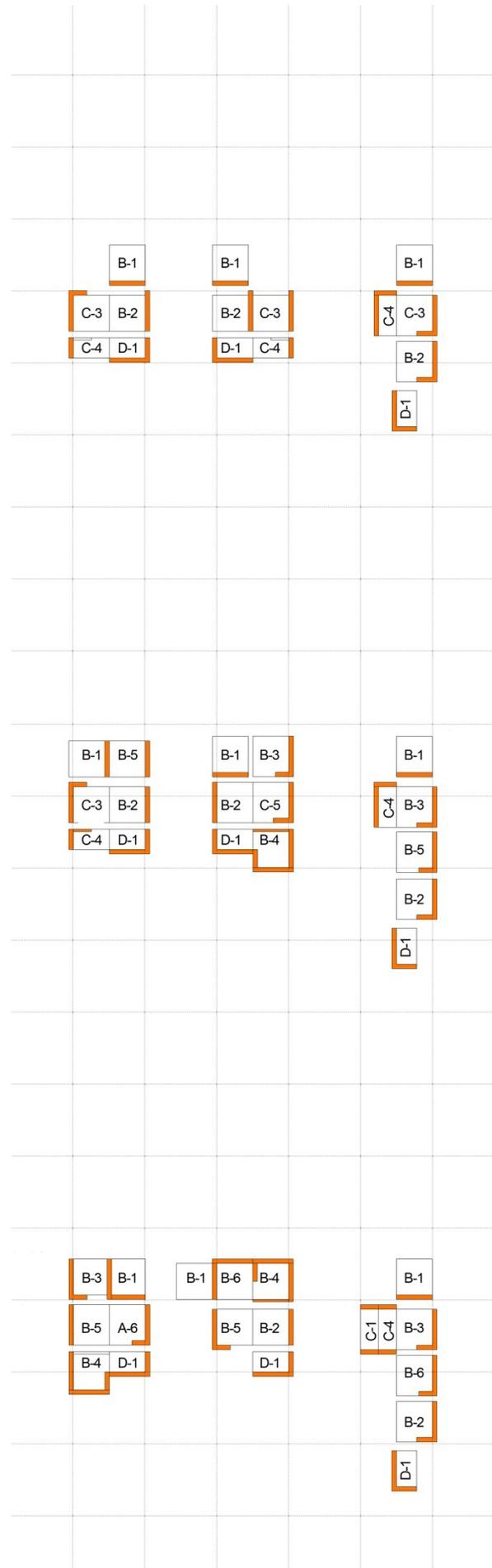


Figure 22: Massing model of arrangements of blocks

Figure 23: Plan diagram of possible combinations of block arrangements based on universal design adjacency methods.

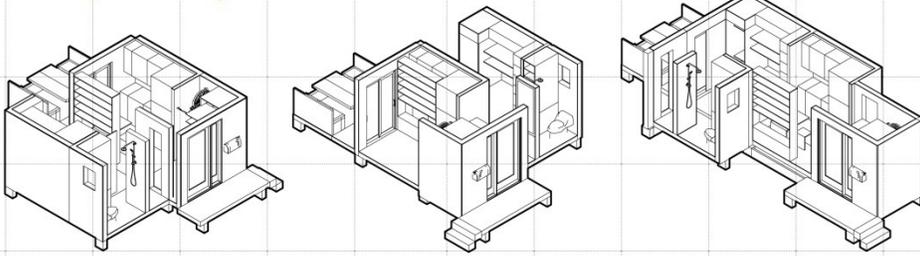
Figure 24: Axonometric Diagrams showing the possibilities of producing bachelor, one-bedroom, & two-bedroom apartments from the proposed modules



BACHELOR



B-1 D-1 + B-2 C-3 + C-4



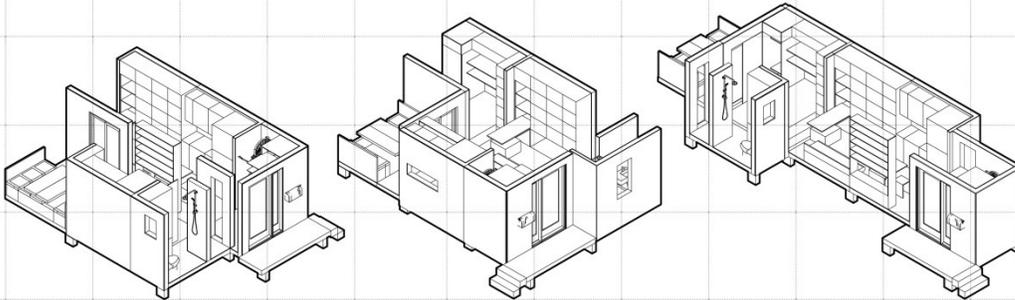
HOUSES MODULATION THAT COULD BE ALTERED TO FIT SITE CONDITIONS



ONE BEDROOM



D-1 B-1 + B-2 B-3 + B-4 + B-5
C-3



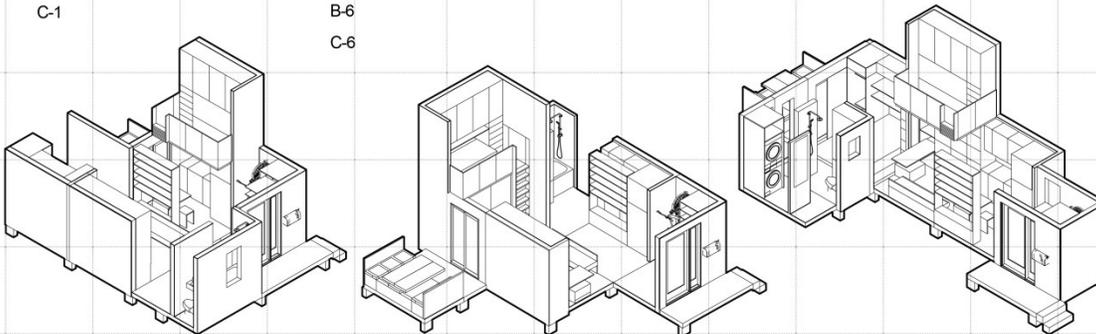
HOUSES MODULATION THAT IS SUITABLE TO CONSUMERS' NEEDS



TWO BEDROOM



D-1 B-1 + B-2 C-3 + C-4 + A-6
C-1 B-6 C-6



HOUSES MODULATION THAT CAN GROW





THE HOME

More saving.
More storing.

Your project
starts at
the home



THE HOME

More saving.
More storing.

BACHELOR 200 SQ. FT.

ADD AN EXTRA 64 SQ. FT. FOR A DECK

SKU # 1000675932
SKU # 1000675933
SKU # 1000675934
SKU # 1000675935
SKU # 1000675936

B-1	D-1	B-2	C-3	C-4
\$ 500	\$ 700	\$ 1500	\$ 1000	\$ 1500

Vist us at BUILD THE HOME CENTRE at

thehome.ca

1-BEDROOM 296 SQ. FT.

ADD AN EXTRA 64 SQ. FT. FOR A DECK

SKU # 1000675932 SKU # 1000675936
SKU # 1000675933 SKU # 1000675935
SKU # 1000675934

B-1	D-1	B-2	C-3	B-3
\$ 500	\$ 700	\$ 1500	\$ 1000	\$ 1500

Vist us at BUILD THE HOME CENTRE at

HOME®

Your project starts at the home



THE HOME®

More saving. More storing®

Your project starts at the home

Q. FT.
Q. FT. FOR A DECK
1000675937

B-4	B-5
\$ 2000	\$ 2500

2-BEDROOM 360 SQ. FT.
ADD AN EXTRA 64 SQ. FT. FOR A DECK

SKU # 1000675932 SKU # 1000675937
SKU # 1000675933 SKU # 1000675938
SKU # 1000675931
SKU # 1000675935
SKU # 1000675936

B-1	D-1	C-1	B-2	B-3	B-4	C-6	
\$ 500	\$ 700	\$ 2000	\$ 1500	\$ 1500	\$ 2000	\$ 5500	

THE HOME CENTRE at

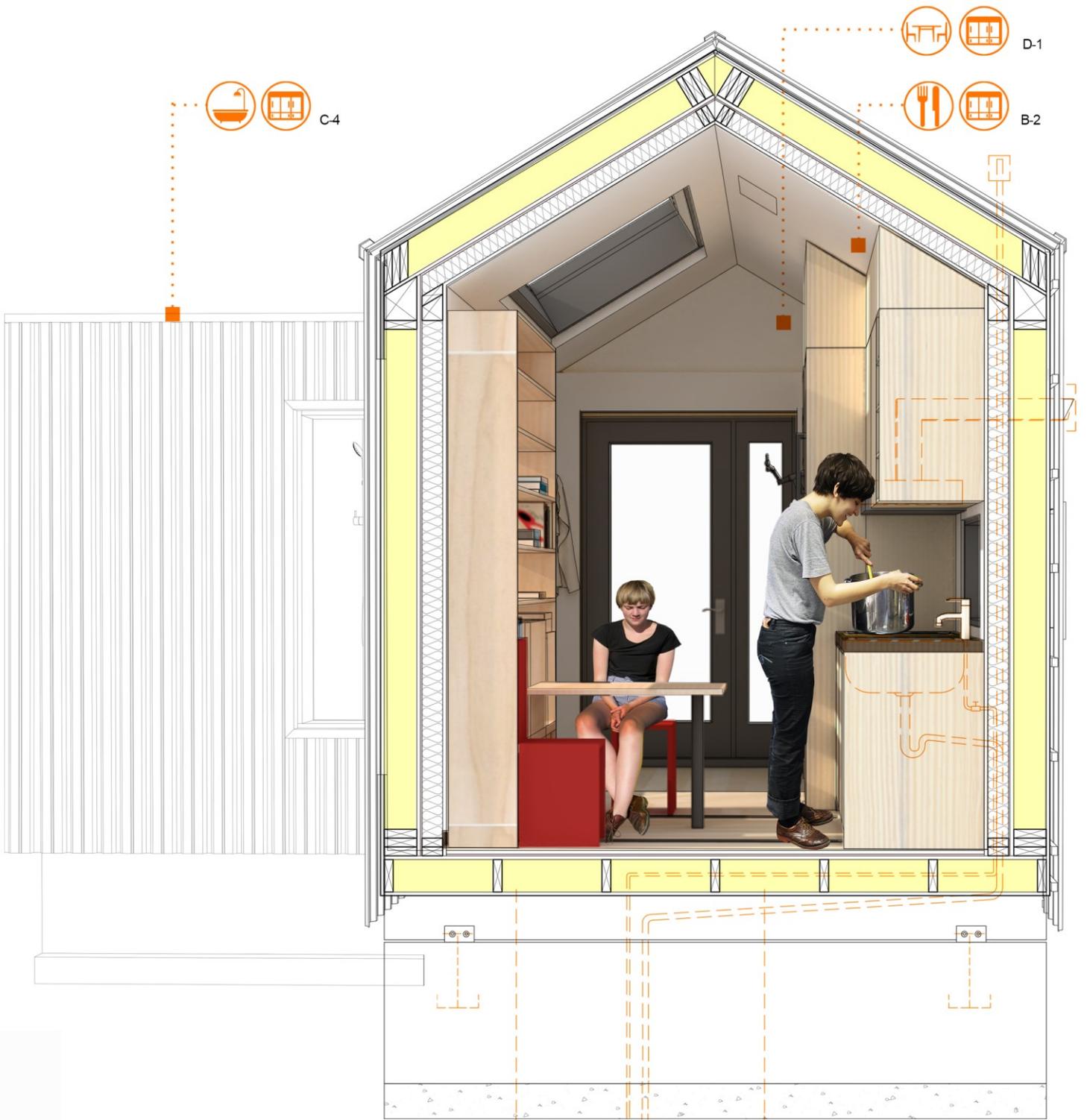
thehome.ca

Vist us at BUILD THE HOME CENTRE at

thehome.ca



Figure 25: Section Perspectives illustrating the flexibility of the interior and exterior modular system.



Modules' Construction

The exterior walls' are structural and are made of Structurally Insulated Panels (SIP). These SIPs come in standard sheets of 4 x 8 feet and are composed of two layers of Oriented Strand Board (OSB) with an Expanded Polystyrene (EPS) layer in between. The typical thickness of OSB is 5/8 inches. Experts on prefabrication recommend the use of EPS as the insulation material for the exterior panels, to allow for maximum thermal efficiency. A second wall (2 x 4 framing plus a sheet of standard drywall, and filled with UltraTouch Denim insulation) is affixed behind the structural wall, to create the interior wall. For the floor structure, 2 x 6 wood framing is anchored into a two to six foot-deep concrete foundation pier with a steel rod. SIPs are added and finished with flooring tiles or hardwood flooring. The electrical wiring runs through the interior walls and is connected on site. The modules are connected with steel clips along the edge of the SIPs. A FoamSealR™ Sill Gasket made of polyethylene is placed between the modules along the clipping side to eliminate heat loss from air infiltration between the modules. This gasket membrane is moisture-resistant, so it acts as a second layer of water sealant between the modules.

The Modules, placed back-to-back or side-to-side, are combined in groups based on the user's space needs. The facades are composed of vertical and horizontal rows of windows dictated by module placement, and window placement.

The millwork components are made of plywood sheets of 5/8" or 3/4" thickness, and are installed in the modules before being transported to the site for final assembly. The overall architecture is driven by function, technology, availability of materials, and program, rather than by aesthetics. The house can be covered with any cladding (corrugated stainless steel is illustrated in this configuration).

1 ENCLOSURE - ROOF

THE ROOF ENCLOSURE CAN BE CUSTOMIZED TO AN ARRAY OF MODULAR COMPOSITION RANGING FROM FLAT ROOF TO GABLE ROOF

A RANGE OF SKYLIGHTS CAN BE CONNECTED TO THE ROOF TO INCREASE NATURAL LIGHT AND OPERABLE FENESTRATION FOR NATURAL VENTILATION

2 ENCLOSURE - WALLS

SPATIAL ENCLOSURE CAN BE ACHIEVED THROUGH A VARIETY OF CUSTOMIZED PANELS (MATERIAL PALETTES AND WINDOW OPENINGS)

3 CORE

THE CORE INCLUDES THE INTERIOR PROGRAM (MILWORK) ATTACHED TO THE FLOORS AND EXTERIOR WALLS

4 THRESHOLD 1

ORIENTATION OF THE SUITE ENTRANCE CAN BE TOWARDS THE MAIN HOUSE OR A LANEWAY WHERE ONE EXISTS

5 THRESHOLD 2

THE DECK PROVIDES A CONNECTION TO EITHER THE MAIN HOUSE AND THE BACKYARD OR TO THE LANEWAY

6 VISUAL CONNECTION

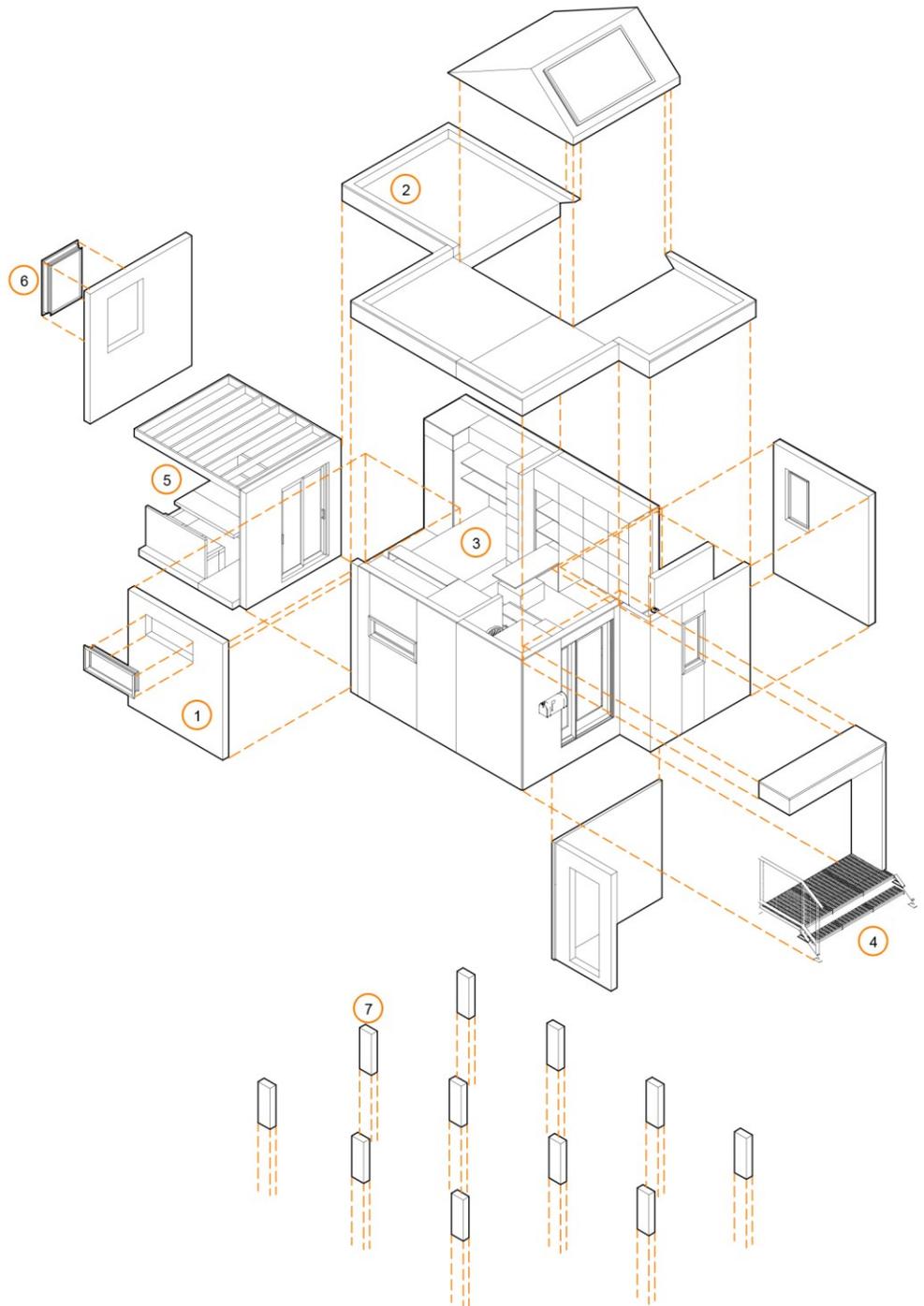
THE WINDOWS PROVIDE VISUAL CONNECTIONS TO THE BACKYARD & THE MAIN HOUSE

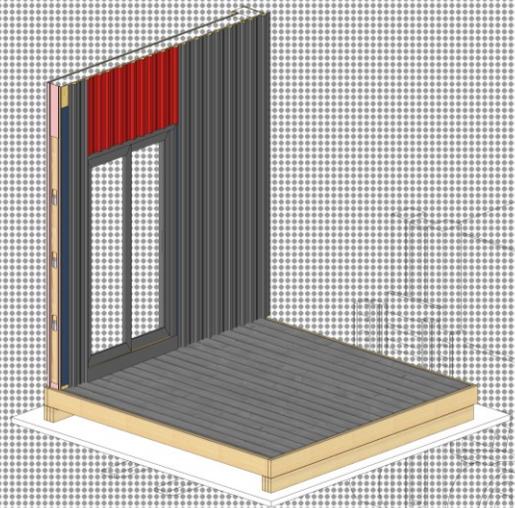
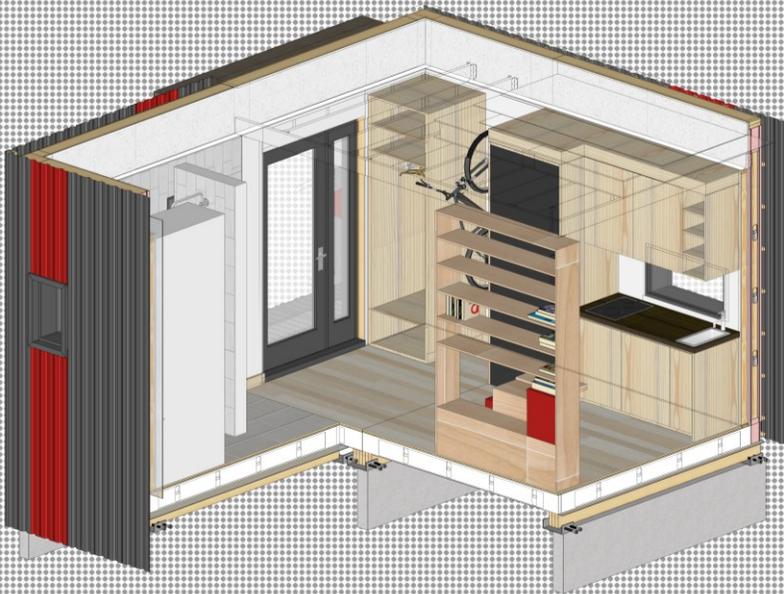
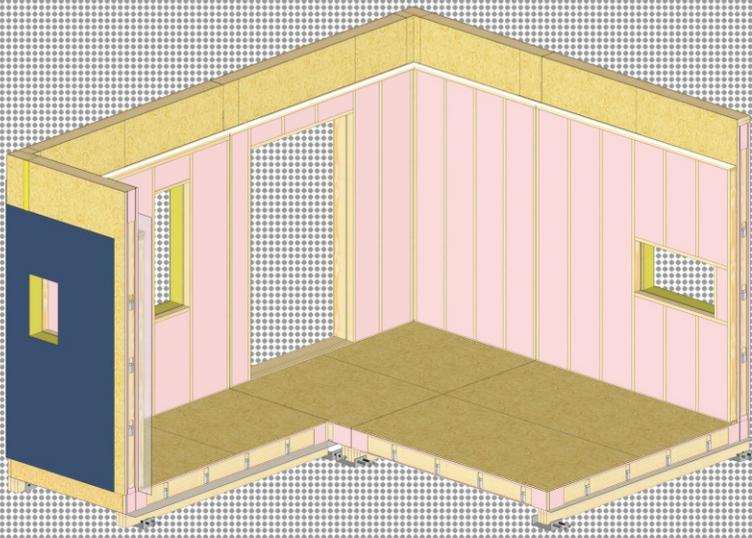
WHEN PRIVACY IS REQUIRED A SMALLER WINDOW CAN BE USED AND WHEN MORE VISUAL CONNECTION TO THE OUTSIDE IS REQUIRED, A BIGGER WINDOW CAN BE USED

7 CONNECTION TO GROUND

THE CONNECTION DETAIL CAN VARY FROM CONCRETE PEIRS TO STEEL PIER.

THE CONNECTION CAN EITHER BE EXPOSED OR COVERED WITH A SKIRT DETAIL





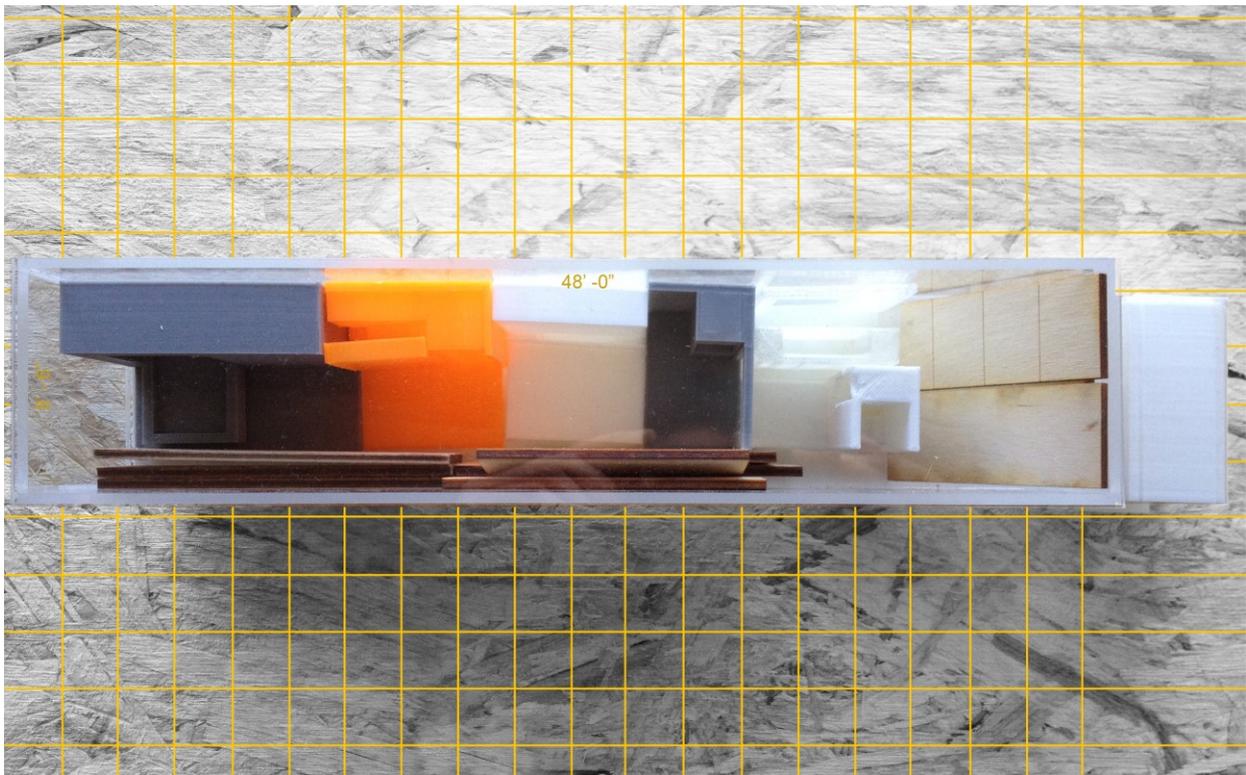
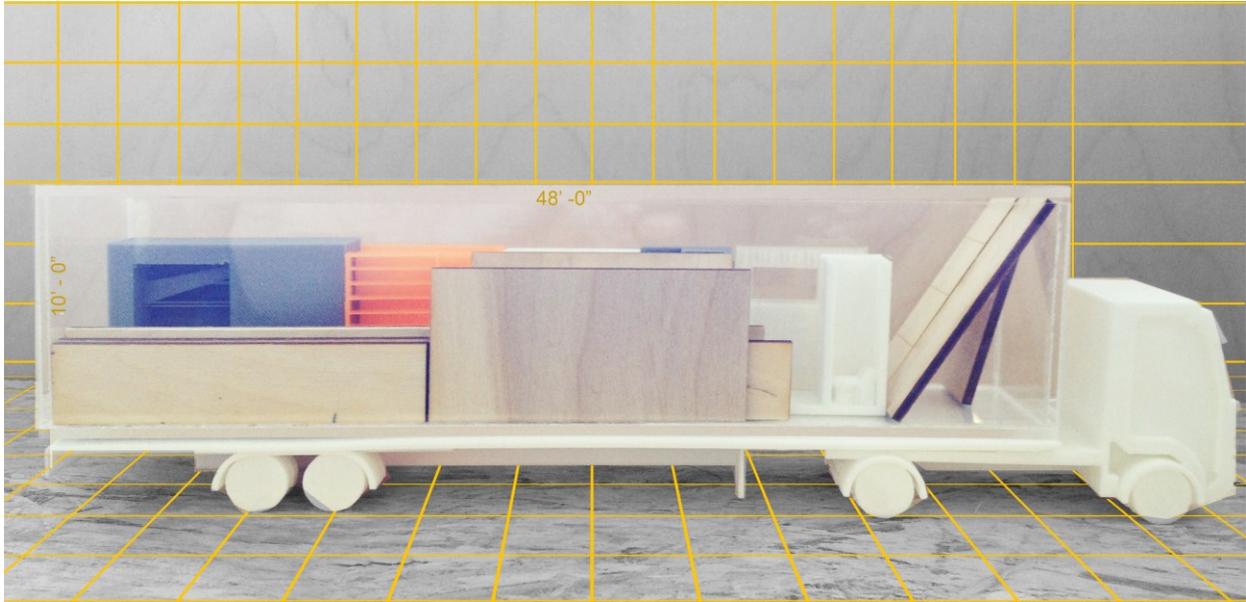
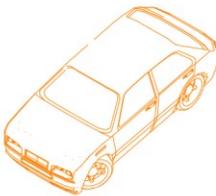
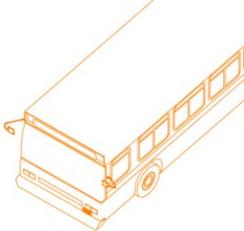
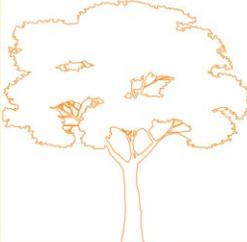
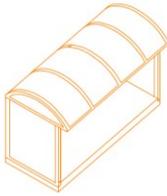
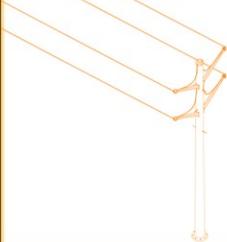
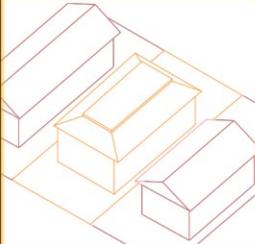
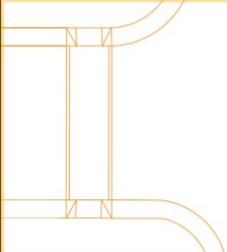
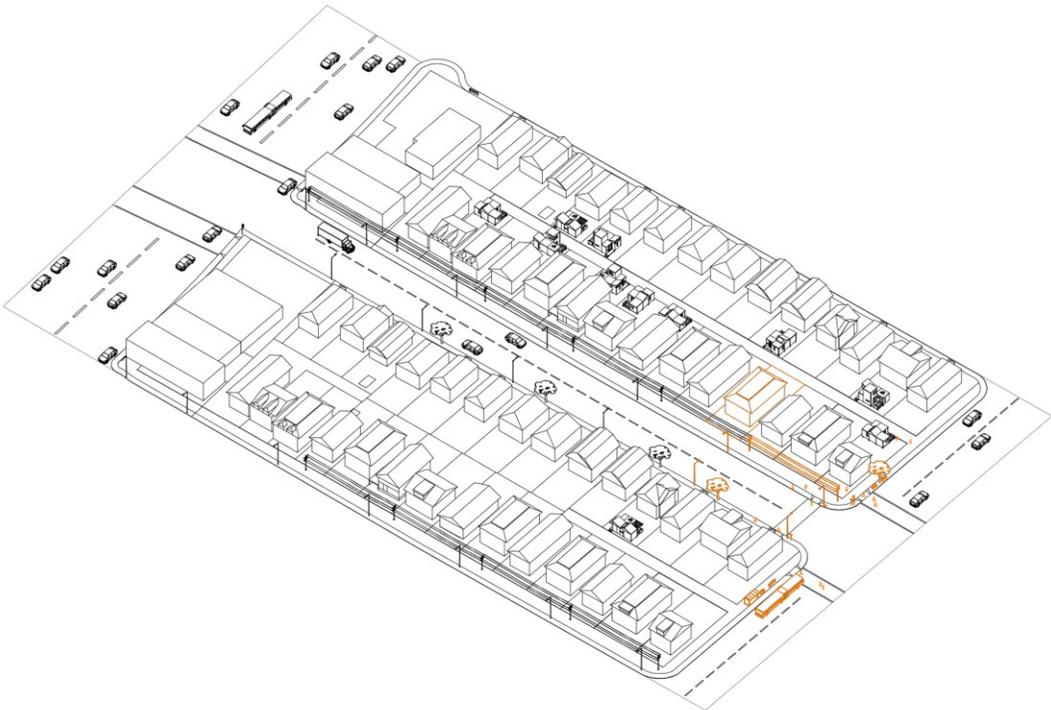
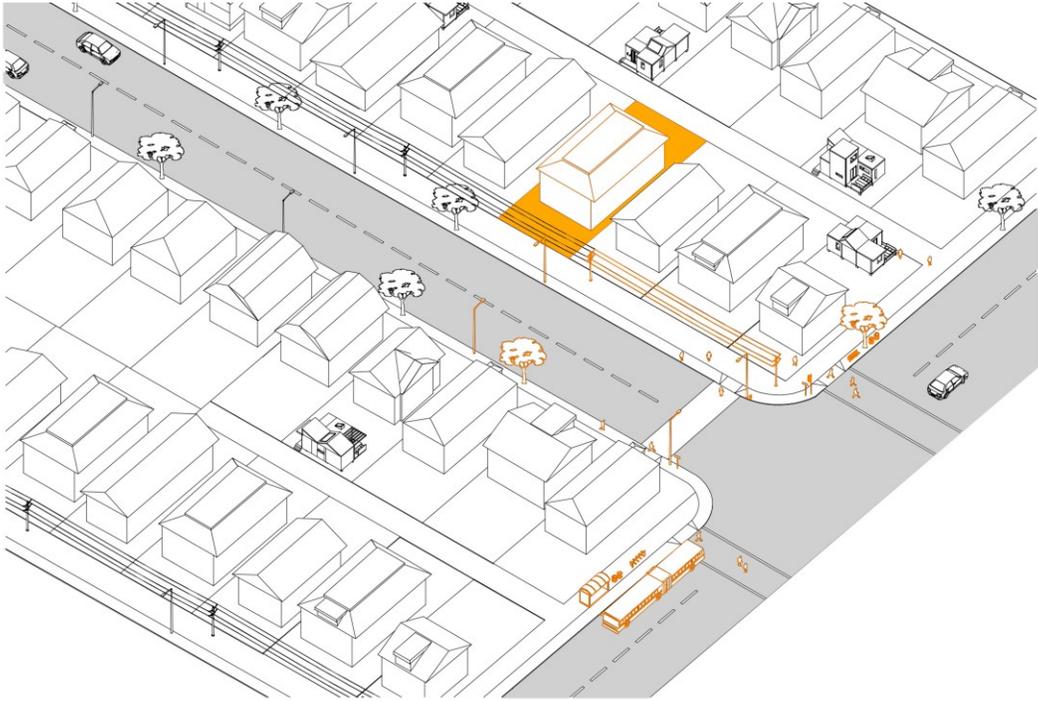


Figure 26: 3D printed modules & truck model – module arrangement in Flat-bed Truck 48 long x 8'-6" wide Size

Figure 27: Typical obstacles to be found in urban lots are illustrated on the left diagram. The diagram on the right depicts two blocks in Old Ottawa South and illustrates the location of these obstacles on the two blocks related to the deployment of modules in interior lots.

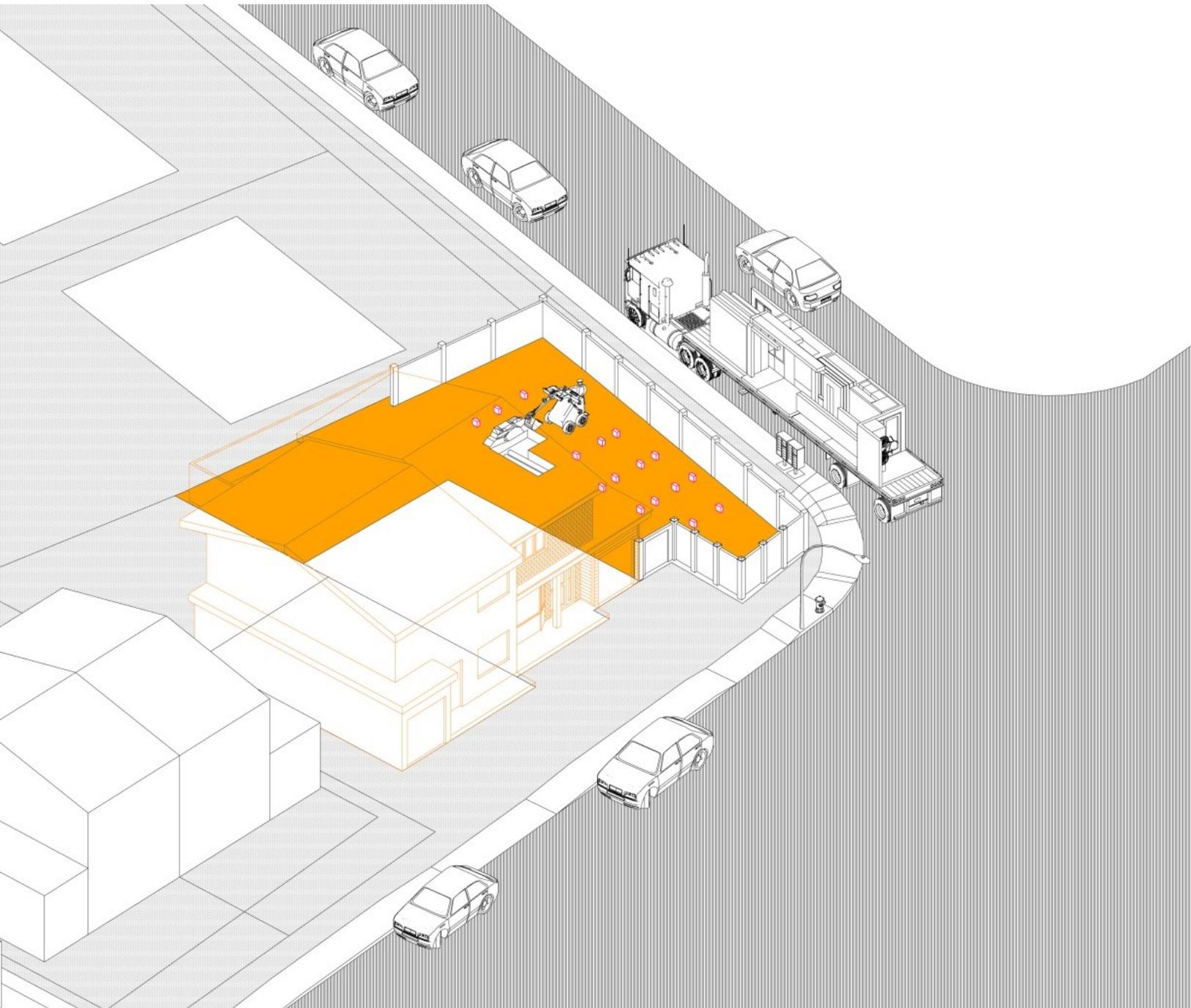
PARKED CARS	PUBLIC TRANSPORTATION	FIRE HYDRANT
		
LANDSCAPE	BUS STOPS	UTILITY LINE
		
STREET FURNITURE	STREET DISPOSALS	INTERIOR NARROW LOTS
		
SIGNAGE	TRAFFIC LIGHTING	PEDESTRIAN
		
STREET LIGHT POSTS	BIKE RACKS	PEDESTRIAN WALKWAYS
		



Site Access & Assembly

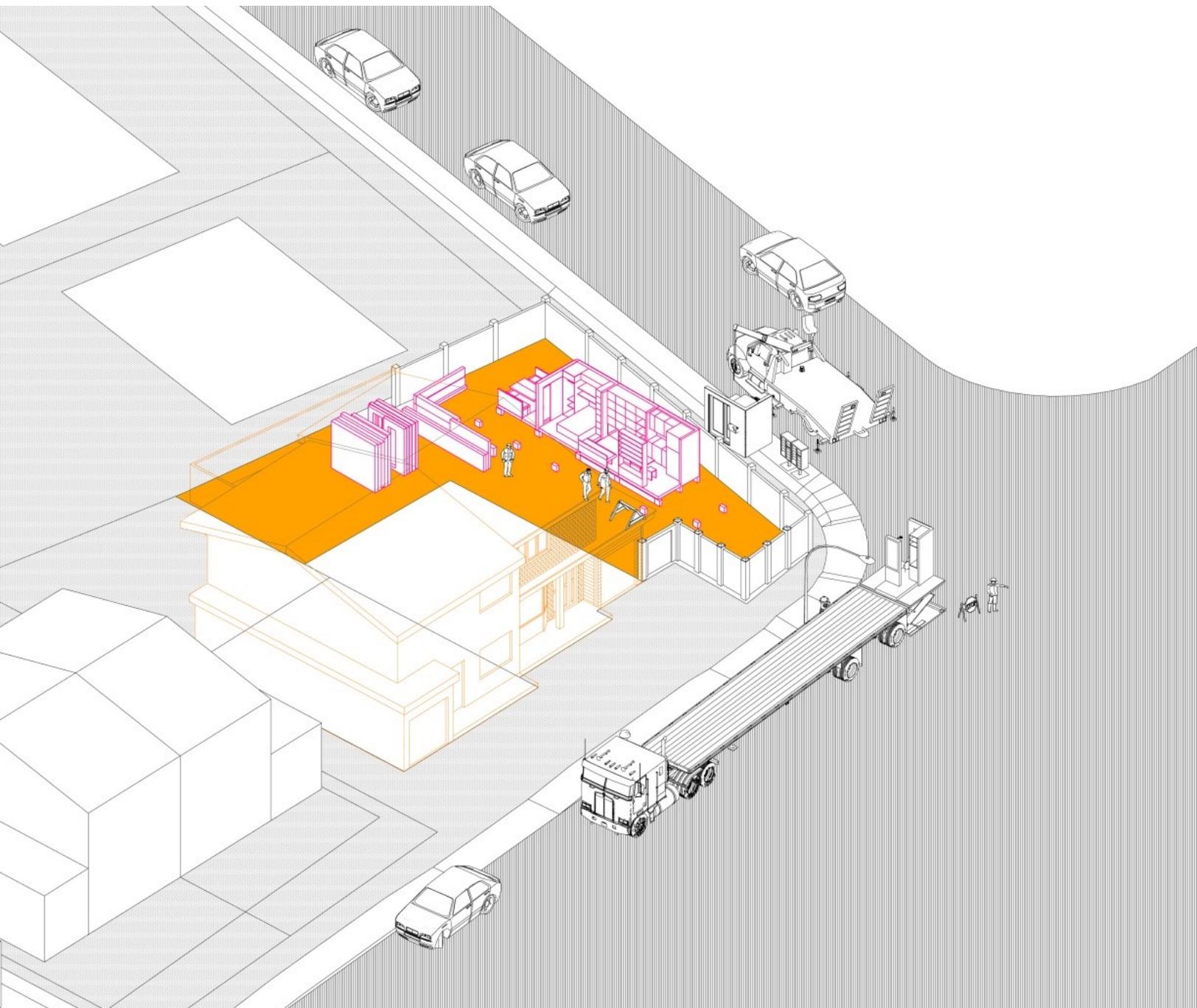
STAGE ONE:

For the purpose of illustration, a corner lot located on the Southgate block was chosen. In this stage, the lot is excavated to be connected to the City water pipe and sewage system. The foundation system is put in place after and site is prepared for modules' deployment.



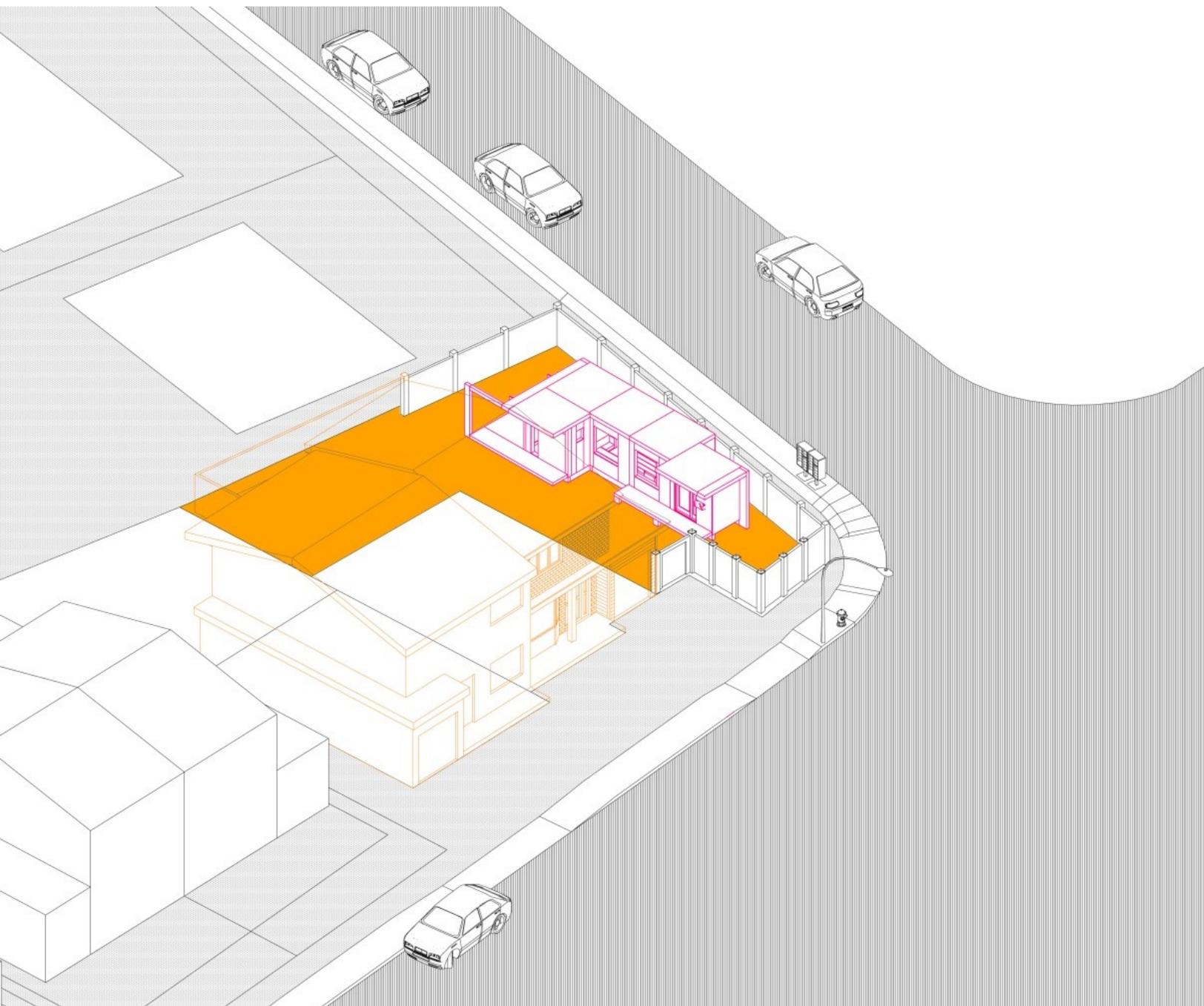
STAGE TWO:

During this stage, a truck is required to deliver the modules. To access the lot, a crane is used to lift the modules and place them into the lot. A lift jack is used to move the modules around the lot, reducing the need for physical effort.



STAGE THREE:

The modules are assembled and located on the lot with proper orientation and required setbacks. The orientation of the modules is very crucial to determine elements such as access to sunlight, privacy, and public entry.



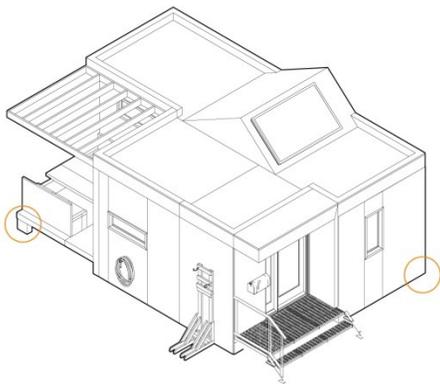
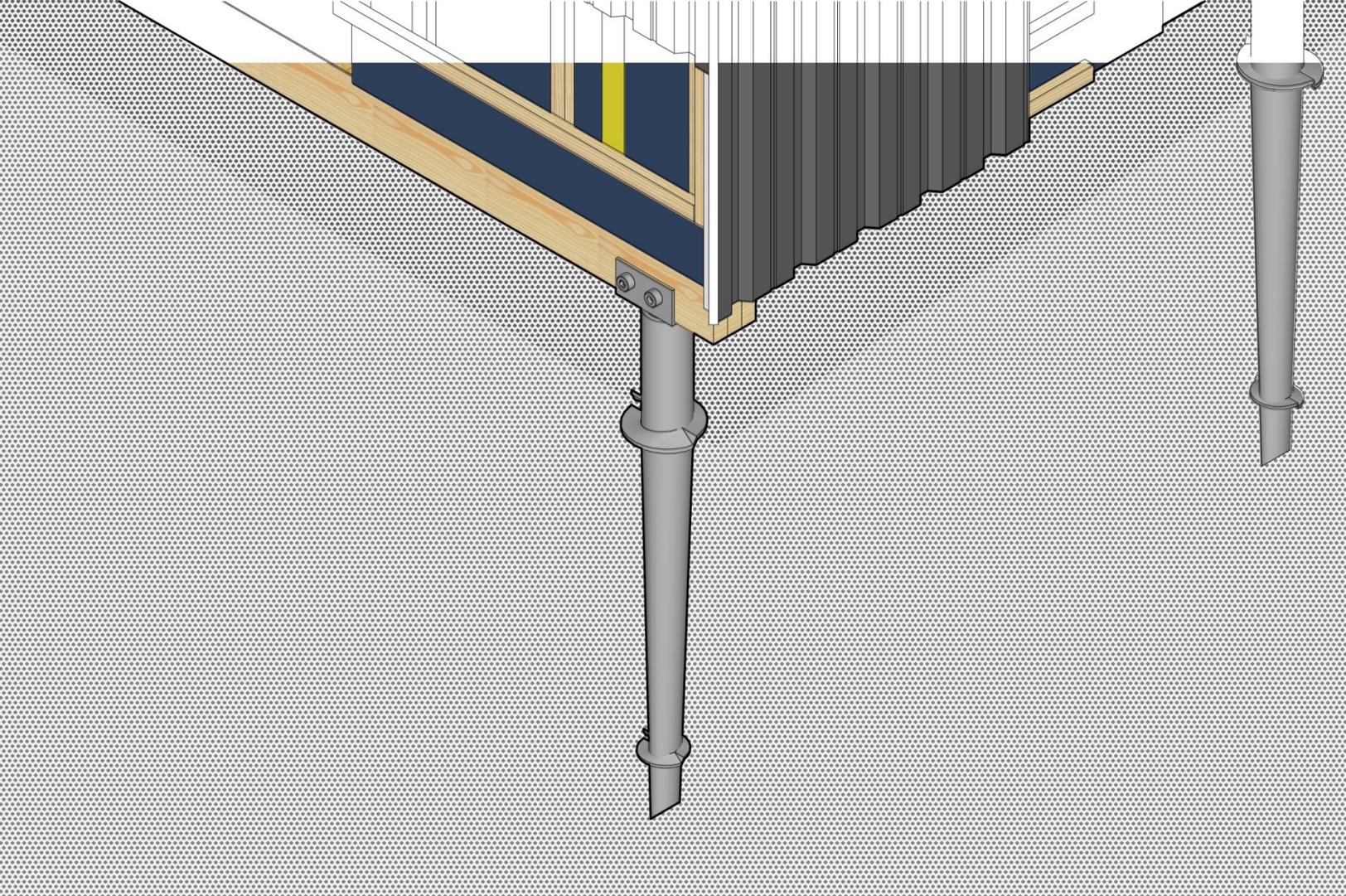


Figure 28: Possible variation of foundation methods based on site conditions – In this situation the diagrams is of a steel post connection detail

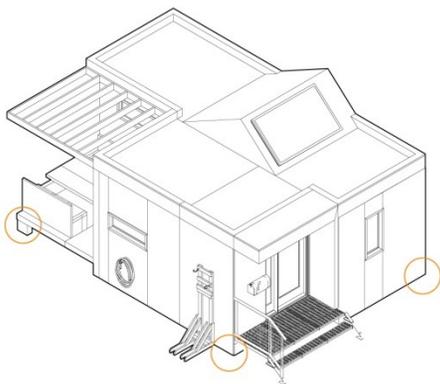
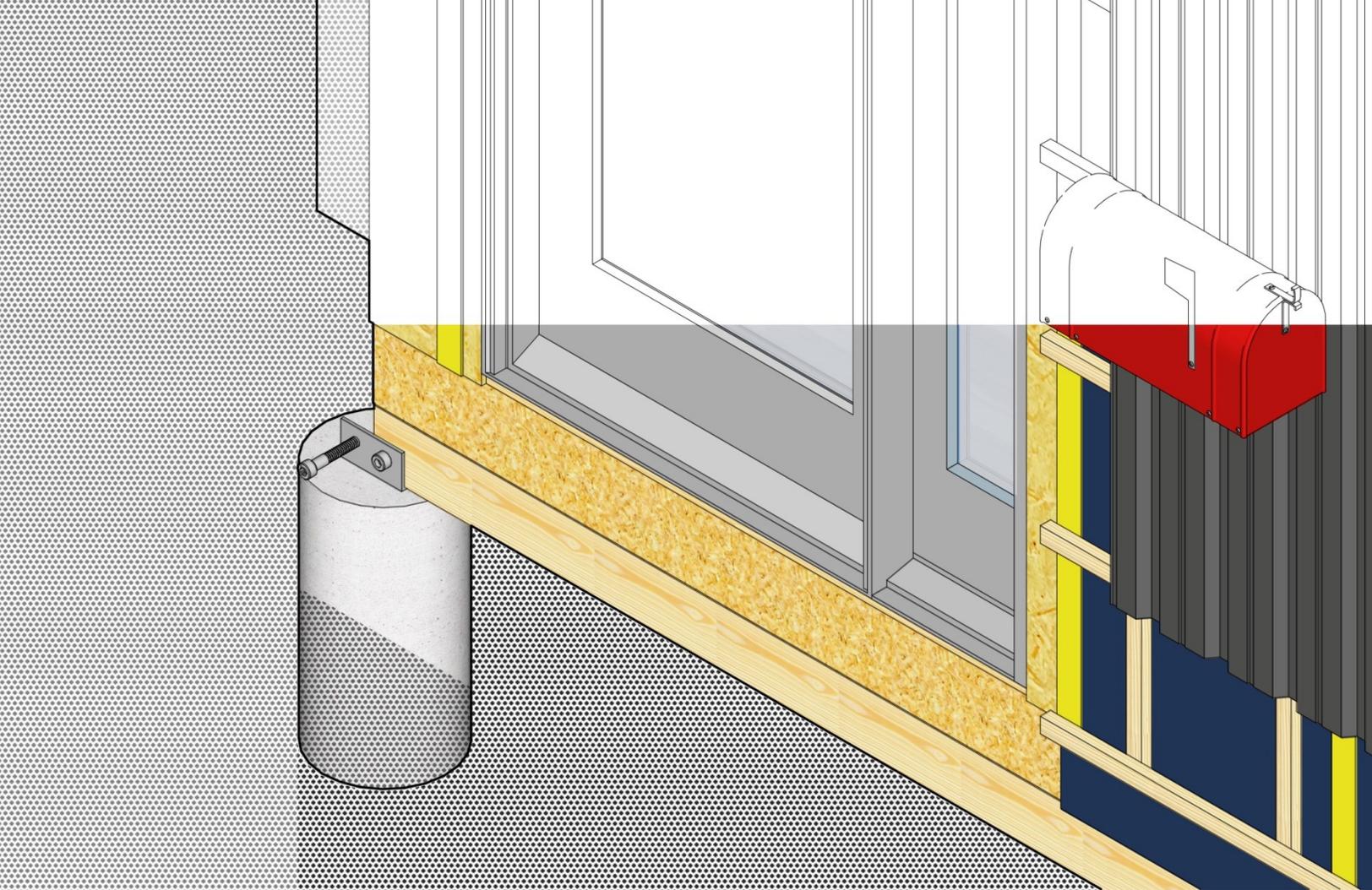


Figure 29: Possible variation of foundation methods based on site conditions – In this situation the diagram shows a concrete pier foundation & connection detail

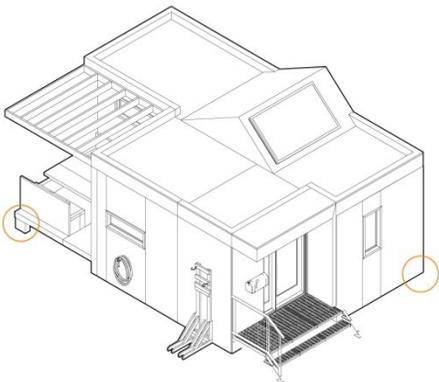
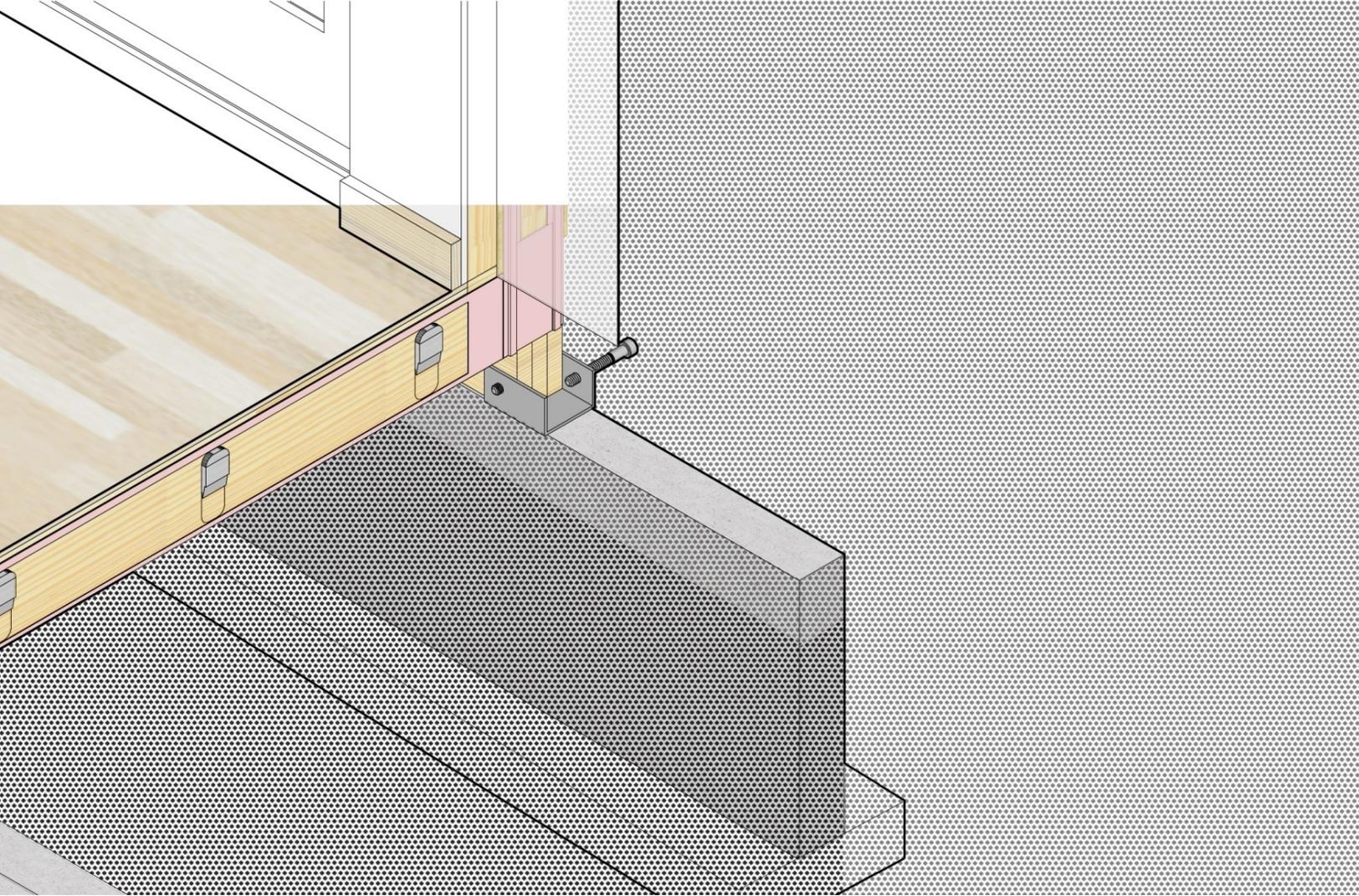
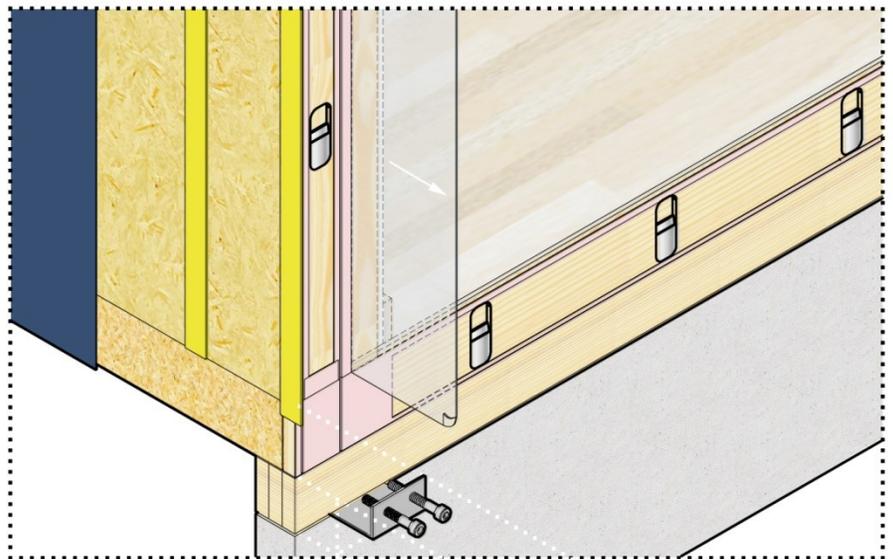
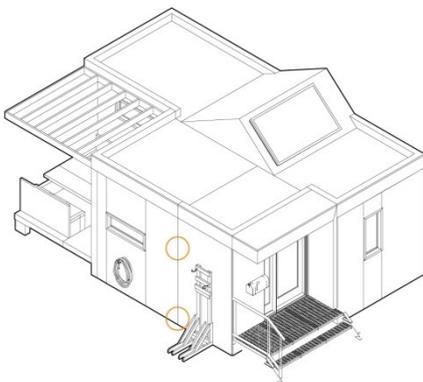
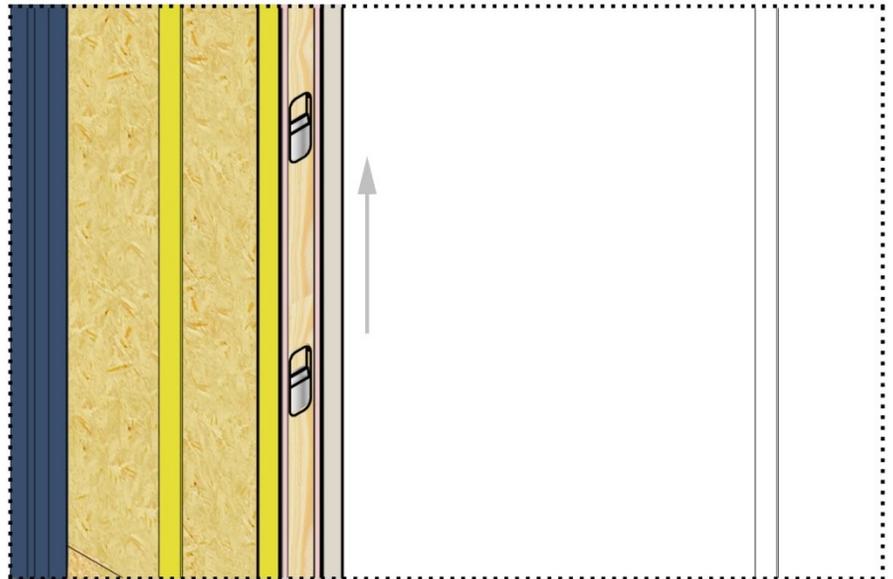
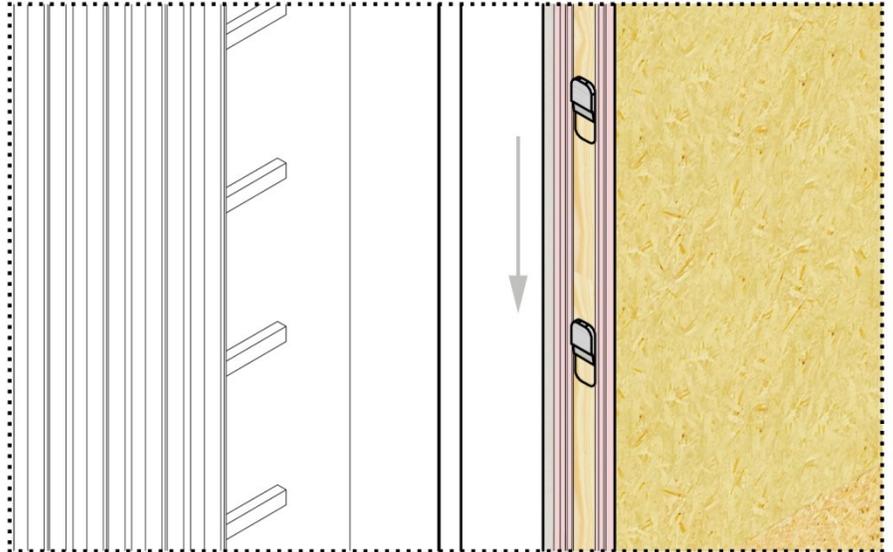


Figure 30: Possible variation of foundation methods based on site conditions – In this situation the diagram is of a concrete knee wall foundation & connection detail

Figure 31: Connection details between prefabricated modules showing steel clip detail – water seal is slipped in between modules (overlap)



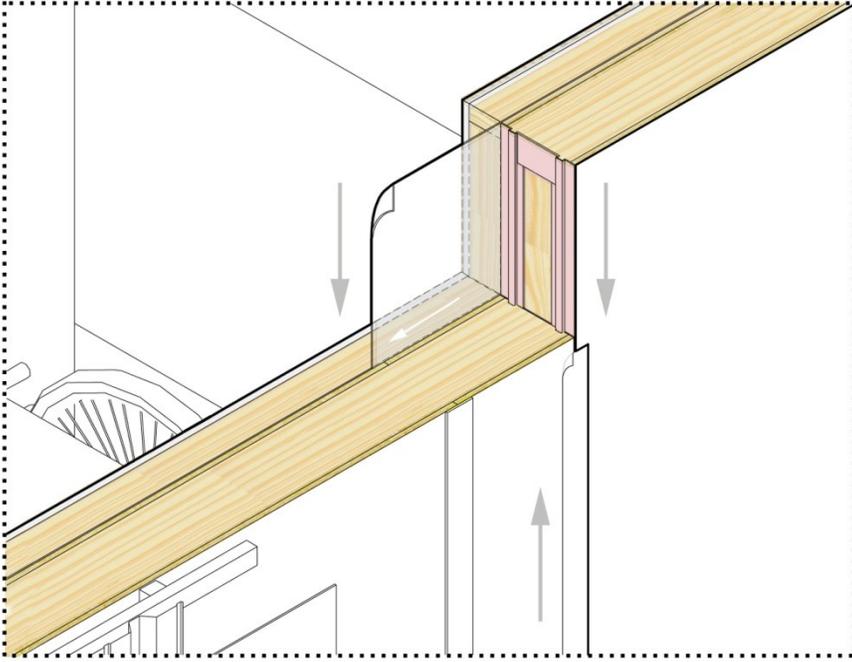
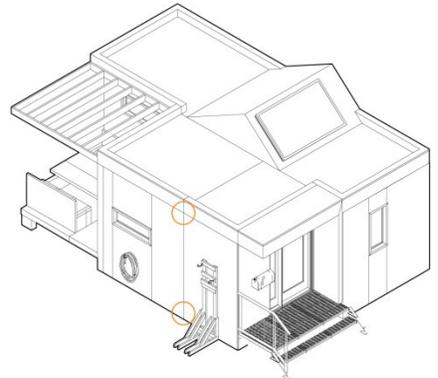
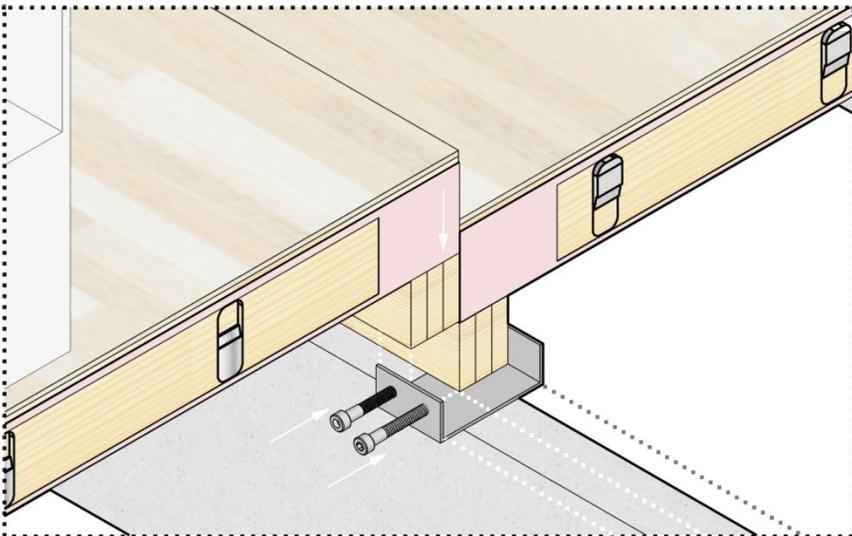
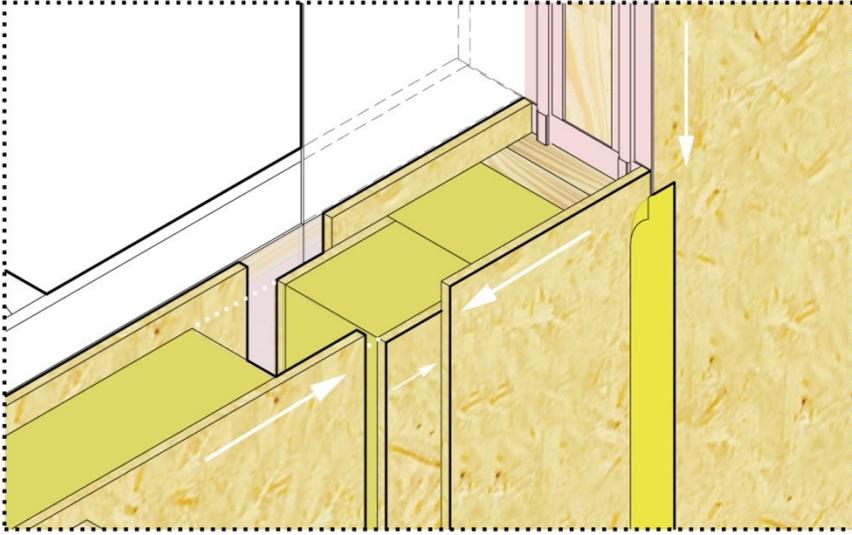
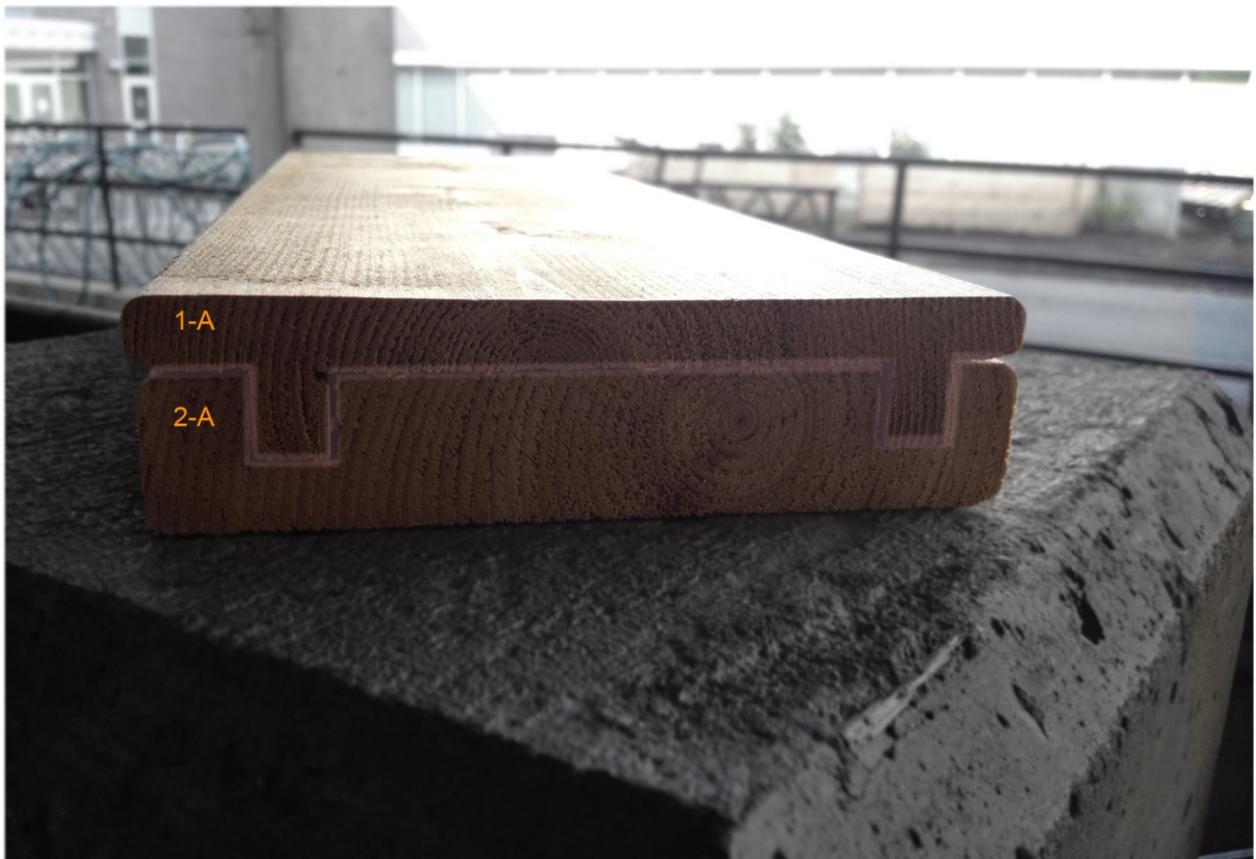
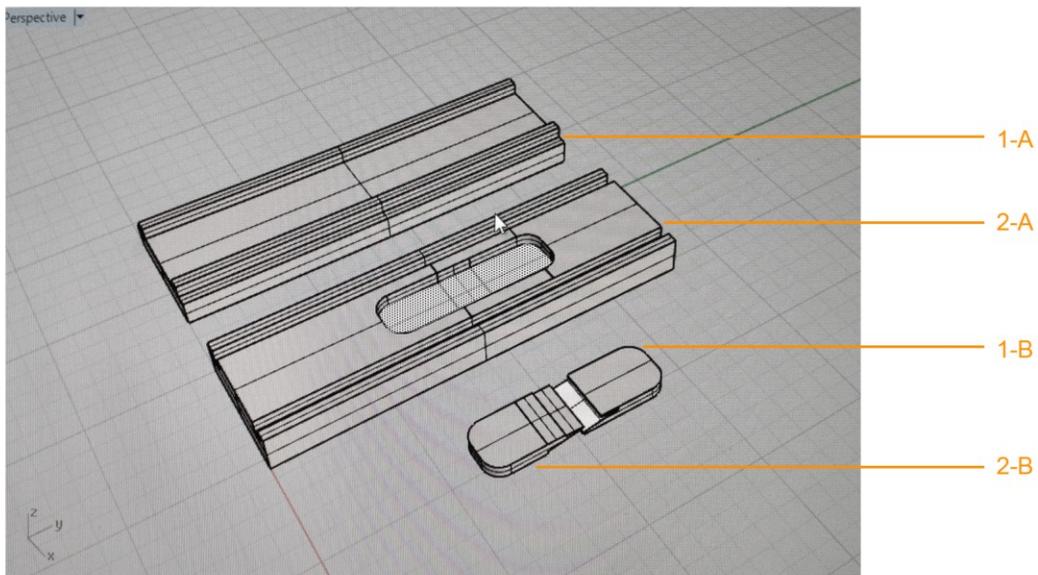
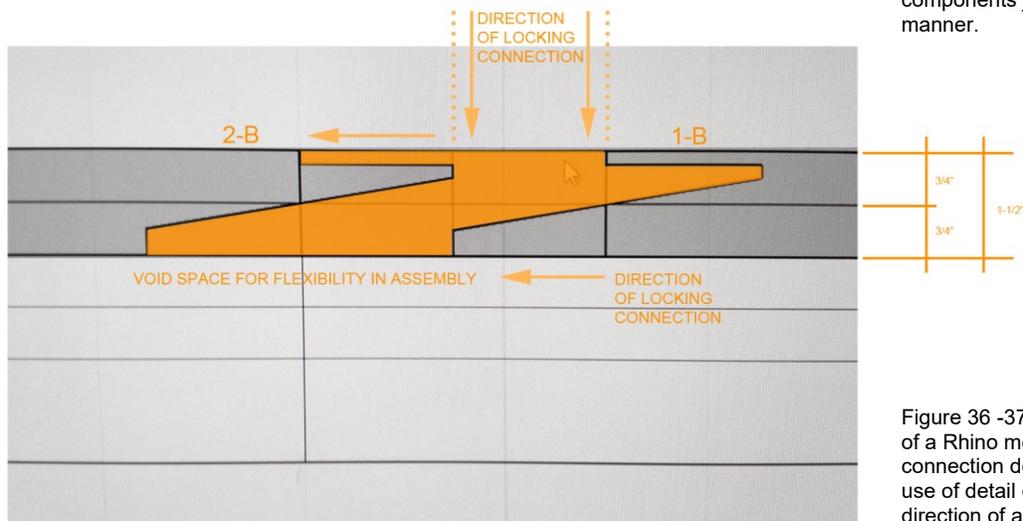
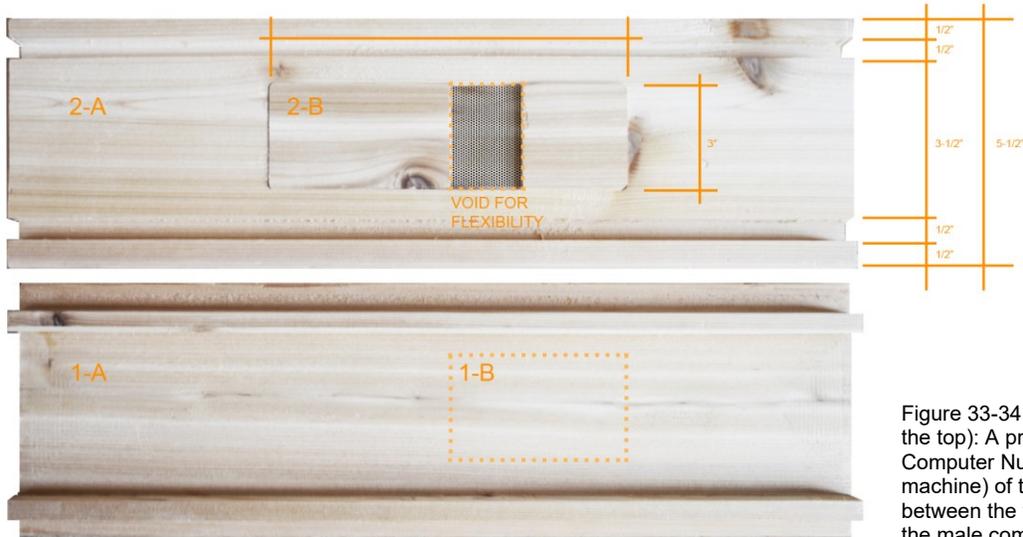


Figure 32: Structurally Insulated Panels (SIP) used as a wall framing system – connection detail between the two modules with a gasket on the exterior perimeter of the module in between to ensure air seal







SITE SPECIFICITY (*The Scale of the City*):

These sites were chosen based on their diversity of lot size, house type and block location in Ottawa. The presentation below indicates distances between the sites, imagining the route a large truck might take, delivering houses to each of them consecutively.

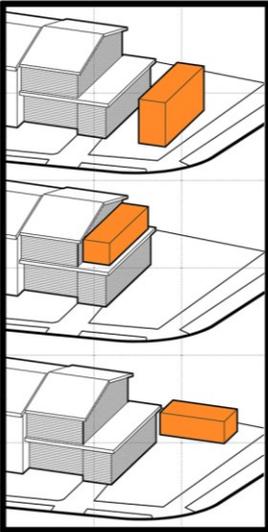
Southgate Block:

Suburbs of Ottawa South

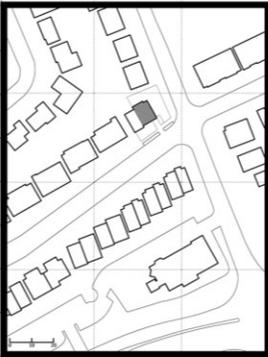
According to Census Canada data, the Southgate population is projected as: younger families, relatively lower income than other blocks, higher unemployment rate, greater density per household. According to Census Canada Data, 47% of the households in this neighborhood report less than \$80,000 annual income with an unemployment rate of 6%. The average number of people per house is about 4 people, which is relatively high when compared to the size of the Semi-detached, two storey high homes in the block. The addition of coach houses can provide affordable detached, ground-oriented housing options as well as provide a source of rental revenue.

Based on this data, this thesis makes the assumption that the coach house model would apply to the people who report an income of less than \$80,000. The coach house would serve as a source of additional income for these households. It is estimated that each block would therefore warrant 12 new coach houses (47% of 26 houses/ block). These new coach houses would begin to create a secondary micro community within the larger context of the neighbourhood. The lots size (40' x 90') will allow for modular bachelor and one bedroom suite types; these could provide a secondary means of income and revenue. Single professionals and young couples will find these houses appealing for their affordability and relative access to amenities and transportation.

ADDITIONAL REVENUE



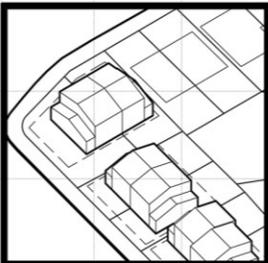
LOCATION OF COACH HOUSE



HOUSE LOCATION ON BLOCK



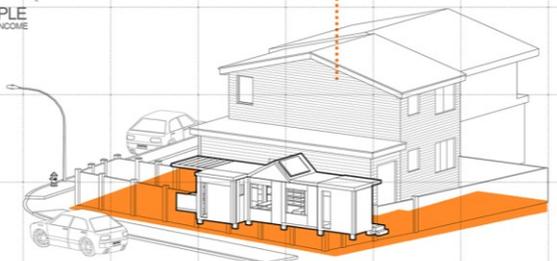
DISTANCE FROM HOME DEPOT ORIGINAL STATUS OF BLOCK



NEW LANEWAY INTERVENTION



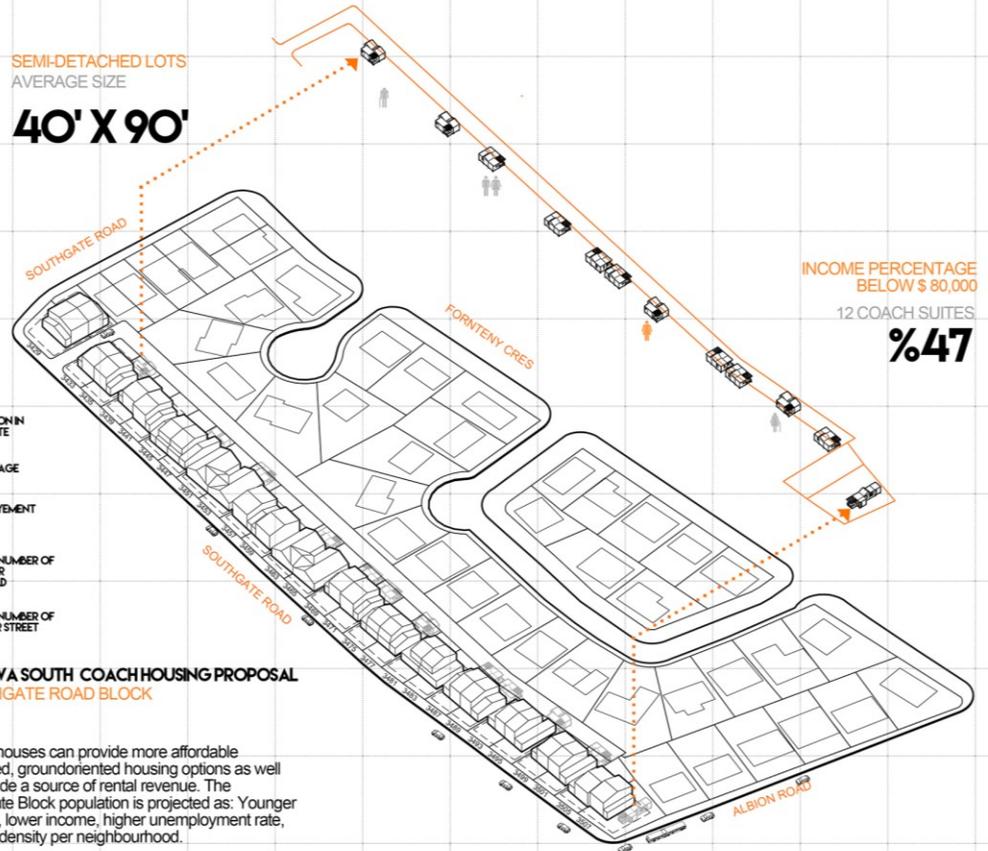
AVE VALUE OF HOMES IN THE AREA \$ 315,898



MODEL NO.	LOCATION	TYPE	LOT SIZE	DISTANCE
1 7 ADULT MEMBERS	3507 SOUTHGATE RD	SEMI DETACHED TWO STORY	57.95 FRONTAGE 69.08 DEPTH	1.9 km

SOUTHGATE BLOCK

SEMI-DETACHED LOTS AVERAGE SIZE **40' X 90'**



INCOME PERCENTAGE BELOW \$ 80,000
12 COACH SUITES
%47

CURRENT POPULATION IN SOUTHGATE 10825
AVERAGE AGE 35-49
UNEMPLOYMENT RATE 6%
AVERAGE NUMBER OF PEOPLE PER HOUSEHOLD 4
AVERAGE NUMBER OF HOMES PER STREET 26

OTTAWA SOUTH COACH HOUSING PROPOSAL SOUTHGATE ROAD BLOCK

Coach houses can provide more affordable detached, groundoriented housing options as well as provide a source of rental revenue. The southgate Block population is projected as: Younger families, lower income, higher unemployment rate, greater density per neighbourhood.

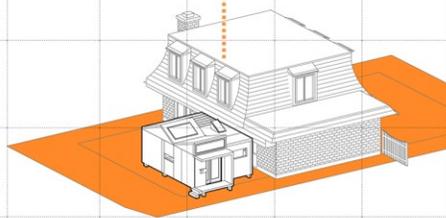
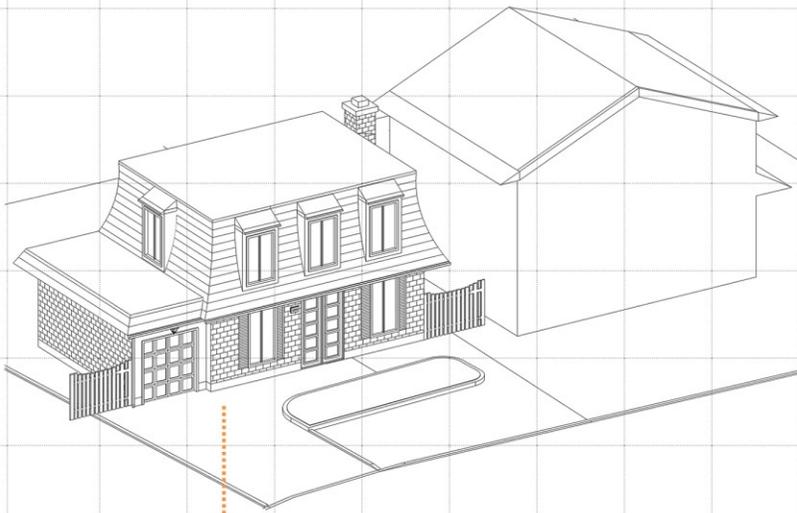
Clearwater Block:

Suburbs of Ottawa South

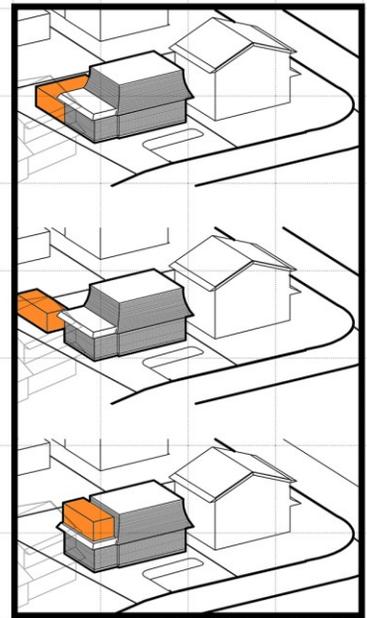
About 0.4 kilometers from the Southgate Block is the Clearwater block. According to Census Canada, the Clearwater population consists of older families with relatively higher income than the Southgate block. With an average age of 50-59 years old, a common scenario amongst this demographic is empty nesters who may be looking to downsize yet remain within the neighborhood. The average number of people per house is about 2 people, which is relatively low compared to the size of the single detached, two storey homes on the block. The addition of coach houses can provide a secondary house option for those who are downsizing.

Based on the data from Ottawa Neighbourhood Studies in Greenboro East, 25.7% of the residents in the Clearwater Block are over 50 years of age.⁴⁸ This number is projected to increase to 43% in the next ten years. Based on this, it is anticipated that this neighbourhood could warrant 9 coach houses (43% of 20 houses per block). The lot size (60' x 100') allows for modular suite types of one bedroom or two bedrooms which would serve the purpose of the addition; a secondary affordable mean of living. Single professionals, elderly, and young couples would find these houses appealing for their affordability and relative access to amenities and transportation.

⁴⁸ Ottawa Neighbourhood Study, Greenboro East, 2016
Access: <http://neighbourhoodstudy.ca/greenboro-east/>



AVE VALUE
OF HOMES IN THE AREA
\$ 464,900



LOCATION OF COACH HOUSE

DOWNSIZING

OTTAWA SOUTH
NEIGHBOURHOOD

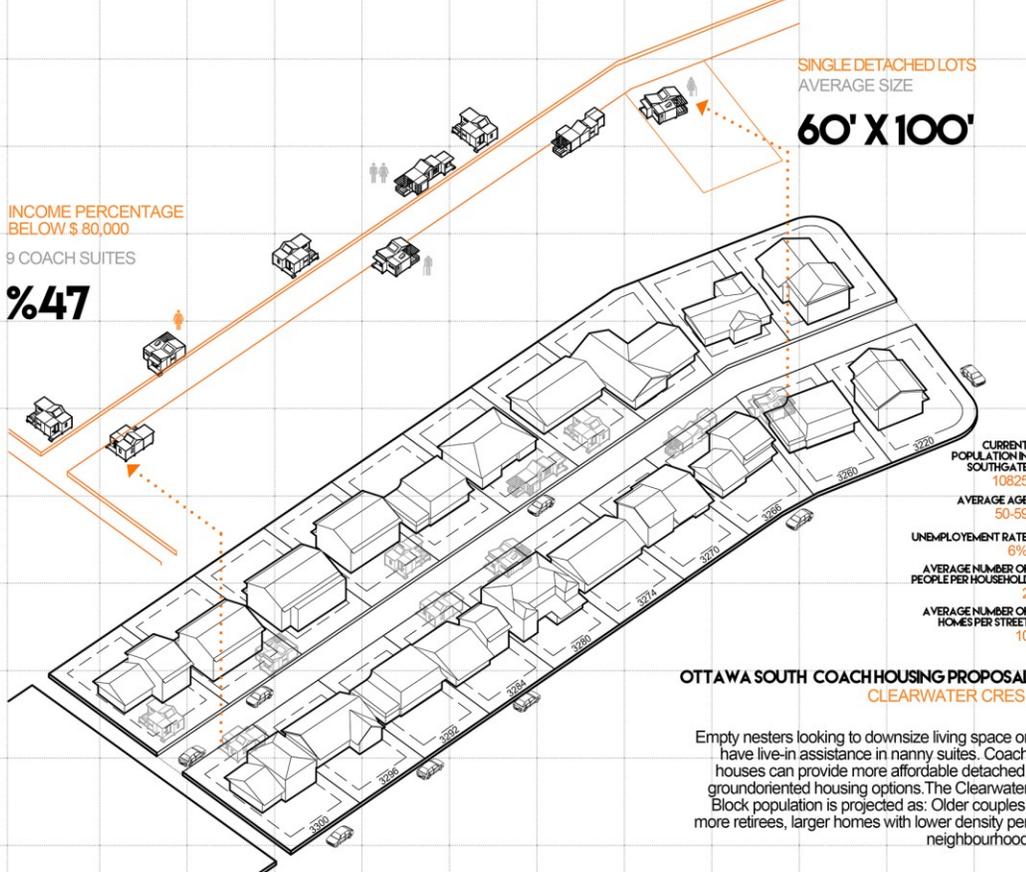
KEY LOT
LOT TYPE

MODEL NO.	LOCATION	TYPE	LOT SIZE	DISTANCE
2 8 ADULT MEMBERS	3292 CLEARWATER CRES.	SINGLE DETACHED TWO STORY	88.00 FRONTAGE 100.00 DEPTH	1.0 KM

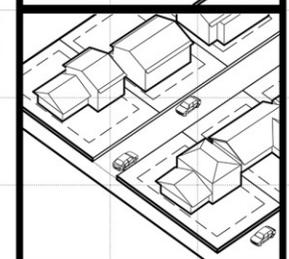
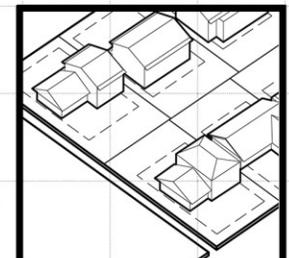


HOUSE LOCATION ON BLOCK

CLEARWATER BLOCK



DISTANCE FROM HOME DEPOT
ORIGINAL STATUS OF BLOCK



NEW LANEWAY ALLOWANCE

- CURRENT POPULATION IN SOUTHWEST 10825
- AVERAGE AGE 50-59
- UNEMPLOYMENT RATE 6%
- AVERAGE NUMBER OF PEOPLE PER HOUSEHOLD 2
- AVERAGE NUMBER OF HOMES PER STREET 10

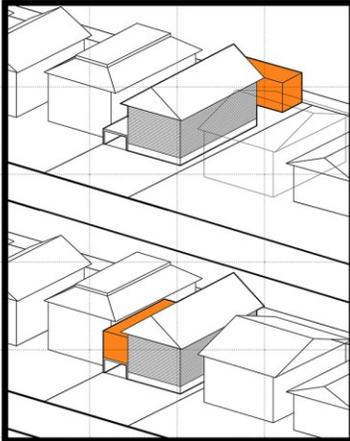
Glen Block:

Suburbs of Old Ottawa South

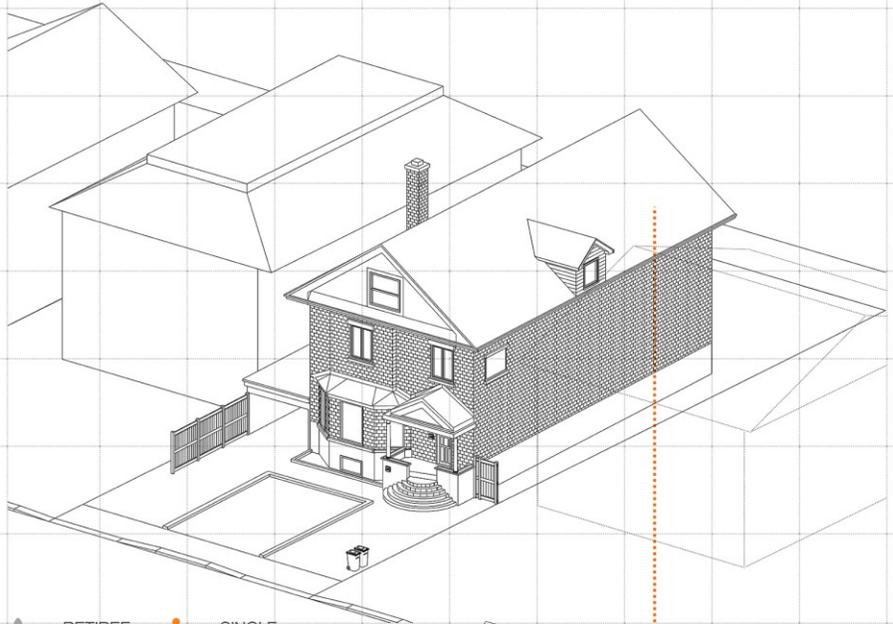
About 6.5 kilometers from Ottawa South is the Glen block in Old Ottawa South, a streetcar suburb located inside what is considered to be city's core. According to Census Canada, Old Ottawa South population is a mix of old and young families including young professionals with higher than average incomes. The neighbourhood also is home to long-time residents with lower incomes. Neighbourhood housing costs are high, and density per household is low. According to Census Canada Data, 35% of the street block has an income below \$80,000. There exists a 4% of unemployment rate and the average age range is 50 to 59 years old in this neighbourhood. The average number of people per house is about 2, which is relatively low compared to the size of the single detached, two and a half storey high homes on the block. Adding small homes to existing lots would help to raise the population density in the area. Long-time residents purchased their homes in Old Ottawa South when prices were lower and are struggling now to maintain their home with the rising property taxes. The addition of coach houses can provide a secondary house option for these people. Again, the coach house can also serve as a housing solution to those who are downsizing and for owners wishing to generate supplemental revenue.

Based on this data, this thesis makes the assumption that the coach house model would apply to the people who report an income of less than \$80,000. The coach house would serve as a source of additional income for these households. It is estimated that each block would therefore warrant 10 new coach houses (35% of 28 houses/ block). These new coach houses would begin to create a secondary micro community within the larger context of the neighborhood. The lot size (40' x 95') would allow for one bedroom or two bedrooms modular suite types. These could serve as secondary housing, income generators, or new "downsized" housing for the owners of the main house. Single professionals, student roommates, elderly, and young couples, would find these houses appealing for their affordability and relative access to downtown, Carleton University, and other attractions.

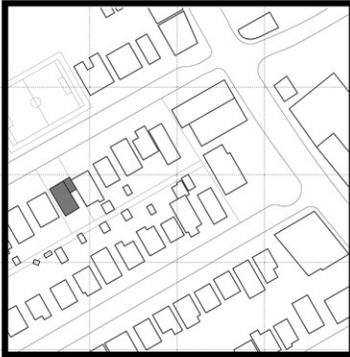
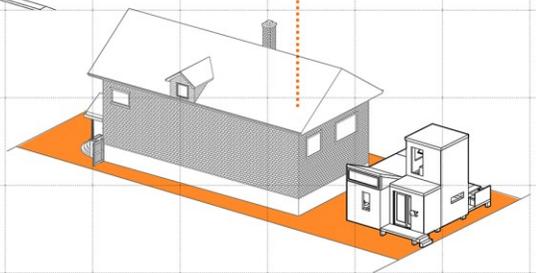
REVENUE, DOWNZONING



LOCATION OF COACH HOUSE



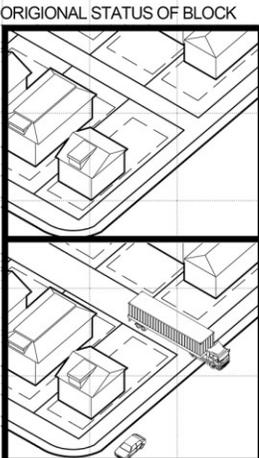
 RETIREE
SINGLE INCOME
 SINGLE
SINGLE INCOME
 COUPLE
DOUBLE INCOME
 AVE VALUE
OF HOMES IN THE AREA
\$ 707,934



HOUSE LOCATION ON BLOCK



DISTANCE FROM HOME DEPOT



NEW LANEWAY INTERVENTION

R3-Residential Third Density Zone
mature neighbourhood overlay

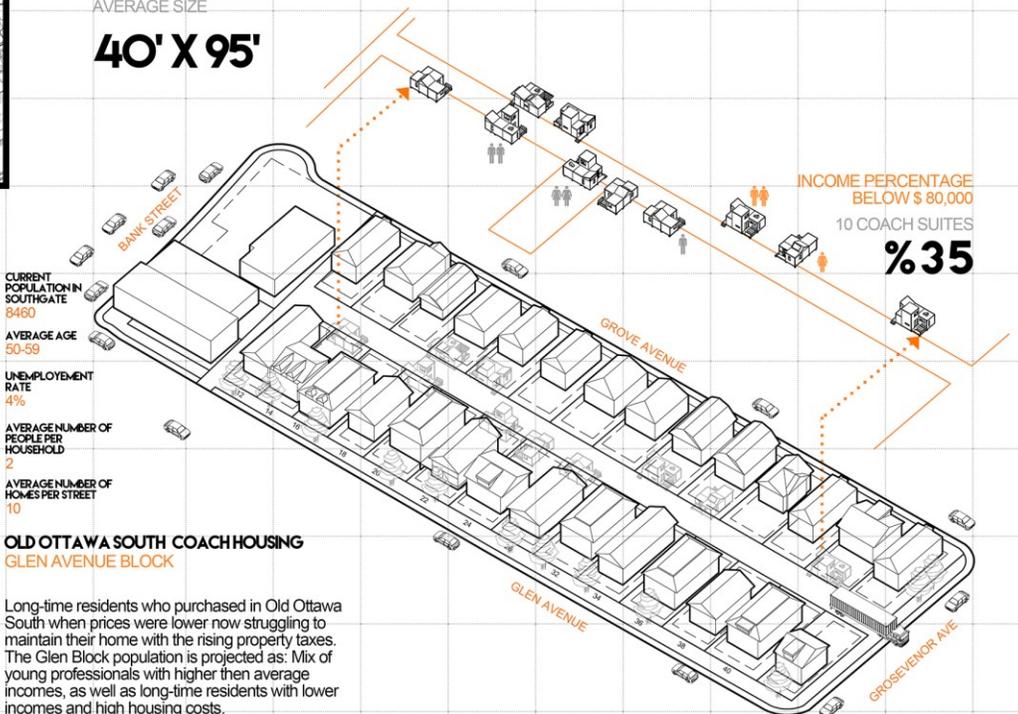
OLD OTTAWA SOUTH
NEIGHBOURHOOD INTERIOR LOT
LOT TYPE

MODEL NO.	LOCATION	TYPE	LOT SIZE	DISTANCE
3 3 ADULT MEMBERS	22 GLEN AVE	SINGLE DETACHED TWO AND A HALF STORY	40.00 FRONTAGE 94.00 DEPTH	6.3 KM

GLEN BLOCK

SINGLE DETACHED LOTS
AVERAGE SIZE

40' X 95'



CURRENT
POPULATION IN
SOUTHGATE
8460
 AVERAGE AGE
50-59
 UNEMPLOYMENT
RATE
4%
 AVERAGE NUMBER OF
PEOPLE PER
HOUSEHOLD
2
 AVERAGE NUMBER OF
HOMES PER STREET
10

**OLD OTTAWA SOUTH COACHHOUSING
GLEN AVENUE BLOCK**

Long-time residents who purchased in Old Ottawa South when prices were lower now struggling to maintain their home with the rising property taxes. The Glen Block population is projected as: Mix of young professionals with higher than average incomes, as well as long-time residents with lower incomes and high housing costs.

SITE MODEL



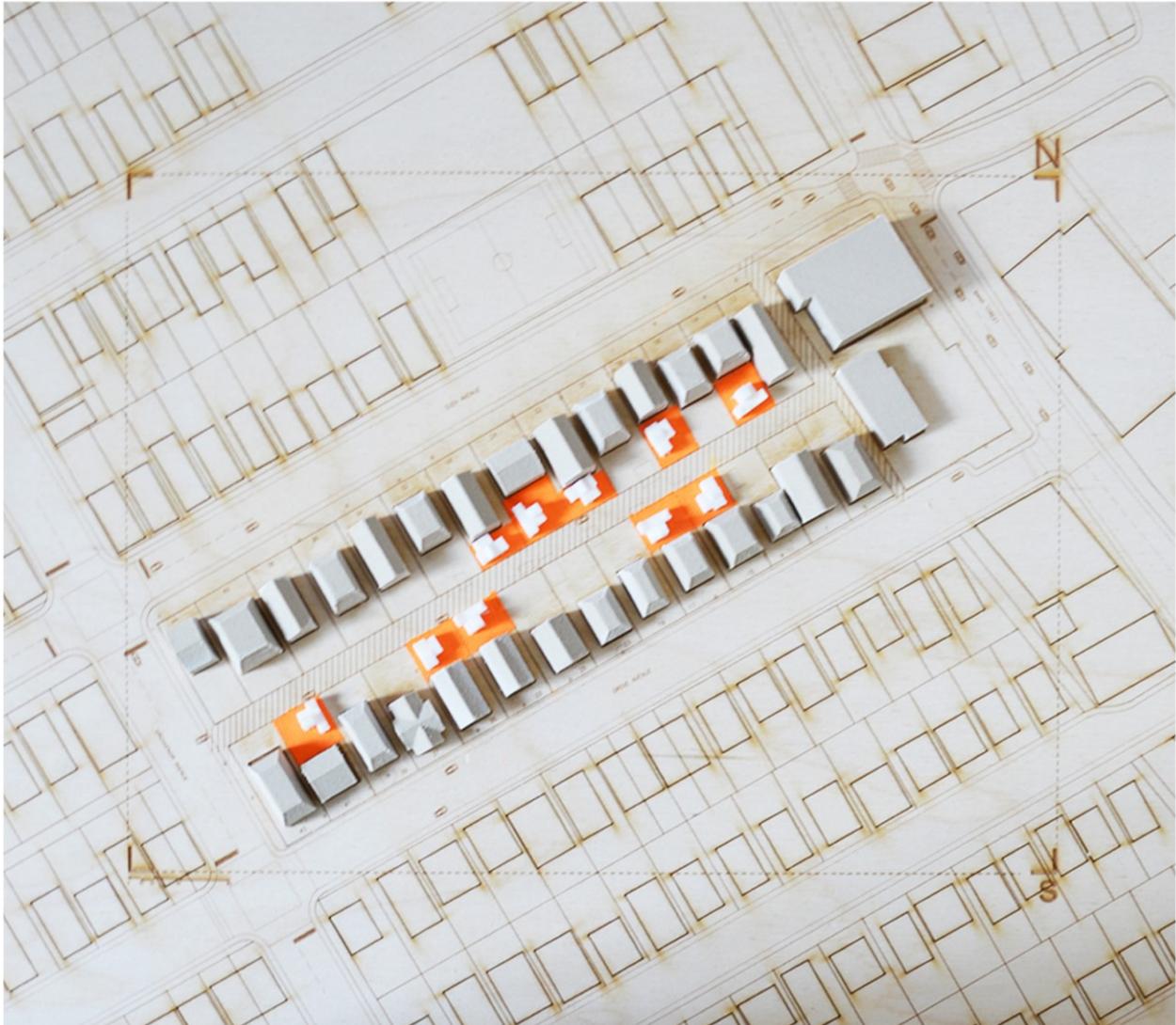
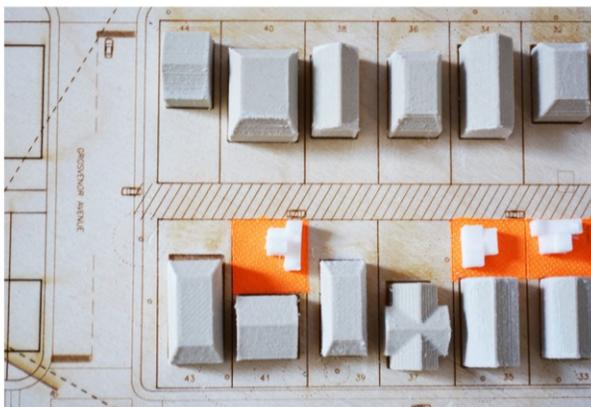


Figure 38: A site model of the Glen Avenue block in Ottawa South Suburbs after the addition of the *Coach Suites*



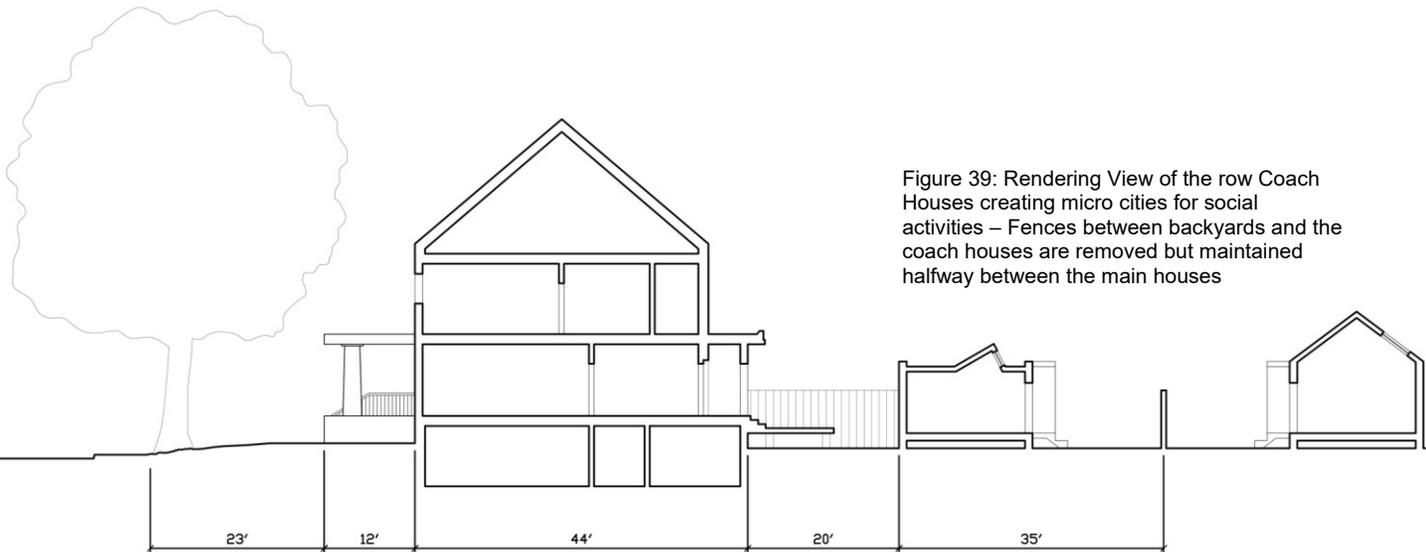


Figure 39: Rendering View of the row Coach Houses creating micro cities for social activities – Fences between backyards and the coach houses are removed but maintained halfway between the main houses

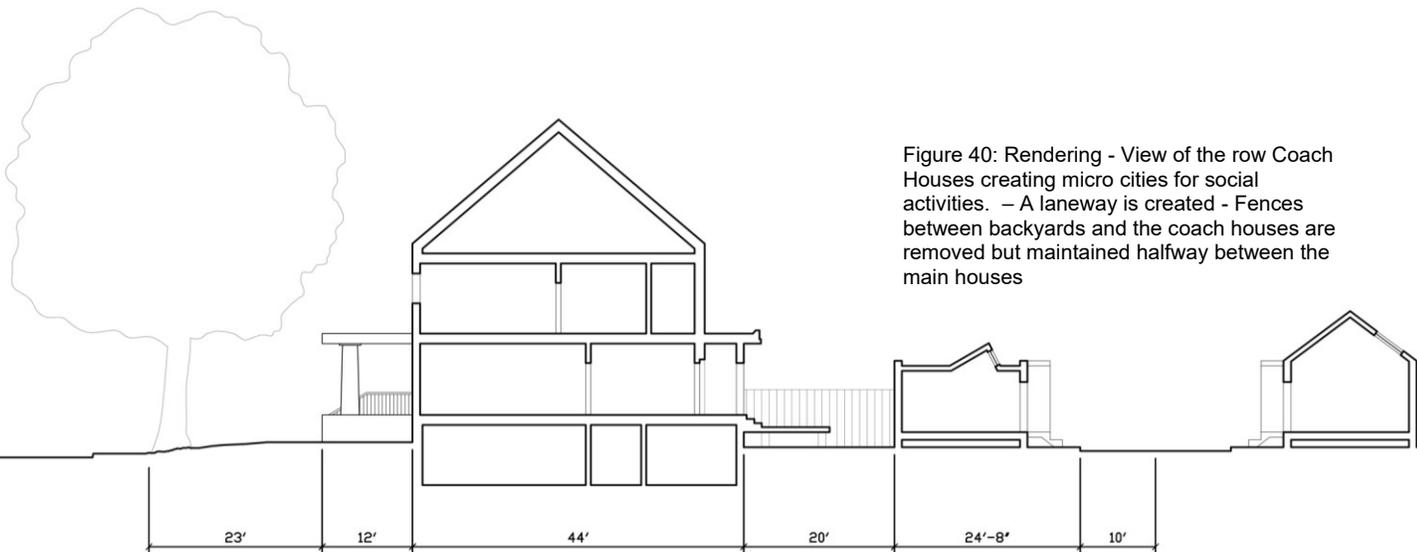
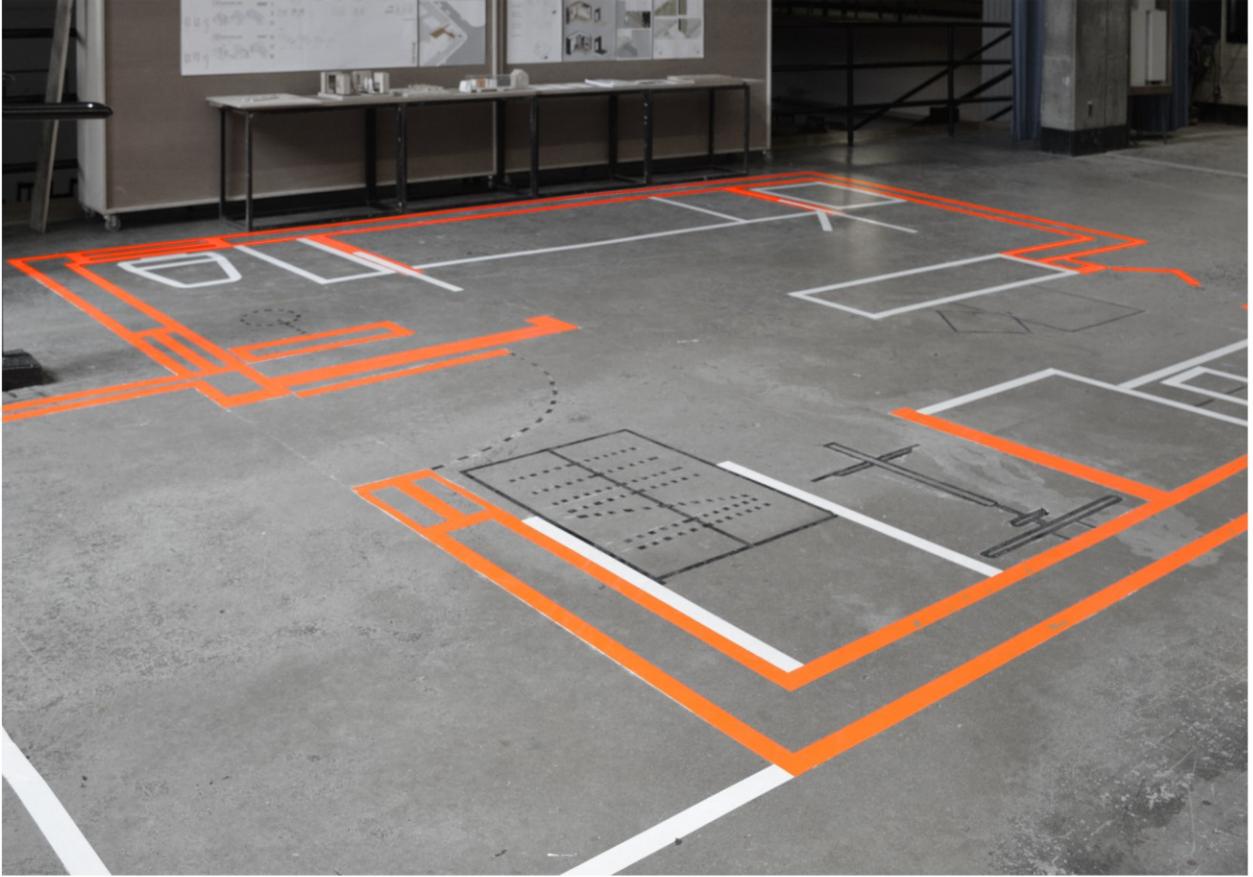
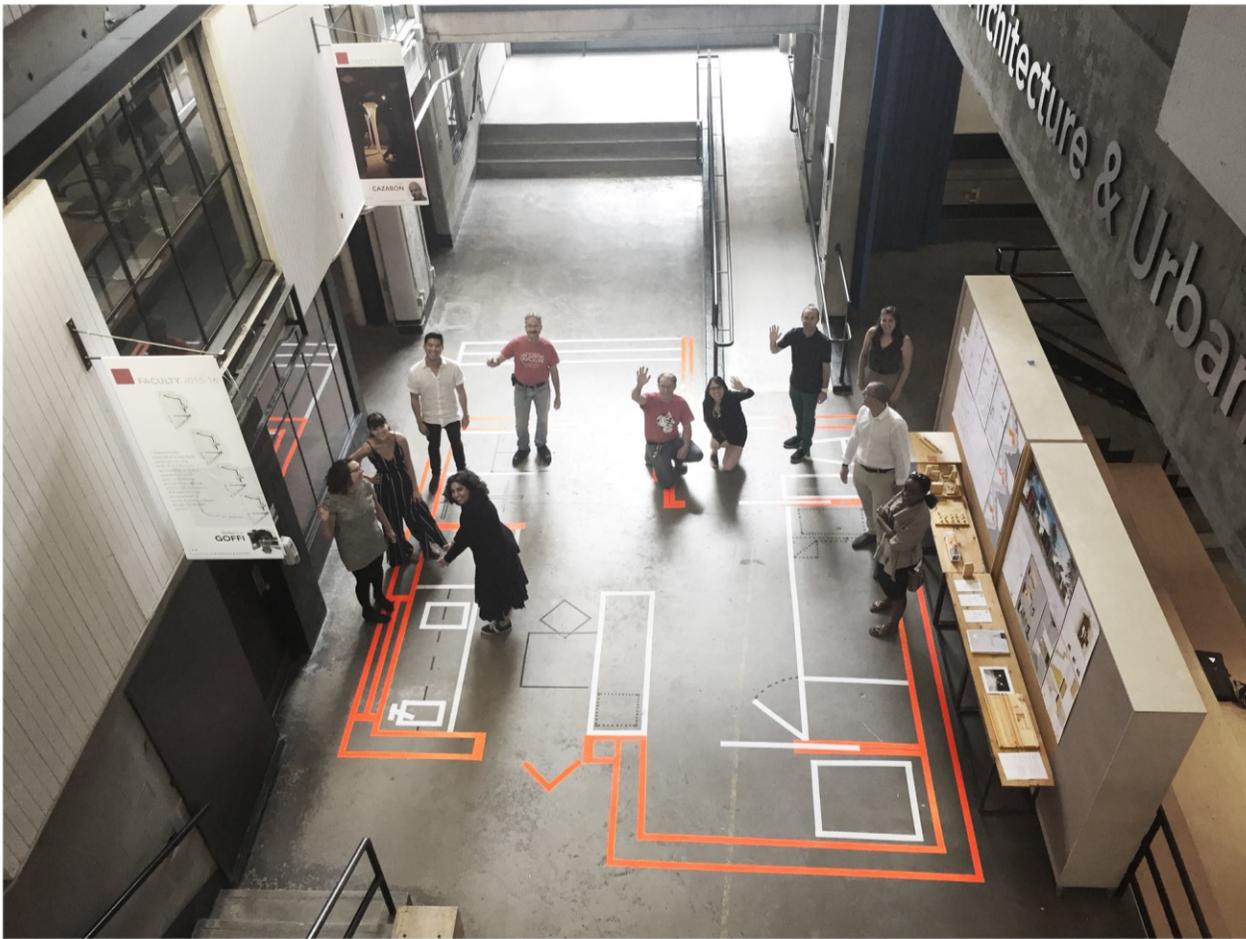
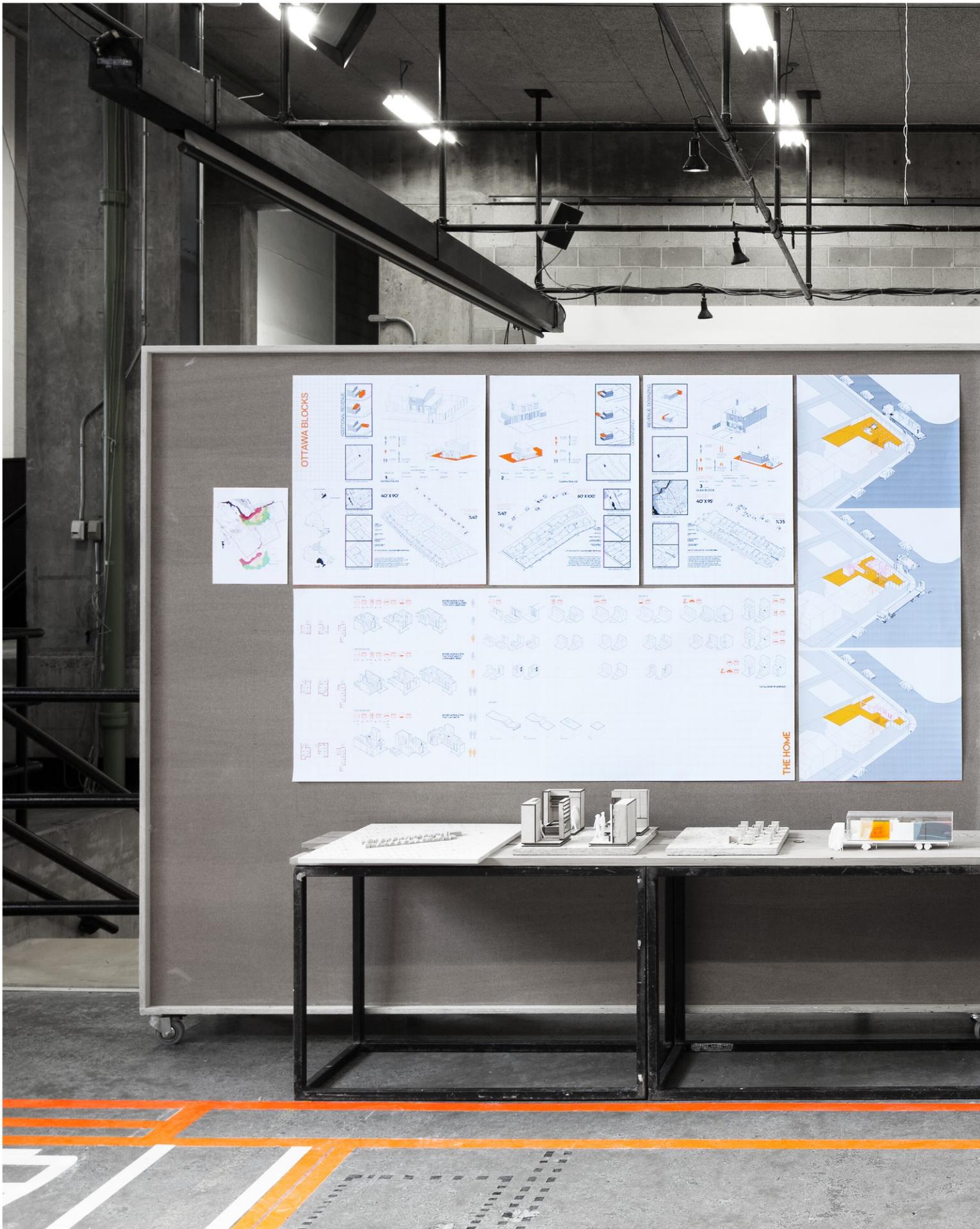


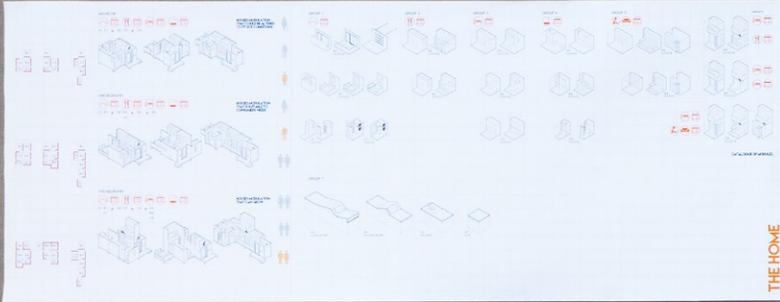
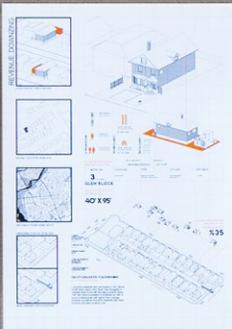
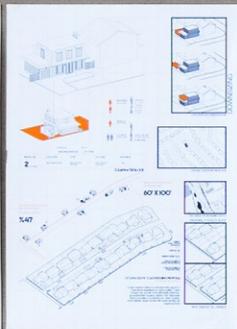
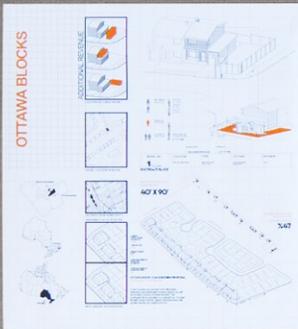
Figure 40: Rendering - View of the row Coach Houses creating micro cities for social activities. – A laneway is created - Fences between backyards and the coach houses are removed but maintained halfway between the main houses



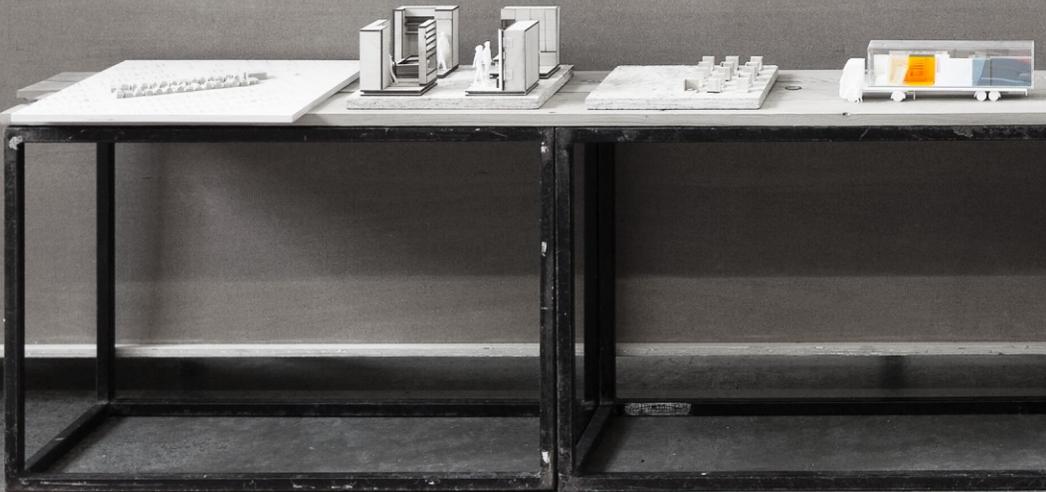




OTTAWA BLOCKS

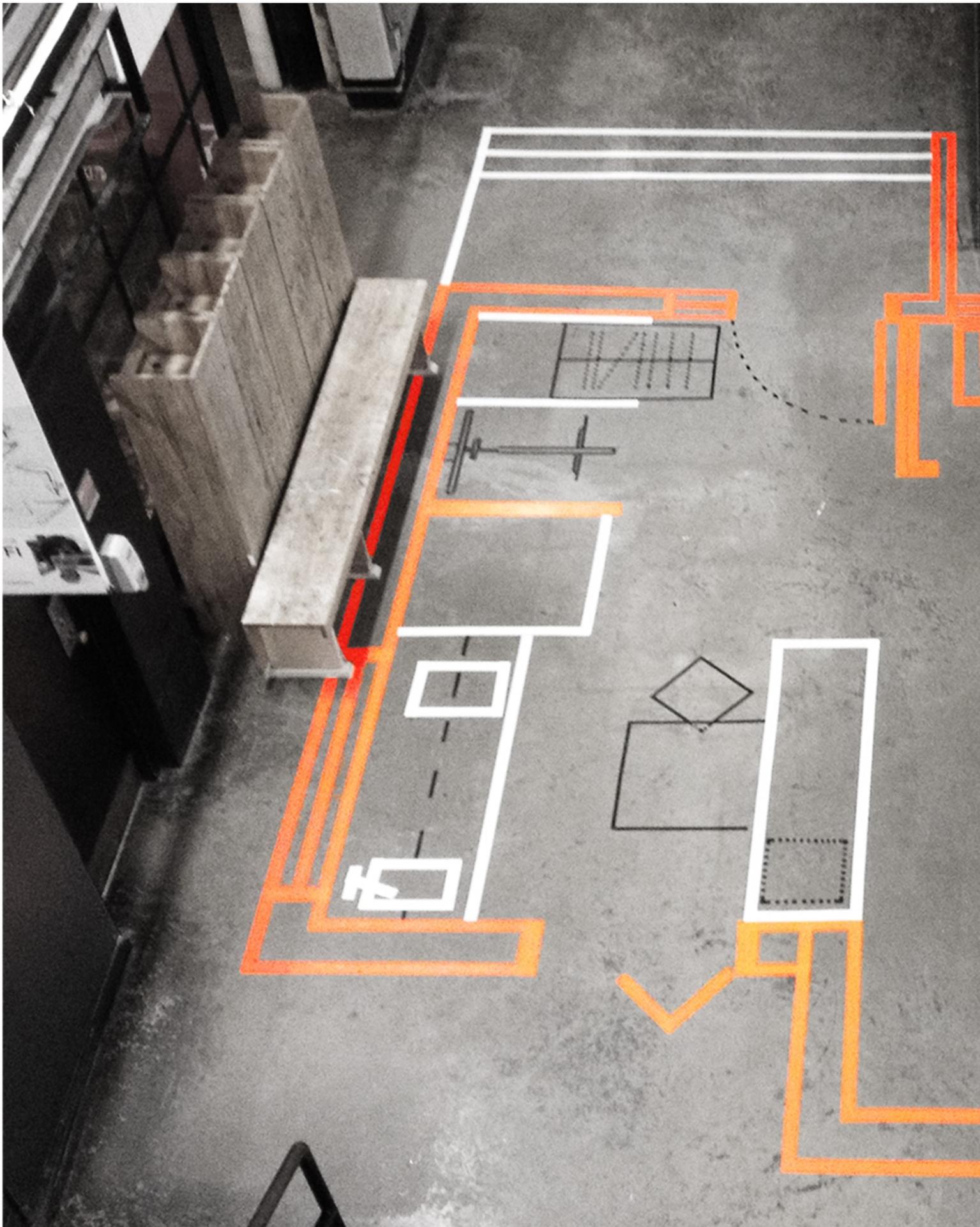


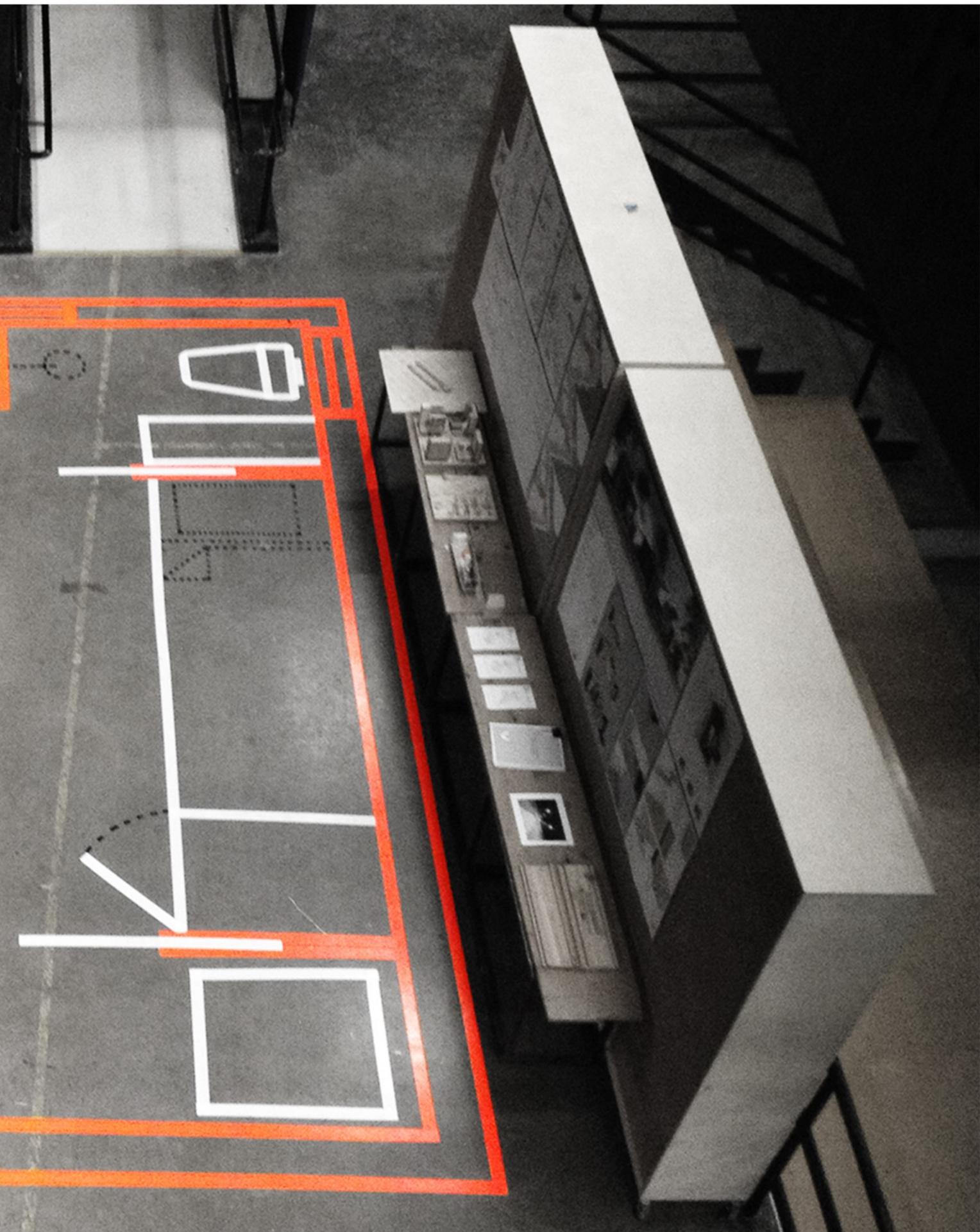
THE HOME



Building22











PART 5:
Epilogue: A Factory
“Home Depot +”

The Home Depot store provides the building components for the coach houses. This thesis also envisions that a factory would be “clipped on” to existing Home Depot stores, just as the seasonal garden section is clipped on the store in the summer months. The factory, though, would be a permanent addition. Within it, the coach houses would be produced, and trucks would load them and receive them to their new sites for installation.

The factory becomes a kind of “activation” of the super hardware store, which is Home Depot. There, the store’s contents are “set in motion,” made to “become something.” There is



tremendous potential in this space, to be a theater of making for the Ottawa public.

It is almost like Home Depot is actually a “home depot” storage that keeps disassembled houses in boxes, not unlike how a storage facility stores one’s own house contents when a person is moving.

Figure 34: Analysis of the Home Depot (Zones, railroad, district) location in South Keys

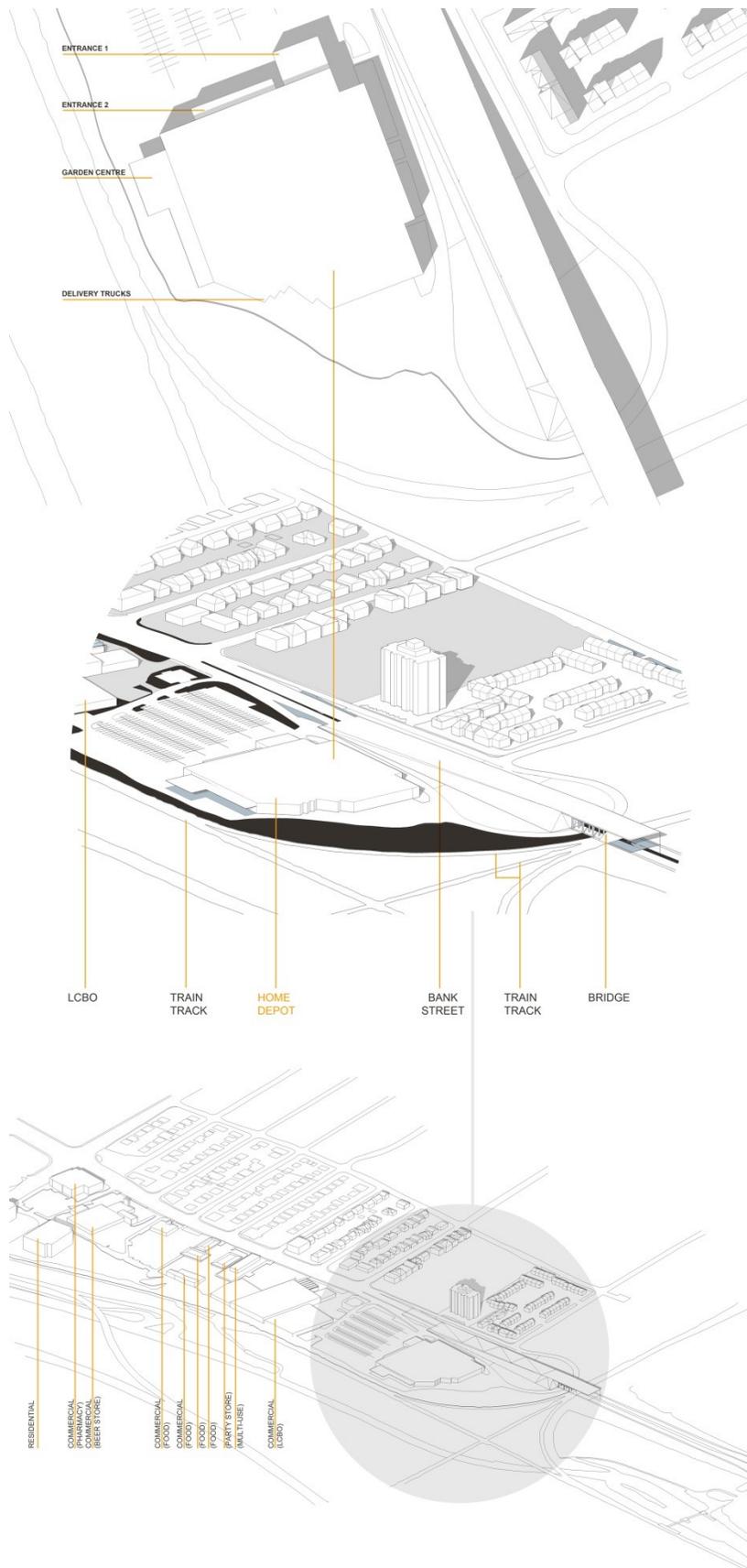


Figure 35: Analysis of the Home Depot (Zones, railroad, district) location in South Keys

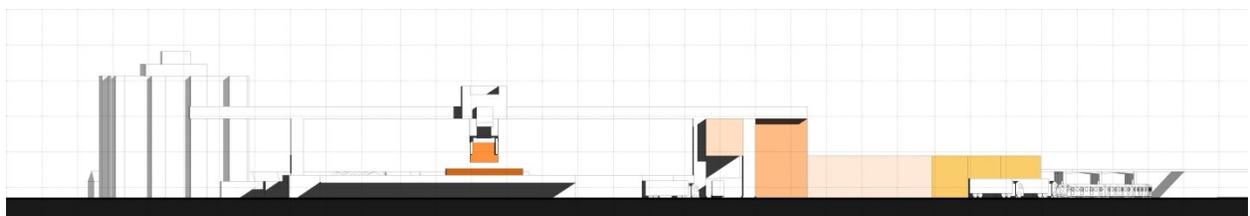
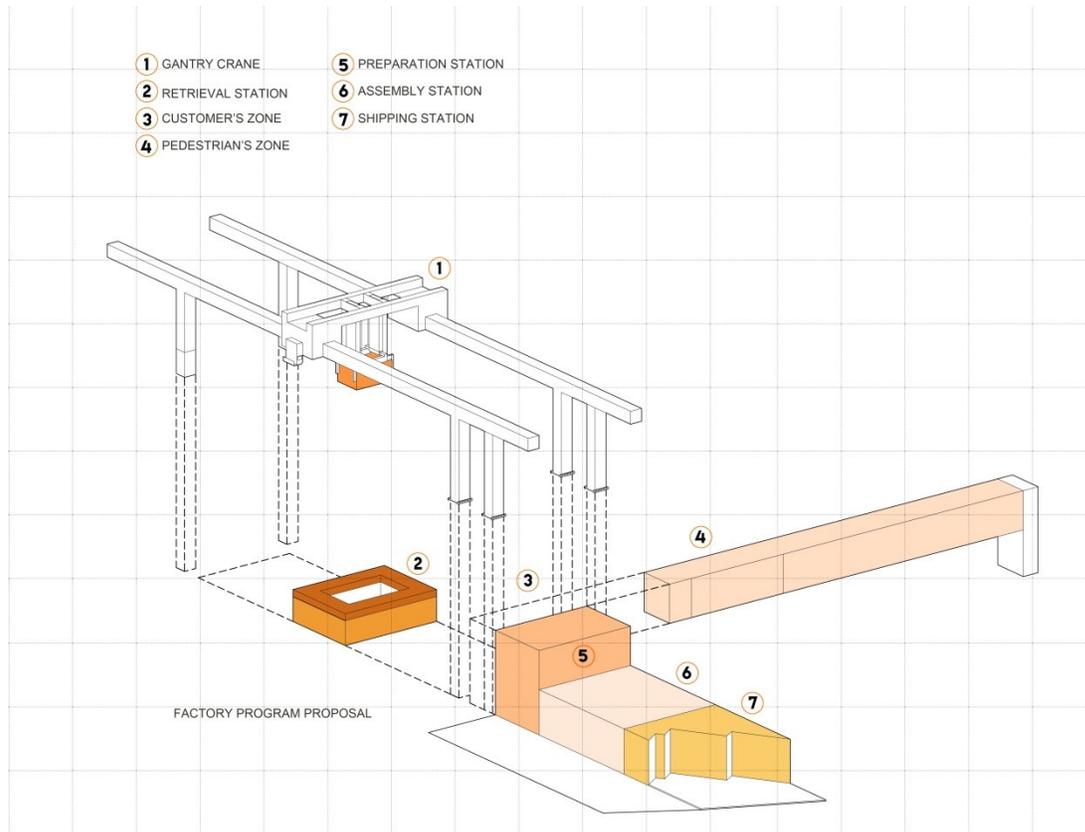


Figure 36: Proposal of a factory addition to the Home Depot in South Keys

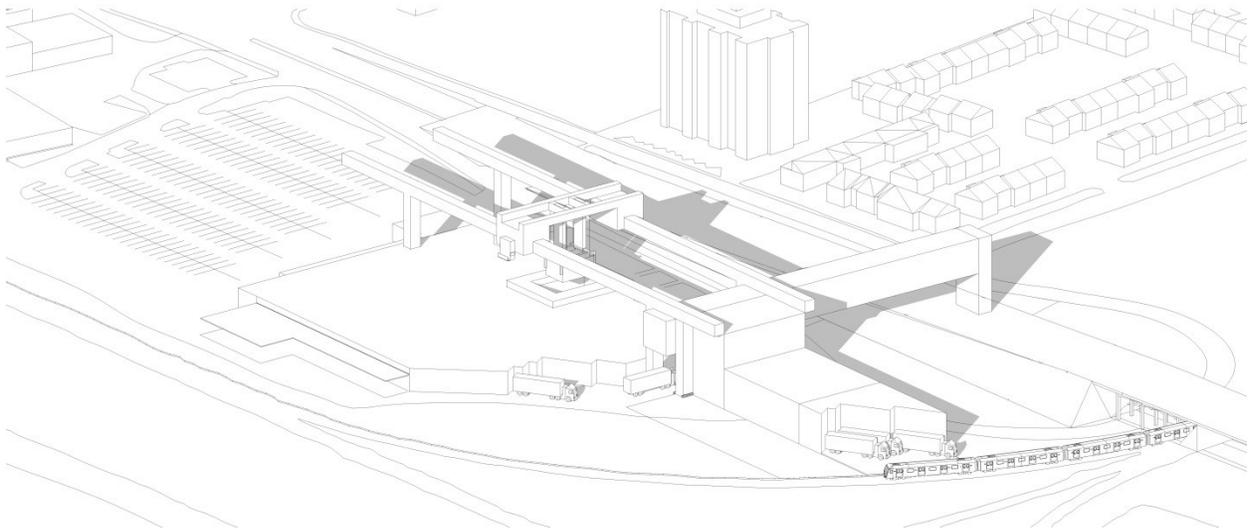
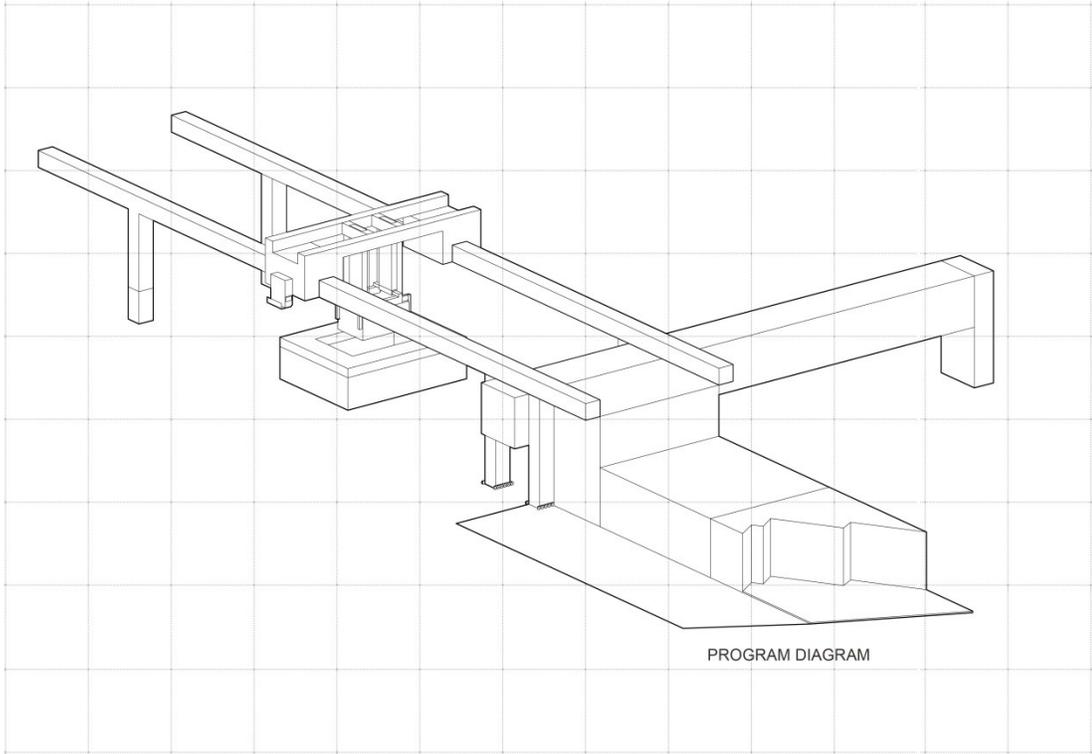


Figure 37: Proposal of a factory addition to the Home Depot in South Keys

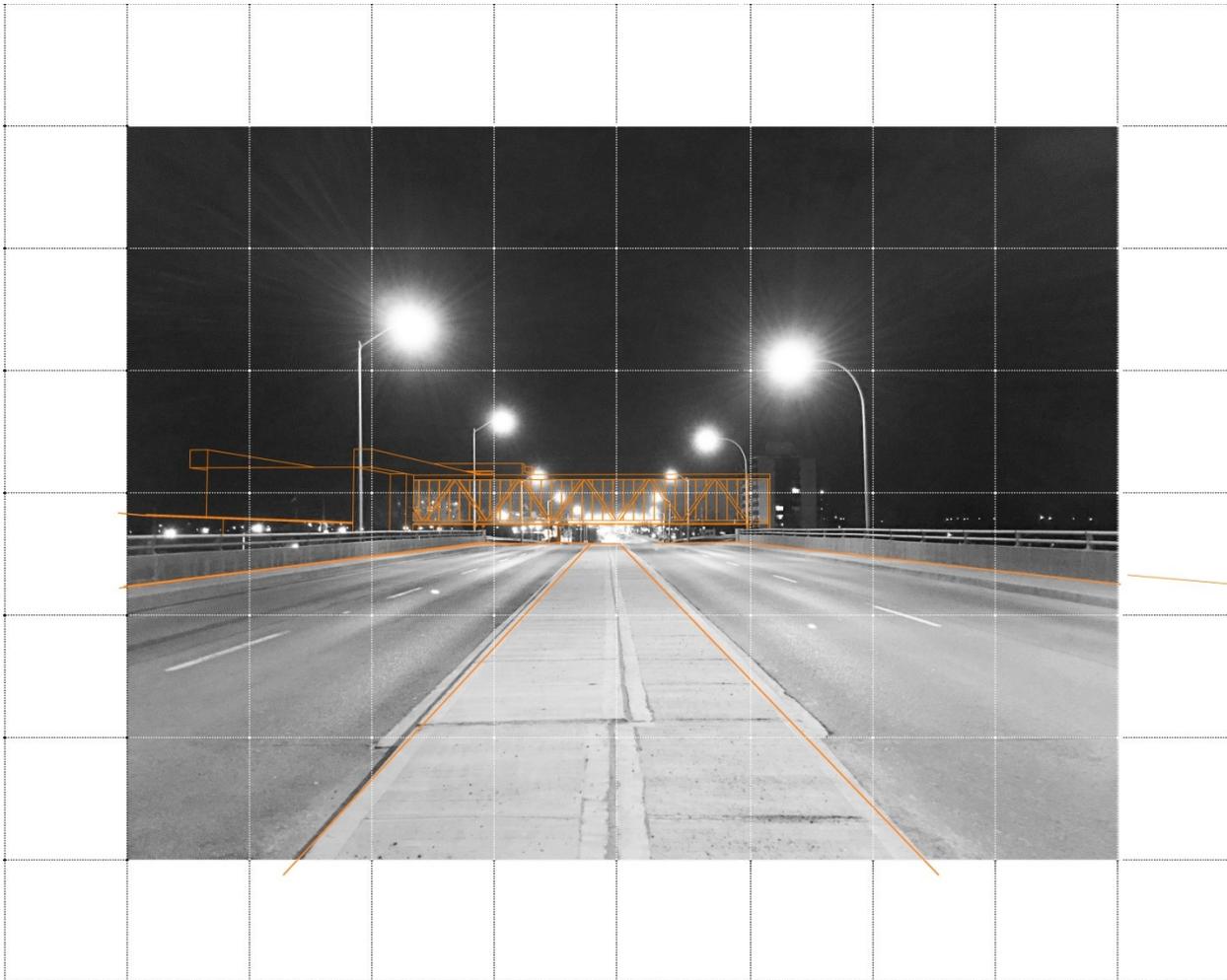


Figure 38: View of the pedestrian bridge over Bank Street, connecting Home Depot to the opposite side of the street

CONCLUSION

This thesis has explored the concept of the coach house as a potential dwelling opportunity in Ottawa, and as the trigger of a second dwelling domain within the city. The new system of small houses on the lots of larger houses promises to modify the urban fabric, open up its patterns, and expand the social realm in domestic Ottawa. As a rental dwelling inserted into the landscape of ownership, the coach house's presence is sure to have profound implications on neighbourhood fabric and logic. This thesis recognizes that more work on this issue must be done. The focus of the thesis, however, has been largely on architectural design strategies and fabrication systems and in particular on new architectural assemblies that relied on available and affordable materials. The precise material conception and detailing of the coach house emerged as a central concern and goal because dwelling is intimately tied to the act of building.

As a strategy, the conception of the house as an assemblage of blocks (the entrance, the porch, the laundry, the kitchen, the bedroom, the bathroom, and the living block) began to open up possibilities of a dialogue between technology and domestic habits and preferences. The block system also conceived of the interior walls and exterior claddings as one entity. The infill wall panels, roof panels and connector system provided a solution to choices and adjustments of size. The act of living invites careful architectural thoughts. In turn, the mode of prefabrication brings sharpness to these thoughts. The designs presented in this thesis were formulated in answer to the question of prefabricated small houses; the hope, however, is that they also could nourish much broader architectural thinking regarding small footprint affordable dwelling in cities.

The science of prefabricated architecture is vast, and this thesis has explored a minor aspect of it. The idea of integrating a small house's architectural design, its commercialization, and the logic of its transportation and delivery has been innovatively explored previously and continues to be in the present. Barry Bergdoll underscored this idea again recently, stating: "the prefabricated house continues to be one of architecture's most radical pursuits. Prefabrication is a reflection on the house as a critical agent in the discourse of sustainability, architectural invention, and new formal research."⁴⁹

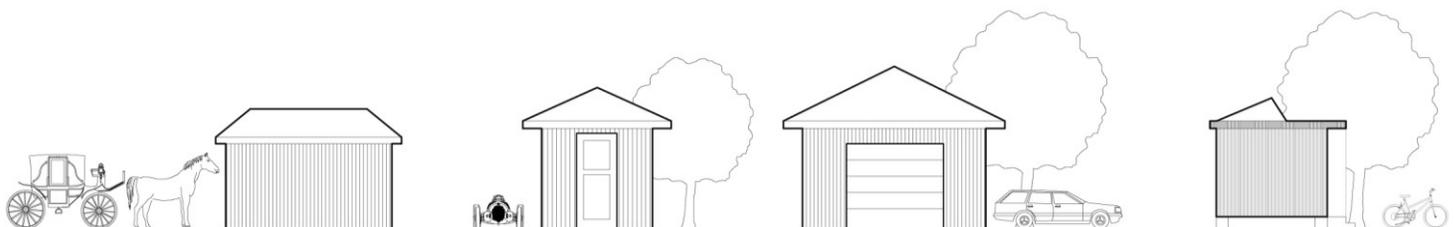
The proposal of utilizing the existing Home Depot infrastructure as a factory of assembly for the coach house presented in this thesis also invites further investigation. A thorough study of how a Home Depot "coach house factory" could incorporate new technologies would be valuable. Could digital fabrication technologies, such as CNC machines, 3D printing, and online design/ ordering, become a natural extension of the Home Depot store or any other generic building material store for that matter?

The insertion of coach houses raises interesting questions in regards to the logistics of land division, adjacency and privacy questions. Further research also must be conducted to determine the most appropriate means of accessing the units particularly in denser neighbourhoods where access is dependent upon easements on adjoining properties. More radical thinking about the creation of new laneways for the coach houses, so that these can have an inner street presence rather than be "hidden" in the backs of lots, is also called for. This

⁴⁹ Artdaily, *Home Delivery: Fabricating the Modern Dwelling at The Museum of Modern Art in New York*, (July 26, 2016), http://artdaily.com/index.asp?int_sec=2&int_new=25193&b=aldrich#.V5fQj_kwh7c

may be an area for City of Ottawa zoning officials to further explore, in order to ensure the feasibility and vibrancy of a micro-community of coach houses in Ottawa's mature neighbourhoods. As Ottawa's population continues to increase and house prices continue to rise, pressure on mature neighbourhoods will continue to build. A new approach to urban densification is needed and coach houses may be the answer.

END



LIST OF FIGURES:

NOTE: All figures not listed is a property of the author

Figure 1:

City of Ottawa Policy Development and Urban Design Branch, *Coach Houses: Secondary Dwelling Units in Accessory Structures, Guiding Principles and Draft Recommendations Paper*, (January 2016): 5.

Figure 2:

<http://web.ncf.ca/bf250/images/b21.jpg>

Figure 6:

http://modernrealtor.blogspot.ca/2011_03_01_archive.html

Figure 7:

<https://www.flickr.com/photos/rdb466/sets/72157647065273344/>

Figure 8:

<http://ottawa.ca/en/residents/arts-culture-and-community/museums-and-heritage/witness-change-visions-andrews-newton-5>

Figure 9:

<http://blog.ottawamove.com/2011/10/18/perfect-home-location-findlay-creek/>

Figure 12 :

<http://w3eames.blogspot.ca/2012/12/eames-house-frame-construction.html>

Figure 13-14:

<http://360photography.in/?tag=midcentury>

Figure 15:

Bergdoll Christensen, *Home Delivery: Fabricating the Modern Dwelling*: (The Museum of Modern Art, New York 2008)

Figure 16:

Bergdoll Christensen, *Home Delivery: Fabricating the Modern Dwelling*: (The Museum of Modern Art, New York 2008)

Figure 17:

Bergdoll Christensen, *Home Delivery: Fabricating the Modern Dwelling*: (The Museum of Modern Art, New York 2008)

Figure 20:

<http://360photography.in/?tag=midcentury>

PART 5: BIBLIOGRAPHY

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https://www.oanhss.org/oanhssdocs/Issue_Positions/External_Resources/Ottawa_Council_on_Aging_Housing_Seniors_Rpt_Aug2008.pdf.

APPENDIX 1:

City of Ottawa Documents Pertaining to the Coach House By-Law Background Study

The following is the integral text for the City of Ottawa's Development Charge Background Study Amendment to Coach Houses, quoted from the City of Ottawa's official website:

http://documents.ottawa.ca/sites/documents.ottawa.ca/files/dev_charge_study_en.pdf

The document was prepared on June 16, 2016 initiated by The City of Ottawa.

City of Ottawa

Development Charge

Background Study

Amendment to the definitions for "*coach house*" and addition of a new category and rate

Introduction

The purpose of this document is to satisfy the requirements of the Development Charges Act (1997). The legislation requires the preparation of a background study to support an amendment to the City of Ottawa Development Charges By-law (2004-2981).

This background report provides the rationale to support a change to the definitions section of the By-law and an addition of a new category. The proposed change will define a new unit type known as *coach house*. Based on the service requirements, occupancy characteristics and affordability direction from the province, a coach house is to require a lower level of service from that of other dwelling types.

The report provides a background of the provincial direction, a description and definition of the unit type and a rationale for the type of appropriate development charge for a coach house.

The public consultation carried out in preparation of this report consisted of meetings with City Staff and representatives of the Greater Ottawa Homebuilders Association. Consultation with the general public will be undertaken through the mandatory meeting to be held by the Corporate Services and Economic Development Committee.

Background

The City of Ottawa Development Charges By-law was adopted under the Development Charges Act (1997) as a means to recover the service related costs for new growth.

The province made changes to the Strong Communities Through Affordable Housing Act (2001) requiring municipalities to authorize *second units* in detached, semi-detached and row houses, as well as in ancillary structures. The Strong Communities Through Affordable Housing Act is the provinces foundation for long-term commitment to affordable housing and requires a wide range of actions to improve the affordable housing system. The Act resulted in changes to the Planning Act to enhance *second unit* provisions, whereas requiring municipality to allow for attached and detached second units as an appropriate form of affordable housing.

The City of Ottawa currently permits *second units*, termed *secondary dwelling units*, within certain types of primary residential buildings in all residential zones. However our policy structure and current Zoning By-law provisions do not allow for *second units* in accessory structures as-of-right, for example in detached garages. The City of Ottawa has termed these new detached residential units *coach houses*, depicting small ancillary residential units detached from a primary residential building.

Description of Unit Type

Coach House

The ***coach house*** is a small ancillary residential unit which is detached from the primary residential building. A coach house contains one dwelling unit and must be located on the same lot as the primary residential use building.

The design of a coach house allows for discrete infill housing opportunities within established neighbourhoods. These units can range in size from the minimum permitted size afforded under the Ontario Building Code up to a proposed maximum permitted footprint of 95 square metres of living space. Outdoor amenity space is proposed to be shared with the primary residential use building and servicing must be obtained from the primary home.

Recommendation

To account for coach houses within the Development Charges By-law, the term is proposed to be added to Section 1 - Definitions:

Coach House: Means a separate dwelling unit detached from a principal dwelling unit located either in its own building or within an existing accessory building and on the same lot as the principal dwelling.

Further the following text is proposed to be added to Section 7 – Exemptions:

Item (u) – Coach houses excluding the public transit portion of a development charge.

Rationale

A coach house is meant to be an affordable housing unit. The direction from the province is to create opportunities for the affordable housing system to capitalize on. Charging a full development charge for a coach house would not support this initiative or goal. The City is therefore proposing to exempt coach houses from a development charge with the exception of the public transit component. The public transit component is nominal thus working with the affordability nature of these housing units. Further by charging the public transit component for coach houses assists the City to further strengthen its funding for Light Rail Transit (LRT). It is anticipated that the majority of coach houses will be built within close proximity to LRT thus justifying the application of the transit fee amount. Further, coach houses are seen as affordable housing units where tenants are less likely to own private vehicles, thus relying on public transit.

Coach houses are also proposed to be small in nature where the persons per unit are lower than an average single family dwelling. A coach house also does not require the same level of service as a single family dwelling. Coach houses will be required to obtain City water and sewer services from the existing connections provided to the main home, therefore not allowing any new laterals from City infrastructure. Further, these units are to be built in established neighbourhoods where recreational infrastructure and support services already exist. Road systems will see little impact as these units do not require parking and it is anticipated tenants are less likely to own a vehicle.

Conclusion

Coach houses are a proposed new form of residential housing which is mandated by the province, through the Strong Communities Through Affordable Housing Act. The intent is that these new units are to be an affordable housing option. These units will materialize on existing lots with an established primary residential use building. The coach house will be required to connect both water and sewer from the primary home, therefore reducing the impact on municipal infrastructure. They will be integrated within established residential neighbourhoods where support-services already exist. Coach houses are therefore an appropriate form of housing warranting an exemption from a full development charge rate, under the Development Charges Act. This background study suggests applying only the transit charge to coach houses, in an effort to support the ongoing commitment to Light Rail Transit and to recognize that the tenants of these units are more likely to utilize public transit.

APPENDIX 2:

City of Ottawa Coach House By-Law Proposal Summary

The following is the integral text for the City of Ottawa's Coach House By-Law Proposal Summary, quoted from the City of Ottawa's official website:

http://documents.ottawa.ca/sites/documents.ottawa.ca/files/site_plan_en.pdf
http://documents.ottawa.ca/sites/documents.ottawa.ca/files/zoning_amend_en.pdf

The documents were prepared on June 24, 2016 by Tim Moerman.



Site Plan Control By-law Amendment Summary

Overview of the Proposed Amendments:

The proposed amendments implement the Ministry of Municipal Affairs and Housing changes to the *Strong Communities through Affordable Housing Act* which resulted in changes to Section 16 of the *Planning Act*. These changes require municipalities to develop or enhance policies in their Official Plans to allow secondary dwelling units within single detached, semi-detached and townhouse dwellings as well as ancillary structures.

The City currently allows secondary dwelling units within primary residential use buildings but not within ancillary (accessory) structures. The proposed amendments require properties in the rural area on private servicing (septic system and/or well) requesting a coach house to obtain a Site Plan Control approval.

Site Plan Control By-law Amendment Summary:

The proposed amendment adds an additional language to the Site Plan Control By-law to exclude coach houses which are serviced by municipal water and sewer. This proposed amendment therefore requires Site Plan Control approval for coach houses which are located in the rural area and serviced by private well and septic systems. This new amendment requires Site Plan Control for properties located in the rural area and on private well and septic systems in order to confirm the water quality and quantity for servicing the coach house. Further the Site Plan Control process will also allow the municipality to ensure that the ground water is not affected by the increased level of effluent produced as a result of the coach house development.

Approval Timelines & Authority:

The target date the proposal will be considered by the City's Planning Committee on Sept 13, 2016 and by Agricultural and Rural Affairs Committee on October 6, 2016.

Further Information:

Please go to the project webpage at: www.ottawa.ca/coachhouses

Zoning By-law Amendment Proposal Summary

File Number: D02-02-15-0021

Date: June 24, 2016

Owner/Applicant: City Initiated

Agent/Consultant: City-initiated

Site Location:

The proposed amendments will affect residential lands City wide.

Details of Proposed Amendments:

The proposed amendments implement the Ministry of Municipal Affairs and Housing changes to the *Strong Communities through Affordable Housing Act* which resulted in changes to Section 16 of the *Planning Act*. These changes require municipalities to develop or enhance policies in their Official Plans to allow secondary dwelling units within single detached, semi-detached and townhouse dwellings as well as ancillary structures.

The City currently allows secondary dwelling units within primary residential use buildings but not within ancillary (accessory) structures. The proposed amendments include Zoning By-law Amendments to Sections 133 allow for detached Secondary dwelling units, which will be termed Coach Houses in Ottawa.

Zoning By-law Amendment:

The proposed Zoning By-law amendments introduce Coach Houses as a permitted residential use for properties that have a detached, semi-detached, linked detached, duplex or rowhouse dwelling as the primary dwelling on the lot. Changes to Section 133 (Secondary Dwelling Units) will provide the performance standards to allow Coach Houses. Supplementary changes are required throughout the By-law to ensure that existing provisions do not conflict with this new permitted use, including a change to Section 139 to allow for two walkways. The below table provides a summary of the proposed amendments which include new provisions similar in effect to the following:

Type of Amendment	Description of proposed change
Definition	Add definition for "Coach House": Means a separate dwelling unit detached from a principal dwelling unit located either in its own building or within a building also containing an accessory use and on the same lot as the principal dwelling.
Exclude	Add provision which states that a Coach House is not considered to be an

Accessory Provisions	accessory use.
Prohibit Coach Houses in the Floodplain	Add provision to prohibit Coach Houses in the floodplain.
Allow Permitted Projections Above the Height Limit	Add provision to allow permitted projections above the height limit for Coach Houses, but exclude roof top amenity areas from all Coach House buildings.
Allow Permitted Projections into Required Yards	Add provision to allow permitted projections for Coach Houses into required yards.
Where Permitted	<p>Add a provision to allow a Coach House dwelling on any lot occupied by a detached, semi-detached, linked detached, duplex or rowhouse dwelling, where that dwelling type is a listed permitted use, provided that:</p> <ul style="list-style-type: none"> - the primary home is serviced by a public or communal water and waste water system and the Coach House must obtain water and wastewater services from the primary dwelling; and - the Coach House is located on the same lot as its principal dwelling. <p>On lots smaller than 0.8 hectares in size, the coach house must be located in the rear yard of the principle dwelling.</p> <p>Despite the above:</p> <ul style="list-style-type: none"> • In the case of a lot with frontage on both a street and a travelled public lane, the coach house must be located in the yard adjacent to the travelled public lane. • In the case of a lot with a rear yard less than 5 meters in depth, the coach house can be located in the side yard provided one of the walls of the coach house is on or within 1 metre to the rear property line. • On lots 0.8 hectares or greater and located in the rural area, the coach house may locate anywhere on the lot, subject to the setbacks under the applicable subzone, and may be serviced by a private well or septic system.
Where Not Permitted	Add a provision to prohibit a Coach House on privately serviced lots in the urban area.
Maximum Number	Add a provision to only allow a maximum of one Coach House dwelling unit per principal dwelling unit. A Coach House cannot be located on a lot where the principal dwelling also has a secondary dwelling unit, garden suite or any rooming units within the principal dwelling on that lot.
Maximum	Add a provision to restrict the maximum size of a Coach House as follows:

Size	<p>The coach house must not:</p> <ul style="list-style-type: none"> a) have a footprint exceeding 40% of the footprint of the principle dwelling unit on the lot b) exceed a lot coverage of 40% of the yard in which it is located c) exceed a footprint of 95 m² <p>If the primary home is less than 100 m² in footprint, a coach house of up to 50 m² is permitted, and must not exceed 40% of the yard in which it is located.</p>
Footprint Size	<p>Add a definition for footprint, as follows:</p> <p>Footprint means the area of the ground floor of a building, measured from the exterior of the outermost walls, including an attached garage but excluding any projections or accessory buildings.</p>
Maximum Height	<p>Add a provision to restrict the maximum height of a Coach House as follows:</p> <p>In the urban and village areas:</p> <ul style="list-style-type: none"> 1) maximum height not to exceed the building height of the existing primary dwelling; and 2a) where no basement is provided, maximum height of 3.6 metres; or 2b) where a basement is provided, maximum height of 4.0 metres, with maximum height of the outer walls not to exceed 3.6m. <p>In the rural area outside of village areas:</p> <ul style="list-style-type: none"> 1) maximum height not to exceed the building height of the existing primary dwelling; and 2a) where the living area of the coach house is entirely located on the second storey above a detached garage, maximum height of 6.1 metres; or 2b) in all other cases, maximum height of 4.0 metres.
Setbacks: Rear lot line in the urban area	<p>Add a provision to establish a maximum rear yard setback of 1 metre, for lots in the urban area, where no windows are proposed on the rear wall or where the rear lot line abuts a lane.</p>
Setbacks: Interior lot line in the urban area	<p>Add a provision to establish a maximum interior yard setback of 1 metre, for lots in the urban area, where no windows are proposed on the wall</p>
Setbacks: Corner side lot line	<p>Add a provision to require a minimum required setback from a corner side lot line to be the same as for the principal dwelling.</p>
Setback: Rear lot line	<p>Add a provision to require a minimum rear yard setback of 4 metres where transparent windows are proposed on the rear wall, except for a rear lot line</p>

	that abuts a travelled public lane.
Setbacks: Interior lot line	Add a provision to require a minimum interior yard setback of 4 metres where transparent windows are proposed on the side wall
Combination of Coach House and Accessory Use, Buildings and structures	<p>Add a provision for lots in the urban and village areas setting a maximum coverage, for a Coach House combined with all accessory buildings, of 50% of the yard in which they are located, with a maximum cumulative floor area of the accessory use of 55 m² as measured from the exterior walls of the use within the building.</p> <p>Add a provision for lots in the rural area setting a maximum coverage of 5% of the total lot area for a Coach House combined with all accessory buildings, with a maximum cumulative floor area of the accessory use of 150 m² as measured from the exterior walls of the use within the building</p>
Location of Entrance	Add a provision requiring the doorway entrance to a Coach House to be limited to locations that are not facing any lot line, unless the lot line in question borders a travelled lane, or the Coach House is set back further than 4 m from said lot line.
Minimum Access Route	Add a provision requiring a minimum 1.2 m wide access from a public street or travelled lane to the Coach House. This access may comprise a permitted driveway.
Parking Yards and Driveways	<p>Add a provision requiring the principal dwelling and Coach House dwelling to share the parking area and yards provided for the principal dwelling unit, and prohibiting the creation of a new driveway.</p> <p>Despite the above, a driveway is permitted in the following circumstances:</p> <ul style="list-style-type: none"> • Where a garage or carport is provided as part of the Coach House, in the urban and village areas, an extension of an existing driveway is permitted and in the rural area a new driveway is permitted. • In the case of lots served by a travelled public lane, a new driveway may only be created in a yard that did not contain a driveway prior to a Coach House being established.
Parking: Requirements	Add a provision to not require parking for a Coach House dwelling.
Parking: Paved areas	Add provision to clarify that the creation of a Coach House must not lead to the paving of any existing landscaped areas in order to create more parking, except in the case where a new paved area leads to a garage or carport.
Density Control Limits	Add provision to clarify that Coach House dwelling units will not be limited by, nor included in, any density control requirement, including for example, number of dwelling units and unit per hectare counts.
Grandfathering Clause	<p>Add provision to allow an accessory structure existing as of December 31, 2015 to be allowed to convert in part or in whole to a Coach House, up to a maximum footprint of 95 m², and to be exempt from the following clauses:</p> <ul style="list-style-type: none"> • Maximum size: <p>The coach house must not:</p> <ol style="list-style-type: none"> a) Be greater in size than 40% of the footprint of the principle

	<p>dwelling unit on the lot</p> <p>b) Exceed a lot coverage of 40% of the yard in which it is located</p> <ul style="list-style-type: none"> Where permitted: On lots smaller than 0.8 hectares in size, the coach house must be located in the rear yard of the principle dwelling. Maximum height: A coach house on lots in the urban area and villages cannot be taller than the existing primary dwelling, up to a maximum height of 3.6 metres for coach houses without a basement or 4.0 metres for coach houses with a basement. A coach house on a lot in the rural area cannot be taller than the existing primary dwelling, up to a maximum height of 3.6 metres, or 6.1 metres for a coach house that contains a garage. Setbacks: The setbacks are as follows for lots within the urban area or villages: <ul style="list-style-type: none"> Rear and interior side lot line: 1 metre maximum OR 4 metre minimum Corner side yard: same as principle dwelling <p>The setbacks are as follows for lots within the rural area:</p> <ul style="list-style-type: none"> Rear and interior side yard setbacks: 4 metre minimum <p>Further add a provision where an existing structure is located within 1 to 4 metres from a rear lot line or an interior side lot line, any existing glazing on those walls will be required to be translucent or such windows to be closed.</p>
Planned Unit Development	Add a provision to clarify that adding a Coach House to a property is not considered a Planned Unit Development.
Section 139	<p>Add a provision to allow for a walkway to a coach house, as follows: A walkway that is neither abutting nor adjacent to a driveway or existing walkway, on the same lot as the one on which the coach house is located, and that does not exceed 1.25 metres is permitted:</p> <ol style="list-style-type: none"> on a corner lot, or extending from the end of an existing interior side yard driveway back to a coach house, or that leads from the walkway, that accesses the main entranceway of the principal dwelling, around the dwelling to the entranceway of the coach house, or in the case of an interior lot with a minimum 15-metre lot width, a walkway leading from the right-of-way and located further away than 5 metres from any existing walkway.

Approval Timelines & Authority:

The target date the proposal will be considered by the City's Planning Committee on **Sept 13, 2016** and by Agricultural and Rural Affairs Committee on **October 6, 2016**.

Further Information:

Please contact the undersigned planner or go to the project webpage at:

www.ottawa.ca/coachhouses

Notification and Submission Requirements:

If you wish to be notified of the adoption of the proposed Official Plan and Zoning By-law amendments, or of the refusal of a request to amend the official plan, you must make a written request (i.e., return the attached comment sheet) to the City of Ottawa.

If a person or public body does not make oral submissions at a public meeting or make written submissions to the City of Ottawa before the proposed Official Plan amendment is adopted, the person or public body is not entitled to appeal the decision of the Council of the City of Ottawa to the Ontario Municipal Board.

If a person or public body does not make oral submissions at a public meeting or make written submissions to the City of Ottawa before the proposed Official Plan amendment is adopted, the person or public body may not be added as a party to the hearing of an appeal before the Ontario Municipal Board unless, in the opinion of the Board, there are reasonable grounds to add the person or public body as a party.

Please provide any comments to the undersigned planner by July 22, 2016.

Tim Moerman, Planner

City of Ottawa

Planning and Growth Management Department

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