

# **HOUSING A FAMILY**

designing for  
multigenerational  
urban living

FLETCHER CORK BRUEGGER

*Housing is not a commodity. It is an all-but-permanent, all-but-immovable product that affects the lives not only of those who live in it, but those who live around it, whose experience is powerfully or subtly affected by it.*

~Alan Mallach, 53



**HOUSING A FAMILY**  
designing for  
multigenerational urban living

FLETCHER CORK BRUEGGER

Thesis submitted to the faculty of  
Virginia Polytechnic Institute and State University  
in partial fulfillment of the requirements for the degree of

Master of Architecture  
in  
Architecture

Susan Piedmont-Palladino, Chair  
Paul Kelsch  
David Lever

August 26, 2017  
Alexandria, Virginia

keywords:  
architecture | design | housing | multigenerational living | family | row house

# HOUSING A FAMILY

designing for  
multigenerational  
urban living

FLETCHER CORK BRUEGGER



## ABSTRACT

My interest in the study and practice of architecture is as a creative tool or solution to many of the challenges in our daily lives and communities. To not just create beautiful space that brings joy to be and exist in, but also space that, through design, addresses problems and helps make life easier and more livable.

When exploring an idea for a thesis, I wanted to find “design solutions” for many of the problems associated with housing and the changing space needs or requirements throughout one’s family life-cycle.

For over a century the single family home with the nuclear family has been the quintessential American cultural housing ideal. (Think of all the suburban developments and houses with perfectly manicured lawns and identical rows of winding streets stretching for miles and miles out into the countryside). However, in my opinion, this form of housing is quite wasteful in terms of space, material, family, and community resources. It segregates and separates us from our extended family reserves, costing us money, time and most importantly the daily support we might otherwise have from those closest to us: family.

I recognize that I am proposing rethinking longstanding cultural understandings about our most basic everyday functions: where and how we live. Part of my architectural exploration includes a question that I know I can never fully answer in these pages: can design lead culture? More specifically, can I or “we” as architects create a desire for something new in our culture through design? Not a new toy or gadget, but a new way of thinking about our future and how we want to live?





## HOUSING A FAMILY

designing for  
multigenerational  
urban living

FLETCHER CORK BRUEGGER

### GENERAL AUDIENCE ABSTRACT

While studying for my degree and completing my thesis, my family life has undergone many changes (a baby boy...and another on the way), which has added innumerable complications and paradoxically joy to my studies, professional career, and everyday life. When looking around for whatever help I could find I felt hamstrung, limited, by my living situation and the cultural biases that created many of the structures that guide and shape our lives.

When I looked around me, I saw others in similar situations:  
college graduates moving back home because they can't find jobs that pay enough to support living on their own,  
families taking in elderly and sick members because they can't afford or don't wish to put them in facilities,  
young families moving in with grandparents to help cover childcare,  
and on and on and on.

People, everywhere trying to make do, survive, in challenging circumstances.

These challenges turned my attention to a search for design solutions.

What could help make this process easier and more tenable?  
How can I marshal the resources I already have to fulfill my commitment to being  
an architect and a mother?

And how can architecture and design help with these everyday challenges?

My desire was to design housing that will allow for the ebb and flow of family life, to create flexible living conditions that can grow and adapt to one's changing circumstances, and enable varying living conditions (especially multigenerational families) without sacrificing the privacy and independence that we have grown to enjoy and expect.

As an additional challenge, I wanted to explore doing this in an urban situation, partially because I believe this problem is more easily resolved in a suburban or rural condition by building another separate unit or addition on the same lot or compound to accommodate these changes and partially because I believe urban living allows us easier access to resources/amenities (natural, community, and others), is less wasteful, and the current progression of our species.

The following pages are an imperfect and incomplete first step to answer to these questions and challenges, something I'm sure I will continue to explore throughout my career and life.

I look forward to you joining me on this journey.

*for my husband Mark  
whose patience, unending encouragement, and  
personal sacrifice made this whole life possible.*

*and for my son R. Taylor  
who is the light in my life.*



First day at the WAAC (06.03.2015)  
with Taylor, just 7 months.

## **ACKNOWLEDGMENTS**

*I would like to thank my thesis committee for their many attentive critiques that helped guide my wondering thoughts and to rein in this unwieldy thesis.*

*Susan, Paul, and David, thank you for sharing your very limited time and endless amount of knowledge and experience with me. Your guidance and advice has influenced my design perspectives and thoughts about architecture, design, and urbanism in ways I cannot fully express, but am deeply grateful to, and that will shape my career and life into the future.*

*Paul Emmons, thank you for introducing me to the poetry of architecture and always challenging me to stretch a little further to find meaning and beauty behind every design decision.*

*Joan Holt, thank you for your vision, dedication, and tireless effort in creating the WAAC, making and preserving it as the wonderful place to study and learn that it is. And also, for providing the final breakthrough ideas in my thesis. Your advice and critiques are always spot on, even if one can't see it at first, your insights always seem obvious at the end.*

*To my friends and fellow journeymen/women at the WAAC for all your helpful discussions and inspiration. Carlos thank you for always having time and willingness to help me work through an issue or technical problem. Mahkam, thank you for always being willing to lend a hand, even from almost before the first moment we met.*

*Most importantly, I would like to thank my family, Mom, Dad, Gregor thank you for your unconditional love and support. Taylor and Ryan, thank for bringing new meaning, challenges and light into my life. Mark, thank you for making this all possible, words cannot express my gratitude, love, or your importance to my life.*



# THE ARCHITECTURE OF AMERICAN HOUSES

A STRUCTURED SURVEY FROM 1600 TO THE PRESENT

COLONIAL FOLK/VERNACULAR ROMANTIC VICTORIAN ECLECTIC MODERN NEO-ECLECTIC



A graphical reference log capturing of the evolution of housing styles in America through time:  
 The Architecture of American Houses, Pop Chart Lab

# HOUSING A FAMILY

designing for  
multigenerational  
urban living

## TABLE OF CONTENTS

### THESIS

#### WHAT

-Thesis Questions..... 1

### RESEARCH

#### WHO

-Family Demographics..... 3

-Family Cycles..... 4

#### WHEN

-Historical Precedent..... 5

-Current Options

#### WHERE

-Site Selection..... 7

-Site Details..... 9

### DESIGN

#### HOW

-Discovery of Hestia..... 11

-Row House..... 15

-Floor Plans | Sections..... 17

-Floor Plan Evaluations..... 28

-Final Site Design..... 33

-Elevations..... 35

### FINDINGS

FINAL THOUGHTS..... 39

BIBLIOGRAPHY..... 41

IMAGE CREDIT..... 43

# WHAT? THESIS QUESTION(S)



## EXPLORING THE CHANGES AND CHALLENGES OF POPULATION AND HOUSING TRENDS IN AMERICA

Over the last century, (1905-2015) the American housing situation has changed dramatically, the average family house has increased from under 1000sf to over 2500sf (over 2.5 times in size) (U.S. Census Bureau) while the average family size living in that house has decreased from almost 5 people to less than 3. (U.S. Census Bureau)

Yet the population has continue to increase. ~84 million to ~321 million over the same time period.. (U.S. Census Bureau)

Additionally, 69% of US housing is designed for a nuclear family (bread-winning father, home-making mother, 2-4 children) This household is in the minority, as is households with two working parents. For the first time, the single-parent household is the fastest-growing type with over 50% of women 18 and older living without a husband and over 25% of the population living alone. (McCamant, 4)

Moreover, while only recently has the world become a majority urban population, that transformation happened in the United States between 1910 and 1920, and now more than four out of five Americans live in urban areas. (U.S. Census Bureau)

This means less people living in more houses that don't fit their needs, requiring more space, more cars/traffic more resources.

How can design better address these demographic challenges?

*If people move simply because their house no longer fits them, the long-range benefits of a stable community are jeopardized.*  
(McCamant, 269)



## SUPPLY OR DEMAND?

When purchasing housing are people buying what they want or simply what is available? “When a typical home buyer is looking for a house, he or she simply chooses from a menu of houses or apartments that are already built - often by a developer who hasn’t put much thought into it” except for what they think will “sell.” (Wann, 2) The defense for this continued method of building is the oft heard refrain “this is what consumers want.” But how can consumers choose something that doesn’t exist? Therefore market trends reinforce developer’s beliefs that they are building according to demand. But what if there was something different? Is this something Americans would want?

## WHAT DO AMERICANS WANT FROM THEIR HOUSING?

Besides being affordable and a pleasant place to spend one’s time in, how do American’s actually want to live? This question is so open ended it would be impossible to completely explore or answer it in the following pages.

However, in terms of location and “walkability” Tom Vanderbilt has found a partial answer: “Do Americans want sidewalks in front of their houses and actual places to walk to—“Leave the car in the garage!” is a common refrain on real estate sites—or are Americans happy, as transportation analyst Alan Pisarski puts it, to “drive to where they can walk?” Surveys on this question are decidedly mixed. A National Association of Realtors survey found that a majority of people would rather live in a “smart growth” community than a “sprawl community”; the same survey found that a majority, however, were willing to accept a longer drive to shops and restaurants if it meant having a single-family home. [...] What these surveys tend to reveal is that **most Americans would like to live in places that don’t really exist.** [emphasis added] [...] people want a big house on a big lot, where there are stores they can walk to.” The truth is there are relatively few places in America” like this. [...] ‘In most metropolitan areas, only 5 to 10 percent of the housing stock is located in walkable urban places.’ Some of those buyers who might like to buy in a walkable area, simply cannot afford to—at least in the way they would desire. ‘Some of the naysayers say people want to live in this sprawling way, but then why is it that houses in the urban areas are so expensive? The market’s saying it’s valued—it’s so expensive most people can’t afford it.’” (Vanderbilt, Part III)

Extrapolating from this idea, that most Americans would like to live in places that don’t really exist, I believe that housing is one of those areas where the ideal has yet to be achieved.

And perhaps, like so many things, people don’t know they need or are missing it until it has been designed.

## DESIGN QUESTIONS

Can a house in an urban environment be designed to evolve and change with the transforming needs and requirements of a family?

Can design lead culture? If such a house could be designed, could the design itself prompt adjustments in current American dwelling behavior and fuel desire away from the iconic single (nuclear) family detached house to multigenerational living?

## DESIGN CHALLENGE CRITERIA

- flexible housing that can evolve with changing family dynamics (including adaptability to issues with aging-in-place and mixed use for times when there is extra space)
- access to the ground and defensible spaces (no higher than 3-4 floors, space that belongs to and is controlled by specific units)
- mindful of the urban situation (site close to transit and walkable amenities, but also respects the street and the community in which it exists.)
- respects current standards of privacy and independence that many Americans have come to expect (something that appeals to a majority of people, even those with many options)

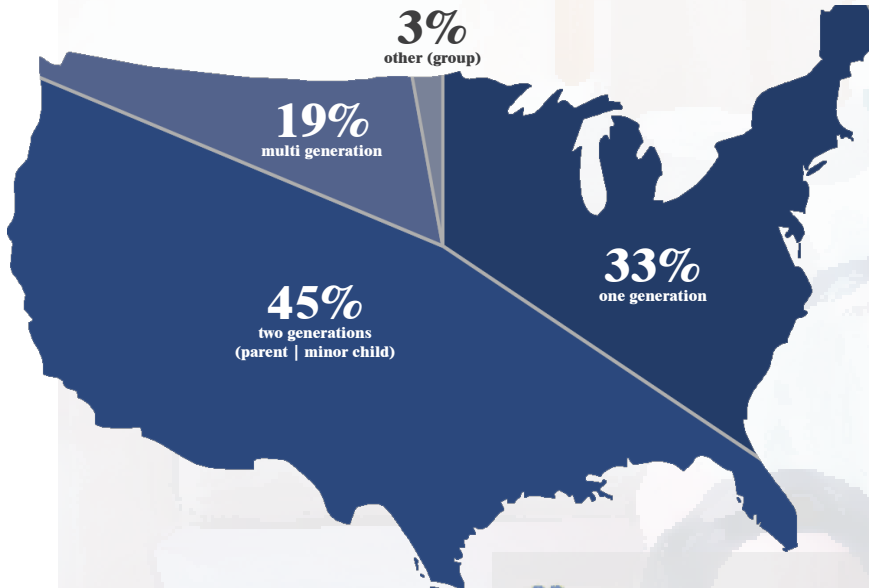
*A home has always meant far more than shelter from the elements or a convenient place to carry out the necessities of daily life. Individually, they provide the setting within which each family frames its domestic existence; collectively, they define their block, their neighborhood, and their community. How well they perform those tasks greatly affects the stability and health of the family and the community.*  
(Mallach, 54)

# WHO?

## FAMILY DEMOGRAPHICS

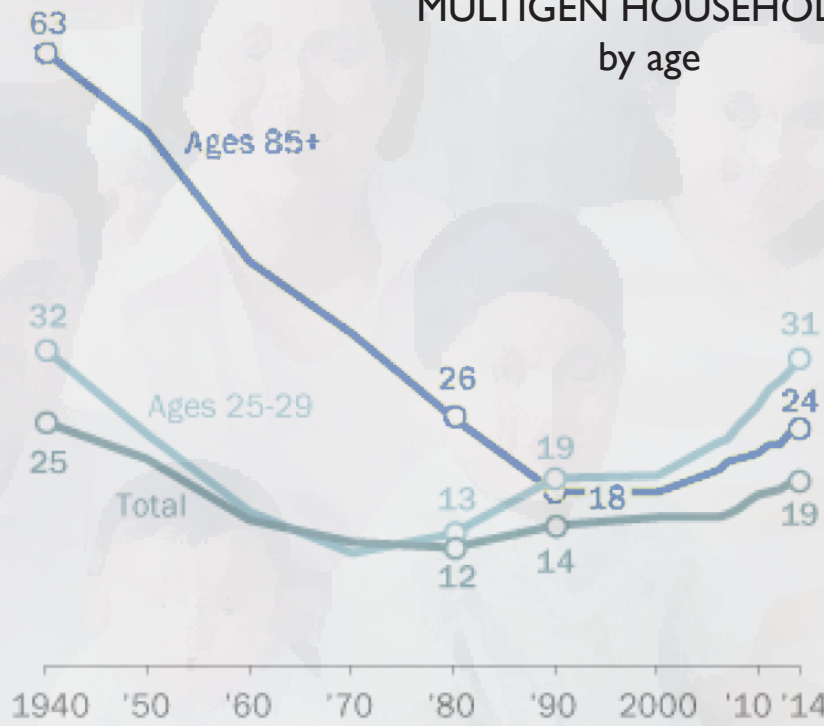
EXPLORING THE CHANGING AMERICAN DEMOGRAPHICS  
(as of 2014)

**60.6 MILLION** Americans live in **MULTIGENERATIONAL HOUSEHOLDS**  
(19% OF THE POPULATION) • 2014 Pew Research Center



Of the US Population (as of 2014)  
19% live in multigenerational households (2+ adult generations)  
33% live in single generation households (singles, couples, group)  
45% live in two generation households (adult parent | minor child)  
(Pew Research Center)

% of Americans in MULTIGEN HOUSEHOLDS by age



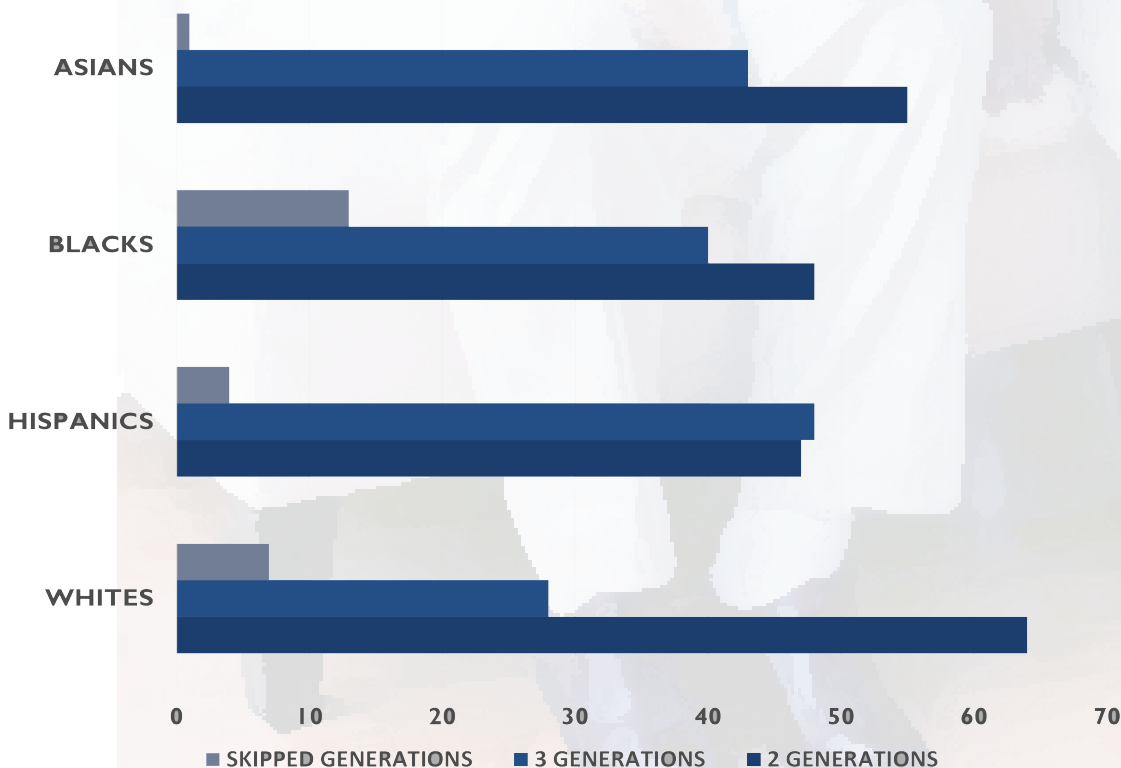
Over time the numbers of people living in multigenerational households have

- gone down for the elderly (ages 85+) (from 63% to 18% with a slight up-tick to 24%, living alone or in single generation housing)
- gone up for ages 25-29 (from 32% down to 13% back to 31%) (Pew Research Center)

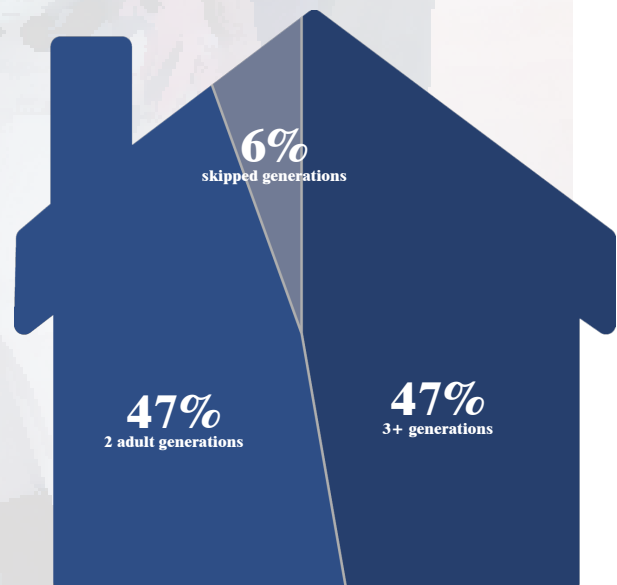
Who are living in Multigenerational Households?

- 45+% of Asian families
- 40% of African American families (and 15% in skipped generations)
- 50% of Hispanic families
- 28% of White families

(Pew Research Center)  
% OF MULTIGEN HOUSEHOLDS by race



CHARACTER of today's MULTIGEN HOUSEHOLDS



Make up of Multigenerational Households

- 47% are 2 adult generations
- 47% are 3+ adult generations
- 6% are skipped generations

(Pew Research Center)

# FAMILY CYCLES

## CYCLE OF POTENTIAL CHANGING MULTIFAMILY DYNAMICS

Below is a diagram representing how a family cycle might change over time in regard to necessity of flexible space [This is not representative of the myriad of potential family situations that exist in the world, for example a Nuclear Family could have many more children and/or be missing a parent, have a step parent/siblings, etc. Likewise the Sandwich Family could have one or more parents, one or more grandparents (great aunts/uncles, etc.), adult siblings or cousins, and one or more children (step or otherwise), and on and on *ad infinitum*].

### DEFINITION OF TERMS

**SINGLE:** one individual or group of individuals

**COUPLE:** one generation, typically a pairing

**NUCLEAR:** two generations,; adult parent(s) + minor child(ren)

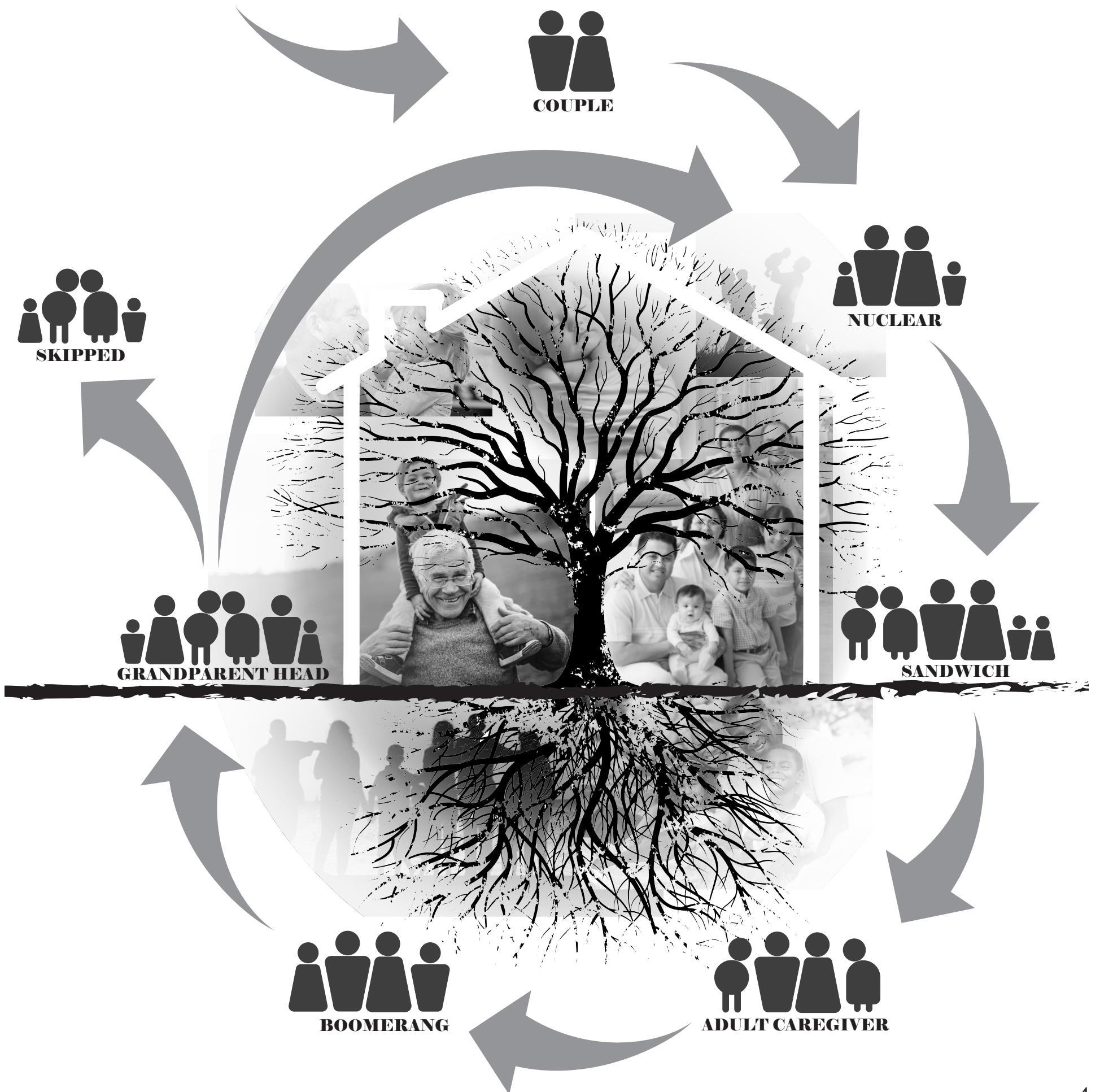
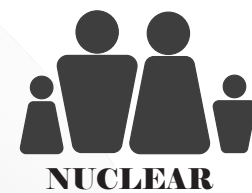
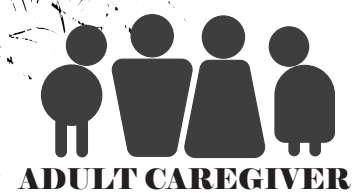
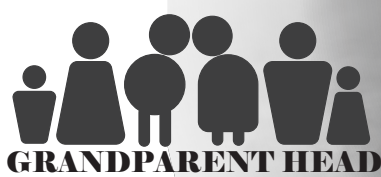
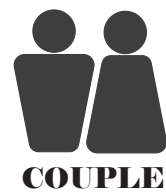
**SANDWICH:** three generations: adult parent(s) (head) + minor child(ren) + adult grandparent(s)

**ADULT CAREGIVER:** two generations: adult child(ren) (head), typically as caregiver + adult parent(s)

**BOOMERANG:** two generations adult parent + adult child (from children of the “Baby Boom” generation who returned home after college)

**GRANDPARENT HEAD:** three generations: adult parent(s) + adult child(ren) + minor grandchild(ren)

**SKIPPED:** two generations: adult grandparent(s) + minor grandchild(ren)





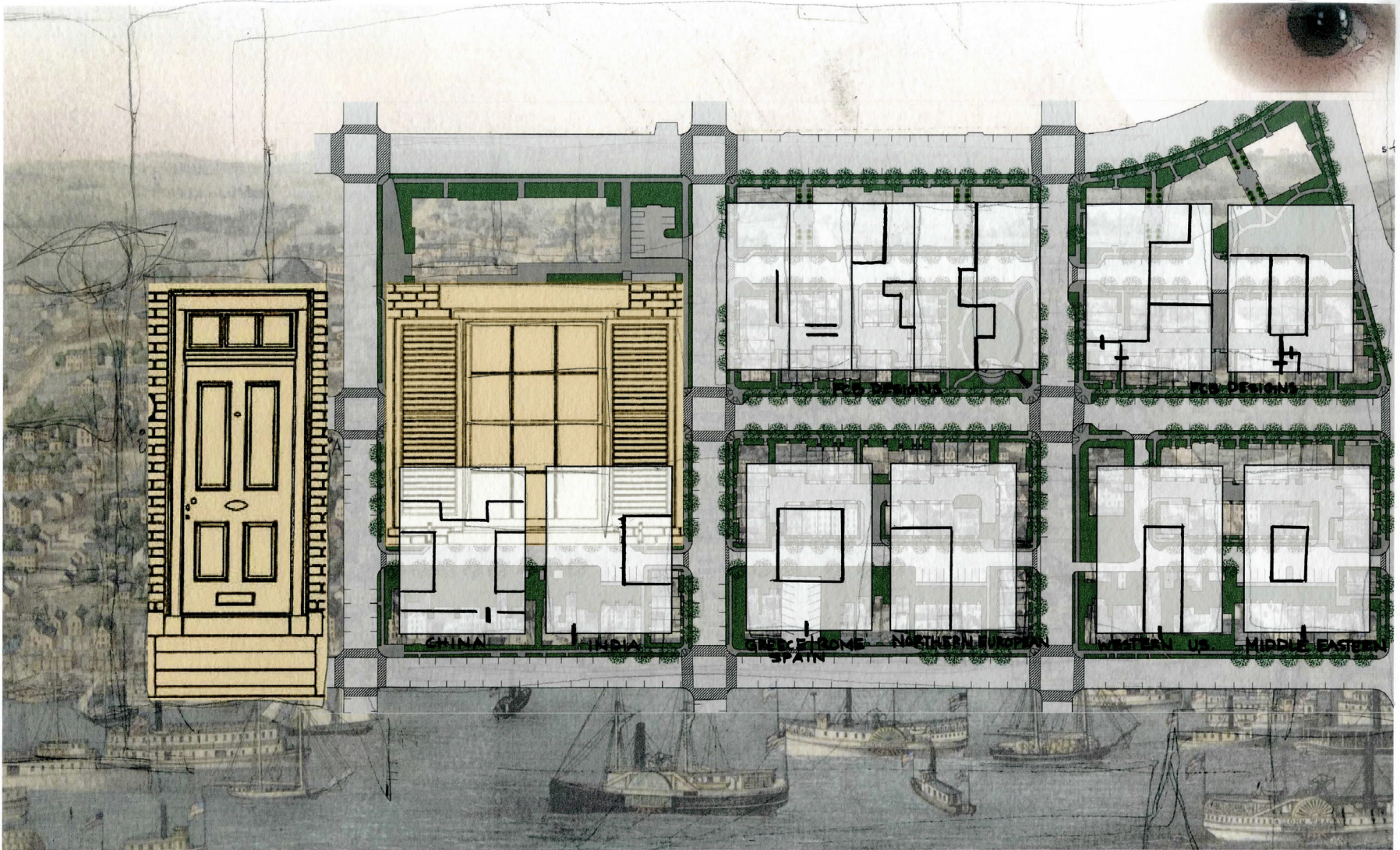
# WHEN?

## HISTORICAL PRECEDENT

### FAMILY HOUSING HISTORICALLY

#### The Courthouse or Compound

NOTE: this graphic is a response to an assignment requiring, first through lines, to describe architecturally the threshold between your thoughts and the material world in reference to one's thesis topic and forge a story about process (with the requirement that an image of one's own hand and eye was to be present). As I was still in the beginning stages... I explored SITE and PLAN on the RECTO side and ELEVATION and the MEANING of HOME and FAMILY on the VERSO side.

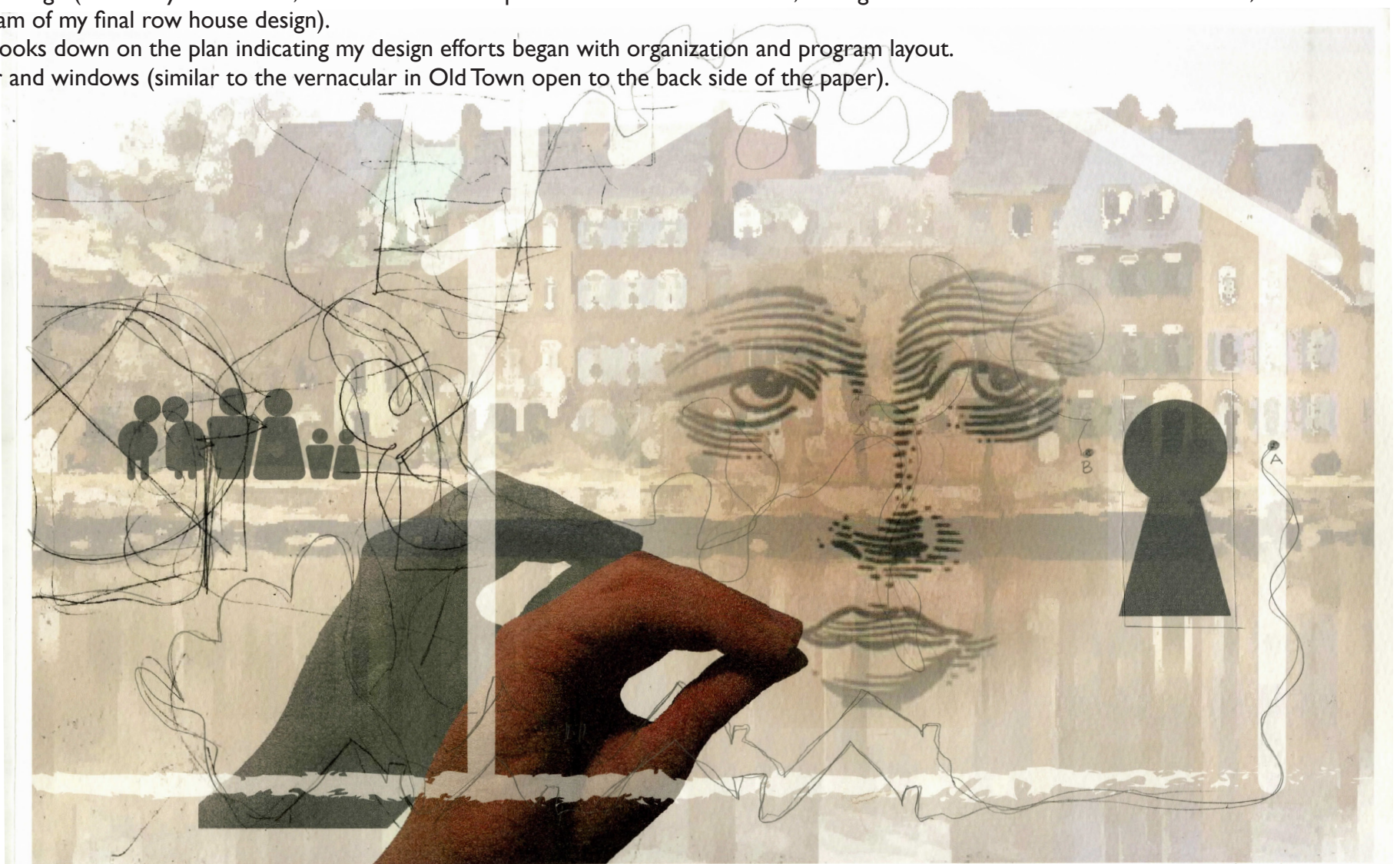


### RECTO - PUBLIC

-Background image is a perspective of historic Old Town Alexandria overlaid with a site plan of my chosen site. On each block are simple diagrams of historic courtyard/compound styles from throughout history and around the world: (**Bottom Row** Left to Right: China (Siheyuan style), India, Spanish (Cordoba), Northern European, Western US (U-shaped), Middle Eastern | **Top Row** Right to Left: diagram of my attempts at a courtyard design (ultimately abandoned, because these floor plans turn the houses inward, leaving an undesirable urban street condition; Left: diagram of my final row house design).

-The eye looks down on the plan indicating my design efforts began with organization and program layout.

-The door and windows (similar to the vernacular in Old Town open to the back side of the paper).



### VERSO - PRIVATE

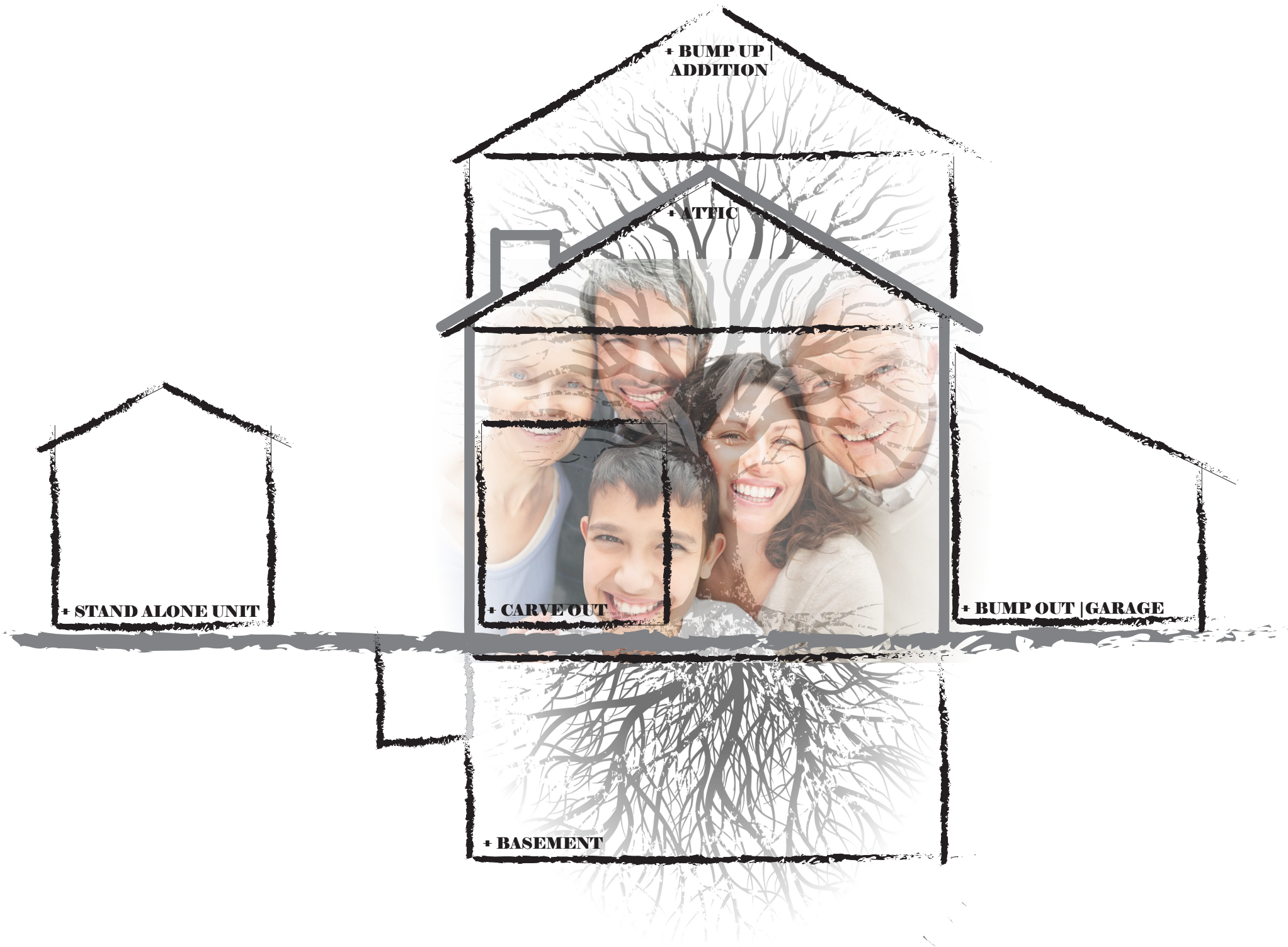
-Background image is an elevation of historic Old Town Alexandria, overlaid with the image of a house, a multigenerational family, and a face with a hand that is performing the American Sign Language symbol of "HOME" "ear to mouth" (where you eat and where you sleep). Through the key is the door opening to the other side of the paper. This side of the paper is the private world inside the house while the other side is the public world of which the house and household is an integral part.



## CURRENT OPTIONS

### OPTIONS AS THE FAMILY CHANGES, CURRENT FLEXIBILITY OF HOUSING

While some of these dynamic family situations described earlier are new or have been growing as society norms change, many are not. How have people dealt with needing more space or accommodating family changes in the past and in our current society with the dominant housing stock being the single-family-detached house?



Because the range and breadth of options available for a single family detached house (assuming you had enough land and the zoning laws in your jurisdiction allowed it), I chose instead to focus my design efforts on an urban situation where space is at a premium and many of the adaptation options for a single family detached house (such as creating a stand alone unit) are not viable.



# WHERE?

## SITE SELECTION

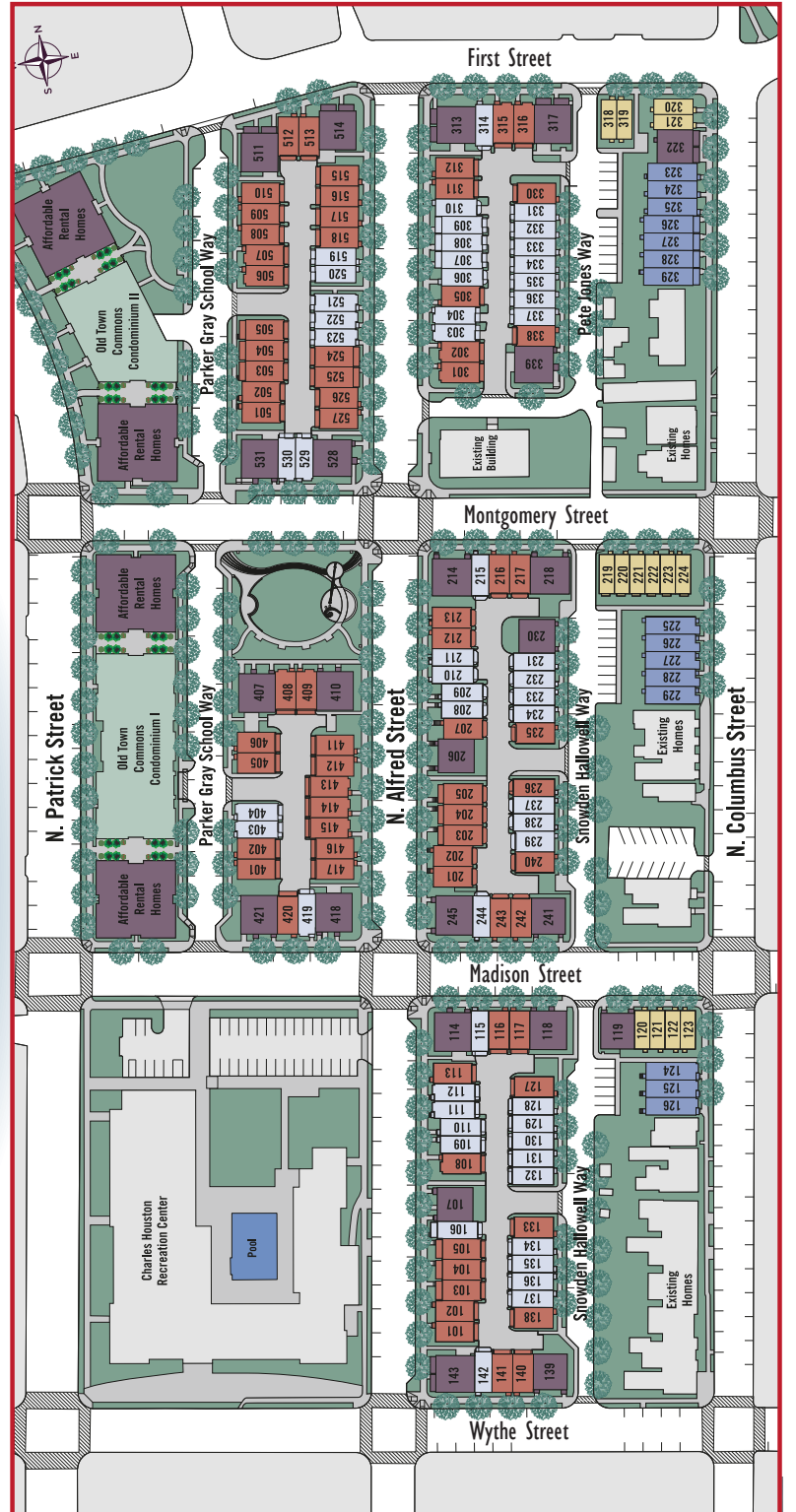
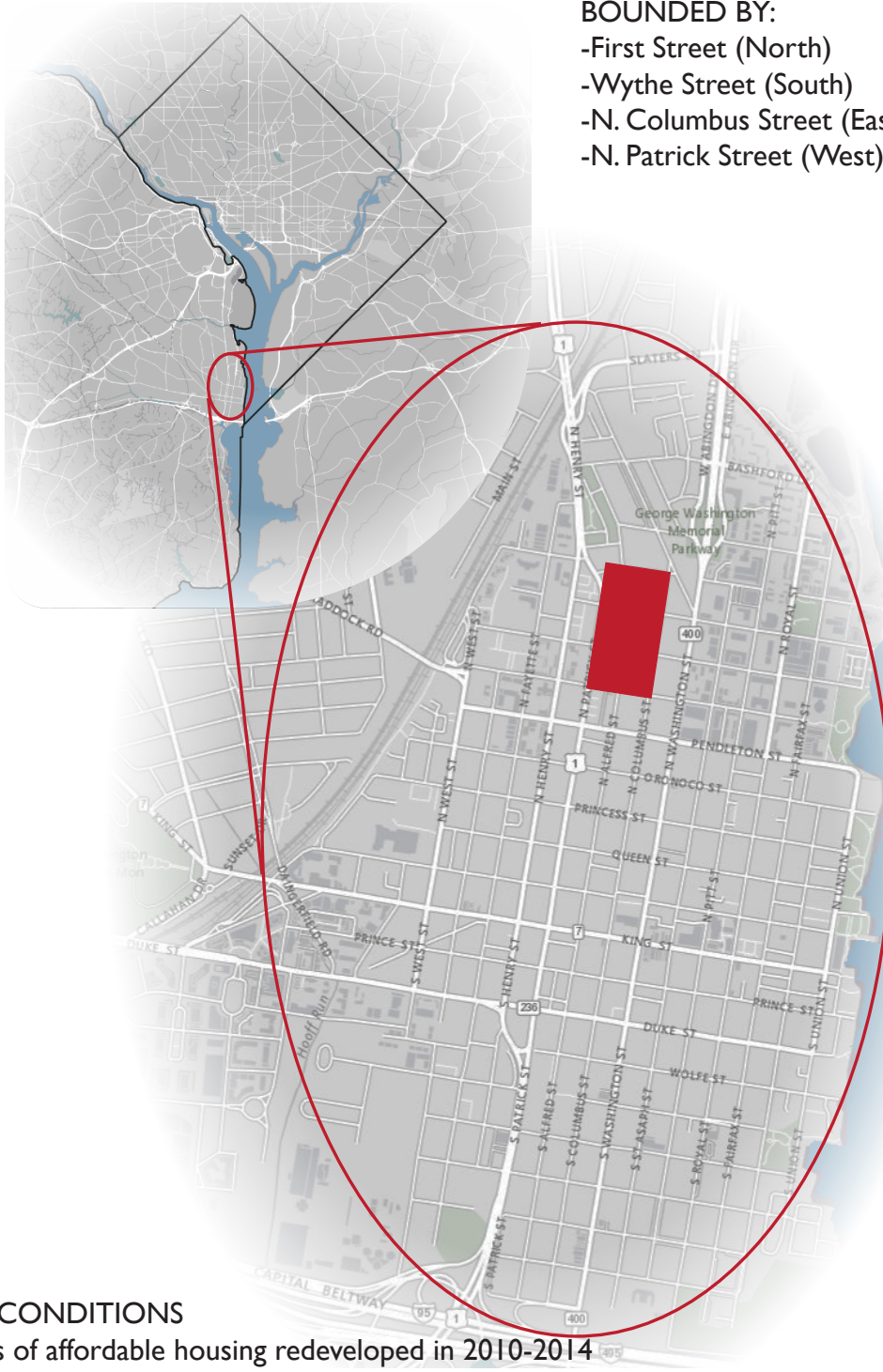
### OLD TOWN COMMONS | JAMES BLAND AFFORDABLE HOUSING REDEVELOPMENT

Re-imagining a whole development in North Old Town Alexandria, VA

Community just south of Washington DC

BOUNDED BY:

- First Street (North)
- Wythe Street (South)
- N. Columbus Street (East)
- N. Patrick Street (West)



### EXISTING CONDITIONS

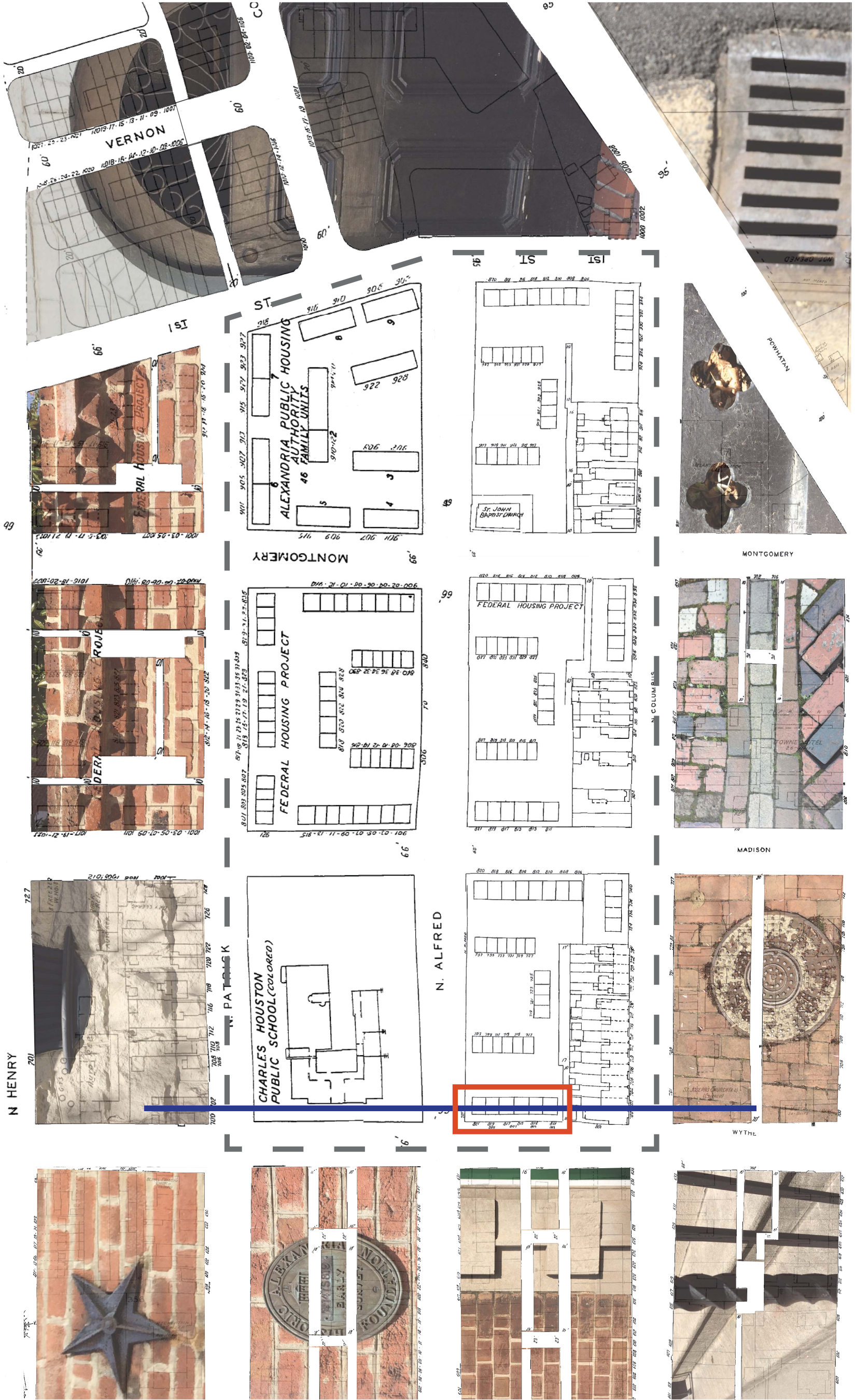
- 5 blocks of affordable housing redeveloped in 2010-2014
- 8.49 acres (369,952 sf)
- 194 Affordable units to 365 units total (134 Affordable)
- 72 Affordable row house units + 62 Affordable Multifamily units = (134)  
+ (60 Affordable units moved off site) = 194 total
- 155 market rate row house units + 76 market rate multifamily units = 231 total
- 24 units/acre to 43 units/acre





EXISTING CHARACTER

- historic brick and painted wood siding row houses
- brick sidewalks (some concrete), street trees @ 20'-25' spacing
- colorful painted doors, iron railing, hand crafted detailing

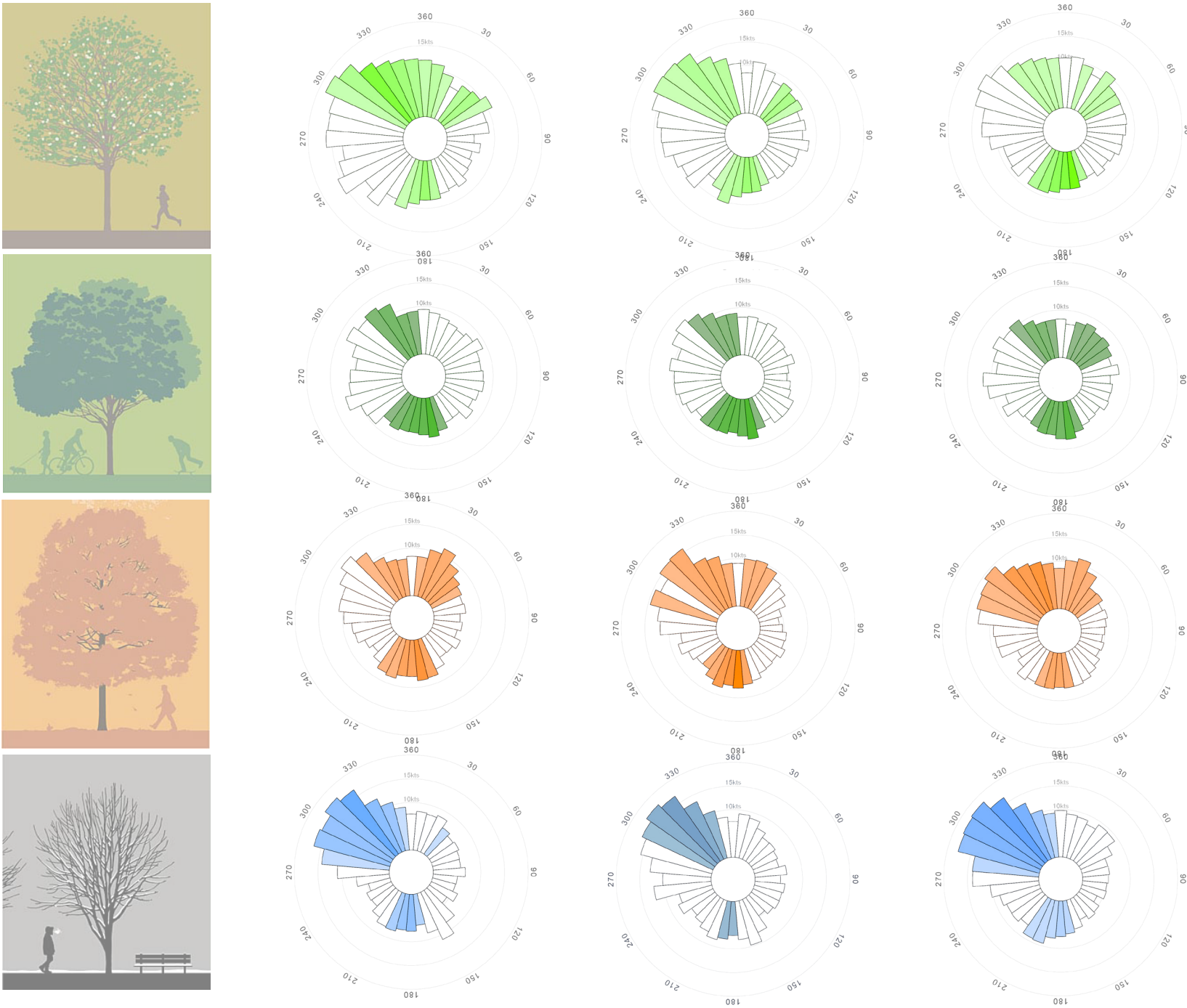




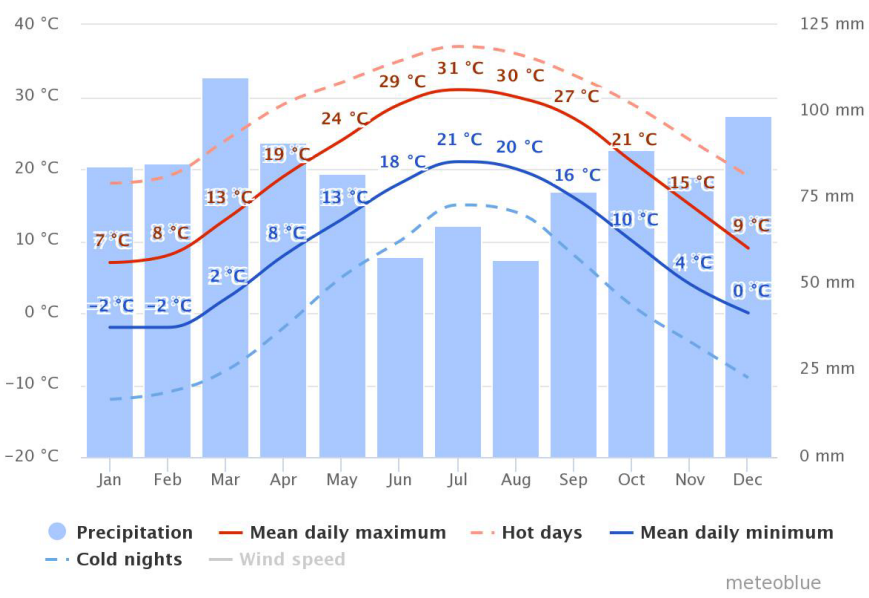
# SITE DETAILS

## WIND + SOLAR DATA

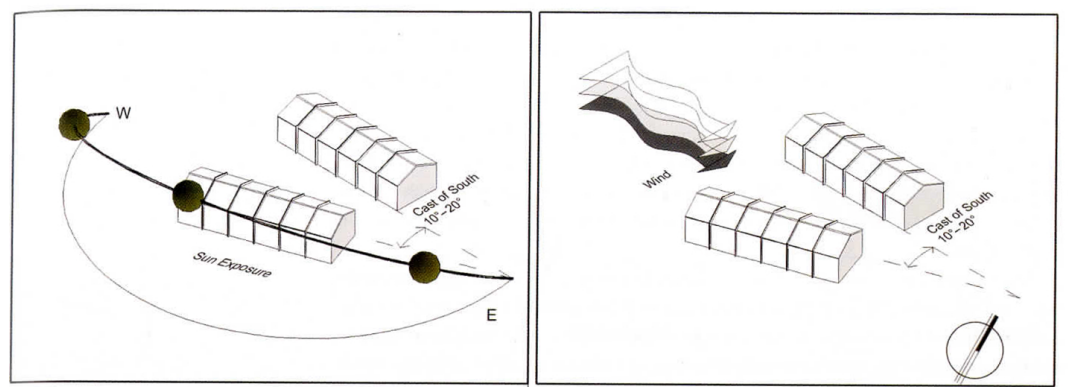
### WIND DIRECTION + INTENSITY BY SEASON (meteoblue)



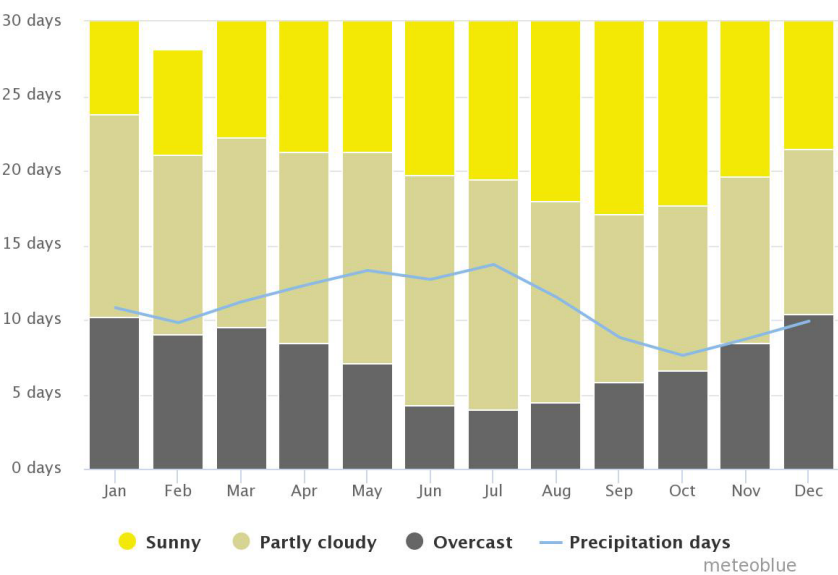
### AVERAGE TEMPERATURE+ PRECIPITATION BY MONTH (meteoblue)



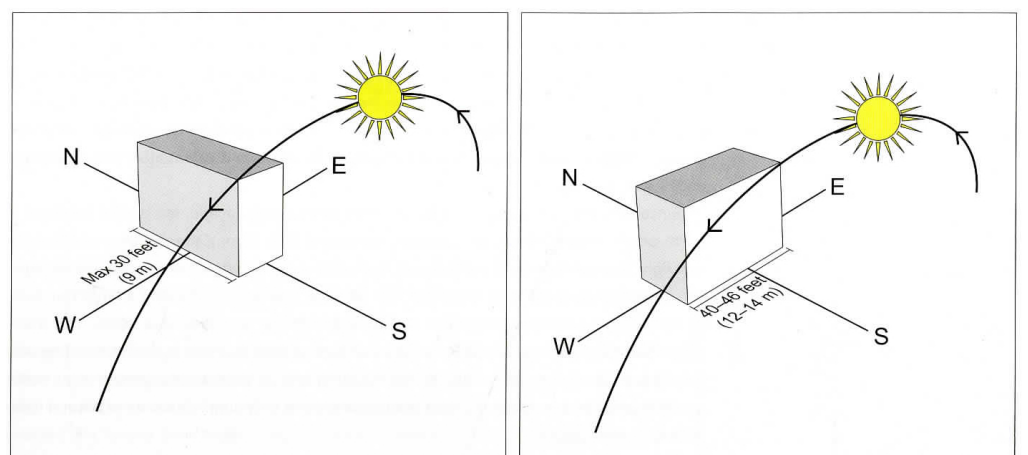
### IDEAL WIND ORIENTATION for Row HOUSES (Friedman)



### SUNNY, CLOUDY, PRECIPITATION DAYS (meteoblue)



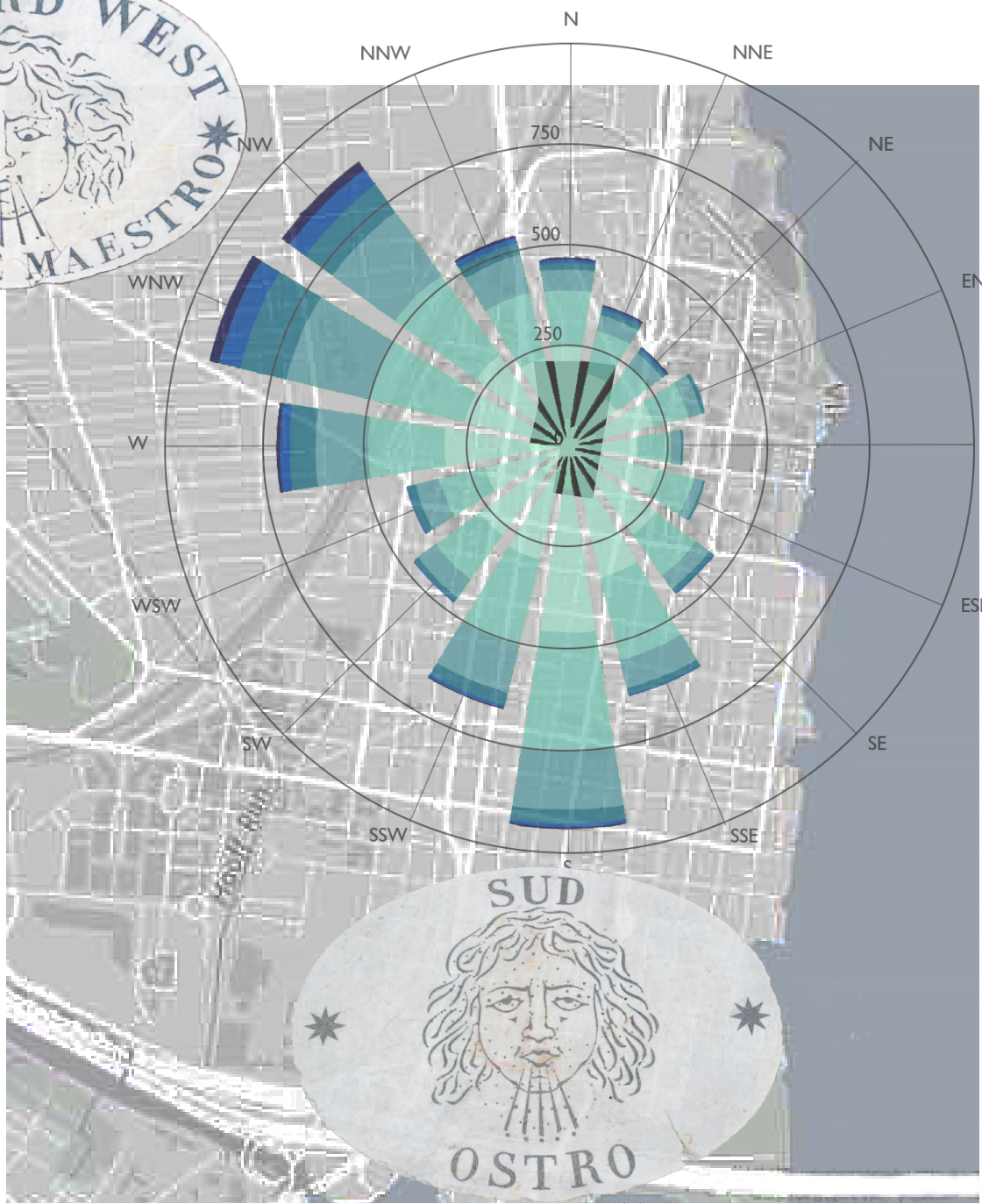
### IDEAL SOLAR ORIENTATION for Row HOUSES (Friedman)







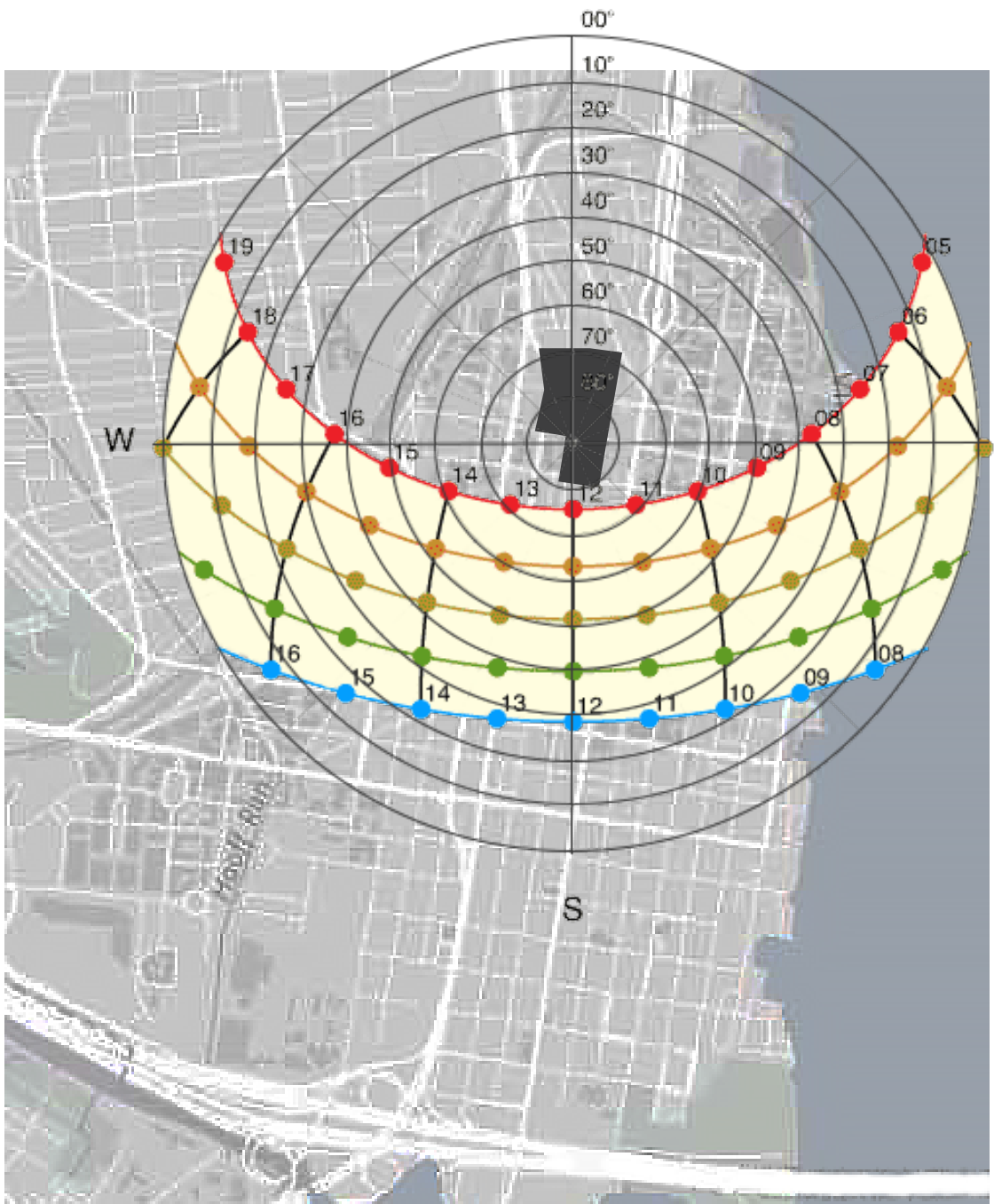
WIND ROSE (ANNUAL)  
(meteoblue)



38°N

N

SOLAR PATH DIAGRAM  
(GEOB 300)





# HOW? THE DESIGN

## DISCOVERY OF HESTIA



### RECTO

the relationship between the wall and the hearth

Through time human management of fire has grown more sophisticated which has allowed for changes in our building techniques to accommodate fire in our houses.

Bottom to Top (plan view, scale doubles in each plan through time as size of fire and heat radius also changes)

- GENESIS - fire pit in open air, with earthen retaining wall and wooded surround
- COURTSHIP - medieval hall with open fire pit and smoke venting from hole in the roof (5th-15th centuries)
- RESOLUTION - chimney/fireplace, placed against walls (11th or 12th century Northern Europe)
- INTRUDER - fireplace and wall become one, fireplace venting improvements by Benjamin Franklin (1741, convection chamber from basement to roof) & Count Rumford (1796, tall shallow firebox) (18th century)
- ALTERNATE RESOLUTION - modern condition - No fire - radiant heating or HVAC (Heating, Ventilation & Air Conditioning) system outside the wall in ductwork - Nikolay Lvov (1793, heat exchange ductwork furnace) (19th century to present).



### VERSO

Transformation of  
HESTIA|VESTA

greek|roman

goddess of "hearth" or "fireside"

virgin goddess of hearth, architecture,  
right ordering of domesticity and community  
(the family, the home, the state)

an accidental or negligent extinction  
of a fire was equal to:

failure of domestic and religious care for the family  
(in the domestic sphere)

breach of duty to the broad community  
(in a public sphere)

Today fire is no longer a physical requirement in of  
our homes (although in many cases, she remains  
as a symbolic gesture in a fireplace that is a central  
gathering place for family occasions).

Where has HESTIA gone?

What is the new center of family life in the home?



## MODERN DAY HESTIA

WHERE DOES HESTIA (HEART OF THE HOME)  
EXIST IN OUR MODERN DAY HOUSES?

-ANSWER: Each family creates Hestia in their own way,  
As a design tool, I imagined 5 families,  
each with a different focus or central essence at their core



LIBRARY | STUDY - **HAKIM**  
(Muslim for learned scholar, wise)



KITCHEN - **KOCH**  
(German & Jewish for to cook & to love)



GARDEN - **CROFTON**  
(English for vegetable garden)



MEDIA | TV ROOM - **ALMANZAR**  
(Spanish for lookout point, watchtower)



FIREPLACE | HEARTH - **HAYES**  
(Irish for fire, enclosure, life)

NOTE: I have used the idea of "HESTIA" as a design tool to explore different floor plan options and to imagine different family scenarios, rather than trying to make something completely blank and devoid of character. These alternatives for the new "heart of the home" of course do not represent the limits of all possible families focus, but rather potential options. I also recognize, no matter the design intent, once a family takes possession of a house, it becomes their home to make their own, and they have every right (and rightly so) to do so.



# FIVE CHARACTERS OF HESTIA IN ONE HOUSE

MODEL PHOTOS

TAYLOR IN THE GARDEN





TAYLOR IN THE LIBRARY



TAYLOR BY THE FIRESIDE



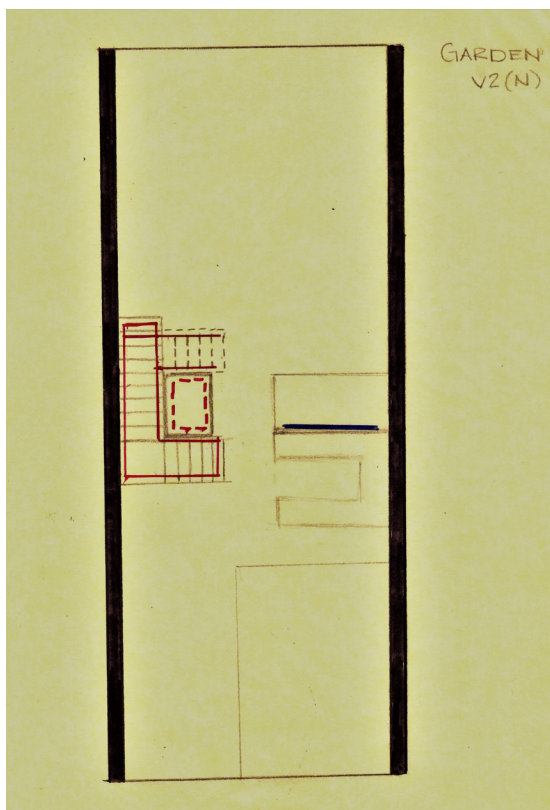
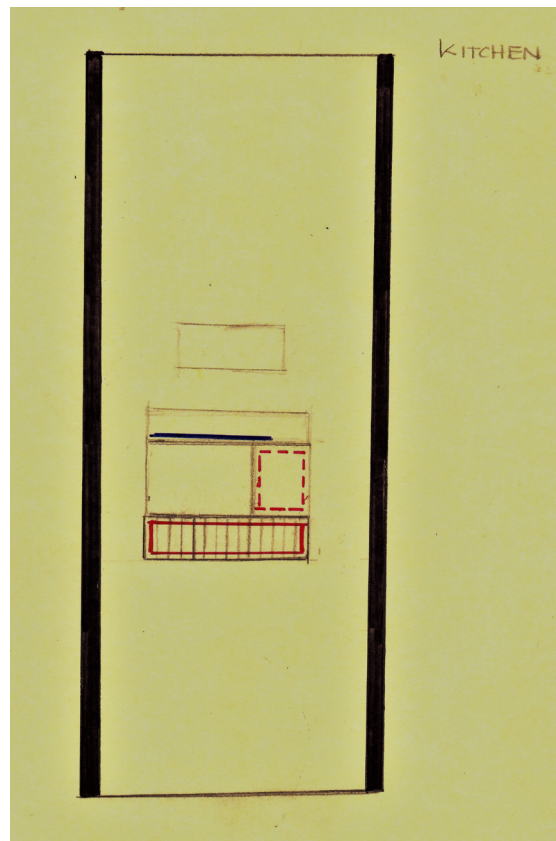
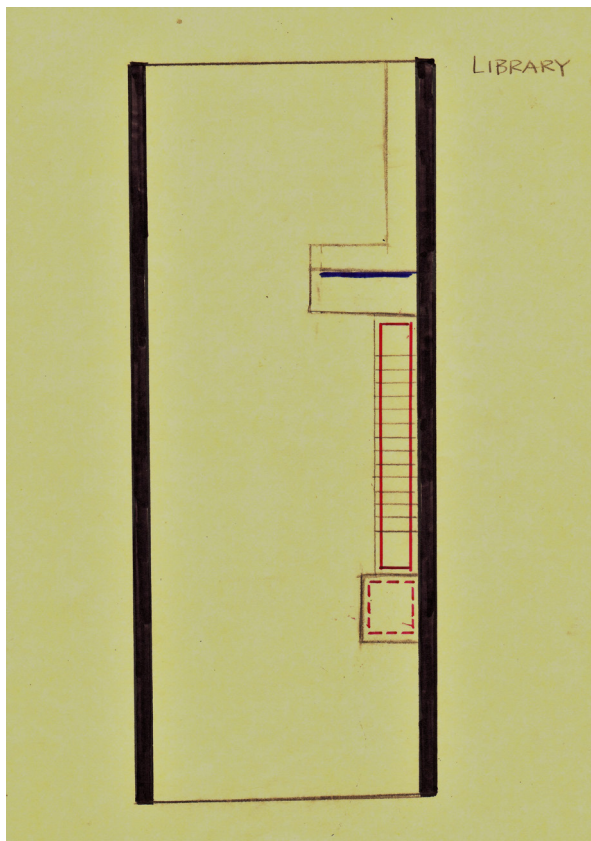
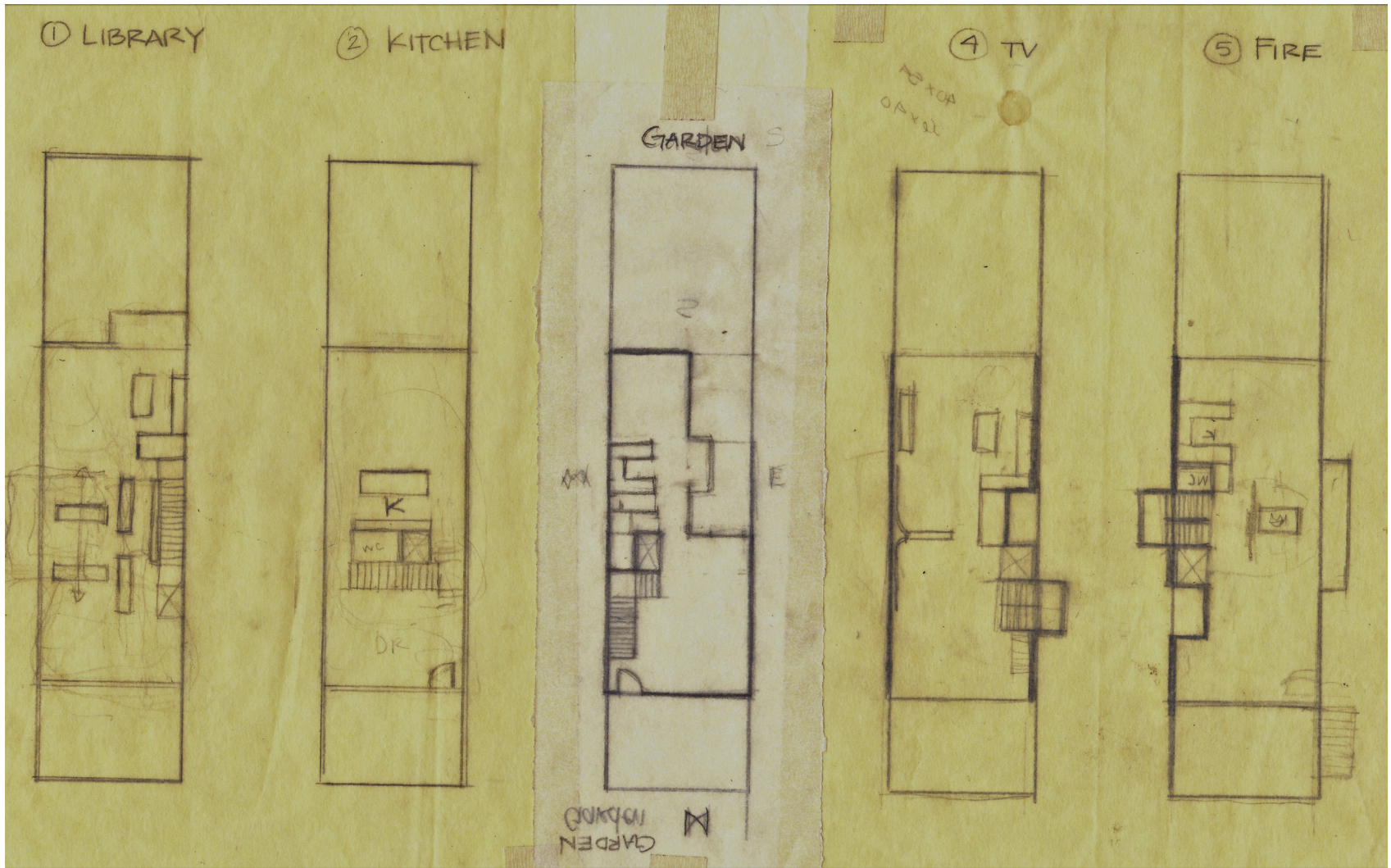
TAYLOR IN THE KITCHEN  
(& ON THE STAIRS)



TAYLOR IN THE MEDIA ROOM  
(WITH THE TOY ICE CREAM TRUCK)



# ROW HOUSE - INITIAL SKETCHES





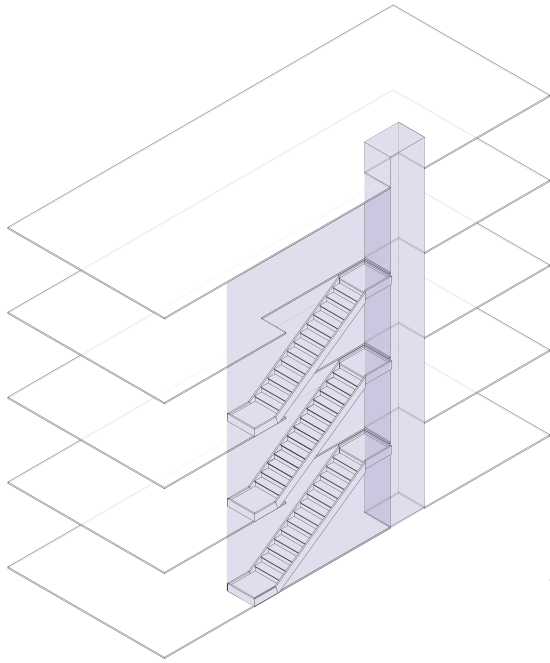
# FINAL DESIGN

## ROW HOUSE

Exploring strengths and limitations of the row house

- CIRCULATION - Location and orientation of the staircase greatly affects the flexibility in dividing up space

\*NOTE: In all designs I included a potential “future” elevator shaft space (currently as a closet or some other use) to allow for aging in place as the main goal of my thesis is to address the ever changing family life cycle. Additionally, all units have at least one level (lower level in the back) that provides direct access to the ground without the use of stairs.

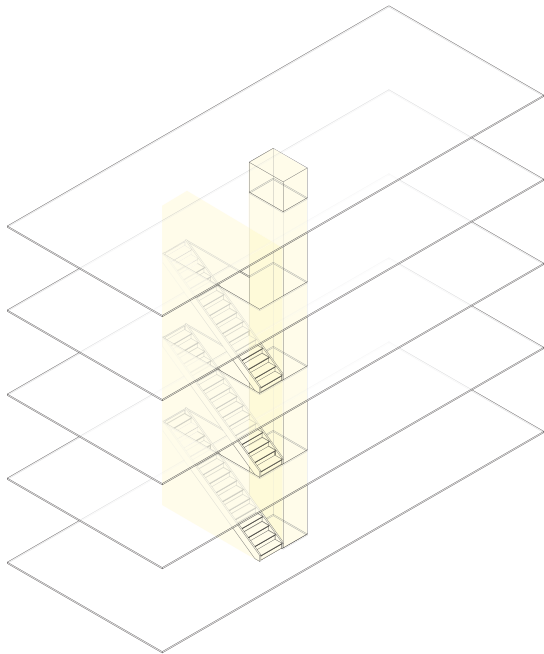


### PARALLEL STAIR

when placed at one side

allows greatest versatility/flexibility for dividing up and modifying space

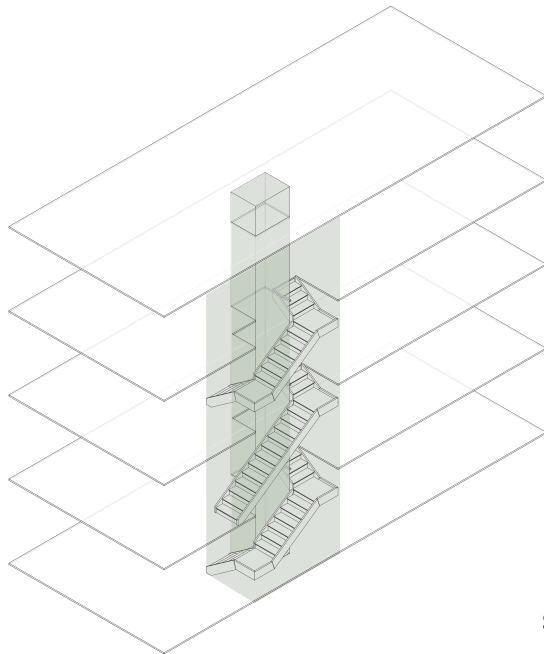
PARALLEL STAIR



### PERPENDICULAR STAIR

creates most challenging circumstances for dividing the house into separate units

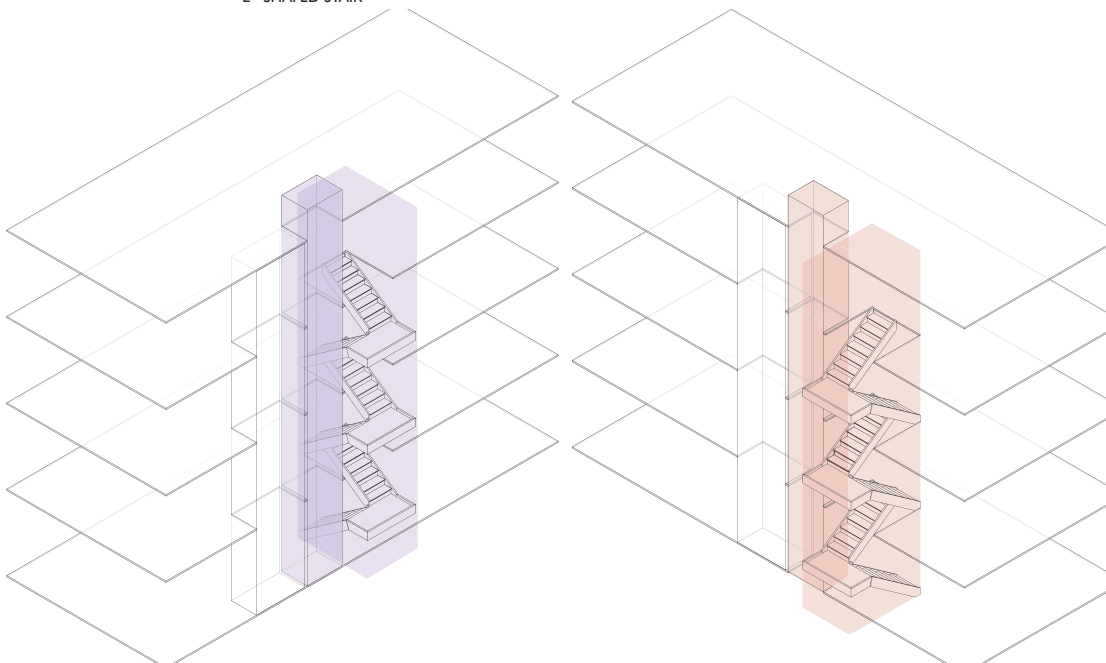
PERPENDICULAR STAIR



### L-SHAPED STAIR

similar to parallel stair, but leaves slightly less open space on all floors

L - SHAPED STAIR



### INNER-LOCKED U-SHAPED STAIR

takes up less horizontal floor space than an L-shaped stair, and less hallway space than a parallel stair, but requires two units lock together, limiting versatility

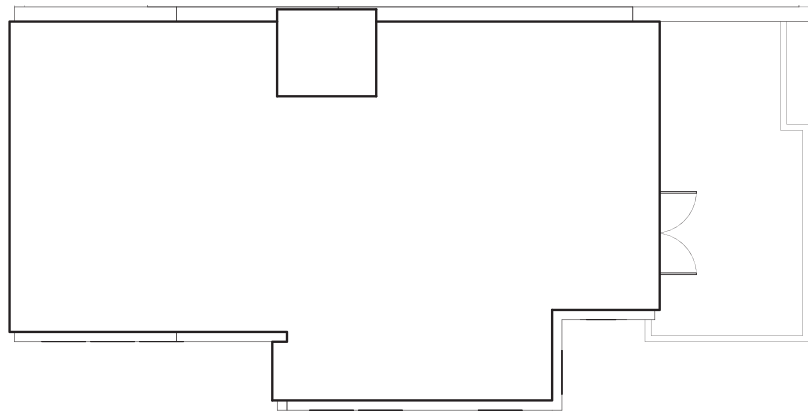
U - SHAPED STAIR (1)

I - SHAPED STAIR (2)

# FLOOR PLANS

**HAKIM - LIBRARY | STUDY**  
(area highlighted in BLUE is space dedicated to essence of the home)

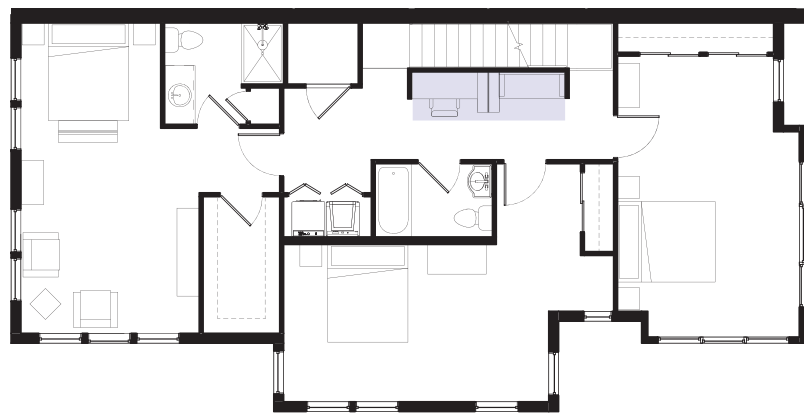
ROOF



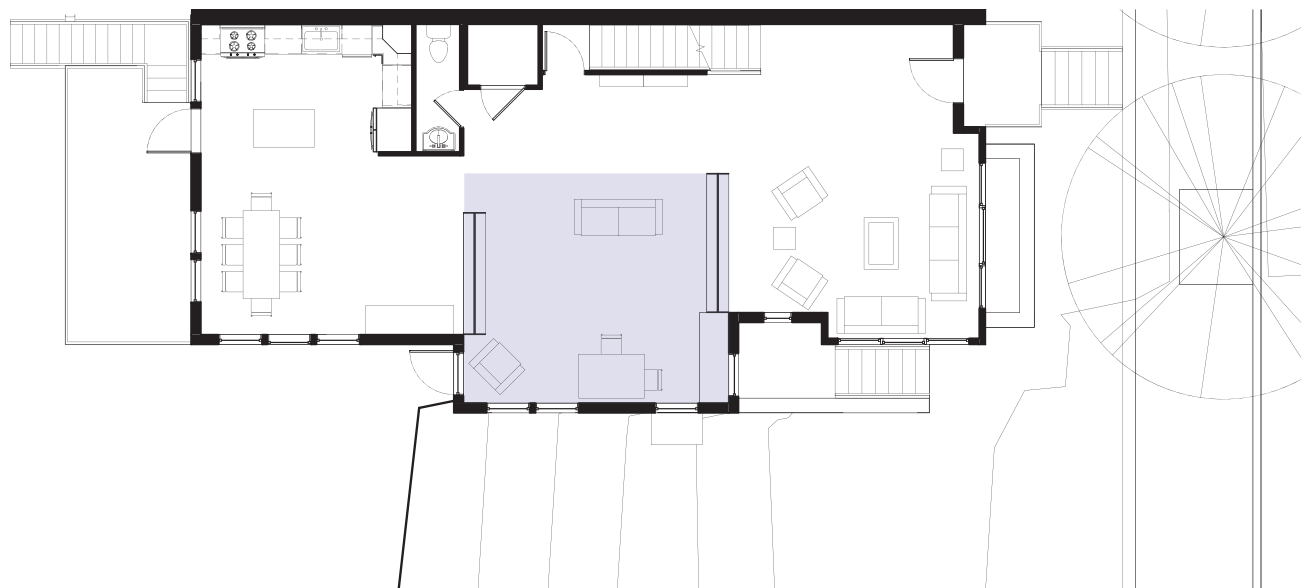
3RD LEVEL



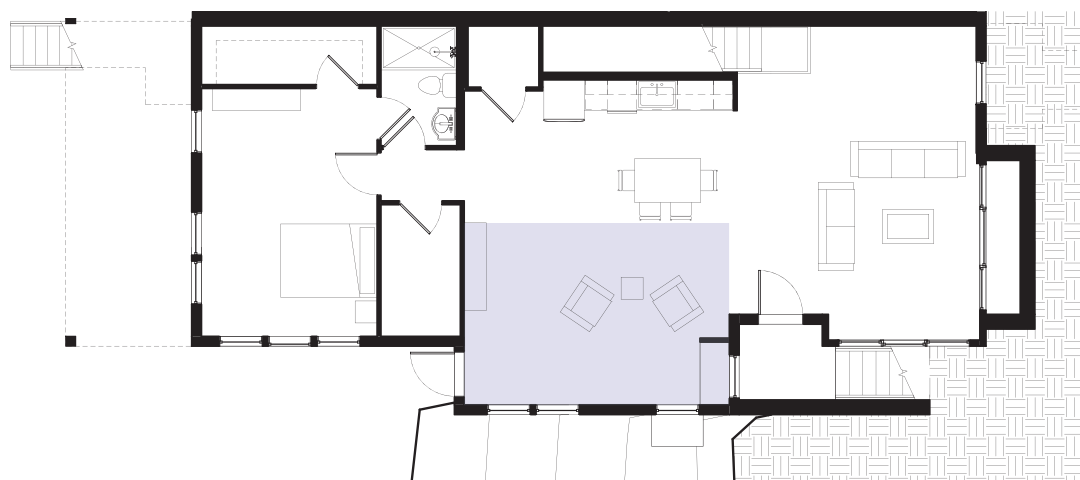
2ND LEVEL



1ST LEVEL



LOWER LEVEL





**SECTIONS**  
**HAKIM - LIBRARY | STUDY**



① SECTION - 1 - LIBRARY  
0 5' 10' 25'



② SECTION - 1 - LIBRARY (STAIR)  
0 5' 10' 25'

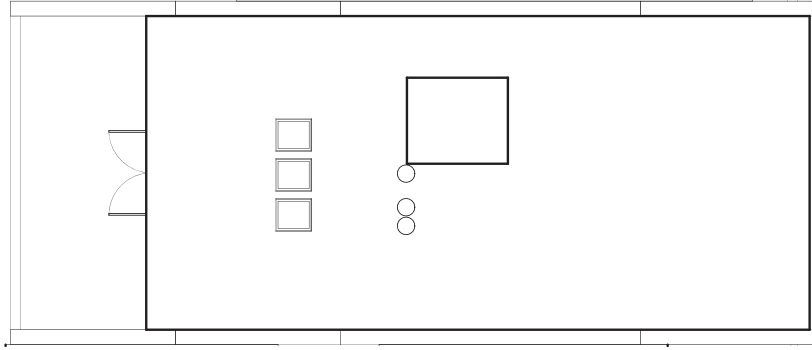
# FLOOR PLANS

## KOCH - KITCHEN

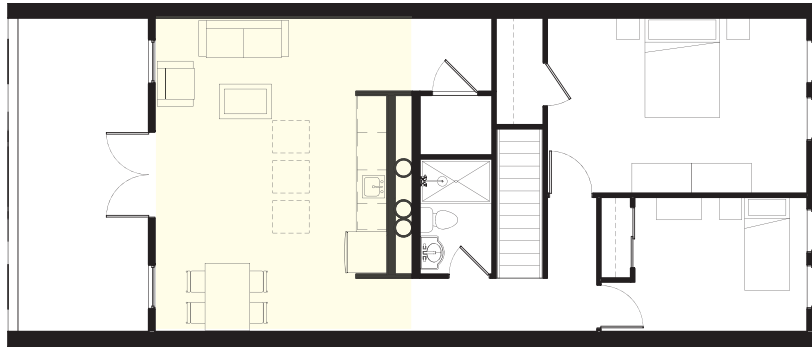
(area highlighted in YELLOW is space dedicated to essence of the home)

NOTE: this unit has solar tube to bring natural light to each level as the stairway limits penetration of light from windows

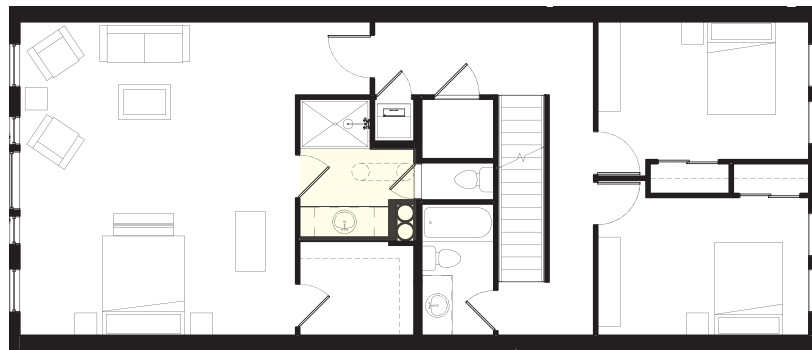
ROOF



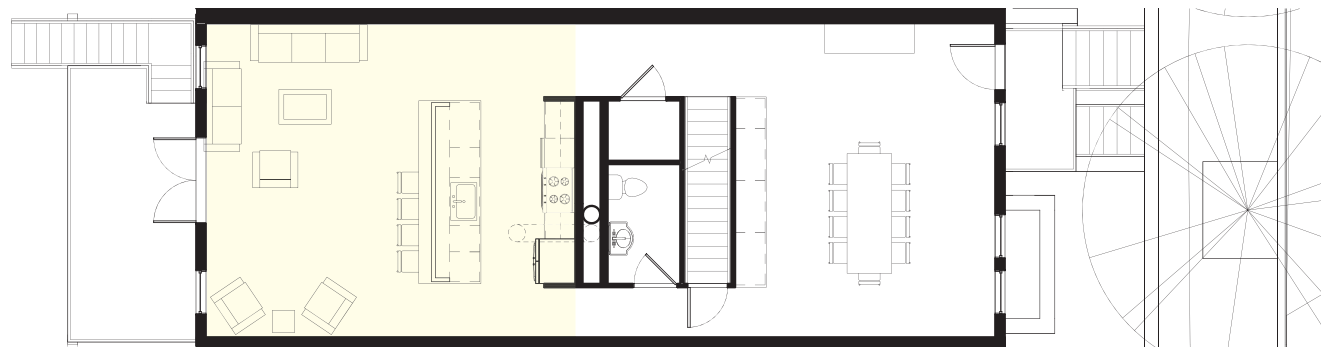
3RD LEVEL



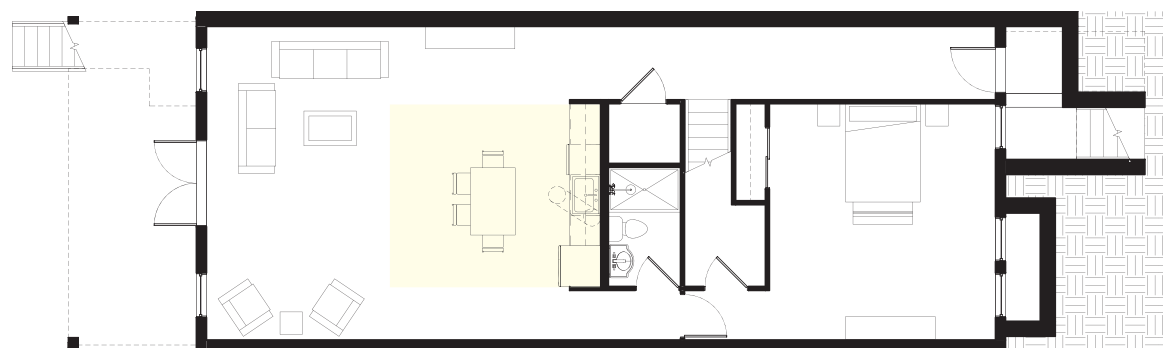
2ND LEVEL



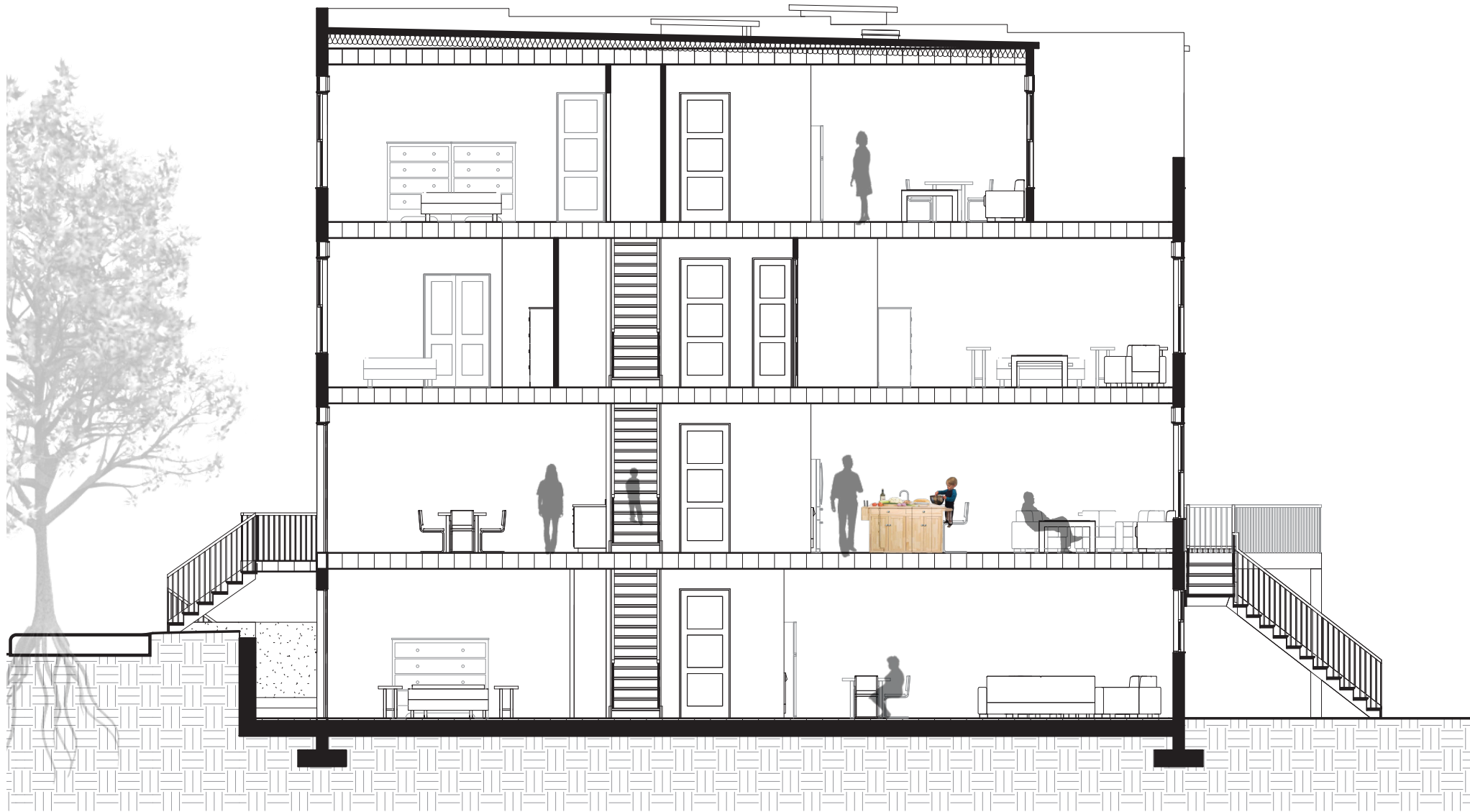
1ST LEVEL



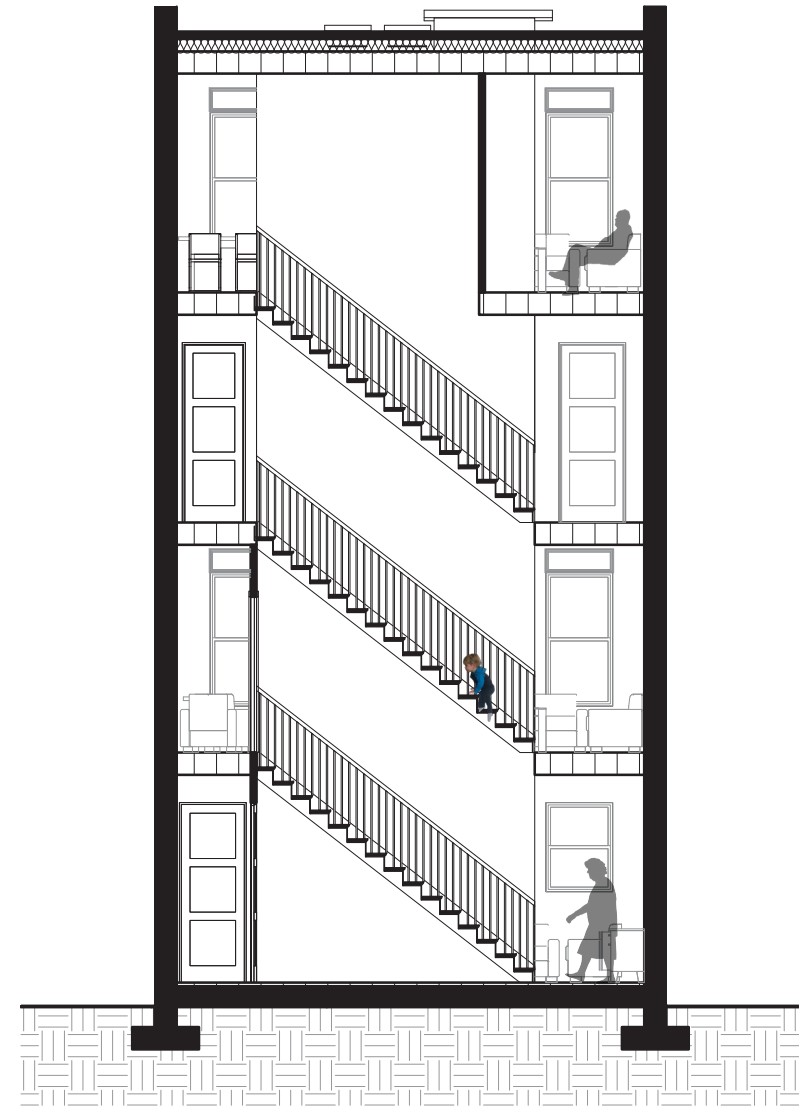
LOWER LEVEL



**SECTIONS**  
**KOCH - KITCHEN**



① SECTION - 2 - KITCHEN



② SECTION - 2 - KITCHEN (STAIR)

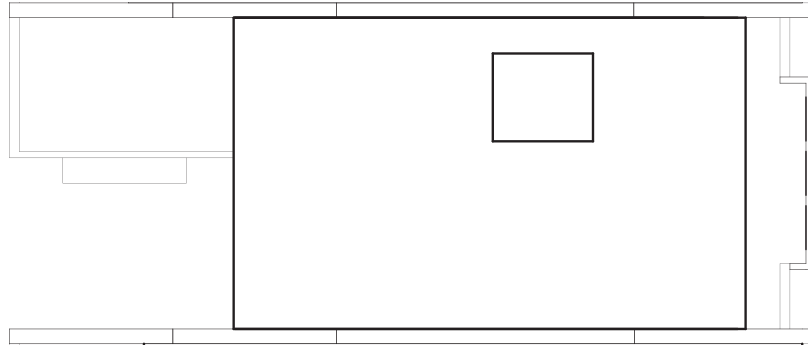


# FLOOR PLANS

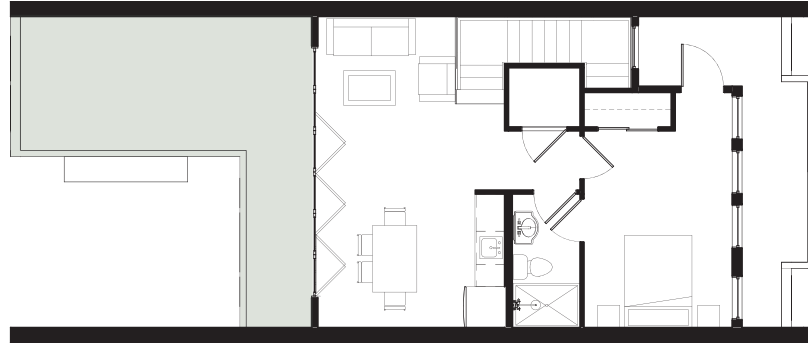
## CROFTON - GARDEN

(area highlighted in GREEN is space dedicated to essence of the home)

ROOF



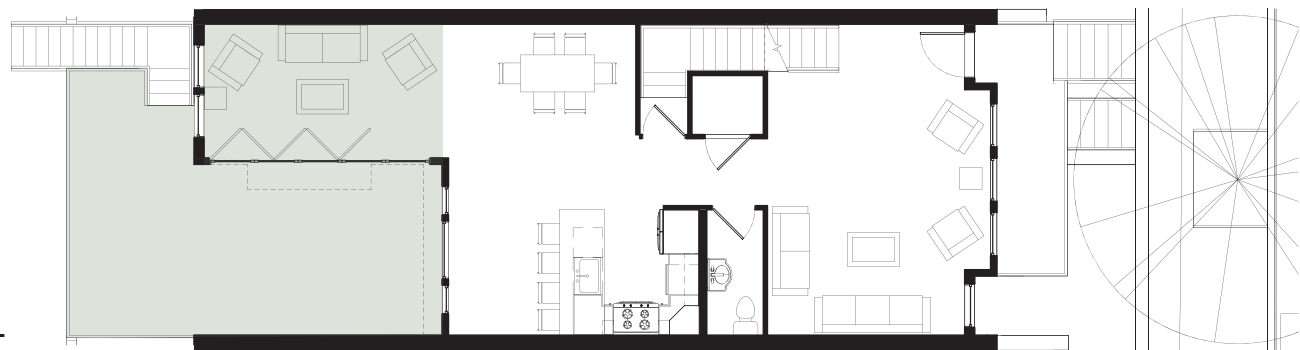
3RD LEVEL



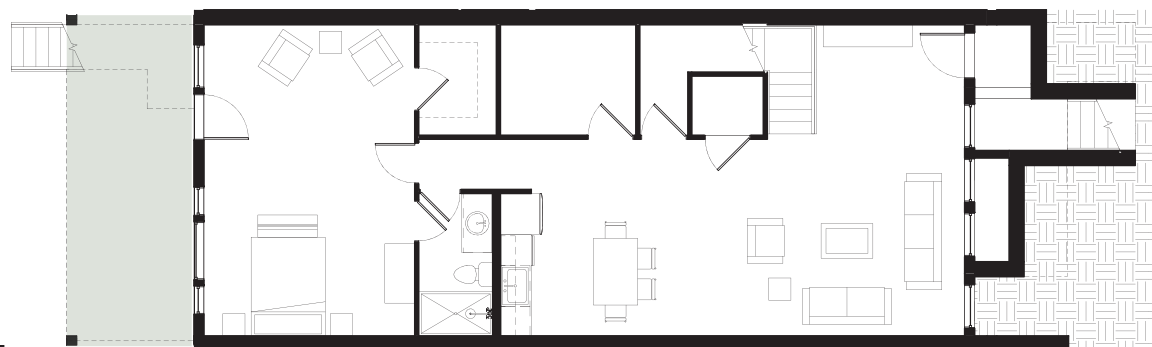
2ND LEVEL



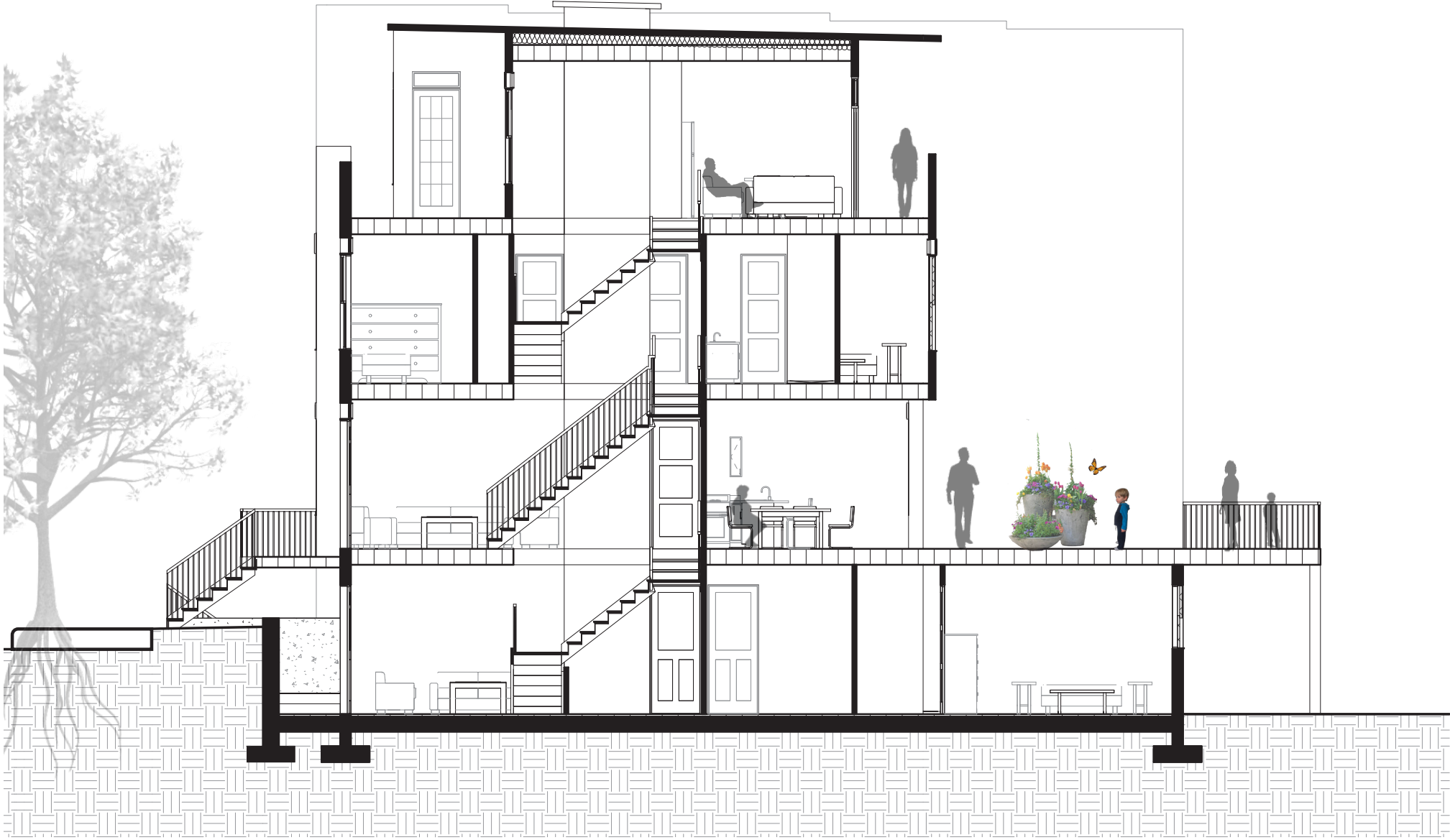
1ST LEVEL



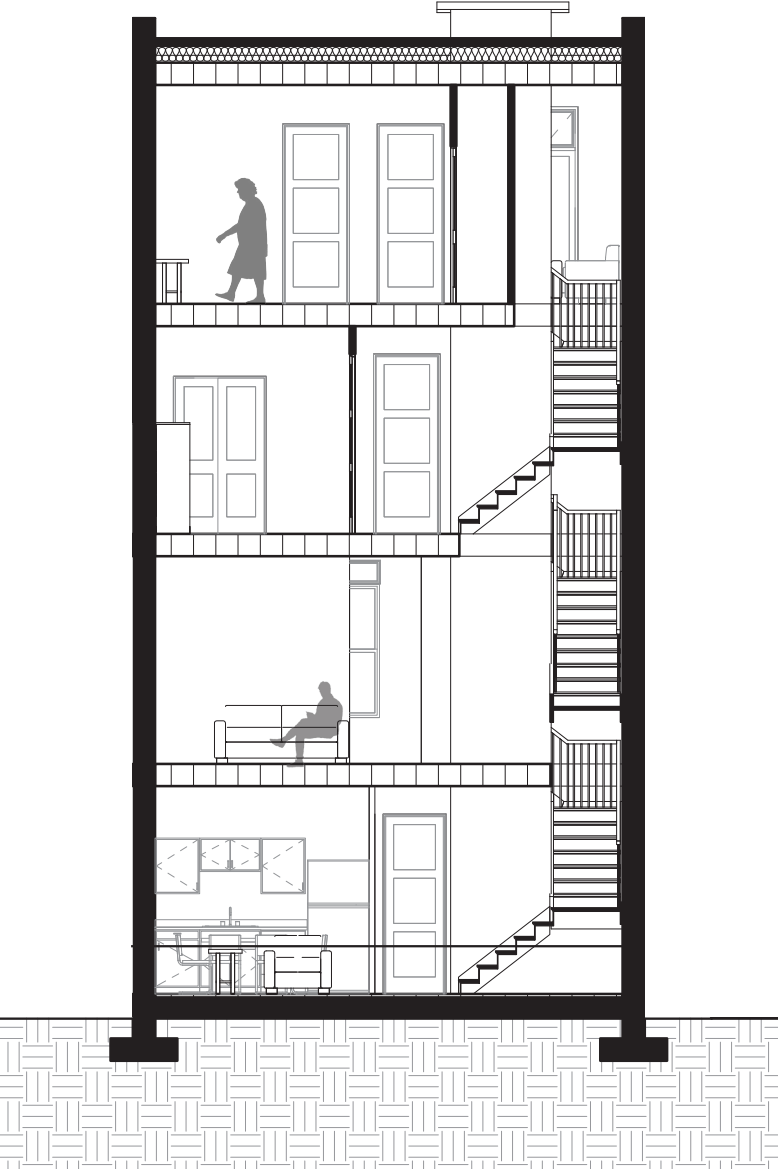
LOWER LEVEL



**SECTIONS**  
**CROFTON - GARDEN**



① SECTION - 3 - GARDEN  
0 5' 10' 25'

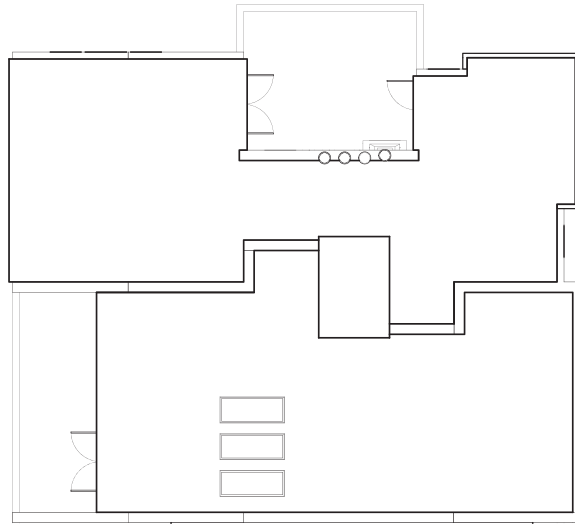


② SECTION - 3 - GARDEN (STAIR)  
0 5' 10' 25'

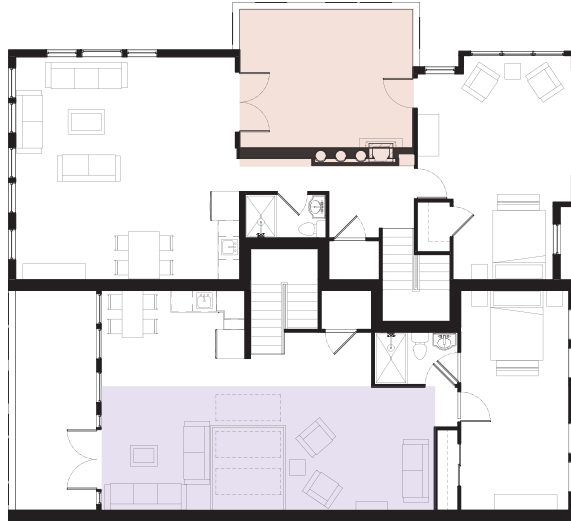
# FLOOR PLANS

**ALMANZAR - MEDIA | TV**  
(BOTTOM UNIT PLANS)  
(area highlighted in PURPLE is space dedicated to essence of the home)

ROOF



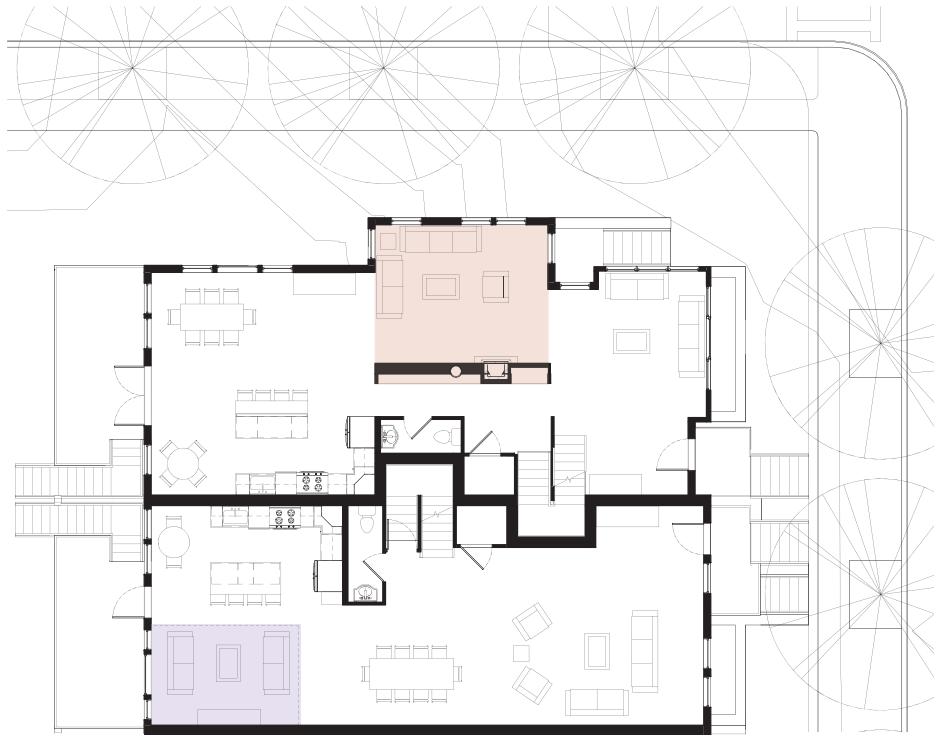
3RD LEVEL



2ND LEVEL



1ST LEVEL



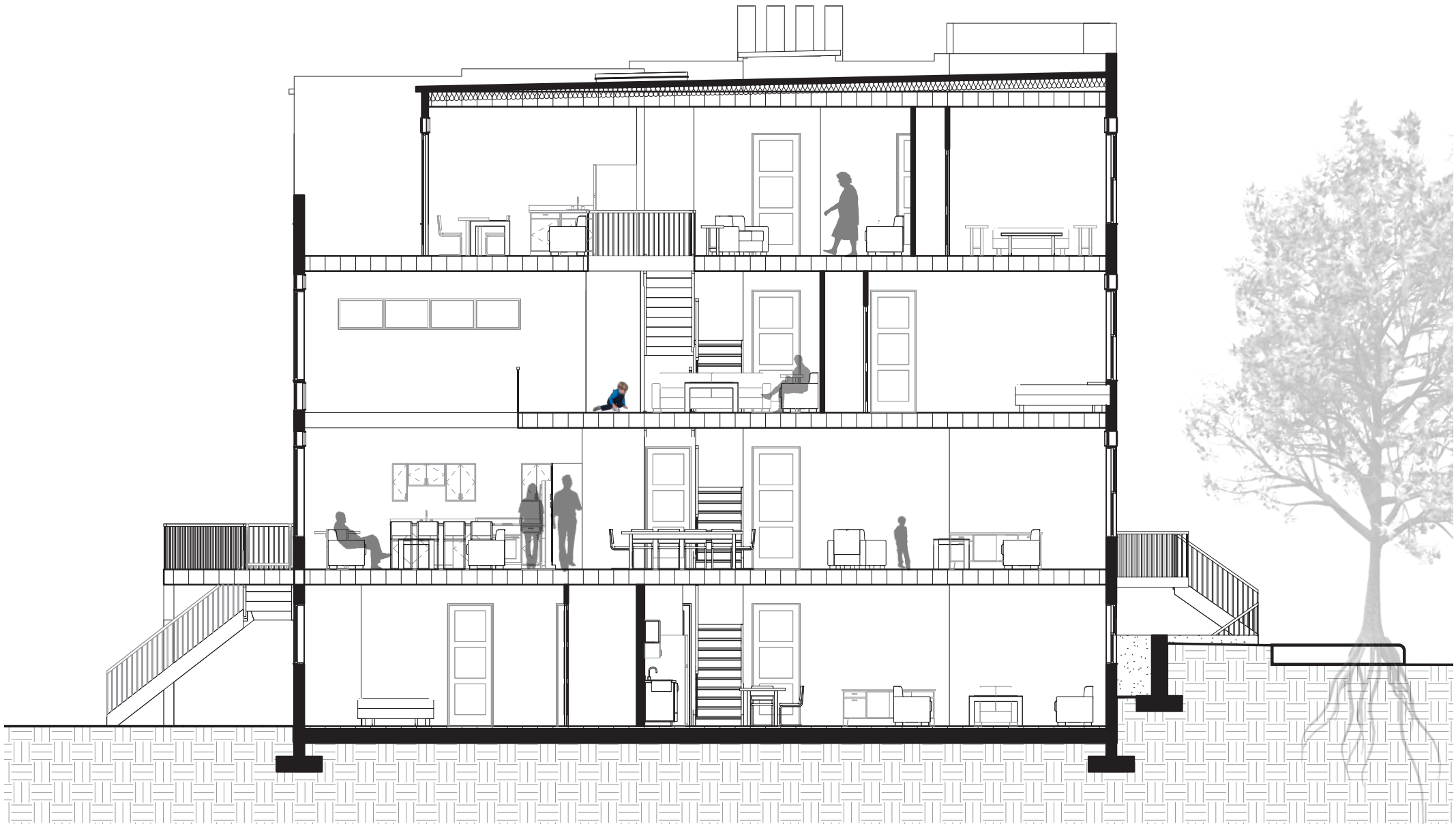
LOWER LEVEL



**SECTIONS**  
**ALMANZAR - MEDIA | TV**



② SECTION - 4 - TV MEDIA (STAIR)



① SECTION - 4 - TV MEDIA

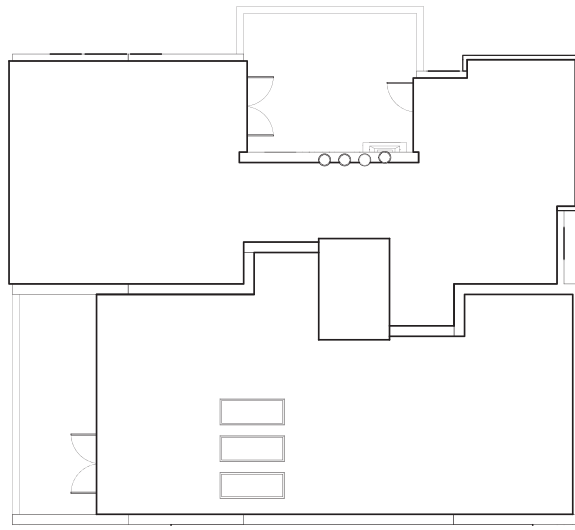


# FLOOR PLANS

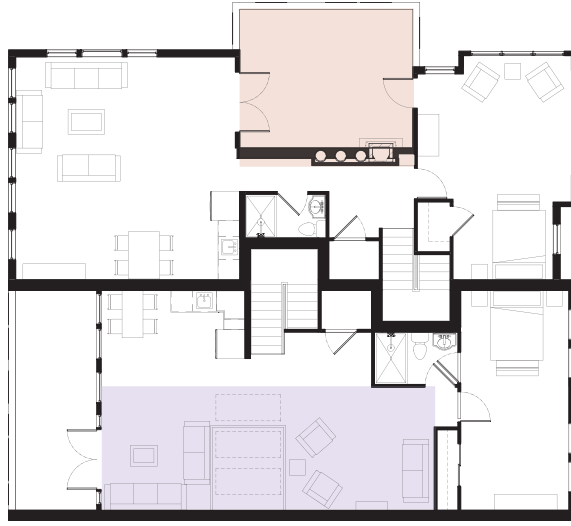
## HAYES - FIREPLACE | HEARTH (TOP UNIT PLANS)

(area highlighted in RED is space  
dedicated to essence of the home)

ROOF



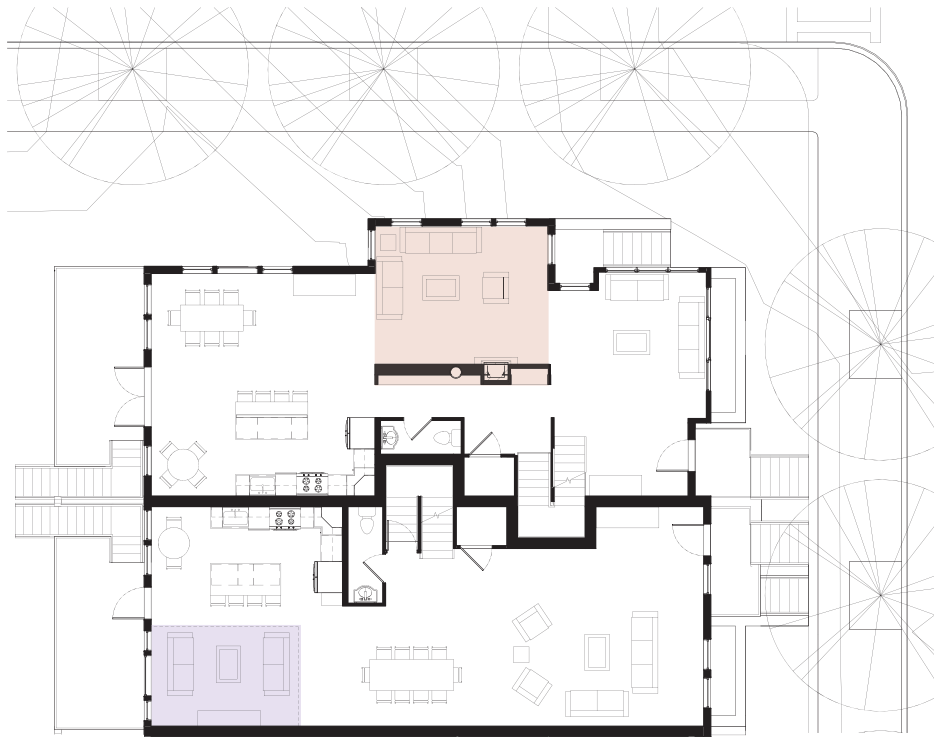
3RD LEVEL



2ND LEVEL



1ST LEVEL

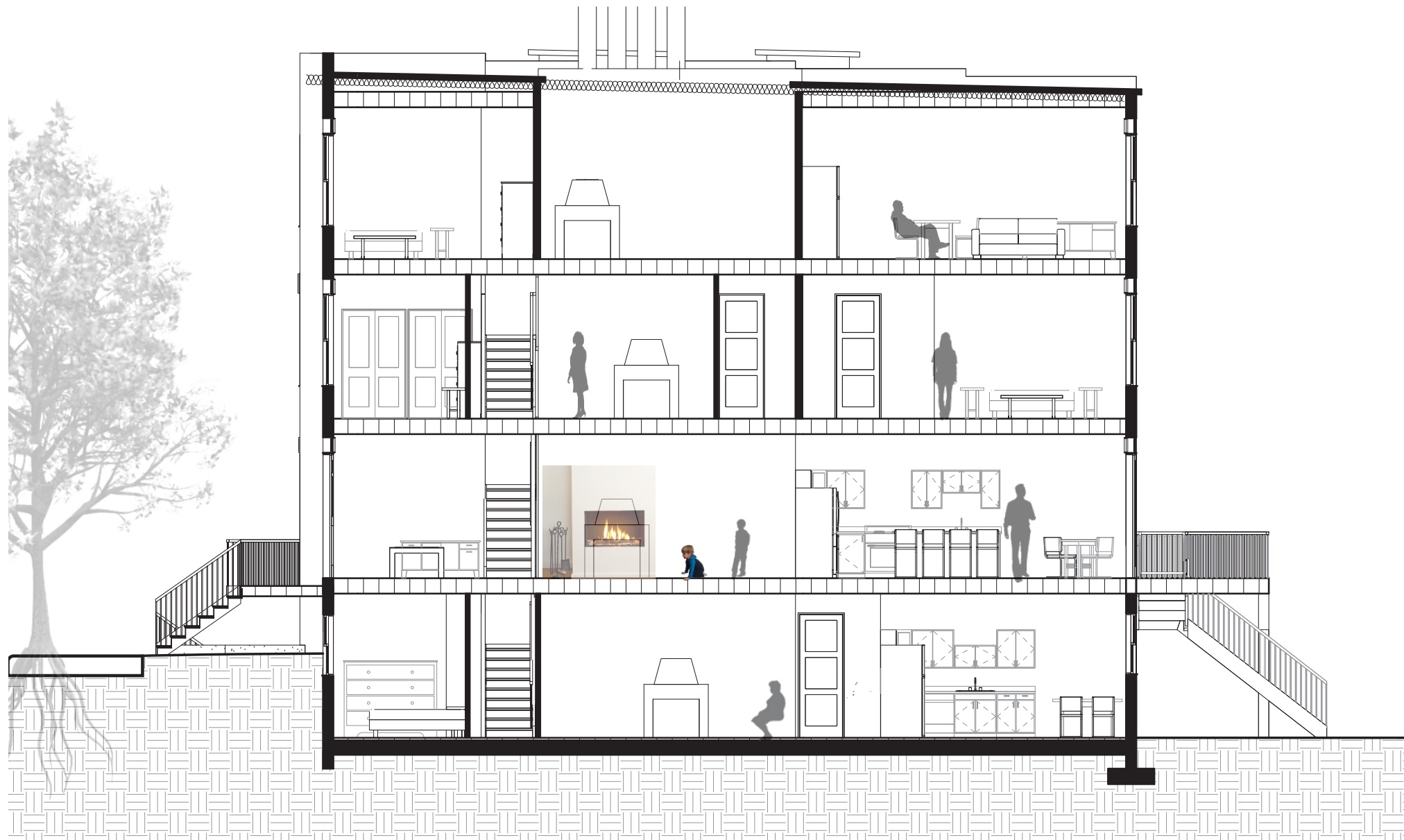


LOWER LEVEL





**SECTIONS**  
**HAYES - FIREPLACE | HEARTH**



① SECTION - 5 - FIRE (2)



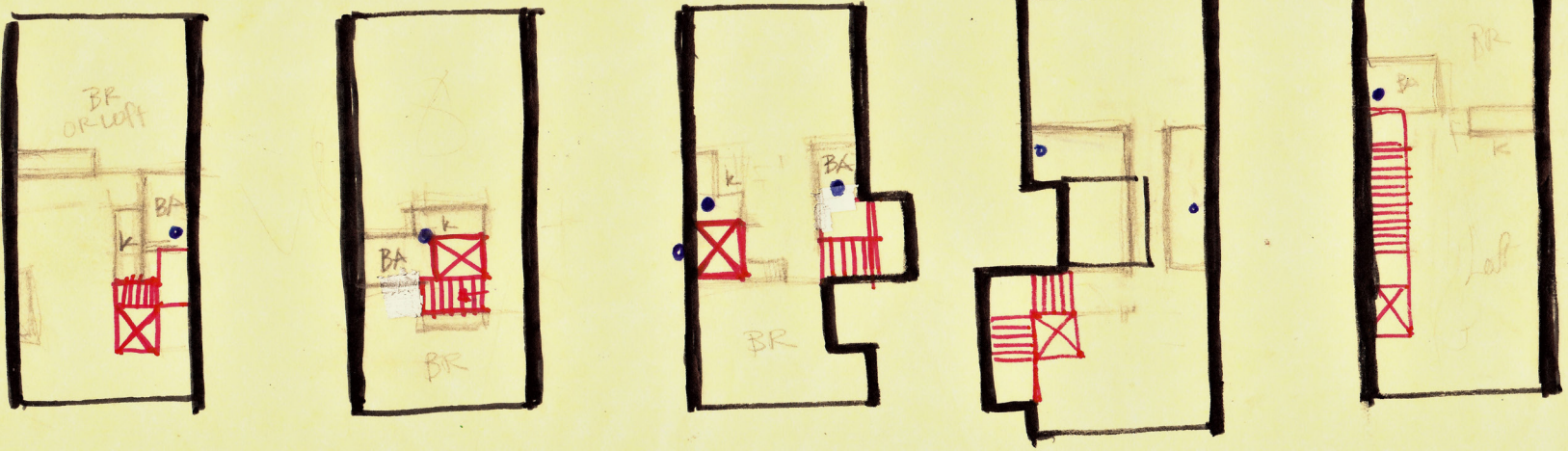
② SECTION - 5 - FIRE (STAIR)



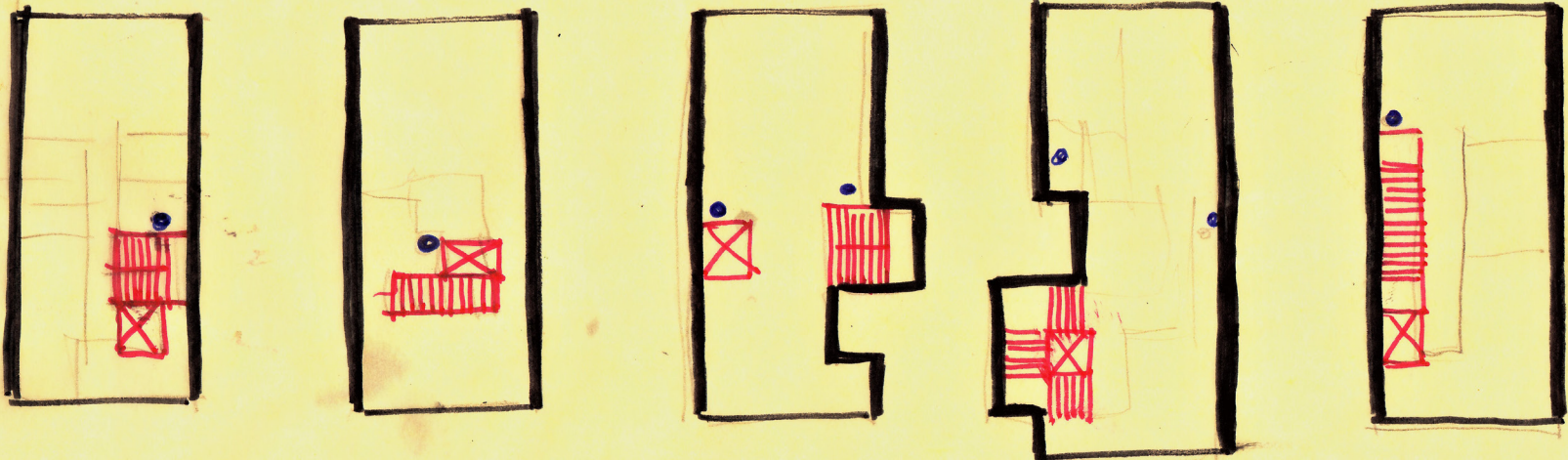


# FLOOR PLAN - INITIAL SKETCHES

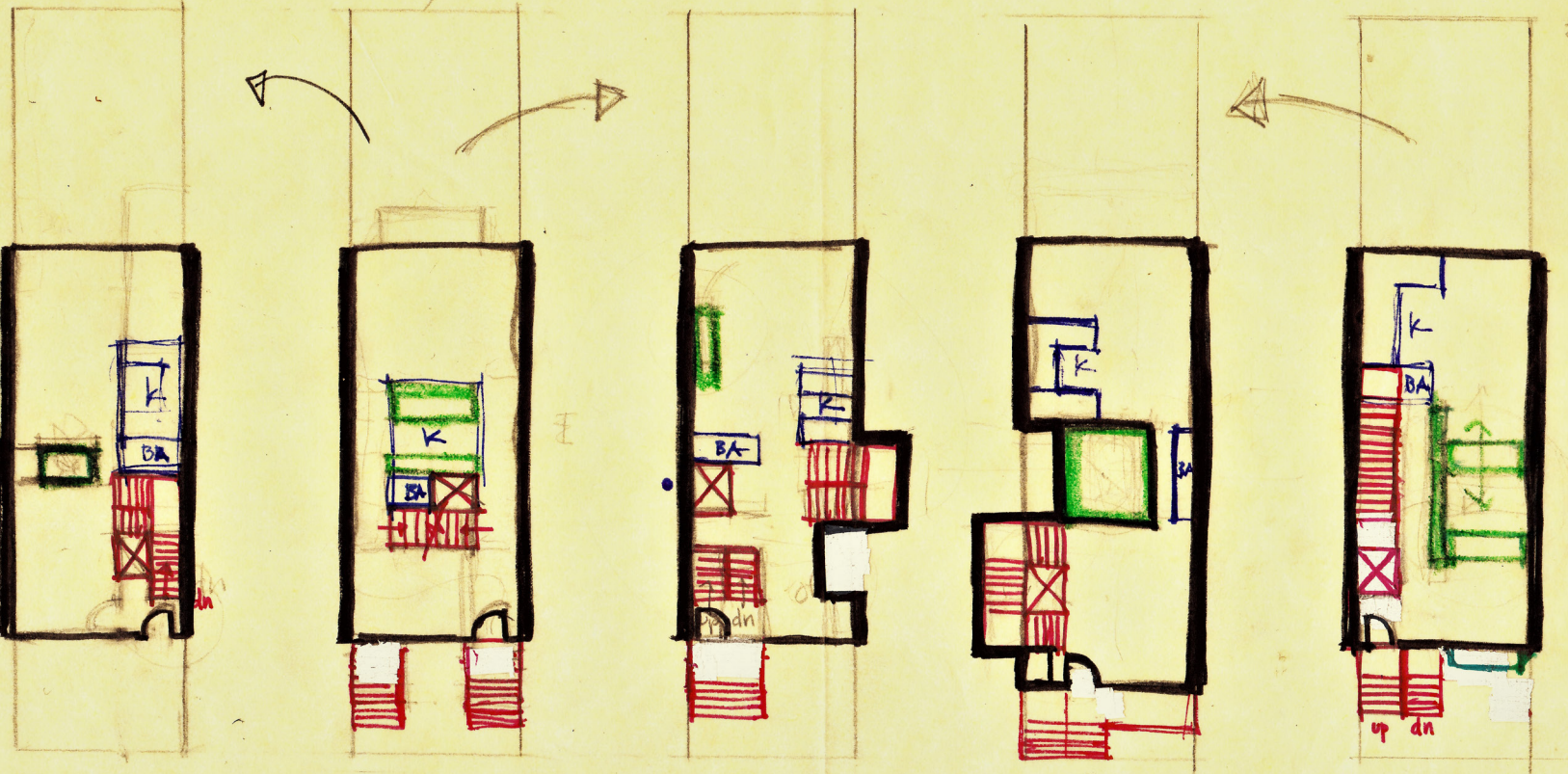
Fast End Unit  
3RD LEVEL



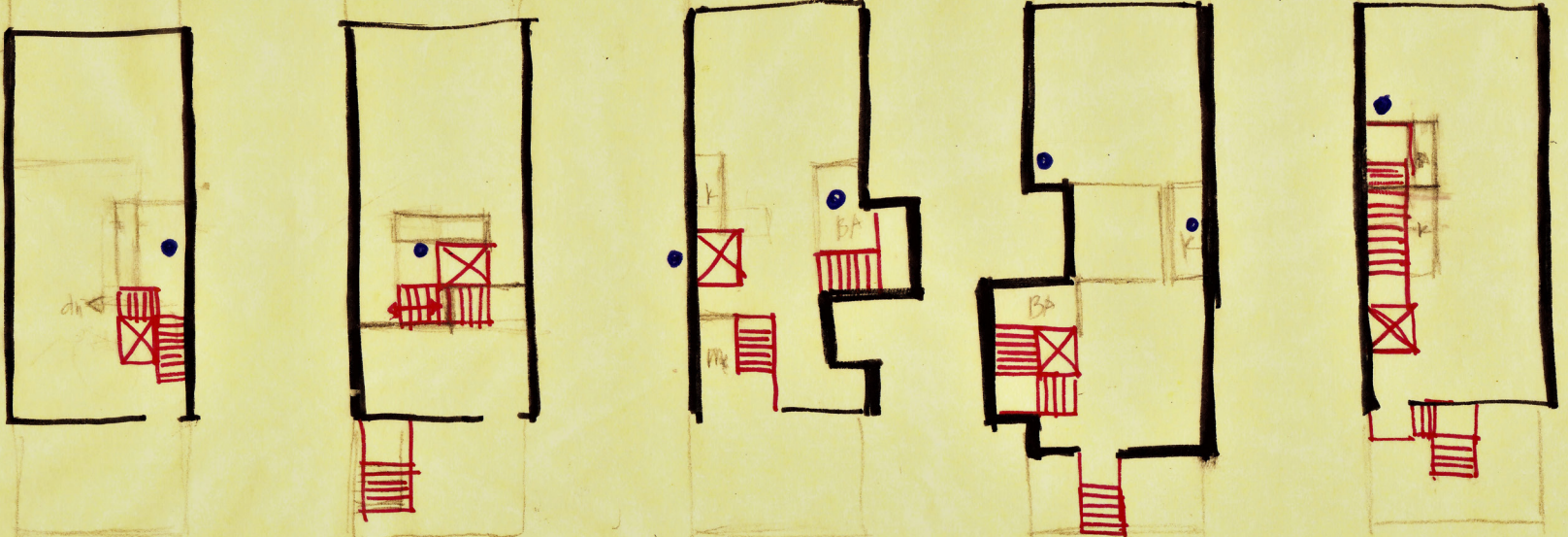
2ND LEVEL



1ST LEVEL



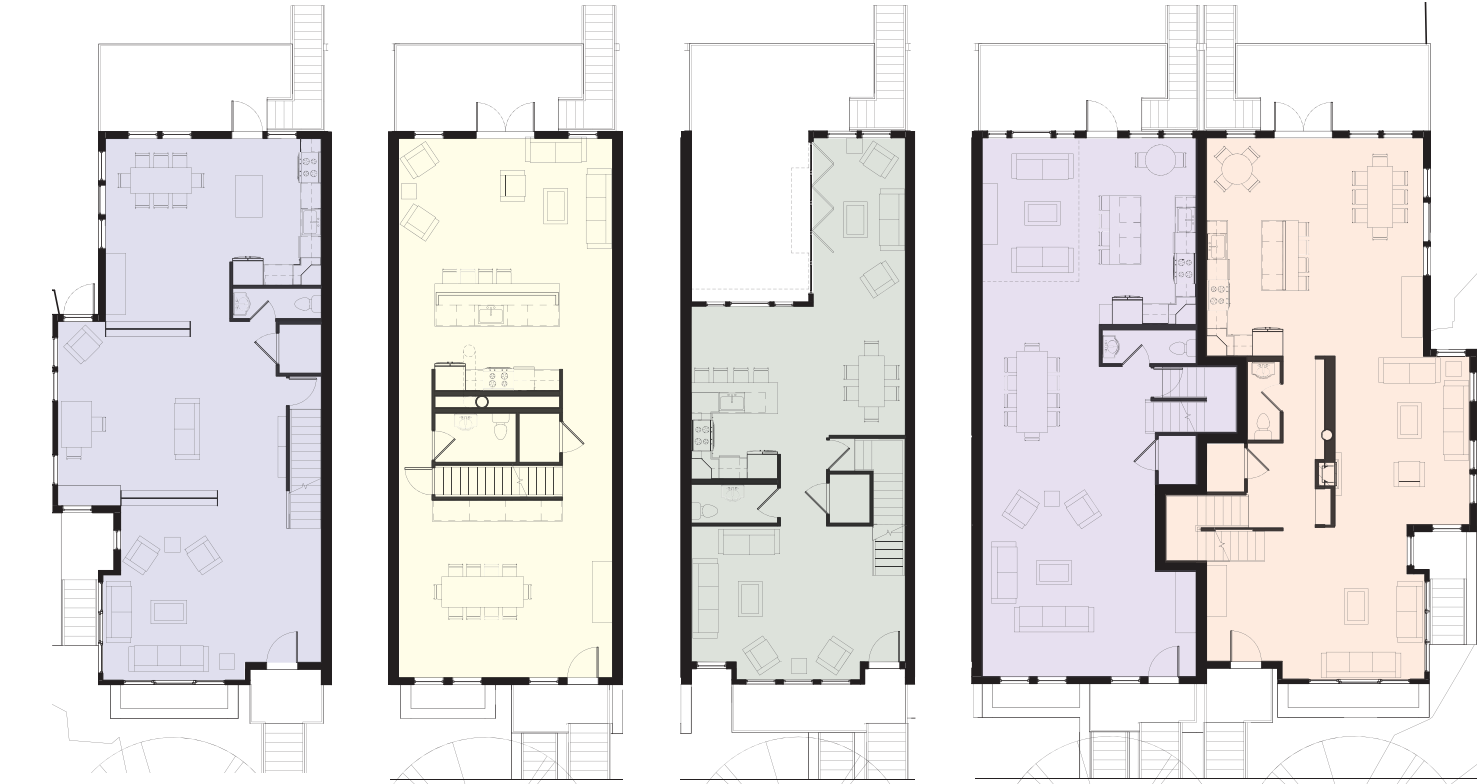
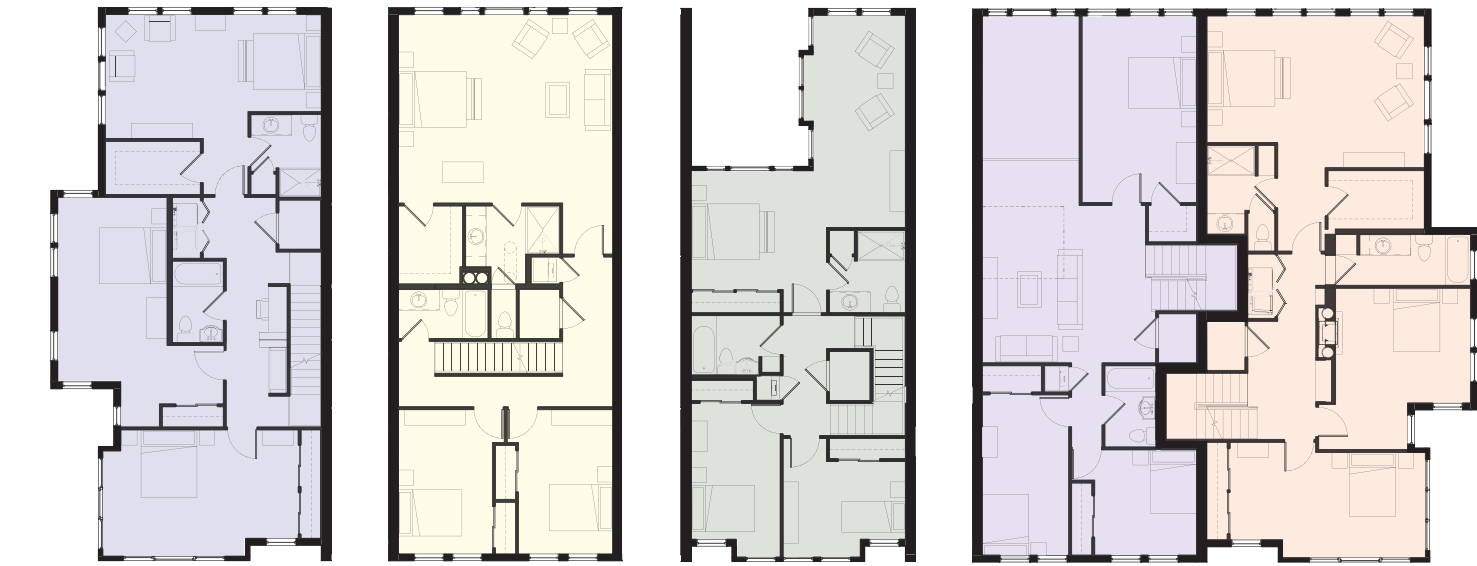
LOWER LEVEL





**FLOOR PLAN EVALUATION**  
**for FAMILY DYNAMICS FLEXIBILITY**  
**1 UNIT HOUSE**

**1 UNIT HOUSE**  
(SINGLE FAMILY HOUSE)



1 UNIT HOUSE w/ ACCESSORY SUITE  
(SINGLE FAMILY HOUSE + ENGLISH BASEMENT)

1 UNIT HOUSE w/ ACCESSORY SUITE

\*variation in shading indicates separate units





**3 UNIT HOUSE**  
(BASEMENT + MAIN 2 LEVEL + PENTHOUSE)



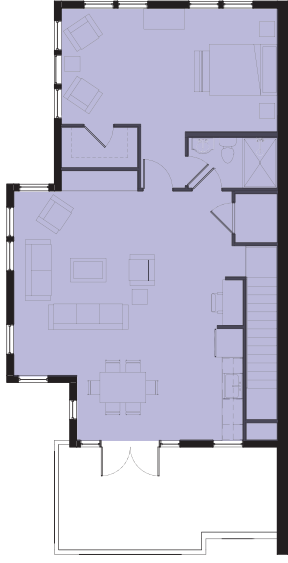
**ADULT CAREGIVER**



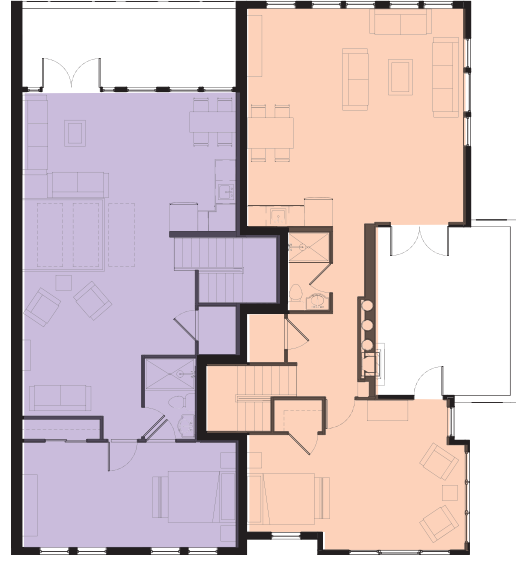
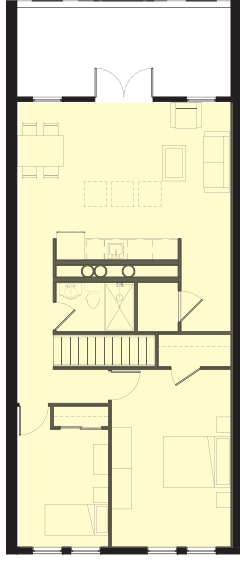
**BOOMERANG**

**3 UNIT HOUSE**

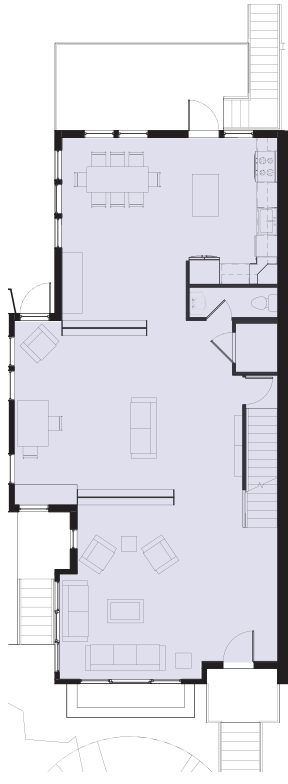
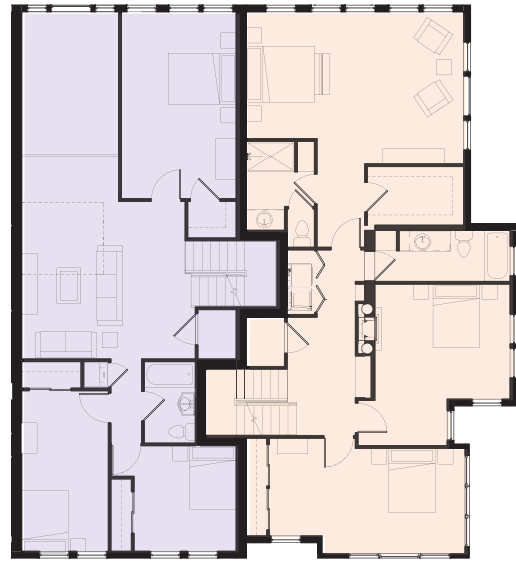
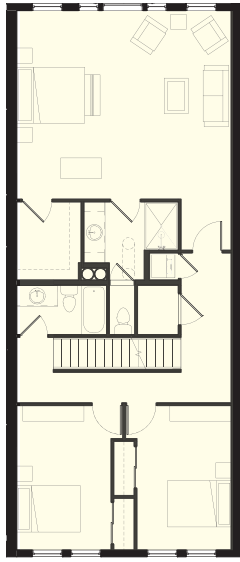
\*variation in shading indicates separate units



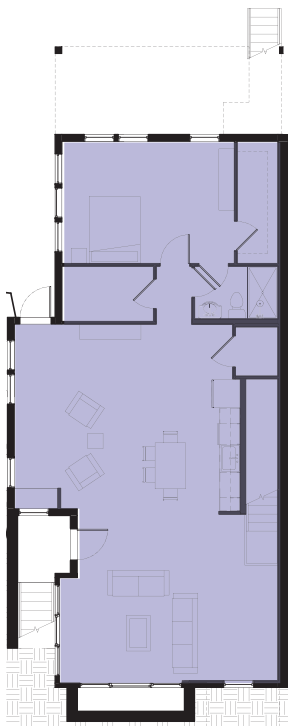
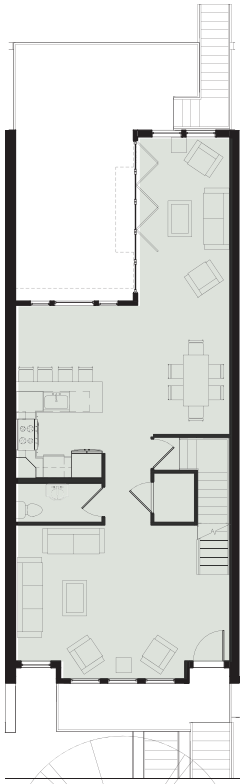
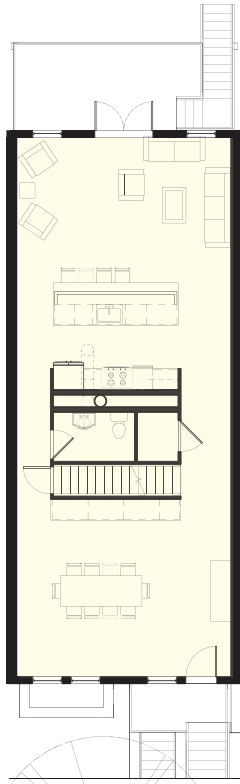
PENTHOUSE SUITE



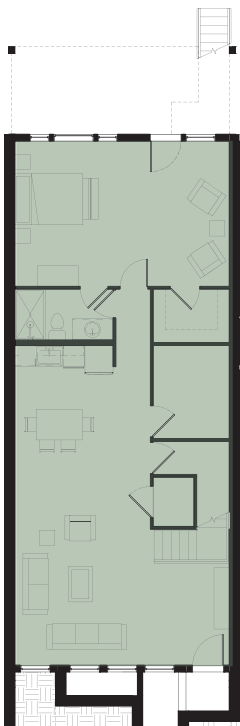
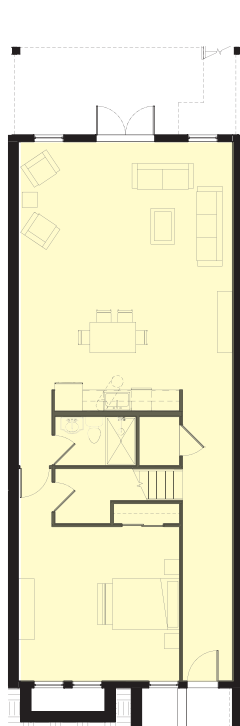
MAIN SUITE - 2ND LEVEL



MAIN SUITE - 1ST LEVEL



GARDEN SUITE



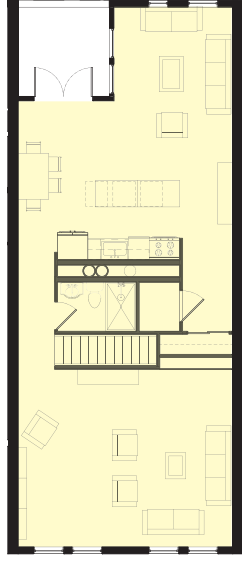
# 2 UNIT HOUSE

\*variation in shading indicates separate units

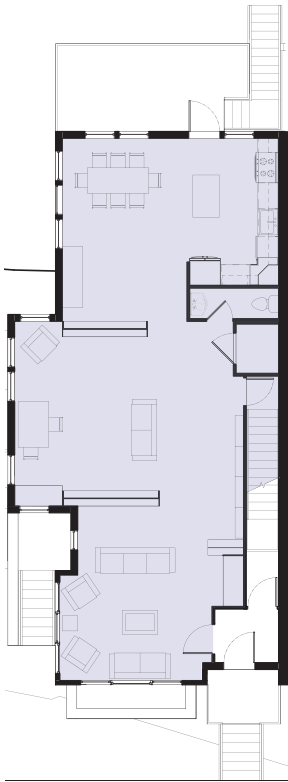
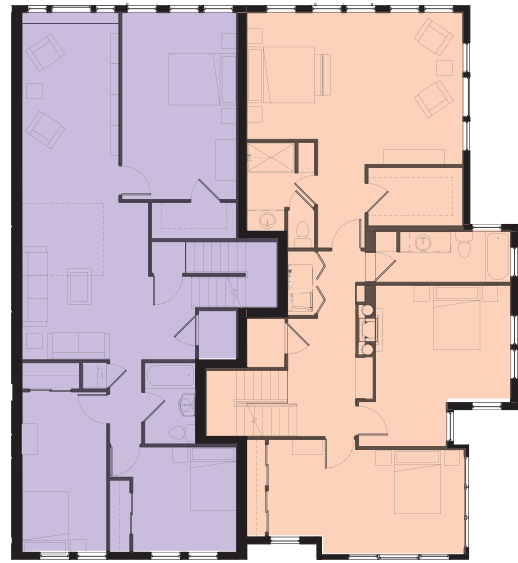
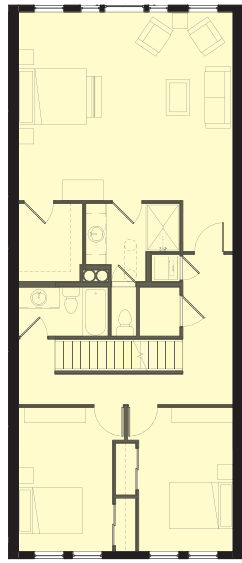
## 2 UNIT HOUSE (DUPLEX)



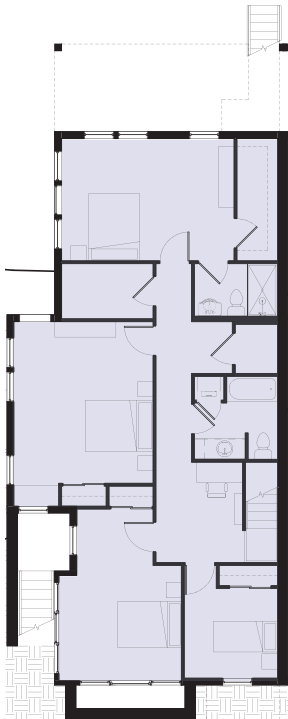
UNIT 2 - 2ND LEVEL



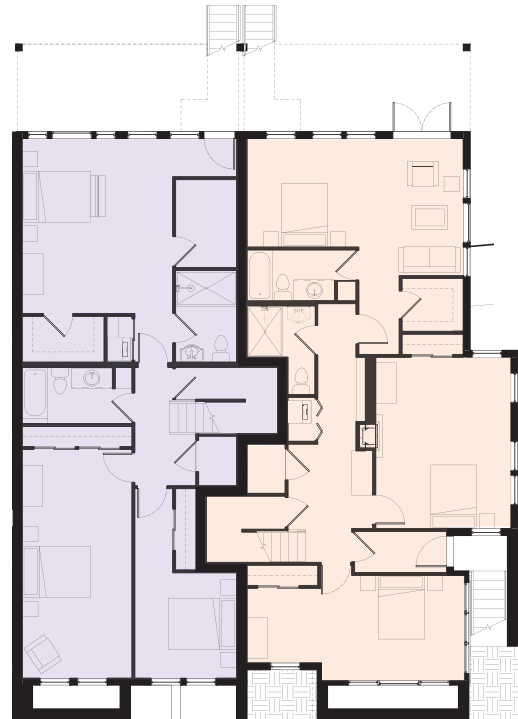
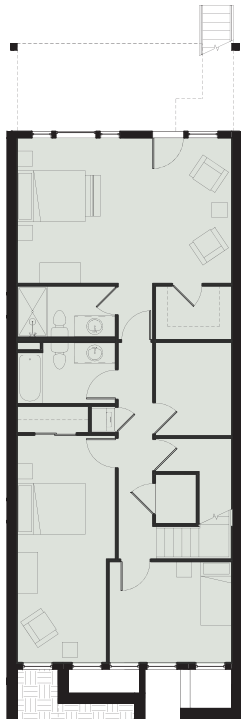
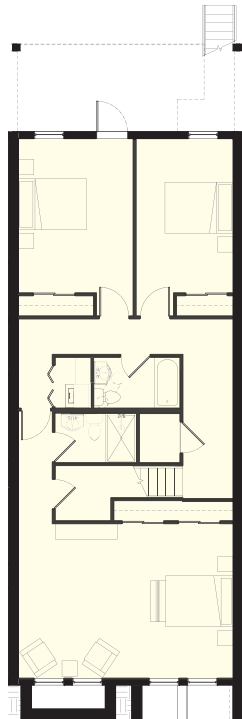
UNIT 2 - 1ST LEVEL



UNIT 1 - 2ND LEVEL



UNIT 1 - 1ST LEVEL

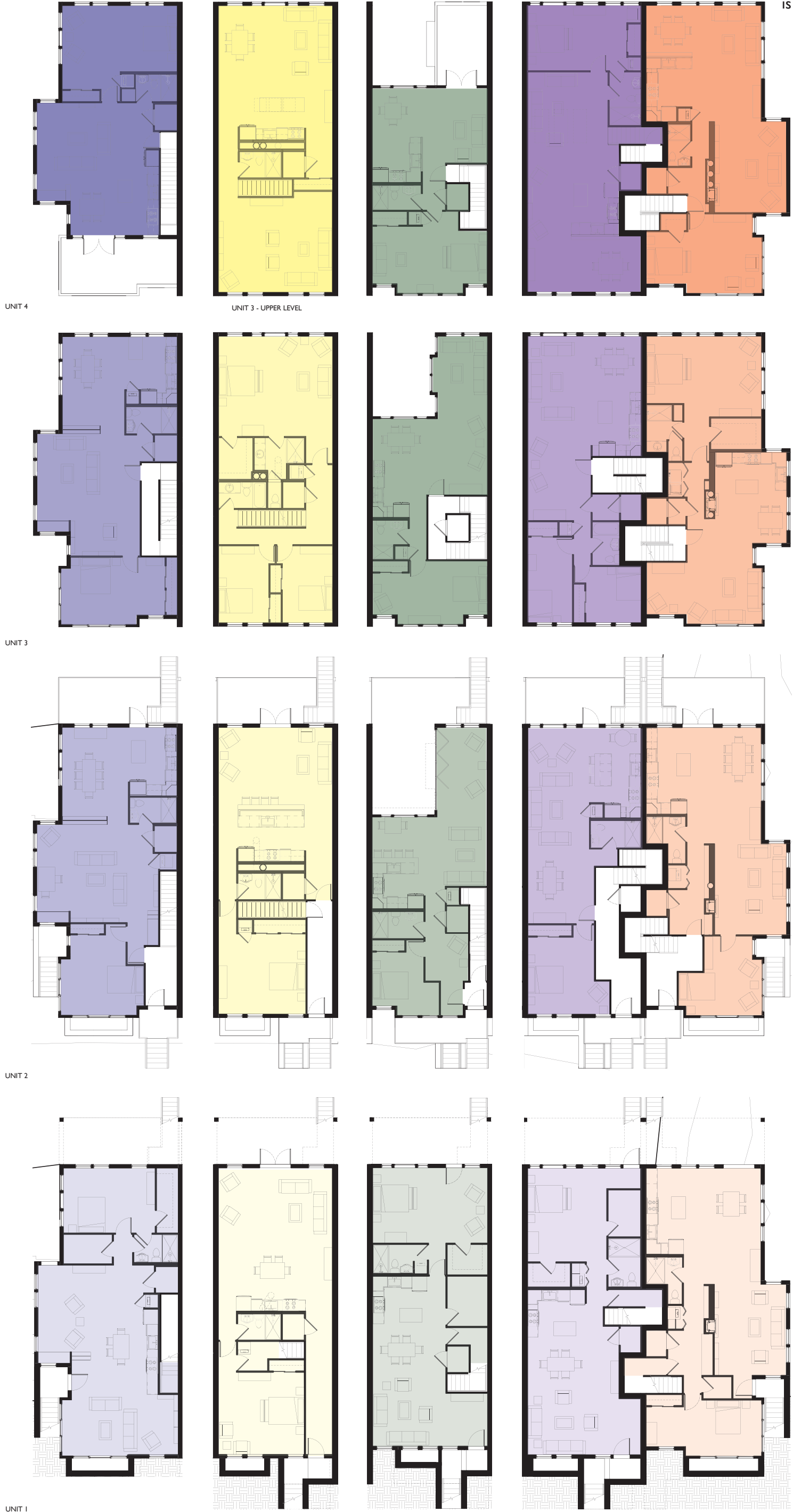


**4 UNIT HOUSE**  
(INDIVIDUAL FLATS)



**4 UNIT HOUSE**

\*variation in shading indicates separate units  
NOTE: due to limitations of the stair KITCHEN (yellow unit) can only be divided into 3 units, unless you assume each room is rented out separately).



UNIT 4

UNIT 3 - UPPER LEVEL

UNIT 3

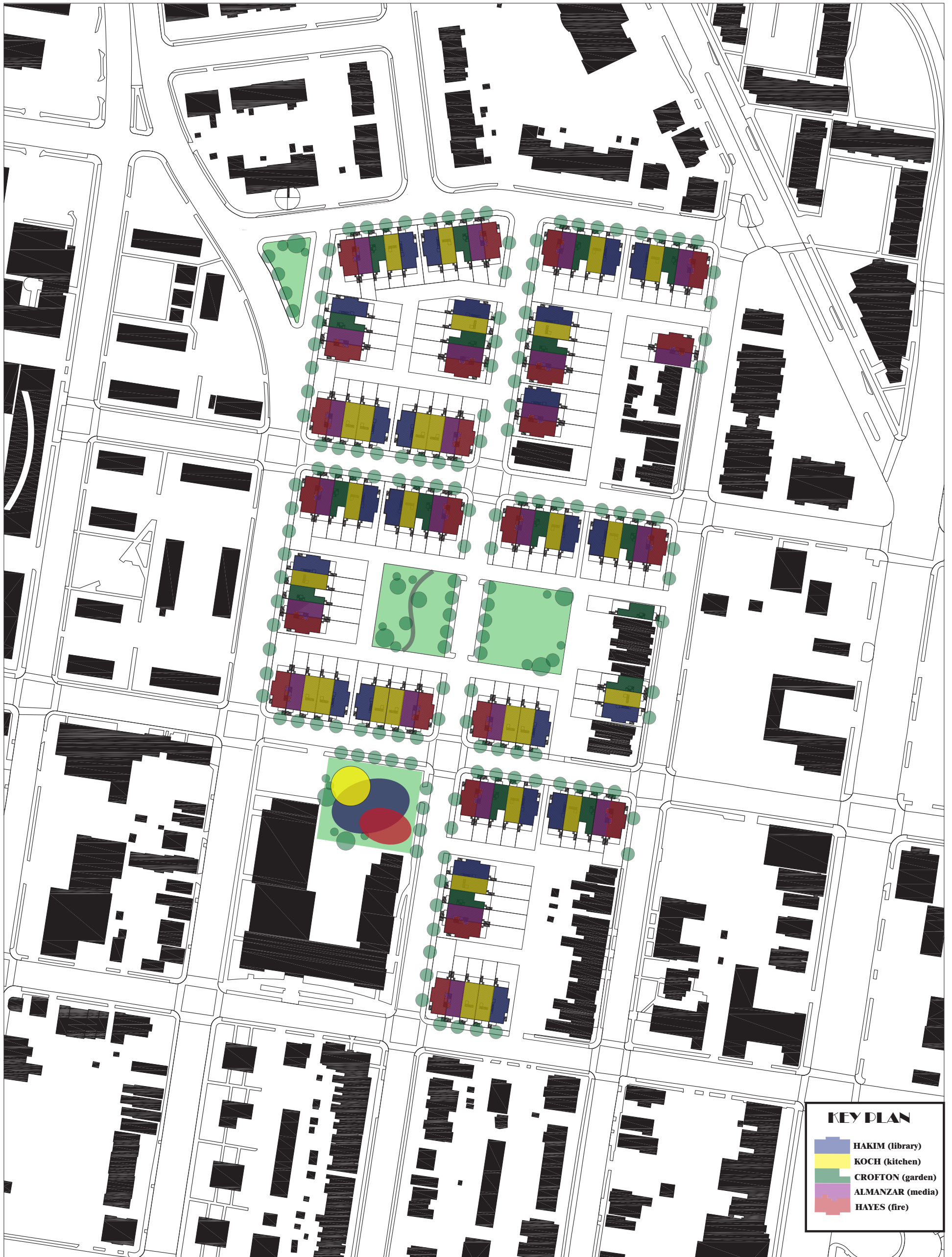
UNIT 2

UNIT 1

# FINAL SITE DESIGN

## HIGHLIGHTS

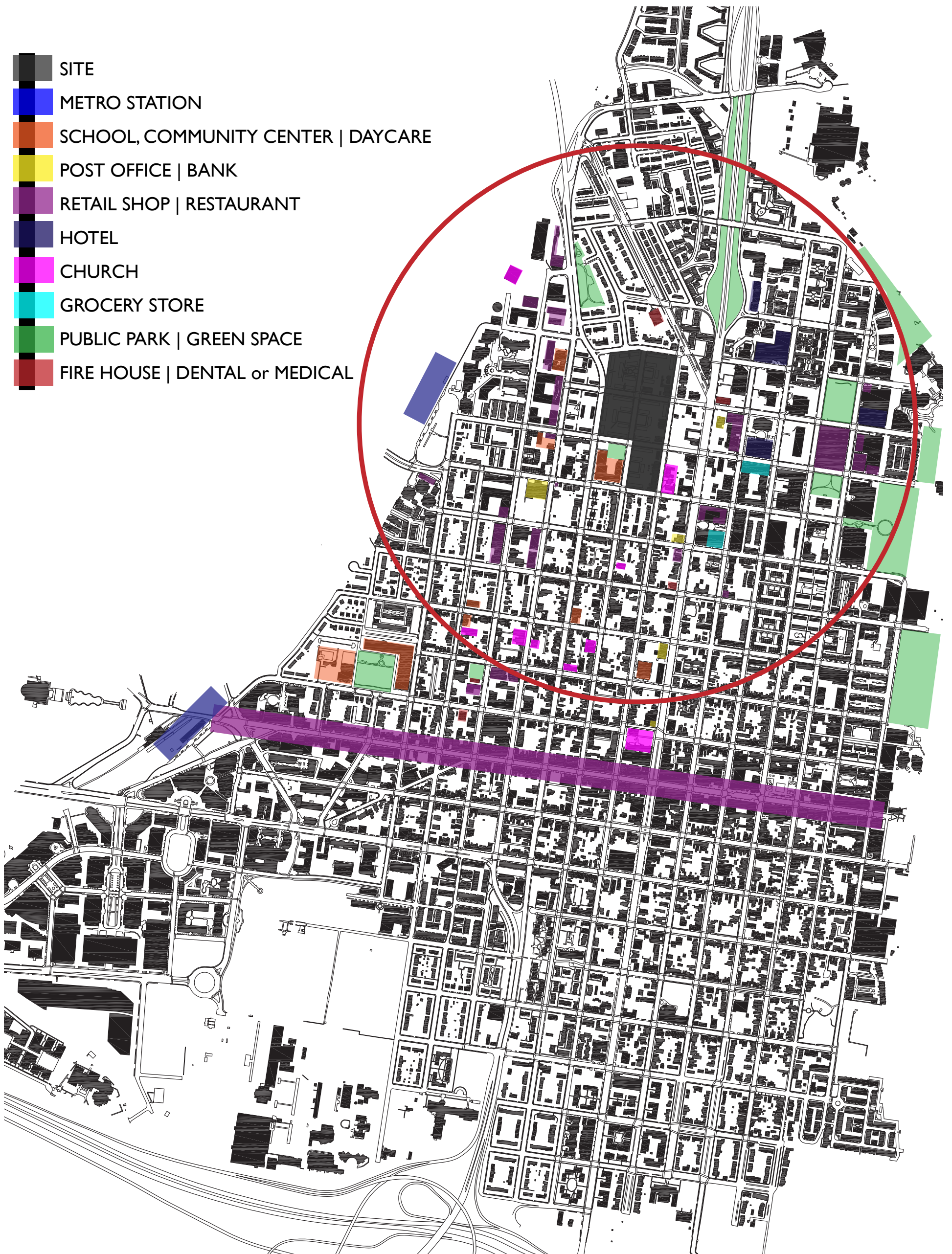
- 113 UNITS TOTAL (can be subdivided up to 425 UNITS)
- 23 (92) BLUE UNITS
- 27 (81) YELLOW UNITS
- 17 (68) GREEN UNITS
- 23 (92) PURPLE UNITS
- 23 (92) RED UNITS





# SITE AMENITIES

FIGURE GROUND - OLD TOWN ALEXANDRIA





**ELEVATIONS**



FRONT ELEVATION



SIDE ELEVATION



REAR ELEVATION



SIDE ELEVATION



**STREET ELEVATIONS**

ONE FULL BLOCK (MIRRORED) SET OF FIVE UNITS



FRONT STREET ELEVATION

**STREET ELEVATIONS CONTINUED**





# FINDINGS

## FINAL THOUGHTS | NOTES

Through much of my research and through this experience of designing family housing in the urban condition, I found row houses provided the best option for balancing many of the requirements of desirable housing with maximum flexibility and utility as far as:

- units per acre
- cost of construction (and by extension affordability)
- defensibility (access to ground, sense of ownership, and clear control over surrounding area)
- floor plan/unit flexibility - with the parallel stair providing the greatest flexibility and least amount of space dedicated to shared circulation (should the house be divided into separate units); but many of the other circulation patterns can also provide similar flexibility if such adaptability is desired and considered from the start, with the perpendicular stair offering the most challenging configurations as far as separating units.

When looking at designing for maximum flexibility and to cover all stages of life and something that could apply to the greatest amount of family circumstances I felt it very important to include architectural options for privacy, separation, and age-in-place features, these include:

- **walkout level** - a level that has no stairs, that one can walkout directly to the ground without use of a ramp or lift. My walkout is on the lower level (garden suite) in the back, but this is likely to vary from site to site and situation to situation. This aspect is so important because even a single stair can make navigating in and out of a house quite challenging for those who have lost mobility.
- **space for potential future elevator** - at the time of writing, the cost to install a residential elevator is \$18,000 - \$24,000 (not chump change, but not much more than the price of a new car and potentially much more affordable than moving to a new house or medical facility outside the home). However, if a shaft does not already exist, that cost is more in the range of \$30,000-\$40,000+ (almost double if not more, depending enormously on structural requirements). And if there is no place inside the home for an elevator shaft, to construct an external unit, the cost is \$50,000+ (over twice as much and considerably less affordable). All my designs have a “closet” or accessory space next to the stairs that can become a future elevator shaft if necessary. I chose not to include an active current elevator in the designs as an affordability concern (so as not to cater to only the luxury market), but instead leave it as a potential future option.
- **bathrooms & kitchens** - as much as having a “room” or space of one’s own, I felt it important to provide families with an added level of privacy and independence through separate bathrooms and kitchens. This aspect allows family members in different generations to share many of the same resources and the ability to keep an eye on each other, all without forcing multiple interactions per day as one would definitely have in a space where there was only one kitchen or bathroom to share. In all my designs I have included bathrooms on all levels (another important aspect for age-in-place) and kitchen or kitchenettes on 3 of 4 levels and a spot for a potential future kitchen on all levels (excepting the perpendicular stair house for reasons explained earlier) should ones circumstances require such an arrangement. Moreover, each of these units within the row house can be completely private and lockable with only the entrances and vertical circulation being shared space if so desired.

While I recognize there are people who don’t want to live anywhere near or perhaps even more extreme cases have anything to do with their family, when conceived in this way, multigenerational living is less of a burden or invasion of privacy that one has to endure during tough circumstances or only out of necessity and instead can be seen as an asset or even something to be desired or strived for.

### NOTES:

**AUTOMOBILES:** Many of the new construction projects in this area, including the one this design replaces, dedicate a significant amount of floor space to garage/parking, I have not. I have assumed each lot can handle 2-car parking with access via an alleyway in the back. This is unconditioned space, and not ideal for some automobile enthusiasts. I have, however, left enough space on each lot to accommodate a small garage structure, should the owner choose, however I justify leaving dedicated enclosed parking out of my design by the nature of this particular site and its urban condition. If one flips back to page 43, one can see that this site is within 1/2 mile walking distance of the following community amenities:

- one, almost two Metro Stations (including multiple bus lines)
- a Library
- multiple Parks, Green Space & a Bike Path that connects to over 150 miles of local area trails
- two major Supermarkets (Harris Teeter & Trader Joes)
- Community Center with play ground, pool and fitness center
- a School and several Day Care Centers
- a Post Office
- several Banks & Financial Institutions
- several Dental/Medical Offices
- several Beauty Salons and Barber Shops
- a myriad of Places of Worship
- Dry Cleaners, Fitness Centers, Car Repair, Corner Markets, etc.
- several Hotels
- a Fire House
- many Restaurants, Cafes, Retail Shops and more

With all these amenities, the necessity or requirement for an automobile to conduct everyday life is greatly reduced. Additionally, as our society continues to evolve, it seems the reliance on the ownership of automobiles has lessened with the rise of online commerce, doorstep delivery of everything imaginable, and the ascent of the sharing economy.

**GARDEN HOUSE:** I have included a floor plan that celebrates gardens and at that the same time chosen to “respect the street” urbanistically in regard to the orientation of each row house, which in America does not always lend itself to the best orientation for planting (especially in small spaces). Therefore the garden unit (CROFTON) is the only unit especially sensitive to site orientation and in this particular case, I have limited its use in the several occasions where the fronts face south and the garden would be forced to face North. In place of these units I have inserted the kitchen (KOCH) unit because other than the garden unit, it is the only non-end and non-interlocking unit, but in practice one could adapt any of the units, follow my example and replace those specific units with a different one, or even use the garden unit and enclose the courtyard areas entirely in places where a garden would be less practical.

**LOCAL VERNACULAR:** These units have been designed to fit the vernacular of the local community: Old Town Alexandria. The typical row house style in the area, while common is not directly translatable to every community. However, the beauty of these designs (in my opinion), but perhaps much to the chagrin of my architectural educators, is that they could be placed almost anywhere with different facades. They would work well as terraced units in London, as one building (4-story walk-up but with separate entrances) in Paris, or a brownstone in New York. Perhaps the only place they wouldn’t adapt quite so well is the areas of the world where tall apartment buildings are the norm, such as Hong Kong or Seoul, Korea, though I am in no means an expert, I imagine there could be a place for this type of development in those such places as well.







## BIBLIOGRAPHY

- Alexander, Christopher, Sara Ishikawa, Murray Silverstein. *A Pattern Language: Towns, Buildings, Construction*. New York, Oxford University Press, 1977. Print.
- Churchill, Winston. "House of Commons Rebuilding." House of Commons Debate. London. 28, October 1944. Speech.
- Chutter, Jennifer. "Is the Kitchen Still the Hearth of the Home." *GLS Symposium*. 2012. Web. 02 April, 2017.
- City of Alexandria. Department of Planning and Zoning and Department of Transportation and Environmental Services. *Parking Standards for Multi-Family Residential Development Projects: Guiding Document*. Alexandria, VA: 2015. Print.
- Cohn, D'Vera and Jeffrey Passel. "A record 60.6 million Americans live in multigenerational households." *Pew Research Center*. Washington, D.C. 2016. Web. 22 September 2016.
- Friedman, Avi. *Town and Terraced Housing: For Affordability and Sustainability*. New York, Routledge, 2012. Print.
- Fry, Richard. "For First Time in Modern Era, Living With Parents Edges Out Other Living Arrangements for 18-to34-Year-Olds: Share living with spouse or partner continues to fall." *Pew Research Center*, Washington, D.C. 2016. Web. 22 September 2016.
- Kellert, Stephen R., Judith H. Heerwagen, and Martin L. Mador. *Biophilic Design: The Theory, Science, and Practice of Bringing Buildings to Life*. Hoboken, NJ, John Wiley & Sons, Inc., 2008. Print.
- Krumwiede, Keith. *Atlas of Another America: An Architectural Fiction*. Zurich, Park Books, 2017. Print.
- Lawrence, Robyn Griggs. "Full House: A Guide to Surviving Multigenerational Living." *nextavenue.org*. Next Avenue. 21 May 2012. Web. 22 September 2016.
- Mallach, Alan. *A Decent Home: Planning, Building, and Preserving Affordable Housing*. Chicago, American Planning Association Planners Press, 2009. Print.
- McCamant, Kathryn and Charles Durrett. *Creating Cohousing: Building Sustainable Communities*. Gabriola Island, Canada, New Society Publishers, 2011. Print.
- Newman, Oscar. *Creating Defensible Space*. Institute for Community Design Analysis. U.S. Department of Housing and Urban Development, Office of Policy Development and Research. 1996. Print.
- Philipsen, Klaus. "Anatomy of the (Baltimore) Rowhouse." *Community Architect*. archplanbaltimore.blogspot.com. 2012. Web. 15 May 2017.
- Philipsen, Klaus. "The Rowhouse and the City: Streets, Alleys and Urban Living." *Community Architect*. archplanbaltimore.blogspot.com. 2012. Web. 15 May 2017.
- Relph, Edward. *Place and Placelessness: Research in Planning and Design*. Pion. 1st Edition, 1976. Print.
- Ricco, John. "Not all density looks the same. Far from it, actually." *Greater Greater Washington*. Washington, D.C. 2016. Web. 04 January 2017.
- Taylor, Paul, et al. "The Return of the Multi-Generational Family Household." *Pew Research Center*, Washington, D.C. 2010. Web. 05 October 2016.
- Tuan, Yi-Fu. *Space and Place: The Perspective of Experience*. Minneapolis, University of Minnesota Press, 1977, Eighth printing, 2001. Print.
- Vanderbilt, Tom. "Walking: America's Pedestrian Problem." *Slate*. 10-13 April 2012. Web. 13 September 2016  
"Part I: The Crisis in American Walking: How we got off the pedestrian path."  
"Part II: Sidewalk Science: The peculiar habits of the pedestrian, explained."  
"Part III: What's Your Walk Score?: The company that puts a number on walkability."  
"Part IV: Learning to Walk: How America can start walking again."
- Wann, David. *Reinventing Community: Stories from the Walkways of Co-housing*. Golden, CO, Rulcrum Publishing, 2005. Print.
- Wright, Gwendolyn. *Building the Dream: A Social History of Housing in America*. Cambridge, MA, MIT Press, 1985. Ninth printing, 2001. Print.
- U.S. Census Bureau. *United States Summary: 2010 Population and Housing Unit Counts*. 2010 Census of Population and Housing. U.S. Department of Commerce. Economics and Statistics Administration. 2012. Web.

### Abstract Page

“Suburban Rural Stock Photo.” *Keyword Team*. <http://keywordteam.net/gallery/454412.html>. Accessed 31 August 2016.

### Abstract General Audience Page

Nuclear Family. “Operation June Cleaver.” *Envisioning the American Dream*. 16 March 2015, <https://envisioningtheamericandream.com/2015/03/16/operation-june-cleaver/>. Accessed 31 April 2017.

### Page vii

Architecture of American Houses. “A Visual History of Homes in America.” *Mental Floss*. 20 July 2015. <http://mentalfloss.com/article/66382/visual-history-homes-america>. (originally from *Pop Chart Lab*). Accessed 31 August 2016.

### Page 10

“Suburban Sprawl Stock Photo.” *Alamy*. Gary Moon. <http://www.alamy.com/stock-photo-suburban-sprawl-residential-aerial-placer-county-californai-usa-61040910.html>. Accessed 31 August 2016.

If you build it, they will come. “Field of Dreams’ Farm Up For Sale.” *ecorazzi*. 13 May 2010. <http://www.ecorazzi.com/2010/05/13/field-of-dreams-farm-up-for-sale/>. Accessed 2 September 2016.

“Chicken and egg Clipart.” *Fotolia*. <https://us.fotolia.com/id/113166546>. Accessed 2 September 2016.

### Page 13

“Tree with Roots.” *Pinterest*. <https://www.pinterest.com/pin/406661041325325542/>. Accessed 23 September 2016.

Grandpa with Grandson on Shoulders Stock Photo, “Today is National Grandparent’s Day!” *American Adoptions*. 13 September 2016. <https://www.americanadoptions.com/blog/today-is-national-grandparents-day/>. Accessed 23 September 2016..

“Nuclear Family Silhouette Stock Photo, “ Different Visions of What Families Will Look Like 50 Years From Now.” *Futurist*. 28 August 2015 <http://nikolasbadminton.com/top-5-futures-for-august-28th-drones-families-and-3d-printed-bones/>. Accessed 23 September 2016.

“Multi-generational family watching the sunset Stock Photo.” *Getty Images*. <http://www.gettyimages.no/detail/photo/multi-generational-family-watching-the-sunset-royalty-free-image/160187559>. Accessed 23 September 2016.

“Portrait of multi-generational, multi-ethnic family Stock Photo.” *Fotosearch*. <http://www.fotosearch.com/BLD029/blid049557/>. Accessed 23 September 2016.

“African American Grandparents With Grandchildren Relaxing in Park Stock Photo.” *Shutterstock*. <https://www.shutterstock.com/image-photo/african-american-grandparents-grandchildren-relaxing-park-280362638?src=iyIzTESe4nq3gkxwF5GAEA-1-13>. Accessed 23 September 2016.

Father and Daughter Stock Photo, “The Ideal Community Center.” A Medium Corporation. 4 June 2016. <https://medium.com/architecture-landscape-urban-design/synergetic-community-centers-ae72f08a9983>. Accessed 23 September 2016.

Sleeping Baby Stock Photo, “Sleep Consulting.” *Dr. Jennifer Castle*. <https://drjennifercastle.com/sleep-consulting/>. Accessed 23 September 2016.

### Page 14

“View Up King Street, Old Town Alexandria.” *City of Alexandria Virginia*. <https://www.alexandriava.gov/Historic>. Accessed 31 January 2017.

“Wednesday Wanderlust ~ Old Town Alexandria, VA.” *You may be Wandering*. 20 February 2013. <http://youmaybewandering.com/2013/02/wednesday-wanderlust-old-town.html>. Accessed 31 January 2017

“Sun Face Compass Rose.” *Wellingtons Map Blog*. 24 April 2013. <http://mapblog.wellingtonstravel.com/post/48791079313/sun-face-compass-rose>. Accessed 5 May 2017.

### Page 15

“Tree with Roots.” *Pinterest*. <https://www.pinterest.com/pin/406661041325325542/>. Accessed 23 September 2016

“Smiling Family Stock Photo.” *Lynnwood Centre Dental (Getty Images)*. <http://www.lynnwoodcentredental.com/service/conscious-sedation/>. Accessed 23 September 2016.



## IMAGE CREDIT CONTINUED...

### Page 16

“Old Town Commons Site Plan.” *flickr: The Neighborhoods of EYA*. 18 July 2013. <https://www.flickr.com/photos/eya-homes/9316485084>. Accessed 30 September 2016.

“Washington DC Base Map.” *Creative Commons*. <https://creativecommons.org/>. Accessed 3 October 2016.

“North Old Town Alexandria Base Map.” *Creative Commons*. <https://creativecommons.org/>. Accessed 3 October 2016.

### Page 17

*Old Town Alexandria Sanborn Maps, 1941* pages 21, 25, 27. Accessed through Virginia Tech Library Database. Accessed 2 November 2016.

### Page 18

“Zen Habits: Questions to Ask Yourself at Year’s End.” *American Vagabond*. 11 December 2013. <https://alicia-prague-blog.com/category/zenliving/>. Accessed 28 February 2017.

“Temperature Chart | Precipitation Chart.” *MeteoBlue*. [https://www.meteoblue.com/en/weather/forecast/modelclimate/alexandria\\_united-states-of-america\\_4744091](https://www.meteoblue.com/en/weather/forecast/modelclimate/alexandria_united-states-of-america_4744091). Accessed 27 February, 2017.

Friedman, Avi. “Figure 3.3 Forms and Prototypes.” *Town and Terraced Housing: For Affordability and Sustainability*, New York, Routledge, 2012. Page 40.

Friedman, Avi. “Figure 6.16 Siting a Project.” *Town and Terraced Housing: For Affordability and Sustainability*, New York, Routledge, 2012. Page 123.

### Page 19

“The Wind Rose.” *St. Peters Basilica.Info*. <http://stpetersbasilica.info/Exterior/Obelisk/WindRose.htm>. Accessed 28, February 2017.

“38 N Sun Chart.” University of British Columbia GEOB 300. <http://ibis.geog.ubc.ca/courses/geob300/applets/sunpath/>. Accessed 16 February 2017.

“Wind Rose.” *MeteoBlue*. [https://www.meteoblue.com/en/weather/forecast/modelclimate/alexandria\\_united-states-of-america\\_4744091](https://www.meteoblue.com/en/weather/forecast/modelclimate/alexandria_united-states-of-america_4744091). Accessed 16, February 2017.

### Page 20

“Portrait of Goddess Hestia.” *MyGodPictures.com*. <http://www.mygodpictures.com/category/goddess-hestia/>. Accessed 17 February 2017.

“Vector - Decorative Composition in style the steam punk - pipes.” *123RF*. <https://www.123rf.com/clipart-vector/thermodynamics.html?mediapopup=63248817>. Accessed 6 March 2017.

“Fire.” *Wikipedia*. 31 December 2008. <https://en.wikipedia.org/wiki/Fire>. Accessed 14 February 2017.

All non-original images were used for the purpose of research and scholarship.

All additional images, drawings, collages produced by the author.



Last day at the WAAC (05.25.2015)  
with Taylor, 2 years, 7 months,

*We shape our buildings, thereafter they shape us.*  
~ Winston Churchill (1944)