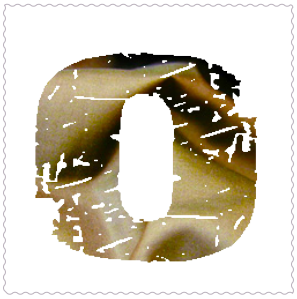



Brittney Frey







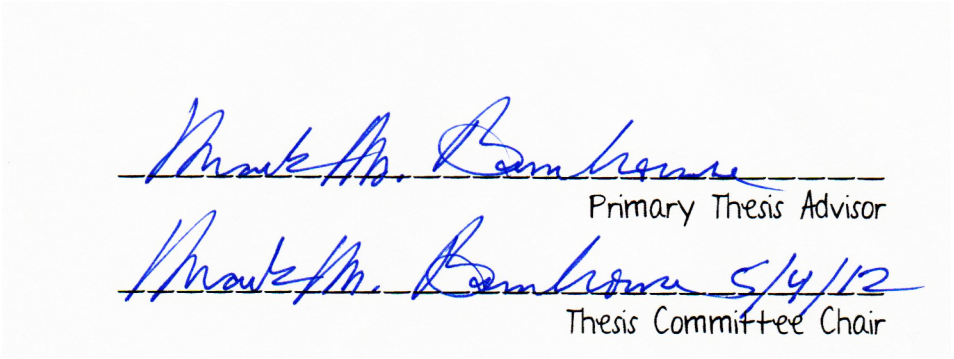
BY YOU, FOR YOU

A Design Thesis Submitted to the Department of Architecture and Landscape Architecture Of North Dakota State University

By

Brittney Frey

In Partial Fulfillment of the Requirements For the Degree of Master of Architecture



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ABSTRACT

By You For You examines how much stimulus is necessary for a space to meet our needs. The typology is a multi-family dwelling. The theoretical premise/unifying idea states that designing merely for basic human needs allows for use that is more adaptable. Within the given parameters, the individuals are responsible for the uniqueness of the space. The project justification is that architecture demands strict codes to ensure the health, safety, and welfare of its occupants. However, flexibility of space is also important to society because individuals respond better to different environments. By designing just the basics, buildings remain progressive instead of a product of the times. The final design offers 18 residential units, underground parking for 22 vehicles, and a rooftop garden terrace at a total of 43,200 square feet.

At just around 100,000 residents and growing, Rochester, MN, provides many amenities and activities to locals and smalltown commuters. There is a need for more housing because of the dynamic demographics. The Mayo Clinic also brings in student residents needing temporary and potential long-term housing.

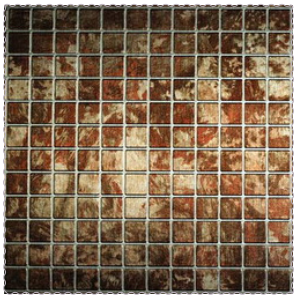
Using the concurrent transformative strategy, I will analyze and interpret both historical and present conditions relating to adaptive spaces. From there, I will also research related topics including green design, health, and wellbeing in relation to building form and function and building materials. Data will be collected both quantitatively and qualitatively through a variety of means. The quantitative data will include both statistical and scientific data gathered mainly through archival searches. The qualitative data will be gathered from direct observation and analysis, local surveys, archival searches, and interviews.

Key words: adaptable, unique, flexible, housing.

PROBLEM STATEMENT

How much stimulus is necessary for a space to meet our physical and psychological needs of a home but not limit individuality and adaptability?

STATEMENT OF INTENT



STATEMENT OF INTENT

Project Typology

Multi-family residential dwelling

Claim

Architectural typologies demand certain codes to ensure the health, safety, and welfare of users. By only designing for basic human needs, the individual(s) using the provided space can uniquely adapt the surroundings.

Premises

Each inhabitant of a space responds differently to unique stimuli.
Flexibility within a parameter allows the actors to adapt to better suit their needs throughout important life changes (Friedman, 2002).
Building components remain transitional to the satisfaction of the individuals.

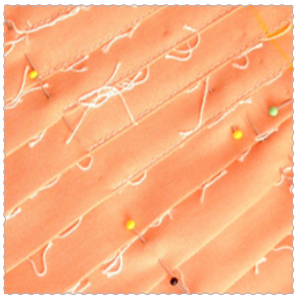
Theoretical Premises/Unifying Idea

Designing for basic human needs allows for use that is more adaptable. Within the given parameters, the actors are responsible for the uniqueness of the space.

Project Justification

Architecture demands strict codes to ensure the health, safety, and welfare of its occupants. However, flexibility of a space is also important to society because actors respond better to different environments. By designing merely for the basic requirements, buildings remain progressive instead of a product of the times.

PROPOSAL



NARRATIVE

The driving force behind this thesis project is the ability for individuals or groups of individuals to adapt to their surroundings under their own conditions. A family of two will not use a space the same way a family of five will. Basic human needs such as food, shelter, and comfort can all be present but in a more open format. Mostaedi (2006) precisely states, "Equally important is the desire to avoid our lives being determined by the rigid mold of the space we inhabit" (p. 7).

Historically, a single dwelling often accommodated several households, and homes were inhabited by multiple generations of the same family. Homes also doubled as work spaces. Eventually, people discarded that way of life and, in the process, transformed the composition of the family unit. Other family compositions began to emerge with the acceptance of non-family unions and single-parent households. Friedman (2002) states, "Marrying, having children, getting divorced, and then remarrying require spatial arrangements that permit the move from one status to another if the household wishes to remain in the same residence" (p. 6).

Culturally, dwelling elements vary based on ethnic differences. The book *Houses Generated by Patterns*, talks about a group of architects who were asked to submit competition designs for a community of 1500 houses to low income white collar Peruvian workers. Alexander (1969) discusses design considerations, saying, "In Peruvian life there is a strong distinction between members of the family, who may go anywhere in the house, and strangers, who must be entertained in the sala." He also mentions that Peruvians do not like being isolated so alcoves for smaller tasks are clustered around common spaces (p. 21-22). When considering design solutions, it is important to understand who will use the space and if it speaks to the cultural needs.

Socially, home builders offer designs that fit preconceived notions of how families use space. In today's revolutionary stance, people want to make what is theirs their own. Susanka (1998) believes, "a house is not an expression about society or technology; it's an expression of the people who live in it" (p. 181). Allowing for adaptable use of a space also allows users to express their personality.

Economically, the budget is often viewed as a negative aspect of a project while it should be seen as setting challenging parameters within which a solution must be found (Jones, 2005, p. 116). This gives designers an extra push to use innovative materials and techniques. Mass production is also a popular way to save time and money, however when used incorrectly can result in 'cookie cutter homes'. According to Schneider and Till (2007), using the latest CAD/CAM technology, purchasers can call up an almost infinite array of layouts with custom finishes which give apparent choice at the start of the process, but is not necessarily compatible with long-term adaptability (p. 36).

Generally, a household member's habits, lifestyles, and use of space change as he or she grows older. However, Friedman (2002) points out that residents tend to regard the physical environment in which these changes occur—the home—as unchangeable (p. ix). Certainly, the housing needs at the end of this century will be different from needs and wishes today.

The focus of this project is to design for the ever-changing needs of the individuals residing in their surroundings. Often times, our 'wish lists' are out of touch with our 'reality lists'. Drawing a boundary between what is a need and what is a wish gives meaning and relevance to the way we live. All other components are interchangeable.

USER/CLIENT DESCRIPTION

This project intends to serve individuals and families needing a place to reside. The flexible program of the space also allows for a variety of user interaction and budget accommodations.

The property is privately owned by one company. That company is responsible for renting or leasing the spaces to individuals wishing to reside in the building. They are also responsible for maintenance of the building such as lawn care, landscaping, and snow removal.

The spectrum of potential inhabitants varies from single parties to families searching for a residence suited to their needs. The design also lends itself to all ages.

This thesis focuses primarily on one building with 15-20 units. As part of a larger complex, this building may serve as a starting point for future buildings to be constructed and rented through the same company. There is no particular peak usage associated with these units. The adaptability of each space will allows users to reside for a longer period in each unit. Parking on site is available.

Physical restrictions vary by occupant. All units meet the ADA Guidelines although not all inhabitants require the use of a wheelchair. All units are also designed in such a way that natural lighting and good ventilation are priority. Building materials are selected and used in a way that is important to both physical health and energy efficiency, having less impact on the environment.

As previously stated, each unit is designed around basic human needs- i.e. health, safety, and welfare. All other building components are contingent on the individual needs of the occupants. All other social, cultural, ethnic, and economical issues not previously mentioned are not considered in the design process.

MAJOR PROJECT ELEMENTS

The major project elements of each unit include a bathroom and space for sleeping, eating, playing, and studying.

Because of the nature of this project, the bathrooms and kitchens are the only space permanently defined and consistent. All other spaces are subject to change throughout the use of the space by various individuals.

The building as a whole offers a lobby, office, gym, laundry room, TV/game lounge, 15–20 dwelling units including a guest suite, personal storage space, bike storage, and parking.

The lobby includes seating for guests as well as one office space for use by the property owner. All leases, rent payments, and the like are handled directly on site.

The gym is equipped with treadmills, bikes, and free weights for use by the residents and guests. Also on site is easy access to coin laundry for residents.

Separate from the lobby is a TV/game lounge where residents can relax, play, or entertain guests for private parties.

The guest suite is designed as any other unit and is available by reservation for guests of current residents. This allows friends and family to visit without intruding on the daily rhythm of the residents.

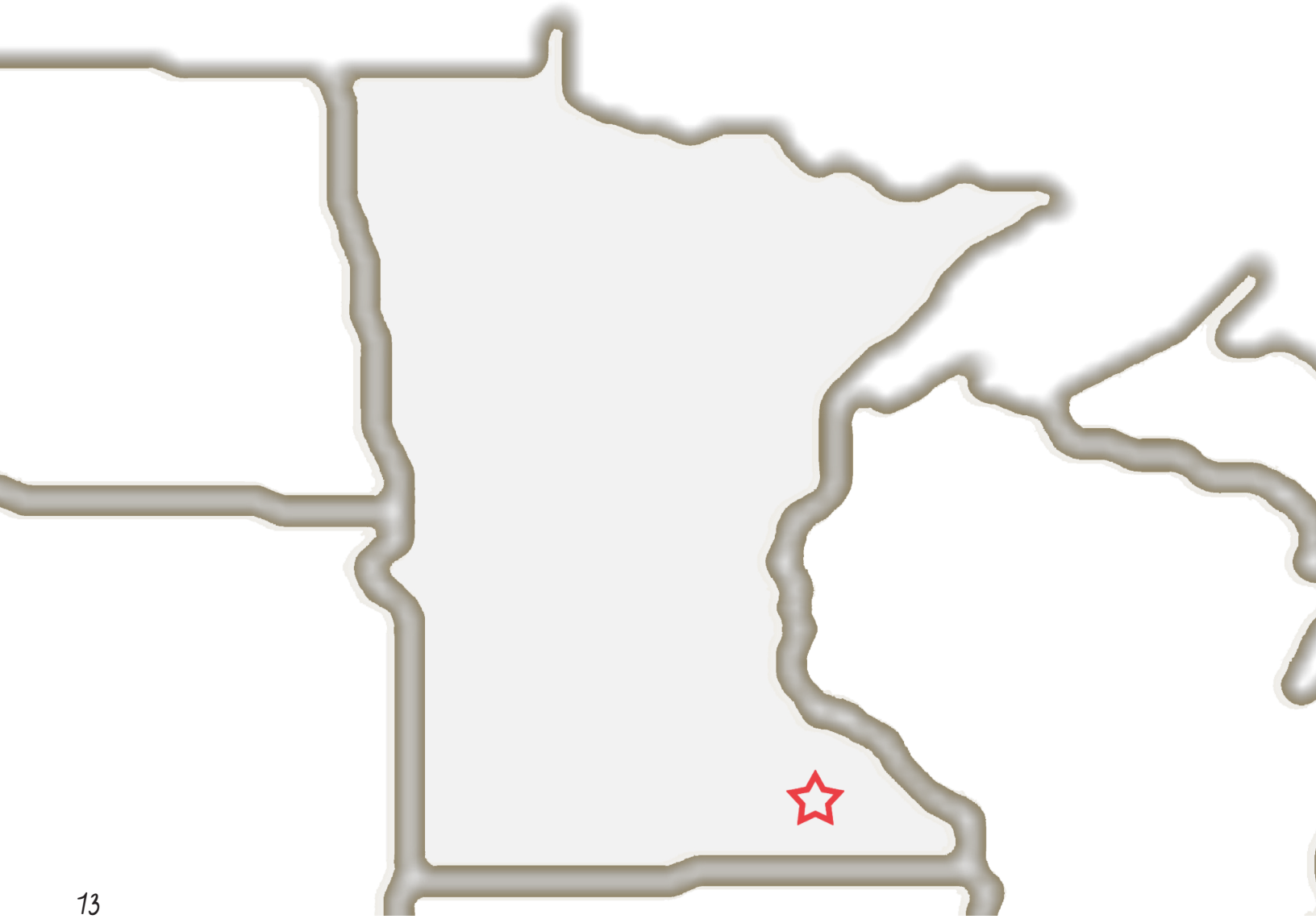
Each unit also has access to personal storage space adjacent to the residence.

Lastly, bike storage and vehicle parking is available for residents.

Other amenities include easy access to public transit, shopping centers, and public parks.

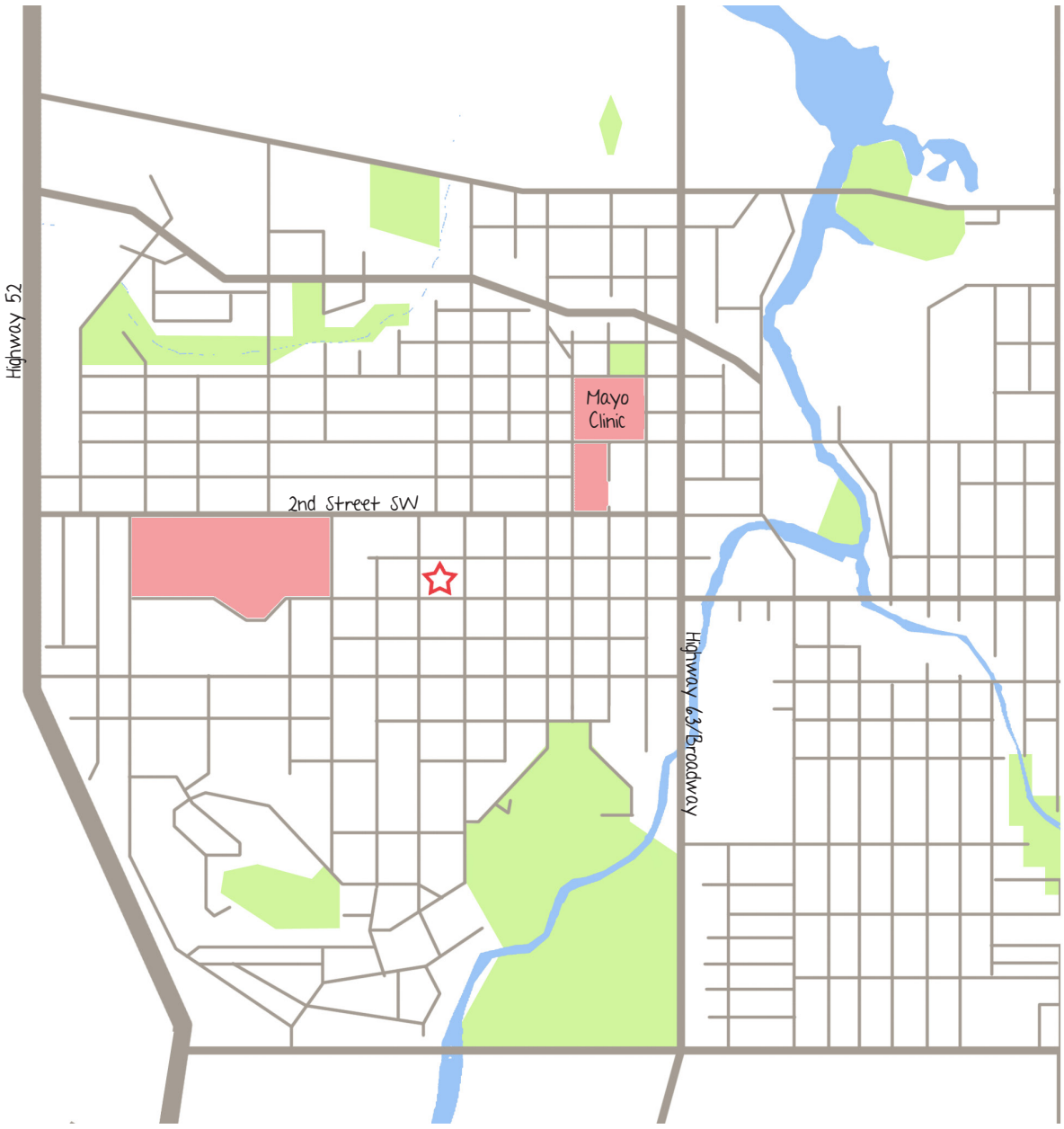
MACRO SITE

America has plenty of bustling cities constantly expanding and in need of housing. Located in the southeast corner of Minnesota, Rochester is most commonly known for the Mayo Clinic and IBM, among other things. At just around 100,000 residents and growing, it also provides many amenities and activities to locals and small town commuters. Essentially, this thesis project could be designed for any region. However, I take particular interest in this location because of the number of students fulfilling residencies at the Mayo Clinic needing temporary and potential long-term housing. Rochester also benefits because of the dynamic demographics.



MICRO SITE

The area of Rochester that I am most interested in is the historic southwest neighborhood. This site is filled with rich character as well as a mix of residential single family homes and apartment buildings. It provides easy access to public transportation, shopping, and public parks. With views to the northeast of downtown Rochester, it doesn't get much better than this.



PROJECT EMPHASIS

During the life cycle of a typical North American dwelling, eight families will reside in that dwelling, each with unique characteristics . Achieving a close fit to habit, lifestyles, and use of a space ought to be simpler than it is at present (Friedman, 2002, p. x preface). Residence units must meet certain codes to function as a living space. Oftentimes, however, they also include unnecessary building components in an attempt to "customize" the space.

This project stretches the limits by designing around basic human needs. The actors are responsible for determining the organization of the remaining floor space of each dwelling unit. With the use of mobile partitions and other adjustable components, actors live at the mercy of their individual needs. This ensures that each individual gets the best use of his or her space.

PLAN FOR PROCEEDING

Research Direction

Research will be conducted in all of the following areas: the theoretical premise/ unifying idea, project typology, historical context, site analysis, programmatic needs.

Design Methodology

I will employ a variety of methodologies to uncover both historical and current conditions relating to the topic of adaptability to better understand the issues associated with residential architecture. Other areas related to this issue might include green design, health benefits related to spatial arrangements, and building materials.

Using the concurrent transformative strategy, I will analyze and interpret different media using such sources as a starting point for future design work. Research will be done through quantitative and qualitative data collection and guided by my theoretical premise/unifying idea.

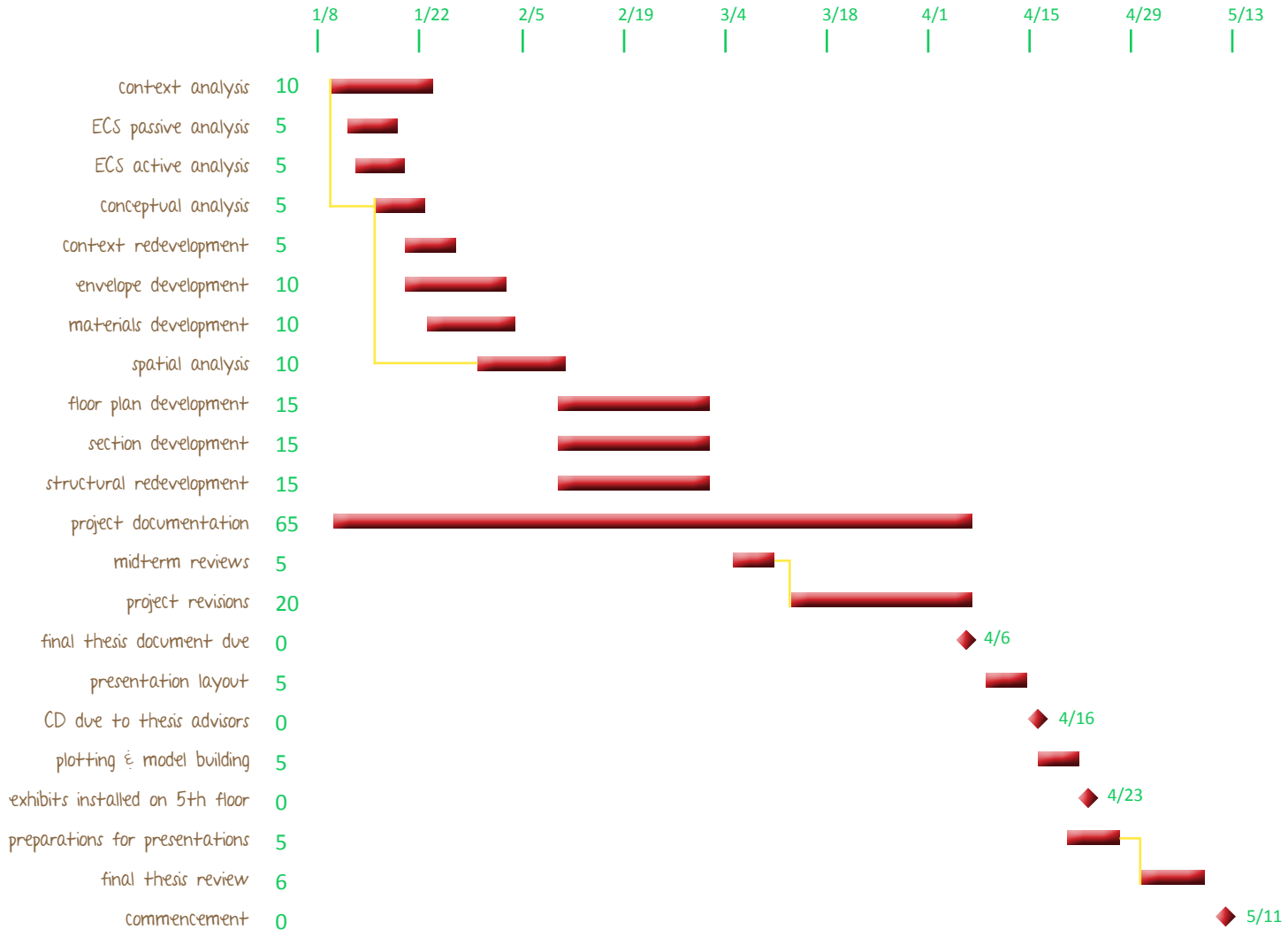
This data will be integrated at several stages, concurrently being analyzed, interpreted, and reported throughout the research process. The data will be gathered through instrumentation, experimentation, direct observation and analysis, local surveys, archival searches, and interviews.

Documenting the Design Process

This project will be documented digitally, using the data I obtain and analyze. A copy will be placed into the North Dakota State University Institutional Repository and a hard copy will be provided at the final thesis review.

At the conclusion of this thesis, I will explain why I pursued this topic and use any additional data to support my design decisions. Preliminary data will be collected and completed before the initial design concept of my building. All other information will be collected and integrated throughout the design process.

SPRING SEMESTER WORK PLAN



PREVIOUS STUDIO EXPERIENCE

Arch 271: Fall 2008: H. Fischer & M. Duda: Tea House, Boat House

Arch 272: Spring 2009: M. Christensen: Dance Studio

Arch 371: Fall 2009: C. Urness: Center of Excellence, Wellness Center

Arch 372: Spring 2010: R. Ramsay: Shaker Barn, Chicago Hotel

Arch 471: Fall 2010: A. Bakr: Highrise

Arch 472: Spring 2011: P. Gleye: France Urban Design

Arch 771: Fall 2011: M. Barnhouse: Water Resource Experiment Station

PROGRAM DOCUMENT

RESEARCH RESULTS

Kronenburg (2007) stated precisely, "There was a time when our existence was based on our capacity for movement and adaptability. Most cultures now lead a more or less sedentary life, but it could be that flexibility is once again becoming a priority in human development and that technological, social and economic changes are forcing, or at least encouraging, a new form of nomadic existence based on global markets, the world wide web and cheap, fast transportation" (p. 9). It is true that the way we choose to live now is very different from the way we knew to live 20 years ago. Advancements in materials and technology have begun to transform the ways in which we think and exist, but there is still a need for more flexibility and less "wasted" space.

There remains a simplistic relationship between flexibility and progress. Schneider and Till (2007) admit something that can move is no longer restrained by tradition. Something that can be changed is forever new (p. 5). The word "flexible" has very specific connotations for most architects. In essence, it suggests immediate potential for movement and change.

According to Susanka (1998), maybe it was the 1980s that created the "starter castle" complex - the notion that houses should be designed to impress rather than to nurture (p. 3). Regardless of when certain trends started and disappeared, it is evident that the way we live is not always in harmony with the places in which we live. Friedman (2002) discusses how dwellings continue to change every day, but a large shift emerged after the Second World War. Prior to it, North American home-building firms consisted primarily of small teams of skilled carpenters who would build one house at a time for individual families. Although homes were better suited to inhabitants' needs, this ultimately resulted in lengthy construction periods. All housing components were manufactured and custom-built on site (p. 51).

Kronenburg (2007) talks about how buildings are created using a process that requires deconstruction before construction can take place again. This is wasteful in building resources, ecologically damaging and inefficient in terms of placing the facility out of use for substantial periods (p. 13). By designing smarter for flexibility, economy, and decades of use, we eliminate the need for wasteful building space and damaging deconstruction.

One of the major issues with tract housing and mass production is that different subcontractors deal with the electrical, plumbing, painting, carpentry, roofing, etc. However, communication lines do not run between subcontractors and so customization is costly and time consuming (Friedman, 2002, p. 52). Although this assembly line of work on the site is meant to make construction practices extremely efficient, Kronenburg (2007) believes that mass-produced industry struggles to meet the real benefits—efficiency in production and delivery. All the while, industry leaders continue to make basic assumptions about the range of activities and operating parameters for most building types with the prime objective of cutting costs (p. 27).

Leo Marmol (2009) comments on the future of prefab:

> In the beginning, the focus was always on the cost savings related to the process. Now people are more interested in the green benefits. Potential homeowners are looking for ways to reduce their impact on the planet and want to surround their families with safe, eco-friendly materials. People are also starting to grasp how prefab can save them time and reduce the burden associated with the building process. It's exciting. The general public is starting to understand that prefab can help reduce their impact on the planet and streamline their lives without forcing them to sacrifice on design. We feel this is only the beginning.

In a short article by Michael Sylvester (2009) in addition to Marmol's statement, he discusses a few of the benefits that prefabricated design has to offer. He claims the sticker price is not the only sign of affordability. Rocio Romero's prefab homes come in a kit form, allowing the buyer to decide how much to participate in the onsite assembly process (Affordable section, para. 1). A buyer can hire a contractor or work with some generous friends and a bit of gumption to build the house him or herself. Avoiding the cost and hassle of a contractor helps to subsidize the overall cost of the house. In turn, home ownership is attainable for more people.

In response to Kronenburg's claim that new construction is wasteful in building resources, we can counteroffer that many prefab designers offer materials derived from recycled products. Sylvester (2009) talks about one company, Logical Homes, who use repurposed cargo containers as steel-frame modules. A customizable skin system keeps the container surfaces under wraps, for those who don't want the outside elements making their way inside (Recycled section, para. 1). In addition, prefabricated home factories produce far less waste than traditional job sites, making prefab lower impact by definition. Sustainability practices are on the up and up with the use of renewable materials and integrating them with efficient technologies.

Some companies in Japan, notably Toyota Home, offer designs that are completely digital and automated. Employing such strategies offers high levels of dimensional accuracy, reducing additional costs in wasted materials on traditional job sites due to precision cuts and non-standard sizes. These digital homes vary in style from modern interpretations of classic forms to sleek shelter products that embody the essence of the Japanese lifestyle.

Perhaps one of the biggest misconceptions of prefabricated design is that they lack personality and character. It is the case that some prefabs feature fixed floor plans while others are completely customizable. They are designed for a specific client and utilize a defined methodology, such as steel- or timber-frame modular construction. Sylvester (2009) adds, "One of the primary benefits for the buyer is predictability: predefined design details and construction processes give the client a degree of surety about the outcome that is often absent in custom projects." Custom projects, even prefab ones, are usually more expensive, but the final design is unique.

Prefabricated design also lends itself to an endless variety of size and form. Some product fabricators specialize in smaller sized prefab for the intention of building homes on wheels. Sylvester (2009) adds, "Although technically related to the trailer home, these sharp-looking houses are from a very different part of the family tree" (Mobile section, para. 1). Other lines, such as Kieran Timberlake and LivingHomes, are designed to fit easily into the urban infill lots. These reconfigurable designs allow you to add rooms and entire floors as living needs evolve.

In an article from *Architecture Australia*, Nigel Bertram (2011) talks of a project by Simon Anderson that explores the potential of industrial processes and contractors to make flexible, affordable, and low-energy housing. He opens:

> Many architects talk of building cheaply but few achieve it. The conventional approach to cost control is to reduce size and material/specification quality but, in many cases, the inability to strategically let go of what is normally understood as architectural culture of the aesthetic shaping of form, space and technique burdens the architectural house with a heavy cost penalty for the undeniable benefits of customization. Though one of the architect's core skills is the ability to make each space and element of the building fabric work harder and to glean more efficiency, utility and delight from less space and material, the price of a perfect fit to particular needs or opportunities can be measured through the traditional unit of construction cost per square metre—affordability of space, per se, inevitably suffers as soon as an architect becomes involved. (p. 79)

Anderson's response, as an architect, breaks the mold of conventionality. Instead of controlling cost by reducing size, Anderson aims to build the largest possible space for a given cost by deliberately letting go of traditional aesthetic preconceptions and employing observed industrial technology in a non-judgmental and even detached manner (Bertram, 2011, p. 79). In his Factory House, Anderson thinks carefully through labor and site efficiencies to produce a house for $1,400/m2 that would normally cost $2,200–$2,800/m2. Much like prefabricated houses, he uses construction methods and found techniques that have been honed and refined by others over time to great efficiency.

Additionally, he took simple measure to reduce cost in areas that other architects traditionally would not. Bertram (2011) notes, "The [windows] are familiar, standard, and readily available. The windows have been deployed and organized almost dispassionately, as a logical part of a system and are stripped of any particular expressive or extraordinary role. (Even though, of course, the final result of this organization has a very deliberate architectural expression)" (p. 79).

Similarly, inside, affordability is achieved through the rejection of any notion of "interior design". The kitchen is from Ikea. The selection of other fitting and fixtures is left entirely in the hands of the client. Also, the arrangement and division of space is non-prescriptive-it is simple and direct, highly efficient spatially, and inherently flexible. Bertram (2011) concludes the article by commenting, "This generous attitude and accommodation of difference is rare in architects but fits perfectly the notion of an industrial container to suit any flavor of occupant" (p. 82).

Late in the 19th century, designers of traditional complexes created rooms of equal-dimension sizes that let occupants decide their uses and the changes to them later during occupancy. Typically, in North America, closets in a room suggest its use as a bedroom. However, in Europe, housing occupants bring their own clothes cupboards when they move. With simple changes like this, spaces instantly open themselves to a variety of opportunity and use.

I think many preconceived notions are stuck around the idea that each room serves a particular function and one function only. By designing in a way that serves multiple functions in one space, many generations and families will find the spaces more adaptable. A notable sign of scientific and societal progress is the advancement in the field of medicine. Men and women live longer now, creating more need for flexibility and adaptability in architecture. Seniors require different resources than younger generations and amount of space fluctuates according to life-cycle changes.

Along with varying needs for older age, it can also be argued that a single person might need a minimal number of walls in the private zones since acoustic separation and privacy are less of a concern. Susanka (1998) talks about her experiences as an architect throughout her book telling of different clients and needs. In one chapter, she describes a couple who had recently purchased their own home but were having troubles getting along.

Susanka claims to be no marital counselor but upon visiting the house she realized that the couple did not have enough privacy. The house was a complete modern rendition of a single family home with the master bedroom sharing a 3-foot-tall dividing wall with the living space. The husband and wife simply had no privacy. In sticking with the fluidity of the design, Susanka proposed glass panes that stretched to the ceiling to provide more acoustical privacy (p. 37). This example stresses the importance of flexibility in building because each household has different requirements for living.

In an article by Andrew Gorman-Murray and Robyn Dowling (2011), changing demographics and modes of domesticity in Australia are discussed:

> This defining value of Australian society is more than an aspiration for home ownership; it is a yearning for domestic "bliss", a longing to make a house into a home, creating somewhere we feel we belong and have some control over our ability to live the life we desire. This dream is changing. The households that we form are altering, pressures of land availability are increasing the supply of apartments and other medium-density dwellings, and younger and more culturally diverse generations are more resistant to, or cannot afford, the dream. (p. 45)

They continue to give statistics on household size saying the share of lone-person households increased from 15.1 percent in 1976 to 24.4 percent in 2006, and is tipped to reach 30.2 percent by 2026 (Gorman-Murray & Dowling, 2011, p. 45). The rising numbers of non-traditional family dynamics leads us to ask, how does one "make" home and "do" domesticity alone, without family or residents? Living alone enhances some normative meaning of home: the link between home and identity is amplified in single occupancy, were interior design decisions are entirely the single occupant's. This issue takes center stage in terms of flexible and adaptive use. Our homes need the ability to change throughout major lifestyle transitions. Adding another occupant into the equation adds a whole new dimension to the meaning of home and privacy.

Friedman (2002) lists four forms of adaptability in her book including manipulation of volumes, spatial arrangement, growth and division, and manipulation of subcomponents. Manipulation of volumes relates to the considerations that a designer, builder or occupant give to use of the entire building. Spatial arrangement looks at how the private and public spaces within the greater whole are used. Designers and owners need to establish important relationships between the spaces so that the layout is effective yet flexible. Growth and division are design strategies that come before, during, or after construction to permit expansion or reduction of a space. Lastly, manipulation of subcomponents talks about the elements employed in construction and use of the building (p. 16). From large scale down to the nitty-gritty subcomponents, spaces lend themselves to a variety of arrangements to suit individual needs.

Whether a home has been custom built or mass-produced, there remains the issue of preparing for the future while still embracing a few well-worn concepts from the past. Susanka (1998) believes every house should express our values and personalities, but that does not always have to come at a high price. Anything more than basic space, minimally detailed, will exceed the budget. She says, "A good architect will suggest reducing square footage to allow more detail" (p. 13). A house becomes a home when there are beautiful forms, lots of daylight, natural materials, and the things we love.

Schneider and Till (2007) use the terms 'soft' use and 'hard' use as a simple method of dividing and interpreting information in their collection of over 150 examples of flexible housing. They admit its binary nature of classification is crude, but it does identify the tensions evident in many of their examples. "Soft" refers to tactics that allow a certain indeterminacy, allowing the user to adapt the plan according to their needs. The designer, in this case, works in the background. "Hard" refers to elements that more specifically determine the way the design may be used. Here, the designer works in the foreground, determining how spaces are used over time (p. 7).

The parallel histories of hard and soft use identify a contradiction of the term "flexibility". The hard view extends the influence of the architect, and therefore becomes part of the wider regimen of control that modernity is associated with. Flexibility is provided, but on the architect's terms. In the soft view, flexibility dissolves the control of the architect and hands it over to the user. Regardless of where individuals stand on the spectrum between soft and hard, it is important to address the tension between the reality and ideals of spatial occupation (Schneider & Till, 2007, p. 7).

In another article from *Architecture Australia*, Peter Mould (2011), an NSW Government Architect, talks about the NSW State Environmental Planning Policy No. 65 (SEPP 65). This planning policy was set to influence the quality of the built environment, striking an awareness in architects and assessors alike of the imperative for high quality and residential amenity in apartment design. More importantly, it tied together recommended responses to the current social trends of population growth, housing affordability, ageing population, and changing household type and size (p. 49).

SEPP 65 - Design Quality of Residential Flat development was legislated as a planning law in July 2002. It established consistent objectives and processes within the planning system and enshrined the role of registered architects in designing this building type. This is the only legislation in Australia to mandate the role of architects (Mould, 2011, p. 49).

Mould (2011) states that affordability was the key issue considered in the submission by the Urban Design Alliance (UDAL) recommending supporting, strengthening, and extending the policy laid out by SEPP 65. Although the goal of the planning law was to improve quality in residential design, the UDAL argued that the majority of residential flat development was not undertaken on behalf of the end user. In many cases, the design and development process relates to commercial interest at the initial sale rather than the long-term performance of the building (p. 49). The issue of bad agendas in building design (i.e. money or generalization of the user) continues to be a nuisance in the effort to make housing more flexible in planning for the future today.

The ability to think creatively about needs and wishes and not to preconceived notions of what a house should be is the secret to a unique space that conforms to our everyday needs. Our understanding of what a house should do gives us a prototype beside which innovation is tested. It enables us to explore everything from new construction and structural systems to experimental social groupings. Kronenburg (2007) makes this analogy, "The house is the 'laboratory', test tube and Petri dish for new forms, technologies and living patterns" (p. 20).

Kronenburg (2007) states that ultimately, buildings serve as a form of investment. The value of investment lies in its stability, so development that has a predictable, fixed outcome leads to a more stable investment. Paradoxically, building for an unknown future user could be a driver towards better flexible architecture. Instead, it tends to lead to the antithesis of building for change because, instead of remaining flexible for use by whoever has most need, the type of user is determined by investment potential (p. 16). Simply put, the principle underlying driver in design and manufacture is economics. What proves to be the best financial investment over time also creates conflict with smart design practices.

Kronenburg (2007) believes that flexible architecture might create an environment that automatically responds to our every need or one that requires us not to be too comfortable, to try living in a different way and to force adaptability and change in ourselves. He references German philosopher Martin Heidegger from his essay, 'Building, Dwelling, Thinking,' saying that, "Though the essence of a place is supported by the costly and time consuming act [of construction], a place can also be brought into existence by much simpler acts such as rearranging the furniture in a room or even unpacking a suitcase" (p. 12).

Human psychological needs are simple: to be warm and to have enough food and drink. This can extend to our feelings safety and being wanted. Along with advancing technologies and services comes the need for advanced measure to meet our basic psychological needs and the most important ingredient for this improvement is flexibility. We need to let go of those preconceived notions that prevent us from moving forward. We need to start thinking about the future today.

RESEARCH RESULTS

Summary

In an article from the *Japan Architect*, Yoshiaki Hanada (1999) questions what exactly a house is. His first response is, "A house is a building in which a family dwells," but admits that gets us nowhere. He attempts a functional definition saying, "A house is a place where people gather together in close harmony" or "A house is the only place where certain kinds of behavior are possible." However, with so many different building types in existence today, it is difficult to imagine any behavior that is engaged in exclusively in a house (p. 16). This thesis aims to investigate how much stimulus is necessary for a space to meet our physical and psychological needs of a home but not limit individuality and adaptability.

Humans have always had a need and the capacity for movement and adaptability but lead a more sedentary life. However, new global markets, the World Wide Web, and cheap, fast transportation are encouraging that shift back towards flexibility in architecture. Keeping up with the times is not always an easy feat. Family dynamics are changing and evolving everyday with the definition of family constantly expanding.

Men and women also live longer now, creating an ever-increasing need to plan for future generations. Seniors require different resources than younger generations and amount of space fluctuates according to life-cycle changes. It can also be argued that a single person does not need as much privacy and space as a family of four. Living alone enhances some normative meaning of home and that link between home and identity is amplified in single occupancy, where interior design decisions are solely the responsibility of one person. Even adding one member to that equation changes the entire dynamic of required space and privacy.

With so many variations of family and so many new technologies available to us, it is a wonder we do not employ more of these strategies into our everyday existence. Prefab design is on the up and up, offering benefits to homeowners that traditional methods can't even compare with. In the beginning, the focus was always on the cost savings related to the process, but now people are more interested in the green benefits. People are looking ways to reduce impact on the planet and surround families with safe, eco-friendly materials. Prefab also offers more flexibility in terms of customization and user involvement. Essentially, the predefined design details and construction processes are predictable but the possibilities for use are limitless.

I think many preconceived notions of design and affordability still linger that hold us back from fully exploring the potential of these new building strategies. Late in the 19th century, designers started to create rooms of equal dimensioned sizes that let occupants decide their uses. However, in North America, typically a room has to have a closet for it to be considered a bedroom. Over the decades, multiple designers have tried to introduce new ideas. Schneider and Till (2007) use Mies van der Rohe, for example, who only built the perimeter walls and two columns inside to support the ceiling. He felt that everything else ought to be as free as possible (p. 20).

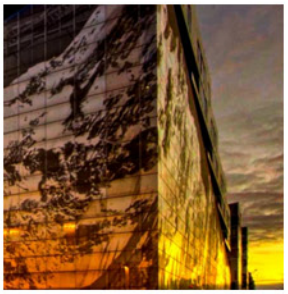
Advancements in factory-built components and improved methods of installation allow plans to be more flexible and adaptable. A family should not have to move just because of an addition of a new member. Architect Toshiharu Yoshii of Japan sees the house as being itself an apparatus for making adjustments, that is, he sees the creation of such an apparatus for adjustment as the objective of design (Hanada, 1999, p. 16). Prefab among other things, allows users to add on and even subtract from a home after it no longer serves the needs of the family. All this relates back to the initial building process. Unfortunately, as it stands now, buildings serve as a form of investment and the stability of that investment lies in a development that is predictable and fixed. Instead of building for change, the type of user is determined by the investment potential.

Quite simply, we, as home owners and designers, need to let go of all our reserves and open up to the idea of new possibilities for change and expansion. By spending a little more time and money planning for the future today, we can save a lot more time and money down the road.

Frederick Kiester (1966) captures it well:

> I don't know why, but I have always had the feeling that I have time. Time to go. Time to do. Time to be. That any time is just a beginning and that the real time to live, to give and to achieve is far ahead of me, and that I do not need to worry about it now.
> I only know now that I must stop postponing actions or decisions to execute ideas. I must act, and I must act at once, immediately. I feel that postponement is deadly by now. I have skipped and still skip so many chances, and I have learned that they don't come back. (p. 96)

TYPOLOGICAL RESEARCH



YERBA BUENA LOFTS

Stanley Saitowitz Office/Natoma Architects Inc.
San Fransisco, California, USA
2002

Andrew Lin

YERBA BUENA LOFTS

Summary

"San Francisco was steeped in the image of itself as a Victorian city," said Stanley Saitowitz, one of the city's better-known designers of modernist buildings (Viladas, 2001, para. 2). However, the explosion of technology, its culture of risk-taking and the wealth it generated created an ominous and unstoppable market for new architecture and design. Mr. Saitowitz's striking Yerba Buena Lofts project in trendy South of Market area, was likened to Soviet housing by the planning commission staff at the time it was being constructed. Saitowitz believed that as the new designs reached critical mass over the next few years, public opinion would come around. And it has.

Viladas (2001) adds that despite tough building guidelines in San Francisco, much of the new work is outspokenly modern. This new movement is transforming the city into the country's epicenter of modernism and provoking soul-searching in a community that prides itself on distinct character. Yerba Buena Lofts, completed in 2002, is a good example of doing just that—transforming the city through its modernist style. Natoma Architects designed this residential building under the direction of award winning architect Stanley Saitowitz (para. 2).

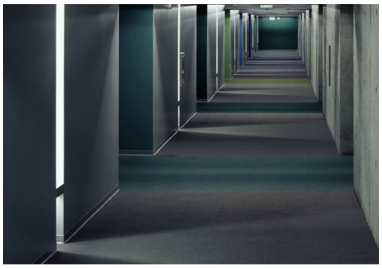
The buildings location is between Folsom and Shipley Street in the middle of the blocks between Fourth and Fifth Street. The appearance and size of the exterior matches the typical forty-foot-height of the surrounding buildings. The project was modeled on the city: a vertical grid was extruded, establishing a series of "lots" for lofts. All units have connected indoor/outdoor spaces. Double-height private balconies are typical; large urban decks fill the upper portion of the structure as it steps back on Shipley Street. These outdoor spaces offer a connection to the climate and culture of California, maintaining a tradition so prevalent in the Bay Area.

Within the exterior of the poured-in-place concrete "egg crate", translucent-glass-cube bay windows alternate with balconies in a musical composition. The image of the South of Market industrial type is kept familiar, new and synthesizing. The tradition of matter-of-fact industrial buildings converted to lofts is prevalent in Yerba Buena Lofts' robust frame that supports habitation. The flying form floors are post-tensioned to allow for durability and stability in this earthquake-ridden climate. The systemized and repetitive method also uses standardized forms for exterior walls and columns. As a result, the process of construction was fast and simple, exchanging time for material and facilitating higher quality. No scaffolding was used; the building was essentially built from itself. The actual material and construction are the final object.

Two recesses into three zones divide the 338-foot-long Folsom Street façade. The eastern recess leads to the lobby. Upon entering the building, the busy neighborhood is soon forgotten. The entry sequence also shares a lineage similar to the individual units. The lobby embodies a quiet and tranquil Japanese garden with an urban court, private plaza, dry garden, roofed and protected, yet open and connected. Ambiguity present in the entry sequence between outside and inside introduces the experience of the building that is to be seen throughout. It is also a way of establishing the character of Yerba Buena Lofts.

Andrew Lin



The complex offers 200 apartment units ranging in size from 640–1400 square feet. All units are built for loft-style living with 2 levels and 16'3" high ceilings. Channel glass on the outermost face of the bays allows light to radiate into the space through floor-to-ceiling high windows while letting the residents peer out to the city beyond. Free space inside the apartments is maximized by incorporating galley kitchens and compressing the zones for bathrooms, stairs, and storage. Inhabitants are invited to personalize and customize their spaces to suit individual needs of space and privacy. In the dense urban area of San Francisco, cubic feet replace square feet as a measure. The limited area is amplified by volume in generous quantities. Concrete is exposed as a finish on the interior and exterior, including all ceilings. Yerba Buena Lofts come complete with high quality finishes, fixtures, appliances and building materials.

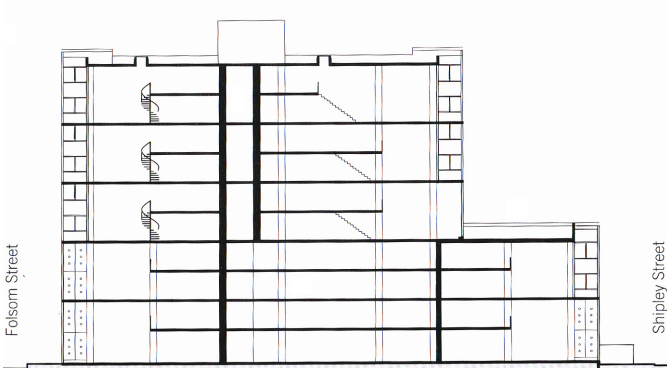
Parking and ground-floor work spaces are some of the amenities for residents. Four floors of parking are embedded in the lower section of the building, consistent with the floors of the residential units. Above on the Folsom side are six more floors of two-story lofts. The Shipley side is set back, making a city wall along Folsom Street. Its location sets it within walking distance of the yerba Buena Gardens, San Francisco's Center for the Arts, and other culturally significant expressions. The building is also conveniently close to the Financial District and Union Square. With its proximity to all the major transportation links, these lofts are ideal for urban living.




YERBA BUENA LOFTS

Section & Elevation

North – Folsom Street Elevation

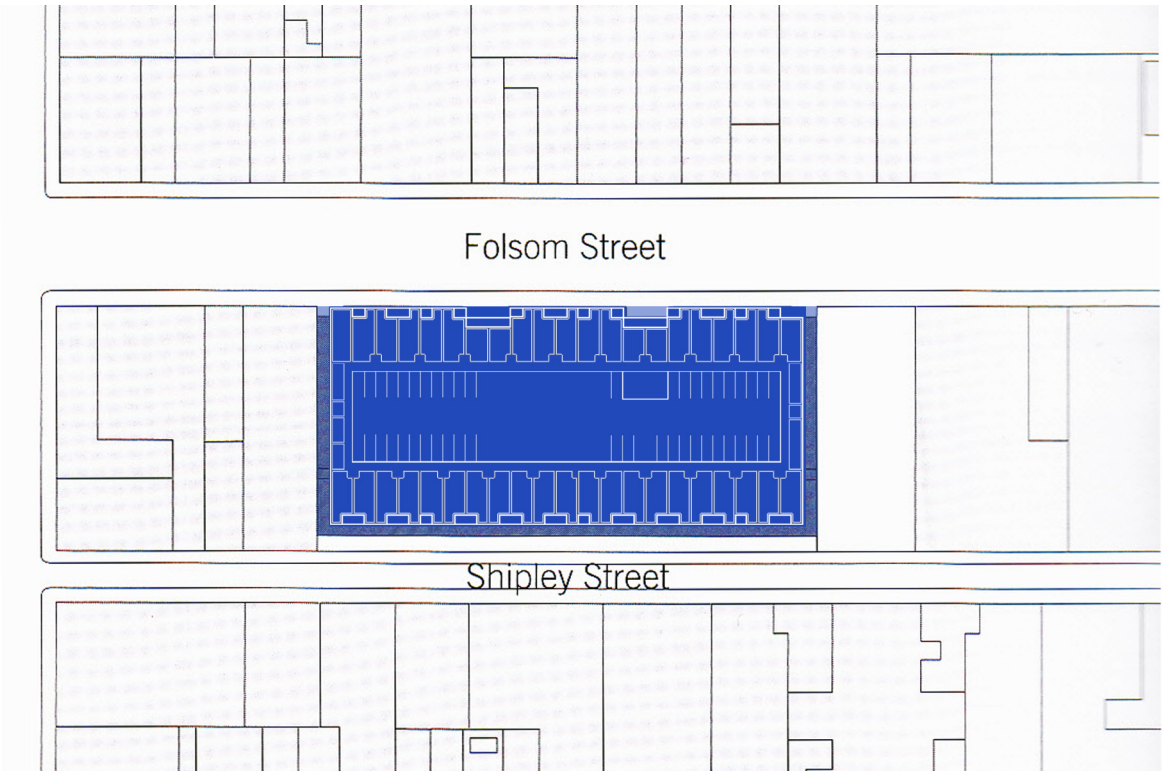


Section

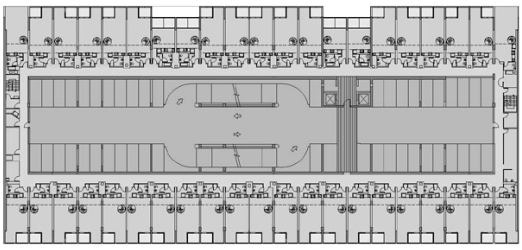
0 5 10m

YERBA BUENA LOFTS

Plans

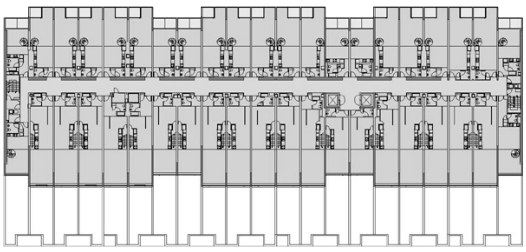


Site Plan



0 5 10m

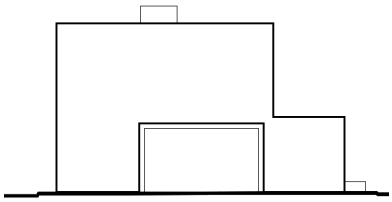
Ground



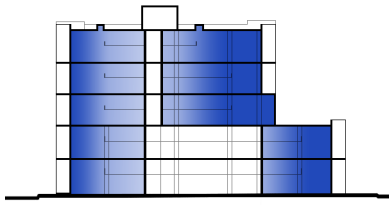
Third

YERBA BUENA LOFTS

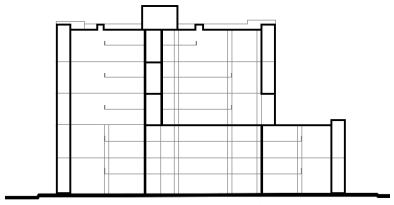
Graphic Analysis

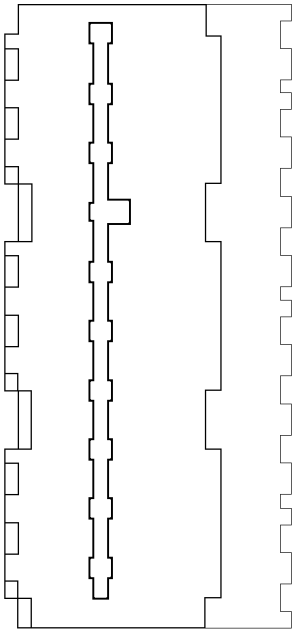


Massing

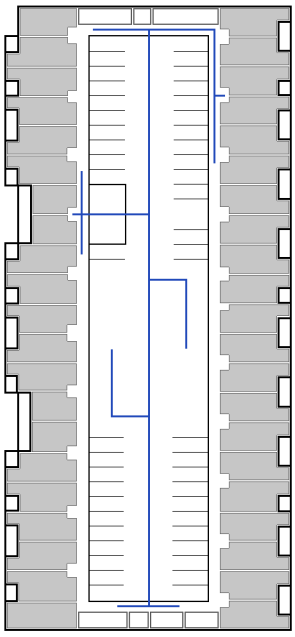


Natural Light

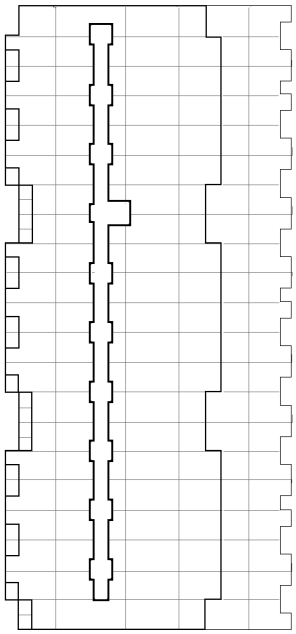




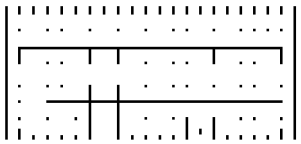
Hierarchy



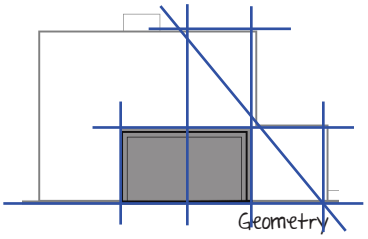
Circulation



Plan to Section



Structure



Geometry

MOUNTAIN DWELLINGS

Bjarke Ingles Group & Julien De Smedt
Copenhagen, Denmark
2008

BIG

MOUNTAIN DWELLING

Summary

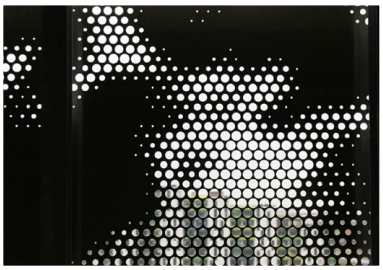
Bjarke Ingels Group was asked to design a project in Copenhagen, Denmark, that had 1/3 living and 2/3 parking. Instead of designing two separate buildings, BIG Architects decided to combine the two programs into one 108,267 square-foot structure. By doing so, BIG was able to keep the suburban backyard feeling while allowing the social intensity of urban density to come alive. The solution: terraced housing over the parking area.

The client, Høpfner A/S, also owns a project on the neighboring lots known as VM Houses. All the size requirements are the same as the first except this 2nd generation VM housing project requires 2/3 parking and the parking needs to be connected to the street.

The residents of the 80 apartments were the first in Orestand to have the ability of parking right outside their homes when the development was completed in 2008. The 2/3 parking contains enough square footage to house 480 cars as well as a plethora of bikes. Onside the structure, there is a sloping elevator extending to all the floors. In some places the ceiling is 52'6" to give the impression of a cathedral-like space. Vibrant colors of the rainbow cover the walls to move you through the space and establish the layers.

BIG





The living requirements asked that houses receive plenty of sunlight, fresh air, and views. Therefore, all terraces have gardens facing the sun, amazing views, and parking on the 10th floor. The roof gardens consist of plants changing character according to changing seasons. The building helps to water the gardens by way of collecting rainwater. The only thing keeping the elements out is a glass wall with sliding doors. Inside the apartments, space is minimally detailed, allowing the resident to be the designer. Moveable wall partitions work to close off spaces or open them up to switch the function of the rooms.

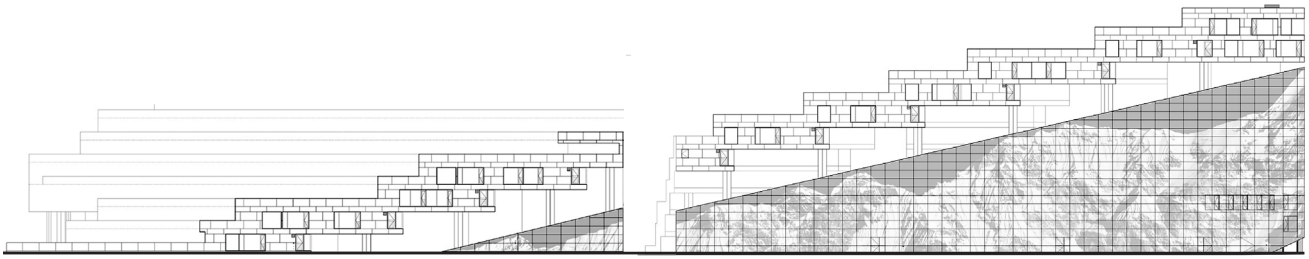
The south and east facades cascade from the 10th floor to the street edge like a concrete hillside covered by a thin layer of housing. On the north and west facades are plates of perforated aluminum, which let air and light into the parking spaces. The holes in the façade form a huge reproduction of Mount Everest. During the day, the darkness of the holes give the enormous photo a rough rasterized look. At night, the façade shows the different colors of the interior walls peeping through to give the effect of a photo negative.

The Mountain Dwelling by BIG is known for offering the best of both worlds. Not only does it contain housing and parking, it also offers easy access to the hectic city life in the center of Copenhagen with the tranquility characteristic of suburban life (Saieh, 2009).



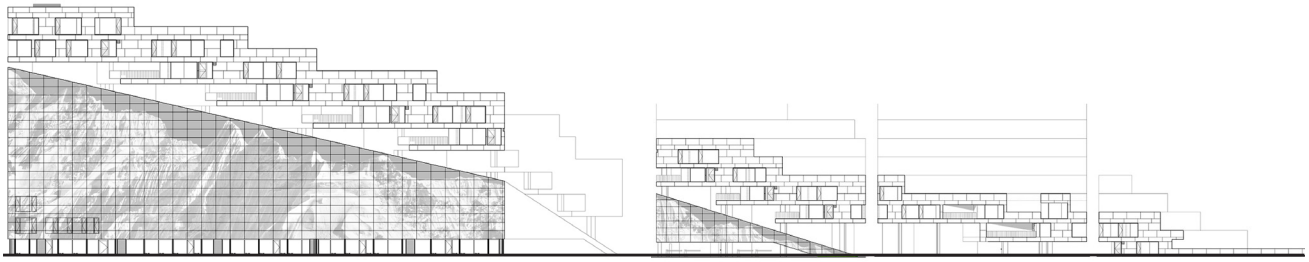
MOUNTAIN DWELLINGS

Section & Elevations



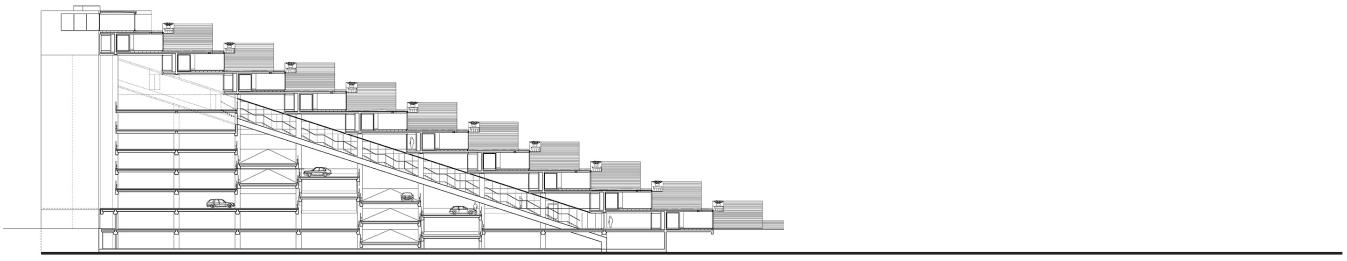
West

North



East

South



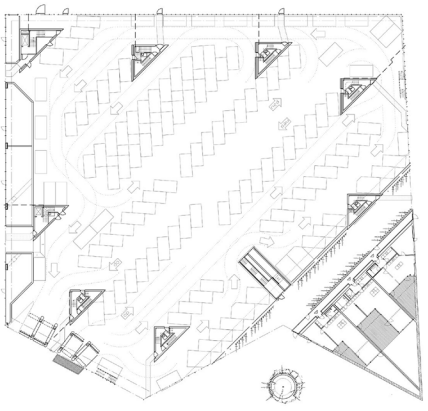
Section

0 5 10m

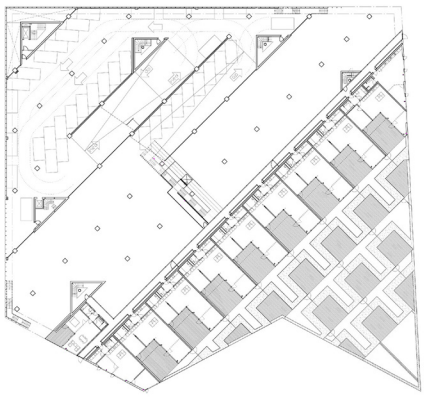
MOUNTAIN DWELLINGS

Plans

Site



Ground

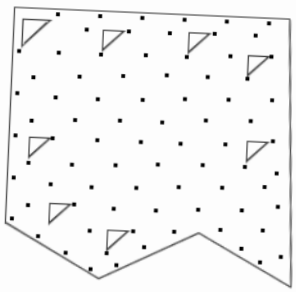


Third

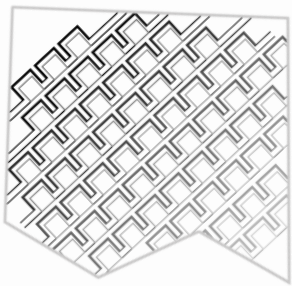
0 5 10m

MOUNTAIN DWELLINGS

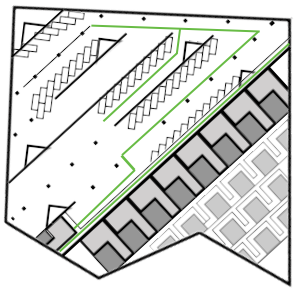
Graphic Analysis



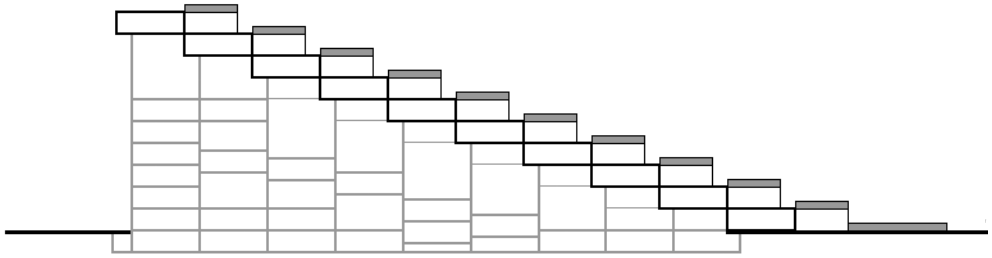
Structure

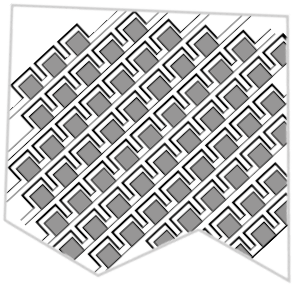


Hierarchy

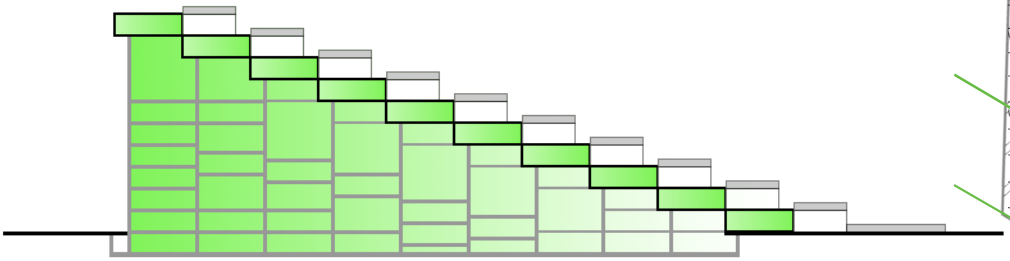


Circulation

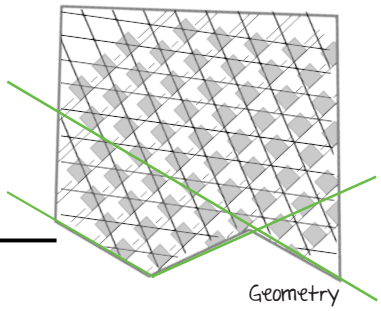




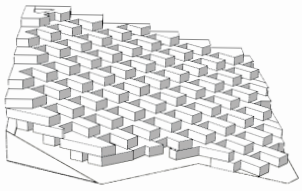
Plan to Section



Natural Light



Geometry



Massing

Kristen Pelou

RUE de NORD

Charles Henri-Tachon
Paris, France
2010

RUE de NORD

Summary

Charles Henri-Tachon recently designed the Rue de Nord apartments in Paris, France in 2010. This 3,270 square-foot social housing project is constructed entirely of concrete, paying close attention to detail. Three fundamental objectives reinforce the design decisions made to complete this building for client, SIEMP.

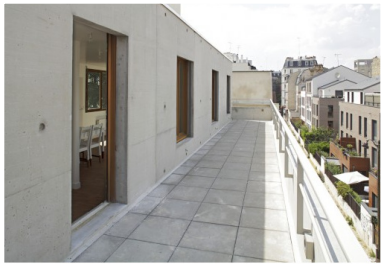
The first objective relates to the classification of social housing. The term "social" is essential as it indicates the ability of the residents to share a social background, creating cohesion among the building. Sociability relies on the idea of familiarity. In one consideration, familiarity is a matter of discovering your surroundings. This includes your perception of the surroundings from your own apartment, both inside and out. Even the smallest apartments provide natural light and views.

On the other hand, familiarity includes the recognition of others. This gives the feeling of being in the city as well as a part of the city. Each individual unit is recognizable by the façade. To your neighbors you are "the one with the large window" or "the one on the roof". Thereby, each inhabitant becomes a piece of the puzzle; an essential part of the building. Additionally, the shared spaces between neighbors provide a common character.

The second objective shows in the uncompromising layout of plans for the individual units. There is seemingly more space than there are surfaces, giving way to flexibility and function for different habitation patterns. In order to give a large spatial feel, diagonal views introduce the idea of transparency. Additionally, balconies and terraces are designed as a direct extension of the indoor living room. They are spacious and comfortable enough to serve as outdoor living areas, in addition to the interior spaces.

Kristen Pelou





Sequences of continuous spaces and a wide range of different interiors add to the openness of the plan. Interior elements are strategically located so as to avoid loss of essential elements—light, air and views. Bathrooms are placed opposite to the exterior walls and glass fanlights work to provide indirect natural lighting to the deeper interior spaces.

The third, and final, objective recognizes the importance of details created by the architect. Bathrooms are tiled, the form and fittings for the appliances are just right, and the use of concrete maintains its graciousness throughout. All in all, a variety of details were used to show that even with a small budget, quality and aesthetics are attainable.

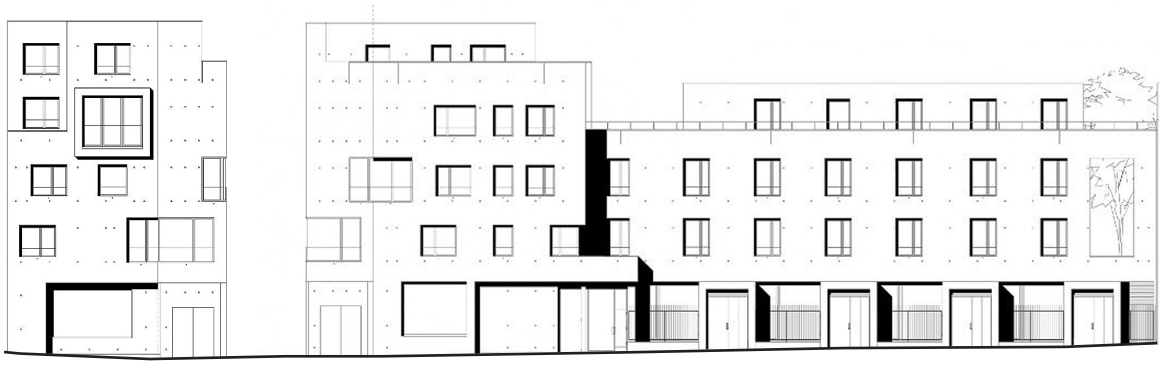
Detail is also found on the site. The design of the building reacts to the context of the street, reminding us of the particular urban situation. Set backs are used at the corner of the façade to give the appearance of delicacy. As you approach the building, it is easy to see that care was taken in every aspect of the design. Rue de Nord fits well into the context, the interior is generously laid out, and the ability of community growth is present throughout (Jett, 2011).





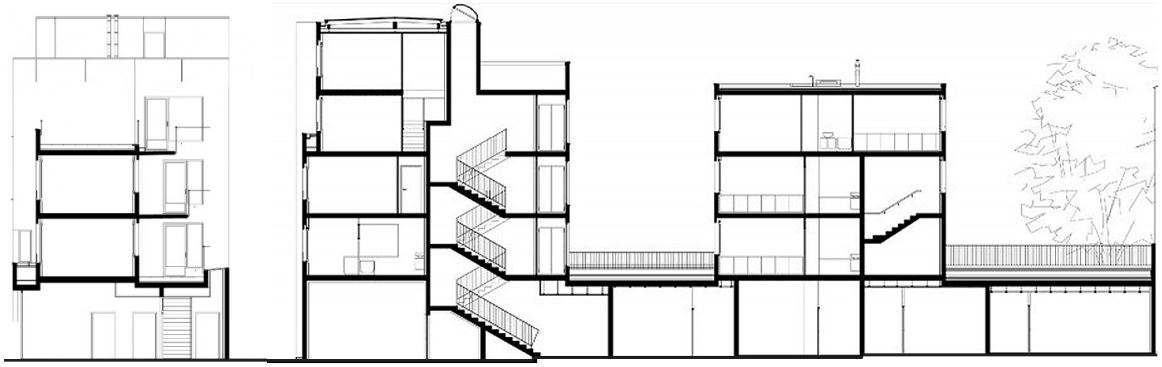
RUE de NORD

Section & Elevations



West

North



Section

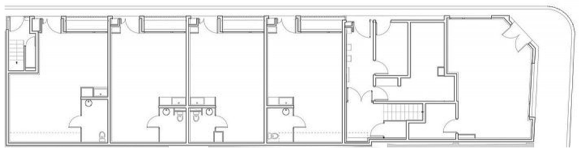
Section

Section

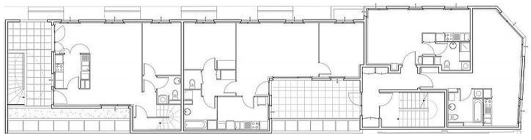
0 5 10m

Plans

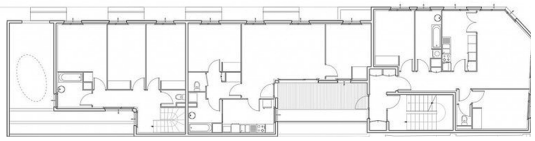
Site Plan



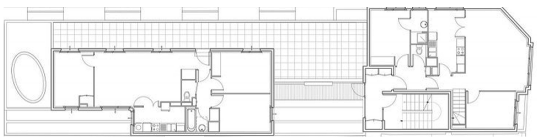
Ground



First



Second



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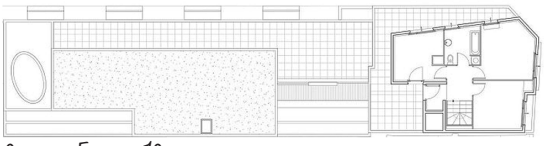

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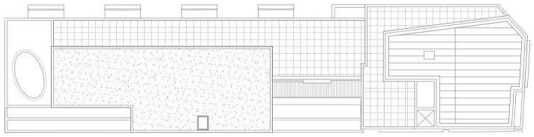

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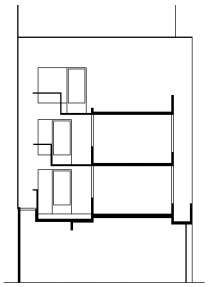

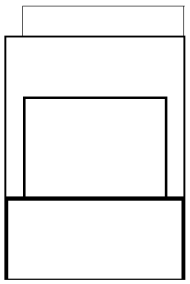

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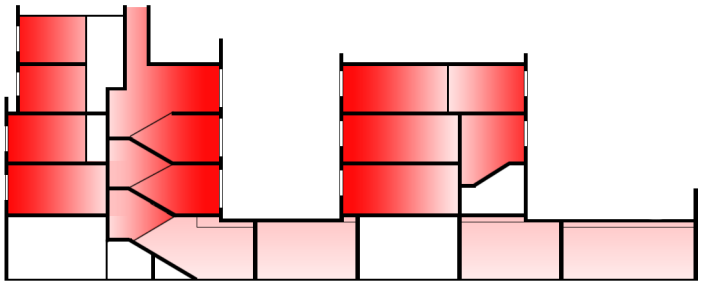

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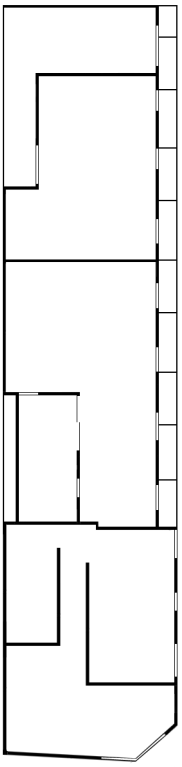

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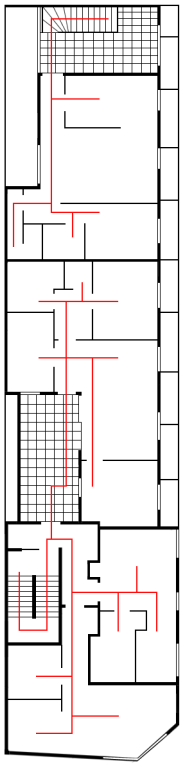

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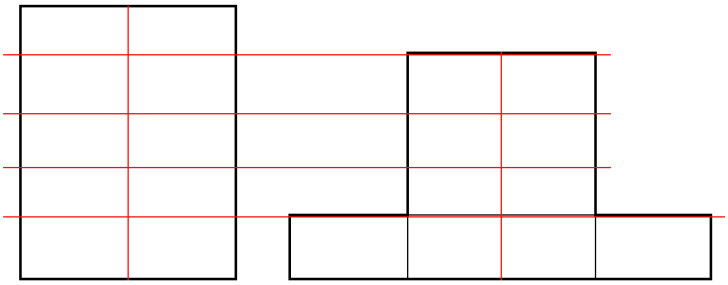

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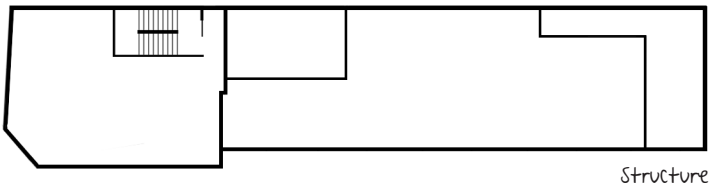

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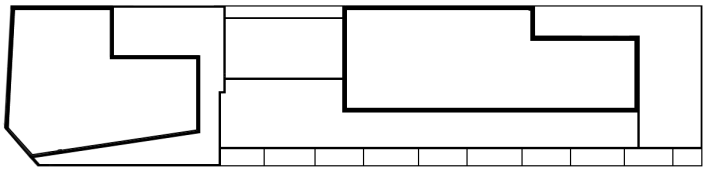


Hierarchy

CASE STUDIES
Summary

All three case studies share a typology but are different in many ways. Each case took a unique approach to issues that are common in residential projects. I looked at examples from different parts of the country to shed some light on cultural dissimilarities with regard to project outcomes. I also chose newer projects dues to recent advancements in technology that have had a large influence on design. My hope was to gain insight into the challenges I will face throughout my thesis and to reflect on how past projects have dissolved certain issues.

With regards to breaking down cultural barriers, Saitowitz's Yerba Buena Lofts did just that. At the time it was being built, critics gave two thumbs down, claiming that it resembled Soviet housing. San Francisco has been steeped in the image of a Victorian city for a long time. Any building that challenged this image was rejected, but times are changing. Saitowitz, one of the city's better-known designers of modernist buildings took on the challenge to design this simple yet luxurious loft building. The robust concrete frame, similar to industrial buildings, remains durable and true in its modern identity. After completion in 2002, attitudes shifted to a more liberal stance.

Some of the more common elements of Yerba Buena Lofts are the details to the interior. All lofts come standard with two floors and ceiling heights of 16'3" to allow lots of natural light to penetrate deep into the space. Large panes of channel glass work floor-to-ceiling providing endless views of the exterior balcony and city beyond. The outdoor living spaces, so common to the Bay Area, help disguise the building into its context. Other amenities include parking for residents, a common feature in North America.

BIG's modern solution to the Mountain Dwellings was widely accepted at its introduction. Copenhagen, Denmark, is known to have a wide variety of architecture. The challenge here was to design 1/3 living with 2/3 parking. The client did not specify one building versus two, and so BIG proposed combining two programs into one space. Unlike in America, parking is not an amenity often included in residential design. At the time of completion in 2008, these were the first apartments to offer parking right outside the homes.

In my opinion, the way in which BIG designed the parking was innovative and thoughtful. When you step inside, vibrant colors carry your eye throughout the space in a rainbow of fun. If you are on foot, a diagonal elevator greets you to take you to whatever floor you desire.

In some areas, the ceiling is over 50 feet tall, giving the impression of a cathedral-like space. If you are viewing from the outside at night, the colors of walls inside pour out of the gigantic photo of Mount Everest giving the look of a photonegative.

Some of the more common characteristics appear similar to Yerba Buena Lofts. The plans are open and flexible with a strong emphasis on indoor/outdoor living spaces. This residence was designed with green in mind. Every single unit has a terrace facing south or east with lots of sunlight and great views. The only things keeping the elements out are large floor-to-ceiling panes of glass.

With the Rue de Nord complex in Paris, France, Charles Henri-Tachon faced problems commonly associated with Social housing. How do you bring a community together through a building program while still allowing residents to encompass their own individuality? The need to create separate public and private space was amplified by the limited amount of volume available. Not only were the dimensions of the site small, but Paris also has laws limiting heights of buildings. To respond to these issues, Tachon created uninterrupted linear spaces on the inside to link communal space with the outdoors. Each unit is also unique to the building, much like its inhabitants, and each unit is necessary to complete the whole. By doing so, the final design encompasses continuity as well as a sense of social belonging.

One of the more common qualities, although not often thought of, was the architect's ability to stretch the small budget in great detail. Using only a few materials, Tachon designed a concrete structure much like Yerba Buena Lofts. The detail put into this simple monolithic material added elegance to the site.

As architects and designers, it is our job to find solutions that are both innovative and aesthetically pleasing. Attention to detail in using materials, laying out spaces, and creating an urban identity is essential to the profession. All three projects dealt with issues during the design process but all were resolved in the final building. Some projects dealt with criticisms of the community while others dealt with creating a sense of community. For some, budget appeared not to be an issue while for others it was the driving force. I was interested in studying the different cultural approaches, and in the process discovered a lot of congruence in building materials. Given the same typologies, all three cases have something new and different to bring to the table. Having researched these case studies for the last few weeks, I feel better prepared to take on the challenges that await me.

HISTORICAL CONTEXT

Urban living environments are a relatively recent phenomenon given the history of human existence. According to Schoenauer (1992), it is estimated by Philip M. Hauser that as late as the 1800s only 3 percent of the world's population lived in urban settlements of 5000 inhabitants or more. In just 50 years, the urban population grew to 6.4 percent and a mere 100 years later, the population reached 29.8 percent. Since 1950 the overall urban population of the world has grown annually at an average rate of 3 percent (p. 96).

Even while urban development was still in its early years, the adaptation of indigenous rural dwellings to new urban conditions was complementary to both psychological needs and economic forces. Schneider and Till (2007) talk about in vernacular housing the responses are oriented by culture and climate. The system of individual huts arranged around an open space is extremely flexible. In a way, this arrangement of the vernacular compound is a precursor to the early court-garden dwellings and a type of modern apartment plan (p. 13). The necessary harmony culminated in early urban dwellings still carries through in many ways today. One of the first expressions of this harmony was evident in the court-garden dwellings (Schoenauer, 1992, p. 96).

According to Schoenauer (1992), housing took a turn at the start of the Industrial Revolution. England was the first to experience the Industrial Revolution around 1760, for it was the only country in the eighteenth century that possessed the preconditions for a change from a basic local market economy to that of an international industrial one. It had many attributes working in its favor. The political institutions were stable, it had internal free trade and experience in foreign trade, it had an abundance of energy, its climatic conditions were advantageous, and it was in a favorable geographic location (p. 101).

As factories prospered and new technological advancements led to the extension of existing industries, people from over-crowded rural areas flocked to the cities. With an increase in the urban population, there was a need for more housing but many did not meet standards of fresh air and natural light. For years, societies struggled to find a way to deal with space limitations while still providing enough housing and sanitation for all its inhabitants. In 1855, Parliament passed the Nuisance Removal and Disease Prevention Act to establish health standards in housing (Schoenauer, 1992, p. 298).

The response to increasing urban areas in Britain and Europe was later adopted in the United States during the second half of the nineteenth century when apartment house living was introduced to New York City. NYC building regulations made no distinction between a "tenement" and an "apartment building" although there were a few notable differences. Both were multi-unit housing types with accommodation for three or more families living independently from each other (Schoenaver, 1992, p. 128). However, tenements varied in that they hardly met minimum spatial standards required by law.

According to "A History of Housing in New York City", little was understood of the consequence of rapid, uncontrolled growth, and in some cases, the desire to understand was even less (Plunz, 1990, p. 4). The mid-Nineteenth Century showed the spread of disease as an epidemic in strong correlation with lack of light and air. Epidemics were a grave threat to city life. According to Plunz (1990), one source calculated that 1 in 46 New Yorkers died annually in 1810 and by 1859, that number had shifted to 1 in 27. After the introduction of new sanitary reforms and medical breakthroughs, the death rate quickly declined (p. 33).

The earliest fully documented new project for the poor was Gotham Court built in 1850 by Silas Wood. It consisted of two rows of six tenements back-to-back and six stories in height. The buildings were organized along two narrow alleys. It was initially designed for 140 families, but by 1879, it was alleged to contain 240 families (Plunz, 1990, p. 6). It was tenement horror stories such as Gotham Court that made Americans so apprehensive about apartment style living. Schoenaver (1992) writes, at the time, new housing was only for the rich and consisted mostly of single-family houses. Many critics claimed it was "wicked and immoral to house several families under one roof, a domestic arrangement only suitable for low income families" (p. 4).

Richard Morris Hunt is credited with the design of some of the first New York City apartment houses. This Paris trained American architect was the first graduate of the Ecole des Beaux Arts. Around 1855, he is said to have designed an apartment house on Wooster Street, although his best-known early building was the Stuyvesant Apartments. These apartments, also known as the French Flats, were complete in 1869.

Until the 1880s, affluent New Yorkers steadfastly refused to live in apartments, or French flats as they were called. The term "French flat" generally referred to multiple dwelling for the middle class: large apartments as opposed to small tenements (Plunz, 1990, p. 62). Although in spite of the growing fondness for all things French, the French flat was not popular among those who could afford other alternatives.

Americans also shared extreme fears associated with apartment style living, including adultery and the destruction of family life. Sarah Gilman Young explained:

> There are no objections to apartment houses in American cities, except prejudice, and this is stronger in the United States than elsewhere. To Americans it is a question of rank. Anything that resembles what we term a tenement house is tabooed. There being no fixed caste in America, as in foreign states, we have established a certain style of living and expenditure, as a distinctive mark of social position...The desire to live in a fine house is particularly American. Europeans of distinction, of all countries, think much less of the exterior of their residences. (Plunz, 1990, p. 62)

According to Plunz (1990), Young partially blamed the quality and management of American apartment houses saying, "There is no doubt that apartment houses would gain rapidly in favor in America, if properly constructed and rightly managed. They should at first be designed by architects who have completed their studies in Europe, especially in France, where this system has reached its greatest perfection" (p. 62). What Baron Haussman had done for the bourgeoisie of Paris was the considerable envy of the New Yorker.

Eventually, the concept of apartment style living gradually gained acceptance in New York City. However, these dwellings did not offer the flexibility inherent in most Parisian flats, which were considered to have set the standard of perfection for that type of housing. They could be subdivided further into private apartments by joining adjacent rooms in accordance with individual needs or preferences. Six years after Hunt's apartment houses were introduced to New York City, 112 new apartment houses were built in a single year (Schoenaver, 1992, p. 334).

Schneider and Till (2007) admit it is difficult to trace a linear route through flexible housing, with one exemplar apparently informing the next in a determinist way. Their belief is that flexible housing developed in two ways. The first method is a result of the evolving conditions of the vernacular. The second method is a result of external pressures that prompt housing designers and providers to develop alternative design solutions, including flexible housing (p. 13). Although it has existed for some time, flexible housing has been in and out of focus over the course of the twentieth century.

With the growth of families, whether nuclear or extended, the care of young children and the ill, and the death of older family members, the demands on the dwelling to meet a changing family size and structure are considerable. Following the First World War, European nations faced high urban housing demand. Previous models based on bourgeois apartment blocks and standard terraced houses did not meet the demand in terms of economics, density, or required scale. Bruno Taut wrote in 1920, "Versatile is the house: just like men, flexible yet solid" as cited by Schneider and Till (2007, p. 17).

Eight years later, the famous architect Marcel Breuer wrote in Das Neue Frankfurt as cited by Scheider and Till (2007):

> Because the outside world of today affects us in the most intense and disparate ways, our way of life is changing more rapidly than in previous times. It goes without saying that our surroundings will undergo corresponding changes. This leads us to layouts, spaces, and buildings of which every part can be altered, which are flexible, and which can be combined in different fashions. (p. 18)

The Congress of International Architects (CIAM) held in Frankfurt in 1929 was a debate for the best solutions for new reduced space standards. The title of the convention literally translates to 'Subsistence Dwelling' (Schneider & Till, 2007, p. 10). Even under the same law, interpretation lead to different outcomes. In Germany, the bylaws generally resulted in standardization of size. The Netherlands, on the other hand, looked at processes of use.

With the first episodes of flexible spaces motivated by social and economic forces, as written by Schneider and Till (2007), the second episode was driven by technological influences. Particularly, the focus was on adoption of industrialized solutions to housing provisions (p. 21). From 1914 on, Corbusier designed projects that could be built on an assembly line. Although this push had a profound effect on nineteenth century life, its use in terms of mainstream housing did not start until the beginning of the twentieth century.

Friedman (2002) writes, as with most new ideas, the post-war housing industry had to deal with a few realities. First, the traditional design and construction methods were no longer feasible practices in affordability considerations. They simply took too long to produce and most building components had to be custom built on site. The cheaper alternative was to use pre-manufactured components of standard sizes that shippable to the site, immediately ready for installation. Second, there was significant savings and efficiency in small-house construction that accumulated not from major items but from meticulous attention to innumerable details and alternatives (p. 21).

Schneider and Till (2007) state that Walter Gropius was a main figure associated with industrialized housing. Similar to Le Corbusier's intentions, he saw the house as a set of components rather than a complete product. His intent of the single prototype was twofold. First, he showed the efficiencies in factory based construction in terms of minimizing site time and better build quality. Second, he demonstrated how standard elements enabled variation and thereby could respond to differing customer demands or economic means (p. 22). With the excess capacity of the defense industry towards the end of the Second World War, there was enough manpower to carry on the development of prefabrication and standardized systems of production.

Another large shift occurred with the return of millions of veterans to North America and the ensuing baby boom of the 1940s and 50s. This, coupled with the stagnant housing industry as an after-effect of the Great Depression, created a housing crisis of great magnitude (Friedman, 2002, p. 20). The demand outweighed the supply, there was a shortage of skilled labor, and there was the predicament of overcrowding and enforced communal living combined with the emergence of non-family groups.

Friedman (2002) writes that by the 1940s, the average house had doubled in price, which stimulated the development of new building materials and products: prefabricated window units, weather-resistant exterior plywood, latex glues and caulking, composite-board products, and improved drywall construction. William and Alfred Levitt introduced assembly-line production system to the housing industry around that time. The Institution of power tools and labor specialization at the construction site is attributed to the Levitts. They are self-described as the General Motors of the housing industry (p. 22). They divided housing construction into 26 steps with extensive use of prefabricated components. Hypothetically, with this building efficiency, every 15 minutes an 800-square-foot house was built.

In the late 1960s, flexibility became an issue pursued by architects as well as sociologists, who believed that every occupant should have the right of choice in terms of location and orientation, and in the layout of the dwelling unit. Eventually, stringent government regulations provided a foundation of affordability that established adaptability as a criterion in the diligent and efficient planning of these homes (Friedman, 2002, p. 20).

From the late 1960s onwards, there were a growing number of schemes that developed the principles of flexible housing in the context of user empowerment. According to Schneider and Till (2007), two leaders in this field were French architects Luc and Xavier Arsene-Henry. They defined three principles based on the central belief that "not to reckon with the originality and unique character of each person is to negate one dimension of Man" (p. 28).

Putting their ideas into practice, the two architects designed a large number of pioneering buildings within which the future occupants could determine the layout for their apartment. They allowed each occupant to plan the location, type and number of rooms as well as the external elevations. This gave the occupants the choice of how they wanted to use spaces instead of architecturally predetermining their lives. Research conducted by Manuel Perianez found that the plans produced by the occupants would never have been made by architects, but reflected individual and sometimes quite idiosyncratic wishes (Schneider & Till, 2007, p. 29).

Another way to maximize efficient use and keep prices low was to keep the floor plans square or rectangular with as few interior partitions as possible. An added benefit of these floor plans was lowered heating costs due to more efficient surface area exposure. Schneider and Till (2007) quote Mies van der Rohe saying:

> For the present, I only build the perimeter walls and two columns within, which support the ceiling. Everything else ought to be as free as possible. Were I to succeed in producing cheaper plywood walls, I would only design the kitchen and bathroom as fixed rooms, and the remaining space as variable unit, so that I would be able to subdivide these spaces according to the needs of the occupant. This would also have advantages insofar as it would provide the possibility to change the layout of a unit according to changes within a family, without large modification costs. Any joiner or any down-to-earth laymen would be in the position to shift walls. (p. 20)

Improved living environment was essentially a reevaluation of conventional housing form restrained by demands of affordability. Space-making devices came into play in multiple ways. Large plate-glass windows and patio doors were used to relate houses to their immediate surroundings. In addition, drapery, accordion walls, and ceiling-high movable partitions and storage devices were used in place of traditional studded walls making spaces more flexible and adaptable.

A brief investigation of the history of housing suggests issues of flexibility per se are not the primary motivation in the design of housing, but has usually developed in response to another set of demands. In the early years of the Industrial Revolution, the demand was to house large populations in densely populated cities. For years, societies struggled to find a way to deal with space limitations while still providing enough housing, lighting and air, and sanitation for all its inhabitants. The return of American architect Richard Morris Hunt from the French school of Ecole des Beaux Arts in the mid-1800s led to the start of the New York City apartment houses. With French flats serving as the icon of perfection for that housing type, America had founded its next revolution.

Another shift occurred with the return of Veterans from the Second World War and the ensuing baby boom of the 1940s and 50s. The traditional design and construction methods were no longer feasibly practices in affordability and they simply took too long to produce. This prompted the insistence of prefabricated construction materials and methods. Although the struggles have left their mark in the history of housing, flexible housing strategies are ever-rising and forthcoming. It's only a matter of time before architects and designers start to make flexible architecture a standard in design.

THESIS PROJECT GOALS

Academic & Professional

To formulate a thought provoking theoretical premise and unifying idea that pushes the limits of innovation and creativity.

To conduct research based on the parameters of my proposal in a timely and complete fashion.

To design a project of the specified typology while testing new methodologies based on the research results of the theoretical premise and unifying idea.

To communicate my knowledge and design with a presentation that is professional, engaging and complete.

To compile all of the education I have received thus far and work it into a clean, concise, and captivating project.

To design a project that will show future employers my ability to process information in a timely, organized, and intuitive manner.

Personal

To use the tools I learn with this project and others towards the success of all future endeavors, both professional and personal.

To provide an accurate representation of my own interests and ideas.

To be able to look back at where I started and where I have come and to feel a sense of pride.

SITE HISTORY

A rush for land marked the early days of the United States and disputes over property rights usually involved fighting for claims. Land was free in 1854 when the first settlers came to present-day Olmsted County. The first person to state property claim in Rochester was Thomas Simpson, a land surveyor from Winona, MN. He marked his territory with a shanty of rock and sod. However, when he left for home and returned several weeks later, he discovered somebody had jumped his claim.

George Head, a baker from Waukesha, Wisconsin, was the man who saw potential along the Zumbro River and decided to claim his land. Today, he is known as the founder of Rochester. It did not take long for people to hear of the land and make the journey to stake their claim. Shortly thereafter in 1857, it was estimated that 700 town plots were plotted. The city was already expanding with more and more on their way. Head finally built a log cabin where Broadway and Fourth Street South now rest.

Twenty-nine years after its inception, Rochester was hit by a devastating tornado in 1883, taking at least 24 lives. A man known as William Worral Mayo, an English doctor from the countryside, was enlisted to care for the victims (Sellnow, 2008). Mayo, with his two sons Will and Charlie, along with the help of Mother Alfred Moes and her Sisters of St. Francis, brought some relief back to the city by helping with the aftermath of the tornado. Because of the great success of their efforts, Mother Moes urged Mayo to start up a hospital. He was unenthusiastic at first, but the Sisters of St. Francis had started to save their money. Four years later, they were able to purchase land for a hospital with plans for 27 beds and suggestions from Mayo and his sons.

Mayo was 70 when they opened the new St. Mary's hospital. His sons, who were doctors as well, helped lay the foundation of good practice. In the years following, more help arrived. Doctor Plummer joined the growing practice and helped to implement many new technologies and advancements in patient care. He also introduced a clinical practice, which included a model for modern medical record-keeping.

In 1919, the Mayo brothers turned the private practice into a nonprofit endeavor, giving most of their life savings to charitable foundations. Later, two additional hospitals were built, making downtown Rochester a spectacle to visit from all around. The Mayo Clinic, along with the Rochester Methodist Hospital and St. Mary's Hospital make up the Mayo Clinic Campus. Today, the clinic offers virtually every medical expertise, treatment and diagnostic tool in existence (Hanson, 2007).

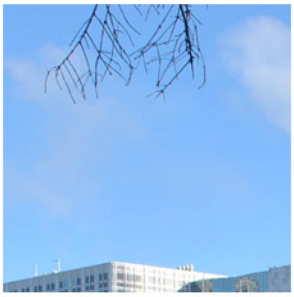
The Clinic campus occupies 13 million square feet—that is 2.5 times the size of the Mall of America. In 2010, the number of employees was 56,100. That includes 3,700 staff physicians and scientists, 3,300 residents, fellows and students, and 49,100 administrative and allied health staff. The Mayo Clinic was initially viewed as unconventional for practicing medicine through a group teamwork approach. However, integrated group practice quickly caught on and has worked to make the Mayo Clinic what it is today.

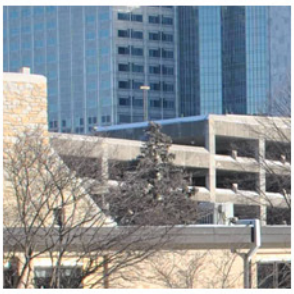
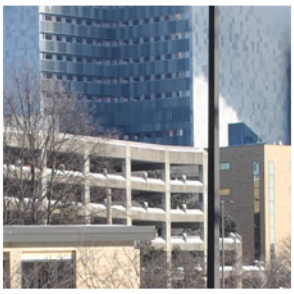
I chose Rochester as my site for this thesis project because it is a growing community with lots of potential for new ideas. When I first moved to Rochester in 1990, the population was 70,745. In just twenty years, it grew to 106,769 people. This growth is, in large part, due to the success of the Mayo Clinic. This thesis is geared towards multi-unit housing to serve Mayo Clinic employees, students, and visitors.

The Clinic draws close to 2 million visitors each year, some requiring longer visits than others. For those visitors who need to stay little longer, hotels may not be the best alternative. Perhaps short-term housing would better suit their needs. Of those 56,100 employees, many are students fulfilling three-year residencies to complete their education. A large portion of those residents may also find full-time jobs at the Clinic.

Due to the large numbers of visitors and employees, there is a constant need for short-and long-term housing. Also, because of its rich history, I believe Rochester is the perfect place to test the boundaries of innovation. I think Rochester will always benefit from new housing types because so many family dynamics come and go over the years.

SITE ANALYSIS









SITE ANALYSIS

The historic southwest neighborhood of downtown Rochester has a lot to offer in terms of amenities, accessibility, and safety. Just a few blocks from where George Head first staked his claim to the land, this neighborhood has existed since the town's beginning. Given its close proximity to downtown, there is a unique mix of residential homes, small businesses, and larger businesses. The entire neighborhood is within walking distance to the Mayo Clinic as well as transport links. This historic southwest offers the advantages of urban living without the constraints normally associated with it.

Traffic

Both pedestrian and vehicular traffic are relatively moderate on the site. Its close proximity to the downtown center makes it more heavily traveled than other urban areas in Rochester. All streets surrounding the site are single lane. However, a few blocks in each direction lends itself to two lane roads with an average speed limit of 30 mph. The relation to major highways and roads also bring more traffic. Being that there are businesses, parks, and schools in the neighborhood, pedestrian traffic is also moderate.

Plant Cover and Visual Forms

The historic southwest neighborhood of Rochester is filled with the rich history of the city. This includes lots of plant cover or trees and vegetation that have been around for over a hundred years. New vegetation is planted annually as well as the removal of dying vegetation to keep the city healthy. A mix of residential and small business exists in a variety of styles. The heights of these buildings range from single story to twenty stories plus. Views of downtown Rochester fill the site to the northeast.

The overall quality of the site is pleasant. Neighborhood associations work hard to keep up the beauty and character of this historic district. Residential lawns are well cared for, sidewalks and streets are clear of debris, and crime is virtually nonexistent. The noise levels are also quite low considering its location to the city center. A lot of coverage is provided by the existing vegetation and building density.

Soils

Minnesota contains many sub-orders of soils, while Rochester is abundant in three of those sub-orders. The most prominent category covers considerable land area of Minnesota and is the basis for the state's productive agricultural base. Its most distinguishing feature is a thick, dark-colored surface layer that is high in nutrients. It occurs throughout the prairie areas of Minnesota. The name is descriptive in that most of these soils usually have a rather loose, low-density surface.

The second category of soils in the region has an accumulation of aluminum and iron. They are primarily fertile soils of the forest, formed in loamy or clayey material. The surface layer of soil, usually light gray or brown, has less clay in it than does the subsoil. These soils are usually moist during the summer, although they may dry during occasional droughts (Anderson, Bell, Cooper & Grigal, 2001). All soils present in the area are suitable for building.

Water Table

Rochester does not experience many problems with water supply, neither too much nor too little. A commonly employed strategy for Minnesota is artificial subsurface drainage. This helps to improve the productivity of poorly drained soils by lowering the water table, providing greater soil aeration, and enabling faster soil drying and warming in the spring. The water table in and around Rochester is at a normal level. The lowest recorded frost depth for Rochester is 42 inches.

Slopes

The slope of the land is significant in terms of water drainage and construction methods. All of the water flows from the Southwest to the Northeast, towards the downtown center and the Zumbro River. The overall elevation changes from 1082 feet to 1063 feet above sea level creating a variation of slopes in the area. The slope varies anywhere from 5% to 11.45% on and around the site.

Views

North

East

South

West











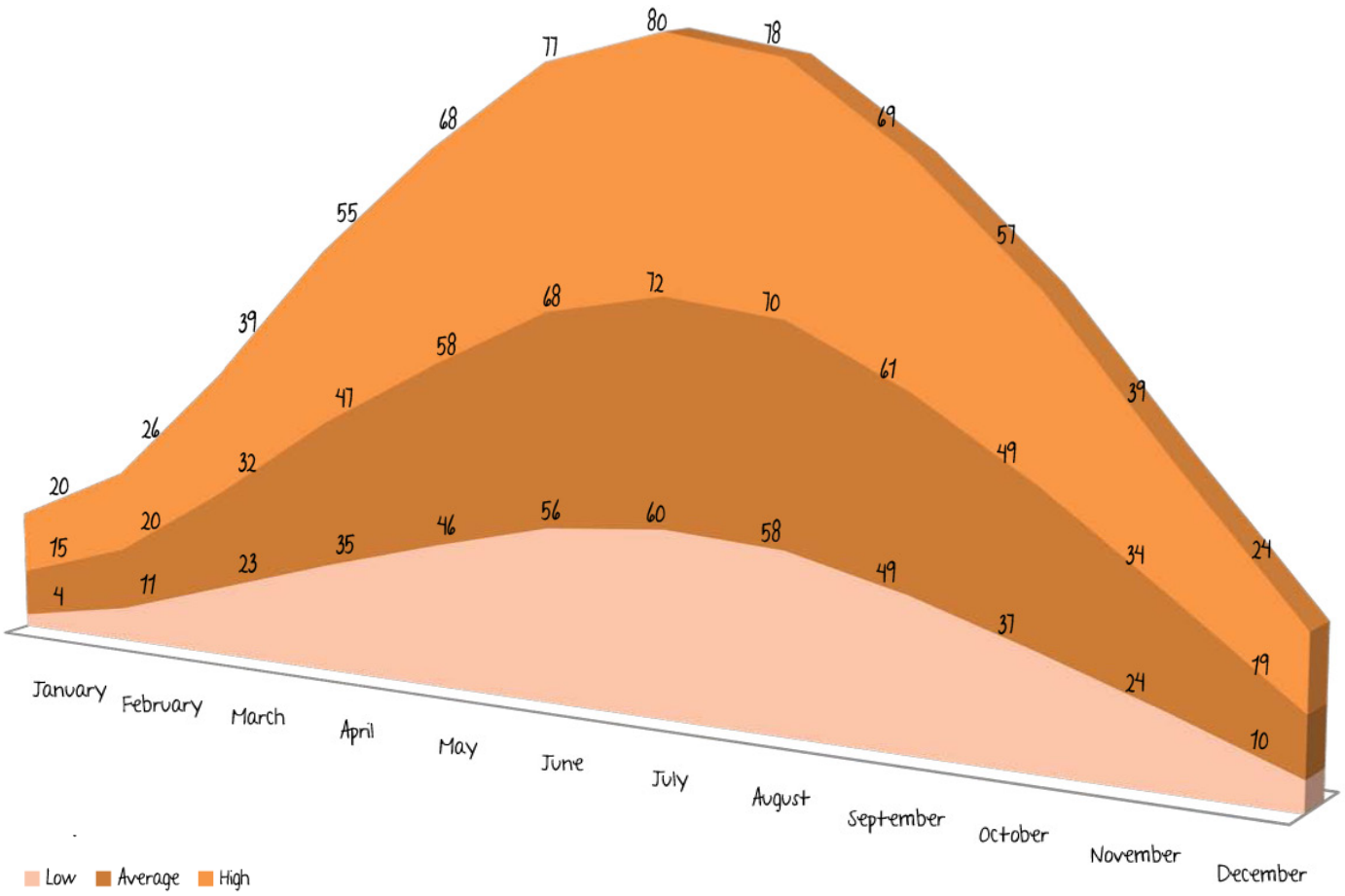

Roger Thiemann

CLIMATE DATA

Rochester, MN

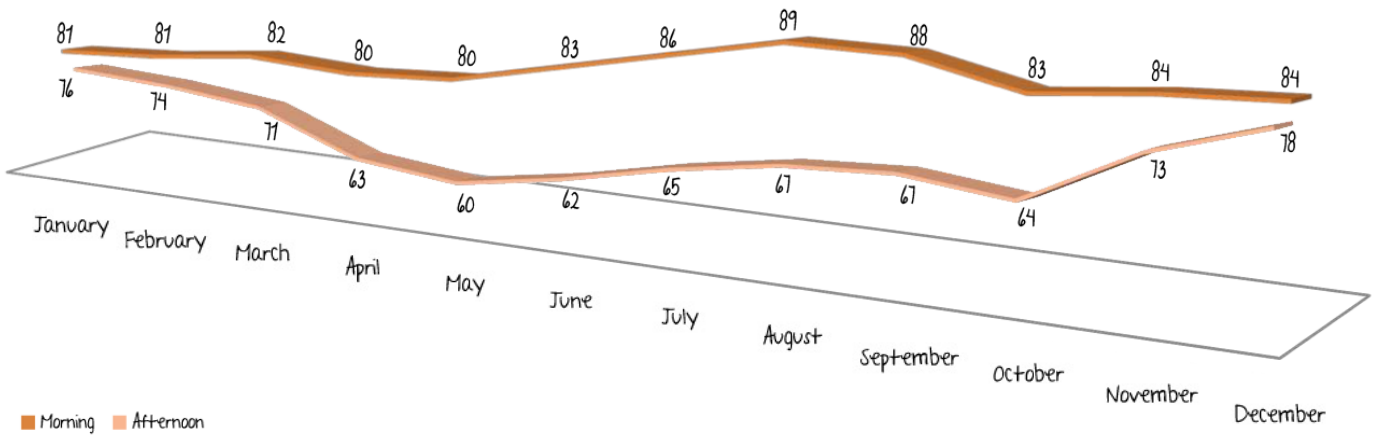
CLIMATE DATA

Temperature (°F)



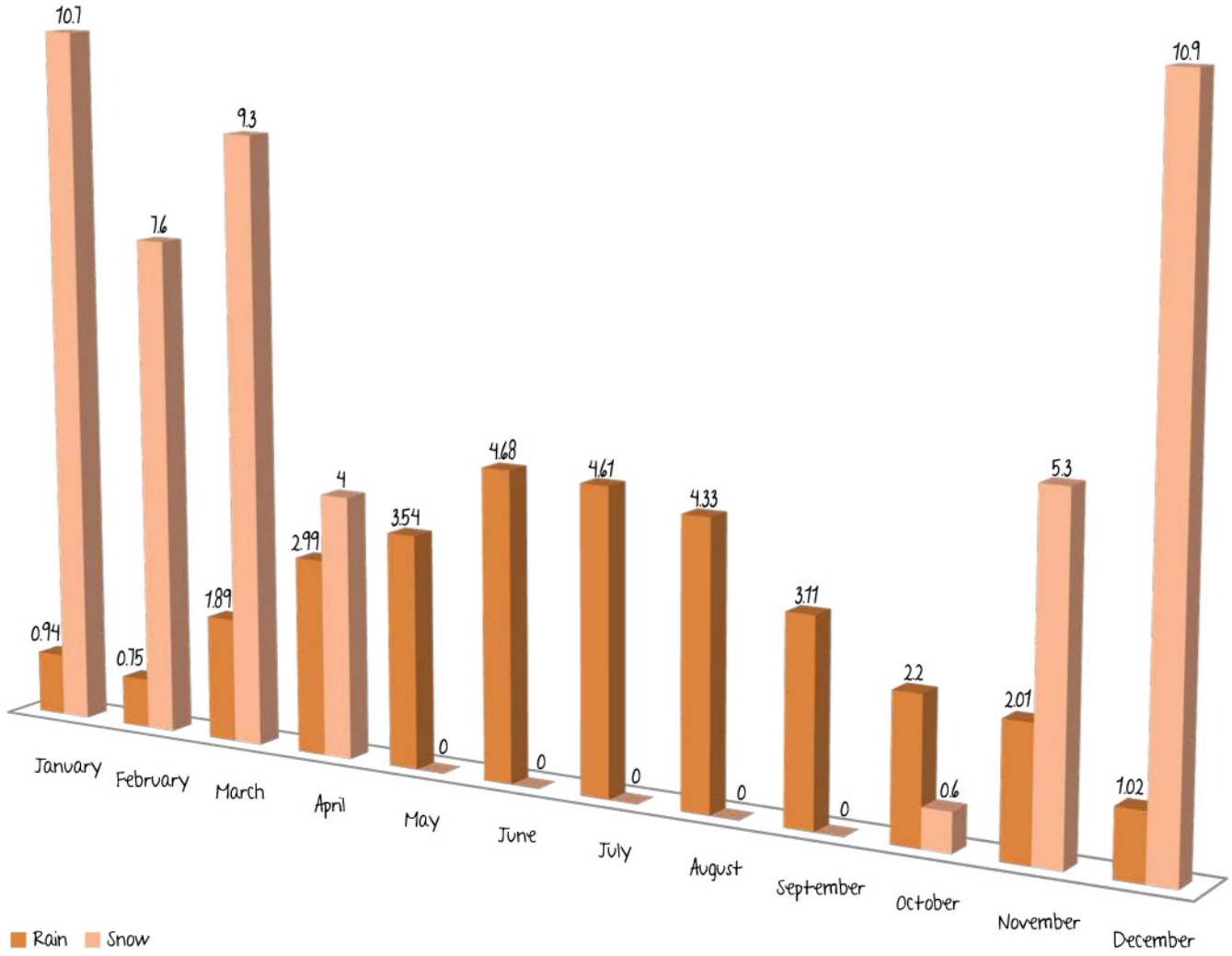
CLIMATE DATA

Relative Humidity (%)

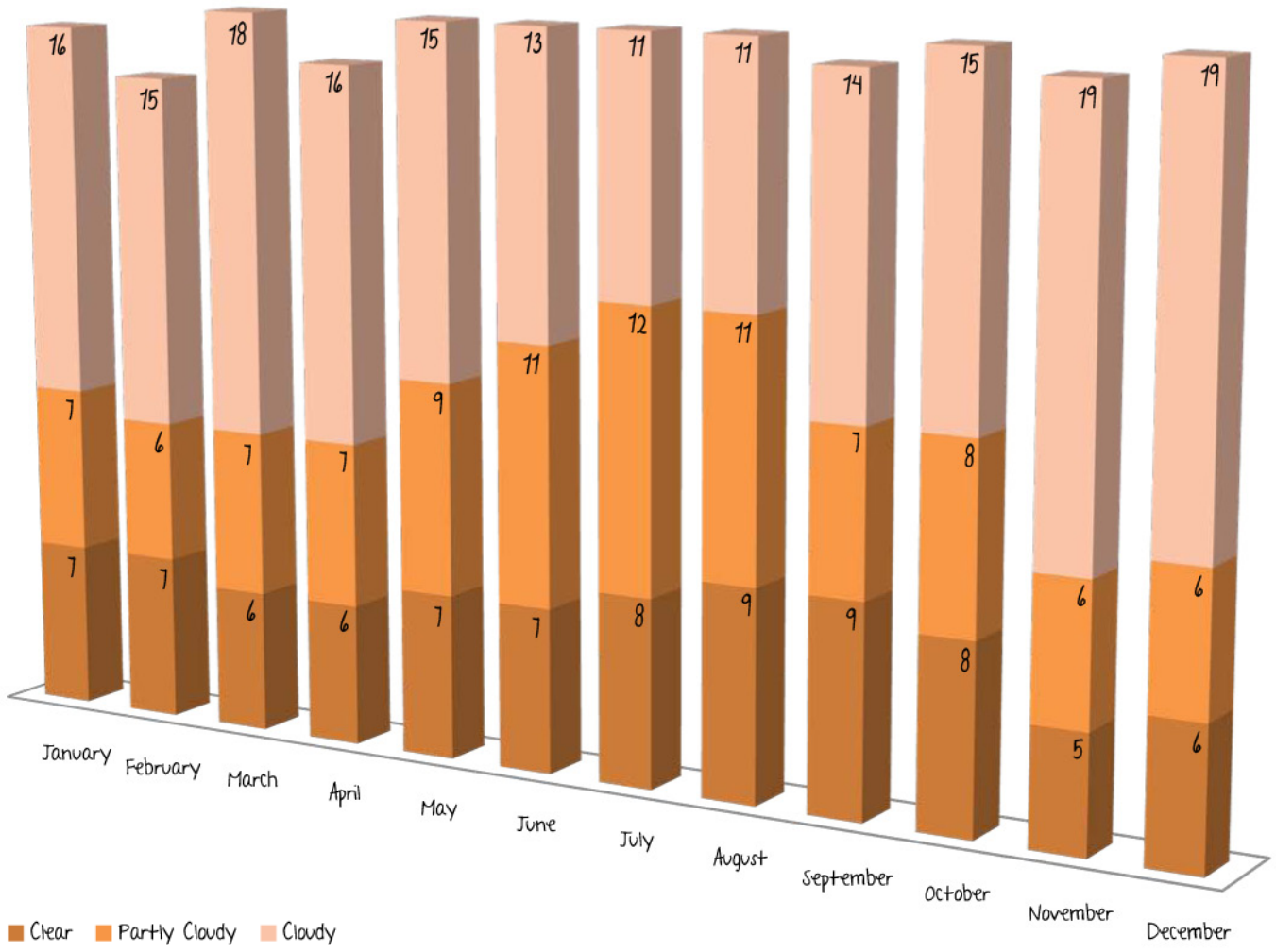


CLIMATE DATA

Precipitation (Inches)

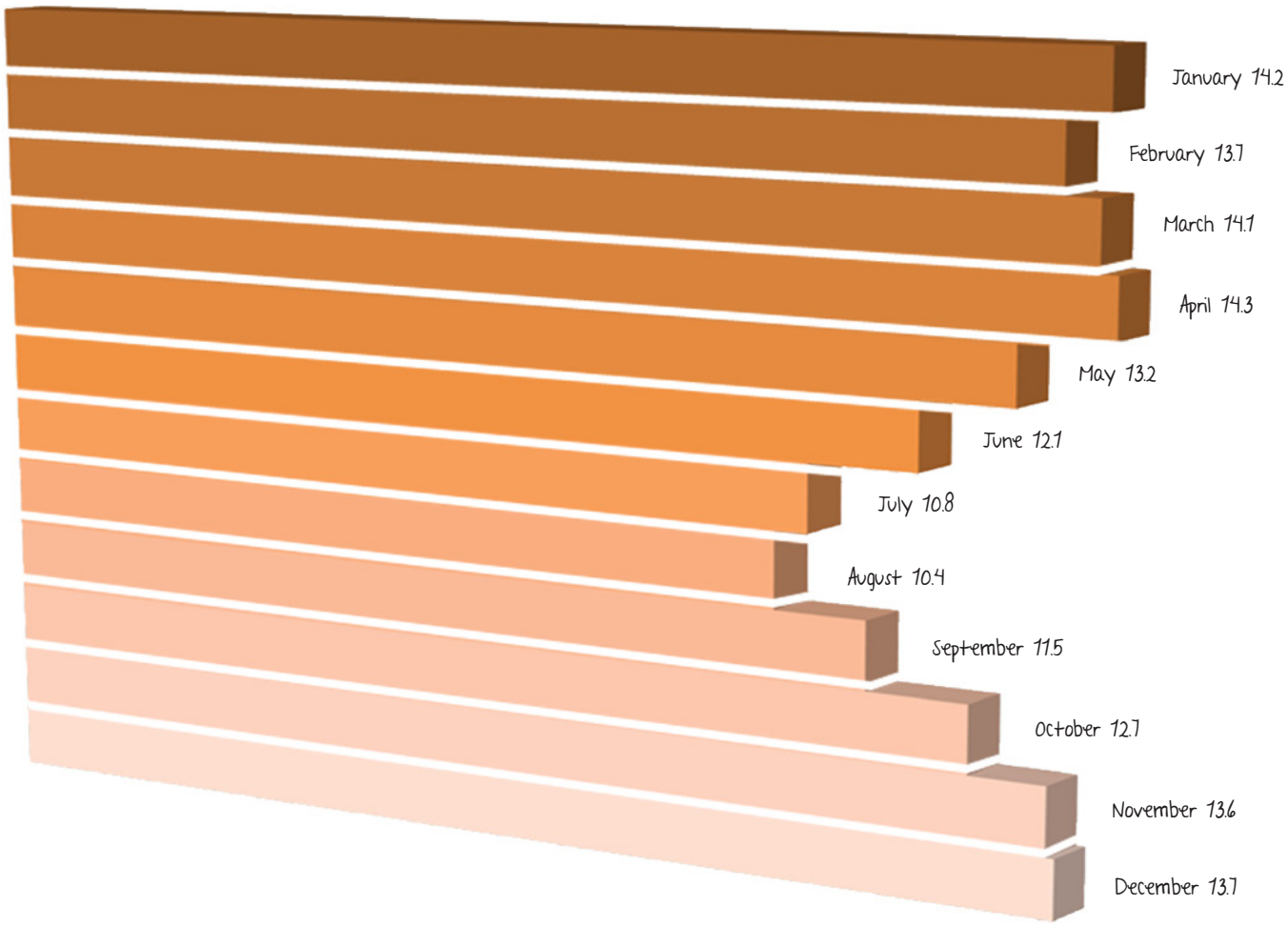


Cloudiness (Days)

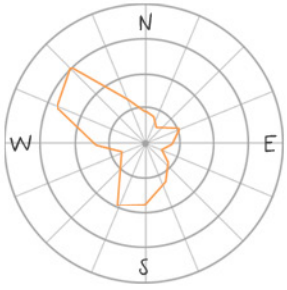


CLIMATE DATA

Wind Speed (MPH)



CLIMATE DATA
Wind Direction



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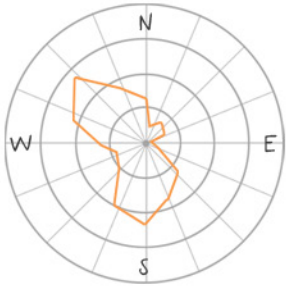

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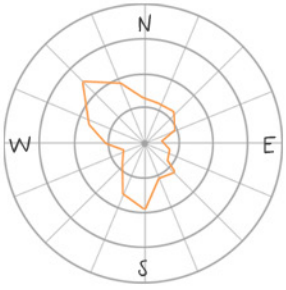

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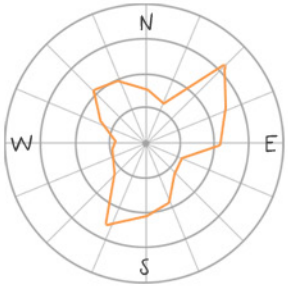

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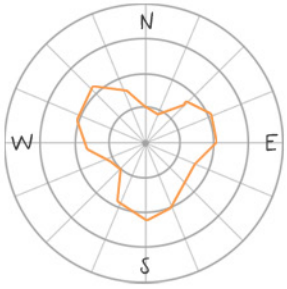

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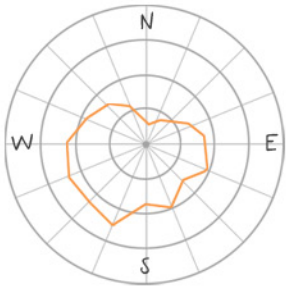

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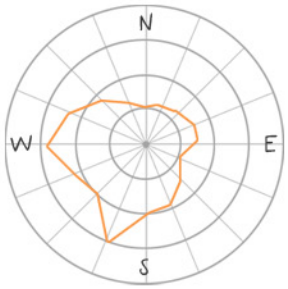

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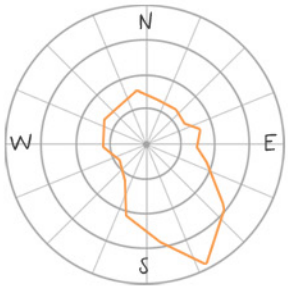
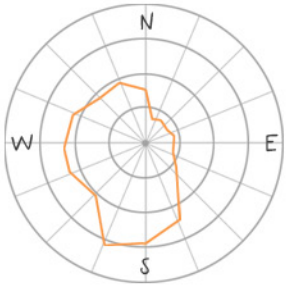


August



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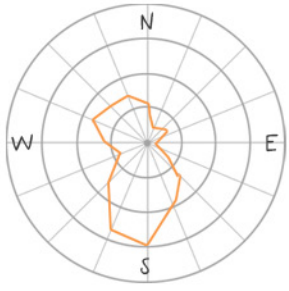

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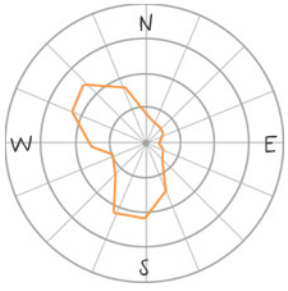

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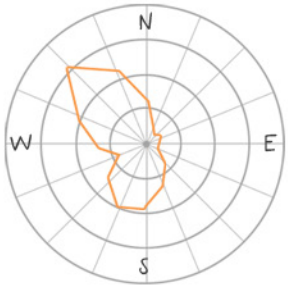
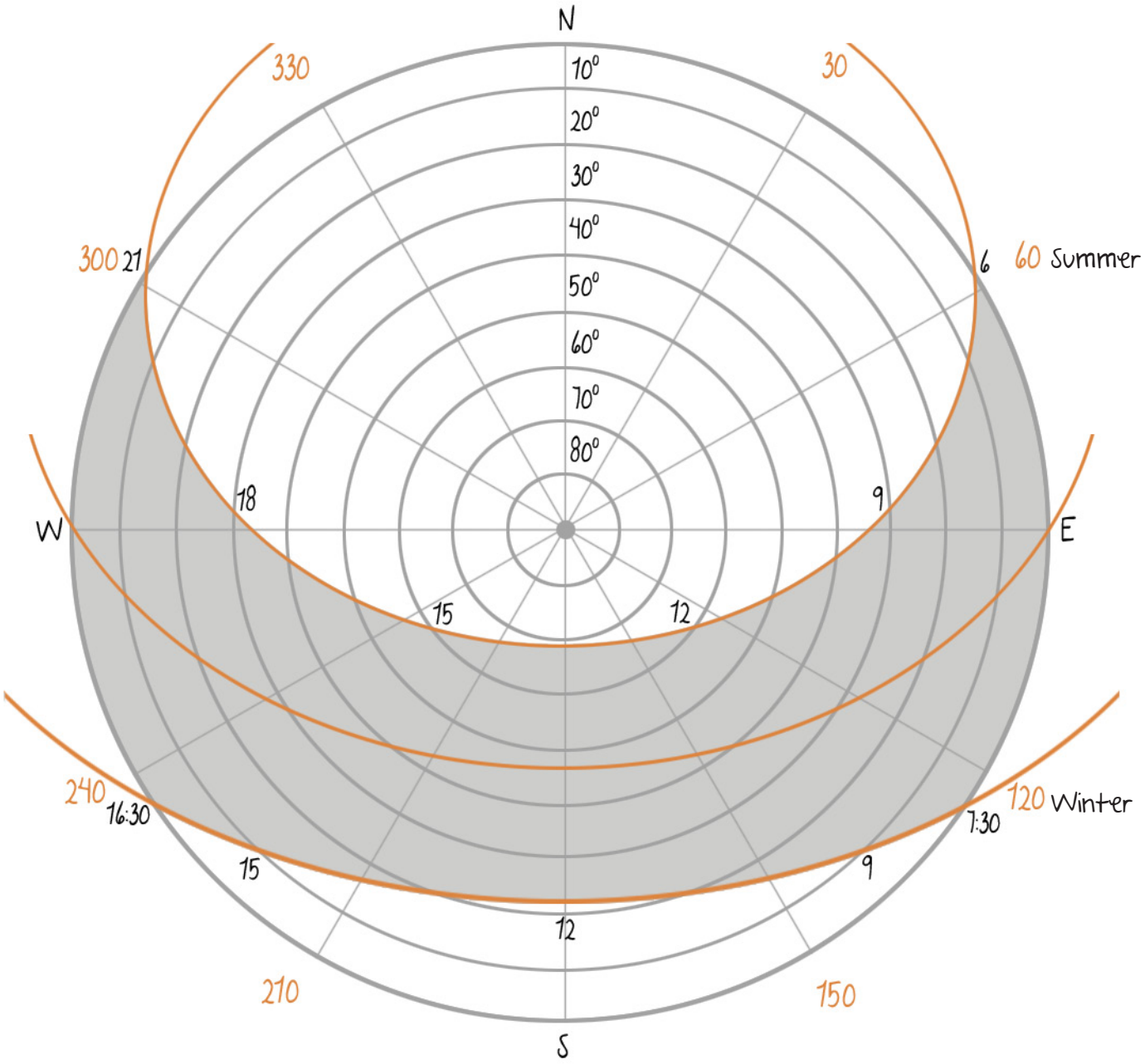


December

CLIMATE DATA

Sun Path

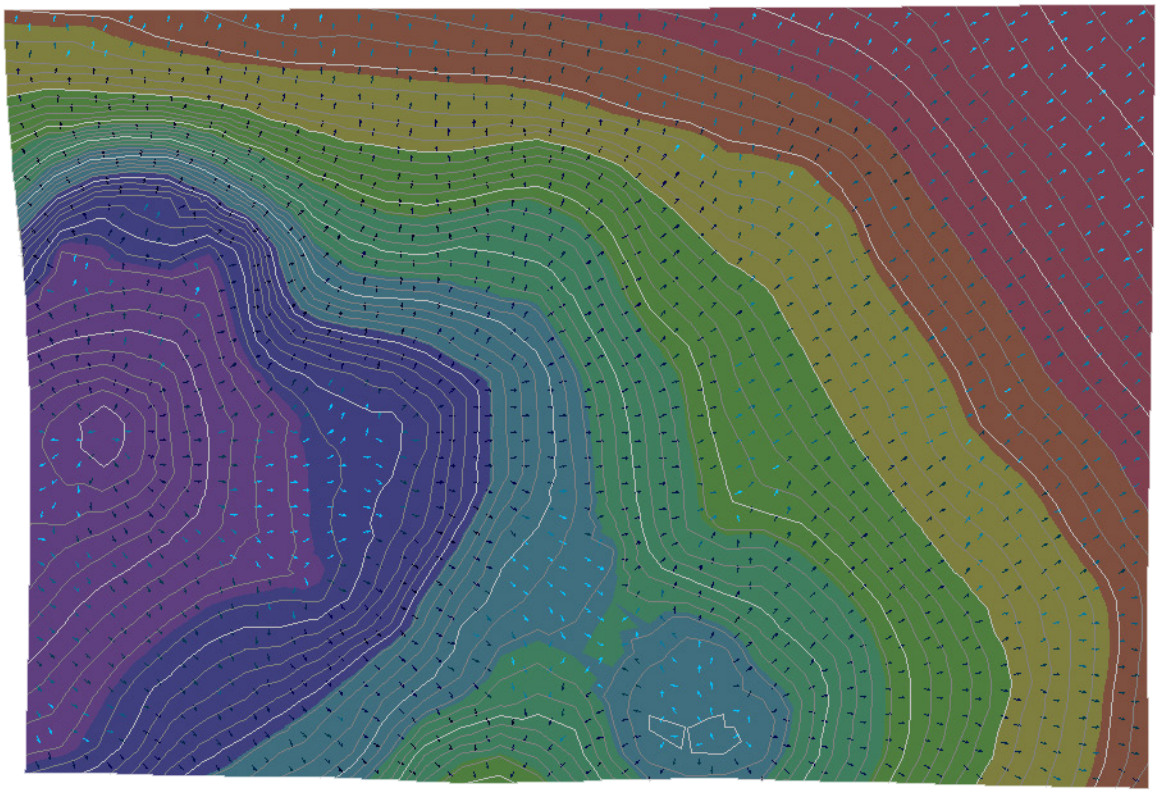


CLIMATE DATA

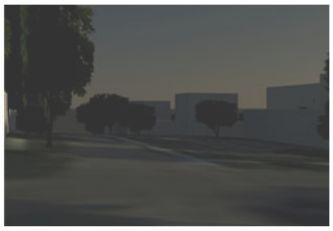
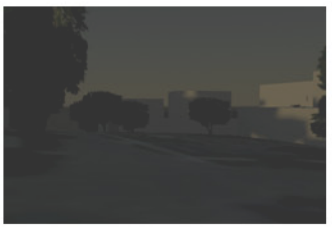
Slope & Topography

Number	Minimum Slope	Maximum Slope	Color
1	0.11%	3.94%	
2	3.94%	4.66%	
3	4.66%	5.07%	
4	5.07%	5.81%	
5	5.81%	6.96%	
6	6.96%	8.34%	
7	8.34%	11.47%	
8	11.47%	255.17%	

Number	Minimum Elevation	Maximum Elevation	Area	Color
1	1015.55	1034.07	292540.15	
2	1034.07	1040.86	297926.51	
3	1040.86	1049.98	333934.76	
4	1049.98	1062.58	325395.50	
5	1062.58	1075.38	313069.54	
6	1075.38	1088.46	305148.86	
7	1088.46	1103.11	299474.18	
8	1103.11	1121.59	261746.96	



CLIMATE DATA
Shading

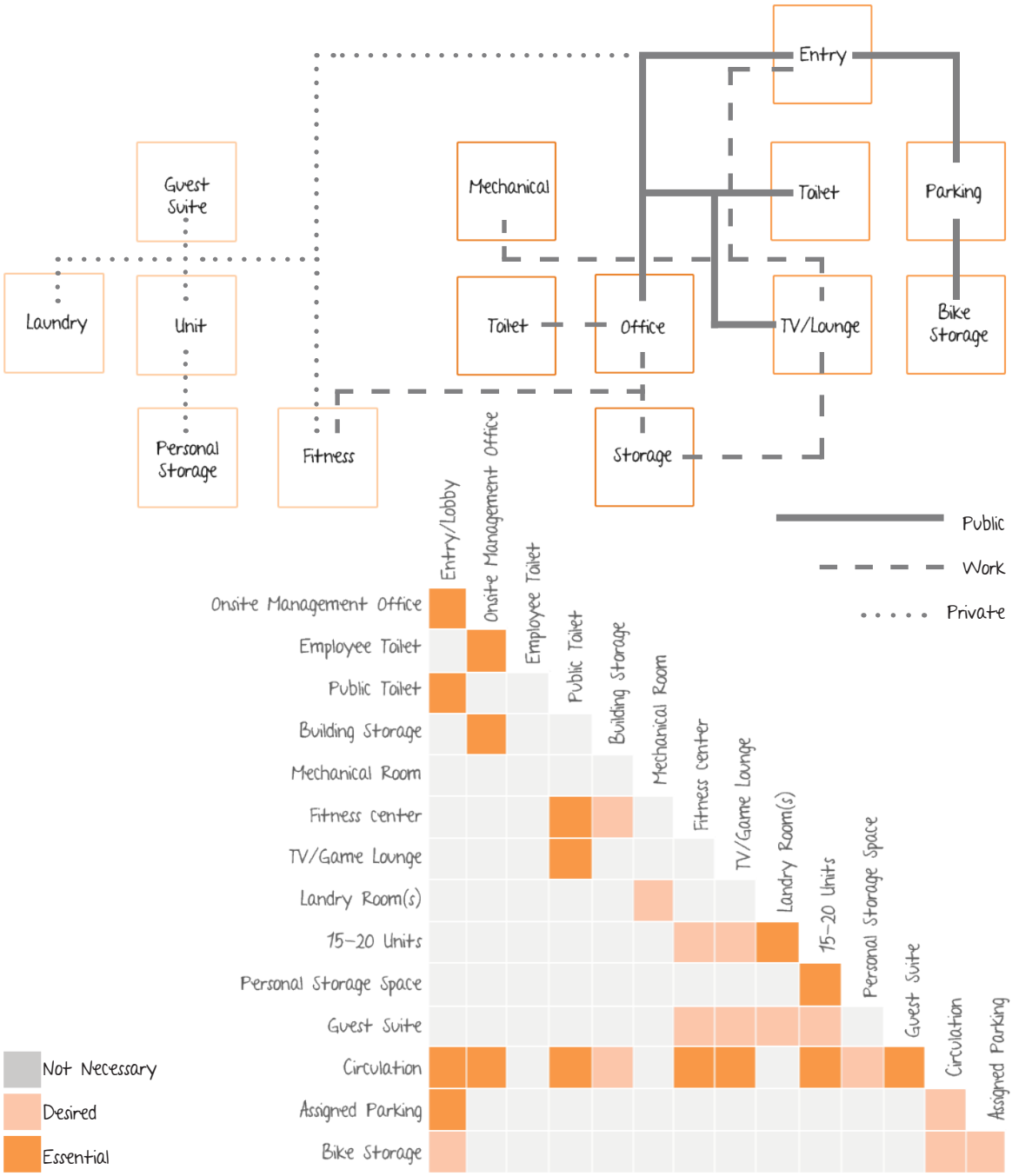
March 21	June 21	September 21	December 21
			
Sunrise	Sunrise	Sunrise	Sunrise
			
9:00 AM	9:00 AM	9:00 AM	9:00 AM
			
Noon	Noon	Noon	Noon
			
3:00 PM	3:00 PM	3:00 PM	3:00 PM
			
Sunset	6:00 PM	Sunset	Sunset
			
	Sunset		

PROGRAMMATIC REQUIREMENTS

Lobby & Entrance	200 ft^2	Company Office	100 ft^2
Public Toilets	100 ft^2	Employee Toilet	50 ft^2
TV/Game Lounge	240 ft^2	Storage	150 ft^2
		Mechanical	As needed
Parking	40 Cars	Fitness Center	360 ft^2
Bike Storage	150 ft^2	Residential Units	750–1300 ft^2
Circulation	10%	Guest Suite	900 ft^2
		Personal Storage	80 ft^2
		Laundry/Floor	100 ft^2
		Total	30,600 ft^2

PROGRAMMATIC REQUIREMENTS

Interaction Net & Matrix



REFERENCE LIST

Alexander, C. (1969). *Houses generated by patterns*. Berkley: Center for Environmental Structure.

Anderson, J., Bell, J., Cooper, T., & Grigal, D. (2001). Soils and landscapes of Minnesota. Unpublished raw data, College of Food, Agriculture, and Natural Resource Sciences, University of Minnesota, Minneapolis, Minnesota. Available from *U of M Extension*. Retrieved from http://www.extension.umn.edu/distribution/cropsystems/dc2331.html

Bertram, N. (2011, May/June). Factory house. *Architecture Australia: Housing futures*, 100(3), 79–82.

Friedman, A. (2002). *The adaptable house: designing homes for change*. New York: McGraw-Hill.

Gorman-Murray, A. & Dowling, R. (2011, May/June). Making home in contemporary Australia. *Architecture Australia: Housing futures*, 100(3), 45–46.

Hanada, Y. (1999, Summer). Seeing beyond dichotomies. *The Japan architect: Dimensions of the urban house*, 34, 16–18.

Hanson, K. (2007, November 20). Background of Mayo Clinic. Retrieved from http://ww2.rochestermn.com/background/of/mayo/clinic/story-351.html

Jett, M. (2011, December 6). Rue de Nord / Charles Henri-Tachon. *ArchDaily*, Retrieved http://www.archdaily.com/category/housing/

Jones, W. (2005). *New residential architecture: Radical approaches to contemporary housing*. London: Octopus Publishing Group Ltd.

Kiester, F. (1966). *Inside the endless house*. New York: Simon and Schuster.

Kronenburg, R. (2007). *Flexible: architecture that responds to change*. London: Laurence King Publishing Ltd.

Marmol, L. (2009, February). Leo marmol on the future of prefab. *Dwell*, 09(03), Retrieved from http://www.dwell.com/articles/on-the-future-of-prefab-leo-marmol.html

Mostaedi, A. (2006). *Great spaces: flexible homes*. Barcelona: Carles Broto.

Mould, P. (2011, May/June). SEPP 65. *Architecture Australia:* Housing futures, 100(3), 49.

Plunz, R (1990). *A history of housing in New York City*. New York: Columbia University Press.

Saieh, N. (2009, March 11). Mountain dwellings / BIG with JDS. *ArchDaily*, Retrieved from http://www.archdaily.com/15022/mountain-dwellings-big/

Schneider, T & Till, J. (2007). *Flexible housing*. Oxford: Elsevier Inc.

Schoenauer, N (1992). *History of housing*. Montreal: McGill University Printing Service. Connecticut: The Taunton Press, Inc.

Sellnow, G. (2008, June 11). Rochester builds. Retrieved from http://ww2.rochestermn.com/rochester/builds/story-792.html

Susanka, S. (1998). *The not so big house*. Connecticut: The Taunton Press, Inc.

Sylvester, M. (2009, February). Pretty fabulous. *Dwell*, 09(03), Retrieved from http://www.dwell.com/articles/pretty-fabulous.html

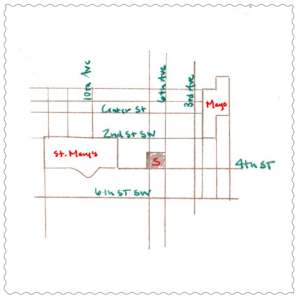
Viladas, P. (2001, August 16). San Francisco opens the gate, and modern rushes in: A city protective of its tradition confronts the new.. Retrieved from http://www.yerbabuenalofts.com/press.html

VM Bjerget. (n.d.). Retrieved from http://www.vmbjerget.dk/vmbjerget.html

Yerba Buena Lofts. (2004). Retrieved from http://www.yerbabuenalofts.com/

PROCESS


Center St
Mayo
2nd St SW
St. Mary's
S
4th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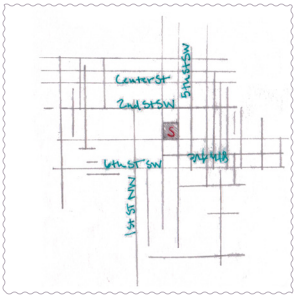
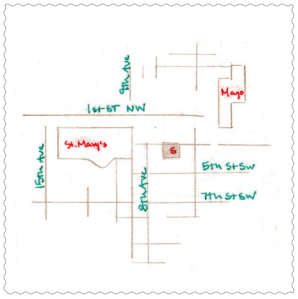
6th Ave
3rd Ave
Center St
Mayo
2nd St SW
St. Mary's
S
4th ST
6th ST SW


Center St
2nd St SW
5th St SW
S
6th ST SW
7th St SW
1st ST NW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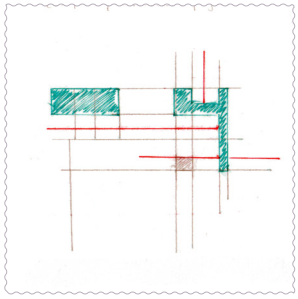
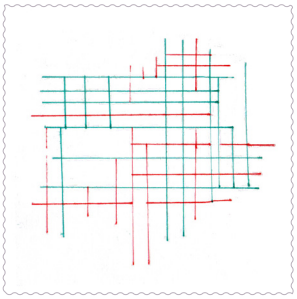
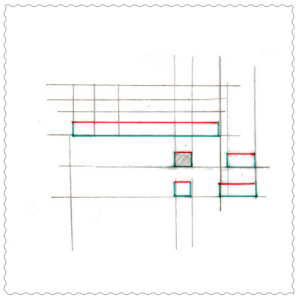
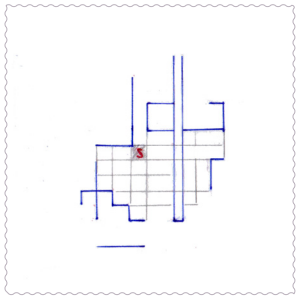
St. Mary's
S
15th Ave
5th St SW
8th Ave
7th St SW





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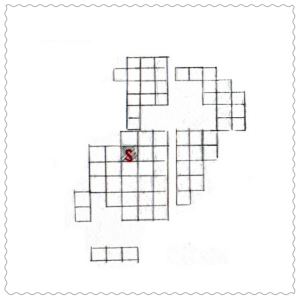
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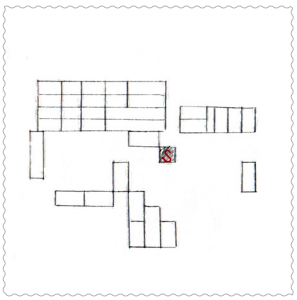
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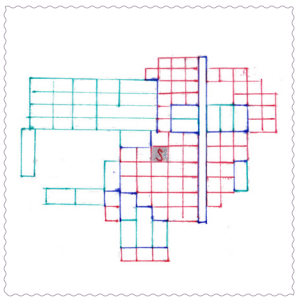
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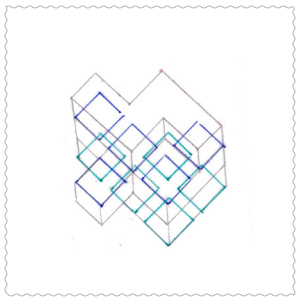
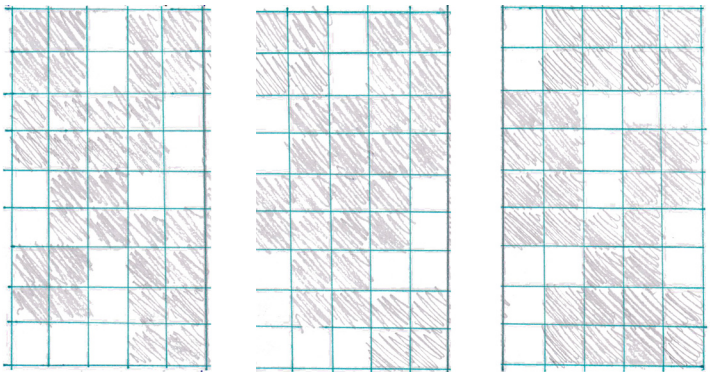
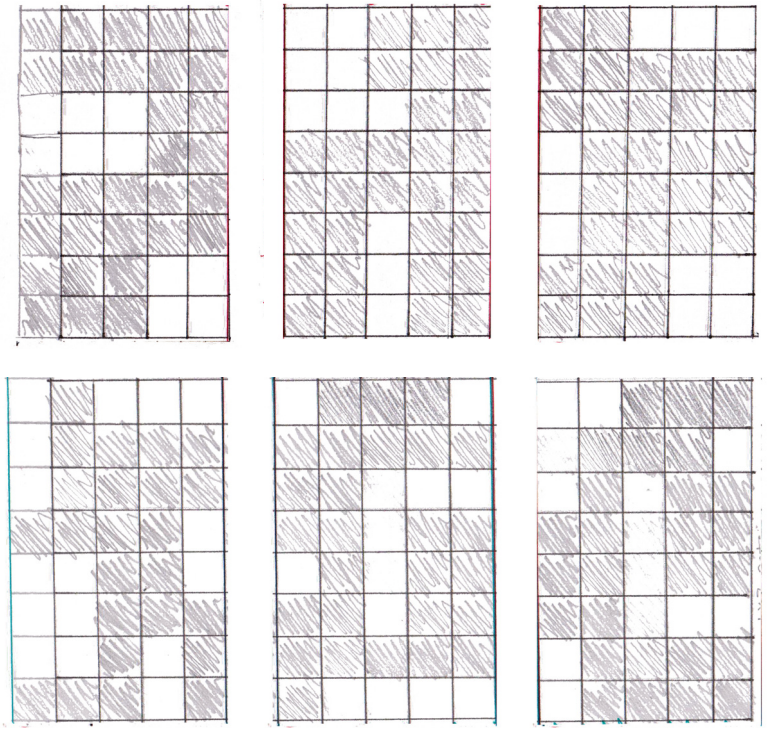


PROCESS

Grid Studies





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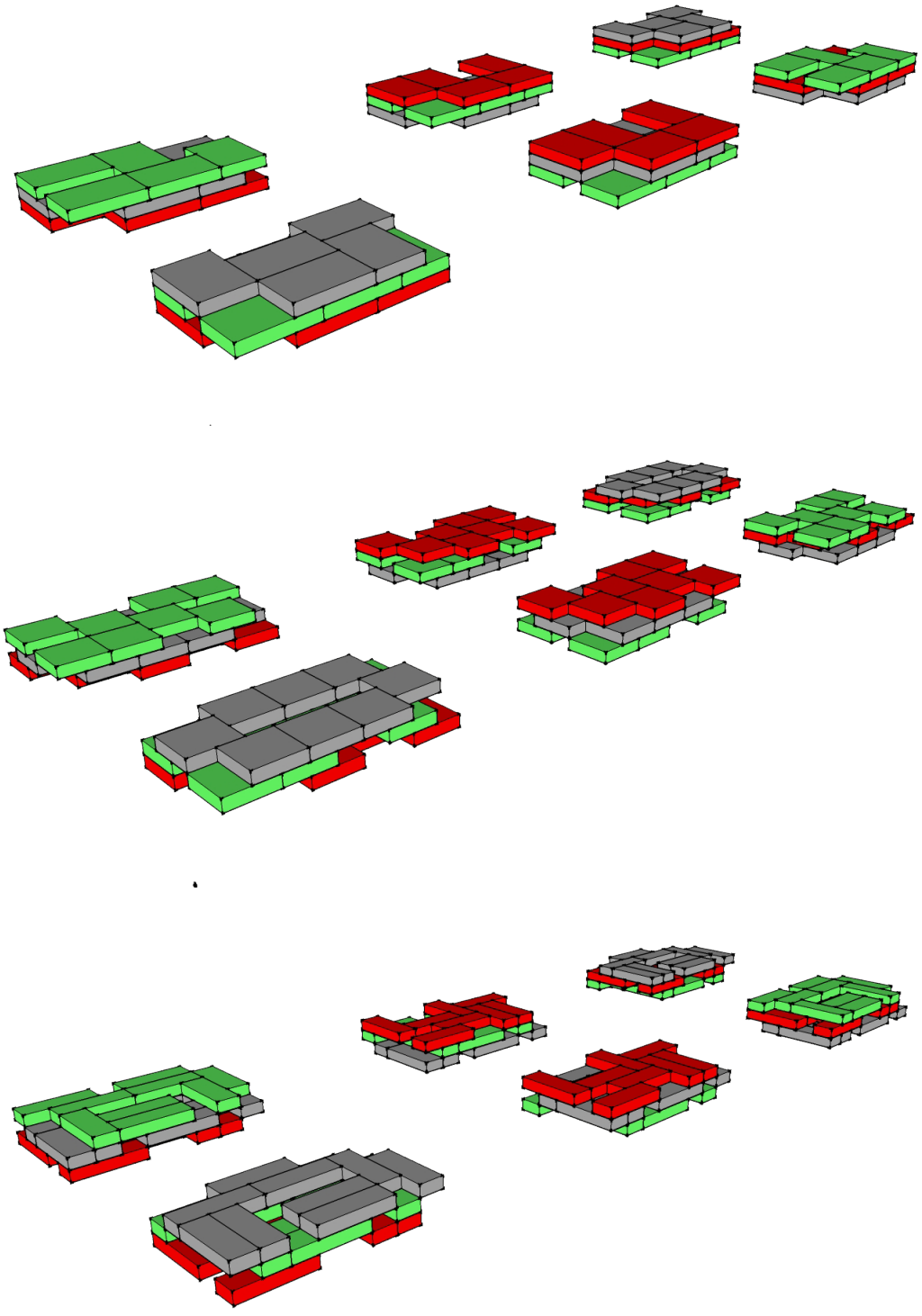
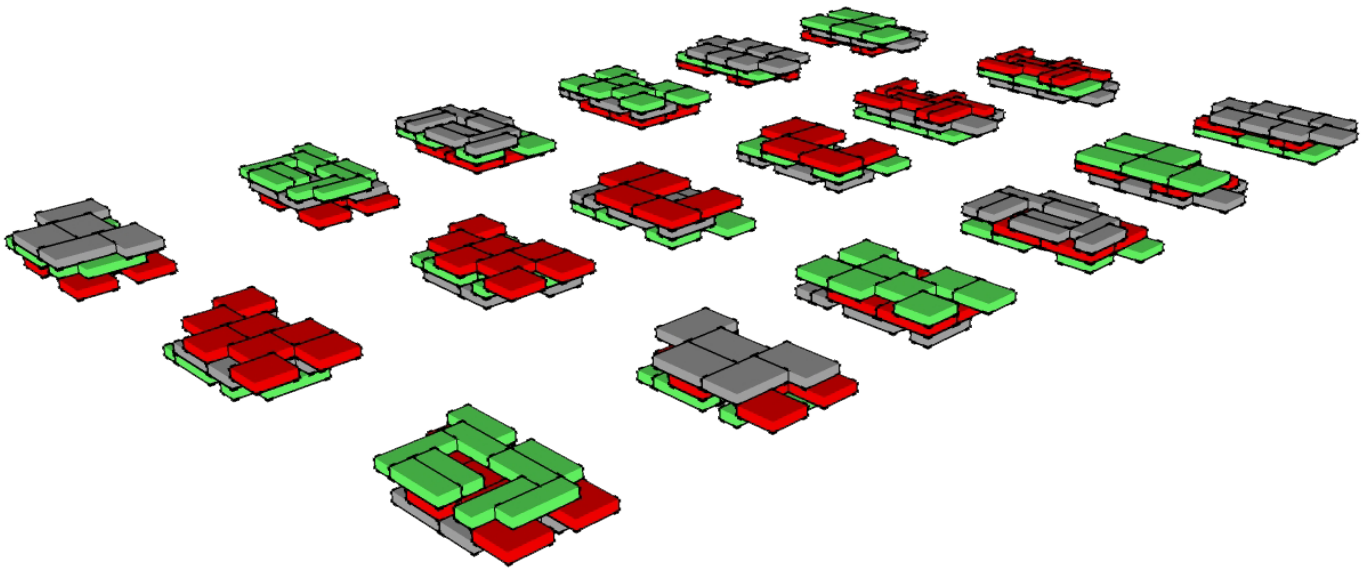
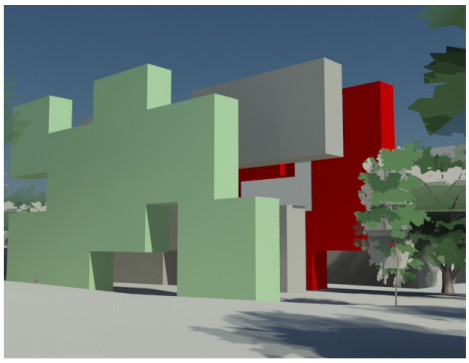
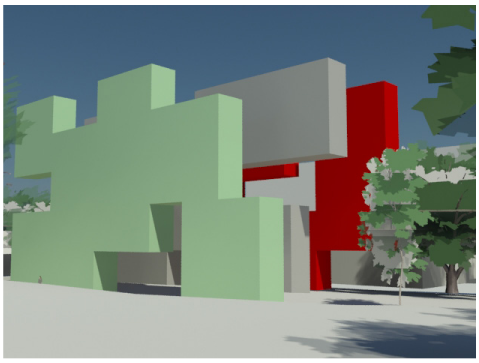


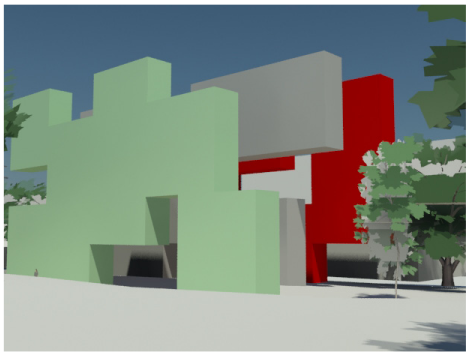
3 Dimensional Grid Studies

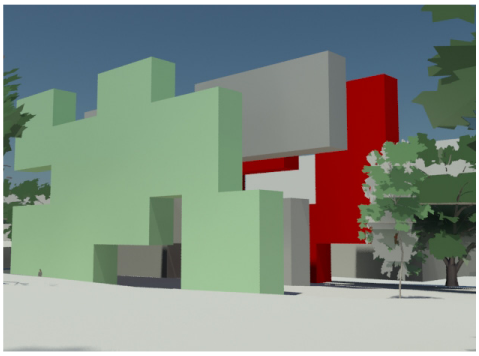


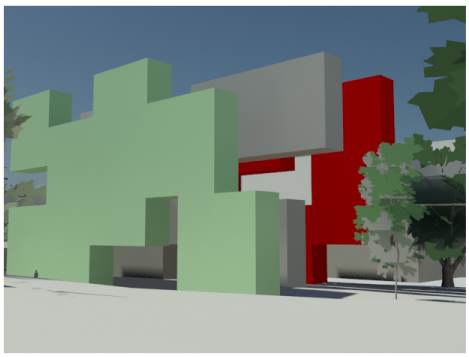
PROCESS
Sun Studies

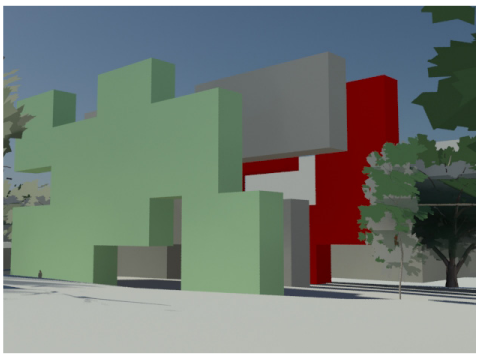


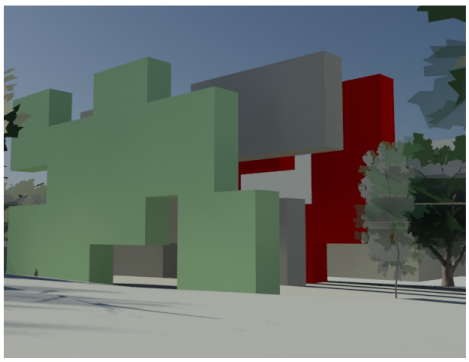


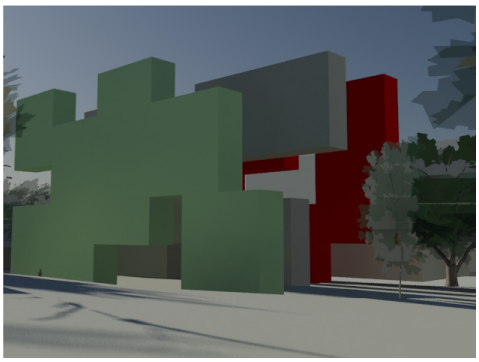




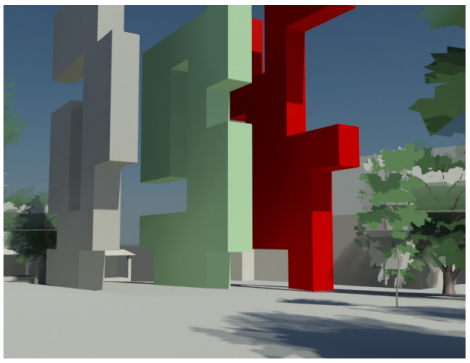
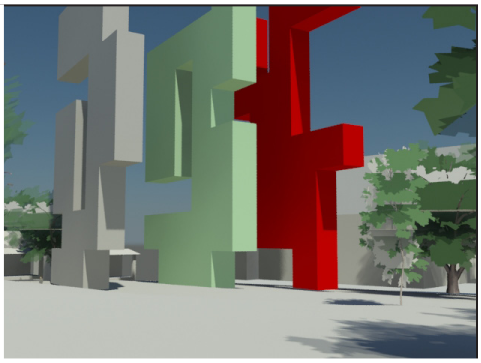
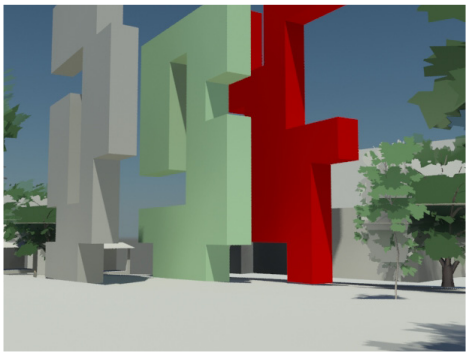
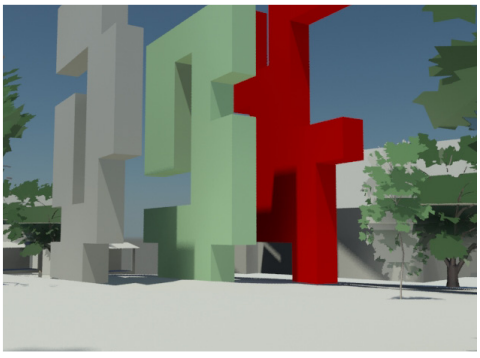
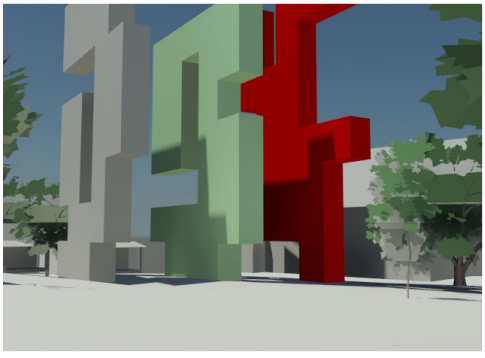
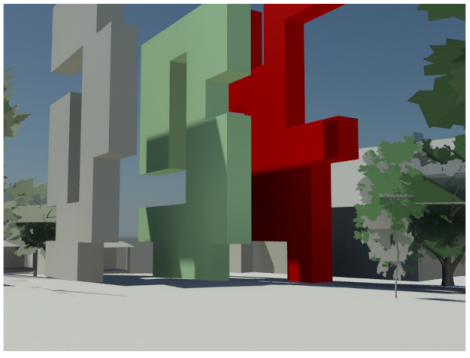
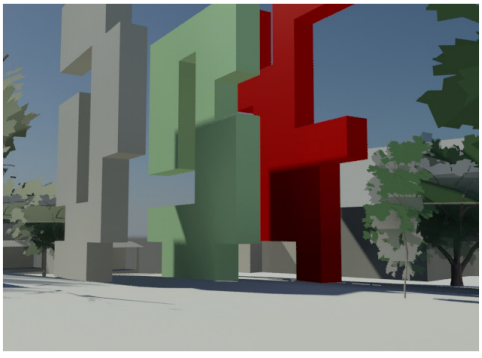
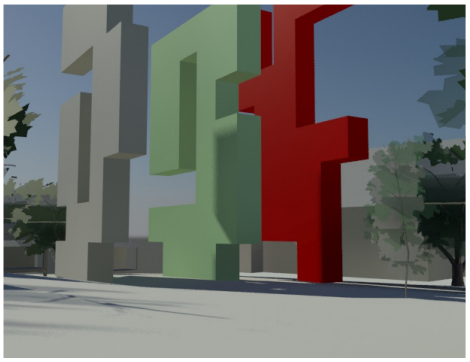
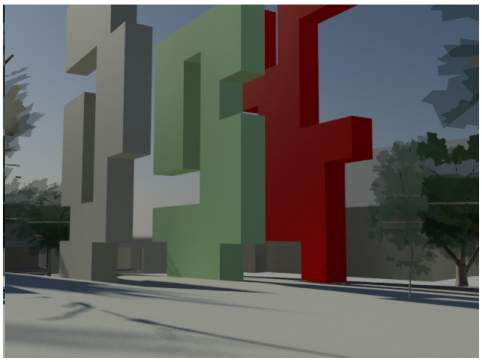


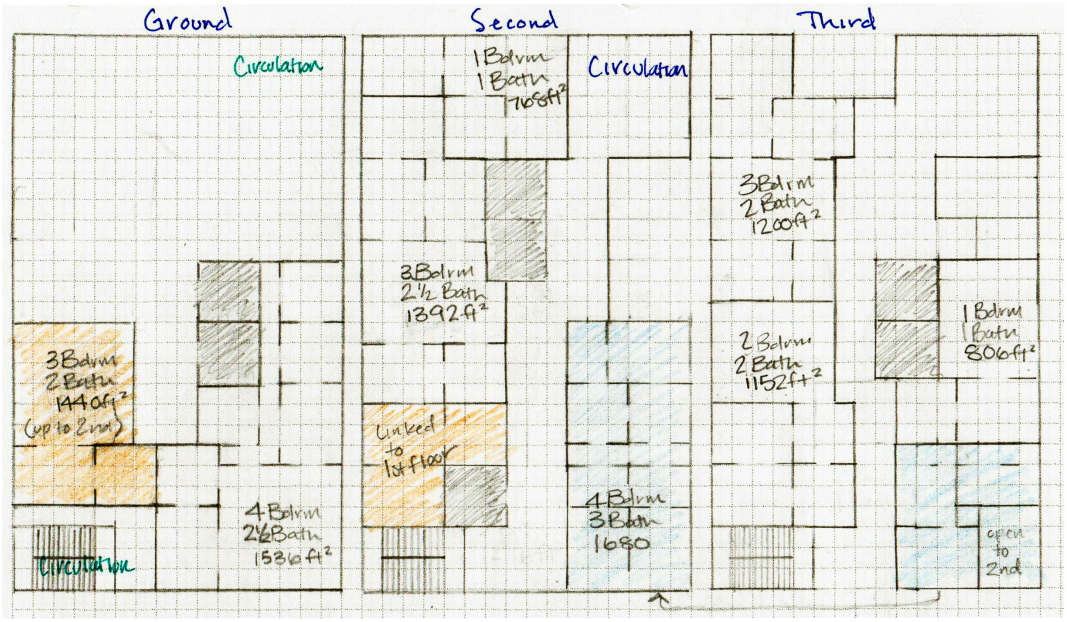


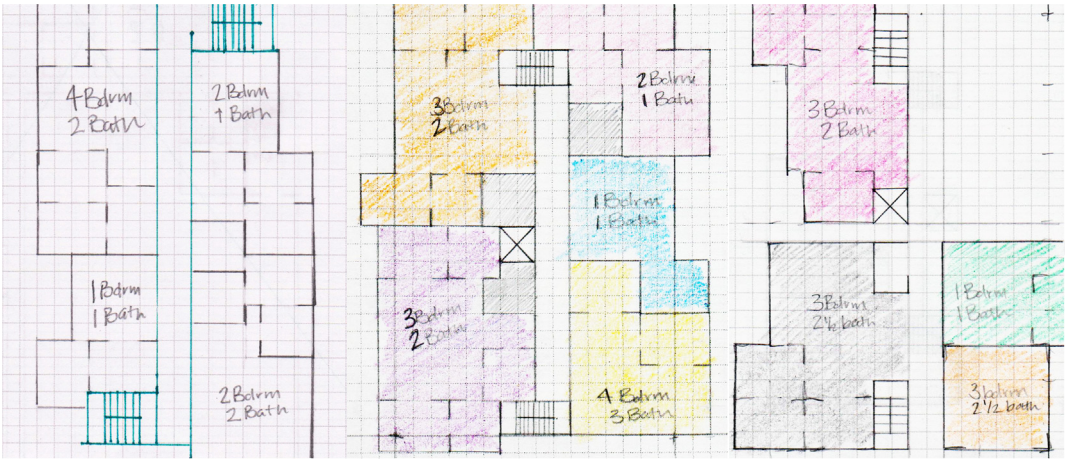




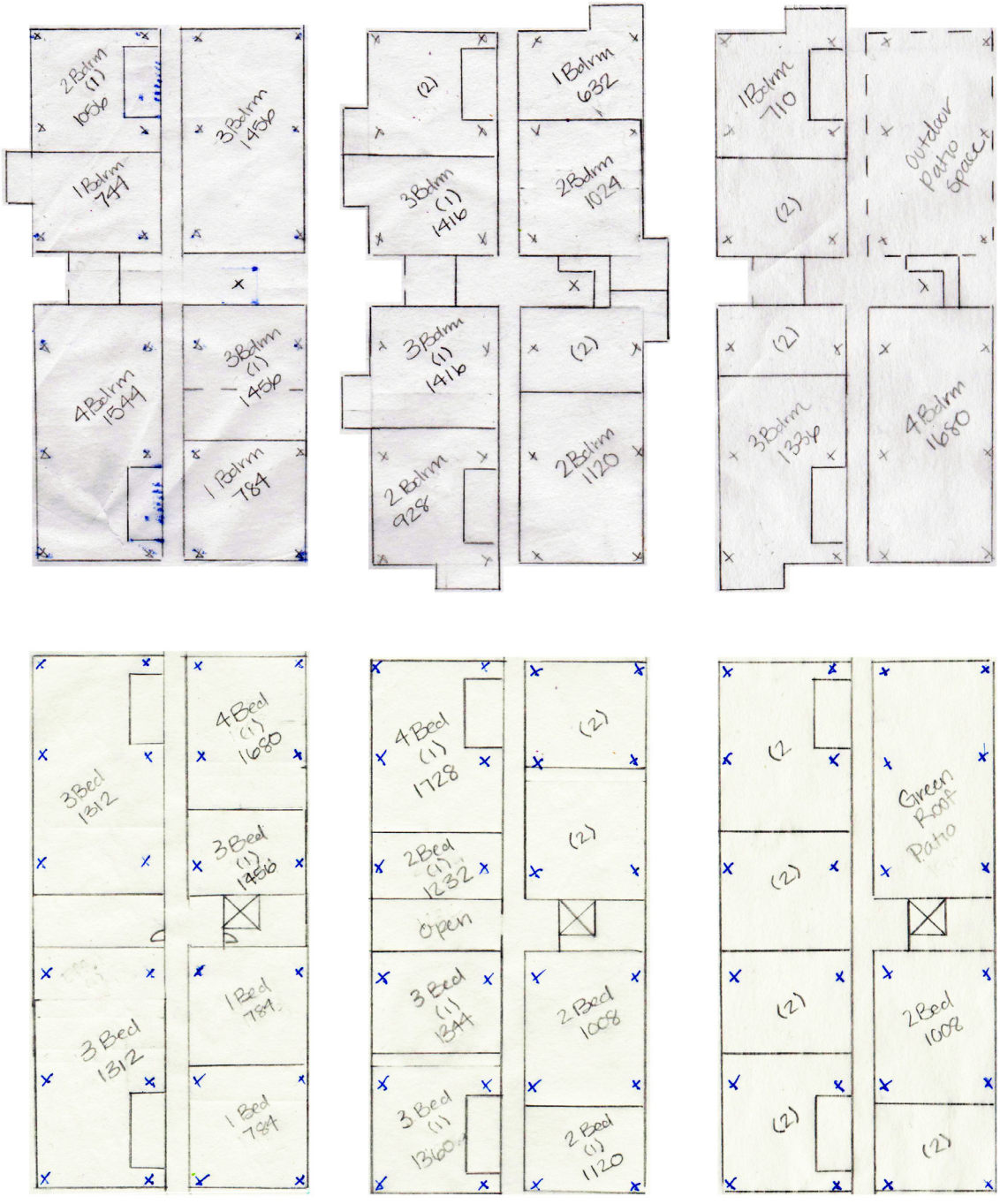
PROCESS
Sun Studies

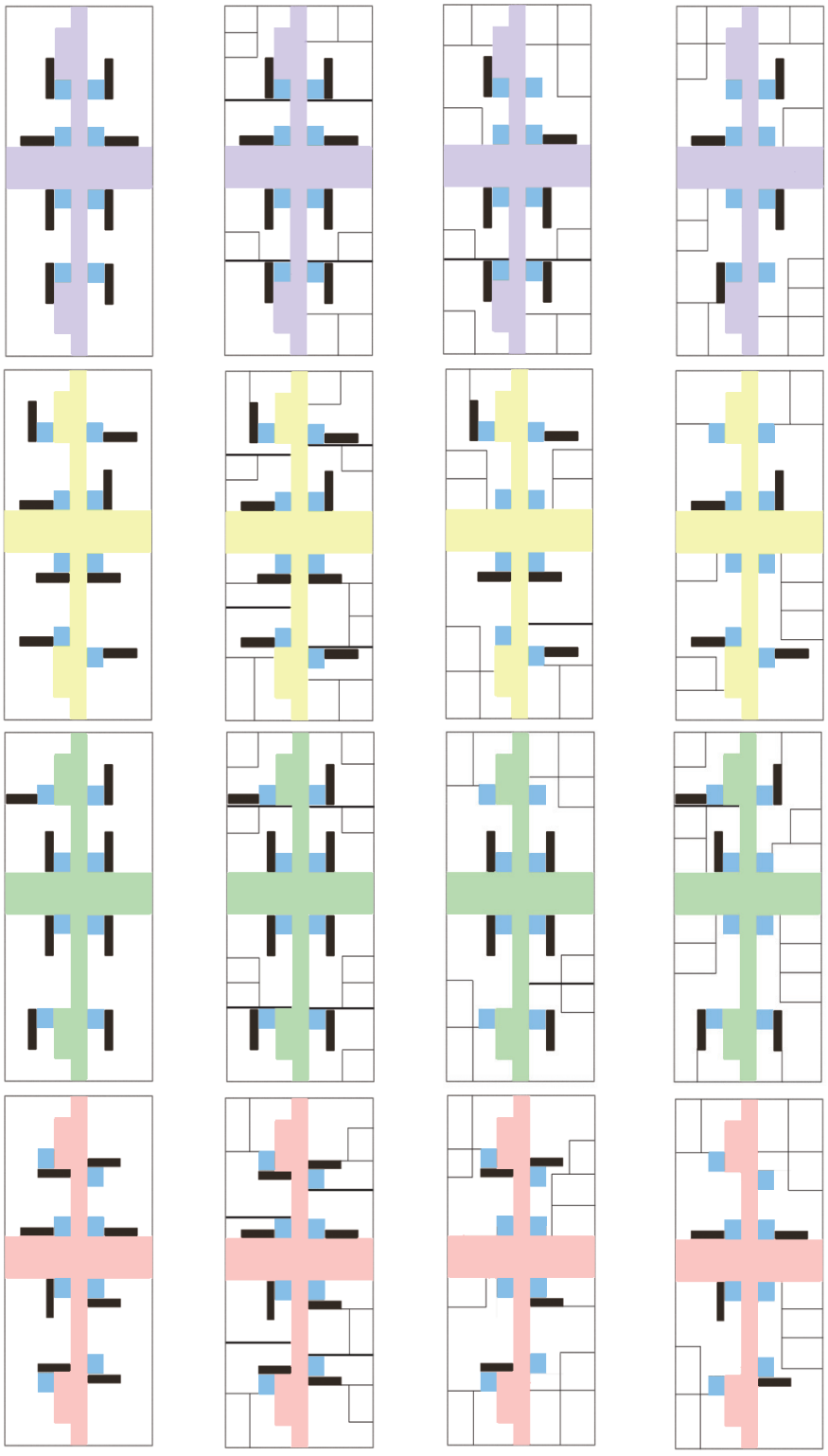

Ground
Second
Third
Circulation
1 Bdrm
1 Bath
765ft²
Circulation
3 Bdrm
2 Bath
1200ft²
3 Bdrm
2 ½ Bath
1392ft²
1 Bdrm
1 Bath
806ft²
3 Bdrm
2 Bath
144 0ft²
(up to 2nd)
2 Bdrm
2 Bath
1152ft²
Linked
to
1st floor
4 Bdrm
3 Bath
1680
4 Bdrm
2½ Bath
1536 ft²
Circulation
open
to
2nd


4 Bdrm
2 Bath
2 Bdrm
1 Bath
3 Bdrm
2 Bath
2 Bdrm
1 Bath
1 Bdrm
1 Bath
3 Bdrm
2 Bath
1 Bdrm
1 Bath
3 Bdrm
2½ bath
2 Bdrm
2 Bath
4 Bdrm
3 Bath
1 Bdrm
1 Bath
3 Bdrm
2½ bath

Column Placement and Refined Plans



Kitchen and Bathroom Layouts



PROJECT DOCUMENTATION





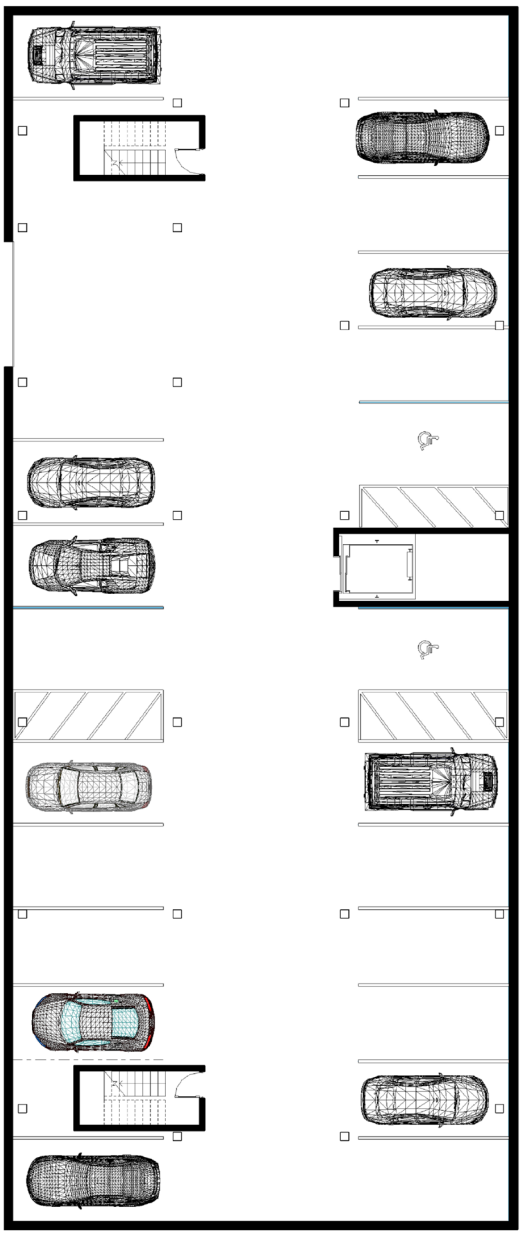


PROJECT DOCUMENTATION

Site Plan

PROJECT DOCUMENTATION

Underground Parking & Ground Level

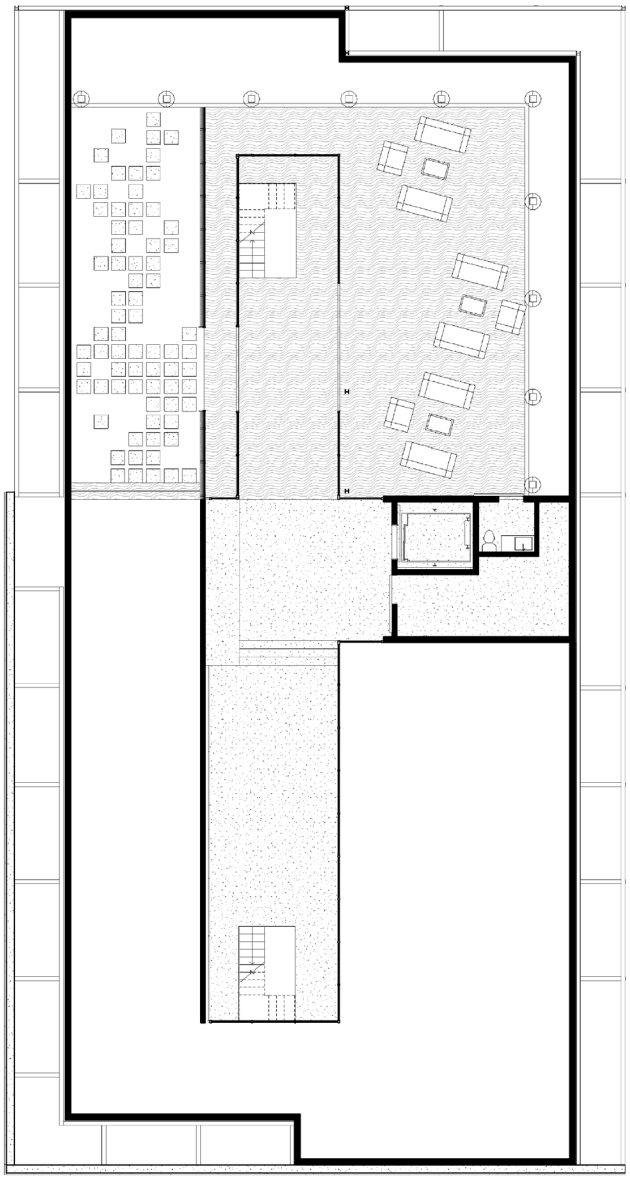


PROJECT DOCUMENTATION

Second & Third Level

PROJECT DOCUMENTATION

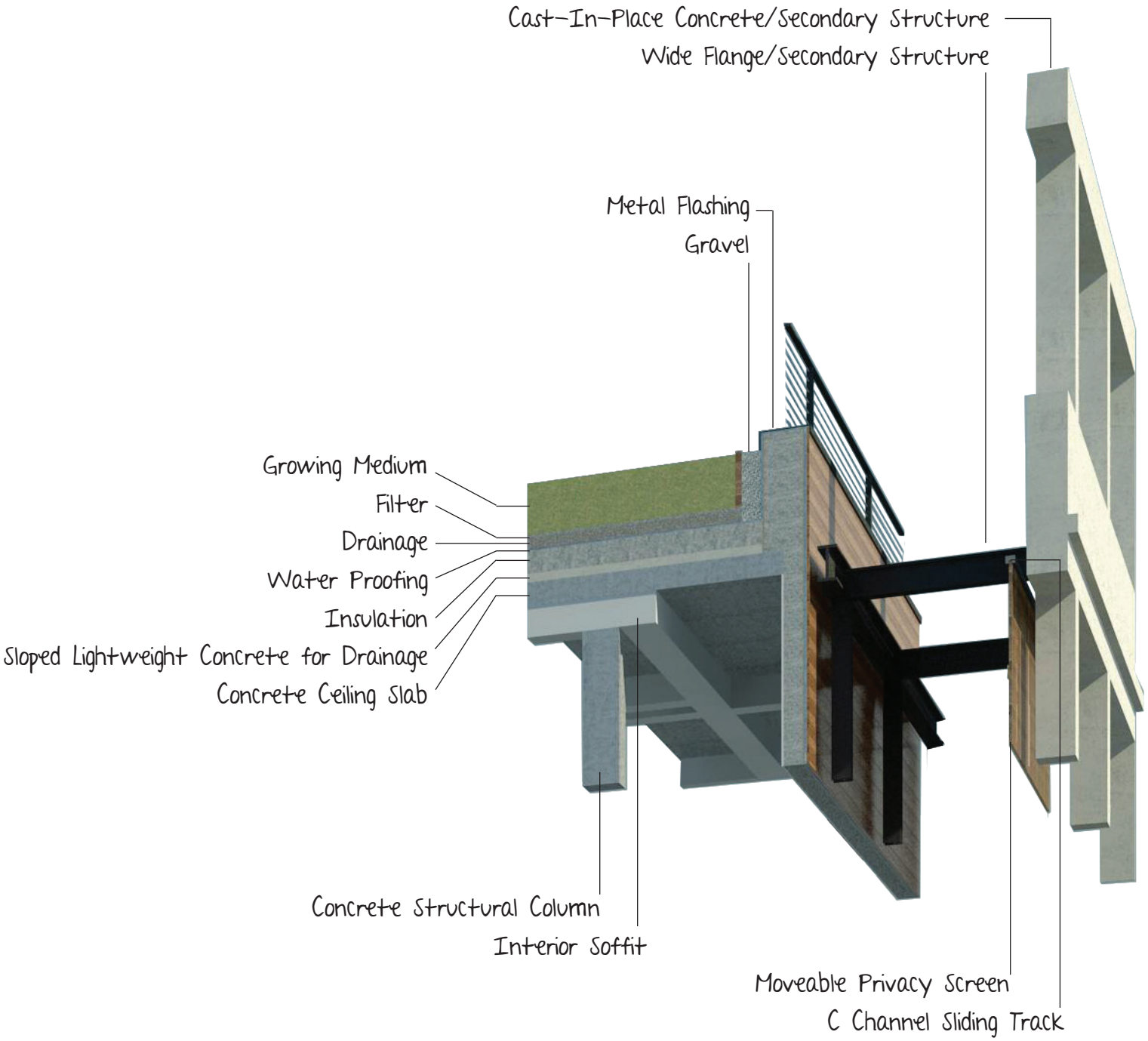
Fourth Level & Roof Garden



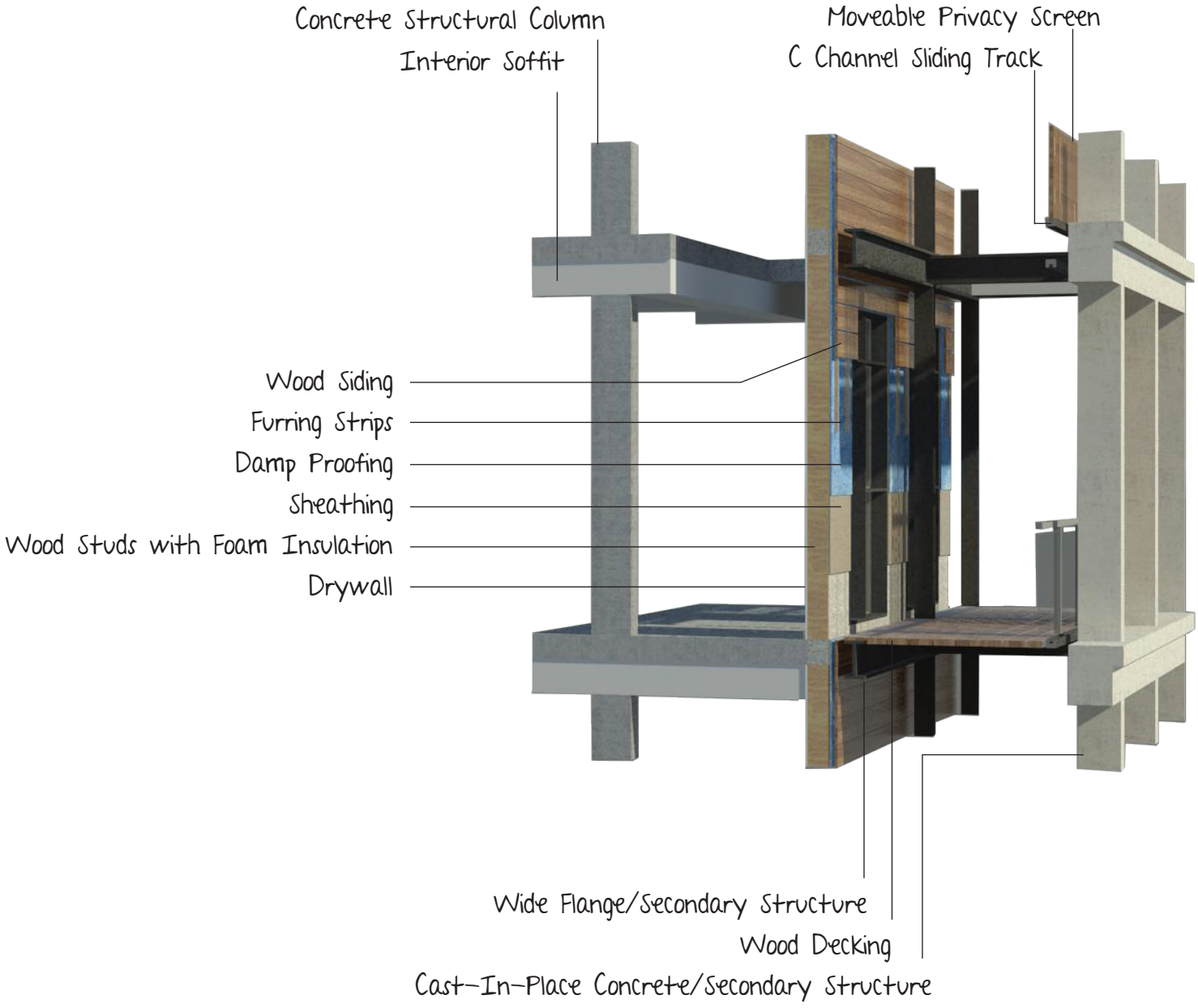
PROJECT DOCUMENTATION

Section Perspective

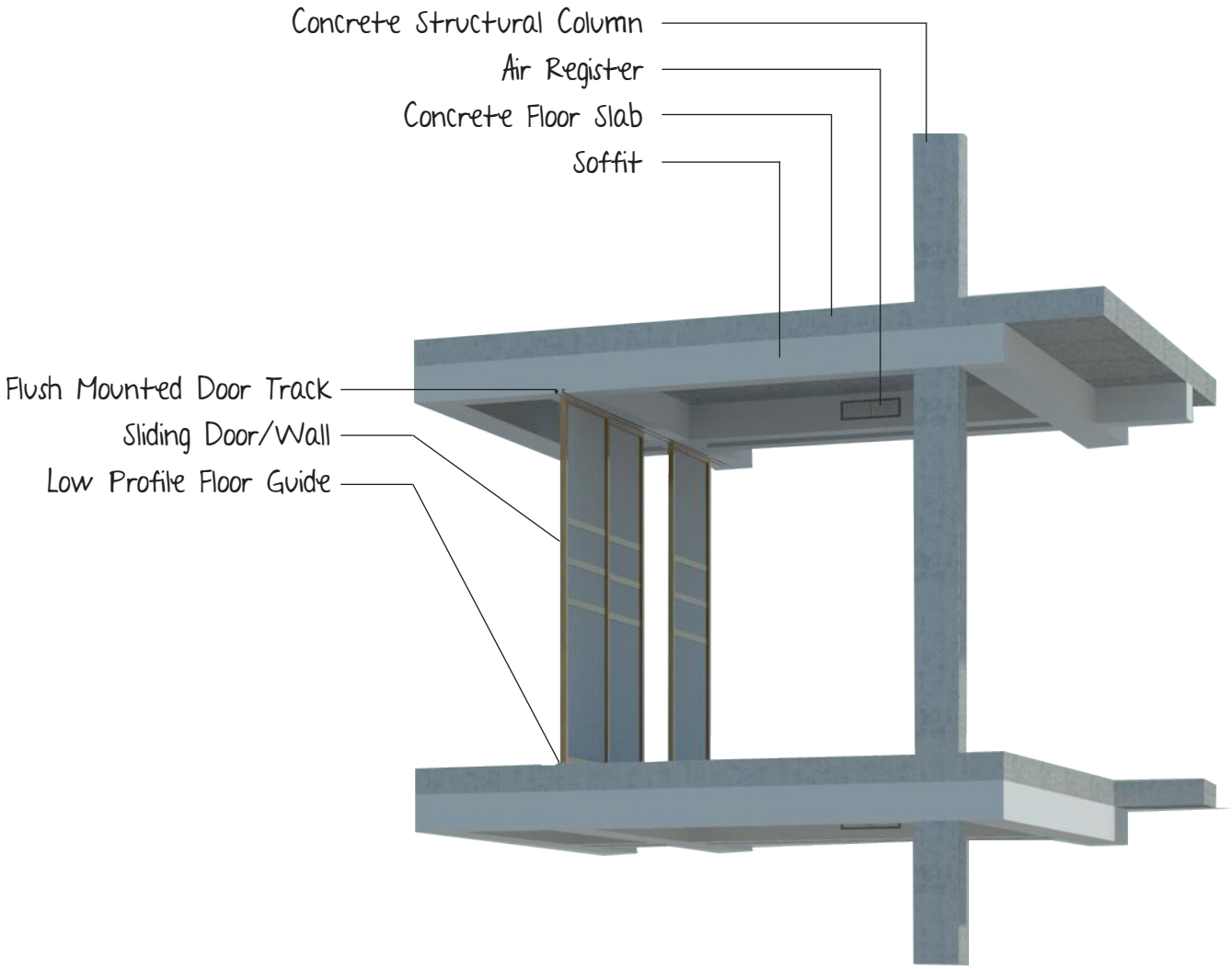
Roof Detail

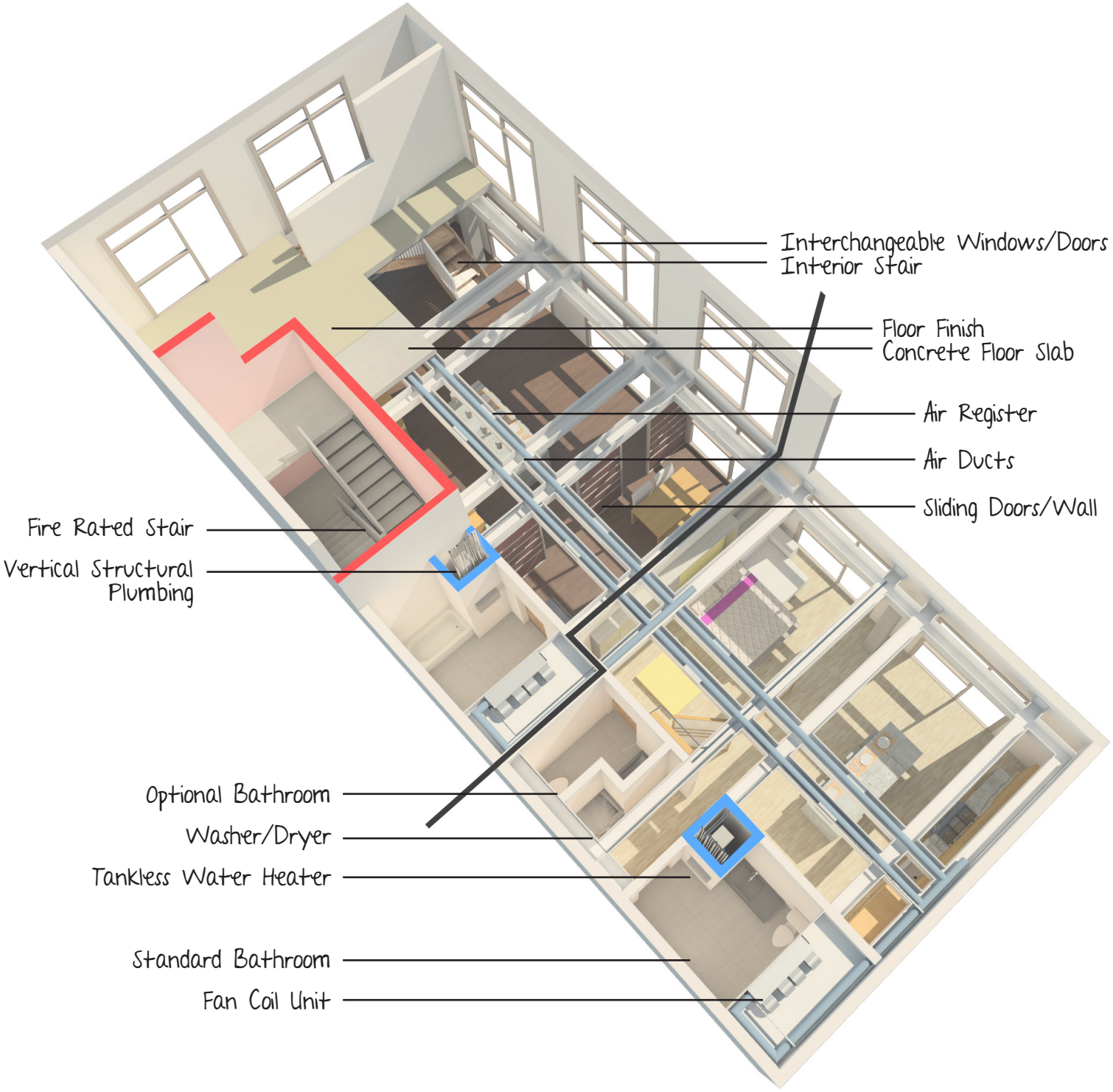

Cast-In-Place Concrete/Secondary Structure
Wide Flange/Secondary Structure
Metal Flashing
Gravel
Growing Medium
Filter
Drainage
Water Proofing
Insulation
Sloped Lightweight Concrete for Drainage
Concrete Ceiling Slab
Concrete Structural Column
Interior Soffit
Moveable Privacy Screen
C Channel Sliding Track

Exterior Wall Detail



Interior Wall Detail




Interchangeable Windows/Doors
Interior Stair
Floor Finish
Concrete Floor Slab
Air Register
Air Ducts
Sliding Doors/Wall
Fire Rated Stair
Vertical Structural Plumbing
Optional Bathroom
Washer/Dryer
Tankless Water Heater
Standard Bathroom
Fan Coil Unit

Southeast Approach

Northwest Approach

Entry

PROJECT DOCUMENTATION

Living Room

Bedroom

Kitchen

Private Patio

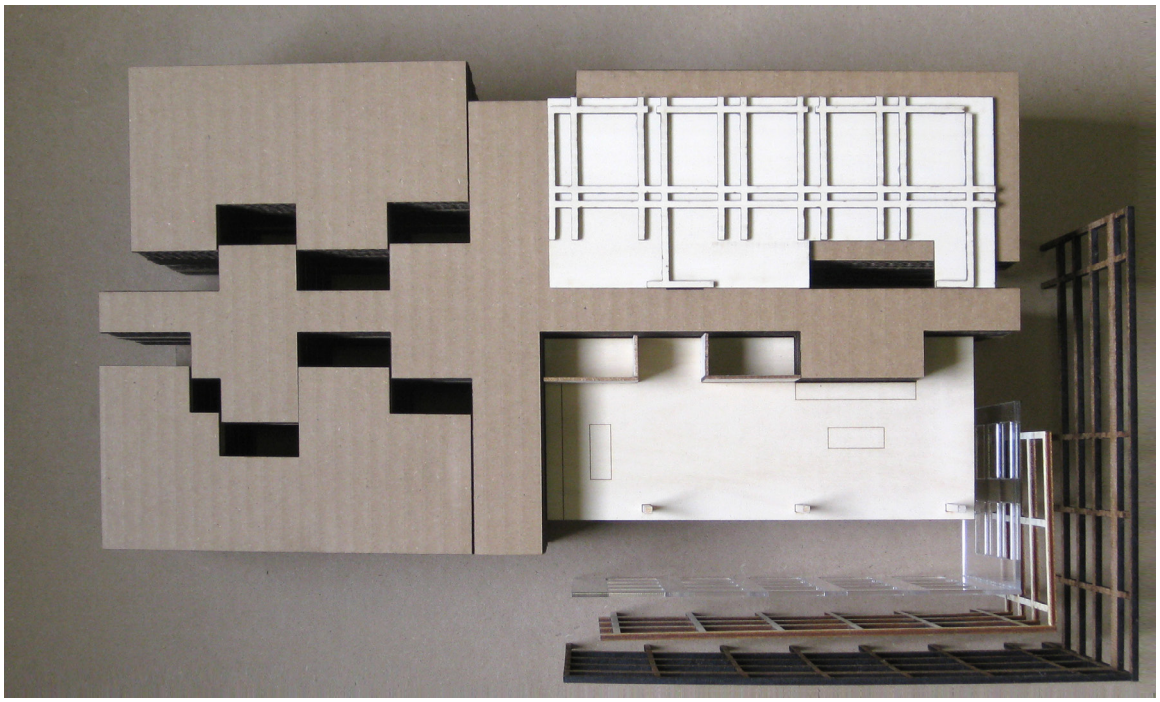
Private Patio

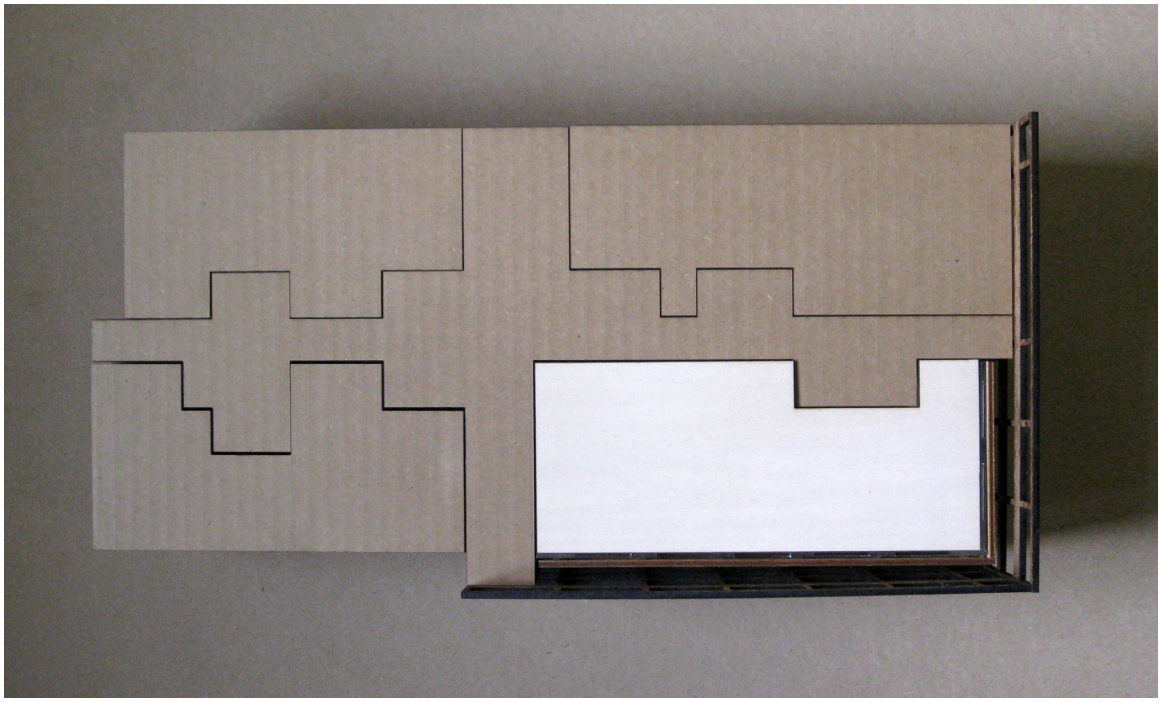
Roof Deck

PROJECT DOCUMENTATION

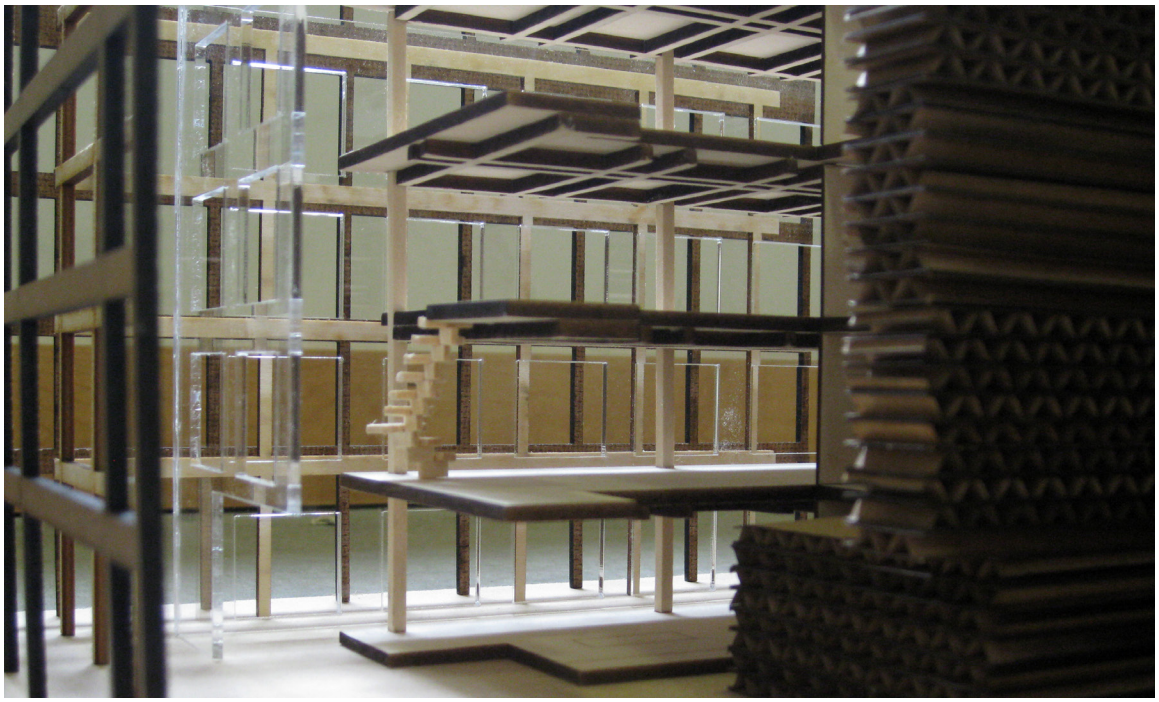
Roof Garden

Model





Model



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"If I could do it all over again, I would be exactly where I am today."